DRAFT ENVIRONMENTAL IMPACT REPORT
FOR THE
BELMONT VILLAGE ENCINITAS-BY-THE-SEA PROJECT
VOLUME II: APPENDICES
SCH NO. 2019100475

April 2020

Prepared for:
City of Encinitas

Prepared by:
BRG Consulting, Inc.

DRAFT
ENVIRONMENTAL IMPACT REPORT
VOL. 2: APPENDICES

BELMONT VILLAGE ENCINITAS-BY-THE-SEA PROJECT
CARDIFF, CALIFORNIA

SCH No. 2019100475

Lead Agency:
CITY OF ENCINITAS
DEVELOPMENT SERVICES DEPARTMENT
505 SOUTH VULCAN AVENUE
ENCINITAS, CALIFORNIA 92024

Prepared by
BRG Consulting
304 Ivy Street
San Diego, CA 95825
Telephone: (619) 298-7127

APRIL 2020

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Prepared by MJS Landscape Architecture. June 17, 2019

A-1

Notice of Preparation / Public Comments Received

City of Encinitas
Notice of Preparation of a
Draft Environmental Impact Report

Project: Belmont Village Encinitas-by-the-Sea; **Location:** 3111 Manchester Avenue, Encinitas, California**;** **Project Applicant:** Greystar, Inc.; **Project Case Number:** 17-273 TMDB/MUP/DR/CDP

Acting as a lead agency for the California Environmental Quality Act (CEQA), the Planning Division of the City of Encinitas is issuing this Notice of Preparation for the proposed Belmont Village Encinitas-by-the-Sea project, located at 3111 Manchester Avenue, in the Cardiff-by-the-Sea community of Encinitas.

A Draft Environmental Impact Report (EIR) will be prepared to evaluate the potential environmental effects of the proposed project. The EIR will identify any potentially significant impacts, propose feasible mitigation measures to reduce or eliminate potentially significant environmental impacts, and discuss feasible alternatives to the project that may accomplish basic project objectives while lessening or eliminating any of the project's significant impacts.

It is anticipated that the EIR will focus on the following environmental issue areas: aesthetics, agricultural and forestry resources, biological resources, cultural and paleontological resources, geology and soils, greenhouse gas emissions, hydrology and water quality, transportation, and tribal cultural resources. Other required sections of CEQA will also be addressed including cumulative impacts, growth inducement and project alternatives.

For purposes of this notice, the City of Encinitas is soliciting the views of public agencies and other interested parties regarding the scope and content of the Draft EIR for the project. Please send your comments no later than **November 4, 2019** to Scott Vurbeff, Environmental Project Manager, Encinitas Planning Division, 505 S. Vulcan Avenue, Encinitas, CA 92024, or via e-mail to svurbeff@encinitasca.gov. Additional information about the proposed project may be obtained on the city's website at: http://encinitasca.gov/I-Want-To/Public-Notices/Development-Services-Public-Notices under "Environmental Notices".

Project Location: The approximately 19.027-acre project site is located at 3111 Manchester Ave., in the Cardiff-by-the-Sea community of Encinitas, San Diego County, California (Figure 1). The County Assessor's Parcel Numbers (APNs) associated with the project are: 261-210-01 and -12.

Project Description: The project proposes to subdivide a 19.027-acre parcel into 9 lots to accommodate the development of a senior care facility and affordable housing units. Two additional open space lots (5.049 acres and 0.211 acres) and a 1.24-acre private street lot would be provided. The two-story senior care building would be 216,000 square feet (SF) in size and would provide 200 senior care units along with 60,000 SF of common area. The residential lots would be developed with 16 housing units in 8 two-story structures. Of these 16 units, 15 would be designated as affordable housing. A total of 183 parking spaces would be provided for both uses. Primary access to the site would be provide from a new Caltrans spine road off Manchester Ave. Emergency access would be provided from Manchester Ave. via a secondary access at the southeast corner of the site.

The project requires approval of a Tentative Map Density Bonus, Planned Residential Development Permit, Major Use Permit, Design Review and Coastal Development Permit by the City of Encinitas Development Services Department.

SOURCE: Basemap- Esri

BRG CONSULTING, INC.

Project Location Map

3111 Manchester Avenue

Figure 1

U.S. FISH AND WILDLIFE SERVICE
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

CALIFORNIA DEPARTMENT OF
FISH AND WILDLIFE
South Coast Region
3883 Ruffin Road
San Diego, California 92123

In Reply Refer to:
FWS/CDFW-20B0020-20CPA0022

November 1, 2019
Sent by Email

Mr. Scott Vurbeff
Environmental Project Manager
Encinitas Planning Division
505 South Vulcan Avenue
Encinitas, CA 92024
svurbeff@encinitasca.gov

Subject: Comments on the Notice of Preparation of an Environmental Impact Report for the Belmont Village Encinitas-by-the-Sea Project

Dear Mr. Vurbeff:

The U.S. Fish and Wildlife Service (Service) and the California Department of Fish and Wildlife (Department), hereafter collectively referred to as the Wildlife Agencies, have reviewed the above-referenced Notice of Preparation (NOP) dated October 3, 2019. The Wildlife Agencies have identified potential effects of this project on wildlife and sensitive habitats. The project details provided herein are based on the information provided in the NOP and associated documents. The comments and recommendations provided are based on our knowledge of sensitive and declining vegetation communities in the County of San Diego and our participation in regional conservation planning efforts.

The primary concern and mandate of the Service is the protection of public fish and wildlife resources and their habitats. The Service has legal responsibility for the welfare of migratory birds, anadromous fish, and endangered animals and plants occurring in the United States. The Service is also responsible for administering the Federal Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq*.), including habitat conservation plans (HCP) developed under section 10(a)(1)(B) of the Act. The Department is a Trustee Agency and a Responsible Agency pursuant to the California Environmental Quality Act (CEQA; §§ 15386 and 15381, respectively) and is responsible for ensuring appropriate conservation of the state's biological resources, including rare, threatened, and endangered plant and animal species, pursuant to the California Endangered Species Act (CESA; Fish and Game Code § 2050 *et seq*.) and Fish and Game Code section 1600 *et seq*. The Department also administers the Natural Community Conservation Planning (NCCP) program, a California regional habitat conservation planning program. Although the City of Encinitas (City) prepared a draft Multiple Habitat Conservation Program Subarea Plan (SAP) it is no longer participating in the NCCP/HCP program.

The project proposes to subdivide a 19.027-acre parcel into 9 lots to accommodate the development of a senior care facility and 16 residential units and associated parking. Two additional open space lots (5.049 acres and 0.211 acre) and a 1.24-acre private street lot would be provided. Primary access to the site would be provided from a new Caltrans spine road off Manchester Avenue. Emergency access would be provided from Manchester Avenue via a secondary access road at the southeast corner of the site.

The project site includes 1.81 acres of high-quality Diegan coastal sage scrub (CSS) located on the northern portion of the site on and adjacent to coastal bluffs and habitat designated as hardline conservation area under the draft SAP. Freshwater marsh, totaling 0.13 acres, occurs within the northernmost parcel located on the south side of Manchester Avenue and is within the San Elijo Lagoon. An unvegetated ephemeral channel in the form of a managed and maintained soft bottom channel, totaling 0.08 acre, follows the general historical course of a natural drainage feature. There are 15.17 acres of agricultural use on the site comprised of fields, roads, and irrigation infrastructure, in addition to 0.68 acre of disturbed habitat and 1.81 acres of developed land that includes pavement, paths, and business structures. The entire site is located within a softline conservation area under the draft SAP.

We offer our comments and recommendations in the Appendix to assist the City in avoiding, minimizing, and adequately mitigating project-related impacts to biological resources, and to ensure that the project is consistent with ongoing regional habitat conservation planning efforts. In summary, our comments address the following issues: (1) potential impacts to wetland and riparian habitats; (2) compliance with CEQA and the Act; (3) potential project-related impacts to the reserve under the draft SAP; (4) updated protocol-level species surveys for listed species with potential to occur in the project area; (5) the use of native plants in landscaped areas adjacent to native habitats; and (6) information to be included in the draft Environmental Impact Report (DEIR).

We appreciate the opportunity to comment on this NOP. We are hopeful that further consultation between you and us will ensure the protection we find necessary for the biological resources that would be affected by this project. If you have questions or comments regarding this letter, please contact Janet Stuckrath of the Service 760-431-9440 or Eric Hollenbeck of the Department at 858-467-2720.

Sincerely,

for Jonathan D. Snyder
Acting Assistant Field Supervisor
U.S. Fish and Wildlife Service

Gail K. Sevrens
Environmental Program Manager
California Department of Fish and Wildlife

Appendix

cc:
State Clearinghouse

APPENDIX

Wildlife Agency Comments and Recommendations on the Notice of Preparation of a Draft Environmental Impact Report for the Belmont Village Encinitas-By-The-Sea Project

SPECIFIC COMMENTS

1. The Wildlife Agencies have responsibility for the conservation of wetland and riparian habitats. It is the policy of the Wildlife Agencies to strongly encourage avoidance of impacts to wetlands. We also recommend that any unavoidable wetland impacts be mitigated so that, at a minimum, there will be "no net loss" of either wetland habitat values or acreage. Development and conversion include, but are not limited to, conversion to subsurface drains, placement of fill or building of structures within the wetland, and channelization or removal of materials from the streambed. All wetlands and watercourses, whether ephemeral, intermittent, or perennial, should be retained and provided with substantial setbacks to preserve the riparian and aquatic values and maintain their value to on-site and off-site wildlife and plant populations. Mitigation measures to compensate for impacts to mature riparian corridors should be included in the DEIR and must compensate for the loss of function and value as a wildlife corridor.

    a. The project area supports freshwater marsh and unvegetated channel habitats; therefore, the DEIR should include a jurisdictional delineation of the creeks/drainages and their associated riparian habitats. The delineation should be conducted pursuant to the Service wetland definition adopted by the Department (Cowardin *et al*. 1979[1]). Please note that some wetland and riparian habitats subject to the Department's authority may extend beyond the jurisdictional limits of the U.S. Army Corps of Engineers.

    b. The Department also has regulatory authority with regard to activities occurring in streams and/or lakes that could adversely affect any fish or wildlife resource. For any activity that will divert or obstruct the natural flow, or change the bed, channel, or bank (which may include associated riparian resources) of a river, stream, or lake, or use material from a river, stream, or lake, the project applicant (or "entity") must provide written notification to the Department pursuant to section 1600 *et seq*. of the Fish and Game Code. Based on this notification and other information, the Department then determines whether a Lake and Streambed Alteration Agreement (LSAA) is required. The Department's issuance of a LSAA for a project that is subject to CEQA will require CEQA compliance actions by the Department as a Responsible Agency. As a Responsible Agency under CEQA, the Department may consider the lead agency's CEQA documentation for the project. To minimize additional requirements by the Department pursuant to section 1600 *et seq*. and/or under CEQA, the document should fully identify the potential impacts to the stream

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[1] Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service.

or riparian resources and provide adequate avoidance, mitigation, monitoring, and reporting commitments for issuance of an LSAA.[2]

2. The DEIR should include an analysis of potential impacts to the Focused Planning Area (FPA) and project consistency with the draft SAP; section 4.3.1.1 (wetland/wetland buffer policies), including the No Net Loss Policy and Mitigation for Unavoidable Impacts and Conservation and Buffer Requirements; section 4.3.1.5, including prioritizing mitigation sites firstly on site, secondly within the FPA inside the City, and lastly within the FPA outside the City.

3. All firebreaks and fuel modification zones should be located within the development footprint (i.e., included in the impact analysis as loss of habitat) per section 4.3.1.7 of the draft SAP. The DEIR should include a figure depicting the location of the fuel management zones in relation the development footprint and any adjacent conservation area boundary.

4. Any agricultural land proposed for conversion to residential/urban uses should be evaluated for potential benefits to the preserve and analyzed for meeting softline conservation standards prior to development approval as specified in section 4.3.1.10 of the draft SAP. Development of agricultural lands should include setbacks from wetland vegetation and restoration of upland vegetation in the buffer thus created.

5. The Wildlife Agencies are concerned about the potential direct and indirect effects to biological resources associated with the construction of a public recreation trail in designated open space on site. The following information should be included in the DEIR regarding the proposed pedestrian trail: an aerial photograph with an overlay of the proposed alignment of the trail in relation to designated or proposed open space; specifications of the trail design; specification that the trail would be for hiking only; measures to avoid/minimize impacts related to hikers straying off-trail and/or trail use by unauthorized vehicles; and a discussion of how the proposed location and use of the trail would be consistent with the City's draft SAP.

6. The DEIR should address the cumulative effects to sensitive species and habitats resulting from the proposed project and known proposed developments on adjacent properties and hardline preserve, as well as other cumulative impacts to and effects on regional conservation planning (i.e., the draft SAP).

7. To guide project planning and avoid/minimize impacts to ESA and/or CESA-listed species, such as the coastal California gnatcatcher (*Polioptila californica californica*; gnatcatcher) and least Bell's vireo (*Vireo bellii pusillus*; vireo), we recommend that protocol-level surveys be conducted for any listed species with the potential to occur within the project site. Surveys should be performed no more than one year prior to an application for a permit from the Wildlife Agencies, and the DEIR should include the survey results.

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[2] A notification package for a LSAA may be obtained by accessing the Department's website.

8. To facilitate wildlife movement through the project site and minimize effects to on-site wetland function and quality after project construction, we recommend that bridges be used for all proposed riparian crossings.

9. Native plants should be used to the greatest extent feasible in landscaped areas adjacent to and/or near mitigation/open space areas and/or wetland/riparian areas. The applicant should not plant, seed, or otherwise introduce invasive exotic plant species to landscaped areas adjacent and/or near native habitat areas. Exotic plant species not to be used include those species listed on the California Invasive Plant Council's (Cal-IPC) Invasive Plant Inventory. This list includes such species as: pepper trees, pampas grass, fountain grass, ice plant, myoporum, black locust, capeweed, tree of heaven, periwinkle, sweet alyssum, English ivy, French broom, Scotch broom, and Spanish broom.[3] In addition, landscaping adjacent to native habitat areas should not use plants that require intensive irrigation, fertilizers, or pesticides. Water runoff from landscaped areas should be directed away from mitigation/open space and/or wetland/riparian areas and contained and/or treated within the development footprint.

GENERAL COMMENTS

To enable the Wildlife Agencies to adequately review and comment on the proposed project from the standpoint of the protection of plants, fish, wildlife, and other biological resources, we recommend the following information be included in the DEIR.

1. A complete discussion of the purpose and need for, and description of, the proposed project, including all staging areas and access routes to the construction and staging areas.

2. A range of feasible alternatives to ensure that alternatives to the proposed project are fully considered and evaluated; the analyses should avoid or otherwise minimize impacts to sensitive biological resources, particularly wetlands. Specific alternative locations should be evaluated in areas with lower resource sensitivity, where appropriate.

3. To provide a complete assessment of the flora and fauna within and adjacent to the project area, with particular emphasis upon identifying state and federally listed endangered, threatened, rare, or proposed candidate species, California Species of Special Concern and/or Protected or Fully Protected species, and locally unique species and sensitive habitats, the DEIR should include the following information:

    a. Per CEQA Guidelines, section 15125(c), information on the regional setting that is critical to an assessment of environmental impacts, with special emphasis on resources that are rare or unique to the region that would be affected by the project.

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[3] A copy of the complete list can be obtained by contacting the California Invasive Plant Council at 1442-A Walnut Street, Suite #462, Berkeley, California 94709, or by accessing their website.

b. A thorough, recent floristic-based assessment of special status plants and natural communities, following the Department's Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities. The Department recommends that floristic, alliance- and/or association-based mapping and vegetation impact assessments be conducted at the Project site and neighboring vicinity. The Manual of California Vegetation, second edition, should also be used to inform this mapping and assessment (Sawyer *et al*. 2008[4]). Alternately, for assessing vegetation communities located in western San Diego County, the Vegetation Classification Manual for Western San Diego County (Sproul *et al*. 2011[5]) may be used. Adjoining habitat areas should be included in this assessment where site activities could lead to direct or indirect impacts off site. Habitat mapping at the alliance level will help establish baseline vegetation conditions.

c. A current inventory of the biological resources associated with each habitat type on site and within the area of potential effect. The Department's California Natural Diversity Database in Sacramento should be contacted at to obtain current information on any previously reported sensitive species and habitat, including Significant Natural Areas identified under Chapter 12 of the Fish and Game Code.

d. An inventory of rare, threatened, endangered and other sensitive species on site and within the area of potential effect. Species to be addressed should include all those which meet the CEQA definition (see CEQA Guidelines, § 15380). This should include sensitive fish, wildlife, reptile, and amphibian species. Seasonal variations in use of the project area should also be addressed. Focused species-specific surveys, conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable, are required. Acceptable species-specific survey procedures should be developed in consultation with the Wildlife Agencies.

4. To provide a thorough discussion of direct, indirect, and cumulative project-related impacts expected to adversely affect biological resources, with specific measures to offset such impacts, the following should be addressed in the DEIR.

a. A discussion of potential adverse impacts from lighting, noise, human activity, exotic species, and drainage should also be included. The latter subject should address: project-related changes on drainage patterns on and downstream of the project site; the volume, velocity, and frequency of existing and post-project surface flows; polluted runoff; soil erosion and/or sedimentation in streams and water bodies; and post-project fate of runoff from the project site. The discussions should also address the proximity of the extraction activities to the water table, whether dewatering would

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[4] Sawyer, J.O., T. Keeler-Wolf and J.M. Evens. 2009. A Manual of California Vegetation, Second Edition. California Native Plant Society Press, Sacramento.

[5] Sproul, F., T. Keeler-Wolf, P. Gordon-Reedy, J. Dunn, A. Klein and K. Harper. 2011. Vegetation Classification Manual for Western San Diego County. First Edition. Prepared by AECOM, California Department of Fish and Game Vegetation Classification and Mapping Program and Conservation Biology Institute for San Diego Association of Governments

be necessary, and the potential resulting impacts on the habitat, if any, supported by the groundwater. Mitigation measures proposed to alleviate such impacts should be included.

b. Discussions regarding indirect project impacts on biological resources, including resources in nearby public lands, open space, adjacent natural habitats, riparian ecosystems, and any designated and/or proposed or existing reserve lands (e.g., preserve lands associated with a NCCP). Impacts on, and maintenance of, wildlife corridor/movement areas, including access to undisturbed habitats in adjacent areas, should be fully evaluated in the DEIR.

c. A cumulative effects analysis should be developed as described under CEQA Guidelines, section 15130. General and specific plans, as well as past, present, and anticipated future projects, should be analyzed relative to their impacts on similar plant communities and wildlife habitats.

5. The DEIR should include measures for adverse project-related impacts on sensitive plants, animals, and habitats. Specifically, the DEIR should include/address:

   a. Measures to fully avoid and otherwise protect Rare Natural Communities from project-related impacts. The Wildlife Agencies consider these communities as threatened habitats having both regional and local significance.

   b. Where avoidance is infeasible, mitigation measures that emphasize minimization of project impacts. For unavoidable impacts, on-site habitat restoration or enhancement should be discussed in detail. If on-site mitigation is not feasible or would not be biologically viable (e.g., it would not adequately mitigate the loss of biological functions and values), off-site mitigation through habitat creation and/or acquisition and preservation in perpetuity should be addressed. The Wildlife Agencies generally do not encourage the use of relocation, salvage, and/or transplantation as mitigation for impacts on rare, threatened, or endangered species. Studies have shown these efforts are experimental in nature and do not provide for the long-term viability of the target species.

   c. Mitigation measures to alleviate indirect project-related impacts on biological resources, including measures to minimize changes in the hydrologic regimes on site, and means to convey runoff without damaging biological resources, including the morphology of on-site and downstream habitats.

   d. Where proposed grading or clearing is within 100 feet of proposed biological open space, or otherwise preserved sensitive habitats, a requirement for temporary fencing. Fencing should be placed on the impact side and should result in no vegetation loss within open space. All temporary fencing should be removed only after the conclusion of all grading, clearing, and construction activities.

e. A requirement that a Wildlife Agency-approved biological monitor to be present during initial clearing, grading, and construction in sensitive habitat areas and/or in the vicinity of biological open space areas to ensure that conservation measures associated with resource agency permits and construction documents are performed. The biological monitor should have the authority to halt construction to prevent or avoid take of any listed species and/or to ensure compliance with all avoidance, minimization, and mitigation measures. Any unauthorized impacts or actions not in compliance with the permits and construction documents should be immediately brought to the attention of the Lead Agency and the Wildlife Agencies.

f. Plans for restoration and revegetation, to be prepared by persons with expertise in southern California ecosystems and native plant revegetation techniques. Each plan should include, at a minimum: (a) the location of the mitigation site; (b) the plant species to be used, container sizes, and seeding rates; (c) a schematic depicting the mitigation area; (d) planting schedule; (e) a description of the irrigation methodology; (f) measures to control exotic vegetation on site; (g) specific success criteria (e.g., percent cover of native and non-native species; species richness); (h) a detailed monitoring program; (i) contingency measures should the success criteria not be met; and (j) identification of the party responsible for meeting the success criteria and providing for conservation of the mitigation site in perpetuity.

g. Measures to protect, in perpetuity, the targeted habitat values of proposed preservation and/or restoration areas from direct and indirect negative impacts. The objective should be to offset the project-induced qualitative and quantitative losses of wildlife habitat values. Permanent fencing should be installed between the impact area and biological open space and be designed to minimize intrusion into the sensitive habitats from humans and domestic animals, particularly cats. There should be no gates that would allow access between the development and biological open space. Additional issues that should be addressed include proposed land dedications, monitoring and management programs, control of illegal dumping, water pollution, etc.

h. Development and implementation of a management and monitoring plan (MMP), including a funding commitment, for any on- and/or off-site biological open space easements, if applicable. An appropriate natural lands management organization, subject to approval by the Wildlife Agencies, should be identified. The MMP should outline biological resources on the site, provide for monitoring of biological resources, address potential impacts to biological resources, and identify actions to be taken to eliminate or minimize those impacts. A Property Analysis Record (PAR), or PAR-equivalent analysis, should be completed to determine the amount of funding needed for the perpetual management, maintenance, and monitoring of the biological conservation easement areas by the natural lands management organization. It should be demonstrated that the proposed funding mechanism would ensure that adequate funds would be available on an annual basis to implement the MMP. The natural lands management organization should submit a draft MMP, PAR results, and proposed funding mechanism to the Wildlife Agencies for review and approval prior to initiating construction activities; the final plan should be submitted to the Wildlife Agencies and the funds for implementing the MMP transferred within 90 days of receiving approval of the draft plan.

i. The Department recommends that measures be taken to avoid project impacts to nesting birds. Sections 3503.5 and 3513 of the California Fish and Game Code prohibit take of all raptors and other migratory nongame birds and section 3503 prohibits take of the nests and eggs of all birds. Proposed project activities (including, but not limited to, staging and disturbances to native and nonnative vegetation, structures, and substrates) should occur outside of the avian breeding season which generally runs from February 1 to September 1 (as early as January 1 for some raptors) to avoid take of birds or their eggs.

If avoidance of the avian breeding season is not feasible, the Department recommends surveys by a qualified biologist with experience in conducting breeding bird surveys to detect protected native birds occurring in suitable nesting habitat that is to be disturbed and (as access to adjacent areas allows) any other such habitat within 300 feet of the disturbance area (within 500 feet for raptors). Project personnel, including all contractors working on site, should be instructed on the sensitivity of the area. Reductions in the nest buffer distance may be appropriate depending on the avian species involved, ambient levels of human activity, screening vegetation, or possibly other factors.

STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY Gavin Newsom, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 11
4050 TAYLOR STREET, MS-240
SAN DIEGO, CA 92110
PHONE (619) 688-3137
FAX (619) 688-4299
TTY 711
www.dot.ca.gov

Making Conservation
a California Way of Life.

Governor's Office of Planning & Research
NOV 21 2019
STATE CLEARINGHOUSE

November 20, 2019

11-SD-5
PM 38.528
3111 Manchester Avenue Senior Residential Care Facility
NOP/SCH#2019100475

Mr. Scott Vurbeff
Environmental Project Manager
City of Encinitas
505 S. Vulcan Avenue
Encinitas, CA 92024

Dear Mr. Vurbeff:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the Notice of Preparation (NOP) for the 3111 Manchester Avenue Senior Residential Care Facility (Belmont Village Encinitas-by-the-Sea) project located near Interstate 5 (I-5). The mission of Caltrans is to provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability. The Local Development-Intergovernmental Review (LD-IGR) Program reviews land use projects and plans to ensure consistency with our mission and state planning priorities.

Caltrans has the following comments:

Traffic Impact Study

A traffic impact study (TIS) is necessary to determine this proposed project's near-term and long-term impacts to the State facilities – existing and proposed – and to propose appropriate mitigation measures.

- Please include northbound and southbound ramp intersections at I-5/Manchester Avenue. The geographic area examined in the TIS should also include, at a minimum, all regionally significant arterial system segments and intersections, including State highway facilities where the project will add over 100 peak hour trips. State highway facilities that are experiencing noticeable delays should be analyzed in the scope of the traffic study for projects that add 50 to 100 peak hour trips.

- Please provide detailed project distribution percentages, including intersection details.
- A focused analysis may be required for project trips assigned to a State highway facility that is experiencing significant delay, such as where traffic queues exceed ramp storage capacity.
- In addition, the TIS could also consider implementing vehicles miles traveled (VMT) analysis into their modeling projections.
- Any increase in goods movement operations and its impacts to State highway facilities should be addressed in the TIS.
- The data used in the TIS should not be more than 2 years old.
- Please provide Synchro Version 10 files.

Hydrology and Drainage Studies

- Please provide hydraulics studies, drainage and grading plans to Caltrans for review.
- Provide a pre and post-development hydraulics and hydrology study. Show drainage configurations and patterns.
- Provide drainage plans and details, include detention basin details of inlets/outlet.
- Provide a contour grading plan with legible callouts and minimal building data. Show drainage patterns.
- On all plans, show Caltrans' Right-of-Way (R/W).

Complete Streets and Mobility Network

Caltrans views all transportation improvements as opportunities to improve safety, access and mobility for all travelers in California and recognizes bicycle, pedestrian and transit modes as integral elements of the transportation system. Caltrans supports improved transit accommodation through the provision of Park and Ride facilities, improved bicycle and pedestrian access and safety improvements, signal prioritization for transit, bus on shoulders, ramp improvements, or other enhancements that promotes a complete and integrated transportation system. Early coordination with Caltrans, in locations that may affect both Caltrans and the City of Encinitas or other lead agency, is encouraged.

Mitigation

Caltrans endeavors that any direct and cumulative impacts to the State Highway System be eliminated or reduced to a level of insignificance pursuant to the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) standards.

Mitigation measures to State facilities should be included in TIS/TIA. Mitigation identified in the traffic study, subsequent environmental documents, and mitigation monitoring reports, should be coordinated with Caltrans to identify and implement the appropriate mitigation. This includes the actual implementation and collection of any "fair share" monies, as well as the appropriate timing of the mitigation. Mitigation improvements should be compatible with Caltrans concepts.

Right-of-Way

Any work performed within Caltrans' R/W will require discretionary review and approval by Caltrans and an encroachment permit will be required for any work within the Caltrans' R/W prior to construction. As part of the encroachment permit process, the applicant must provide an approved final environmental document including the California Environmental Quality Act (CEQA) determination addressing any environmental impacts within the Caltrans' R/W, and any corresponding technical studies.

If you have any questions, please contact Kimberly Dodson, of the Caltrans Development Review Branch, at (619) 688-2510 or by e-mail sent to Kimberly.Dodson@dot.ca.gov.

Sincerely,

MAURICE EATON, Branch Chief
Local Development and Intergovernmental Review

STATE OF CALIFORNIA GAVIN NEWSOM, Governor

NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691 Phone: (916) 373-3710
Email: nahc@nahc.ca.gov
Website: http://www.nahc.ca.gov

November 1, 2019

Scott Vurbeff
Encinitas, City of
505 S. Vulcan Avenue
Encinitas, CA 92024

RECEIVED
NOV -7 2019
CITY OF ENCINITAS

RE: SCH# 2019100475, 3111 Manchester Avenue Senior Residential Care Facility Project, San Diego County

Dear Mr. Vurbeff:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements**. If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:
    a. A brief description of the project.
    b. The lead agency contact information.
    c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
    d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).
    a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:
    a. Alternatives to the project.
    b. Recommended mitigation measures.
    c. Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:
    a. Type of environmental review necessary.
    b. Significance of the tribal cultural resources.
    c. Significance of the project's impacts on tribal cultural resources.
    d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:
    a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
    b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:
   - **a.** The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
   - **b.** A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:
    - **a.** Avoidance and preservation of the resources in place, including, but not limited to:
      - **i.** Planning and construction to avoid the resources and protect the cultural and natural context.
      - **ii.** Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
    - **b.** Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
      - **i.** Protecting the cultural character and integrity of the resource.
      - **ii.** Protecting the traditional use of the resource.
      - **iii.** Protecting the confidentiality of the resource.
    - **c.** Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
    - **d.** Protecting the resource. (Pub. Resource Code §21084.3 (b)).
    - **e.** Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).
    - **f.** Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
    - **a.** The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.
    - **b.** The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
    - **c.** The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf.

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
    a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
    b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
    a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
    b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
    c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Staff Services Analyst

cc: State Clearinghouse

Rachel Rowe

From: Jessica Carilli <jcarilli@gmail.com>
Sent: Sunday, November 03, 2019 8:05 PM
To: Scott Vurbeff
Subject: Belmont Village comment

[**NOTICE:** Caution: External Email]

Dear Mr. Vurbeff,
The proposed "Belmont Village" development is a terrible location for a senior center. There is nowhere the residents will be able to walk to get groceries or a cup of coffee. They will have to be bussed around or take taxis to get out of the residence and into the town - bad for the residents and bad for the environment. Senior living should be located in walkable locations. This location is not walkable to anything but the lagoon and the University - nice, but not at all acceptable for a senior residence.
This location would be great for apartments intended for Miracosta students, and if it also included faculty housing and a daycare - it would be amazing! That alone would surely rocket Miracosta to a top-10 place-to-teach position, which would surely be beneficial to the City.
I digress...but I hope you get my point. What a waste it would be if this were approved.
What kind of soil sampling has been done at the site so far?
Thank you,
Jessica Carilli, PhD
Encinitas Resident

From: Charles Foster <charles@fosterdm.com>
Sent: Wednesday, October 16, 2019 7:56 AM
To: Scott Vurbeff
Subject: Belmont Village Encinitas-by-the-Sea

[**NOTICE:** Caution: External Email]

Dear Mr. Vurbeff,
If I have a vote, I fully support the Belmont Village Encinitas-by-the-Sea project.
We need more senior care facilities in coastal north county, and Belmont Village Cardiff-by-the-Sea has a very good record of care for those who need care as they get older (as we all are).
With proper planning looking forward, I am sure that this would be an asset to Encinitas and your neighboring towns.
Thank you,
Charles E. Foster
4752 Sun Valley Rd, Del Mar, CA 92014
(SD County jurisdiction, not in the city of Del Mar)
858-414-8638

From: Glen Johnson <Glen_D_J@pacbell.net>
Sent: Friday, November 01, 2019 2:56 PM
To: Scott Vurbeff
Cc: Susan Turney
Subject: Project Case Number: 17-273 TMDB/MUP/DR/CDP

[**NOTICE:** Caution: External Email]

Good Afternoon Mr. Vurbeff,

I am writing regarding the proposed Belmont Village project for a senior residential care facility. The Encinitas Municipal Code Zoning use matrix expects these to be built on a Prime Arterial road which is normally 6 lanes on a right-of-way able to support this. I observe that at this time 3111 Manchester Avenue is only a 4-lane roadway.

In past developments, such as those on South El Camino Real, the city has designated a roadway as a Prime Arterial even with only 4 lanes and required the applicant to provide land, widen the frontage to Prime Arterial status, and install the pavement. I am writing to inquire if this is the city's plan for the Belmont Village project.

Traffic on Manchester Avenue is heavy and with the I5 construction now under way it will be some time before this project begins construction. During this period traffic will continue to increase due to building from the Housing Element sites as well as other construction in the city and its neighbors.

A traffic study will of course be required before this project is approved and it is my hope that my concerns will be covered by this.

Zoning Use Matrix

"29???? Residential care facilities, general for 7 or more are permitted through issuance of a conditional use permit (major) only if the property is located on a prime arterial circulation element road as shown on the General Plan."

Ordinance No. 2018-05 03212018.pdf

"Prime Arterial A six-lane roadway with a typical right-of-way width of 120-130 feet and a pavement width of 100- 110 feet. The roadway is generally divided into three travel lanes in each direction by a median. Access to and from this roadway is restricted."

Thank you in advance for your attention to this matter.

...glen johnson

Scott Vurbeff
Environmental Project Manager
Encinitas Planning Division
505 S. Vulcan Ave
Encinitas, Ca 92024

October 30, 2019

Regarding the proposed project named: **Belmont Village Encinitas-by-the-Sea, which is located at 3111 Manchester and is a development/subdivision for 216,000 sf senior care building and 16 two-story housing units + 183 parking spaces Case #17-273 TMDB/MUP/DR/CDP I am having a variety of concerns.**

1. It is currently zoned RR-2 (Rural Residential 2): Permits low density single-family detached residential units with minimum lot sizes of 21,500 net square feet and maximum densities of 2.0 units per net acre, as a transition from the rural to the more suburban areas within the City. The proposed development vastly exceeds this zoning.
2. With regard to the Special Needs Overlay in zoning, this use would not be consistent between land use/development, redevelopment efforts, capital improvement projects, transit corridor use/development, economic redevelopment/rehabilitation efforts within the area.
3. With regard to the Cultural/Natural Resources Overlay Zone, certainly land in this location near to the San Elijo Lagoon and Manchester Preserve contain Biotic Resources of ecologically sensitive plant and animal habitats. Already, much of the area has been disturbed by the I5 freeway expansion, railroad and lagoon work being done.
4. Allowed lot coverage in the RR-2 zone is 35%, however, this is likely too much coverage for this ecologically sensitive location. In addition, setback should be increased, for the same reason.
5. Encinitas has mass transit, but it is very weak in terms of service. This missing infrastructure should be developed before adding any more residential units.
6. Numerous mature trees have been removed along the I5 corridor due to expansion. It would be wonderful to require, development in this Special Needs area to include large native trees, such as Englemann Oaks and Pine Trees, to help our urban forest and support the wildlife that have been displaced by all of the development/construction work that has been done.

As an Encinitas resident, a California licensed architect, & recently retired engineering professor, I believe it would be best to a) require additional mass transit, such as small, frequent shuttles running from the Encinitas Transit Center in continuous loop fashion around the major roads, (perhaps with trips every 30 minutes), AND b) develop it as high density, car-free affordable housing. Taking these measures would address our shortage of affordable housing AND not increase cars on already congested roads. Provide transit schedules and an electric bike with each new car-free dwelling for affordable domiciles. Creating Single Room Occupancies would increase density, and be appropriate for affordable housing. This would logically serve students and some staff at the nearby Community College. To preserve the Biotic Resources of ecologically sensitive habitat, more of the land should remain undeveloped such as at least 75% open & undeveloped. Encinitas should stop thinking same old usual type of car-based sprawling build-outs. We can and should be better to help meet our climate action plan criteria. We can take it up to the next level towards being a sustainable eco-just community in Encinitas, by walking our talk, and developing logical, sustainable solutions that address our community's needs.

All My Best,

Susan M. Sherod

Susan M. Sherod, Architect, 123 Camino De Las Flores, Encinitas, CA 92024

From: PamSullivan <pamdea@aol.com>
Sent: Tuesday, October 15, 2019 6:12 PM
To: Scott Vurbeff
Subject: Strawberry field development

[NOTICE: Caution: External Email]

We have been a resident of Encinitas for over 40 years and it pains us to think of losing more open spaces. Especially close to the lagoon. This will cause more traffic in an area that is already too congested. Please think carefully about what this could mean to our environment and the quality of life we all enjoy in our community.
We would definitely vote no on any such development and strongly urge the city to keep this area open. We need more open spaces. Once they are developed you can’t get them back. Consider a park, subsiding the strawberry field or anything but a big development.

Sincerely,

Mr & Mrs Patrick J Sullivan
335 Whitewood Place
Encinitas 92024

Sent from my iPhone

From: Kara Wilson <karaweeds@gmail.com>
Sent: Tuesday, November 05, 2019 12:16 PM
To: Scott Vurbeff
Subject: 3111 Manchester Avenue Development

[**NOTICE:** Caution: External Email]

Hi Scott -

This email is about the proposed development at 3111 Manchester. I am opposed to such high density building at the property, with a two-story assisted living facility and NOW AN ADDED 16-unit housing project, especially in light of the fact that it will be built across the street from an environmentally sensitive lagoon. There is no need for more assisted living communities as there are multiple such communities on Manchester and El Camino Real/Santa Fe Drive within several miles of the proposed development. A 16 unit housing project is inconsistent with the surrounding area and likely will require that the City change the approved use/zoning designation of the land. The City should not change the zoning for this property. The surrounding area is either ecologically protected open space or single family resident homes on large lots.

High density housing will add pollution and traffic that is inconsistent with the development or lack of development in the area. Furthermore, all of the traffic congestion on Manchester Avenue will detract from the area. Traffic in that area right now is a nightmare and it will just get worse for the Manchester Avenue area with a high density housing project there.

And I had a couple other questions:

Who is the developer on this project?

What zoning variances are the developers seeking for this project?

Will the City require an Environmental Impact Study to be completed before this development is approved?

Please advise me when there will be a public hearing on this proposed development at the City.

Thanks much,

Kara Wilson

A-2

Environmental Initial Study

BELMONT VILLAGE ENCINITAS-BY-THE-SEA SENIOR RESIDENTIAL CARE FACILITY PROJECT

INITIAL STUDY

Prepared for:

Greystar
444 South Cedros Avenue
Solana Beach, CA 92075

Prepared by:

BPG
BIRDSEYE
PLANNING GROUP

January 2020

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INITIAL STUDY

1. **Project title:**

Belmont Village Encinitas-by-the-Sea Senior Residential Care Facility

2. **Lead agency name and address:**

City of Encinitas
Community Development Department
505 South Vulcan Avenue
Encinitas, CA 92024

3. **Contact person and phone number:**

Scott Vurbeff, Environmental Planner
City of Encinitas
Community Development Department
505 South Vulcan Avenue
Encinitas, CA 92024

4. **Project location:**

The proposed project site is located on a 19.026 net, 14.43-gross acre site at 3111 Manchester Avenue in the City of Encinitas (APN 261-210-01 and -12). The site is located between Via Poco to the west and the Mira Costa Community College, San Elijo Campus parking lot to the east. The majority of the site is located north of Manchester Avenue and east of the Interstate 5 interchange. A small portion of the site is located south of Manchester Avenue adjacent to the San Elijo Lagoon. While this area is part of the subject property, no project-related disturbance would occur in this area. The southern portion of the site is relatively flat and has historically been used for agricultural production. The northern portion of site contains areas of steep slopes 25% and greater with undisturbed native hillside and vegetation cover. Several small agricultural ancillary structures located at the southwest corner. All development would be confined to the disturbed southern portion of the site. The project location is shown in Figure 1 – Vicinity Map and Project Site.

5. **Project sponsor's name and address:**

Mr. Beau Brand, Senior Associate, Development
Greystar, Inc.
444 South Cedros Avenue
Solana Beach, CA 92075

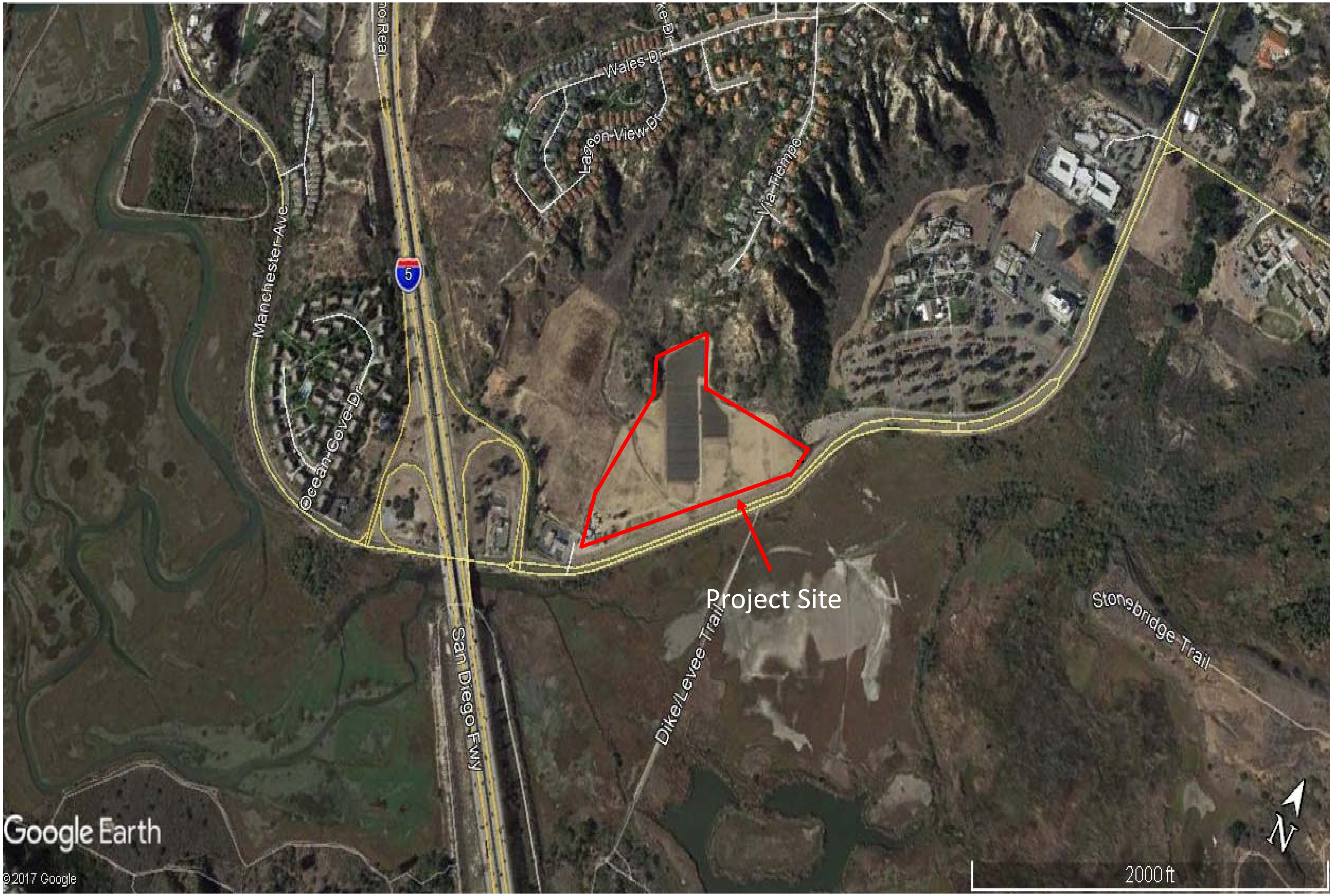

Figure 1—Project Site

6. General Plan designation:

Rural Residential 2

7. Zoning:

Rural Residential 2

8. Description of project:

The Project is for Tentative Map Density Bonus, Planned Residential Development Permit, Major Use Permit, Design Review and Coastal Development Permit for a new, fully-licensed senior care facility and 8 single-family lots that would accommodate 16 affordable housing units located at 3111 Manchester Avenue in Cardiff-by-the-Sea, a community within the City of Encinitas, California. The project site is owned by the Yasuda Family and consists of two lots in a RR-2 zone. The site is located within a California Coastal Appeal Jurisdiction, scenic/visual corridor, hillside/inland bluff overlay zone. The site totals 19.026 gross acres. Caltrans is in process of developing a new facility within an approximately 2.5-acre easement on the western edge of the site. The site has historically been used for agricultural production, primarily strawberries and Asian vegetables. The proposed senior care facility and affordable units are allowed on the site per current zoning provided a major use permit is approved.

The proposed the senior care buildings would be two-stories in height and accommodate a total of 200 units. The 200-unit project will be a fully-licensed Residential Care Facility for the Elderly (RCFE) and would be comprised of 172 IL/AL/CF units and 28 Memory Care units. It is anticipated that 77 of the 172 IL/AL/CF units will be occupied by Independent Living (IL) residents, 68 will be occupied by Assisted Living (AL) Residents and 27 will be occupied by Circle of Friends (CF) Residents. Because the entire facility is licensed, IL units can be converted to AL or CF units, and vice-versa, depending on market demand for acuity type. Memory Care units are not convertible, as they are secured for operational safety. The senior care buildings would be approximately 216,000 square feet (SF) in size, with approximately 60,000 SF of common area. The buildings will be designed in an eclectic Craftsman style incorporating wood, stone and stucco elements. All design aspects would adhere to the City of Encinitas's Design Guidelines.

The 16 affordable units will be located on the eastern side of the site. The units will be approximately 615 square feet and have 17 parking stalls. All design aspects will adhere to the City of Encinitas's Design Guidelines. Greystar is planning to dedicate approximately 6 acres of the site to the San Elijo Lagoon Conservancy as open space.

Vehicle access the project site would be via two driveways off Via Poco. Via Poco is currently a two-lane dead-end street on the north side of Manchester Avenue that provides access to the Project site to the east and to the gas station west of the Project site. The California Dept. of Transportation (Caltrans) plans to improve Via Pico as part of the I-5 North Coast Corridor

Project. Additionally, Caltrans to construct a Park and Ride Lot (e.g., multi-use facility) west of the I-5/Manchester Avenue Interchange, along with a Direct Access Ramp (DAR) to High Occupancy Vehicle (HOV) Lanes from Manchester Avenue. Secondary emergency access from Manchester Avenue would be provided via a gated entrance at the southeast corner of the Project site.

As a condition of approval, that portion of Manchester Avenue fronting the project site would be restriped to match Caltrans improvements on Manchester Avenue which extend east of Via Poco to accommodate DAR improvements and include installation of an eastbound right-turn pocket onto Via Pico. The restriping would shift the existing travel lanes approximately 10 feet to the north to accommodate installation of a 5-foot wide Class II bicycle lane and soft-surface pedestrian trail along the southside of Manchester Avenue, adjacent to the San Elijo Lagoon. These improvements would generally begin at the DAR boundary and extend along the frontage of the project Site.

A 10-foot wide combined bicycle/pedestrian trail and 10-foot wide parkway would be installed on the north side of Manchester Avenue. The parkway improvements would include a vegetated bioswale to retain runoff from Manchester Avenue. East of the project site, Manchester Avenue would transition back to four-through lanes, with a stripped median.

All improvements along Manchester Avenue would be confined to the existing disturbed right-of-way (ROW). No additional ROW would be required, nor would the improvements expand the capacity of Manchester Avenue.

Storm flows from the Project site as well as off-site stormwater flows are currently conveyed under Manchester Avenue and discharged into the San Elijo Lagoon via four existing corrugated metal pipes (CMPs) located along the Project site frontage. Post-construction, the on-site stormwater management system will consist of area drain and catch basin inlets, polyvinyl chloride (PVC) area drain lines, reinforced concrete pipe (RCP) storm drain lines and biofiltration basins. The proposed basins are located near the southeast, southwest and along the west side of the development site.

Storm flows conveyed through the existing soft bottom channel will be captured near the northwest corner of the development area and conveyed around the site perimeter via a dedicated storm drain line. The flows will discharge directly into the San Elijo Lagoon via a new reinforced concrete box culvert. Flows from north and east of the site would be conveyed via a storm drain line around the eastern perimeter and into the San Elijo Lagoon via a new reinforced concrete pipe (RCP). These systems would convey off-site flows around the on-site biofiltration basins. Storm flows associated the project site would be captured, treated and conveyed into the San Elijo Lagoon via four new RCPs. The proposed conveyance features would replace CMPs that would be abandoned in place or removed during construction. These improvements would maintain existing flow rates and discharge locations; thus, flows into the San Elijo Lagoon would not change from existing conditions. Further, proposed storm conveyance infrastructure would have no greater impact on the lagoon than what occurs with the existing system.

The proposed Project also includes construction of a soft surface trail segment (Trail Segment 66) through the northern portion of the Project Site. The proposed trail would extend from an existing sidewalk (planned for use as a trail connector through the Mira Costa College property) on the east to Via Pico on the west where it would connect to a trail segment planned for construction along Via Pico (Trail Segment 65) west of the project site. The proposed trail would be approximately 6 feet in width and constructed as a soft-surface trail consistent with specifications in the Encinitas Trail Master Plan. Trail Segments 66 and 65, along with the proposed 10-foot wide bicycle/pedestrian trail improvements along Manchester Avenue would form a "loop" around the Project site connecting to existing and planned trail segments to the east and west.

A non-wetland, unvegetated ephemeral channel is located onsite. The area permanently impacted by the project north of Manchester Avenue would be 0.08-acre remnant portion of a historical drainage feature. South of Manchester Avenue, the project would temporarily impact approximately 777 square feet of jurisdictional area during replacement of the stormwater outlet pipes. This element of the project would result in 12 square feet of permanent impact to jurisdictional features south of Manchester Avenue.

Impacts to the ephemeral channel and jurisdictional area south of Manchester Avenue would require a Section 1602 Streambed Alteration Agreement (SAA) from the California Department of Fish and Wildlife (CDFW), a Section 404 Clean Water Act (CWA) permit and a Section 401 Water Quality Certification in accordance with the CWA as well as a Coastal Development Permit (CDP) issued by the City of Encinitas under the Local Coastal Program. Direct impacts to this feature would be mitigated by purchasing off-site credits and dedicating a portion of the project site to the San Elijo Lagoon Conservancy for preservation and restoration. No sensitive plants or animals were observed on-site.

Project construction would begin in late-2020 and the facility is expected to be fully operational by mid-2022. A proposed site plan is shown as Figure 2.

9. Surrounding Land Uses and Setting

The adjacent property to the north is zoned R-3 and is developed with single-family residences. Land to the south is designated Ecological Reserve/Open Space/Park (ER/OS/PK) and contains the San Elijo Lagoon. Land to the west is zoned RR-2 and R-3. A gas station is currently located west of the site. The California Department of Transportation (Caltrans) is developing a park-and-ride/transit facility west of the site adjacent to and west of Interstate 5. Land to the east is zoned Public/Semi-Public (P/SP) and is developed with a Mira Costa College campus and parking lot.

10. Public agencies whose approval is required:

- City of Encinitas– Major Use Permit and Coastal Development Permit;
- U.S. Army Corps of Engineers – Section 404 Nationwide Permit;

Project Data

APN:	261-210-01-00
Site Area:	19.02 Acres Gross 14.43 Acres Net
Zone:	RR-2
Water District:	San Dieguito
Sanitation District:	Cardiff Sanitary Div. of the City of Encinitas Public Works Department
Project Description:	New 200 Unit Licensed Senior Living Facility New 16 Workforce Housing Units
Existing Land Use:	Agricultural
Gross Floor Area:	
Senior Living:	±215,870 sf
Workforce:	±10,750 sf
Lot Coverage:	15.9% (±100,130 sf)
FAR:	0.36
Density:	14.97 DU/Net Acres

Setbacks:	
Front	30'
Side	15'
Rear	15'

Occupancy Type:	R-2.1 (Senior Living)
Units:	
Independent Living	75 Units
Assisted Living:	67 Units
Circle of Friends	30 Units
Memory Care	28 Units
Total:	200 Units
Average Unit Size:	635 sf
Occupancy Type:	R-2 (Workforce)
Total:	16 Units (avg. 615 sf)
Parking:	
Senior Living:	162 Stalls (.81 stalls/unit)
Workforce:	17 Stalls (1/unit + 1 acc.)

Site Plan A-02

0 20 50 100 200

September 7, 2018

VTBS #17066

PREPARED FOR:

Greystar

444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

Senior Housing

3111 Manchester Avenue
Cardiff by the Sea, California 92007

VAN TILBURG, BANVARD & SODERBERGH, AIA
ARCHITECTURE + PLANNING + URBAN DESIGN

Figure 2—Site Plan

- San Diego Regional Water Quality Control Board – Section 401 Water Quality Certification;
- California Department of Fish and Wildlife – Section 1602 Streambed Alteration Agreement;
- Coastal Development Permit – Encinitas Local Coastal Program

11. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, has consultation begun is there a plan for consultation?

A Phase I Cultural Resources Report was prepared for the proposed project. As part of the process, a Sacred Lands File (SLF) search was conducted by the Native American Heritage Commission. Tribal representatives identified as part of the SLF search were noticed during preparation of the Phase I Cultural Resources Report. The City of Encinitas will conduct Tribal consultation required per AB 52 upon submittal of the Initial Study and technical appendices.

ENVIRONMENTAL FACTORS AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is "Potentially Significant" or "Potentially Significant Unless Mitigation Incorporated" as indicated by the checklist on the following pages.

- ☒ Aesthetics
- ☐ Agriculture and Forest Resources
- ☐ Air Quality
- ☒ Biological Resources
- ☒ Cultural Resources
- ☐ Energy
- ☒ Geology/Soils
- ☒ Greenhouse Gas Emissions
- ☐ Hazards & Hazardous Materials
- ☒ Hydrology/Water Quality
- ☐ Land Use/Planning
- ☐ Mineral Resources
- ☐ Noise
- ☐ Population/Housing
- ☐ Public Services
- ☐ Recreation
- ☒ Transportation
- ☒ Tribal Cultural Resources
- ☐ Utilities/Service Systems
- ☐ Wildfire
- ☒ Mandatory Findings of Significance

DETERMINATION:

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potential significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

____
Signature

____
Date

____
Printed Name

ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
I. AESTHETICS – would the project:				
a) Have a substantial adverse effect on a scenic vista?	☒	☐	☐	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public view of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☒	☐	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☒	☐	☐	☐

Potential impacts to visual resources were evaluated in a Community Character Study prepared by Latitude 33 (October 2018) and provided herein as Appendix A.

a) The City of Encinitas General Plan Policy 4.7 designates Manchester Avenue from San Elijo Boulevard to Encinitas Boulevard a scenic highway/scenic corridor viewshed. The purpose is to preserve historical views which represent a significant cultural or historical resource to the community. The project site is used for agricultural purposes and is visible from northbound Interstate 5. Further, the site is visible from the residences located to the north of the property. This area was designated a gateway to the City of Encinitas in the Housing Element EIR (2016); and thus, is considered a significant visual resource. While the project would be designed consistent with applicable standards for the RR-2 zone, because the site is located along a locally-designated scenic corridor, potential impacts to visual resources could be considered significant. **Thus, this issue will be evaluated in the EIR.**

b) There are four designated state scenic highways in San Diego County; State Route 75 (Silver Strand Highway and Coronado Bridge); State Route 78 (Anza-Borrego Desert State Park Road); State Route 125 (State Route 94 to State Route 8 near La Mesa) and State Route 163 between the north and south boundaries of Balboa Park. There are no state designated scenic highways in proximity to the project site. As noted, the site is undeveloped. The San Elijo Lagoon is located south of the site and is a visually prominent feature. There are no heritage trees (Section 15.02.110 of the Municipal Code) or historic structures on the site. Because the project would not impact visual resources along a state designated scenic highway, this issue will not be discussed in the EIR.

c) Implementation of the project would occur on an agricultural site. As referenced, Manchester Avenue has been designated as a scenic corridor within the City of Encinitas. Views into the site would change and while development would be consistent with design guidelines in the Municipal Code for properties in the RR-2 zoning district, changes could be considered significant. **This issue will be evaluated in the EIR.**

d) The project would add new buildings and street lighting which would be visible from Manchester Avenue and Interstate 5. Temporary outdoor lighting may be visible during operation of construction equipment; however, construction is expected to occur primarily during daylight hours. All outdoor street lighting would be designed to City of Encinitas standards contained in Chapter 30.40.010 (H) and (I) of the Municipal Code. However, the Municipal Code specifies that the quality of the night sky be preserved by minimizing light and glare nuisances to adjacent properties within the Cardiff-by-the-Sea Community. Impacts related to light and glare impacts may be significant. **This issue will be evaluated in the EIR.**

	Potentially Significant Impact	**Potentially Significant Unless Mitigation Incorporated**	**Less than Significant Impact**	**No Impact**
II. <u>AGRICULTURE AND FOREST RESOURCES</u> -- Would the project:				
a) Convert Prime Farmland, Unique Farmland, Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
II. <u>AGRICULTURE AND FOREST RESOURCES</u> -- Would the project:				
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	☒

Potentially adverse impacts to agricultural resources were evaluated in a Land Evaluation and Site Assessment (LESA) prepared by Birdseye Planning Group, October 2018 and provided herein as Appendix B.

a) The project site is zoned RR-2 which is intended to support residential uses while maintaining aesthetic benefits of lands located within this zoning designation. As referenced, the site has historically been used for agricultural production; thus, the site was evaluated using the California LESA Model to rate the overall value of the project site relative to agricultural production.

The land evaluation score is based on the following:

1. **Land Capability Classification Rating**: The Land Capability Classification (LCC) indicates the suitability of soils for most kinds of crops. Soils are rated from Class I to Class VIII. Soils having the fewest limitations receive the highest rating.

2. **Storie Index Rating**: The Storie Index provides a numeric rating (based upon a 100-point scale) of the relative degree of suitability or value of a given soil for intensive agriculture use. This rating is based upon soil characteristics only.

The site assessment element of the evaluation is based on the following criteria:

- Project Size;
- Water Resource Availability Rating;
- Surrounding Agricultural Land Rating; and
- Surrounding Protected Resource Land.

The scores for the land evaluation and site assessment are calculated and combined to provide one final score which is compared to the significance criteria in the LESA Instruction Manual (1997).

With respect to the land evaluation process, agricultural soils are assigned a Land Capability Classification (LCC) which indicates the suitability of soils for most crops. Soils are rated from Class I to Class VIII. Soils having the fewest limitations receive the highest rating. The dominant soil type on the site that is used for agricultural production is Corralitos loamy sand (CsC)(5-9% slopes). This soil type is a Capability Class III-s soil. According to the Natural Resources Conservation Service (NRCS), Class III soils have severe limitations which minimizes the selection of plants, requires special conservation practices or both. Thus, Class III soils are not Prime soils under the California Department of Conservation (CDC) or the United States Department of Agriculture definitions, unless they are irrigated. The CDC Farmland Mapping and Monitoring Program has classified soils on the southern portion of the site as Prime, if irrigated. The Storie Index score is calculated by multiplying the proportion of the project within each soil type by the soil type's Storie Index rating. Similarly, because the majority of lands surrounding the site are not protected resources, a low rating was also assigned to this criteria.

The LESA Model is weighted so that one-half of the total score is derived from the Land Evaluation and one-half from the Site Assessment. The Land Evaluation subscore for the project site is 30.25, while the Site Assessment subscore is 16.5. The final LESA score is 46.75. As provided Section IV or the LESA Instruction Manual, a final LESA score between 40 and 59 is considered significant only if both the Land Evaluation and Site Assessment sub-scores are each greater than or equal to 20 points. In this case, the Land Evaluation subscore is greater than 20 points (30.25); however, the Site Assessment subscore is less than 20 (16.50). Thus, the project would have a **less than significant** impact on agricultural resources. A detailed discussion of the scoring criteria is provided in the LESA Report (Appendix B). No mitigation for agricultural impacts would be required should the project be developed as proposed. This issue will not be evaluated in the EIR.

b) The project site is not enrolled in a Williamson Act contract. The proposed project would not conflict with any zoning designations designed to promote agriculture. **No impact** would occur under this threshold**.** This issue will not be evaluated in the EIR.

c-e) Neither the site nor surrounding areas are used for timber production. As referenced, the site has been used for commercial agricultural purposes; however, removing the site from agricultural production would not cause a significant or adverse impact as described above. The project would not conflict with any zoning designations designed to preserve timber or agricultural resources. **No impact** would occur under this threshold. This issue will not be evaluated in the EIR.

	Potentially Significant Impact	**Potentially Significant Unless Mitigation Incorporated**	**Less than Significant Impact**	**No Impact**
III. **<u>AIR QUALITY</u> --** Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

Emission estimates provided herein were obtained from the California Emission Estimator Model version 2016.3.2 (Appendix C).

The project site is located within the San Diego Air Basin, which is under the jurisdiction of the San Diego Air Pollution Control District (SDAPCD). A significant adverse air quality impact may occur when a project individually or cumulatively interferes with progress toward the attainment of the ozone standard by generating emissions that equal or exceed the established long-term quantitative thresholds for pollutants or exceed a state or federal ambient air quality standard for any criteria pollutant.

As part of its air quality permitting process, the SDAPCD has established thresholds in Rule 20.2 requiring the preparation of air quality impact assessments for permitted stationary sources. The SDAPCD sets forth quantitative emission thresholds below which a stationary source would not have a significant impact on ambient air quality. Project-related air quality impacts estimated in this environmental analysis would be considered significant if any of the applicable significance thresholds presented in Table 1 are exceeded.

Table 1
Daily Emission Thresholds

Pollutant	Daily Emission Thresholds (lbs/day)
Carbon Monoxide (CO)	550
Nitrogen Oxides (NOx)	250
Particulate Matter 10 (PM_{10})	100
Particulate Matter 2.5 ($PM_{2.5}$)	55
Sulfur Oxides (SOx)	250
Volatile Organic Compounds/Reactive Organic Gases	137*

*- VOC threshold based on the significance thresholds recommended by the Monterey Bay Unified Air Pollution Control District for the North Central Coast Air Basin, which has similar federal and state attainment status as the SDAB for O_3.

Regional construction emissions associated with implementing the proposed project were calculated using the California Emissions Estimator Model (CalEEMod) version 2016.3.2 (2016) software. Construction emission modeling for site preparation, grading, building construction, paving, and architectural coating application is based on the overall scope of the proposed development and construction phasing. In addition to SDAPCD Rules 52 and 54 requirements, emissions modeling also accounts for the use of low-VOC paint (150 g/L for non-flat coatings) as required by SDAPCD Rule 67. Further, emissions modeling assumed the painting phase would overlap with building construction and paving phases to reduce daily VOC emissions. Construction is expected to begin mid-2019 and continue through 2020.

a) The Federal Clean Air Act Amendments (CAAA) mandate that states submit and implement a State Implementation Plan (SIP) for areas not meeting air quality standards. SIPs are comprehensive plans that describe how an area will attain national and state ambient air quality standards. SIPs are a compilation of new and previously submitted plans, programs (i.e., monitoring, modeling and permitting programs), district rules, state regulations and federal controls and include pollution control measures that demonstrate how the standards will be met through those measures.

State law makes CARB the lead agency for all purposes related to the SIP. Local air districts and other agencies prepare SIP elements and submit them to CARB for review and approval. CARB forwards SIP revisions to the USEPA for approval and publication in the Federal Register.

Thus, the Regional Air Quality Strategy (RAQS) and Air Quality Management Plan (AQMP) prepared by SDAPCD and referenced herein become part of the SIP as the material relates to efforts ongoing in San Diego to achieve the national and state ambient air quality standards. The most recent SIP element for San Diego County was submitted in December 2016. The document identifies control measures and associated emission reductions necessary to demonstrate attainment of the 2008 Federal 8-hour ozone standard by July 20, 2018.
The San Diego RAQS was developed pursuant to California Clean Air Act (CCAA) requirements. The RAQS was initially adopted in 1991 and was updated in 1995, 1998, 2001, 2004, 2009 and 2016. The RAQS identifies feasible emission control measures to provide progress in San Diego County toward attaining the State ozone standard. The pollutants addressed in the RAQS are volatile organic compounds (VOC) and oxides of nitrogen (NOx), precursors to the photochemical formation of ozone (the primary component of smog). The RAQS was initially adopted by the San Diego County Air Pollution Control Board on June 30, 1992, and amended on March 2, 1993, in response to ARB comments. At present, no attainment plan for particulate matter less than 10 microns in diameter (PM_{10}) or particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) is required by the state regulations; however, SDAPCD has adopted measures to reduce particulate matter in San Diego County. These measures range from regulation against open burning to incentive programs that introduce cleaner technology.

The RAQS relies on information from CARB and San Diego Association of Governments (SANDAG), including mobile and area source emissions, as well as information regarding projected growth in the County, to estimate future emissions and then determine strategies necessary for the reduction of emissions through regulatory controls. CARB mobile source emission projections and SANDAG growth projections are based on population and vehicle trends as well as land use plans developed by the cities and the County as part of the development of the individual General Plans. As such, projects that propose development consistent with the growth anticipated by the general plans would be consistent with the RAQS. In the event that a project would propose development which is less dense than anticipated within the General Plan, the project would likewise be consistent with the RAQS. If a project proposes development that is greater than that anticipated in the General Plan and SANDAG's growth projections, the project might conflict with the RAQS and SIP; and thus, have a potentially significant impact on air quality.

Under state law, the SDAPCD is required to prepare an AQMP for pollutants for which the SDAB is designated non-attainment. Each iteration of the SDAPCD's AQMP is an update of the previous plan and has a 20-year horizon. Currently the SDAPCD has implemented a 2012 8-hour National Ozone Implementation/Maintenance Plan, a 2007 8-hour Ozone Plan, and a 2004 Carbon Monoxide Plan. The SDAPCD adopted the 2008 8-hour Ozone Attainment Plan for San Diego County on December 16, 2016. CARB adopted the ozone plan as a revision to the California SIP on March 23, 2017. The ozone plan was submitted to the USEPA for review on April 12, 2017. Comments from the USEPA are pending. These plans are available for download on the ARB website located at the following URL: http://www.arb.ca.gov/planning/sip/planarea/sansip.htm.

A project may be inconsistent with the AQMP if it would generate population, housing, or employment growth exceeding forecasts used in the development of the AQMP. The 2016 AQMP, the most recent AQMP adopted by the SCAQMD, incorporates local city General Plans and the Southern California Association of Government's (SCAG) Regional Transportation Plan (April 2016) socioeconomic forecast projections of regional population, housing and employment growth.

As noted, the RAQS relies on information from CARB and SANDAG, including projected growth in the County, mobile, area and all other source emissions to project future emissions and determine from that the strategies necessary for the reduction of stationary source emissions through regulatory controls. Projects that propose development that is consistent with the growth anticipated by the general plan is consistent with the SIP, AQMP and RAQS.

The proposes to construct 200 independent living, assisted living and memory care units and 16 affordable housing units. The project is consistent with current zoning with approval of a MUP. The project is intended to provide senior and affordable housing and is expected to serve existing residents within the San Diego region. It would not induce growth or cause the local population to increase beyond what is planned within the region. Project-related emissions would not exceed daily thresholds established by the SDAPCD during construction or operation as shown in Tables 2 and 3 or otherwise cause an adverse impact to air quality. The project would be consistent with the SIP, AQMP and RAQS and significance threshold (a - air quality plans) referenced above. Impacts related to this threshold would be **less than significant**; and thus, will not be discussed in an EIR.

b) Project construction would generate temporary air pollutant emissions. Both construction emissions and vehicle emissions associated with operation of the facility are quantified herein.

Construction Emissions

Construction vehicles and equipment operating on the graded site as well as grading/site preparation activities have the potential to generate fugitive dust (PM_{10} and $PM_{2.5}$) through the exposure of soil to wind erosion and dust entrainment. Project related construction activities would also emit ozone precursors (oxides of nitrogen (NO_X), reactive organic gases (ROG)) as well as carbon monoxide (CO). The majority of construction-related emissions would result from site preparation and the use of heavy-duty construction equipment. However, emissions would also be associated with constructing the buildings and paving surface streets.

Site preparation and grading would involve the greatest concentration of heavy equipment use and the highest potential for fugitive dust emissions. The project would be required to comply with SDAPCD Rules 52 and 54 which identify measures to reduce fugitive dust and is required to be implemented at all construction sites located within the SDAB. Therefore, the following conditions, which are required to reduce fugitive dust in compliance with SDAPCD Rules 52 and 54, were included in CalEEMod for site preparation and grading phases of construction.

1. **Minimization of Disturbance.** Construction contractors should minimize the area disturbed by clearing, grading, earth moving, or excavation operations to prevent excessive amounts of dust.

2. **Soil Treatment.** Construction contractors should treat all graded and excavated material, exposed soil areas and active portions of the construction site, including unpaved on-site roadways to minimize fugitive dust. Treatment shall include, but not necessarily be limited to, periodic watering, application of environmentally safe soil stabilization materials, and/or roll compaction as appropriate. Watering shall be done as often as necessary, and at least twice daily, preferably in the late morning and after work is done for the day. Note – it was assumed watering would occur three times daily for modeling purposes.

3. **Soil Stabilization.** Construction contractors should monitor all graded and/or excavated inactive areas of the construction site at least weekly for dust stabilization. Soil stabilization methods, such as water and roll compaction, and environmentally safe dust control materials shall be applied to portions of the construction site that are inactive for over four days. If no further grading or excavation operations are planned for the area, the area shall be seeded and watered until landscape growth is evident, or periodically treated with environmentally safe dust suppressants, to prevent excessive fugitive dust.

4. **No Grading During High Winds.** Construction contractors should stop all clearing, grading, earth moving, and excavation operations during periods of high winds (20 miles per hour or greater, as measured continuously over a one-hour period).

5. **Street Sweeping.** Construction contractors should sweep all on-site driveways and adjacent streets and roads at least once per day, preferably at the end of the day, if visible soil material is carried over to adjacent streets and roads.

Construction emission modeling for site preparation, grading, building construction, paving, and architectural coating application is based on the overall scope of the proposed development and construction phasing which is expected to begin mid-2020 and extend approximately 18-months. It was assumed for modeling purpose that the entire 14.43 net acre development area would be disturbed during construction. For dust control, it was assumed the disturbed area would be watered three times daily.

As shown in Table 2, construction of the proposed project would not exceed the SDAPCD regional thresholds during either 2020 or 2021. No mitigation in addition to compliance with SDAPCD Rule 52 and 57 would be required to reduce construction emissions to less than significant. Construction impacts would not cause an adverse air quality impact per thresholds (b) and (d) referenced above.

Table 2
Estimated Maximum Mitigated Daily Construction Emissions

Construction Phase	Maximum Emissions (lbs/day)					
	ROG	NO_x	CO	SOx	PM_{10}	$PM_{2.5}$
2021 Maximum lbs/day	4.5	50.2	32.5	0.06	20.4	11.9
2022 Maximum lbs/day	102.9	21.4	22.4	0.05	2.7	1.3
SDAPCD Regional Thresholds	*137*	*250*	*550*	*250*	*150*	*55*
Threshold Exceeded 2021	**No**	**No**	**No**	**No**	**No**	**No**
Threshold Exceeded 2022	**No**	**No**	**No**	**No**	**No**	**No**

Operation Emissions

Table 3 summarizes emissions associated with operation of the proposed project. Operational emissions include emissions from electricity consumption (energy sources), vehicle trips (mobile sources), and area sources including landscape equipment and architectural coating emissions as the structures are repainted over the life of the project. The majority of operational emissions are associated with vehicle trips to and from the project site. Trip volumes were based on trip generation factors for storage facilities incorporated into CalEEMod. As shown in Table 3, the net change in emissions would not exceed the SCAQMD thresholds.

Table 3
Estimated Daily Operational Emissions

	Estimated Emissions (lbs/day)					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Proposed Project						
Area	6.3	0.2	17.8	0.01	0.09	0.09
Energy	0.04	0.3	0.1	0.01	0.03	0.03
Mobile	0.9	3.5	7.9	0.02	2.3	0.6
Maximum lbs/day	**7.2**	**4.0**	**25.9**	**0.04**	**2.4**	**0.7**
SCAQMD Thresholds	*137*	*250*	*550*	*250*	*150*	*55*

Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

See Appendix C for CalEEMod version. 2016.3.2 computer model output for operational emissions. Summer emissions shown.
Note – totals may vary slightly due to rounding.

Therefore, the project's regional air quality impacts (including impacts related to criteria pollutants, sensitive receptors and violations of air quality standards) would be **less than significant.** This issue will not be evaluated in the EIR.

c) The nearest sensitive receptors to the project site are the single-family residences located north of the site at the south end of Via Tiempo. As shown above, neither the total construction or operation emissions would exceed the SDAPCD thresholds. In addition to quantifying emissions, SDAPCD recommends performing a local CO hotspot analysis if an intersection meets one of the following criteria: 1) the intersection is at Level of Service (LOS) D or worse and where the project increases the volume to capacity ratio by 2 percent, or 2) the project decreases LOS at an intersection to D or worse. A CO hotspot is a localized concentration of CO that is above the state or national 1-hour or 8-hour CO ambient air standards. Localized CO "hotspots" can occur at intersections with heavy peak hour traffic. Specifically, hotspots can be created at intersections where traffic levels are sufficiently high such that the local CO concentration exceeds the federal AAQS of 35.0 parts per million (ppm) or the state AAQS of 20.0 ppm. As discussed in Section XVII, *Transportation/Traffic*, the proposed project would not cause any significant or adverse impacts to the intersections and road segments studied. All intersections and segments studied would operate at LOS C or better with the project. The project would not contribute to traffic conditions that would create a CO hotspot adverse health risks. Therefore, impacts would be **less than significant.** This issue will not be evaluated in the EIR.

d) The proposed project would generate odors from construction (i.e., diesel exhaust, asphalt). Construction odors would be temporary. Construction emissions would not exceed SDAPCD impact thresholds; thus, short-term odors are not expected to be significant. During operation, the facility would not generate odors. Odors impacts would be **less than significant.** This issue will not be evaluated in the EIR.

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
IV. <u>BIOLOGICAL RESOURCES</u> -- Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES -- Would the project:				
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

The material presented herein is based on the *Biological Resource Assessment for the 3111 Manchester Avenue Site,* prepared by BLUE Consulting Group, October 2019 and the Jurisdictional Waters/Wetland Delineation Report, prepared by RECON, August 2019. The reports are provided herein as Appendices D and E.

a) This section identifies and evaluates impacts to biological resources associated with the proposed project in the context of the draft North County Multiple Species Habitat Conservation Plan (MSHCP) and State and Federal regulations such as the Endangered Species Act (ESA), Clean Water Act (CWA), and the California Fish and Game Code.

The draft North County MHCP is a comprehensive, multiple jurisdictional planning program designed to develop an ecosystem preserve in northern San Diego County. Implementation of the regional preserve system is intended to protect viable populations of key sensitive plant and animal species and their habitats, while accommodating continued economic development and quality of life for residents of the North County region. The MHCP is one of several large multiple jurisdictional habitat planning efforts in San Diego County, each of which constitutes a subregional plan under the California Natural Community Conservation Plan (NCCP) Act of 1991. The MHCP includes seven incorporated cities in northwestern San Diego County: Carlsbad, Encinitas, Escondido, Encinitas, San Marcos, Solana Beach, and Vista. These jurisdictions will implement their respective portions of the MHCP through citywide “subarea” plans, which describe the specific implementing mechanisms each city will institute for the MHCP.

The City of Encinitas Subarea Habitat Conservation Plan (HCP)/Natural Community Conservation Plan addresses how the City of Encinitas will conserve natural biotic communities and sensitive plant and wildlife species under the MHCP framework. The Subarea Plan will provide regulatory certainty to the landowners within the City and aid in conserving the region’s biodiversity and enhancing the quality of life. The Subarea Plan addresses the potential impacts to natural habitats and rare, threatened or endangered species caused by projects within the Cities. The Subarea Plans will also form the basis for Implementing Agreements, which will be the legally binding agreements between the City and the Wildlife Agencies that ensure implementation of the plan and provides the City with State and federal "Take authority."

Vegetation Communities

As referenced, the entire project site is comprised of approximately 19.026 acres. A 19.68-acre areas was surveyed and recorded as part of the biological field work. Table 4 shows the breakdown of vegetation communities.

Table 4
Habitat Type

Habitat Type	Acreage
Channel, unvegetated ephemeral*	0.08
Freshwater marsh*	0.13
Coastal sage scrub	1.81
Agricultural/Greenhouse (graded/maintained)	15.17
Disturbed habitat (urban)	0.68
Developed (paved)	1.81
Total	19.68

*-jurisdictional wetlands

A total of six habitat types occur within the project site: freshwater marsh, unvegetated ephemeral waters of the U.S. (channel), coastal sage scrub, agricultural, urban disturbed (previously graded), and developed. The Freshwater marsh (0.13 acres) occurs on the portion of the property located south of Manchester Avenue and would not be affected by project improvements. The Coastal sage scrub community located on the north end of the property comprises approximately 1.81 acres. This area would be avoided and placed in a conservation easement for long-term preservation.

Special Status Plants

Sensitive or special interest plant species are those which are considered rare, threatened, or endangered within the state or region by local, state, or federal resource conservation agencies. Sensitive plant species are so called because of their limited distribution, restricted habitat requirements, or particular susceptibility to human disturbance, or a combination of these factors. A total of 31 sensitive plant species have the potential to occur on-site; however, the potential to occur is low because there is a lack of appropriate habitat. No sensitive plant species were observed on-site. No compensatory or avoidance action would be required for sensitive plants under CEQA.

Special Status Animals

Sensitive or special interest wildlife species and habitats are those which are considered rare, threatened, or endangered within the state or region by local, state, or federal resource conservation agencies. Sensitive species are so called because of their limited distribution, restricted habitat requirements, or particular susceptibility to human disturbance, or a combination of these factors. A single sensitive wildlife species, a Turkey Vulture (*Cathartes aura*), was observed flying overhead. The subject property supports a high-quality CSS community; however, based on the location, it has low habitat value for use by the coastal California gnatcatcher.

Raptor Use
The site contains numerous scattered mature trees as well as mature ornamental landscaping. Mature trees can support raptor nesting. Raptors are large predatory or scavenger birds that typically require tall trees for perching and nesting associated with adjacent open grasslands to forage. Due to declining habitat and the associated declining numbers of these species on the whole, many raptor species have been designated as California Species of Special Concern by the CDFW. These species are protected, especially during their critical nesting and wintering stages. Raptors are protected under the CDFW California Raptor Protection Act (Title 14, Section 670). No historic raptor nests were observed within the trees onsite.

Nesting Birds
The project has the potential to impact active bird nests if vegetation is removed during the nesting season (February 1 to August 31). Impacts to nesting birds are prohibited by the Migratory Bird Treaty Act and California Fish and Game Code. Mitigation Measure BIO-1 would reduce potential nesting bird impacts to less than significant.

> **Mitigation Measure BIO-1**: As feasible, vegetation clearing should be conducted outside of the nesting season, which is generally identified as February 1 through September 15. If avoidance of the nesting season is not feasible, then a qualified biologist shall conduct a nesting bird survey within three days prior to any disturbance of the site, including disking and grading. If active nests are identified, the biologist shall establish suitable buffers around the nests based on his/her judgement, and the buffer areas shall be avoided until the nests are no longer occupied and the juvenile birds can survive independently from the nests.

With implementation of Mitigation Measure **BIO-1**, impacts to sensitive species would be **less than significant**. Further, the project would be consistent with the City of Encinitas's biological regulations, the draft North County Multiple Habitat Conservation Program (MHCP). However, reasonable or feasible options to avoid impacts to migratory birds without mitigation. **This issue will be addressed in the EIR.**

b and c) As referenced, a jurisdictional delineation was performed for the project site (see Appendix D and E). Two jurisdictional features occur on the property. A 0.13-acre Freshwater marsh is located south of Manchester Avenue. This area would not be affected by the project. The 0.08-acre area unvegetated ephemeral channel would be permanently impacted by project improvements north of Manchester Avenue. South of Manchester Avenue within the area affected by the replacement of stormwater discharge pipes, there are a total of 10 vegetation communities comprising 2.7 acres in the area studied. Replacement/modifications to the existing drainage pipes would result in 777 square feet of temporary impact and 12 square feet of permanent impact to jurisdictional features south of Manchester Avenue.

The jurisdictional features are under the jurisdiction of the US Army Corps of Engineers, Regional Water Quality Control Board (RWQCB) and CDFW and would require permits from each agency for impacts to this resource. The following permits would be required: a Section 1602 Streambed Alteration Agreement (SAA) from the CDFW, a Nationwide Permit (NWP) in accordance with Section 404 of the federal Clean Water Act (CWA) and a 401 Water Quality Certification in accordance with Section 401 of the CWA. Additionally, a Coastal Development Permit would be required from the City of Encinitas through their Local Coastal Program. Implementation of Mitigation Measure **BIO-2** would reduce direct impacts to the non-vegetated ephemeral channel to **less than significant.** However, there may be feasible alternatives to avoid impacts to the non-vegetated ephemeral channel. **This threshold will be evaluated in the EIR.**

> **Mitigation Measure BIO-2**: Purchase a 0.08-acres of mitigation land within the San Luis Rey Mitigation Bank and donate 0.13 acre of Freshwater Marsh to the San Elijo Lagoon Conservancy.

d) Corridors and linkages are smaller constrained areas of habitat that connect larger areas of habitat which are otherwise separated by rugged terrain, changes in vegetation, or urban development. This allows for an exchange of gene pool between wildlife populations which increases the genetic viability of otherwise isolated populations. The property is itself generally developed and actively utilized with the surrounding are to the north and east dominated by high density development. While the San Elijo Lagoon and Open Space is immediately adjacent to the southern property line, the Property located on the north side of Manchester Avenue is not within an existing recognized habitat corridor. N**o impact** to wildlife movement corridors would occur with project implementation; thus, this issue will not be addressed in the EIR.

e-f) No native or ornamental trees occur on-site. No impacts associated with tree removal and/or related policies would occur as a result of the proposed project. As referenced, the project site is covered within the draft North County MHCP and City of Encinitas Subarea Habitat Conservation Plan (HCP)/Natural Community Conservation Plan. Both are multiple jurisdictional planning programs designed to develop an ecosystem preserve in northern San Diego County. The project site does not contain sensitive plant or animal resources that are regulated these documents; thus, **no impact** would occur under this threshold. This issue will not be addressed in the EIR.

	Potentially Significant Impact	**Potentially Significant Unless Mitigation Incorporated**	**Less than Significant Impact**	**No Impact**
V. <u>CULTURAL RESOURCES</u> -- would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource as defined in §15064.5?	☒	☐	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

Information in the following section was obtained from the *Phase I Cultural Resource Study for the 3111 Manchester Avenue Project,* Brian F. Smith and Associates, Inc. (August 2018) and is provided herein for reference as Appendix E.

a) The project site is used for agricultural purposes and has several out buildings located near the southwest corner of the site. These structures are not considered historic. There are no historic buildings, structures, rock outcroppings or other features on or in proximity to the site. Because there are no historic features present, **no impact** would occur as a result of project implementation. This issue will not be addressed in the EIR.

b) Tribal noticing was performed during preparation of the Cultural Resources Report. No formal consultation with Native American Tribes has occurred as part of the current application or cultural resource investigation. Consultation required per AB 52 would be performed as part of the formal CEQA process conducted by the City of Encinitas. As referenced in the Cultural Resource Report, the property survey did not identify any significant cultural resources. One isolate metate fragment was observed; however, this fragment does not retain any cultural value. However, while the survey was negative for significant cultural resources, archaeological and Native American monitoring was recommended during all ground-disturbing activities as grading may expose areas containing buried cultural deposits not observed during the survey. The recommendation for archaeological monitoring is based upon the sensitivity of the area and the fact that soil movement downslope toward Manchester Avenue over many decades of agricultural disturbance has created the potential for buried and covered archaeological sites that may have existed along the lagoon shoreline. Because of the potential site sensitivity, the following mitigation measures are recommended.

Mitigation Measure CUL-1: ***In the event Cultural Resources are discovered:*** The project permittee/owner shall retain a certified archaeological monitor to monitor all ground-disturbing activities in an effort to identify any unknown cultural resources. Prior to grading, the project permittee/owner shall provide to the City verification that a certified archaeological monitor has been retained. Any newly discovered cultural resource deposits shall be subject to a cultural resource evaluation. A final report documenting the monitoring activity and disposition of any recovered cultural resources shall be submitted to the City of Encinitas, San Diego Museum of Man and the appropriate tribe within 60 days of completion of monitoring.

Mitigation Measure CUL-2: ***Archaeological Monitoring:*** At least 30-days prior to application for a grading permit and before any grading, excavation, and/or ground-disturbing activities on the site take place, the project permittee/owner shall retain a Secretary of the Interior Standards qualified archaeological monitor to monitor all ground-disturbing activities to identify any unknown archaeological resources.

1) The Project Archaeologist, in consultation with consulting tribes, the permittee/owner, and the City, shall develop an Archaeological Monitoring Plan to address the details, timing, and responsibility of all archaeological and cultural activities that will occur on the project site. Details in the plan shall include:

    a. Project grading and development scheduling;
    b. The development of a schedule in coordination with the permittee/owner and the Project Archeologist for designated Native American Tribal Monitors from the consulting tribes during grading, excavation and ground-disturbing activities on the site: including the scheduling, safety requirements, duties, scope of work, and Native American Tribal Monitors' authority to stop and redirect grading activities in coordination with all project archaeologists; and,
    c. The protocols and stipulations that the permittee/owner (Developer), City, tribes, and Project Archaeologist will follow in the event of inadvertent cultural resources discoveries, including any newly discovered cultural resource deposits that shall be subject to a cultural resource evaluation.

Mitigation Measure CUL-3: ***Native American Monitoring:*** Professional Native American Tribal monitors shall also participate in monitoring of ground-disturbing activity. At least 30 days prior to issuance of grading permits, agreements between the Developer/Applicant and a Native American Monitor shall be developed regarding prehistoric cultural resources and shall identify any monitoring requirements and treatment of cultural resources so as to meet the requirements of CEQA. The monitoring agreement shall address the treatment of known cultural resources; the designation, responsibilities, and participation of professional Native American Tribal monitors during grading, excavation, and ground-disturbing activities; project grading and development scheduling; terms of compensation for the monitors; and treatment and final disposition of any cultural resources, sacred sites, and human remains discovered on-site.

Mitigation Measure CUL-4: ***Disposition of Cultural Resources:*** In the event that Native American cultural resources are inadvertently discovered during the course of grading for this project, one or more of the following treatments, in order of preference, shall be employed with the tribes. Evidence of such shall be submitted to the City of Encinitas Planning Department:

1) Preservation-in-place means avoiding the resources, leaving them in the place where they were found with no development affecting the integrity of the resource.

2) On-site reburial of the discovered items as detailed in the Monitoring Plan required pursuant to Mitigation Measure CUL-2. This shall include measures and provisions to protect the future reburial area from any future impacts in perpetuity. Reburial shall not occur until all legally required cataloging and basic recordation have been completed. No recordation of sacred items is permitted without the written consent of all Consulting Native American Tribal Governments

2) The permittee/owner shall relinquish ownership of all cultural resources, including sacred items, burial goods, and all archaeological artifacts and non-human remains as part of the required mitigation for impacts to cultural resources, and adhere to the following:

    a. A curation agreement with an appropriate qualified repository within San Diego County that meets federal standards per 36 Code of Federal Regulations Part 79 and therefore would be professionally curated and made available to other archaeologists/researchers for further study. The collections and associated records shall be transferred, including title, to an appropriate curation facility within San Diego County, to be accompanied by payment of the fees necessary for permanent curation; and,

    b. At the completion of grading, excavation, and ground disturbing activities on-site, a Phase IV Monitoring Report shall be submitted to the City documenting monitoring activities conducted by the Project Archaeologist and Native Tribal Monitors within 60 days of completion of grading. This report shall document the impacts to the known resources on the property; describe how each mitigation measure was fulfilled; document the type of cultural resources recovered and the disposition of such resources; provide evidence of the required cultural sensitivity training for the construction staff held during the required pre-grade meeting; and, in a confidential appendix, include the daily/weekly monitoring notes from the archaeologist. All reports produced will be submitted to the City of Encinitas, San Diego Museum of Man and interested tribes.

> **Mitigation Measure CUL-5**: ***Human remains:*** If human remains are encountered, California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the San Diego County Coroner has made the necessary findings as to origin. Further, pursuant to California Public Resources Code Section 5097.98(b), remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made. If the San Diego County Coroner determines the remains to be Native American, the Native American Heritage Commission must be contacted within 24 hours. The Native American Heritage Commission must then immediately identify the "most likely descendants(s)" for purposes of receiving notification of discovery. The most likely descendant(s) shall then make recommendations within 48 hours and engage in consultation concerning the treatment of the remains as provided in Public Resources Code Section 5097.98 and the agreement described in CUL-32.

With implementation of Mitigation Measures CUL-1 through CUL-5, potential impacts to cultural resources would be **less than significant**. However, there may be feasible options to avoid or reduce potentially significant impacts related to cultural resources. **This issue will be evaluated in the EIR.**

c) The potential for encountering human remains at the project site is low. No known burial sites have been identified on the site or in the vicinity. With implementation of Mitigation Measure CUL-5 as a condition of project approval, this impact would be reduced to **less than significant.** This issue will not be evaluated in the EIR.

	Potentially Significant Impact	**Potentially Significant Unless Mitigation Incorporated**	**Less than Significant Impact**	**No Impact**
VI. ENERGY – would the project:				
a) Result in potentially significant adverse impact due to wasteful, inefficient, consumption of energy resources during project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

a) Project construction would utilize common methods for site preparation, grading and installation of all infrastructure. Techniques are not expected to be wasteful or otherwise result in inefficient use of fuels or other sources of energy. The proposed project would be required to comply with California Energy Code Title 24 requirements in effect at the time buildings are being designed. A **less than significant** impact would under this threshold. This issue will not be addressed in the EIR.

b) The project would construct a residential care facility and 16 affordable housing units. The project would utilize heavy equipment that meets CARB requirements for energy efficiency and emission reduction. The project would be consistent with the City of Encinitas Climate Action Plan as discussed in Section VIII, *Greenhouse Gas*. The project would not conflict with a state or local plan regarding renewable energy or energy efficiency. **No impact** would under this threshold. This issue will not be addressed in the EIR.

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
VII. GEOLOGY AND SOILS – would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☒	☐	☐	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable as a result of the project, and potentially result in on- or	☒	☐	☐	☐

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
VII. GEOLOGY AND SOILS – would the project:				
off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?				
d) Be located on expansive soil, as defined in Table 1-B of the Uniform Building Code, creating substantial direct or indirect risks to life or property?	☒	☐	☐	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

A geotechnical investigation for the proposed project site was performed by Alta California Geotechical, Inc., dated January 2, 2018 and provided for reference as Appendix F. The geotechnical investigation provides site specific information related to seismic and non-seismic hazards as summarized below.

a (i-ii) Ground rupture and related effects such as lurching (i.e., the rolling motion of surface materials associated with passing seismic waves) can adversely affect surface and subsurface structures. The project site is not located within the boundaries of an Earthquake Fault Zone as defined by the Alquist-Priolo Earthquake Fault Zoning Act of 1972 or a San Diego County Fault Hazard Zone for surface fault rupture hazards. No active or potentially active faults with the potential for surface fault rupture are known to pass directly beneath the site. There are no known active or potentially active faults traversing the area and the risk of ground rupture resulting from fault displacement beneath the site is low (Alta California Geotechnical, Inc., 2018).

During the life of the proposed improvements, the property may experience moderate to occasionally high ground shaking from known faults, as well as background shaking from other seismically active areas of the Southern California region. However, site preparation and construction of building foundations consistent with the geotechnical report recommendations, subsequent geotechnical design recommendations addressing liquefaction and current California Building Code (CBC) requirements, would address seismic concerns and related structural impacts associated with ground shaking. Impacts would be **less than significant** and not addressed in an EIR.

a (iii) Liquefaction typically occurs within the upper 50 feet of the surface, when saturated, loose, fine- to medium-grained soils (sand and silt) are present. Earthquake shaking suddenly increases pressure in the water that fills the pores between soil grains, causing the soil to lose strength and behave as a liquid. When liquefaction occurs, the strength of the soil decreases, reducing the ability of the underlying soil to support foundations for buildings and other structures. The type of geologic process that created a soil deposit has a strong influence on its liquefaction susceptibility. Saturated soils that have been created by sedimentation in rivers and lakes can be very susceptible to liquefaction. Based on the site location and depth to groundwater (2-6 feet above sea level), the project site has high liquefaction potential. The geotechnical report recommends further evaluation be performed by engineers with specific expertise in liquefaction design to provide recommendations for addressing liquefaction at the project site. Because liquefaction and/or related effects may occur on the site and avoidance options may be available. **This issue will be evaluated in the EIR.**

a (iv) The project site gently slopes to the north. The slopes are steeper near the north end of the site which terminates in proximity to residential properties located at the southern end of Via Tiempo. The geotechnical report indicated there was no evidence that landslides have occurred on the property. Further, based on the soil type, graded fill slopes up to 30 feet in height at a 2:1 ratio would be stable. The slopes are expected to be no steeper than 2:1 and stabilized to avoid any impacts related to landslides. Impacts related to landslides would be **less than significant** and not addressed in an EIR.

b) As noted, the site gently slopes to the north with the degree of slope increasing towards the north end of the site. The site is greater than one acre in size and individual improvements would disturb more than one acre; thus, the project would be subject to State Water Resources Control Board General Construction Permit during construction to minimize soil erosion. For additional information, see Section IX, *Hydrology and Water Quality*. With implementation of Best Management Practices (BMPs) specified in the Stormwater Pollution Prevention Plan (SWPPP) prepared for the project, soil erosion hazard impacts would be **less than significant** and not addressed in an EIR.

c, d) Land subsidence is defined as the sinking or settling of land to a lower level. Causes can include: (1) earth movements; (2) lowering of ground water level; (3) removal of underlying supporting materials by mining or solution of solids, either artificially or from natural causes; (4) compaction caused by wetting (hydro-compaction); (5) oxidation of organic matter in soils; or (6) added load on the land surface. The soils on-site are comprised of young alluvial flood plain deposits. The alluvium is comprised of sand, silty sand, sandy silts and clayey silts. Soil testing indicates the alluvium has a low potential for expansion. However, given the need to address liquefaction potential, measures implemented would also alleviate the potential for subsidence and related impacts to structures. The geotechnical report provides remedial recommendations for the upper 30 feet of alluvium that include (1) dynamic compaction and (2) use of stone columns. Implementation of these and/or measures provided during subsequent geotechnical review would reduce potential impacts to **less than significant**. However, land subsidence and expansive soils can be related to liquefaction. **This issue will be addressed in the EIR.**

e) The proposed project would connect to an existing sewer line located along Manchester Avenue. No septic systems would be installed. This issue will not be evaluated in the EIR.

f) Construction of new development projects is not anticipated to adversely affect known unique paleontological resources or unique geologic features; however, because the site is located in proximity to areas that have been documented as highly sensitive for paleontological resources, this issue may be significant. Because it is unknown whether paleontological resources occur on-site, it is not reasonable or feasible to develop avoidance alternatives and evaluated this issue in the EIR. Implementation of Mitigation Measures **CUL-1** and **CUL-2** would reduce potential impacts to paleontological resources to **less than significant**. This issue will not be addressed in an EIR.

	Potentially Significant Impact	**Potentially Significant Unless Mitigation Incorporated**	**Less than Significant Impact**	**No Impact**
VIII. <u>GREENHOUSE GAS EMISSIONS-</u> Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☒	☐	☐	☐
b) Conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Information in this section was obtained from the *3111 Manchester Avenue Greenhouse Gas Technical Report* prepared for the project by Birdseye Planning Group (December 2019) Appendix G).

Gases that trap heat in the atmosphere are often referred to as greenhouse gases (GHGs), analogous to the way in which a greenhouse retains heat. Common GHG include water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O_x), fluorinated gases, and ozone. GHGs are emitted by both natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills. Man-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases, such as hydrofluorocarbons (HFCs), perfluorocarbons (PFC), and sulfur hexafluoride (SF_6). The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without the natural heat trapping effect of GHGs, Earth's surface would be about 34° C cooler. However, it is believed that emissions from human activities, particularly the consumption of fossil fuels for electricity production and transportation, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations (Cal EPA, 2006).

Pursuant to the requirements of SB 97, the *CEQA Guidelines* were amended to include feasible mitigation of GHG emissions and analysis of the effects of GHG emissions. The adopted *CEQA Guidelines* provide regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents, while giving lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts.

The vast majority of individual projects do not generate sufficient GHG emissions to create a project-specific impact through a direct influence to climate change; therefore, the issue of climate change typically involves an analysis of whether a project's contribution towards an impact is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines, Section 15355).

For future projects, the significance of GHG emissions may be evaluated based on locally adopted quantitative thresholds, or consistency with a regional GHG reduction plan (such as a Climate Action Plan). The proposed project is evaluated herein based on a 900 MT CO_2E significance threshold. To determine whether GHG emissions associated with the proposed project are "cumulatively considerable," consistency with applicable GHG emissions reductions strategies recommended by the City of Encinitas 2018 Climate Action Plan is discussed herein.

a) Construction activities would generate greenhouse gas (GHG) emissions associated with equipment operation. Site preparation and grading typically generate the greatest emission quantities because the use of heavy equipment is greatest during this phase of construction. Emissions associated with the construction period were estimated based on the projected maximum amount of equipment that would be used onsite at one time. Air districts such as the SDAPCD have recommended amortizing construction-related emissions over a 30-year period to calculate annual emissions. Construction of the project would generate approximately 1,140 metric tons of GHG emissions during construction. Amortized over 30 years, the project would generate 38 metric tons per year, as shown in Table 6 below.

Table 5 also shows the new construction, operational, and mobile GHG emissions associated with the proposed project. Long-term operational emissions relate to energy use, solid waste, water use, and transportation. Each source is shown below in Table 5. Cumulatively, the estimated emissions would not exceed the 900 MT CO_2E annual emission threshold.

Table 5
Combined Annual Greenhouse Gas Emissions

Emission Source	Annual Emissions (CO_2E)
Construction	38 metric tons
Operational	
Energy	316 metric tons
Solid Waste	24 metric tons
Water	89 metric tons
Mobile	425 metric tons
Total	**892 metric tons**

See Appendix for CalEEMod software program output.

The project would incorporate design strategies intended to minimize GHG emissions. These features focus on reducing energy consumption, water demand and transportation vehicles miles traveled and implementation would be conditions of approval for the overall project:

- Improved transit connectivity to ensure pedestrian access to neighboring transit services;
- Exceed Title 24 standard by 15% (as required by City of Encinitas 2011 CAP);
- Install high efficency lighting to achieve a 95% reduction in electrical demand associated with lighting;
- Install energy efficient mechanical systems and appliances;
- Install low flow plumbing fixtures;
- Implement water conservation system to reduce demand by 20%; and
- Install water efficient irrigation system to achieve 6.1% reduction in water use.

With implementation of the above referenced design measures required Title 24 of the California Energy Code and state legislation, GHG emissions would be less than the 900 MT annual standard. This would be **less than significant** impact. However, because measures to reduce GHG emissions statewide are an important issue at the local level, this issue will be addressed in the EIR.

b) The City of Encinitas adopted a Climate Action Plan (CAP) in January 2018. The following GHG reduction measures incorporated in the CAP that are relevant to new residential construction are listed below:

BE-2 Require New Single-Family Homes to Install Solar Water Heaters. Require all new single-family homes to install solar water heaters or other efficiency technology, unless the installation is impracticable due to poor solar resources. Other efficiency technology would include installation of a renewable energy technology system that uses renewable energy as the primary energy source for water heating.

RE-2 Require New Homes to install Solar Photovoltaic Systems. Require new single-family homes to install at least 1.5 Watt solar per square feet or minimum 2 kiloWatt (kW) per home. Require new multi-family homes to install at least 1 Watt solar per square foot or minimum 1 kW per unit, unless the installation is impracticable due to poor solar resources.

CET-4 Require Residential Electric Vehicle Charging Stations. Require new residential units to install EVCS equipment. For single family residence, install complete 40-Amp electrical circuit (EV Ready). For multi-family residences, install EVCS equipment at 5% of the total number of parking spaces.

ZW-1 Implement a Zero Waste Program. Implement a Zero Waste Program to reduce waste disposal from residents and businesses in the community. By 2020, divert 65% of total solid waste generated (equivalent to 5.3 pounds per capita per day waste disposal). By 2030, divert 80% of total solid waste generated (equivalent to 3 pounds per capita per day waste disposal).

The proposed project would be designed and constructed to comply with applicable policies in the CAP intended to reduce GHG emissions from new residential construction. With implementation of measures to reduce GHG emissions, the project would not exceed the 900 MT CO2E annual threshold. However, because measures to reduce GHG emissions statewide are an important issue at the local level, this issue will be addressed in the EIR.

	Potentially Significant Impact	**Potentially Significant Unless Mitigation Incorporated**	**Less than Significant Impact**	**No Impact**
IX. <u>HAZARDS AND HAZARDOUS MATERIALS</u> - Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the	☐	☐	☒	☐

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
IX. **HAZARDS AND HAZARDOUS MATERIALS** - Would the project:				
environment?				
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school	☐	☐	☒	☐
d) Be located on a site which is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☐	☐	☐	☒

Information provided in this section was provided in the *Phase I Environmental Site Assessment for 3111 Manchester Avenue* prepared by Advantage Environmental Consultants, November 2017 (Appendix H).

a-c) The proposed project would be a senior residential care facility with 16work force housing units. Aside from the typical materials (i.e., cleansers, automobile fluids, etc.) used and/or stored in small quantities, no hazardous materials would be used, stored or transported to/from the site.

It is assumed that some level of medical care would be provided. Like any medical facility, operation would require the ongoing use, storage and routine transport of hazardous materials consisting primarily of pharmaceuticals, medical waste, disinfectants and common cleaning chemicals. In the state of California, medical waste is managed according to the Medical Waste Management Act (MWMA). The Department of Environmental Health (DEH) is responsible for implementing the MWMA which is part of the California Health and Safety Code 117600-118360. The MWMA was adopted by the state legislature in 1990 and regulates the generation, handling, storage, treatment and disposal of medical waste. The MWMA provides the authority for DEH to issue permits and enforce regulations at facilities such as hospitals, skilled nursing facilities, biotech facilities, clinics and offices that generate large quantities of medical waste.

To implement MWMA requirements, facilities that generate medical waste are required to prepare and implement a Medical Waste Management Program. The Plan ensures the protection of public health and safety and the environment, through the implementation and enforcement of regulations that apply to the handling, storage, treatment, and disposal of biohazardous waste. The Medical Waste Management Plan addresses, sharps (i.e., needles), blood and blood products and microbiology laboratory waste and specifies how these materials are to be segregated, packaged and labeled for pick up and transportation off-site for treatment and disposal.

The nearest school to the project site is the Mira Costa College San Elijo Campus which is located adjacent to and east of the property. The Country Day School which is located at 3616 Manchester Avenue in Encinitas, is approximately one-mile northeast of the site. While the Mira Costa Campus is located within ¼ mile of the site, all hazardous waste would be managed according to MWMA requirements referenced above. No other schools are located within ¼ mile of the site. A **less than significant** impact would occur under these thresholds. This issue will not be addressed in an EIR.

d) As referenced, the site has been historically used for agricultural purposes. As part of the Phase I ESA process, soils samples from the site were tested to determine whether organochlorine pesticides (OCPs) and arsenic were present. No OCP concentrations were detected above the laboratory detection limits in any of the soil samples analyzed. Total arsenic was detected in two of the four soil samples at concentrations of 2.80 milligrams per kilogram (mg/kg) (001) and 8.94 mg/kg (002). The concentrations are below the ambient screening level of 12 milligrams per kilogram recognized by the State of California Department of Toxic Substances Control. The Phase I ESA determined that no Recognized Environmental Conditions (RECs) are present on the site and that no further evaluation for the presence of hazardous materials is warranted. A **less than significant** impact would occur under this threshold. This issue will not be addressed in an EIR.

e, f) McClellen-Palomar Airport is located approximately 8.0 miles north of the site and is the closest airport. The project site is not located within the McClellen-Palomar Airport Influence Area, within 2 miles of a public use airport or in proximity to a private airstrip. **No impact** would occur under this threshold; and thus, this issue would not be addressed in an EIR.

g) The proposed project would not obstruct access to the project vicinity through road closures or other project actions that could impact evacuation routes or otherwise impair evacuation during emergencies. Any improvements to Manchester Avenue to facilitate ingress/egress into the project would be managed via a traffic control plan to minimize safety and access impacts during construction. **No impact** would occur under this threshold; thus, this issue will not be addressed in an EIR.

h) The project site is located in a developed area. The project site is not located in a Fire Hazard Severity Zone as designated in maps prepared for San Diego County by the California Department of Forestry and Fire Protection (San Diego County, 2018). **No impact** would occur under this threshold; and thus, this issue will not be addressed in an EIR.

	Potentially Significant Impact	**Potentially Significant Unless Mitigation Incorporated**	**Less than Significant Impact**	**No Impact**
X. <u>HYDROLOGY AND WATER QUALITY</u> – Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surveys, in a manner which would:	☐	☐	☒	☐

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
X. **HYDROLOGY AND WATER QUALITY** – Would the project:				
(i) result in substantial erosion or siltation on- or off-site?				
(ii) substantially increase the rate or amount of surface water runoff which would result in flooding on- or off-site?	☐	☐	☒	☐
(iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
(iv) Otherwise impede or redirect flood flows?	☒	☐	☐	☐
d) In flood hazard, tsunami or seiche zone, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

Material in this section was obtained in part from the 3111 Manchester Avenue Senior Care Facility Drainage Study prepared by Urban Resource, Inc. (September 2018) (Appendix I).

a) The on-site stormwater management system will consist of area drain and catch basin inlets, polyvinyl chloride (PVC) area drain lines, reinforced concrete pipe (RCP) storm drain lines, and biofiltration basins. To meet water quality, hydromodification, and detention requirements, onsite stormwater mitigation measures will, at a minimum, include three biofiltration basins onsite that comprise of mulch, engineered soil media, gravel, and an underdrain system. The proposed development will increase peak storm flows. Onsite stormwater detention is proposed to mitigate the increase in peak storm flows for the 100-year storm frequency. Increased peak flows for the 100-year storm frequency will be addressed with the proposed biofiltration basins, and if necessary, underground storage pipes.

This project is categorized as a Priority Development Project for storm water subject to the requirements of hydromodification management. The proposed biofiltration basins will also provide water quality treatment for the developed area and will provide hydromodification mitigation. Biofiltrations BMPs will incorporate underdrains per geotechnical recommendations. Critical Coarse Sediment Protection for off-site flows will be addressed by proposed RCP storm drains that will convey the off-site storm flows directly to the San Elijo Lagoon, bypassing the onsite biofiltration basins.

The on-site storm drain system has been designed to capture and convey flows into biofiltration basins for treatment and address hydromodification requirements. The project will not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. However, because this issue has the potential to affect jurisdictional resources on the south side of Manchester Avenue, this issue will be addressed in the EIR.

b) The project site is located in the City of Encinitas in the Olivenhain Municipal Water District service area. OMWD's potable distribution system consists of approximately 434 miles of pipeline, fourteen reservoirs and six pump stations. Per the 2015 Urban Water Management Plan, all potable water distributed by OMWD is purchased from the California Water Association (CWA). No groundwater is pumped from wells within the service area to augment supplies of purchased water. The project site is not within a groundwater recharge area. Project impacts on groundwater supply would be **less than significant**. This issue would not be addressed in the EIR.

c) The project would modify on-site drainage. Construction of the stormwater treatment system would retain the design capture volume for the project. This would avoid substantial erosion or siltation on- or off-site.

i) While the project would modify on-site drainage, it would not alter the course of an existing stream or river that would result in on- or off-site erosion or siltation. Construction of the stormwater treatment system would retain the design capture volume for the project. This would avoid flooding on- or off-site. The project would not substantially degrade water quality or otherwise violate discharge standards. With the implementation of on-site BMPs to capture flows and BMPs designed to address impervious surface runoff from paved surfaces, impacts related to stormwater would be reduced to **less than significant.** However, because this issue has the potential to affect jurisdictional resources on the south side of Manchester Avenue, this issue will be addressed in the EIR.

ii) As referenced, off-site flows entering the property would be captured and conveyed around the on-site stormwater treatment system prior to release off-site. The on-site stormwater system would be designed to retain the capture volumes for the project. The project site is not located within a 100-year mapped flood zone (FEMA Flood Map 06073C1063G, May 2012). As referenced, the project would redirect on-site drainage patterns; however, it would not impede or redirect flood flows. All on-site drainage would be managed to ensure pre-construction flows off-site are maintained. The project would not expose people or structures to flood hazard from severe storm events. **No impact** would occur under this threshold. This issue will not be addressed in the EIR.

iii) As referenced, off-site flows entering the property would be captured and conveyed around the on-site stormwater treatment system prior to release off-site. The on-site stormwater system would be designed to retain the capture volumes for the project. The project would not exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. Impacts would be **less than significant** under this threshold. This issue will not be addressed in the EIR.

iv) The project will not incorporate features that would impede storm flows or other drainage features such that on- or off-site flooding would occur. However, the project would require the removal of an existing unvegetated ephemeral channel that occurs on-site. This would be mitigated as referenced in Section IV, *Biological Resources*. However, reasonable or feasible alternatives may be implemented to avoid impacts to features both on the north and south side of Manchester Avenue. **This issue will be evaluated in the EIR.**

d) Seiches are oscillations of the surface of inland bodies of water that vary in period from a few minutes to several hours. Seismic excitations can induce such oscillations. Tsunamis are large sea waves produced by submarine earthquakes or volcanic eruptions. The tsunami wave runup map prepared for the Encinitas quadrangle by the California Emergency Management Agency, shows the runup zone is limited to areas west of Interstate 5. The site is located east of the runup area and is not projected to be affected by a tsunami. As referenced, the project site is not within the inundation zone of the nearest reservoirs; and thus, is not expected to be affected by a seiche if a seismic event were to occur. The project generally slopes to the south with steep slopes to the north that could become unstable during grading or other ground disturbing activities. As referenced, the steep slope area would not be disturbed during grading. Thus, the project is not expected to be subject to a mudflow hazard. **No impact** would occur under this threshold. This issue would not be addressed in the EIR.

e) The JRMP is the City of Encinitas's approach to improving water quality in its creeks, lagoons, and the ocean through reducing discharges of pollutants to the municipal separate storm sewer system. To reduce pollutants in these storm drain system discharges to water bodies, the City implements or requires its residents and land owners to implement a variety of BMPs. These are summarized above and addressed in detail within the drainage report and Stormwater Quality Management Plan (SQWMP) prepared for the project. The project would be designed to meet applicable stormwater regulations, including the JRMP. As referenced, off-site flows entering the property would be captured and conveyed around the on-site stormwater treatment system prior to release off-site. The on-site stormwater system would be designed to retain the capture volumes for the project. These features would be consistent with the JMRP. **No impacts** would occur under this threshold. This issue will not be addressed in the EIR.

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
XI. LAND USE AND PLANNING -- Would the proposal:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

a) The proposed project would develop a new senior care facility and 16 work force housing units on a 19.026 gross-acre site. As referenced, the project is allowed with the RR-2 zoning and General Plan (last amended August 21, 2013) provided a Major Use Permit is approved. The site is located in an existing developed area with development to the west, north and east. The San Elijo Lagoon is located to the south on the south side of Manchester Avenue. The proposed project would utilize the existing Manchester Avenue alignment with project-related improvements occurring at the project access road intersection. The project would not result in the construction of improvements that would physically divide existing residential neighborhoods or otherwise impact circulation on Manchester Avenue. N**o impact** would occur under this threshold. This issue will not be evaluated in the EIR.

b) The proposed project site is located in the Cardiff Community as defined within the City of Encinitas General Plan 2025. The General Plan Land Use element recognizes the Cardiff Community as a commercial district generally along Highway 101. As referenced, Manchester Avenue is designated a sensitive view corridor within the City of Encinitas; however, no specific land use policies are related to development proposals along Manchester Avenue within the area containing the project site.

As referenced, the use proposed is consistent with the RR-2 zoning designation provided a Major Use Permit is approved. Other required entitlements ancillary to the Major Use Permit are listed in the project description. As proposed, the project would not conflict with the City of Encinitas General Plan Land Use Element and the design would facilitate compliance with the Municipal Code. The proposed project would be compliant with goals, objectives and policies contained in the General Plan that pertain to the proposed use on the subject property.

McClellan-Palomar Airport is the closest airport and is located approximately 8.0 miles north of the site. The project site is not located within the McClellan-Palomar Airport Influence Area as depicted in the Airport Land Use Compatibility Plan (amended December 1m 2011), within 2 miles of a public use airport or in proximity to a private airstrip.

No impact would occur under this threshold. This issue will not be addressed in the EIR.

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
XII. <u>MINERAL RESOURCES</u> -- Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

a, b) Per the California Division of Mines and Geology Report, the lands within the City of Encinitas are not located within designated Mineral Resource Zones (MRZ). The closest state-classified mineral resource zone (MRZ-2) is located in the Kearney-Mesa/Mission Valley area. The project is not located within or in proximity to a MRZ. The proposed project would not require excavation of mineral resources nor would construction result in the loss of availability of any known regional or local mineral resources. Therefore, **no impact** to mineral resources would occur. This issue will not be addressed in the EIR.

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
XIII. <u>NOISE</u> – Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the	☐	☐	☒	☐

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
XIII. <u>NOISE</u> – Would the project result in:				
project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?				
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Noise levels (or volume) are generally measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound power levels consistent with the human hearing response, which is most sensitive to frequencies around 4,000 Hertz (about the highest note on a piano) and less sensitive to low frequencies (below 100 Hertz).

Sound pressure level is measured on a logarithmic scale with the 0 dB level based on the lowest detectable sound pressure level that people can perceive (an audible sound that is not zero sound pressure level). Based on the logarithmic scale, a doubling of sound energy is equivalent to an increase of 3 dB, and a sound that is 10 dB less than the ambient sound level has no effect on ambient noise. Because of the nature of the human ear, a sound must be about 10 dB greater than the reference sound to be judged as twice as loud. In general, a 3 dB change in community noise levels is noticeable, while 1-2 dB changes generally are not perceived. Quiet suburban areas typically have noise levels in the range of 40-50 dBA, while those along arterial streets are in the 50-60+ dBA range. Normal conversational levels are in the 60-65 dBA range, and ambient noise levels greater than 65 dBA can interrupt conversations.

In addition to the instantaneous measurement of sound levels, the duration of sound is important since sounds that occur over a long period of time are more likely to be an annoyance or cause direct physical damage or environmental stress. One of the most frequently used noise metrics that considers both duration and sound power level is the equivalent noise level (L_{eq}). The L_{eq} is defined as the single steady A-weighted level that is equivalent to the same amount of energy as that contained in the actual fluctuating levels over a period of time (essentially, the average noise level). Typically, L_{eq} is summed over a one-hour period.

The time period in which noise occurs is also important since noise that occurs at night tends to be more disturbing than that which occurs during the daytime. Two commonly used noise metrics – the Day-Night average level (L_{dn}) and the Community Noise Equivalent Level (CNEL) recognize this fact by weighting hourly L_{eq} over a 24-hour period. The L_{dn} is a 24-hour average noise level that adds 10 dB to actual nighttime (10:00 PM to 7:00 AM) noise levels to account for the greater sensitivity to noise during that time period. The CNEL is identical to the L_{dn}, except it also adds a 5 dB penalty for noise occurring during the evening (7:00 PM to 10:00 PM).

Vibration is sound radiated through the ground. The rumbling sound caused by the vibration of room surfaces is called ground borne noise. Ground borne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors. Ground-borne vibration related to human annoyance is generally related to velocity levels expressed in vibration decibels (VdB). However, construction-related groundborne vibration in relation to its potential for building damage can also be measured in inches per second (in/sec) peak particle velocity (PPV) (Federal Transit Administration, May 2006). Based on the FTA's *Transit Noise and Vibration Impact Assessment* and the California Department of Transportation's 1992 *Transportation-Related Earthborne Vibration, Technical Advisory*, vibration levels decrease by 6 VdB with every doubling of distance.

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with those uses. Residences, hospitals, schools, guest lodging, libraries, and parks are most sensitive to noise intrusion; and therefore, have more stringent noise exposure standards than commercial or industrial uses that are not subject to impacts such as sleep disturbance. Sensitive land uses generally should not be subjected to noise levels that would be considered intrusive in character. Therefore, the location, hours of operation, type of use, and extent of development warrant close analysis in an effort to ensure that noise sensitive receptors are not substantially affected by noise.

Noise Standards

Federal Noise Policies. There are no federal noise requirements or regulations that apply directly to the City of Palm Desert. However, there are federal regulations that influence the audible landscape, especially for projects where federal funding is involved. For example, the FHWA requires abatement of highway traffic noise for highway projects through rules in the Code of Federal Regulations (23 CFR Part 772), the Federal Transit Administration (FTA), and Federal Railroad Administration (FRA). Each agency recommends thorough noise and vibration assessments through comprehensive guidelines for any highway, mass transit, or high-speed railroad projects that would pass by residential areas.

Federal Vibration Policies. The Federal Transit Administration (FTA) has published guidelines for assessing the impacts of groundborne vibration associated with construction activities, which have been applied by other jurisdictions to other types of projects. The FTA measure of the threshold of architectural damage for non-engineered timber and mason buildings (e.g., residential units) is 0.2 in/sec PPV. The threshold of perception of vibration is 0.01 in/sec PPV (Federal Transit Administration, Office of Planning and the Environment, 2006).

State Noise Policies. Title 24, Section 3501 et. seq. of the California Code of Regulations codifies California Noise Insulation Standards. This code section uses the Community Noise Equivalency Level (CNEL) as its primary noise evaluation measurement. The CNEL measurement assesses noise variation during different times of the day for the purposes of averaging noise over a 24-hour period. Essentially, CNEL takes average sound levels at an observation point and adds a weighted penalty to those sounds that occur during the evening (+5 dBA) and nighttime hours (+10 dBA). An interior noise level of 45 dBA CNEL is often considered the desirable noise exposure level for single-family residential units. An exterior noise level of 65 dBA is generally considered an acceptable level for residential and other noise-sensitive land uses.

State Vibration Policies. There are no state standards for traffic-related vibrations. California Department of Transportation's (Caltrans) position is that highway traffic and construction vibrations generally pose no threat to buildings and structures. For continuous (or steady-state) vibrations; however, Caltrans considers the architectural damage risk level to be between 0.2 and 2.0 inches/second (California Department of Transportation, 2013).

City of Encinitas Noise Ordinance. Chapter 9.32.410 of the Encinitas Municipal Code prohibits the operation of commercial construction equipment on Sundays or between the hours of 7:00 p.m. and 7:00 a.m. Monday through Saturday. Construction noise cannot exceed 75 decibels for more than 8 hours during any 24-hour period when the construction site is located in proximity residential properties.

Per Chapter 30.40.010 (A), of the Encinitas Municipal Code, the maximum allowable exterior noise level at residences is 50 dBA from 7 a.m. to 10 p.m., and 45 dBA from 10 p.m. to 7 a.m.

a) Construction Noise. Temporary, construction-related noise would occur during construction of the proposed project. The noise levels associated with the operation of common construction equipment are shown in Table 6. The noise levels are provided for reference purposes; not all equipment shown would be used for the proposed project. Noise levels are expected to occur within the ranges shown.

Table 6
Typical Construction Equipment Noise Levels

Type of Equipment	Range of Maximum Sound Levels Measured (dBA at 50 feet)	Maximum Sound Levels for Analysis (dBA at 50 feet)
Pile Driver 12,000 to 18,000 ft-lb/blow	81–96	93
Rock Drills	83–99	96
Jack Hammers	75–85	82
Pneumatic Tools	78–88	85
Pumps	74–84	80
Scrapers	83–91	87
Haul Trucks	83–94	88
Cranes	79-86	82
Portable Generators	71-87	80
Rollers	75-82	80
Dozers	77–90	85
Tractors	77–82	80
Front-End Loaders	77–90	86
Hydraulic Backhoe	81-90	86
Hydraulic Excavators	81–90	86
Graders	79–89	86
Air Compressors	76–89	86
Trucks	81–87	86
Trencher	73-80	80

Source: Bolt, Beranek & Newman, Noise Control for Buildings and Manufacturing Plants, 1987.
dBA = A-weighted decibels, ft-lb/blow = foot-pounds per blow

Construction of the proposed improvements may utilize dozers, tractors, loaders, trucks and a variety of other types of equipment as individual phases of the construction process progress.

No blasting, pile-driving or deep excavation is anticipated for the project. Noise levels associated with the equipment commonly used will range from 80 to 88 dBA at 50 feet from the source. A doubling of sound energy yields an increase of three decibels, so multiple pieces of equipment operating together may cause relatively small but noticeable increases in noise levels above that associated with one piece of equipment. Assuming two pieces of construction equipment, each producing a noise level of 88 dBA, are operating at one time on the site, the worst-case combined noise level during the site preparation phase of construction is an estimated 91 dBA at a distance of 50 feet from the active construction area.

The nearest sensitive property are single family residences at the southern terminus of Via Tiempo adjacent to and north of the site. The northern portion of the site will remain undeveloped and placed in a conservation easement. The closest that construction would occur to the residences is approximately 500 feet. Construction noise may be audible at the nearest residences neighboring the site; however, assuming noise levels are 91 dBA at 50 feet from the source and sound energy would attenuate 6 dBA per doubling of distance, sound energy would attenuate to approximately 71 dBA at 500 feet. Noise levels at the nearest residences would not exceed the 75-dBA threshold referenced in the Encinitas Municipal Code. As stated, the Encinitas Municipal Code permits construction activities between the hours of 7:00 a.m. and 7:00 p.m. Monday through Saturday. Construction occurring consistent with these provisions is exempt from regulation. Thus, noise impacts during construction of each phase would be **less than significant**.

Operational Noise. Operation of the proposed project would generate noise associated with vehicle traffic. To gather data on the general noise environment at the project site, one weekday morning 15-minute noise measurement was taken on September 19, 2018. The monitoring location is located near the southeast corner of the property. The measurement was taken using an ANSI Type II integrating sound level meter. The predominant noise source was traffic on Manchester Avenue. The temperature during monitoring was 70 degrees Fahrenheit with gusty wind from the west. A windscreen was used to minimize related effects caused by wind. The Leq during monitoring was 66.0 dBA.

Exterior. Traffic is the primary noise source that would be generated by the proposed project. Thus, whether a traffic-related noise impact would occur is based on whether project traffic, when added to the existing traffic, would cause the Leq to noticeably increase (+3 dBA) or exceed the 50-dBA exterior standard referenced in the Encinitas Municipal Code. For a noticeable increase to occur, the sound energy (i.e., traffic volumes or speeds) would need to double. Existing noise levels exceed the day- and nighttime requirement (50 and 45 dBA, respectively) for residential areas as defined in the municipal code. Thus, whether an impact would occur is based on whether project traffic, when added to baseline conditions, would cause noise levels to increase by 3 dBA. For a noticeable (3 dBA) change to occur, traffic volumes along Manchester Avenue would have to double. According to the *Manchester Senior Living Traffic Letter Report* (Linscott, Law and Greenspan, Inc., August 2018), daily volumes along Manchester Avenue are 28,565. Assuming 10% of daily traffic occurs during the peak hour, peak hour volumes along Manchester Avenue are approximately 2,857 vehicles. The project would generate 712 daily trips with 37 morning peak hour trips and 57 pm evening peak hour trips. The addition of project traffic would not cause traffic volumes to double; thus, no noticeable traffic noise increase would occur. Because the project would not noticeably increase off-site noise levels over ambient conditions, a **less than significant** impact would occur under this threshold. This issue will not be addressed in the EIR.

b) Vibration is a unique form of noise because its energy is carried through buildings, structures, and the ground, whereas noise is simply carried through the air. Thus, vibration is generally felt rather than heard. Some vibration effects can be caused by noise; e.g., the rattling of windows from truck pass-by events. This phenomenon is caused by the coupling of the acoustic energy at frequencies that are close to the resonant frequency of the material being vibrated. Typically, groundborne vibration generated by manmade activities attenuates rapidly as vibration rapidly diminishes in amplitude with distance from the source. In the U.S., the ground motion caused by vibration is measured as particle velocity in inches per second and is referenced as vibration decibels (VdB).

The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people. If a roadway is smooth, the groundborne vibration from traffic is barely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration velocity, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings.

Construction activity on the project site would be temporary and any vibration would likely not persist for long periods. Assuming vibration levels would be simlar to those associated with a large bulldozer, typical groundborne vibration levels would be 87 VdB at 25 feet, 81 VdB at 50 feet, and 75 VdB at 100 feet, based on the Federal Transit Administration's (FTA's) *Transit Noise and Vibration Impact Assessment* (May 2006) as shown in Table 7.

Construction activities that typically generate substantial groundborne vibration include deep excavation and pile driving. Based on the proposed scope of improvements, this type of construction activity is not expected. General construction associated with the project would be confined to the project site and consist of grading and excavation for building footings. It would be temporary in duration. The closest single-family residence to the site is located approximately 500 feet to the north of the disturbance area. Based on the information presented in Table 8, vibration levels would not be perceptible at the nearest receiver during construction assuming a bulldozer is the heaviest piece of equipment used during grading or site clearing.

As discussed, 100 VdB is the threshold where minor damage can occur in fragile buildings. Vibration levels are projected to be under this threshold; thus, structural damage is not expected to occur as a result of construction activities associated with the proposed project.

Table 7
Typical Vibration Source Levels for Construction Equipment

Equipment	Approximate VdB				
	25 Feet	50 Feet	60 Feet	75 Feet	100 Feet
Large Bulldozer	87	81	79	77	75
Loaded Trucks	86	80	78	76	74
Jackhammer	79	73	71	69	67
Small Bulldozer	58	52	50	48	46

Source: Federal Railroad Administration, 1998

Given the distance between the construction area and the residences, would not exceed the groundborne velocity threshold level of 72 VdB for residences and/or buildings where people sleep as discussed above. Maximum vibration levels could be 81 VdB at 50 feet from the source.

As referenced, the Encinitas Municipal Code allows construction activities between the hours of 7:00 a.m. and 7:00 p.m. Monday through Saturday. Construction occurring consistent with these provisions is exempt from regulation. Construction occurring consistent with these provisions is exempt from regulation. Thus, vibration occurring during construction of each phase would be **less than significant**. This issue will not be addressed in the EIR.

c) As referenced, McClellen-Palomar Airport is located 7.0 miles north of the site and is the closest airport. The project site is not located within the McClellen-Palomar Airport Influence Area, within 2 miles of a public use airport in proximity to a private airstrip. While some aircraft overflights may occur and be audible, the proposed project would experience noise levels any greater than what occurs in neighboring residential areas. **No impact** would occur under this threshold. This issue will not be addressed in the EIR.

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
XIV. <u>POPULATION AND HOUSING</u> — Would the project:				
a) Induce substantial unplanned population growth in an area, either	☐	☐	☐	☒

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
XIV. POPULATION AND HOUSING — Would the project:				
directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

a) The proposed project would provide housing and/or senior care for approximately 200 people (assuming one resident per unit). CalEEMod estimates the work force element would provide housing for approximately 46 people assuming 2.9 people per unit. The project is proposing studio units which may limit the number of residents to one per unit. However, for the purpose of discussion, it is assumed the total resident population would be approximately 246 (i.e., 200 senior care facility residents and 46 work force housing residents) people. The proposed project would not require the removal of housing to accommodate improvements. It is assumed the senior care facility would house existing residents living within the San Diego area and the work force housing would project housing for employees or others who meet the housing requirements. The project would not induce population growth directly as a result of new development or indirectly through the extension of utility infrastructure to a currently unserved area. All improvements would occur on the project site and adjacent street. **No impact** related to population growth would result from project implementation. This issue will not be addressed in the EIR.

b, c) The project site is used for agricultural purposes and contains several out buildings located near the southwest corner. Project implementation would not result in the removal of existing housing or the displacement of residents that would require the construction of replacement housing elsewhere. **No impact** would occur**.** This issue will not be addressed in the EIR.

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
XV. PUBLIC SERVICES				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
i) Fire protection?	☐	☐	☒	☐
ii) Police protection?	☐	☐	☒	☐
iii) Schools?	☐	☐	☒	☐
iv) Parks?	☐	☐	☒	☐
v) Other public facilities?	☐	☐	☒	☐

a (i-v) The City of Encinitas Fire Department provides fire and emergency medical services to the City of Encinitas. Fire Station 4 is the nearest station to the project site. It is located at 2011 Village Park Way approximately 3.5 miles north of the site. Like any development project, the project may increase demand for fire service; however, the project is consistent with the land use designation for the site and would not increase the population beyond what was anticipated in the City of Encinitas General Plan. Further, the project would be designed and constructed consistent with applicable codes and standards for access and fire suppression infrastructure. It is not expected that the project would require construction of a new fire station to maintain service ratios. The project would be required to pay impact fees to cover costs associated with providing fire service. This would reduce the potential increase in demand to **less than significant.**

Law enforcement services are provided by the San Diego County Sheriff. The North Coastal Sheriff Station is located at 175 North El Camino Real. The North Coastal Sheriff Station is the largest division in the City of Encinitas and provides first response to all emergencies, performs preliminary investigations, and provides basic patrol services to the City of Encinitas. The San Diego County Sheriff's Department has approximately 4,000 sworn officers and support staff.

The project could potentially increase demand for law enforcement services by increasing activity in the area. However, the project is consistent with the land use designation for the site and would not increase the population beyond what was anticipated in the City of Encinitas General Plan. The project is not expected to require the construction of new or expanded Police Department facilities. This would reduce the potential increase in demand to **less than significant.**

The nearest school operated by the Encinitas Union Elementary School District is Park Dale Lane Elementary School located at 2050 Park Dale Lane, Encinitas, CA approximately 2.5 miles northeast of the site. Private schools include the Encinitas Country Day School located at 3616 Manchester Avenue approximately one-half mile northeast of the site. The senior care facility would not generate demand for school services. The approximately 47 work force housing units may house school age children but it is not anticipated to affect demand for school services or require the construction of new schools. The payment of impact fees will offset any school impact related to increased enrollment associated with the project. As indicated by the service letters provided with the Tentative Map/Major Use Permit application, the San Dieguito Unified School District has adequate capacity to provide school services to new project residents. The project is not expected to require the construction of new or expanded school facilities. This would reduce the potential increase in demand to **less than significant.**

The City of Encinitas Public Library provides library services to city residents. The library is located at 540 Cornish Drive, Encinitas, California 92024. The senior care facility is not expected to generate significant demand for library services. The affordable housing residents may generate demand for library services. This is not expected to require new library facilities. No new or expanded library services would be required. This impact would be **less than significant.**

Cardiff Sports Park is the nearest park to the project site. It is located at 1661 Lake Drive in Encinitas, approximately 1 mile north of the project site. The San Elijo Lagoon provides passive recreational opportunities. The senior care facilities is not expected to generate demand for new recreational facilities. The affordable housing residents may use park services; however, the population is small in comparison to the availability of resources within the City of Encinitas. The project would not remove park or recreational facilities that would require replacement elsewhere. With the payment of impact fees for each unit, the project would cover any fair share costs for the provision of park resources necessary to meet City demand. This impact would be **less than significant.**

The project would not require the provision of new or physically altered governmental facilities to maintain acceptable service levels. As noted, an increase in demand for fire, police or other services may occur. This would be **less than significant** as would impacts to school, library and recreation services. These issues will not be addressed in the EIR.

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
XVI. RECREATION --				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☒	☐

a-b) The project would be a new senior care facility with 16 affordable housing units. The project would contribute to an increase in the City of Encinitas population which may affect demand for recreational resources. As referenced in Section XIV, *Public Services*, the project would be required to pay impact fees to cover improvements to recreational resources. The project does not include recreational facilities or the expansion of existing facilities that may adversely affect the environment. With the payment if impact fees, a **less than significant** impact would occur. This issue will not be addressed in the EIR.

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
XVII. TRANSPORTATION -- Would the project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☐	☒
b) Would the project conflict with or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☒	☐

	Potentially Significant Impact	**Potentially Significant Unless Mitigation Incorporated**	**Less than Significant Impact**	**No Impact**
XVII. TRANSPORTATION -- Would the project:				
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible use (e.g., farm equipment)?	☐	☐	☐	☒
d) Result in inadequate emergency access?	☐	☐	☐	☒

Material in this section was obtained in part from the Belmont Village Encinitas-by-the-Sea Traffic Impact Letter, prepared by Linscott, Law and Greenspan, Inc., (December 2019) (Appendix J).

a) The project would be consistent with the current zoning and General Plan designation for the project site. No inconsistencies with General Plan Circulation Element policies would occur. **No impact** would occur under this threshold. This issue will not be addressed in the EIR.

b) As discussed in the Manchester Senior Living, Traffic Impact Letter, the project would generate approximately 712 daily trips. Of the total, 37 would occur during morning peak hour; 57 would occur during the evening peak hour. Primary access to the project site would be from Manchester Avenue and Via Pico. An evaluation of project impacts was performed at the following intersections and road segments:

Intersections:
1. I-5 Southbound Ramps / Manchester Avenue;
2. I-5 Northbound Ramps / Manchester Avenue; and
3. Manchester Avenue / DAR Access Road (Future).

Segments:
Manchester Avenue
1. Interstate 5 Southbound Ramps to Interstate 5 Northbound Ramps;
2. Interstate 5 Northbound Ramps to DAR Access Road (Future); and
3. DAR Access Road (Future) to Mira Costa College Road.

The DAR is a future condition that would provide direct transit access to northbound Interstate 5 from the transit facility currently under construction. The DAR road would also provide primary access to the site. The traffic evaluation concluded that short-term peak hour operations at study area intersections would result in a Level of Service (LOS) of C or better with and without the addition of project traffic to existing traffic volumes. No adverse impacts to the adjacent intersections studied would occur. Based on the results of the street segment capacity analysis, Manchester Avenue would operate at LOS C or better both with and without the project.

Long-term conditions (2030) show the LOS would be D or better with or without project traffic and with or without the DAR. No intersection impacts were calculated in any of the long-term analysis scenarios.

With respect to the segments evaluated, Manchester Avenue is calculated to operate at LOS D with near-term conditions in both with and without the project with the exception of the segment between the I-5 Southbound Ramps and the I-5 Northbound Ramps, which is calculated to operate at LOS F both with and without the project. Based on the City of Encinitas significance criteria, no significant impacts are identified on the segment of Manchester Avenue between the I-5 Southbound Ramps and the I-5 Northbound Ramps because the project traffic contribution is below the allowable threshold.

Impacts to traffic operations and circulation would be **less than significant.** However, this issue will be evaluated in the EIR.

c) Road improvements would be limited to the construction of two driveways from the DAR road. A secondary emergency access road would be constructed at the southeast corner of the site providing access to Manchester Avenue. All construction would occur consistent with city standards. Project design would not increase hazards. **No impact** would occur. This issue will not be addressed in the EIR.

d) The proposed project would not alter emergency access routes. The site would be accessed by two driveways along the DAR access road/Via Pico with secondary access from Manchester Avenue at the southeast corner of the site. The proposed DAR roadway would provide access to the site for residents, employees, visitors and emergency service vehicles. No project activity would impair emergency access to the area. **No impact** would occur. This issue will not be addressed in the EIR.

	Potentially Significant Impact	**Potentially Significant Unless Mitigation Incorporated**	**Less than Significant Impact**	**No Impact**
XVIII. TRIBAL CULTURAL RESOURCES -- Would the project:				
a) Cause a substantial adverse change in the significance of a	☒	☐	☐	☐

tribal cultural resource, defined in the Public Resource Code section 21074 as either a site, feature, place cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place or object with cultural value to a California Native American tribe, and that is:

i. Listed or eligible for listing in the California Register of Historic Places, or in a local register of historical resources as defined in Public Resource Code section 5020.1(k), or

ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resource Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe. ☒ ☐ ☐ ☐

a) As required under AB 52, the City of Encinitas will send consultation notices to Native American tribal representatives regarding the proposed project as part of the CEQA review process. As discussed in Section V., *Cultural Resources*, the property survey did not identify any significant cultural resources. One isolate metate fragment was observed; however, this fragment was determined not to be significant. While the survey was negative for significant cultural resources, archaeological and Native American monitoring was recommended during all ground-disturbing activities as grading may expose areas containing buried cultural deposits not be observed during the survey. The recommendation for archaeological monitoring is based upon the sensitivity of the area and the fact that soil movement downslope toward Manchester Avenue over many decades of agricultural disturbance has created the potential for buried and covered archaeological sites that may have existed along the lagoon shoreline.

Implementation of Mitigation Measures **CUL-1** through **CUL-5** would reduce potential impacts to Tribal Cultural Resources to less than significant. However, reasonable or feasible alternatives to the proposed project may reduce potentially significant or adverse impacts to Tribal Cultural Resources. **This issue will be addressed in the EIR.**

b) The *Phase I Cultural Resources Survey* did not identify the presence of significant resources on-site pursuant to criteria set forth in subdivision (c) of Public Resource Code Section 5024.1. To date, formal consultation required per AB 52 has not occurred. This will occur during preparation of the EIR. **This issue will be addressed in the EIR.**

	Potentially Significant Impact	**Potentially Significant Unless Mitigation Incorporated**	**Less than Significant Impact**	**No Impact**
XIX. <u>UTILITIES AND SERVICE SYSTEMS</u> -- Would the project:				
a) Require or result in the relocation or construction of new or expanded water, or wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities or expansion of existing facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure,	☐	☐	☒	☐

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
XIX. UTILITIES AND SERVICE SYSTEMS -- Would the project:				
or otherwise impair the attainment of solid waste reduction goals?				
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

a) Wastewater would be conveyed off-site within existing sewer lines located along Manchester Avenue west to the San Elijo Water Reclamation Facility (SEWRF). The SEWRF is located at 2695 Manchester Avenue approximately one mile west of the site and is operated by the Cardiff Sanitation District. The Cardiff Sanitation District owns and operates a sanitary sewer collection system (collection system) consisting of over 84 miles of sewer lines. The project would generate approximately 15.6 million gallons of wastewater annually (assuming 60% of total water demand) or 43,000 gpd. The SEWRF capacity is 2.5 mgd; thus, additional demand would be approximately 0.1% of capacity. The project would create additional demand on existing facilities. The project is consistent with the General Plan and zoning; thus, wastewater volumes could be accommodated within flows projected for planning purposes.

Potable water would be provided by OMWD. Per the 2015 Urban Water Management Plan, water demand within the service area was 19,549-acre feet in 2015. Demand is expected to increase to 22,843-acre feet by 2020 and 23,813-acre feet by 2035. Per the Urban Water Management Plan, future supply is expected to match service area demand. The project would minimize water demand by installing low flow fixtures and implementing other water reduction features that further reduces demand by 20% over projected volumes. Further, landscaping would be required to comply with the City of Encinitas Water Efficient Landscape Regulations (Chapter 23.26 EMC). No new water treatment or off-site distribution systems would be required to serve the project.

As discussed, the project onsite stormwater management system will consist of area drain and catch basin inlets, PVC area drain lines, RCP storm drain lines, and bioretention basins. To meet water quality, hydromodification, and detention requirements that are necessary to develop the existing site, onsite stormwater mitigation measures will, at a minimum, include bioretention basins onsite that comprise of mulch, engineered soil media, and gravel. The only off-site improvements required would be replacement of existing stormwater culverts and outfall structures along the south side of Manchester Avenue. These would be constructed as part of the project.

Other public utilities (i.e., electrical, natural gas, telephone/cable) would be extended to serve the site. This would not require the expansion of existing facilities to provide these services.

A **less than significant** impact would occur. This issue will not be addressed in the EIR.

b) The project site is located in the City of Encinitas in the Olivenhaven Municipal Water District service area. OMWD's potable distribution system consists of approximately 434 miles of pipeline, fourteen reservoirs and six pump stations. Water demand projections as calculated by CalEEMod 2016.3.2 (see Appendix C) is approximately 19.5 million gallons annually or 53,500 gallons per day. The proposed project would be required to comply with federal, State and local plans, policies and regulations and Executive Order B-29-15, which requires a 20% reduction in potable water use during construction and implementation of Best Management Practices for new development concerning water conservation, both for potable and non-potable uses. Chapter 3.1.2 of the City of Encinitas Climate Action Plan contains measures that can be implemented to reduce water consumption and related energy costs associated with water reclamation and transport.

Potable water would be provided by OMWD. Per the 2015 Urban Water Management Plan, water demand within the service area was 19,549-acre feet in 2015. Demand is expected to increase to 22,843-acre feet by 2020 and 23,813-acre feet by 2035. Per the Urban Water Management Plan, future supply is expected to match service area demand. The project would minimize water demand by installing low flow fixtures and implementing other water reduction features that further reduces demand by 20% over projected volumes. Further, landscaping would be required to comply with the City of Encinitas Water Efficient Landscape Regulations (Chapter 23.26 EMC). The purpose of this ordinance is to reduce potable water demand through the implementation of regulatory controls affecting landscape design in the City of Encinitas. Project design features would minimize potable water demand. No new water entitlements would be necessary to serve the project. A **less than significant** impact would occur. This issue will not be addressed in the EIR.

c) As discussed, the project onsite stormwater management system will consist of area drain and catch basin inlets, PVC area drain lines, RCP storm drain lines, and bioretention basins. To meet water quality, hydromodification, and detention requirements that are necessary to develop the existing site, onsite stormwater mitigation measures will, at a minimum, include bioretention basins onsite that comprise of mulch, engineered soil media, and gravel. The proposed development will increase peak storm flows in the develop condition, and onsite stormwater detention is proposed to mitigate the increase in peak storm flows for the 100-year storm frequency. No impact in addition to those evaluated in Section IX, *Hydrology and Water Quality*, would occur. Impacts would be **less than significant**. This issue will not be addressed in the EIR.

d) The proposed project would generate construction/demolition waste (CDW) as well as ongoing domestic waste from the commercial uses on-site. Solid waste generated in the City of Encinitas is collected by the City of Encinitas or EDCO Inc. and disposed of in landfills located within San Diego County. The nearest landfill is Miramar Landfill located in San Diego, California. The Project site is located approximately 14 miles north of the Miramar Landfill which is located at 5180 Convoy St, San Diego, California 92111. The landfill is owned and operated by the City of San Diego. The landfill property area consists of over 1,500 acres. The landfill has a permitted capacity of 3,900 tons per day. The disposal capacity is expected to last through the year 2030.

e) It is presumed that construction waste would be comprised of concrete, metals, wood, landscape and typical domestic material. The California Integrated Waste Management Act (CIWMA) of 1989 mandates that all cities and counties in California reduce solid waste disposed at landfills generated within their jurisdictions by 50% and has a long-term compliance goal of 70%. AB 341 (2015) increased the recycling goal to 75%. CDW associated with the proposed project will be recycled to the extent practicable with the remainder sent to a landfill. The construction debris would be processed and recycled or sent to the landfill.

Cal Recycle estimates that the project would generate approximately 190 tons of solid waste annually without implementation of recycling measures. Assuming the project complies with AB 341, the quantify of solid waste would be reduced to 47.5 tons annually or approximately 520 pounds per day. Assuming Miramar Landfill receives the waste, this would increase the total volume of material going to landfill daily by less than 1 percent. A **less than significant impact** would occur under this threshold. This issue will not be addressed in the EIR.

XX. WILDFIRES -- Would the project:

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☒	☐
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☒	☐

XX. WILDFIRES -- Would the project:

d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☒	☐

a) The site is currently accessed from Manchester Avenue which serves as the primary evacuation route for residents living in the general area. The project would add 37 trips during morning peak hour and 57 trips during the evening peak hour. The project site would be accessed from Via Pico on the west side of the site. Emergency vehicle access would be provided at the southeast corner of the site. The project would not adversely impact traffic operations on Manchester Avenue; and thus, would not impact use of Manchester Avenue as an evacuation route. A **less than significant** impact would occur under this threshold. This issue will not be evaluated in the EIR.

b) The project is surrounded by single family residential to the north, Mira Costa College to the east and a new Caltrans park and ride facility to the west. The San Elijo Lagoon is located to the south. Prevailing wind is from the west. The project is downslope of the development to the north. Native habitat would be located between the developed areas of the project site and single-family residential to the north. This area could be affected by wildfire; however, it is surrounded by urban development. Further, sufficient fuel modification area would be provided around the site perimeter to avoid potential impacts associated with a wildfire should one occur in the undeveloped area to the north. The project site is not expected to be exposed to high risk resulting from surrounding slopes or prevailing winds. **Impacts would be less than significant.** The issue would not be evaluated in the EIR.

c) The majority of the site is vacant and used for the production of agricultural crops. The portion of the site north of the development area would remain vegetated with native habitat. City of Encinitas fuel modification regulations require a 100-foot clear area around each structure. These areas have been included in the project design and are intended to minimize fire risk for structures constructed in the future.

d) The site is located downslope from the vegetated area to the north. The area is relatively small and there is adequate distance between the vegetated area and the development area, that if burned, is not expected to result in substantive risk from landslide or mudflows. The area west and east of the site does not contain steep slopes. Thus, if burned, it is unlikely that landslides or mudflows would occur to the extent that property damage downslope would result. Impacts would be **less than significant.** This issue will not be evaluated in the EIR.

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
XXI. MANDATORY FINDINGS OF SIGNIFICANCE —				
a) Does the project have the potential to substantially degrade the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self- sustaining levels, eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

a) Pre-construction surveys to locate nesting birds on-site would be performed per Mitigation Measure BIO-1. This would avoid potential impacts to migratory bird species. The site contains an unvegetated ephemeral soft-bottom channel. The area impacted by the project would be 0.08 acres which comprises a historical course of the drainage feature. As referenced, impacts to the ephemeral channel would require a Section 1602 Streambed Alteration Agreement (SAA) from the California Department of Fish and Wildlife (CDFW), a Section 404 Clean Water Act (CWA) permit and a Section 401 Water Quality Certification in accordance with the CWA. No sensitive plants or animals were observed on-site. CSS habitat is located at the north end of the site. This is not quality habitat and no gnatcatchers were present during the survey performed for preparation of the Biological Resources Report.

The project site contains no known cultural resources. However, because the site was determined to be sensitive for cultural resources, archaeological and Native American monitoring is recommended during ground disturbing activities.

Because mitigation is required to minimize impacts to biological and cultural resources, alternatives will be evaluated in the EIR to avoid impacts to the resources.

b) As presented in the discussion of environmental checklist Sections I through XX, the project would have no impact or a less than significant impact with respect to most all environmental issues. Potentially significant impacts could occur to aesthetic/visual resources, biological and cultural resources, greenhouse gas, geology/soils, hydrology/water quality, traffic and tribal cultural resources; and thus, will be addressed in the EIR. Based on the limited scope of direct physical impacts to the environment associated with the proposed project and the fact that mitigation or avoidance would reduce potentially significant or adverse impacts , the impacts are project-specific. Consequently, the project along with other cumulative projects would result in a **less than significant** cumulative impact with respect to all environmental issues.

d) In general, impacts to human beings are associated with air quality, hazards and hazardous materials and noise. As presented in the environmental checklist discussions, the project would have no impact or a less than significant impact with respect to these environmental issues. Therefore, the project would have a **less than significant** impact on human beings.

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B

Community Character and Scenic Resource Study

COMMUNITY CHARACTER AND SCENIC RESOURCE STUDY

3111 Manchester Avenue Senior Housing Project

Cardiff by the Sea, California 92007

CASE NO.:17-273

June 2019

Prepared by:
latitude33
PLANNING & ENGINEERING
9968 Hibert Street 2nd Floor, San Diego, CA 92131
p| 858.751.0633
www.latitude33.com

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1.0 INTRODUCTION

1.1 EXECUTIVE SUMMARY

The purpose of this Community Character and Scenic Resource Study is to evaluate the proposed development located at 3111 Manchester Avenue and its effect on community character, scenic resources and adopted land use/ design review policies. The analysis is intended to promote a well-designed development within the community, emphasizing design features that help maintain and enhance its character through architecture, landscaping and site planning.

The Neighborhood Study Area for the proposed project includes properties within approximately 850 feet of the project site boundary. The limits of the Neighborhood Study Area were determined in consultation with City of Encinitas staff. The neighborhood is characterized by open space and lower density single-family residential development to the north, Mira Costa College to the east, California Department of Transportation park-and-ride lot and related improvements associated with the Interstate 5/Manchester Avenue interchange to the west and the San Dieguito Lagoon Preserve to the south. Architectural styles within the Neighborhood study area are varied with both large and small buildings incorporating mixed setbacks, heights and building patterns.

The City of Encinitas is comprised of five distinctly unique communities. Each community possess an individuality that is a vital aspect to the overall character of the city. Architectural style, natural landforms, landscape palette and streetscape design are the primary criteria in determining its character. The combination of varied architecture, narrow streets with unimproved shoulders, pedestrian orientation and natural settings create an eclectic, small town feel that dominates the character of these communities. Cardiff-by-the-Sea is the community of focus in this study.

The analysis of the City Design Guidelines found that the proposed project is consistent with the intent set forth by the City. Through the use deep setback, projecting elements to break up wall plans, a mix of colors and materials and the use of appropriate scale the project respects the eclectic nature of the Cardiff community within the City of Encinitas.

The community of Cardiff-by-the-Sea encourages new development to respect and respond to the surrounding setting. The Community Character analysis found that the Manchester Senior Housing project has been designed to create a positive transition from undeveloped to developed land while respecting the character of the existing land uses. This is accomplished by maintaining consistency with the City Design Guidelines by integrating deep setbacks, projecting elements to break up wall plans, a mix of colors and materials and appropriate scale.

There are no community landmarks acknowledged on the project site. Thus, the analysis shows no adverse effect due to development of the proposed project.

The analysis of scenic resources found that though the proposed future development of this site would be visible from a designated scenic view corridor, it would not adversely impact scenic resources from Interstate 5 and the public viewpoints along Manchester Avenue because the architectural and landscape design would be complimentary to existing development and respect the natural topography of the site and surrounding area.

The existing site area would be slightly altered with the introduction of the Manchester Senior Housing project, but the overall openness and low-scale character of the community would be preserved. The proposed project will be in harmony with the surrounding context by combining diverse architectural and landscape design elements.

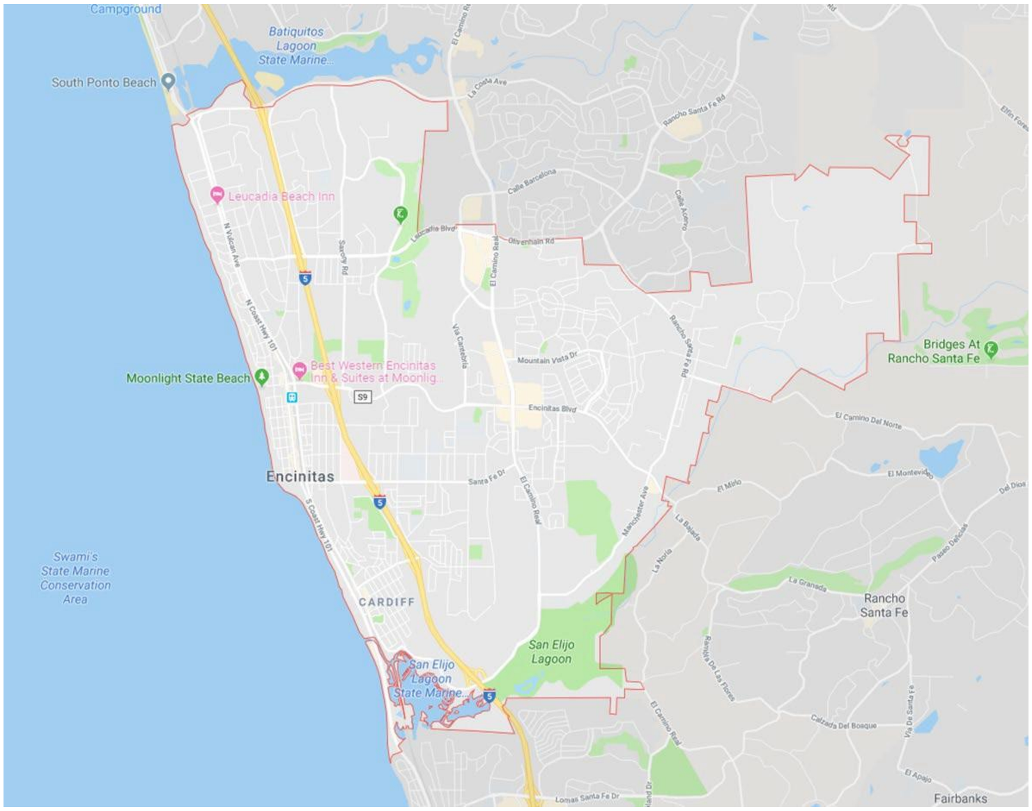


FIGURE 1-1 REGIONAL MAP

1.2 PROJECT SUMMARY DESCRIPTION

The Project is for Tentative Map Density Bonus, Planned Residential Development Permit, Major Use Permit, Design Review and Coastal Development Permit for a new, fully-licensed senior care facility and 8 single-family lots with each lot containing an accessory dwelling unit for a total of 16 *workforce affordable housing units located at 3111 Manchester Avenue in Cardiff-by-the-Sea. The project site is owned by the Yasuda Family and consists of two lots in a Rural Residential (RR)-2 zone. The site is also located within the California Coastal Appeal Jurisdiction, scenic/visual corridor and hillside/inland bluff overlay zone. The site totals approximately 19 gross acres. The California Department of Transportation (Caltrans) is in process of developing a new park-and-ride facility on an approximately 2.5-acre easement on the western edge of the site as part of the Interstate 5 North Coast Corridor Program Manchester Avenue interchange improvements. Proposed primary vehicular access to the site will be from Via Pico on the west side of the site north of Manchester Avenue. Secondary emergency vehicle access will be from Manchester Avenue at the southeast corner of the site. Vegetation consists of ruderal species around the perimeter with coastal sage scrub occurring along the north and northeastern border of the site.

The senior care facility is proposed to be two-stories in height and a third basement level and will accommodate a total of 200 units comprised of approximately 75 independent living units, 67 assisted living units and 58 memory care units (including both Circle of Friends** and a secured dementia wing of the facility). The size of the building is approximately 216,000 square feet with roughly 85,000 square feet of common area and 166 parking spaces. The building will be designed in an eclectic Craftsman style, incorporating wood siding and wood trim. The 16 workforce affordable units will have 17 parking stalls on the eastern side of the site. Greystar is proposing to dedicate approximately 6 acres of land to the north and east of the improvement area to the San Elijo Lagoon Conservancy for restoration and preservation as open space. All design aspects will adhere to the City of Encinitas's Design Guidelines.

* "Workforce Affordable" or "Workforce Housing" (referenced throughout this application) refers to the affordable component of this project. These units will be dedicated for persons making between 50% and 100% of AMI and therefore qualify towards the City's RHNA requirements. While these units are dedicated for any qualified person or household of the public, our goal is to potentially have some of the workers of the senior care facility live in these units.

** "Circle of Friends" is a proprietary program developed specifically for residents with mild- to moderate cognitive impairment who are not elopement risks. Circle of Friends residents live in an unsecured portion of the facility but participate in their own unique program of care and activities designed to preserve and maintain cognitive function as they age.

FIGURE 1-2 PROJECT AREA MAP

1.3 SUMMARY OF PUBLIC INVOLVEMENT/COMMUNITY PARTICIPATION PROGRAM ACTIVITIES

1.3.1 Overview

The City of Encinitas requires project applicants to create and implement a Citizen Participation Plan (CPP) early in the application process. The goal is to provide both the applicant and concerned citizens with adequate opportunities to discuss, understand and resolve issues related to potential impacts of the proposed project and surrounding area.

To encourage early participation by the public and create open dialogue between the applicant and neighbors, a CPP was prepared and provided to those who requested it. In addition, two CPP meetings were held with the community. The input received assisted the team in preparing a project design that meets project goals, reflects existing community character and addresses concerns raised by residents.

1.3.2 CPP Meetings

Meeting #1:

Date: The first CPP meeting was held on December 11, 2017 at 6pm at the Encinitas City Hall located at 505 S. Vulcan in Encinitas

Attendees:
Representatives for the applicant included:

- Bob LaFever, Greystar
- Beau Brand, Greystar
- Jerry Brand, Greystar
- Jordan Chase, Greystar
- Mark Faulkner, Consultant to Greystar
- Joe Zink, Greystar
- Ted Youngs, VTBS

Meeting Summary:
A brief presentation of the proposed senior care facility was made by the development team and architect, including an outline of the Citizens Participation Program. After these initial remarks, there were several questions/comments regarding details of the proposed facility. These questions, comments and responses are as follows and are included herein to provide some context for decisions regarding site planning and building design:

1. **What techniques did you use to notify and involve the public regarding your project?**

   A neighborhood letter and vicinity map notifying all property owners and occupants within 850 feet of the project site was mailed on November 27th, 2017. The Cardiff Town Council, Cardiff Chamber of Commerce, California Coastal Commission San Diego Office, Encinitas Department of Development Services and San Elijo Lagoon Conservancy were also notified via a letter per the request of the

Planning & Building Department. Of the 37 notices mailed out, 5 were returned as undeliverable; 8 people attended the CPP meeting at the Carnation Room and signed-in.

2. What concerns, issues, and problems did you hear during the process?

a. How will you address light pollution and noise pollution from the building?
b. Why are you allowed to build this residential care facility in a residential zone?
c. How will you address traffic caused by this project?
d. How will Greystar address the roof? Will there be A/C systems on the roof?
e. Who will manage and operate this facility, are they legitimate?
f. Does the city really need another IL/AL/MC facility?
g. What is the timeline of this project? Does Greystar already have permits?
h. How will Greystar address the fire risk associated with this project and its operations?
i. Where will displaced animals and wildlife go with this project?
j. Why will the project be one large building?
k. Regardless of the City's direction, will Greystar perform an EIR?
l. How many beds will be licensed as an RCFE (Residential Care Facility for the Elderly)?
m. Is the wrap around parking too much?

3. How have you addressed the concerns, issues and problems raised above?

a. Greystar will ensure that the design of this building orients lighting in such a way to minimize any outward/unnecessary light pollution to its neighbors. Noise pollution is mitigated by having ample separation from the project facility to the most proximate houses on the hill. Greystar is proposing to leave the entire land area north of the building footprint as open space, providing such a buffer. Additionally, Greystar will adhere to City of Encinitas staff recommendations related to noise and light pollution.
b. The site is zoned as Rural Residential (RR-2) which allows for the development of a residential care facility with a Major Use Permit when a site is located on a prime arterial thoroughfare. Manchester Avenue is designated as a prime arterial thoroughfare.
c. Traffic impact and mitigation will be addressed through a traffic impact study that will be executed as a requirement for achieving entitlements. This traffic study will identify all traffic impacts of the proposed project and recommend ways for Greystar to mitigate such impacts. Greystar will follow recommendations of traffic impact professionals and City of Encinitas staff.
d. The roof element of the project will be largely determined by the prescribed Design Guidelines by the City of Encinitas. Current conceptual elevations include pitched rooves and ground-level A/C systems. All design elements at this point are conceptual and final design will be in strict adherence to the Design Guidelines.
e. Greystar is in advanced negotiations with multiple reputable senior care operators with experience in the San Diego market. As a distinguished real-estate developer,

investment manager and property manager, Greystar takes the selection of a reputable/legitimate operator very seriously. As Greystar works through the development/entitlement process, an operator will be selected and identified to the City of Encinitas.

f. While the City of Encinitas has several senior care facilities, most of these facilities are over ten years old. Low vacancies at these existing facilities, coupled with an exponentially growing 75+ population in Encinitas indicate there is an undersupply of senior care units in the market. Additionally, per the current zoning code, there are almost no more feasible senior care sites to develop in the City of Encinitas.

g. Greystar does not have any entitlements/permits related to the proposed project. Greystar anticipates two to three years to attain the entitlements for this project, with an additional two years of construction once entitlements are attained.

h. Fire risk is always a major concern for Greystar. Greystar met with City of Encinitas staff on 9/20/2017, including the Fire Marshall Anita Pupping. Anita described all requirements, including 100ft setbacks from coastal sage brush. Greystar already took measures to ensure site plans followed the required setbacks, and Greystar will adhere to all additional requirements prescribed by the City of Encinitas related to fire safety. The building will be sprinkled, and all require state of the art fire suppression and warning technology will be designed into the construction.

i. Greystar understands that the site, while currently being used as a commercial farm, is largely open and free for animals to access. Greystar has proposed keeping all land to north and east of the building footprint (+/-6 acres), as open space to act as a wildlife and animal corridor. This corridor will provide uninterrupted access to and from the San Elijo Lagoon and the hillside to north of the project site.

j. The current conceptual design of the project is one contiguous building because Greystar holds the safety of its future residents in the highest regards. Senior care residents should not have to walk between two separate buildings to access common areas, including the bistro/restaurant. It is industry standard to have connected contiguous buildings to minimize the chance of an unnecessary fall.

k. Greystar will provide an Environmental Impact Assessment (EIA) for review of the City, and through CEQA review, will determine the level of environmental study that will be required for the project.

If there are concerns, issues and problems you can't address, explain why?

l. Greystar cannot say how many beds will be licensed, as this depends on the senior care operator selected to manage the property. Once an operator is selected, Greystar will have a better idea as to how many units or beds will be licensed.

m. As part of the entitlement process with the City of Encinitas, Greystar will need to perform a parking study to understand how many total stalls will be needed per the intended use. Once this parking study is complete, Greystar will be able to more accurately address to parking needs/designs for the project.

The meeting lasted just over one hour. The attendees were informed that a report of the meeting would be prepared by the development team and architect and submitted to the Planning & Building Department. The report would include the questions and comments received and responses. Copies of the report would be mailed to the attendees once approved by the Planning & Building Department. The development team received no additional comments within the two weeks leading up to the meeting.

Meeting #2:

Date: The second CPP meeting was held on September 24, 2018 at 6pm at the Encinitas City Hall located at 505 S. Vulcan in Encinitas

Attendees:
Representative for the applicant included:

- Jerry Brand, Greystar
- Beau Brand, Greystar
- Mark Faulkner, Consultant to Greystar
- Joe Zink, Greystar
- Andy Gerber, Belmont Village
- Ted Youngs, VTBS
- Melissa Krause, Latitude 33 Planning and Engineering

Meeting Summary:
A brief presentation of the proposed senior care facility & workforce affordable housing was made by the development team, operator and architect, including an outline of the Citizens Participation Program. This was the second CPP meeting to be held for this project. After these initial remarks, there were several questions/comments regarding details of the proposed facility. These questions, comments and responses are as follows:

1. What techniques did you use to notify and involve the public regarding your project?

A neighborhood letter and vicinity map notifying all property owners and occupants within 850 feet of the project site was mailed on September 12th, 2018, and a notice was posted on the City of Encinitas website. The Cardiff Town Council, Cardiff Chamber of Commerce, California Coastal Commission San Diego Office, Encinitas Department of Development Services and San Elijo Lagoon Conservancy were also notified via a letter per the request of the Planning & Building Department. Of the 39 notices mailed out, 0 were returned as undeliverable; 1 person (Glen Johnson) attended the CPP meeting at the Carnation Room and signed-in.

2. What concerns, issues, and problems did you hear during the process?

a. Concerned on traffic impact on Manchester Avenue, how will you manage this?

b. Is Manchester Avenue a prime arterial road?

c. What AMI level will the workforce affordable housing units be for? Will these units count towards City RHNA requirements?

d. Will the workforce affordable units be deed restricted?

e. What levels of care of will the senior facility provide?

3. How have you addressed the concerns, issues and problems raised?

a. At the request of the City, Greystar had a qualified consultant perform a traffic impact study for the project, which will be included in the project application. In addition to this study, Greystar has met with Caltrans to discuss how traffic flow will function on Manchester Avenue. Greystar adjusted their original design from their first application (03/2018) to take main vehicular access off the Caltrans spine road versus Manchester Avenue itself. The only vehicles now allowed to enter our site from Manchester Avenue would be for emergency vehicles. In addition to this change, there will be a right turn installed for the Caltrans spine road access.
b. Yes, Manchester Avenue is a designated prime arterial road.
c. The workforce affordable housing units are being proposed for 60% of AMI (low-income) and will qualify towards City's RHNA requirements.
d. Yes, these units will be deed-restricted for the public. Our goal is to also potentially have some of the workers from the senior care facility live in this units.
e. The senior care facility will provide Independent Living, Assisted Living and Memory Care units. These units will all be licensed and allow for "age-in-place" for our residents.

4. If there are concerns, issues and problems you can't address, explain why?

None of the concerns, issues or problems couldn't be addressed. Glen Johnson also indicated in the comments sheet that the presentation clearly identified the scope of the project.

The meeting lasted just over one hour. The attendee was informed that a report of the meeting would be prepared by the development team and architect and submitted to the Planning & Building Department. The report would include the questions and comments received and responses. Copies of the report would be mailed to the attendees once approved by the Planning & Building Department. The development team received no additional comments within the two weeks leading up to the meeting.

2.0 EXISTING CONDITIONS

This chapter describes existing conditions within the Neighborhood and Community study areas surrounding the proposed project. For this study, only views from public vantage points were evaluated. Information regarding existing conditions was gathered from numerous sources including City's Resource Management Plan, Design Guidelines, zoning maps, Community Character Guidelines, site visits and photographs.

2.1 STUDY AREA

The community character and scenic resources analysis for the project includes the study of both a Neighborhood Study Area and Community Study Area. The Neighborhood Study Area includes area within 850 feet of the project site boundary. The Community Study Area encompasses a much larger area comprising a portion of the Cardiff-by-the-Sea community. These are summarized below and described in more detail in Appendix A.

2.1.1 Neighborhood Study Area

The Neighborhood Study Area for the proposed project includes properties within approximately 850 feet of the project site boundary. The limits of the Neighborhood Study Area were determined in consultation with City of Encinitas staff. Existing uses in the Neighborhood Study Area include, open space, commercial uses, residential uses and institutional uses.

Figure 2-1 Study Areas illustrates the approximately 850' radius map identified as the Neighborhood study area

2.1.2 Community Study Area

The City of Encinitas is comprised of five communities, which are each described in the City's General Plan Land Use Element. The proposed project's study area is defined by the designated community that the project is located within. The Manchester Senior housing project is in the southern portion of Cardiff-By-The-Sea (Cardiff). Cardiff is in the southwest section of Encinitas, just south of old downtown. Cardiff's development is concentrated east of Highway 101 with San Elijo State Park located west of Highway 101 along the coast. Cardiff's major arterials include Highway 101 and Interstate 5 both of which run north-south.

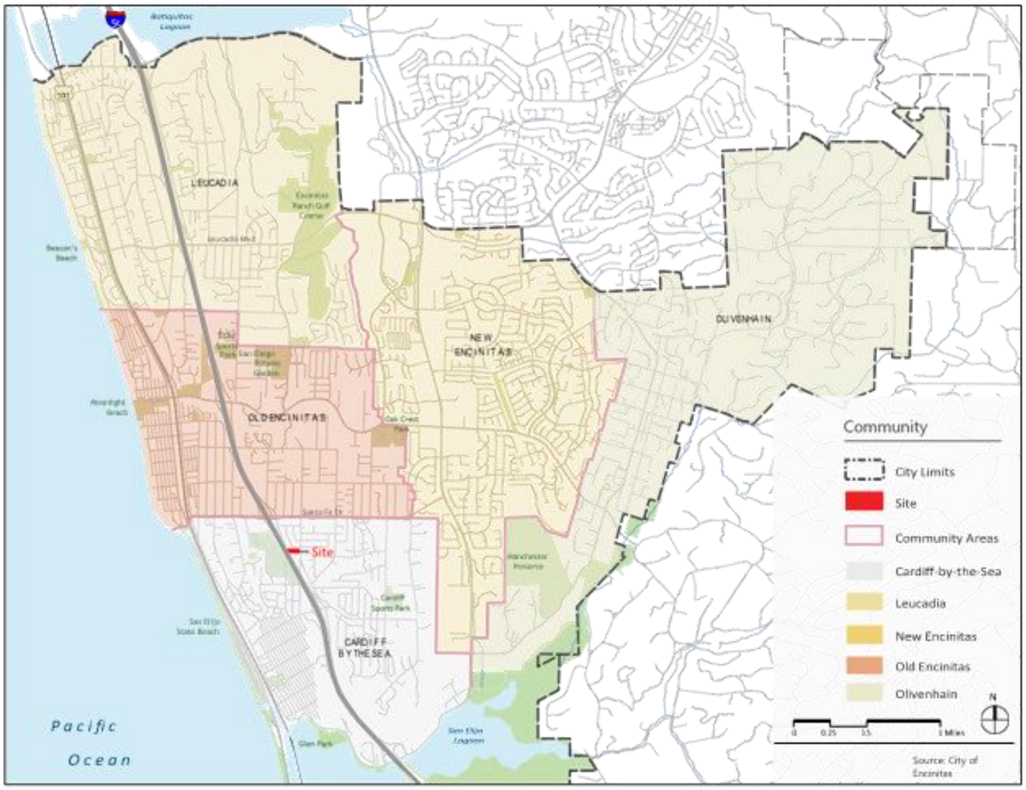


Figure 2-2 Community Study Area illustrates the boundaries between Encinitas' community character areas, identifying where changes in character occur

Currently there are five general community character areas that exist in Cardiff-by-the-Sea. Each of Encinitas' communities has unique land use characteristics that reflect its history and sense of place:

- Coastal Residential
- Village Center
- Inland Residential-Gridded
- Inland Residential-Curvilinear
- Neighborhood Center

The character of the Manchester Avenue project site is considered Inland Residential-Curvilinear.

Inland Residential Curvilinear Community

The coastal communities, which includes Cardiff, have an eclectic and unique character and share similar development patterns. One of the major contributors to the eclectic style of the coastal communities is the variety of architectural styles. The existing buildings have generally taken elements from a specific architectural style but do not always follow one style consistently throughout the community. The mixture of styles from lot to lot is what helps create the distinctive Cardiff -by-the-Sea style and character.

Inland Residential Curvilinear is a predominant community character within Encinitas and the portion of Cardiff the project site resides. Community characters are used to recognize the physical characteristics, including street layout, loot size, and building form and scale of an area. The Inland Residential Curvilinear character exists on the eastern portion of Cardiff and is suburban in character, with curvilinear streets and cul-de-sacs with larger homes set back from the street. The blocks are irregular and very large with long, curving streets that often terminate in cul-de-sacs. Continuous sidewalks and formal curbs are also present.

The context of the community includes mainly single-family residential subdivisions developed in the late 1970's through the mid 1990's however commercial and institutional used are also present. It is suburban in character, with curvilinear streets and cul-de-sacs with larger homes set back from the street.

Lot sizes in Cardiff community character area typically range between 4,000 and 15,000 square feet measuring 60-80 wide and 100-160 feet deep with varying orientation. Buildings typically face the street with parking accessed on-site from the street. Lot coverage ranges between 20-40%. Front setbacks typically vary from 10-30 feet, with side setbacks between 5-15 feet and rear 40-100 feet. Building height is primarily two stories ranging between 20-30 feet. Roof form is commonly hip and gables with entries generally facing the street.

Within this type of community, the following opportunities exist:

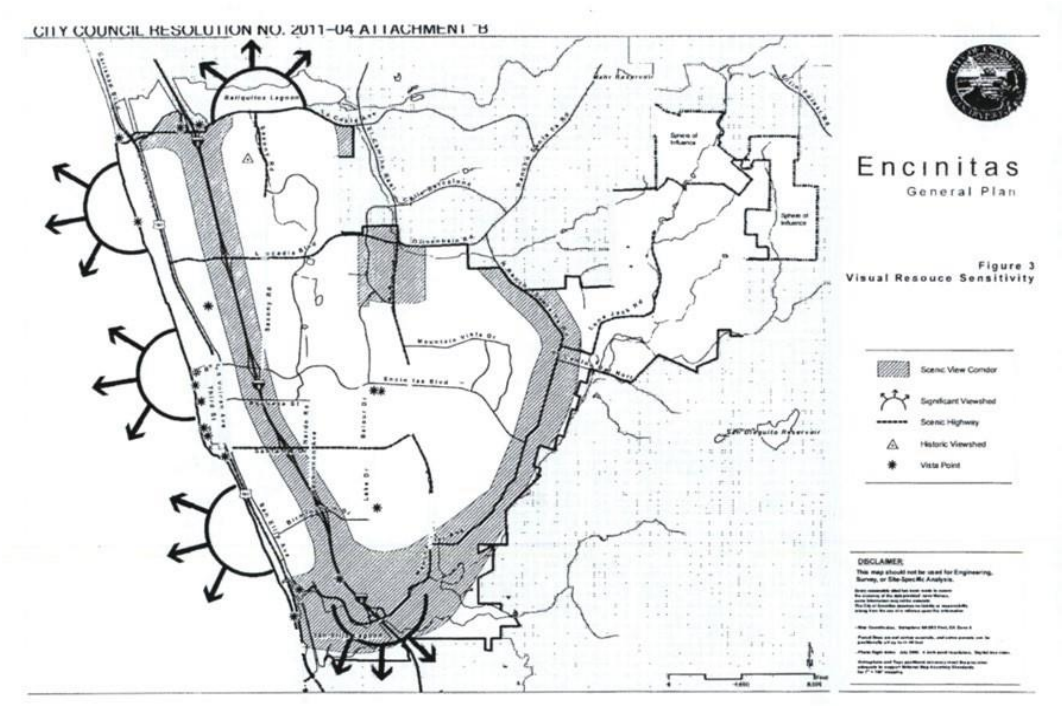
- Design projects with sensitive transitions respecting the existing low- scale residential form and character;
- Focus higher density housing close to arterials and activity centers;
- Enhance active, outdoor lifestyle; and
- Enhance connectivity to services, transit, and open space/trails.

2.2 SCENIC RESOURCES

The City of Encinitas' General Plan Resource Management Element describes the scenic resources within the vicinity of the project. The following narrative describes the scenic resources that could be affected by the implementation of the proposed project.

2.2.1 Public Scenic View Corridors

The Resource Management Element included in the City's General Plan designates Manchester Avenue and Interstate 5 as scenic view corridors. The corridor along Manchester extends just northwest of the intersection of El Camino Real and Manchester Avenue southeast of the intersection encompassing large portions of the San Elijo Lagoon. Interstate 5 viewshed is considered the area crossing San Elijo Lagoon.



Figures 2-3 Visual Resource Sensitivity refers to the location of these scenic roadways and scenic view corridors.

3.0 PROPOSED PROJECT

3.1 BACKGROUND

The Manchester Senior Housing project consists of 200 senior living units on approximately 19 acres, and is located at 3111 Manchester Avenue, east of interstate 5 in the Cardiff-by-the-Sea community. A Tentative Map Density Bonus, Planned Residential Development Permit, Major Use Permit, Design Review and Coastal Development Permit are required for the project.

3.1.1 Existing Site Conditions

The project site is located along a two-lane local collector roadway, Manchester Avenue, just east of Interstate 5. Access to the project will be from Via Pico which is being improved as part of the Interstate 5/Manchester Avenue project being constructed by Caltrans. Emergency vehicles only will be allowed direct access to the site off Manchester Avenue via a secondary entrance located at the southeast corner.

Figure 3-1 Aerial View without Project

The existing site land area is generally characterized by a mix of moderately slopes open terrain and steep vegetated coastal bluff. The total project area is comprised of approximately 14.43 aces and consists of two general topographic zones within the property. Most of the site consists of disturbed vacant land used for agricultural operations and the small remainder of the site is considered coastal bluffs.

The overall property is sloped from the north to south with property elevations that range from approximately 158 to 8 across the site. The small coastal bluff area in the northwest corner of the property slopes from 158 to 37 and contains the highest point of the site. The north central coastal bluff area slopes from approximately 80 to 70. The larger centralized agricultural area which encompasses the majority of the site slopes from approximately 100 to 8.

The coastal bluff areas consist of primarily undisturbed native vegetation while the agricultural area is completely disturbed with various temporary crop rotations through that year as part of the agricultural operation. The site drains from north to south and surface flow drainage is collected in an existing drainage ditch that runs along the southern border of the site parallel to Manchester Boulevard. The site drainage is collected within the ditch and conveyed to the south side of the street with existing culverts beneath the street. The proposed development proposes limits of grading at approximately 10.35 acres of the total site and the development area is located within existing disturbed agricultural area.

3.1.2 Operations

Senior Care Operator: Belmont Village Senior Living

The proposed project will be a fully licensed residential care facility for the elderly (RCFE) regulated by the State of California Community Care Licensing Division of the Department of Social Services. All units in the project, including those designated as “independent living” will be licensed to provide care services to residents including assistance with daily needs and specialized care as needed. This enables us to provide care to residents who move into independent living units but subsequently need assistance without requiring them to move to another unit within the building.

The facility will be exclusively for seniors 60 years of age or older, or seniors younger than 60 who have comparable care needs. However, the average age of residents is expected to be over 80 years old. Residents typically choose to live in this type of community instead of a private home because of a desire for a more social environment and the convenience of dining, activities and amenities available on-site or because they need assistance with daily activities.

Seniors reside at the facility as month-to-month tenants and enter into a Resident Services Agreement (RSA) which provides for the non-exclusive right to occupy a unit within the facility, three meals per day, entertainment, activities, amenities and transportation. Care services are also included in the RSA for assisted living and memory care residents. Since all units within the facility will be licensed, independent living residents may add care to their RSA without being required to move if at any time they develop the need for assistance.

Independent living units will be clustered together but not separated from assisted living units, and both independent living and assisted living residents share the common dining room as well as other common areas and amenity spaces throughout the project. Other common areas shared by independent living and assisted living residents include a private group dining room, an outdoor dining area, outdoor courtyard, therapy pool, beauty salon, bistro, movie screening room, computer room, library, flexible multi-purpose meeting room (a.k.a. “Town Hall”) as well as smaller, flexible gathering spaces. Activity programming is designed to be enjoyed by both independent living and assisted living residents together.

Memory care is required to be secured, and therefore memory care units are segregated from the rest of the project. The memory care wing includes its own dining room and other common areas for use by memory care residents. A secure outdoor courtyard is also included to provide safe outdoor space for memory care residents as required by the State of California for RCFE’s.

3.1.3 Staffing, Visitors and Guests

All uses within the proposed project will operate 24 hours per day. However, most employees will be present during the “day shift” which typically runs from approximately 6:00 am to 2:00 pm. More limited rosters of employees will be present during the night shift (2:00 pm – 10:00 pm) and overnight shift (10:00 pm – 6:00 am). The facility will be staffed by approximately 100 full-time equivalent (FTE) employees. We anticipate approximately 41 employees during day shift, 30 employees during night shift and 7 employees during overnight shift. Shift changes are deliberately scheduled during off-peak traffic hours to minimize our automobile trips during A.M. and P.M. peak hours. In addition to regular staff, some services such as operation of the beauty salon, hospice care and physical therapy may be provided on the premises by outside contractors and vendors.

Family and friends are permitted to visit 24 hours per day, though we try to encourage visiting between 9:00 am and 5:00 pm. We may also provide a night concierge to greet after hours visitors. Vendors and service providers are generally restricted to visiting between 9:00 am and 5:00 pm and are required to have an appointment to visit. Residents are permitted to have guests overnight and, depending on availability, we may provide a furnished apartment for short term stays by guests. All visitors, guests, vendors and service providers are required to check in upon arrival and may park in any available parking space. Residents who wish to park a vehicle onsite must have a valid, current driver's license and vehicle registration and must be active drivers (i.e. no long-term vehicle storage is permitted).

3.2 PROJECT DESCRIPTION

The Manchester Senior housing project would be a licensed senior living facility consisting of independent living units, assisted living units, Circle of Friends units and memory care units. The project will also include 16 workforce housing units. Access to the project will be from Via Pico west of the site. Emergency vehicles will have secondary access off Manchester Avenue at the southeast corner of the site.

3.2.1 Density

The Project is located on land designated as RR-2, Rural Residential zone. The site allows for lower density single-family residential developments with a maximum density of 2.0 units per net acre. The zone is intended to provide a transition from rural to more suburban areas within the City.

3.2.2 Building Types and Architectural Style

Because this parcel has historically been in agricultural use, many aspects of the design relate back to the early agrarian roots of the Cardiff/Encinitas area. Board-and-batten siding, simple pitched roofs, gables with barge brackets, and detailed window surrounds are all elements found in a coastal agrarian design. These design elements and materials create visual interest and are compatible with the local architecture.

The style of the workforce housing is a contemporary take on the coastal agrarian aesthetic, with clean lines and a varied color palette. Board-and-batten siding pitched roofs and simple forms are the foundations of this style. The eight houses are sited to form a central "village green" common space that encourages a sense of community within a larger community. The houses are also situated on stepped pads that respond to the sloped site and take advantage of views.

3.2.3 Site Layout

The site layout is related to various opportunities and constraints of the site that determined the most appropriate overall site plan for the property. The development area was defined by the existing property lines, the City Zoning Code setbacks, existing easement constraints, the existing and proposed street right of way and improvements for Manchester, the proposed street right of way and improvements for the Caltrans DAR road, the FEMA flood zone line, the only allowable vehicular points of access from the proposed DAR road, emergency vehicular access, pedestrian connections to the public system, site topography, earthwork, existing vegetation setbacks, and existing and proposed utility service to the property. The building placement, vehicular and pedestrian ingress, egress and path of travels, utility layout, and storm water / water quality management all played an equally important role in the final site layout. The vertical positioning of the building and site improvements were based upon FEMA flood zone elevations, vehicular and pedestrian access, existing and proposed site utility constraints, the site topography and earthwork; as well as on and off-site visual analysis considerations. The proposed site layout was determined to be the most appropriate solution for the development based on the building types, densities, and zoning requirements in relation to the site opportunities and constraints; resulting in a site plan that provides the best living experience for the residents while protecting the safety, health and welfare of the public.

3.2.4 Building Heights

The proposed project will include both one-story and two-story elements with a finished height of 30’.

To provide visual openness and pedestrian scale along Manchester Avenue, heights of buildings or portions of buildings will be generally lower when adjacent to the street corridor, stepping up to higher elements further from the corridor. Low roof elements, such as porches and building projections have been added to the senior building composition. The proposed project complies with the underlying zoning.

3.2.5 Bulk and Mass

The project’s facade treatments and simple roof gabled roof forms are intended to reflect the existing agrarian nature of the site and the history of Encinitas. Massing is enhanced by varied roof elements and materials such as siding, stucco and stone tile. Staggered façades and projecting wings will allow for a play of light and shadow on the buildings. Lower, smaller scale elements have been added to enhance the human scale of the project. Light to medium colors and materials will reinforce the agrarian theme and reduce the building mass

A massing study was conducted to properly characterize the proposed building envelopes relative to the site. Figure 3-2 depicts an aerial view of the building massing.

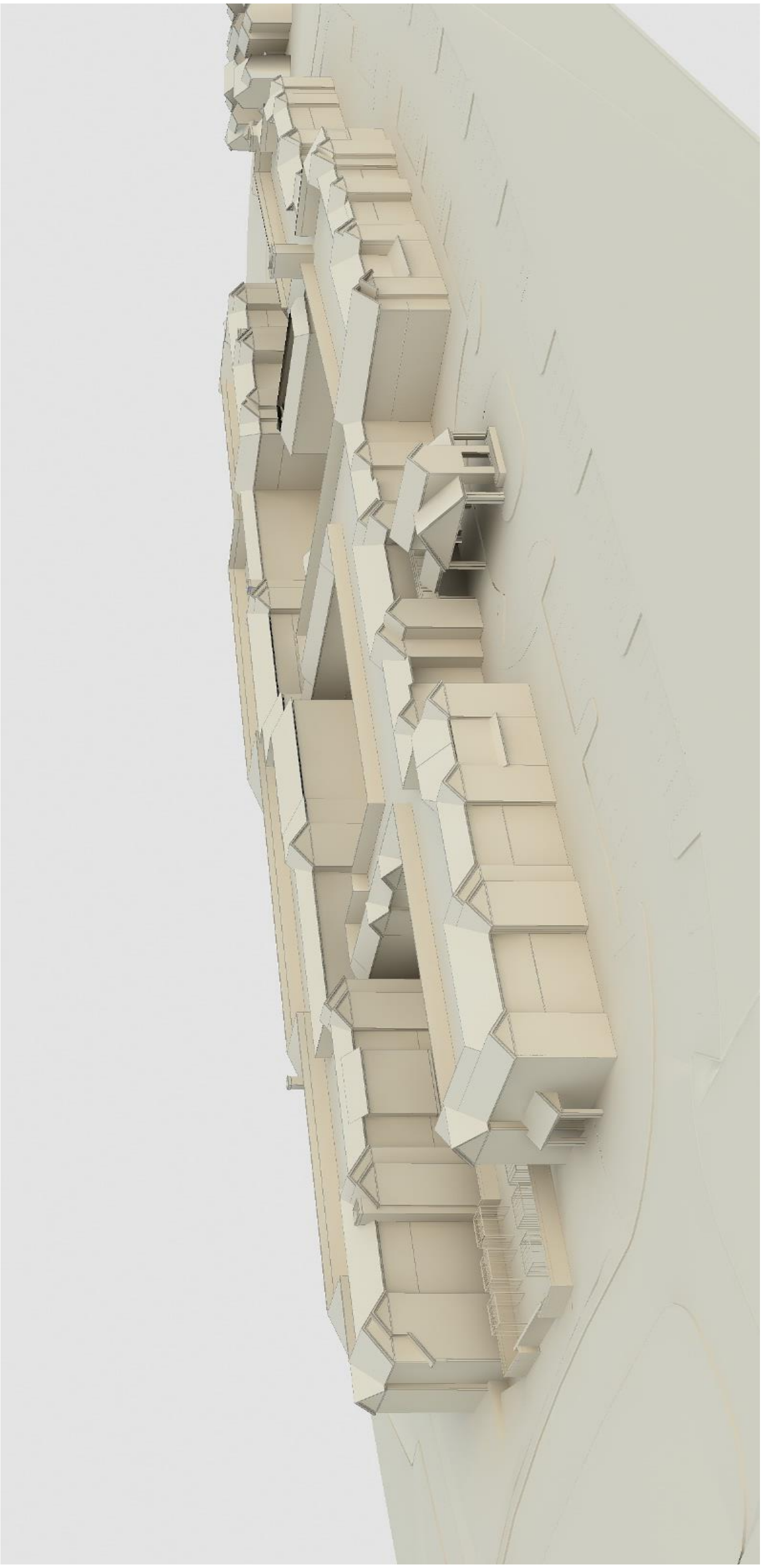


Figure 3-2 Massing Study illustrates the mass of the buildings

3.2.6 Streetscape

Manchester Avenue is a two-lane roadway with a posted speed of 45 mph. The project will shift the existing striping north within the existing right of way to accommodate installation of curb/gutter and a decomposed granite trail segment on the south side of Manchester Avenue. Sidewalks are in place along the north side of Manchester Avenue; however, the project will improve the public area along the property frontage with the construction of standard curb, gutter, non-contiguous sidewalk and landscaping.

3.2.7 Landscaping

The proposed landscaping will consist of non-invasive, drought tolerant native plant material that comply with the San Elijo Conservancy Coastal Sage Shrub Plant Field Guide. The enhanced paving at the entry points throughout the project as well as turf block will be provided in the fire lane to mitigate the expanses of paving. Additionally, appropriately sized trees will be planted within the parkway for screening purposes.

3.2.8 Grading Plan Elements

The site will include manufactured graded slopes with slopes 2:1 or less. There is expected to be a large back cut slope at the rear of property to daylight the developed pad to the existing site topography. Grading design also includes top of slope brow ditch and toe of slope v-ditch drainage systems. There is a typical 2:1 max graded slope between site pad elevation changes.

3.2.9 Retaining and Free-Standing Walls and Fences

The site will include small retaining walls to allow for specific landscape improvements. Private yard wall/fencing is included around the workforce unit lots as specified in the landscape architecture drawings. Storm drain headwalls at inlet/outlet structures are proposed with the possibility for fencing around detention basins if required for safety.

3.2.10 Parking

Surface parking will include accessible parking stalls as required, with appropriate signage, striping, markings and wheel stops. Landscape elements, such as trees and shrubs will be added to screen the parking areas with landscaping installed every six to seven stalls along the building frontage. Additionally, the frontage along Manchester is designed to screen the parking from the street per the City's design guidelines.

3.2.11 Public Improvements

The project will provide public improvements along the property frontage of Manchester Avenue. Improvements shall include the removal of the existing AC berm and the construction of standard curb, gutter and non-contiguous sidewalk on the north side of Manchester Avenue. As referenced, an emergency entrance driveway will be provided at the southeast corner of the site off Manchester Avenue along with two public driveway connections from Via Pico. The existing ditch within the right-of-way will be filled in and replaced with storm drain if necessary. A decomposed granite (DG) path will be constructed along the south side of Manchester Avenue generally beginning at Via Pico and extending along the site frontage. The trail would be installed in the existing disturbed road right of way connecting to a proposed Caltrans trail west of the site. The City of Encinitas would connect a future trail segment to the east end of the trail. Manchester Avenue would be restriped in the existing disturbed right of way to shift traveled lanes approximately 8 feet north. This would accommodate all anticipated trail and pedestrian infrastructure improvements.

Private improvements will include streets and drives including pavement, curb and gutter, emergency access lanes including gated access, pavement, curb and gutter and turf block.

3.2.12 Amenities

The project will include several private amenities such as a pool and spa with both sunning and shaded lounge areas, an entertainment terrace, dining pavilion, fountain garden with patio and large open lawns to allow outdoor activities and community events. It will include a meandering walking path that has direct connections to the private patios.

3.2.13 Non-Vehicular Mobility Features

Paved pedestrian walks and paths that provide an interior path of travel around the entire building and to all the building entrances and site amenities is included in the proposed project design. There will be pedestrian connections to public walk at Via Pico as well as pedestrian parkway concrete walk along the north and south sides of Manchester as described above. ADA accessible path of travel will be included as required by City standards.

3.2.14 Open Space

The project will provide a minimum of 40% of the site area as designated Open Space. The project will dedicate approximately 6 acres to the San Dieguito Lagoon conservancy with the intent that the acreage be designated open space.

The open space area north of the development area will contain vegetation, trails, and other passive landscape amenities. A minimum of 365 square feet for each affordable unit will be required open space that can be either active or passive with an average slope of 15% or less.

3.2.15 Land Use

The proposed project is located on a site that has been previously disturbed for agricultural purposes and is free of any significant landscaping features. The zoning for residential uses in Cardiff is comparable to that of other communities in Encinitas in that housing densities remain higher along the coast of the city. Eastern Cardiff is considerably more rural with some commercial uses that are located along Highway 101 and the offramp of Interstate 5 at Manchester Avenue. Park and recreation uses are located in proximity to the project site.

The Project is located on land designated RR-2. The RR-2 designation permits Residential Care as a use with approval of a Major Use Permit.

The site is bounded by single-family residences to the north, Interstate 5 to the west, and San Elijo Lagoon open space preserve to the south. The zones that immediately surround the site are designated Residential 3 (R-3, max density of 3 units per acre) to the north, Open Space (OS) to the south and Public/Semi-Public (P/SP) to the east. Adjacent and immediately north to the proposed site exists a single-family residential development that permits a minimum lot size of 14,500 square feet and a maximum density of 3.0 units per net acre which services as a transition from rural to suburban. The P/SP zone to the east of the project site permits activities operated by the City, County or other governmental agencies such as fire, school, water, or sewer districts. Semipublic uses such as hospitals and other private institutions may be included. Also included as part of the Neighborhood Study Area is the San Elijo Lagoon open space in the OS zone immediately south of the project site and Manchester Avenue.

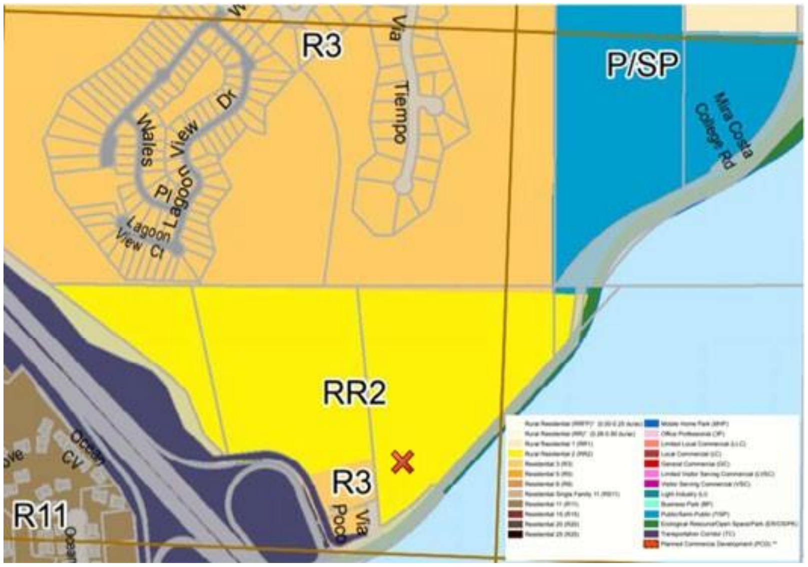


Figure 3-3 Zoning Map delineates the zoning designation of the site and surrounding area.

4.0 ARCHITECTURE

4.1 DESIGN

The Manchester Senior Project has been designed to harmonize with the unique site characteristics. Because the parcel has historically been used for agricultural purposes many aspects of the building's design language relate back to the early agrarian roots of the Cardiff/Encinitas area. Design elements include board-and-batten siding, simple pitched roofs, gables with barge brackets and detailed window surrounds, which are elements found in this restrained coastal agrarian aesthetic. Stone siding serves to not only anchor the building to the ground, but also provide visual consistency with the adjacent rocky hillsides. These design elements and materials create visual interest and are compatible with the local architecture. The overall massing of the proposed building also reinforces the agrarian theme with projecting low-scale wings, a varied yet simple roofline and a myriad of smaller scale features like porches and trellises. Additionally, the massing complements the site by stepping up the hillside rather than dominating the site as one single mass.

The Manchester Workforce Housing project provides a unique design treatment for each of the eight proposed residential structures. The style is a contemporary design based on the coastal agrarian aesthetic incorporating clean lines and a few hints of bold color.

The design guidelines characterize Encinitas as having an eclectic architectural nature. The residential design enhances that notion. Board-and-batten siding, pitched roofs, simple forms and a use of color are the foundations of the design. The site planning and massing of the project further relate these houses back to the community context and site characteristics. The eight structures are sited to form a central "village green" common space that encourages a sense of community within a larger community. The houses are also situated on stepped pads that respond to the sloped site and take advantage of views.

FIGURE 4-1 AERIAL WITH PROPOSED SITE PLAN

TABLE 4-1 BUILDING FOOTPRINT

UNIT TYPE	# UNITS	AVERAGE UNIT SIZE
Independent Living	75 Units	829 sf.
Assisted Living	67 Units	657 sf.
Circle of Friends	30 Units	459 sf.
Memory Care	28 Units	404 sf.
Total	200 Units	

FIGURE 4-2 ARCHITECTURAL STYLES

ARCHITECTURAL STYLES highlights the elevations of the proposed buildings, showcasing the architectural styles that are being proposed.

4.2 SURROUNDING ARCHITECTURE

The architectural nature of Cardiff-by-the-Sea demonstrates a variety of styles in its context that date from the 1950s up to the present. Modest size dwellings dominate the neighborhood to the north, giving its residents a human scale context within their community. The surrounding neighborhood is an eclectic mix of Spanish (with authentic and contemporary expressions of the style), California Coastal Cottage, Italianate, and modern white washed Greek. The closest buildings are a part of the Mira Costa Community College which is rendered in contemporary Spanish Mission style with barrel tile roofs and a simple more modern formal language. The residential area on the bluff above the site is a mix of California Coastal Cottage, contemporary Spanish Mission style and authentic Spanish Mission style. Further east along Manchester is the Greek Orthodox church and the italianate Belmont Village Senior housing.

The photographic documentation that is shown in Figure 4-2 demonstrates the usage of eclectic architectural design patterns that dominate the community helping to portray visual qualities of building design, colors, materials, and architectural characters that new developments should reflect in their designs, to contribute to the overall diverse visual character of the localized area.

FIGURE 4-3 ARCHITECTURAL CONTEXT

4.3 GUIDELINES

The City of Encinitas has established a set of design guidelines with the purpose to guide development within the City of Encinitas toward design that is consistent with the character of each community. The Design Guidelines are intended to promote well designed development in Encinitas. The Manchester senior housing project used the relevant policies within these guidelines as a resource to help create a design that followed the preferred architectural character and development patterns within Encinitas today. The design guidelines complement mandatory development standards by providing additional requirements and good examples of appropriate design solutions.

TABLE 4-2 DESIGN GUIDELINES

POLICY	CONSISTENCY ANALYSIS/COMMENT
Building Location	
Policy 2.4.2: The orientation of buildings, especially those in clusters, should be carefully designed to preserve and/or create view corridors.	Both the senior and workforce housing projects have been oriented to take advantage of the lagoon and hillside views afforded by the site as well as to preserve the views of adjacent neighbors. The senior building consists of radiating wings that not only break up the mass of the building, but also create open ended courtyards that allow views out for the tenants as well as views in for passers-by. The workforce units have been sited in a staggered pattern that allows for views from each unit as well as the village green.
Policy 4.5: In order to provide visual openness and pedestrian scale along major streets, heights of buildings or portions of buildings should generally be lower adjacent to the street corridor, stepping up to higher elements.	The buildings step up the hillside as one moves away from the street frontage.

POLICY	CONSISTENCY ANALYSIS/COMMENT
Views	
Policy 2.5.2: Landscaped areas should be developed, and plant materials selected so as to create and/or preserve view corridors.	The Landscape has been designed to protect and preserve the views from Manchester and viewpoints adjacent to the site.
Policy 2.5.4: Projects should be designed to preserve some of the significant views through the site. Projects should be designed to preserve significant public views. A significant public view is a view of a significant feature (ocean lagoon or backcountry) as viewed from public parks and General Plan designed vista points and scenic view corridors. Trees and vegetation that are themselves part of the view quality should be retained.	The senior and workforce buildings hug the site as grade slopes up to the back. This strategy helps to maintain views over the proposed project from above and down the street. The site's former agricultural use rendered it free of trees or native vegetation.

POLICY	CONSISTENCY ANALYSIS/COMMENT
Separation and Buffers	
Policy 2.6.5: Visual screening is best accomplished through the use of trees and shrubs that fill in at eye level. These visual screens should not be continuous and should allow for visual penetration through areas with views.	A naturalistic tree grove has been created to screen the building elevation from the scenic views of the San Elijo Lagoon. The Landscape setback which accommodates the tree grove will include varying height shrubs to create a continuous screen along the Manchester Avenue frontage.

POLICY	CONSISTENCY ANALYSIS/COMMENT
Grading Principles	
Policy 5.1.2: The impact on surrounding uses shall be considered in the building design.	The buildings sit low on the site in an effort to minimize interruption of views. Site access would be from Via Pico. This street would be shared with the adjacent Caltrans facility to avoid traffic stacking on Manchester Avenue.
Policy 5.1.4: The electric architectural nature in Encinitas should be reflected in any project.	The senior and workforce projects are rendered in different yet compatible styles to reinforce the eclectic quality of Encinitas.
Policy 5.3.2: Structures should be designed to create transitions in form and scale between large buildings and adjacent smaller buildings. For Example, if adjacent buildings are on story, new buildings should gradually transition from one story to two stories.	The site is not immediately adjacent to any buildings except for the houses on the bluff well *above* the site. A tangible scale difference will not be a factor.
Policy 5.3.3: Building forms should be designed to create visual interest. Changes in form accomplished by varying levels and planes can create a visually interesting structure while minimizing the appearance of bulk.	Building massing has been manipulated to create visual interest with wings projecting into the landscape, smaller scale elements such as porches/trellises, and varies roofline.
Policy 5.3.6: Non-residential building facades should be staggered to decrease the commercial strip image as well as provide for additional visual interest and identification for separate retail stores. Building facades should have a compatible material treatment of all elements of the structure.	Colors and materials such as board and batten siding, stone, smooth trim, metal railings and stucco have been used to break up the façades of the proposed buildings.

POLICY	CONSISTENCY ANALYSIS/COMMENT
Reduction of the Visual Bulk of Structures	
Policy 5.4.1: The apparent mass of each building should be minimized by placing the building away from adjacent streets, thus allowing space for landscaping to soften the appearance of the building heights. In addition, the wall planes facing the streets should modulate, creating a varying street facade.	Projecting elements like porches, bay windows, barge brackets and trellises have been used to break up wall planes of the proposed buildings and create a varying street façade. Additionally, the buildings have been set well back from the street edge to allow for landscaping.
Policy 5.4.5: Rooflines should avoid extended flat horizontal lines.	A mix of gable, hip and parapet-wall roof elements break up the line where the building engages with the sky.

POLICY	CONSISTENCY ANALYSIS/COMMENT
Color and Materials	
Policy 5.5.1: Exterior facing materials are one of the major determinants of a building's visual image. Variety in complementary exterior materials and colors should be used. Additional colors, materials and details including, but not limited to, fascia, trim, and railings ay be applied to small areas to emphasize certain features including entrances, desks, etc. Trim, fascia, rafter tails and the like should be of a sufficient dimension to achieve the desired visual effect and to be consistent with the overall character of the building design.	A variety of materials, colors and architectural details have been employed to create visual interest and reinforce the coastal agrarian theme. Appropriately scaled stone, siding, smooth board trim, barge brackets and fascia contribute to the facades' balanced composition.

POLICY	CONSISTENCY ANALYSIS/COMMENT
Architectural Character and Detailing	
Policy 5.6.1: Buildings should include sensitive architectural detailing and careful selection of materials to enhance character definition. Special care should be given to building detailing on all visible sides of development, particularly at building entrances. Although side and rear elevations may be less intensely detailed than the front elevation, some recollection of front elevation materials and detailing shall be incorporated.	All sides of the proposed buildings will be equally detailed with an assortment of materials, massing elements and colors. The senior building's entry is punctuated by a detailed porte cochere. Entries to the workforce housing units are highlighted by porches and boldly colored front doors.

4.4 RESOURCE MANAGEMENT ELEMENT POLICY CONSISTENCY

The City of Encinitas General Plan serves as a roadmap for the City's physical, social, and economic development and contains goals and policies that strive to maintain the City's distinct community characters, provide a balance of land uses and services and to preserve environmental resources. The evaluation of consistency with plans and policies is intended to provide a perspective on whether the Manchester Senior Housing project fits into the framework of goals and policies that the City has adopted to guide its future growth and development. These policies are intended to ensure that the existing character of developments are maintained, and that future development is compatible with existing land uses. Table 3-1 summarizes the relevant policies from the City of Encinitas' General Plan Resource Management Element and provides a consistency review for the proposed project.

TABLE 4-3 RESOURCE MANAGEMENT ELEMENT

POLICY	CONSISTENCY ANALYSIS/COMMENT
COMMUNITY VIEWS, VISTAS, AND AESTHETIC QUALITIES	
Policy 4.5: The City will designate “Scenic/Visual Corridor Overlay” areas within which the character of development would be regulated to protect the integrity of the Vista Points according to the following criteria:	
- Development within the critical viewshed area should be subject to design review based on the following: ○ Building height, bulk, roof line and color and scale should not obstruct, limit or degrade the existing views;	The project’s restrained facade treatments and simple roof gabled roof forms are intended to reflect the existing agrarian nature of the site and the history of Encinitas. Massing is enhanced by varied roof elements and materials such as siding, stucco and stone tile. Staggered façades and projecting wings will allow for a play of light and shadow on the buildings. Lower, smaller scale elements have been added to enhance the human scale of the project. Light to medium colors and materials will reinforce the agrarian theme and serve to reduce the mass of the buildings.
○ Landscaping should be located to screen adjacent undesirable views (parking lot areas, mechanical equipment, etc.)	All proposed landscaping shall consist of non- invasive, drought tolerant native plant material and comply with the San Elijo Conservancy Coastal Sage Shrub Plant Field Guide. Any existing landscaping that does not meet the above requirements shall be removed. All planting shall be maintained in good condition throughout the life of the project. The project proposed enhanced paving at the entry points throughout the project as well as turf block in the firelane to mitigate the expanses of paving. Additionally, appropriately sized trees privately maintained shall be planted within the parkway for aesthetically pleasing screening.

Policy 4.6: The City will maintain and enhance the scenic highway/visual corridor viewsheds. (Coastal Act/30251)	The Scenic corridor regulations apply to all properties within the scenic view corridor along scenic highways and adjacent to significant viewsheds and vista points as described in the Visual Resource Sensitivity Map of the Resource Management Element of the General
Policy 4.10: It is intended that development would be subject to the design review provisions of the Scenic/Visual Corridor Overlay Zone for those locations within Scenic View Corridors, along scenic highways and adjacent to significant viewsheds, historic viewsheds and vista points with the addition of the following design criteria:	Consideration will be given to the visual impact from a proposed development that may trigger design review within the Scenic View Corridor Overlay Zone. Evaluation of project bulk, mass, height, architectural design, grading, and other visual factors to ensure the visual impact of proposed development is properly assessed.
- Development Design o Building and vegetation setbacks, scenic easements, and height and bulk restrictions should be used to maintain existing views and vistas from the roadway.	The proposed site development area is outside the existing steeper slope areas. The project footprint falls within the limits of the existing agricultural area. There is an established 100’ setback from the coastal bluff vegetation. All buildings will be located outside this 100’ setback. There will be limited slope grading and minor street/utility improvement areas within that setback zone. The building locations lie outside the limits of the flood plain established by FEMA for the site/lagoon drainage area, and the elevations of the building is set above the established elevation of the flood plain as required.
o Development regulated along any bluff silhouette line or on adjacent slopes within view of the lagoon areas and Escondido Creek.	The site development area is outside the existing steeper slope areas as shown on page 16 (slope analysis). Everything is basically within the limits of the existing agricultural area and nit on the bluffs.

○ Where possible, development should be placed and set back from the bases of bluffs, and similarly, set back from bluff or ridge top silhouette lines; shall leave lagoon areas and floodplains open, and shall be sited to provide unobstructed view corridors from the nearest scenic highway. Development that is allowed within a viewshed area must respond in scale, roof line, materials, color, massing, and location on the site to the topography, existing vegetation, and colors of the native environment. (Coastal Act/30251/30253)	The project will have an established 100’ setback from the coastal bluff vegetation, which is ultimately the toe of the bluff slopes. All of the proposed buildings are located outside the 100’ setback. There is limited slope grading and minor street/utility improvement areas within that setback zone. The plan was developed to keep the building locations outside the limits of the flood plain established by FEMA for the site/lagoon drainage area, and the elevations of the building is well above the established elevation of the flood plain as required.
Policy 4.11: The City will develop a program to preserve views that also preserves the appropriate vegetation and removes obstacles that impact views. Trees and vegetation which are themselves part of the view quality along the public right-of-way will be retained. (Coastal Act/30251)	The proposed project is located on a site that was previously disturbed for agricultural purposes, free of any significant landscaping features and the surrounding properties have also been developed with institutional, residential and commercial development. The project would not open any undeveloped natural area for development.

POLICY	CONSISTENCY ANALYSIS/COMMENT
ENVIRONMENTAL IMPACTS FROM NEW DEVELOPMENT	
Policy 14.1: The best strategy to reduce erosion and sedimentation is to reduce to the maximum extent feasible, grading and removal of vegetation. It is the policy of the City that, in any land use and development, grading and vegetation removal shall be limited to the minimum necessary. (Coastal Act/3040/30250)	A Storm Water Pollution Prevention Plan (SWPPP) report will be prepared for the project to comply with the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges associated with Construction and Land Disturbance Activities, State Water Resources Control Board Order No. 2012-0006-SWQ, NPDES No. CAS000002. The SWPPP report will include,as required by the Construction General Permit, erosion and sediment control.
Policy 14.4: Revegetation and appropriate landscaping of all areas graded and scraped of vegetative cover shall be required with land use and development. Plantings, hydroseeding, and irrigation systems used shall be selected on the bases of minimizing erosion and conserving water. (Coastal Act/30251)	All proposed landscaping shall consist of non- invasive, drought tolerant native plant material and comply with the San Elijo Conservancy Coastal Sage Shrub Plant Field Guide. Any existing landscaping that does not meet the above requirements shall be removed. All planting shall be maintained in good condition throughout the life of the project.

5.0 ANALYSIS

The following section evaluates the potential visual impacts that may occur because of project implementation by addressing thresholds for determining the significance of Land Use, Community Character, Views and Landform impacts. This section provides a description of the existing land uses near the Project site and while considering the existing land use policies and designations applicable to the proposed project. This section also includes an assessment of consistency with the applicable General Plan Resource Management Element and Design Guideline policies.

5.1 THRESHOLDS FOR EVALUATION

The proposed project was analyzed based on the thresholds described below. Changes in community character and perceived impacts to scenic resources that could result from a project are not necessarily adverse. However, potential adverse effects may occur if one or more of the following thresholds are applicable to the proposed project:

Community Character

Would the project:
1.Have substantial conflicts with applicable provisions of the City's Design Guidelines,
2. Introduce features that would result in substantial, adverse contrast with most of the dominant attributes and assets that generally define the Neighborhood and Community study areas when viewed from surrounding public vantage points; or
3.Result in physical loss, isolation or degradation of a community identification symbol or landmark or other features that contribute to the valued visual character or image of the neighborhoods, community, or localized area (e.g., a stand of mature trees, coastal bluff, native habitat, historic landmark)?

Scenic Resources

Would any of the following conditions apply:
1. The project would substantially block a public view through a designated scenic highway/visual corridor or from a vista point identified in the Encinitas General Plan. To determine whether this condition has been met, the level of effort required by the viewer to retain the view should be considered.
2. The project would substantially obstruct, interrupt, or detract views through a designated scenic view corridor, significant viewshed and/or panoramic vista from the following vantage points;

- Public road;
- Public trail within the Encinitas Trails Master Plan;
- Scenic vista or highway; or
- Public recreational area

3. The project would have an adverse effect by opening up an undeveloped natural area for development, which would ultimately cause extensive public view blockage. Public view blockage would be considered extensive when the overall scenic quality of a visual resources is changed; for example, from an essentially natural view to a largely manufactured appearance.

4. The project would result in substantial policy conflicts with applicable scenic resource/viewshed policies of the General Plan's Resource Management Element.

5.2 COMMUNITY CHARACTER ANALYSIS

Community character can be defined by the appearance of the proposed buildings, landmarks and landscaping of project and surrounding area. Based on current development standards, the proposed project is expected to improve and comply with the appearance of its existing condition. Meaning that the development would enhance its surroundings using landscape, streetscape and architectural design that improves the overall aesthetics of the adjacent uses.

As addressed in Sections 3 and 4 of this document, the Project proposes a residential development that is consistent with the Resource Management Element of the General Plan, City of Encinitas Design Guidelines and Cardiff Community Character policies. The project will introduce a building design that is characteristic of the architectural context of the study area. The incorporation of project design features helps minimize the height, bulk and scale of the proposed buildings to enhance the overall eclectic character of the community, resulting in an articulate and harmonious relationship with the surrounding neighborhood.

5.2.1 Project Design

The proposed project was reviewed for compliance with the above referenced documents to provide direction for site planning, grading, circulation, parking, architecture, and landscaping. The complete set of design guidelines is included as Appendix B Design Guidelines. Specific design elements that reflect consistency with the Design Guidelines are summarized as follows:

The buildings' wings have been shifted relative to one another to not only achieve greater complexity in overall building massing but also create more opportunities for corridor day-lighting. This will also allow for better defined landscaped areas, such as the entry court and porte cochere. The eastern and western ends of the building have been designed so that the courtyards along these edges are not fully enclosed by building mass. This allows for people using the courtyards to enjoy distant vistas, as well as providing enhanced views into the project from the project's boundary. Each wing has been articulated in plan and elevation to create a varied façade expression. Prominent roof elements, a columned porte cochere, and differing window elements help define the building entrance and associated public spaces beyond.

5.2.2 Study Area Features

Community Study Area

The Community character within the Cardiff community is defined as Inland Residential Curvilinear Community, which is suburban in character, with curvilinear streets and cul-de-sacs with development set back from the street. The proposed project is for a senior care facility and 16 workforce housing units, which will include indoor and outdoor amenity space.

The proposed land use does contrast with the many single-family subdivisions developed in the late 1970's through the mid 1990's given their suburban character however the City of Encinitas has included design opportunities in the housing plan update for this community. These details include sensitive transition to respect the existing low-scale residential, enhance connectivity to open space and trails and the enhancement of active, outdoor lifestyles.

The location and design of the proposed project fits within the published design aesthetics presented by the City of Encinitas by creating a trail linkage to adjacent open space and promoting outdoor amenities through the site. Therefore, the proposed land use does not conflict with the character defined for Cardiff-By-The-Sea.

Neighborhood Study Area

The Neighborhood Study Area includes an area within approximately 850 feet of the project site boundary and is defined by site layout, architectural and landscape design and land use. Existing land uses within the area vary greatly, including diverse home types, Open Space, institutional uses, gas station, and another senior living facility. Site layouts and design vary widely with no specific or consistent theme. Development near the project area vary from single-family residential on larger lots with deep setbacks to multi-family and campus-style layouts that have buildings scattered through the property with large parking lots and landscaped areas.

Lot coverage in the surrounding area varies based on land use with Mira Costa Community College having the most. The proposed project conforms with neighboring sites and the underlying zoning by proposing approximately 16% coverage while respecting and incorporating the natural transition from the coastal bluffs to the north. The varying land use types, site layout designs, landscape and architectural themes allow for some flexibility in design of the proposed project. However, the harmonic design foundations of the project that combine diversity in architectural elements and landscaping reflect the overall character of the community creating a balance of new and old; thus, preserving the neighborhood equilibrium.

Because of this, the proposed development does not create a significant impact to the existing neighborhood character and is not considered an adverse contrast to the Neighborhood Study Area.

5.2.3 Community Landmarks

The proposed project is located on a site that has been previously disturbed for agricultural purposes. It does not contain significant landscaping features and the surrounding properties have been developed with institutional, residential and commercial development. No symbols or landmarks as defined by the City of Encinitas will be affected by the development of the proposed project therefore no significant adverse impact will occur to the community character.

5.3 SCENIC RESOURCES ANALYSIS

The Visual Resource Sensitivity Map prepared as part of the Resource Management Element of the City's General Plan describes regulations that apply to properties that lie within the scenic view corridor along scenic highways and adjacent to significant viewsheds and vista points. When new development is proposed on any properties triggering design review within a sensitive scenic resource area, consideration must be given to the overall visual impact of the proposed project and conditions imposed on the site by project bulk and mass, height, architectural design, grading, and other visual factors. The City of Encinitas Municipal Code helps to regulate development in these areas to ensure the visual impact of the proposed development is properly evaluated, the integrity of scenic resource is maintained or enhanced.

5.3.1 Views from designated scenic highway/visual corridor or vista points

The project site lies adjacent to Interstate 5, a designated local scenic highway. The project was designed with a thoughtfulness that allowed for existing topography to be incorporated into the site planning. There is approximately 200' in elevation change from the highest roof on the senior/workforce site to the ground level elevation in the single-family residential area to the north. The proposed buildings are relatively low-slung and step up the hillside. Due to the existing site topography, the lower, flatter portion of the site where the proposed buildings are to be sited, allows for ample views of the hillsides to the north for motorists traveling along Manchester Avenue and Interstate

5.3.2 Views through a designated scenic view corridor

The project site lies within the designated scenic view corridor that runs along Manchester Avenue. Buildings have been shifted to the north to allow for better views for motorists traveling southwest on Manchester Avenue. Additionally, the southeastern wing has been canted relative to the rest of the senior building to follow the angle of Manchester Avenue as it flows to the northeast. As the building steps up the hillside, views of the open space to the north are preserved. In addition, the proposed project intends to include landscape features such as trees and shrubs that will complement the surrounding area. Surface parking areas have been broken up by landscaped areas occurring every six to seven stalls along the building frontage. The project would not significantly diminish views of the corridor along this public roadway.

5.3.3 Development of Natural Areas

The proposed project is located on a site that has been historically used for agricultural purposes. The project would not open any undeveloped natural area for development.

5.4 VIEWPOINTS

Representative key viewpoints which most clearly display the visual effects of the project have been selected. Four key views have been identified based on the types of project-related features that would be visible, the number and frequency of views, and the potential sensitivity of viewers. Each key view is presented in its existing condition and its future condition with the implementation of the proposed project. The locations of the four key views are shown in Figure 5-2, Figure 5-3, Figure 5-4 and Figure 5-5.

Figure 5-1 Key Views

FIGURE 5-2 EXISTING CONDITIONS VIEW POINT LOCATION #1

FIGURE 5-2 PROPOSED VIEW POINT LOCATION #1 WITH 5 YEAR LANDSCAPE GROWTH

FIGURE 5-2 PROPOSED VIEW POINT LOCATION #1 WITH MATURE LANDSCAPE GROWTH

FIGURE 5-3 EXISTING CONDITIONS VIEW POINT LOCATION #2

FIGURE 5-3 PROPOSED VIEW POINT LOCATION WITH 5 YEAR LANDSCAPE GROWTH #2

FIGURE 5-3 PROPOSED VIEW POINT #2 WITH MATURE LANDSCAPE GROWTH

FIGURE 5-4 EXISTING CONDITIONS VIEW POINT LOCATION #3

FIGURE 5-4 PROPOSED VIEW POINT LOCATION #3 WITH 5 YEAR LANDSCAPE GROWTH

FIGURE 5-4 PROPOSED VIEW POINT LOCATION #3 WITH MATURE LANDSCAPE GROWTH

FIGURE 5-5 EXISTING CONDITIONS VIEW POINT LOCATION #4

FIGURE 5-5 PROPOSED VIEW POINT LOCATION #4 WITH 5 YEAR LANDSCAPE GROWTH

FIGURE 5-5 PROPOSED VIEW POINT LOCATION #4 WITH MATURE LANDSCAPE GROWTH

FIGURE 5-6 Figure Site Plan

5.5 SUMMARY

The views of the project site would be altered with the introduction of the Manchester Senior Housing project. Because of its location adjacent to Interstate 5 and along Manchester Avenue, the site would be highly visible from these designated local view corridors. However, the harmonic design foundations of the project that combine diversity in architectural elements and landscaping reflect the overall character of the community creating a balance of new and old; thus, preserving the character of the community. Future development within the scenic view corridor took into consideration the project’s overall visual impact by analyzing project bulk, mass, height, architectural design, grading, and other visual factors. The proposed project would not result in visual incompatibilities or substantial view blockage or strongly contrast with the surrounding development or natural topography. A less than significant impact to community character would occur.

Scenic resources along this section of Interstate 5 for northbound motorists are primarily of the San Elijo Lagoon areas south of the project site. Because the project site is east of Manchester Avenue, it would have no adverse effect on the scenic views along Manchester Avenue in accordance with the City of Encinitas guidelines. Additionally, site visibility from Manchester Avenue would be limited to a short stretch of the roadway due to curves in the road and natural topography surrounding the site. Through careful analysis, this report concludes that future development of the site would not result in an adverse impact on community character and scenic resources within the scenic view corridor or as viewed from Interstate 5 and Manchester Avenue. The visual changes associated with the proposed senior housing project can be deemed compatible with the surrounding neighborhood style and will contribute to the continued eclectic aesthetic of Encinitas. A less than significant impact to scenic resources would occur

C

Land Evaluation and Site Assessment

3111 Manchester Avenue

Land Evaluation and Site Assessment

Prepared for:

Greystar
444 South Cedros Avenue
Solana Beach, CA 92075

Prepared by:

BPG
BIRDSEYE
PLANNING GROUP

AUGUST 2018

LAND EVALUATION AND SITE ASSESSMENT

3111 MANCHESTER AVENUE

Prepared for

Greystar
444 South Cedros Avenue, Suite 172
Solana Beach, CA 92075

Prepared by:

Birdseye Planning Group, LLC
1354 York Drive
Vista, California 92084

August 2018

3111 Manchester Avenue
City of Encinitas, California

LAND EVALUATION AND SITE ASSESSMENT

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3111 Manchester Avenue
Encinitas, California

LAND EVALUATION AND SITE ASSESSMENT

This report is an evaluation of potential impacts to agricultural land associated with a proposal to construct and operate a senior care facility on a 15-acre site located at 3111 Manchester Avenue in the City of Encinitas. This report has been prepared by Birdseye Planning Group (BPG) under contract to Greystar as part of the due diligence process conducted for the proposed project.

Land Evaluation and Site Assessment (LESA) is a term used to define an approach for rating the relative quality of land resources based upon specific measurable features. The LESA system is a point-based approach composed of six factors. Two Land Evaluation factors are based upon soil resource quality. Four Site Assessment factors rate the value of the land for agricultural purposes based on the size of the site, water resource availability, surrounding agricultural lands and surrounding protected resource lands. Each factor is separately rated on a 100-point scale and then weighted relative to one another and combined, resulting in a single numeric score with a maximum attainable score of 100 points. It is this project score that becomes the basis for a determination of a project's potential significance, based upon a range of established scoring thresholds (Department of Conservation, 1997).

Appendix G of the California Environmental Quality Act (CEQA) Guidelines identifies the California Agricultural LESA Model as an optional method for assessing impacts to agriculture and farmland associated with development projects.

PROJECT DESCRIPTION/SETTING

The applicant proposes to construct a 194-unit senior care facility with 16 affordable work for housing units on a 15 gross-acre site located at 3111 Manchester Avenue in the City of Encinitas, California. The proposed site is zoned Rural Residential (RR) 2 and is located in the coastal zone. The project location is shown in Figure 1. The site has historically been used for agricultural production, primarily strawberries and Asian vegetables. The proposed senior care facility is allowed on the site per current zoning provided a major use permit is approved. The City of Encinitas has indicated a LESA is required to evaluate the potential for significant or adverse impacts associated with the loss of agricultural land. If so, mitigation may include the purchase of coastal agricultural land that has been set aside for production in perpetuity. Greystar is currently in the due diligence phase of the project and has requested preparation of a LESA to determine whether impacts caused by the project would require mitigation.

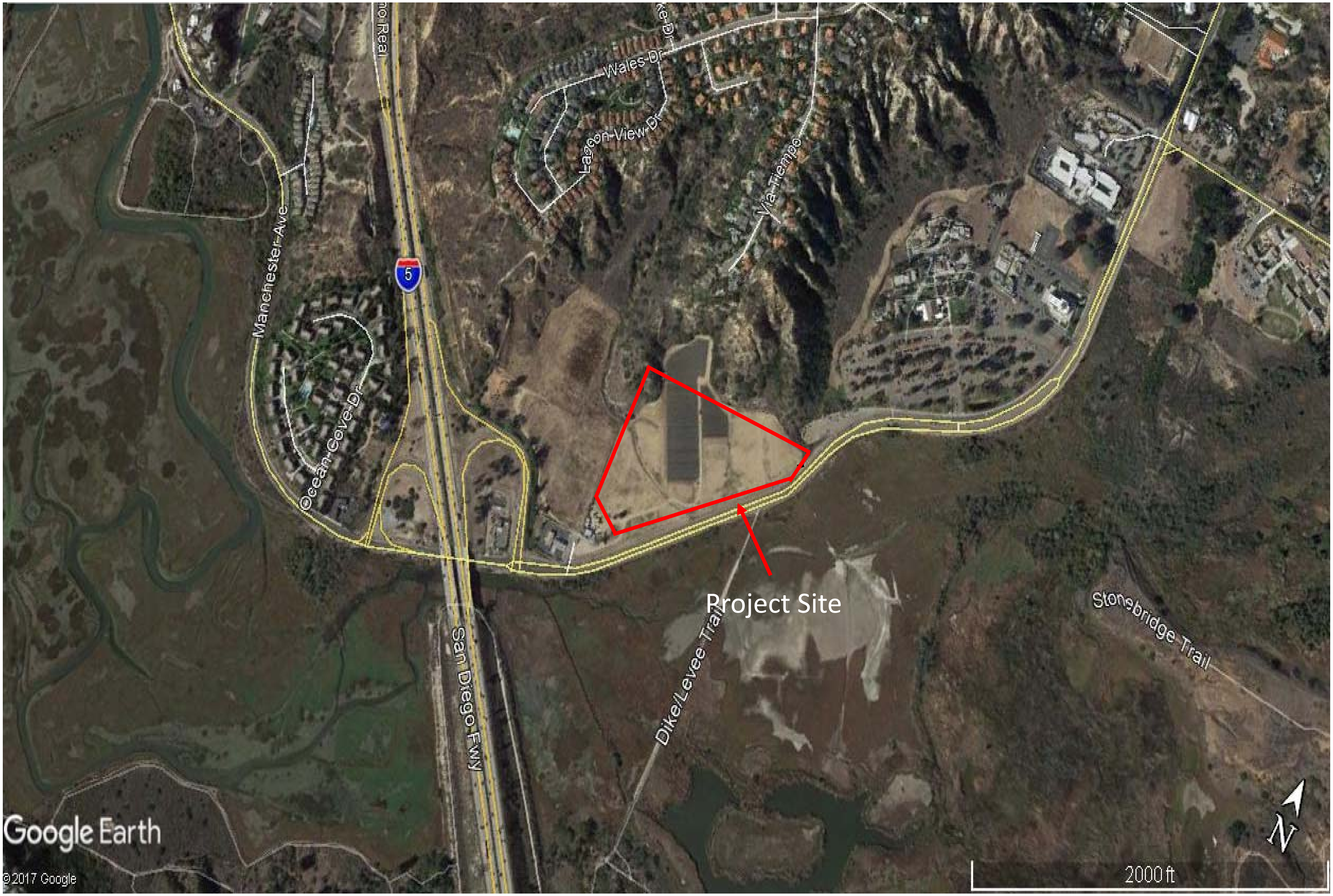

Figure 1—Project Site

LESA EVALUATION

The site was evaluated using the California LESA Model to rate the project site relative to the evaluation/assessment factors referenced above to identify whether the proposed project would meet the threshold criteria as a significant impact to Agricultural Resources under the CEQA Guidelines. The factors used to perform the LESA evaluation are described as follows:

LAND EVALUATION

The Land Evaluation portion of the LESA Model focuses on two main components that are separately rated:

1. **Land Capability Classification Rating**: The Land Capability Classification (LCC) indicates the suitability of soils for most kinds of crops. Soils are rated from Class I to Class VIII. Soils having the fewest limitations receive the highest rating.

2. **Storie Index Rating**: The Storie Index provides a numeric rating (based upon a 100-point scale) of the relative degree of suitability or value of a given soil for intensive agriculture use. This rating is based upon soil characteristics only.

According to the United States Department of Agriculture survey, Corralitos loamy-sand (CsC) (5-9% slopes) is the soil type on the portion of the site used for agricultural production. This soil is a Capability Class III-s soil with a Storie Index rating of 61 (Dudek, 2013). According to the Natural Resources Conservation Service (NRCS), Class III soils have severe limitations which minimizes the selection of plants, requires special conservation practices or both. Thus, Class III soils are not Prime soils under the California Department of Conservation (CDC) or the USDA's definitions, unless they are irrigated. The CDC Farmland Mapping and Monitoring Program has classified the site as Prime, if irrigated.

The LESA Model assigns ratings to each land capability class and multiplies that number by the proportion of the project area that contains each soil class to find the Land Capability Classification score. This analysis assumes the entire 15 acres is Corralitos loamy sand. A Storie Index score is calculated by multiplying the proportion of the project within each soil type by the soil type's Storie Index rating. Table 1 provides a summary of the Land Evaluation (LE) scores. The final LE and Site Assessment (SA) scores are entered into the Final LESA Score Sheet as shown in Table 5, later in this report. In this case, Class III-s soils have a LCC Rating of 60 (California Department of Conservation 1997). Because 100% of the site has Class III-s soils and Storie Index of 61, the LCC and Storie scores are 60 and 61, respectively.

SITE ASSESSMENT FACTORS

The California LESA Model includes the following four Site Assessment factors that are separately rated:

- Project Size Rating

TABLE 1
Land Capability Classification (LCC) and Storie Index Score

A	B	C	D	E	F	G	H
Soils	**Acres**	**Proportion of Project Area**	**LCC**	**LCC Rating**	**LCC Score**	**Storie Index**	**Storie Score**
Corralitos loamy sand (5-9% slope)	15	100%	III-s	60	60	61	61
TOTALS	**15**	**100%**			**60**		**61**

Source: California Department of Conservation, 1997

- Water Resources Availability Rating
- Surrounding Agricultural Land Rating
- Surrounding Protected Resource Land Rating

A. Project Size Rating

The project size rating recognizes the role that farm size plays in the viability of commercial agricultural operations. In general, larger farming operations provide greater flexibility in farm management and marketing decisions. Further, they tend to have a greater economic impact through direct employment and upon supporting industries that include farm equipment operators, fertilizer/pesticide vendors and food processors (California Department of Conservation, 1997).

To define agricultural productivity, the size of the farming operation is considered as well as the proportion of different quality lands comprising the total acreage. Lands with higher quality soils facilitate greater management and cropping flexibility and have the potential to provide higher economic return per acre unit than land with lower quality soils. Thus, rather than rely upon a single acreage figure in the Project Size rating, the project is divided into three acreage groupings based upon possible LCC ratings. Under the Project Size rating, relatively fewer acres of high quality soils are required to achieve a maximum Project Size score. Alternatively, a maximum score on lesser quality soils could also achieve a maximum Project Size score. Table 2 summarizes the Project Size score for the proposed project. As shown, the 15-acre site has Class III-s soils with a corresponding Project Size score of 10.

B. Water Resources Availability Rating

The Water Resource Availability Rating is based upon the availability of water sources that supply the subject property and then determining whether restrictions in supply are likely to take place in years characterized as periods of drought and non-drought.

The 15-acre site is served by the Olivenhain Municipal Water District. As referenced, without water for irrigation purposes, the soils would not achieve a Prime Class III rating. For the purpose of this discussion, it is assumed an uninterrupted supply of water is available for irrigation. Thus, the site was given the highest Water Resource Availability Rating given the consistent water delivery. The project site has no known physical or economic restrictions that could alter water resource supply during either drought or non-drought years. Table 3 summarizes the Water Resources Availability score.

TABLE 2
Project Size Score

	LCC CLASS I-II	LCC CLASS III	LCC CLASS IV-VIII
Total Acres	**0**	**15**	0
Project Size Scores	**0**	**10**	**0**

Source: California Department of Conservation, 1997

C. Surrounding Agricultural Land Rating

The Surrounding Agricultural Land Rating is designed to provide a measurement of the level of agricultural land use within the Zone of Influence (ZOI) of the subject parcel. The "Zone of Influence" is defined as land within one-quarter mile from the subject project boundary. Parcels that are intersected by the 0.25-mile buffer are included in their entirety. Based upon the percentage of agricultural land in the ZOI, the project site is assigned a Surrounding

Table 3
Water Resource Availability

Water Source	Proportion of Project Area	Water Availability Score	Weighted Availability Score
Olivenhain Municipal Water District	100%	100	100
Total Water Resource Score			**100**

Source: California Department of Conservation, 1997; BPG, LLC., 2017

Agricultural Land score. The LESA Model rates the potential significance of the conversion of an agricultural parcel that has a large proportion of surrounding land in agricultural production more highly than one that has a relatively small percentage of surrounding land in agricultural production (California Department of Conservation, 1997).

Land on three sides of the site are developed (or under development); and thus, are not use for agricultural purposes. Land to the west is under development by the California Department of Transportation for transit/transportation-related purposes. Mira Costa College is located adjacent to and east of the site. Manchester Avenue and the San Elijo Lagoon are located to the south. This area is preserved for conservation purposes; and thus, is not developed or used for agricultural production. Steep slopes and residential areas are located north of the site. Figure 2 depicts the ZOI within 0.25 miles of the project site boundary. Per the LESA Instruction Guide, because less than 40% of the surrounding land is used for agricultural production, the Surrounding Agricultural Land Score for the proposed project is zero as shown in Table 4.

Table 4
Surrounding Agricultural Lands

Total Acreage within "Zone of Influence"	Acres in Agricultural Production	Acres of Protected Resource Land	Percent in Agriculture	Percent Protected Resources Land	Surrounding Agricultural Land Score	Surrounding Protected Resource Land Score
260	0	43*	0%	19%	**0**	**0**

Source: Department of Conservation, 1997

*- Approximately 43 acres (19%) within the San Elijo Ecological Reserve are located in the 230-acre ZOI.

D. Surrounding Protected Resource Land Rating

The Surrounding Protected Resource Land Rating is an extension of the Surrounding Agricultural Land Rating, and is scored in a similar manner. Protected resource lands are those lands with long-term use restrictions that are compatible with or supportive of agricultural uses of land. Included among them are the following:

- Williamson Act contracted land;
- Publicly owned lands maintained as park, forest, or watershed resources; and
- Lands with agricultural, wildlife habitat, open space, or other natural resource easements that restrict the conversion of such land to urban or industrial uses.

Land located north of the site is undeveloped slope located adjacent to existing residential development. While these areas are undeveloped and contain some habitat, they are zoned Residential (R) 3 and not considered protected. As referenced, the San Elijo Ecological Preserve is located south of the site across Manchester Avenue. Approximately 43 acres are located within 0.25 miles of the site. This area comprises approximately 19% of the total acreage in the ZOI (260 acres). Per the LESA Instruction Guide, because less than 40% of the surrounding land is protected, the Surrounding Protected Resource Land Rating score is zero.

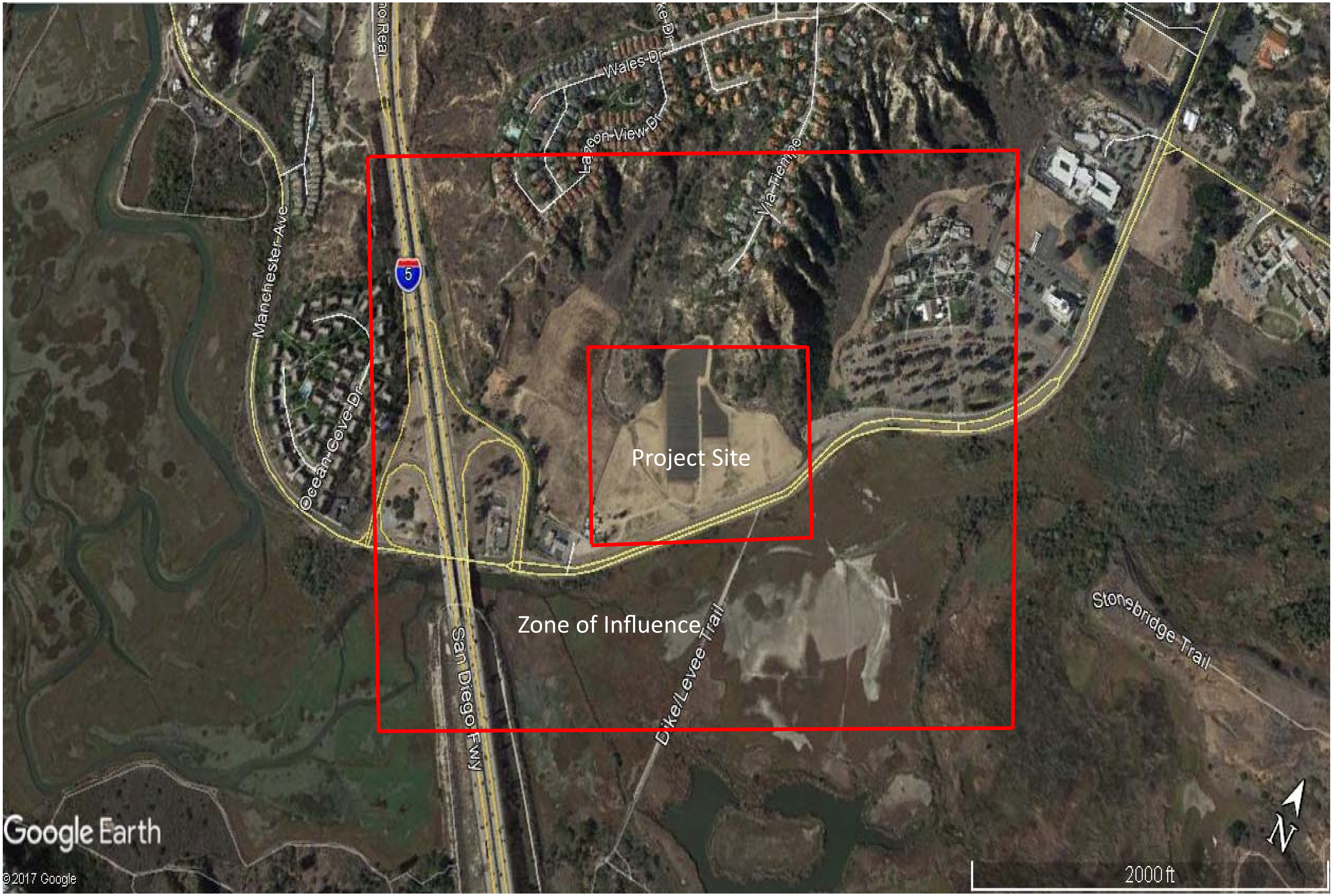

Figure 2—Zone of Influence

CONCLUSION

The LESA Model is weighted so that one-half of the total score is derived from the LE and one-half from the SA. As shown in Table 5, the LE subscore is 30.25, while the SA subscore is 16.5. The final LESA score is 46.75. As provided Section IV or the LESA Instruction Manual, a final LESA score between 40 and 59 is considered significant only if both the LE and SA sub-scores are each greater than or equal to 20 points. In this case, the LE subscore is greater than 20 points (30.25); however, the SA subscore is less than 20 (16.50). Thus, the project would have a less than significant impact on agricultural resources. No mitigation for agricultural impacts would be required should the project be developed as proposed.

TABLE 5

Final LESA Score Sheet Summary

	Factor Rating (0-100 Points)	**Factor Weighting (Total = 1.00)**	**Weighted Factor Rating**
Land Evaluation (LE)			
1. Land Capability Classification (LCC Rating)	60	0.25	15
2. Storie Index Rating	61	0.25	15.25
		Land Evaluation Subscore	*30.25*
Site Assessment (SA)			
1. Project Size Rating	10	0.15	1.5
2. Water Resource Availability Rating	100	0.15	15
3. Surrounding Agricultural Land Rating	0	0.15	0
4. Surrounding Protected Resource Lands Rating	0	0.05	0
		Site Assessment Subscore	*16.50*
		TOTAL	**46.75**

Source: California Department of Conservation, 1997

Coastal Agricultural Resources

The California Coastal Act has specific language and standards applicable to agricultural lands. Coastal Act Section 30241states that farmland within the Coastal Zone must meet any of the following to be designated as Prime: 1) have a NRCS soil classification of Class I or II; 2) have a Storie Index Rating of 80 through 100; 3) have the ability to support livestock, at least one animal unit per acre as defined by the USDA; or 4) have been planted with fruit or nut bearing trees, vines, bushes or crops that have a nonbearing period of fewer than five years and that will normally return during the commercial bearing period on an annual basis from the production of unprocessed agricultural plant production not less than $200 per acre.

As referenced herein, soils on the site are Class III and Prime only if irrigated. The Storie Index Ratio is less than 80 (i.e., 61). Corralitos loamy sand is not suitable for livestock grazing nor has grazing occurred on the site. The parcel is used to cultivate perennial strawberries and Asian vegetables. Based on these characteristics, the property does not meet the Prime agricultural land criteria described above.

In cases where land does not meet the definition of Prime per Section 30241, Section 30242 of the Coastal Act applies. This section addresses lands suitable for agricultural use and limits conversions of such lands to non-agricultural uses unless continued agricultural use is not feasible or the conversion would preserve prime agricultural land or concentrate development consistent with Section 30250. Any permitted conversion of agricultural land pursuant to Section 30242 must be compatible with continued agricultural use on surrounding lands.

The project site is the only remaining parcel of agricultural land in the area and is zoned for development. As referenced herein, conversion of the site from agricultural land to a developed parcel would not be considered a significant impact to agricultural land under Appendix G of the CEQA Guidelines. This is due in part to the fact that all surrounding land is developed or in an ecological preserve. While continued use of the site for agricultural purposes may be feasible, the site is zoned RR-2 and the proposed project is permitted on the site provided a major use permit is approved. Based on existing zoning, the site is not intended to remain in agricultural production. Per Section 30250, new development should be located within, contiguous with, or in proximity to, existing developed areas able to accommodate it or in other areas with adequate public services and where it will not have significant adverse effects, either individually or cumulatively, on coastal resources. Conversion of the proposed site would allow development of the proposed project contiguous to the Caltrans facility to the west and Mira Costa College to the east on the north side of Manchester Avenue. Conversion of the site to a senior care facility would not impact agricultural production on other suitable parcels. No remaining agricultural land exists in proximity to the site; thus, the preservation of prime agricultural land in another location is not applicable. Based on these findings, conversion of the site from agricultural use to a senior care facility would not conflict with the Coastal Act or cause an adverse impact to coastal agricultural lands or coastal resources.

REFERENCES

California Department of Conservation, *California Agricultural Land Evaluation and Site Assessment Model, Instruction Manual*, 1997.

Dudek and Associates, Inc., *Agricultural Viability Analysis for the Manchester Property in Encinitas and the Cannon Road Property in Carlsbad, California for the North Coast Corridor Public Works Plan/Transportation and Resource Enhancement Program,* September 2013.

United States Department of Agriculture, Web Soil Survey, 2017. Accessed October 31, 2017. https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

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D-1

Biological Assessment Letter Report

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BIOLOGICAL ASSESSMENT LETTER REPORT
FOR THE
3111 MANCHESTER AVENUE
CITY OF ENCINITAS

PREPARED FOR:
Greystar
C/O Beau Brand
444 South Cedros Ave.
Suite 172
Solana Beach, CA 92075

PREPARED BY:
Michael Jefferson
Senior Biologist
BLUE Consulting Group

Michael Jefferson
Senior Biologist

February 7, 2020

✉ P.O. Box 501115 San Diego, CA 92150 ☎858.391.8145 💻 Mike@blueconsulting.com
www.BLUEconsulting.com

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1.0 SUMMARY OF FINDINGS

This Biological Assessment (BA) letter report documents the results of the biological surveys completed within and surrounding the boundaries of the subject property in support of the proposed development.

The proposed project consists of re-developing the approximately 19.03-acre property, a dominant portion of which is currently utilized as agricultural fields. The project is located on the 7.5-minute USGS Encinitas, California topographic quadrangle, in Section 33, Township 12 South, Range 4 West. The project includes Assessor's Parcel Numbers (APNs) 261-210-01-00 & 261-210-12-00. The south-east corner of the Property has been assumed by Caltrans for the development of the Manchester Park-N-Ride parking lot (a separate project). The property is situated on the southern edge of the city of Encinitas, east of Interstate 5, north of Manchester Avenue (a small portion of the site is south of Manchester Avenue), adjacent to San Elijo Lagoon, which lies along the southern boundary of the project.

A general habitat, sensitive and rare species biological survey, and a protocol wetland delineation was conducted over the approximately 19.03-acre property, and approximately 100' foot perimeter around the Property, on October 21, 2017. The Property was surveyed on foot and resources mapped using a 2017 aerial photograph of the area. Subsequent to the initial survey, additional site surveys were completed, including protocol gnatcatcher surveys and an offsite (south side of Manchester) protocol wetland delineation by RECON (report attached). All discussions relating to potential take and mitigation is based on the premise that the property will be developed under the City of Encinitas's biological regulations, the Multiple Habitat Conservation Program (MHCP), and CEQA.

Animal species observed directly or detected from calls, tracks, scat, nests, or other sign were noted. All plant species observed on-site were also noted, and plants that could not be identified in the field were identified later using taxonomic keys. The site visit included a directed survey for sensitive plants that would be apparent at the time of the survey. Additionally, surveys were performed during the day and nocturnal animals were not observed.

Limitations to the compilation of a comprehensive floral and faunal checklist were few and only limited to the natural constraints of the season; fall. Since surveys were performed during the day, nocturnal animals were detected by sign. Due to the historic grading of the area as well as the ongoing use and maintenance it was determined that the existing site conditions precluded the recommendation of additional surveys being recommended as a comprehensive checklist was prepared.

Floral nomenclature for common plants follows Hickman (1993). Plant community classifications follow the California Natural Diversity Data Base (CNDDB) and Holland (1986). Zoological nomenclature for birds is in accordance with the American Ornithologists' Union Checklist (1998); for mammals, Jones et al. (1982); and for amphibians and reptiles, Collins (1997). Assessments of the sensitivity of species and habitats are based primarily on CEQA, draft City of Encinitas Subarea Plan (2001), State of California (CDFW, 2014), and U.S. Fish and Wildlife Service (USFWS, 2014).

2.0 INTRODUCTION

The approximately 19.03-acre subject property is located in the City of Encinitas, east of Interstate 5 (I-5) and north of Manchester Avenue. (Figures 1-2).

Land Use, Topography, Soils,

The subject property is situated adjacent to the northern boundary of San Elijo Lagoon. The project is disturbed and has been intensely cultivated for several decades. To the south of the Property is the San Elijo Lagoon Open Space, to the west is developed land and Interstate 5, to the east is Mira Costa College and to the north are coastal bluffs, atop which supports high density housing. Onsite, the property has been impacted by nursery operations for several decades.

The property lies in Township 12 South, Range 4 West, San Bernardino Meridian, as depicted on the USGS *Encinitas* 7.5' topographic quadrangle. Physically, the general project area is characterized by a gently sloping flat area. The project elevations range from 40 to 90 feet above mean sea level. The area surrounding the project is characterized by three significant landform elements. The first is the lagoon, which in the period of prehistoric occupation (*i.e.,* between 10,000 and 1,000 years ago) was similar to the other coastal lagoons along the San Diego County coastline. The lagoon at San Elijo was created as the sea level rose rapidly after a long period of lower sea levels. This canyon was flooded and the lagoon habitat that developed supported a large population identified as the La Jolla Complex. The second major landform component is the mesa bluff above (to the north) the Property and the third is the intermediate area between the two, where this Property is located.

Soils onsite are comprised of Corralitos loamy sand with 5 to 9 percent slopes.

Regional Setting

The proposed project is located in the City of Encinitas draft Subarea Plan area and within a ‘softline’ focused planning area (FPA). If adopted, this Plan would implement policies to conserve natural biotic communities and sensitive plant and wildlife species throughout the City under the MHCP framework. The Subarea Plan would provide regulatory certainty to the landowners within the City and aid in conserving the region’s biodiversity and enhancing the quality of life.

Subarea Plans address the potential impacts to natural habitats and rare, threatened or endangered species caused by projects within Cities having such plans. Subarea Plans also form the basis for Implementing Agreements, which are the legally binding agreements between a City and the Wildlife Agencies to ensure implementation of the plan and provides Cities with state and federal “Take authority.”

Participating cities prepared focused planning areas (FPA), which show expected levels of conservation that could be achieved by applying available regulatory mechanisms to conserve biologically valuable areas (primarily but not exclusively within the BCLA). Creation of the FPAs thus considered not only the biological value of lands, but also economic, legal, and other constraints to preserving these lands. The FPAs are represented by a combination of “hardline” preserves, indicating lands that will be conserved and managed for biological resources, and “softline” planning areas. The FPAs are represented by a combination of “hardline” preserves, indicating lands that will be conserved and managed for biological resources, and “softline” planning areas, within which preserve areas will ultimately be delineated based on further data and planning.

For softlined areas, which do not have development approvals, development and conservation standards and criteria will be applied to achieve the projected conservation. Conservation targets in upland areas within these softlined areas will vary based on the mitigation ratio to be applied to each vegetation community type (see Section 4.3.1.5). For example, if a 2:1 (conservation:take) ratio applies to a vegetation community type, conservation of that community is calculated at 67 percent of its total mapped acreage on the property (i.e., 2 out of every 3 acres will be conserved). This approach requires that onsite and offsite mitigation is balanced among all the ratio areas within the city (i.e., mitigation is generally required to be within the Encinitas Subarea; see Section 4.3.1.5). Conservation of wetland communities will be at 100 percent in softlined areas, and narrow endemics will be conserved at 95 percent in these areas. Natural habitat lands outside the preserve that will be protected pursuant to city General Plan policies and federal wetland permitting requirements are categorized as "Constrained Lands" and are defined below.

3.0 SURVEY METHODOLOGY

BLUE senior qualified biologist, Michael Jefferson, conducted the surveys on October 21, 2017 (Table 1). The site was surveyed on foot and habitat mapped on a current Google Earth aerial (2017; Figure 4).

Mapping was performed following the Guidelines for Determining Significance and Survey, Report Format, Content and Mapping Requirements (City, MHCP). Wildlife species were identified directly by sight or by vocalizations, and indirectly by scat, tracks, or burrows. Field notes were maintained throughout the surveys and species of interest were mapped. The primary focus of the survey was to document and map the size, location, and general quality of all habitat types and the presence or potential presence of any sensitive resources onsite.

TABLE 1
Survey Details

Date	Survey Type	Time	Conditions Temp (ºF), Wind (mph) begin and end, Cloud Cover (CC)	Biologists
10-21-2017	General, Rare, Sensitive, pWD	0800-1030	68º, 0 mph, 5%cc 71º, 1-2 mph, 5%cc	MJ
5/17/19	USFWS protocol CAGN survey #1	1110-1140	68º, 2-4 mph, 15%cc 68º, 2-4 mph, 15%cc	AH
5/27/19	USFWS protocol CAGN survey #2	0945-1050	61º, 1-3 mph, 30%cc 62º, 1-3 mph, 10%cc	AH
6/9/19	USFWS protocol CAGN survey #3	0835-0910	64º, 0-1 mph,100%cc 64º, 0-1 mph, 100%cc	AH

MJ – Michael Jefferson
ACH – Anita Hill

Vegetation communities were assessed and mapped on a color aerial with topography flown in March 2017 (Google earth). Animal species observed directly or detected from calls, tracks, scat, nests, or other sign were noted. All plant species observed on-site were also noted, and plants that could not be identified in the field were identified later using taxonomic keys.

Limitations to the compilation of a comprehensive faunal and floral checklist were few within the survey area – most of which had been previously, legally, graded, cleared (Ag/support structures), and developed. The general quality of graded land and urbanized habitat within the survey area is, as expected, of low quality. The areas of natural habitat to the north of the agricultural fields is comprised of high quality coastal sage scrub.

Prior to conducting the biological survey, a thorough review of relevant maps, databases, and literature pertaining to biological resources was performed. Recent aerial imagery (Google Earth 2017), topographic maps (USGS 2015), soils maps (USDA 2012), and other maps of the project site and immediate vicinity were acquired and reviewed to obtain updated information on the natural environmental setting. In addition, a query of sensitive species and habitat databases was conducted, including the California Natural Diversity Database (CNDDB; CDFG 2012a), the California Native Plant Society Electronic Inventory (CNPSEI; CNPS 2012), and the Consortium of California Herbarium (Consortium 2012) applications, as well as a review of regional species lists produced by the USFWS (USFWS 2012a) and CDFW (CDFW 2011, 2012a, CDFW 2012b, and 2012c).

The pre-survey investigation also included a verification of whether or not the project site falls within areas designated as final or proposed USFWS Critical Habitat for federally threatened or endangered species (USFWS 2012b).The complete list of sensitive species (CNDDB) and habitats that have been previously recorded within the vicinity of the project site was compiled, and all recorded locations of species and other resources were mapped and overlaid onto aerial imagery using Geographic Information Systems (GIS) software. The CNDDB list of sensitive species included all database results for areas within 9 California USGS 7.5 minute topographic quadrangles.

BLUE biologist Michael Jefferson completed the preliminary USACE jurisdictional wetland delineation (pWD). Potential features identified were then investigated further to determine whether they met the criteria of a potentially jurisdictional feature. All features meeting the USACE guidance criteria were delineated. The region received no significant rainfall within the last week before the delineations were conducted. Rainfall patterns were atypical (drought conditions) for that time frame of the surveys.

Delineated boundaries of all features identified within the study area were recorded using a 1" = 100' aerial photograph.

Delineation of Potential Non-Wetland Waters of the U.S.

BLUE methods for the delineation of non-wetland WoUS was based on indicators for Ordinary High Water Mark (OHWM), following established criteria outlined in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008a), and *A Field Guide to the Identification of the OHWM in the Arid West Region of the Western United States* (USACE 2008b).

All jurisdictional features within the study area were determined by the presence of OHWM indicators. This field guide presents a method for delineating the lateral extent of the WoUS in the Arid West using stream geomorphology and vegetation response to the dominant stream discharge. BLUE biologists used this guidance in the field to determine the OHWM for all potentially jurisdictional non-wetland waters.

Three (3) criteria normally must be fulfilled in order to classify an area as a jurisdictional USACE wetland: (1) a predominance of hydrophytic vegetation, (2) the presence of hydric soils, and (3) the presence of wetland hydrology. Details of the application of these techniques are described below.

1. Hydrophytic Vegetation. The hydrophytic vegetation criterion is satisfied at a location if greater than 50% of all the dominant species present within the vegetation unit have a wetland indicator status of obligate (OBL), facultative wetland (FACW), or facultative (FAC) (USACE 1987). An *OBL indicator status* refers to plants that have a 99% probability of occurring in wetlands under natural conditions. A *FACW indicator status* refers to plants that usually occur in wetlands (67 to 99% probability) but are occasionally found elsewhere. A *FAC indicator status* refers to plants that are equally likely to occur in wetlands or elsewhere (estimated probability 34% to 66% for each). The wetland indicator status used for this report follows the *National List of Plant Species that Occur in Wetlands: California (Region 0)* (U.S. Fish and Wildlife Service 1988).

2. Hydric Soils. The hydric soil criterion is satisfied at a location if soils in the area can be inferred or observed to have a high groundwater table, if there is evidence of prolonged soil saturation, or if there are any indicators suggesting a long-term reducing environment in the upper 18inches of the soil profile. Reducing conditions are most easily assessed using soil color. Soil colors were evaluated using the *Munsell Soil Color Charts* (Kollmorgen Corporation 1975).

3. Wetland Hydrology. The wetland hydrology criterion is satisfied at a location based upon conclusions inferred from field observations that indicate an area has a high probability of being inundated or saturated (flooded, ponded, or tidally influenced) long enough during the growing season to develop anaerobic conditions in the surface soil environment, especially the root zone (USACE 1987, 2008a, 2008b).

The field guide describes physical evidence that should be used to ascertain the lateral limits of jurisdiction; generally, more than one physical indicator or other means for determining the OHWM is used. The following physical indicators of OHWM were used in the field:

- Natural line impressed on the bank
- Shelving
- Destruction of terrestrial vegetation
- Presence of litter and debris
- Wracking
- Vegetation matted down, bent, or absent

- Sediment sorting
- Leaf litter disturbed or washed away
- Scour
- Deposition
- Bed and banks
- Water staining
- Change in plant community

Evaluation of SWRCB/RWQCB jurisdiction followed guidance from Section 401 of the CWA and follows the same jurisdictional areas as USACE, unless an isolated water is determined to be present. Isolated water features are not considered jurisdictional under USACE, but are still delineated using the OHWM or wetted area. Isolated water bodies are considered SWRCB/RWQCB jurisdictional under the Porter-Cologne Act.

Delineation of CDFW Jurisdiction

Evaluation of California Fish and Game Code jurisdiction followed the guidance of standard practices by CDFW personnel. CDFW jurisdiction was delineated by measuring the width of top of bank of watercourses, which equaled the bed and bank limits in these small systems, all of which are deeply incised under the currently existing condition. Riparian vegetation was observed within the study area, to the south of Manchester Avenue.

4.0 REGULATORY FRAMEWORK

FEDERAL JURISDICTIONS

Section 404 of the Clean Water Act

Section 404 of the Clean Water Act (CWA) requires that a permit be obtained from the U.S. Army Corps of Engineers (USACE) prior to the discharge of dredged or fill materials into any "waters of the United States", including wetlands. Waters of the United States are broadly defined in the USACE's regulations (33 CFR 328) to include navigable waterways, their tributaries, lakes, ponds, and wetlands. Wetlands are defined as "Those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that normally do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." Such permits often require mitigation to offset losses of these habitat types so there is no net loss. Wetlands that are not specifically exempt from Section 404 regulations (such as drainage channels excavated on dry land and isolated wetlands) are considered to be "jurisdictional wetlands." Under certain circumstances where multiple resources are impacted and interagency consultation is required, the USACE may consult with the U.S. Environmental Protection Agency (USEPA), U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), State Water Resources Control Board (SWRCB), and the various Regional Water Quality Control Boards (RWQCBs) throughout the State in carrying out its discretionary authority under Section 404.

Section 401 of the CWA

A Section 401 Water Quality Certification, or waiver thereof, is required from the SWRCB or RWQCB before a Section 404 permit becomes valid. The RWQCB will review the project for consistency with the achievement of water quality objectives and the reasonable protection of beneficial uses designated in the Water Quality Control Plan for the San Diego Basin 9 (Basin Plan). In reviewing the project, the RWQCB will consider impacts to waters of the United States, in addition to filling of isolated wetlands, riparian areas, and headwaters (i.e., areas of high resource value), hydromodification, applicable water quality objectives and designated beneficial uses, special status species, among other things. Collectively, wetland and water resources regulated by the SWRCB and RWQCB are referred to as waters of the State, and these resources may or may not include waters of the United States. Usually, mitigation is required (if not already a condition of the 404 permit) in the form of replacement or restoration of adversely impacted waters of the U.S.

Migratory Bird Treaty Act of 1918

The Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-711) implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. It is enforced in the United States by the USFWS, and makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). Disturbance that causes nest abandonment and/or loss of reproductive effort (e.g., killing or abandonment of eggs or young) may be considered a “take” and is potentially punishable by fines and/or imprisonment. Migratory birds include geese, ducks, shorebirds, raptors, songbirds, and many other species.

Bald and Golden Eagle Protection Act

Enacted in 1940, this Act prohibits the take, transport, sale, barter, trade, import, export, and possession of bald eagles, making it illegal for anyone to collect bald eagles and eagle parts, nests, or eggs without authorization from the Secretary of the Interior. The Act was amended in 1962 to extend the prohibitions to the golden eagle.

Federal ESA of 1973

The United States Congress passed the FESA in 1973 to provide a means for conserving endangered and threatened species in order to prevent species extinction, extirpation, etc. The FESA has four major components: the Section 4 provisions for listing species and designating critical habitat; the Section 7 requirement for federal agencies to consult with the USFWS to ensure that their actions are not likely to jeopardize the continued existence of species or result in the modification or destruction of critical habitat-the Section 9 prohibition against “taking” listed species-and the Section 10 provisions for permitting the incidental take of listed species. The term “take” is defined by the FESA to include the concept of “harm,” which agency regulations define to include death or injury that results from modification or destruction of a species habitat (50 CFR 17.3).

Section 9 of the FESA

Section 9 of the FESA prohibits any person from “taking” an endangered animal species. Regulations promulgated by USFWS and National Oceanic and Atmospheric Administration make the “take” prohibition generally applicable to threatened animal species as well (50 CFR 17.71). Section 9 thus prohibits the clearing of habitat that results in death or injury to members of a protected species.

An authorization or permit to incidentally take listed species can be obtained either through the Section 7 consultation process or through the Section 10 incidental take permit process. In the context of Section 7, incidental take is authorized through an “incidental take statement” (ITS) that is issued consistent with a Biological Opinion. Measures required to conform to the ITS are contained in “reasonable and prudent measures,” as are the terms and conditions necessary to implement those measures. In the context of Section 10, incidental take is authorized through an “incidental take permit” (ITP) issued pursuant to Section 10(a)(1)(B).

Measures contained in the ITP reflect the measures set out in a habitat conservation plan developed by the applicant in conjunction with the USFWS.

Section 7 of the FESA

Section 7 of the FESA provides that each federal agency undertaking a federal action which could significantly affect FESA species shall consult with the Secretary of Interior or Commerce, that any actions authorized, funded, or carried out by the agency are “not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of lands determined to be critical habitat” (16 USC Section 1536(a)(2)). The term “agency action” is broadly defined in a manner that includes nearly all actions taken by federal agencies such as permitting or carrying out a project, as well as actions by private parties which require federal agency permits or approval (50 CFR Section 402.02). The consultation requirement of Section 7 is triggered upon a determination that a proposed action “may affect” a listed species or designated critical habitat (50 CFR Section 402.14(a)). If the proposed action is a “major construction” activity, the federal agency proposing the action must prepare a biological assessment to include with its request for the initiation of Section 7 consultation.

Included in the USFWS Biological Opinion is an Incidental Take Statement (ITS) that authorizes a specified level of take anticipated to result from the proposed action. The ITS contains “reasonable and prudent measures” that are designed to minimize the level of incidental take, adverse modification, or destruction to critical habitat, and that must be implemented as a condition of the take authorization (50 CFR Section 402.14(i)(5)).

The issuance of a Biological Opinion concludes formal consultation, but consultation can be reinitiated if the amount or extent of incidental take authorized is exceeded, the action changes, new information reveals effects of the action not previously considered, or a new species is listed or critical habitat is designated (50 CFR Section 402.16). Once the Biological Opinion is issued, the project applicant must implement the terms and conditions, and conservation measures, mandated by the USFWS. Monitoring and reporting is required to be coordinated with the USFWS during the implementation of conservation measures.

Section 10 of the FESA

Under Section 10(a)(1)(B) of the FESA, the USFWS may permit the incidental take of listed species that may occur as a result of an otherwise lawful activity. To obtain a Section 10(a)(1)(B) permit, an applicant must prepare a habitat conservation plan that meets the following five criteria: 1) the taking will be incidental to an otherwise lawful activity; 2) the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; 3) the applicant will ensure that adequate funding for the plan will be provided; 4) the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; and, 5) other measures, if any, that the USFWS requires as being necessary or appropriate for purposes of the plan will be met (16 USC Section 1539(a)(2)(A)).

State of California (CDFW)

California Endangered Species Act

The CESA declares that deserving plant or animal species will be given protection by the State because they are of ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of the State. CESA establishes that it is State policy to conserve, protect, restore, and enhance endangered species and their habitats. Under State law, plant and animal species may be formally designated as rare, threatened, or endangered through official listing by the California Fish and Wildlife Commission. Listed species are given greater attention during the land use planning process by local governments, public agencies, and landowners than are species that have not been listed.

CESA authorizes that “private entities may take plant or wildlife species listed as endangered or threatened under FESA and CESA, pursuant to a federal incidental take permit issued in accordance with Section 10 of the FESA, if the CDFW certifies that the incidental take statement or incidental take permit is consistent with CESA (Fish and Game Code Section 2080.1(a)).

Section 2081(b) and (c) of the CESA allows CDFW to issue an incidental take permit for a state-listed threatened and endangered species only if specific criteria are met. These criteria can be found in Title 14 CCR, Sections 783.4(a) and (b). No Section 2081(b) permit may authorize the take of “fully protected” species and “specified birds.” If a project is planned in an area where a fully protected species or specified bird occurs, an applicant must design the project to avoid all take; the CDFW cannot provide take authorization under CESA. On private property, endangered plants may also be protected by the Native Plant Protection Act (NPPA) of 1977. Threatened plants are protected by CESA, and rare plants are protected by the NPPA; however, CESA authorizes that "Private entities may take plant species listed as endangered or threatened under the FESA and CESA through a federal Incidental Take Permit (ITP) issued pursuant to Section 10 of the FESA, if the CDFW certifies that the ITS or ITP is consistent with CESA.” In addition, CEQA requires disclosure of any potential impacts on listed species and alternatives or mitigation that would reduce those impacts.

CEQA: Treatment of Listed Plant and Animal Species

FESA and CESA protect only those species formally listed as threatened or endangered (or rare in the case of the State list). Section 15380 of the CEQA Guidelines independently defines "endangered" species of plants or animals as those whose survival and reproduction in the wild are in immediate jeopardy and "rare" species as those who are in such low numbers that they could become endangered if their environment worsens. Therefore, a project normally will have a significant effect on the environment if it will substantially affect a rare or endangered species of animal or plant or the habitat of the species. The significance of impacts to a species under CEQA must be based on analyzing actual rarity and threat of extinction despite legal status or lack thereof.

Sections 1601 to 1603 of the California Fish and Game Code

Streambeds and other drainages that occur within the project proponent service area and proposed CIP project sites are subject to regulation by the CDFW. The CDFW considers most drainages to be “streambeds” unless it can be demonstrated otherwise. A stream is defined as a body of water that flows at least periodically or intermittently through a bed or channel with banks and supports fish or other aquatic life. This includes watercourses having a surface or sub-surface flow that supports, or has supported, riparian vegetation. CDFW jurisdiction typically extends to the edge of the blue-line streams, and therefore, usually encompasses a larger area than Corps jurisdiction.

Sections 3503, 3503.5, and 3800 of the California Fish and Game Code

These sections of the Fish and Game Code prohibit the take or possession of birds, their nests, or eggs. Disturbance that causes nest abandonment and/or loss of reproductive effort (killing or abandonment of eggs or young) is considered a take. Such a take would also violate federal law protecting migratory birds. ITPs are required from the CDFW for projects that may result in the incidental take of species listed by the State as endangered, threatened, or candidate species. The wildlife agencies require that impacts to protected species be minimized to the extent possible and mitigated to a level of insignificance.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act provides for statewide coordination of water quality regulations. The Act established the SWRCB as the State-wide authority and nine separate RWQCBs to oversee smaller regional areas within the State. The Act authorizes the SWRCB to adopt, review, and revise Water Quality Control Policies for all waters of the State (including both surface and ground waters); and directs the RWQCBs to develop regional Basin Plans. Section 13170 of the California Water Code also authorizes the SWRCB to adopt water quality control plans on its own initiative. The Water Quality Control Plan for the San Diego Basin 9 (Basin Plan) is designed to preserve and enhance the quality of water resources in the San Diego region for the benefit of present and future generations.

The purpose of the plan is to designate beneficial uses of the region’s surface and ground waters, designate water quality objectives for the reasonable protection of those uses, and establish an implementation plan to achieve the objectives.

California Natural Community Conservation Planning Act of 1991

The NCCP Act is designed to conserve habitat-based natural communities at the ecosystem scale while accommodating compatible land uses in coordination with CESA. CDFW is the principal state agency implementing the NCCP Program. The Act established a process to allow for comprehensive, long-term, regional, multi-species, and habitat-based planning in a manner that satisfies the requirements of the State and FESAs (through a companion regional habitat conservation plan). The NCCP program has provided the framework for innovative efforts by the State, local governments, and private interests, to plan for the protection of regional biodiversity and the ecosystems upon which they depend. NCCPs seek to ensure the long-term conservation of multiple species, while allowing for compatible and appropriate economic activity to proceed.

Local Jurisdiction

Multiple Habitat Conservation Program

The MHCP is a comprehensive, multiple jurisdictional planning program designed to develop an ecosystem preserve in northern San Diego County. Implementation of the regional preserve system is intended to protect viable populations of key sensitive plant and animal species and their habitats, while accommodating continued economic development and quality of life for residents of the North County region. The MHCP is one of several large multiple jurisdictional habitat planning efforts in San Diego County, each of which constitutes a subregional plan under the California NCCP Act of 1991. The MHCP includes seven incorporated cities in northwestern San Diego County: Carlsbad, Encinitas, Escondido, Encinitas, San Marcos, Solana Beach, and Vista. These jurisdictions may implement their respective portions of the MHCP through citywide “subarea” plans, which describe the specific implementing mechanisms each city will institute for the MHCP. The goal of the MHCP is to conserve approximately 19,000 acres of habitat, of which roughly 8,800 acres (46 percent) are already in public ownership and contribute toward the habitat preserve system for the protection of more than 80 rare, threatened or endangered species.

City of Encinitas General Plan

The City of Encinitas General Plan is the primary source of long-range planning and policy direction used to guide growth and preserve the quality of life within the City of Encinitas. The Encinitas General Plan states that a goal of the City is to analyze proposed land uses to ensure that the designations would contribute to a proper balance of land uses within the community. The Encinitas General Plan contains stated community goals and policies designed to shape the long-term development of the City, as well as protect its environmental, social, cultural, and economic resources.

The following general and site-specific standards guidelines for preserve design (onsite conservation) have been applied during planning of this Projects as it is located within a softline area of the city (formerly referred to as the mitigation ratio areas). As stated in the MHCP, section 4.3.1 General Standards:

> #### Wetland/Wetland Buffer Policies
>
> No Net Loss Policy For all vegetation communities listed by the MHCP as wetland vegetation communities, the city shall require, in priority order, maximum avoidance of project impacts, minimization of impacts, and mitigation of impacts (see also Section 3.6.1 of the MHCP Plan). Mitigation of unavoidable impacts shall be designed to achieve no net loss of both wetland acreage *and biological value* within the city. This is consistent with existing wetland policies of the CDFG.
>
> Mitigation for Unavoidable Impacts. To achieve the no net loss standard, mitigation for unavoidable impacts (e.g., wetland habitat creation or restoration) shall preferably occur onsite. Alternatively, offsite mitigation may occur as long as such mitigation demonstrably contributes to the Encinitas preserve design and biological value (e.g., by adjacency to other preserve areas). Offsite mitigation should preferentially occur within the same watershed as the impact. In any case, wetland mitigation sites shall be designated as preserve lands and managed for biological values (see also Section 3.6.1 of the MHCP Plan).
>
> Conservation and Buffer Requirements. Wherever development or other discretionary actions are proposed in or adjacent to wetland or riparian habitats, the wetland or riparian areas shall be designated as biological open space and incorporated into the preserve. Biological buffers that are a minimum of 100 feet wide in saltwater wetland areas and 50 feet wide in freshwater riparian areas must be established adjacent to preserved habitat, unless smaller buffers are demonstrated to be appropriate and proposed reductions in buffer widths are approved by the wildlife agencies. Within the biological buffer, no new development or other uses considered incompatible with adjacent preserve goals shall be allowed, although uses considered compatible in preserve buffer areas may be established (e.g., trails or utilities; see MHCP Plan Section 6.2 for a complete discussion of compatible and incompatible land uses adjacent to the preserve, and Encinitas Subarea Plan Section 4.2.1 for a complete discussion of conditionally compatible land uses and activities within the preserve). In addition, the buffer area shall be managed for natural biological values as part of the preserve system. In the event that natural habitats do not currently (at the time of proposed action) cover the buffer area, vegetation appropriate to the location and soils shall be planted as a condition for the proposed action.

5.0 EXISTING CONDITIONS

The following discussion summarizes the existing and potentially present biological resources onsite and within the project footprint.

5.1 Vegetation

Habitat descriptions are based on the Terrestrial Vegetation Communities in San Diego County based in Holland's Descriptions (Oberbauer 2010), however, it has been shown that habitats on the project sites in San Diego County are often not pristine and rarely fit into one description. Therefore, the best-fit definition based on the current descriptions and dominant plant species has been applied. Two areas supporting jurisdictional areas, freshwater marsh and unvegetated ephemeral waters of the U.S. (channel), were observed onsite.

A total of six habitat types occur within the project site (Table 2): freshwater marsh, unvegetated ephemeral waters of the U.S. (channel), coastal sage scrub, agricultural, urban disturbed (previously graded), and developed. A complete list of plant species observed onsite is included in Appendix A (Table 2).

TABLE 2
Biological Resources

Habitat Type	Acreage
ACOE/CDFW ephemeral non-wetland water*	0.08
CDFW Fresh/Saltwater Marsh*	0.13
Coastal Sage Scrub*	1.81
Agricultural	15.74
Disturbed habitat	0.68
Developed	0.59
Total	**19.03**

*Sensitive Habitat

Diegan Coastal Sage Scrub

Coastal Sage Scrub (CSS) is considered a coastal scrub vegetation alliance (CNPS, 2009). It is a native plant community characterized by a variety of soft, low, aromatic, drought-deciduous shrubs. California sagebrush scrub rarely occurs as a continuous vegetation community but rather occurs in a patchy or mosaic distribution pattern throughout its range (USFWS 1997). Shrub cover is rarely 100% (O'Leary 1990a and 1990b; Beyers and Wirtz II 1995).

The 1.81 acres of Diegan coastal sage scrub on-site is of high quality, with little to no areas supporting concentrated non-native species. This habitat is located on the northern portion of the Property on and adjacent to the coastal bluff located to the north of the site. The dominant species within the CSS are California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), and sages (*Salvia* spp.), with scattered evergreen shrubs, including lemonadeberry (*Rhus integrifolia*), laurel sumac (*Malosma laurina*), and toyon (*Heteromeles arbutifolia*). Other, less frequent, constituents include spiny redberry, deerweed, and yellow bush-penstemon. The native understory species include foothill stipa, ashy spike-moss, chalk live-forever. While not in high concentrations, the non-native vegetation occurring in the scrub (generally within the herb layer) includes: black mustard (*Brassica* ssp.), wild oats (*Avena barbata*), and foxtail chess (*Bromus madritensis ssp. rubens*).

Agricultural

Agricultural designation is for those areas that are under agricultural use, with irrigation, and are maintained. These areas support no sensitive species occurrence potential. Onsite, the 14.52 acres of agricultural use is the dominanat feature and is comprised of fields, roads and irrigation infrastructure.

Urban/Disturbed

Urban/Disturbed land consists of all land graded, disturbed and/or covered by non-native ornamental (landscape) vegetation. For the purposes of this assessment, woodlands comprised of eucalyptus trees (*Acacia* spp.) are also considered urban. Non-native plant species typical of urban/developed areas include ornamental trees such as pine (*Pinus* spp.), pepper (*Schinus* spp.), palm (*Washingtonia* spp., *Phoenix* spp.), and gum; shrubs such as acacia (*Acacia* spp.) and oleander (*Nerium oleander*); and, groundcover such as turf grass, red apple (*Aptenia cordifolia*), and hottentot-fig (*Carpobrotus edulis*), Russian thistle (*Salsola tragus*), telegraph weed (*Heterotheca grandiflora*), horehound (*Marrubium vulgare*), and sow-thistle (S*onchus oleraceus*). Disturbed land typically provides little habitat for wildlife species.

Onsite, the 0.68 acres of urban/disturbed land is generally located on the perimeter of the Property and has been historically graded (slopes, and pads) and are maintained.

Developed

This designation is used for the portion of the site that includes the areas that have previously been converted to pavement, paths, and structures. Onsite, this area totaling 1.81 acres is limited to the development of the roads and business structures. This is inclusive of the south west corner of the Property that Caltrans assumed by eminent domain, portions of Manchester Ave. and the drainage brow ditch located on the north side of the road (Figure 4).

WETLAND DELINEATION (Preliminary) RESULTS

The completed onsite (BLUE) and offsite (RECON) preliminary protocol wetland delineation identified CDFW and ACOE/CDFW jurisdictional areas (Figure 5-6). Off-site CDFW jurisdictional Fresh/saltwater Marsh (wetlands to be temporarily impacted) and on-site CDFW/ACOE jurisdictional Unvegetated Ephemeral Channel (permanent impacts to non-wetland waters).

Fresh/Saltwater Marsh (CDFW Jurisdictional)

Fresh/saltwater Marsh habitat occurs in open bodies of fresh water with little current flow, such as ponds, and to a lesser extent around seeps and springs. These marshes occur in areas of permanent inundation by freshwater without active stream flow. Coastal and Valley Freshwater Marsh is a freshwater marsh community which occasional occurs along the coast and in coastal valleys near river mouths and around the margins of lakes and springs. Marsh communities, as with all wetland habitats, have been greatly reduced throughout their entire range and continue to decline as a result of urbanization and are considered sensitive by State and federal resource agencies.

Onsite, the observed Fresh/saltwater Marsh, a jurisdictional wetland totaling 0.13 acres, occurs within the northwestern most portion of the Property and located on the south side of Manchester Ave (Figure 4). This habitat is within the San Elijo Lagoon. Typically, and in this location, this jurisdictional vegetation community is comprised of typical perennial emergent monocots including: Salty Dodder (*Cuscuta salina*), Alkali heath (*Frankenia grandifolia*)*,* Saltgrass *(Distichlis spicata)*, Pickleweed (*Salicornia virginica*) and Southwestern spiny rush (*Juncus acutus*).

Offsite, on the southern side of Manchester Avenue, RECON completed a preliminary wetland delineation (attached) surrounding the existing outlets (which are to be replaced). The following vegetation communities or land cover types were mapped within the offsite survey areas: wetland habitats, Diegan coastal sage scrub, disturbed habitat, and urban/developed land.

Non-Wetland Water of the U.S.; Unvegetated Ephemeral Channel (ACOE/CDFW Jurisdictional Habitat)

The Unvegetated Non-Wetland Waters of the U.S Ephemeral Channel is located onsite in the form of a managed and maintained soft bottom channel, totaling 0.08 acres, which follows the general historical course of this natural drainage feature. The channel enters the Property from the west adjacent to the toe of the bluff and the Caltrans offsite Project and exits the Project at the southern Property Line (PL) draining into a roadside ditch which then enters the San Elijo Lagoon. Waddles are located within the channel, and due to regular maintenance, no vegetation was observed within the channel, which is on average 3 feet wide.

The onsite portion of the developed drainage ditch/flood control infrastructure associated with the development of Manchester Avenue, and located on the northern side of the street, is not a natural drainage channel and is not located in the historic location of a natural channel. Therefore, this developed and maintained flood control brow ditch/street infrastructure is not considered jurisdictional.

5.2 Wildlife

A total of 8 wildlife species were identified onsite. A complete list of wildlife species observed onsite is included as Appendix B (Table 4).

Invertebrates observed included butterflies and bees. The reptile species observed onsite include the western fence lizard (*Sceloporus occidentalis*). Bird species observed included a Turkey vulture, common raven (*Corvus corax*), mourning dove (*Zenaida macroura*), scrub jay (*Aphelocoma californica*), and house finch (*Carpodacus mexicanus*). No mammals were observed or detected onsite.

5.3 Sensitive Resources

Sensitive or special interest plant and wildlife species and habitats are those which are considered rare, threatened, or endangered within the state or region by local, state, or federal resource conservation agencies. Sensitive habitats, as identified by these same groups, are those which generally support plant or wildlife species considered sensitive by these resource protection agencies or groups. Sensitive species and habitats are so called because of their limited distribution, restricted habitat requirements, particular susceptibility to human disturbance, degradation due to development or invasion by non- native species, or a combination of all of these factors.

In addition to CEQA and MHCP City Guidelines for Determining Significance, the following were used in the determination of sensitive biological resources: U.S. Fish and Wildlife Service (USFWS), California Native Plant Society (CNPS), and California Department of Fish and Wildlife (CDFW). An explanation of the sensitivity codes used in this report is included in Appendix E.

5.3.1 Sensitive Habitats

The site and surrounding properties are part of a designated Focused Planning Area (FPA) in the City. Onsite, the 'softline' FPA is comprised of a total of three sensitive habitat types: coastal sage scrub, jurisdictional freshwater marsh and jurisdictional unvegetated non-wetland waters (ephemeral channel running through the existing agricultural fields). Offsite to the south is the Bataquitos Lagoon, a 'Hardline' FPA.

5.3.2 Sensitive Plants

Sensitive or special interest plant species are those which are considered rare, threatened, or endangered within the state or region by local, state, or federal resource conservation agencies. Sensitive plant species are so called because of their limited distribution, restricted habitat requirements, or particular susceptibility to human disturbance, or a combination of these factors. Sources used for the determination of sensitive plant species include: USFWS (2016), CDFW (2015), CNPS (2013), and CNDDB (2015).

5.3.2.1 Sensitive Plants Observed

No sensitive plant species were observed onsite at the time of the surveys. A complete list of all Plants Species observed is described in Table 3.

5.3.2.2 Sensitive Plant Species with the Potential to Occur Onsite (not observed)

A complete list and explanation as to the potential occurrence of all Sensitive Plants Species with the Potential to Occur is described in Appendix C. Thirty -one sensitive plants were assessed for the potential to occur onsite and are discussed in Appendix C.

In summary, of the thirty-one sensitive plant species assessed, none has greater than a moderate potential to occur onsite due to lack of observations in the area and onsite as well as a lack of appropriate habitat.

5.3.3 Sensitive Animals

Sensitive or special interest wildlife species and habitats are those which are considered rare, threatened, or endangered within the state or region by local, state, or federal resource conservation agencies. Sensitive species are so called because of their limited distribution, restricted habitat requirements, or particular susceptibility to human disturbance, or a combination of these factors. Sources used for the determination of sensitive biological resources include: USFWS, CDFW. Additional species receive federal protection under the Bald Eagle Protection Act and the Migratory Bird Treaty Act and Convention for the Protection of Migratory Birds and Animals.

The CDFW also lists species as threatened or endangered, or candidates for listing as threatened or endangered. Lower sensitivity animals may be listed as "species of special concern" (CDFW). The CDFW further classifies some species under the following categories: "fully protected," "protected furbearer," "harvest species," "protected amphibian," and "protected reptile." The designation "protected" indicates that a species may not be taken or possessed except under special permit from the CDFW; "fully protected" indicates that a species can be taken only for scientific purposes. The designation "harvest species" indicates that take of the species is controlled by the state government.

5.3.3.1 Sensitive Wildlife Observed

A single sensitive wildlife species was observed flying overhead, a Turkey Vulture (*Cathartes aura*). U.S. Fish and Wildlife Service (USFWS) protocol coastal California gnatcatcher (CAGN) surveys have been completed and are negative for onsite CAGN (attached). A complete list all Sensitive Wildlife with the Potential to Occur is described in Appendix D.

5.3.3.2 Sensitive Wildlife Species with the Potential to Occur Onsite (not observed)

The subject property supports high quality CSS habitat which is appropriate for the coastal California gnatcatcher. A complete list and explanation as to the potential occurrence of all Sensitive Wildlife with the Potential to Occur is described in Appendix D. To determine presence/absence of the gnatcatcher, protocol surveys were completed in the spring of 2019. No gnatcatchers were observed onsite during the completed surveys (BLUE, October 21, 2017).

5.3.3.3 Raptors

The Property contains numerous scattered mature trees as well as mature ornamental landscaping within the south-west corner of the Property (adjacent to the office and storage structures), which is part of the property to be utilized for the Caltrans project. No appropriate nesting areas for raptors are located within the proposed Project site (consisting of the agricultural portions of the site). Mature trees can support raptor nesting. Raptors are large predatory or scavenger birds that typically require tall trees for perching and nesting associated with adjacent open grasslands to forage. Due to declining habitat and the associated declining numbers of these species on the whole, many raptor species have been designated as California Species of Special Concern by the CDFW. These species are protected, especially during their critical nesting and wintering stages. Raptors are protected under the CDFW California Raptor Protection Act (Title 14, Section 670). No historic raptor nests were observed within the trees onsite.

5.4 Wildlife Corridors

Development within San Diego County has reduced the total available open space for wildlife populations, and in some instances, created isolated "islands" of habitat. In general, corridors and linkages are smaller constrained areas of habitat that connect larger areas of habitat which are otherwise separated by rugged terrain, changes in vegetation, or urban development. This allows for an exchange of gene pool between wildlife populations, which increases the genetic viability of otherwise isolated populations. Wildlife corridors are especially important for species with large habitat ranges or seasonal migrations. A corridor is a specific route that is used for the movement and migration of species, and may be different from a linkage in that it represents a smaller or narrower avenue for movement. A linkage is an area of land that supports or contributes to the long-term movement of wildlife and genetic exchange by providing live-in habitat that connects to other habitat areas. Many linkages occur as stepping-stone linkages that are comprised of fragmented archipelago arrangement of habitat over a linear distance. In either case, corridors and linkages will be comprised of land features which accommodate the movement of all sizes of wildlife, including large animals on a regional scale. Their contributing areas will support adequate vegetation cover, providing visual continuity and long lines of sight, so as to encourage the use of the corridor by all types of wildlife. In San Diego County, important corridors/linkages have been identified on the local and regional scale in establishing a connection between the northern and southern regions.

The property is itself generally developed and actively utilized with the surrounding are to the north and east dominated by high density development. While the San Elijo Lagoon and Open Space is immediately adjacent to the southern property line, the Property located on the north side of Manchester Ave. is not within an existing recognized habitat corridor.

6.0 PROJECT IMPACTS

This section addresses potential direct, indirect, and cumulative impacts to biological resources that would result from implementation of the proposed project and provides analyses of significance for each potential impact.

> **Direct Impacts** are immediate impacts resulting from temporary and permanent removal of habitat through grading and Brush Management Zone (BMZ) activities. As designed, the proposed Projects' structures are sited 100 feet away from the preserved habitat and surrounded by paved/landscaped/maintained areas; as a result, the Brush Management Zone would not impact sensitive habitat.
>
> **Indirect Impacts** result from changes in land use adjacent to natural habitat and primarily result from adverse "edge effects;" either short-term indirect impacts related to construction or long-term, chronic indirect impacts associated with urban development.
>
> **Cumulative Impacts** refer to incremental individual environmental effects of two or more projects when considered together. These impacts taken individually may be minor, but collectively significant as they occur over a period of time.

6.1 Impact Analysis

No species identified as a candidate, sensitive, or special-status species has been recorded onsite and all sensitive habitat has been avoided and preserved. Therefore, the Project –would not have a significant effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

All onsite riparian habitat or other sensitive natural community has been avoided and preserved. Therefore, the Project would not have a significant effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

The Project will impact and mitigate for the 0.08 acres of unvegetated non-wetland waters to a level below significance. Therefore, the Project will not - Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

The Project will impact and mitigate for the 12 square feet of permanent impacts and 777 square feet of temporary impacts to the offsite CDFW jurisdictional wetland habitat(s) to a level below significance. Therefore, the Project will not - Have a substantial adverse effect on state protected wetlands.

All onsite riparian habitat(s) or other sensitive natural community, as well as the potential existing wildlife corridors and nursery sites has been avoided and preserved and nesting season pre-constructions surveys are required. Therefore, the Project will not Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

Direct Impacts

Potentially The proposed project will impact, both on and offsite, a total of 16.69 acres. This total is comprised of the following vegetation types: agricultural, developed, ACOE/CDFW jurisdictional non-wetland water ephemeral drainage channel, offsite CDFW jurisdictional marsh wetlands (temporary impacts, 777 square feet, 12 square feet permanent impacts; Table 5).

A total of 1.43 acres of land within the SW corner of the property has been taken by eminent domain (within the given easement) to be developed as the Caltrans Manchester Park-N-Ride. As a result, while the Property totals 19.03 acres, the proposed Project 'Property' totals approximately 17.6 acres of area onsite.

A total of 16.69 acres of permanent and temporary impacts are proposed; this is broken down as follows: 12.94 acres are to be permanently impacted/developed onsite and the offsite improvements total approximately 3.75 acres.

As described in the subsequent section *6.3.1 Significant Impacts*, impacts to the onsite ACOE/CDFW jurisdictional non-wetland water ephemeral drainage channel and the temporary impacts to approximately 777 square feet of offsite CDFW jurisdictional wetlands are considered potentially significant if not mitigated.

No sensitive plant or wildlife species were observed onsite, and due to the condition of the site, none would be expected to occur onsite or within the offsite development envelope.

TABLE 5
Proposed Project Impacts and
Mitigation Requirements

Habitat Type	Acreage	Impact onsite/offsite	Impact perm/temp	Mitigation Ratio	Mitigation Acreage	Open Space Lots B and C
ACOE/CDFW ephemeral non-wetland water*	0.08	0.08/0.0	0.08/0.0	1:1	0.08	0.0
CDFW Freshwater Marsh*	0.13	0.0/0.018	0.0/0.018	1:1	0.018**	0.13
Coastal sage Scrub*	1.81	0.0/0.0	0.0/0.0	N/A	N/A	1.81
Agricultural	15.74	12.18/0.0	12.18/0.0	N/A	N/A	4.32
Disturbed habitat	0.68	0.68/0.0	0.68/0.0	N/A	N/A	0.0
Developed	0.59	0.0/3.73	3.73/0.0	N/A	N/A	0.0
Total	**19.03**	**12.94/3.75**	**16.67/0.018**		**0.098**	**6.26**

* Denotes a Sensitive Habitat

**Offsite temporary impacts to CDFW jurisdictional marsh to be immediately restored in place as mitigation

The Project will impact and mitigate for the impacts to the onsite 0.08 acres of ACOE/CDFW jurisdictional unvegetated non-wetland waters to a level below significance.

The Project will impact and mitigate for the offsite 12 square feet of permanent impacts and 777 square feet of temporary impacts to the offsite CDFW jurisdictional wetland habitat(s) to a level below significance. Therefore, the Project will not - Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Potential Indirect Impacts

During construction of the project, short-term indirect impacts include dust and noise which could temporarily disrupt habitat and species vitality or construction related soil erosion and run-off. Long-term indirect impacts may include intrusions by humans and domestic pets, noise, lighting, invasion by exotic plant and wildlife species, use of toxic chemicals (fertilizers, pesticides, herbicides, and other hazardous materials), soil erosion, litter, fire, and hydrological changes (e.g., groundwater level and quality).

As described in the Preserve Adjacency Guidelines, the following potential indirect impacts have been assessed and avoided; as described below in Section 6.3, Indirect Impacts - Preventative Mitigation.

> Drainage and Toxics. All new and proposed parking lots and developed areas in and adjacent to the preserve shall not drain directly into the preserve. All developed and paved areas and agricultural and recreational use areas shall prevent the release of toxins, chemicals, petroleum products, exotic plant materials, and other elements that might degrade or harm the natural environment or ecosystem processes within the preserve.
>
> Erosion and Sedimentation. All new development adjacent to preserve areas shall be required to adhere to measures outlined in the city's Grading, Erosion, and Sediment Control Ordinance to avoid degradation of lagoons, other wetland habitats, and upland habitats from erosion and sedimentation.
>
> Lighting. Lighting of all developed areas adjacent to the preserve shall be directed away from the preserve. Where necessary, development shall provide adequate shielding, berming, or other methods to protect the preserve and sensitive species from night lighting.
>
> Noise. Land uses adjacent to the preserve shall be designed to minimize noise impacts. Berms and walls shall be constructed adjacent to commercial areas, recreational areas, and any other use that may introduce noises that could impact or interfere with wildlife utilization of the preserve. Typically, any activities that generate noise levels greater than 60 decibels (A-weighted scale) within 500 feet of nesting sensitive bird species (such as California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, California least tern, and snowy plover) shall be conducted outside of the breeding season or include sound attenuation devices. The ambient sound level onsite supporting the potential nesting habitat is typically above 60dB and is the likely reason no evidence of ongoing or historic nesting was observed during the surveys.
>
> Barriers. The Proposed development adjacent to the preserve will provide barriers (e.g., noninvasive vegetation, rocks/boulders, fences, walls, and signs) along the preserve boundary and the proposed trail(s) to direct public access to appropriate entrance locations and reduce domestic animal predation.
>
> Landscaping Restrictions. No invasive non-native plant species shall be introduced into areas immediately adjacent to the Preserve.

Fire and Brush Management.

After review, the Fire Marshal is not requiring brush management for this Project. As a result of the distance of the Project footprint to the Preserve, specific additional measures, related to the adjacent Preserve, would not be warranted for the project.

Cumulative Impacts

The implementation of mitigation measures for direct/indirect impacts would avoid cumulatively considerable impacts. All native onsite habitat has been avoided and will be conserved. The permanent impact to the 0.08 acres of jurisdictional unvegetated, non-wetland, ephemeral waters and 12 sq. ft. of jurisdictional CDFW wetlands will be mitigated and no-net-loss of wetlands will be required along with the required additional agency permitting. All 777 sq. ft. of temporary impacts to the jurisdictional CDFW wetlands will be mitigated with the immediate restoration of the impacted areas (recontouring/seeding). As a result, the project will not have a cumulatively considerable or significant impact to biological resources.

6.2 Potentially significant Impacts

Potentially significant impacts to two sensitive habitat/areas are proposed to occur (permanent and temporary). These potentially significant impacts a will be mitigated to reduce the level of impact to less than significant. The final specific mitigation measures for the jurisdictional impacts will be determined during the consultation with the required ACOE/RWQCB/CDFW agency permitting process.

- Onsite: Permanent impacts to 0.08 acres of ACOE/CDFW jurisdictional unvegetated, non-wetland, ephemeral water channel
- Offsite: Permanent impact to 12 sq. ft. of jurisdictional CDFW wetlands
- Offsite: Temporary impact to 777 sq. ft. CDFW jurisdictional wetland

Sensitive Habitat

Sensitive habitat(s) were documented onsite; freshwater marsh, coastal sage scrub and jurisdictional non-wetland channel. The jurisdictional non-wetland water ephemeral drainage channel and offsite impacts to CDFW jurisdictional freshwater marsh are the sensitive area/habitat to be impacted. All onsite freshwater marsh and coastal sage scrub would be preserved.

Onsite

The 0.08 acres of onsite jurisdictional non-wetland water ephemeral drainage channel would be permanently impacted. All flows would be captured at the Property Line (on the west side) and conveyed through the property within a proposed underground stormwater pipe system that would discharge the flows in the same location (flows entering on the north - and out on side of Manchester Avenue). In addition, the flows have been designed by the engineer to maintain the existing flow rate (to prevent erosion, etc.) and these waters would be kept separate from Project flows (no mixing) and would directly flow into the Lagoon in the existing location.

Offsite

In order to install the offsite retrofit outlets on the south side of Manchester Avenue effectively (de-minimus) no permanent impacts are proposed (12.0134 square feet or 0.0003 Acres) to the identified jurisdictional habitat.

Temporary impacts totaling 777.0788 square feet or 0.0178 acres are proposed to the offsite CDFW jurisdictional wetland habitat. These 777 sq. ft. would be recontoured to the natural grade and restored to the original state.

All impacts are only within the jurisdiction of the CDFW as designated on Figure 6, as delineated by RECON. A breakdown of the offsite impacts required for the installation of the storm drain outlets is provided below:

Outlet #1:

- Permanent Impact area: 6.8SF
- Temporary Construction Impact Area (area to be restored after construction): 371.0 SF
- Total Combined Impact Area: 377.8SF

Outlet #2:

- Permanent Impact area: 5.3 SF
- Temporary Construction Impact Area (area to be restored after construction): 109.0 SF
- Total Combined Impact Area: 114.3 SF

Outlet #3:

- Permanent Impact area: 0 SF
- Temporary Construction Impact Area (area to be restored after construction): 180.4SF
- Total Combined Impact Area: 180.4 SF

Outlet #4:

- Permanent Impact area: 0 SF
- Temporary Construction Impact Area (area to be restored after construction): 116.7 SF
- Total Impact Area: 116.7 SF

TOTALS:

- Permanent Impact area: 12.0 SF or 0.0003 AC
- Temporary Construction Impact Area (area to be restored after construction): 777.1 SF or 0.018 AC
- Total Combined Impact Area: 789.1 SF or 0.018 AC

As a result of these proposed on (ACOE/CDFW jurisdiction) and offsite CDFW jurisdictional impacts, additional permitting from the ACOE, RWQCB and CDFW will be required.

Sensitive Plant Species

No impacts to sensitive plant species are expected to occur and mitigation would not be required. All sensitive habitat that could potentially support sensitive species will be Avoided and Preserved.

Sensitive Wildlife Species

Spring 2019 protocol CAGN surveys were completed and none were observed onsite. Gnatcatchers were observed offsite immediately offsite in the north east corner and to the north (in the canyon). No sensitive wildlife species were documented onsite. Due to the site conditions and the implementation of the proposed preventative mitigation measures (see Section 6.3, below), no impacts to sensitive wildlife species are expected to occur and specific mitigation measures would not be required.

Because raptors have been historically observed in the area and there are large open areas onsite, raptor foraging within this area may occur. However, as this area is currently and historically utilized by human activity, no historic raptor nest has been observed onsite, the loss of this area does not constitute a potentially significant habitat impact or loss of significant raptor foraging area.

6.3 PROPOSED MITIGATION

Under CEQA, mitigation is required for all significant biological impacts (e.g. impacts within highly constrained areas). In addition, the CDFW 1600 and the ACOE 404 permit process generally require mitigation for the loss of wetland resources. The following mitigation measures are recommendations to locally important biological impacts.

Project Impact and Mitigation Summary

- No species identified as a candidate, sensitive, or special-status species has been recorded onsite and all sensitive habitat has been avoided and preserved. Therefore, the Project –would not have a significant effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

- All onsite riparian habitat or other sensitive natural community has been avoided and preserved. Therefore, the Project would not have a significant effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

- The Project will impact and mitigate for the 0.08 acres of unvegetated non-wetland waters to a level below significance. Therefore, the Project will not - Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

- The Project will impact and mitigate for the 12 square feet of permanent impacts and 777 square feet of temporary impacts to the offsite CDFW jurisdictional wetland habitat(s) to a level below significance. Therefore, the Project will not - Have a substantial adverse effect on state protected wetlands.

- All onsite riparian habitat(s) or other sensitive natural community, as well as the potential existing wildlife corridors and nursery sites has been avoided and preserved and nesting season pre-constructions surveys are required. Therefore, the Project will not Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

- The Project will impact and mitigate for the 0.08 acres of unvegetated non-wetland waters to a level below significance. Therefore, the Project will not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

6.3.1 Direct Impacts - Mitigation

The 0.08 acres of onsite jurisdictional (ACOE/RWQCB/CDFW) non-wetland ephemeral waters and 12 square feet of CDFW jurisdictional wetlands (offsite) would be permanently impacted; mitigation would be required (Table 5).

An Open Space easement will be placed over 6.26 acres, which includes the 100% preserved CSS (1.81 acres) and freshwater marsh (0.13 acres) as well as the northern portion of the existing agricultural operation.

The offsite temporary impacts to the CDFW jurisdictional wetland totaling 777.1 square feet would be immediately recontoured to the natural grade and restored as the appropriate type of wetland (salt/freshwater marsh). No additional Mitigation Measures for the temporary jurisdictional impacts are required, as determined at the batching meetings.

The Project has been presented to the ACOE, RWQCB and CDFW at batching meetings to determine the status of the onsite resources and viable mitigation for impacts to the jurisdictional non-wetland ephemeral waters. The impacts to the non-wetland channel were discussed and mitigation was determined to consist of the purchase of 1:1 wetland mitigation credit (0.08 acres) from the San Luis Rey River Mitigation Bank and the donation of the preserved freshwater marsh (0.13 acres) and coastal sage scrub (1.81 acres) to the San Elijo Lagoon Conservancy.

The Project will impact and mitigate for the 0.08 acres of unvegetated non-wetland waters to a level below significance. Therefore, the Project will not - Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

6.3.2 Indirect Impacts - Preventative Mitigation Measures

In order to prevent potential significant indirect impacts to the proposed OS, sensitive adjacent upland habitats and/or the Bataquitos Lagoon, the following adjacency guidelines have been identified and addressed/incorporated into the Project through the CEQA process.

<u>Drainage and Toxics.</u> All new and proposed parking lots and developed areas in and adjacent to the preserve shall not drain directly into the preserve. All developed and paved areas and agricultural and recreational use areas shall prevent the release of toxins, chemicals, petroleum products, exotic plant materials, and other elements that might degrade or harm the natural environment or ecosystem processes within the preserve.

This will be accomplished using a variety of methods, including natural detention basins, grass swales, or mechanical trapping devices. These systems shall be maintained approximately once a year, or as often as needed to ensure proper functioning. Maintenance shall include dredging out sediments if needed, removing exotic plant materials, and adding chemical-neutralizing compounds (e.g., clay compounds when necessary and appropriate). Restaurants adjacent to the lagoon shall comply with storm drain regulations.

Drainage and Toxins Preventative Measures:

1. All developed and paved areas must prevent the release of toxins, chemicals, petroleum products, exotic plant materials and other elements that might degrade or harm the natural environment or ecosystem processes within the Preserve. This can be accomplished using a variety of methods including natural detention basins, grass swales or mechanical trapping devices. These systems should be maintained approximately once a year, or as often as needed, to ensure proper functioning. Maintenance should include dredging out sediments if needed, removing exotic plant materials, and adding chemical-neutralizing compounds (e.g., clay compounds) when necessary and appropriate.

2. Develop and implement urban runoff and drainage plans which will create the least impact practicable for all development adjacent to the Preserve. All development projects will be required to meet NPDES standards and incorporate BMP as defined by the City's Standard Urban Storm Mitigation Plan (SUSMP).

3. Pursuant to the San Diego Regional Water Quality Control Board Municipal Permit, and the City Storm Water Management Standards Requirements Manual, which includes the SUSMP, all development and redevelopment located within or directly adjacent to or discharging directly to an environmentally sensitive area (as defined in the Municipal Permit and the Local SUSMP) are required to implement site design, source control, and treatment control BMPs.

The BMPs shall, at a minimum include:

- Control post-development peak storm water runoff discharge rates and velocities to maintain or reduce pre-development downstream erosion and to protect stream habitat;
- Conserve natural areas where feasible;
- Minimize storm water pollutants of concern in runoff;
- Remove pollutants of concern from urban runoff;
- Minimize directly connected impervious areas where feasible;
- Protect slopes and channels from eroding;
- Include storm drain stenciling and signage;
- Include additional water quality provisions applicable to individual project categories;
- Ensure that post-development runoff does not contain pollutant loads which cause or contribute to an exceedance of water quality objectives or which have not been reduced to the maximum extent practicable; and,
- Implement BMPs close to pollutant sources.

4. Require all NPDES-regulated projects to implement a combination of BMP's as close to potential pollutant sources as feasible.

Proposed construction (SWPPP) and post-construction BMP's are required and proposed by the project.

As a result of the implemented Project specific construction BMP's, which shall be determined with the SWPPP when the grading permit is issued, and the distance of the Project footprint to the Preserve, specific additional measures, related to the adjacent Preserve, would not be warranted for the project.

<u>Erosion and Sedimentation.</u> All new development adjacent to preserve areas shall be required to adhere to measures outlined in the city's Grading, Erosion, and Sediment Control Ordinance to avoid degradation of lagoons, other wetland habitats, and upland habitats from erosion and sedimentation.

Erosion and Sedimentation Preventative Measures:
These measures include restrictions timing and amount of grading and vegetation removal. For example, grading or vegetation removal shall be prohibited during the rainy season (October 1 through April 15) without an approved erosion control plan and program in place. Grading or vegetation removal shall be prohibited adjacent to preserve areas during the rainy season unless determined to be allowable on a site-specific basis. In addition, all necessary erosion control devices must be in place, and appropriate monitoring and maintenance must be implemented during the grading period.

As a result of the implemented Project specific BMP's, which shall be determined with the SWPPP when the grading permit is issued, and the distance of the Project footprint to the Preserve, the project would not alter drainage patterns or induce erosion and sedimentation; instead, the Project shall maintain and improve the existing storm drainage. Specific additional Erosion and Sedimentation Preventative measures, related to the adjacent Preserve, would not be warranted for the project.

Lighting. Lighting of all developed areas adjacent to the preserve shall be directed away from the preserve. Where necessary, development shall provide adequate shielding, berming, or other methods to protect the preserve and sensitive species from night lighting.

> Lighting Preventative Measures:
> Lighting of all developed areas adjacent to the Preserve shall be directed away from the Preserve wherever feasible and consistent with public safety. Where necessary, development shall provide adequate shielding with non-invasive plant materials (preferably native), berming, and/or other methods to protect the Preserve and sensitive species from night lighting. Consideration will be given to the use of low-pressure sodium lighting.
>
> Specifically, prior to building permit issuance, building plans shall specify that that all outdoor lighting adjacent to the Open Space Lots (b and C) shall be shielded with full-cutoff light fixtures and directed away from adjacent open space easement. Building plans shall also state that if night work is necessary, night lighting shall be of the lowest illumination necessary for human safety, selectively placed, shielded and directed away from the lagoon and natural habitats.

As a result of the implemented Project specific lighting restrictions, and the distance of the Project footprint to the Preserve, specific additional measures, related to the adjacent Preserve, would not be warranted for the project.

Noise. Land uses adjacent to the preserve shall be designed to minimize noise impacts. Berms and walls shall be constructed adjacent to commercial areas, recreational areas, and any other use that may introduce noises that could impact or interfere with wildlife utilization of the preserve. Typically, any activities that generate noise levels greater than 60 decibels (A-weighted scale) within 500 feet of nesting sensitive bird species (such as California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, California least tern, and snowy plover) shall be conducted outside of the breeding season or include sound attenuation devices. The ambient sound level onsite supporting the potential nesting habitat is typically above 60dB and is the likely reason no evidence of ongoing or historic nesting was observed during the surveys.

> Noise Preventative Measures:
> Due to the high level of ambient noise from the adjacent developed uses, including Manchester Avenue, both onsite and within the 500-foot radius, the noise associated with clearing, grading or grubbing will not negatively impact a potentially occupied nest.

No specific bird breeding season(s) restrictions shall be placed on temporary construction noise because of the existing high level of ambient noise as well as the buffer distance of the Project footprint to the Preserve, specific additional measures, related to the adjacent Preserve, would not be warranted for the project.

Barriers. The Proposed development adjacent to the preserve will provide barriers (e.g., noninvasive vegetation, rocks/boulders, fences, walls, and signs) along the preserve boundary and the proposed trail(s) to direct public access to appropriate entrance locations and reduce domestic animal predation.

> Specifically, construction plans shall portray construction fencing to protect the wetlands adjacent to the proposed offsite CDFW jurisdictional wetland impacts within the Batiquitos Lagoon (on the south side of

Manchester Avenue) and limits of the proposed open space easement (onsite) to the satisfaction of the Development Services Department. The construction plans shall specify that construction fencing shall be installed and maintained for the entire duration of construction activity, and until permanent fencing is installed.

The following restrictions shall be included as part of the Homeowner Association (HOA) Covenants, Restrictions, and Conditions (CC&Rs) or other legally-enforceable HOA regulations.

These restrictions shall not be amended without prior approval by the City of Encinitas:

- Permanent fencing protecting access into the proposed open space easement shall be installed by the developer and maintained in perpetuity by the Bataquitos Lagoon Foundation.

As a result of the implemented Project specific barriers, and the distance of the developed Project footprint to the Preserve, specific additional measures, related to the adjacent Preserve, would not be warranted for the project.

Landscaping Restrictions. No invasive non-native plant species shall be introduced into areas immediately adjacent to the Preserve. When landscaping within or adjacent to the preserve, the following guidelines shall be followed:

- Prohibit the use of nonnative, invasive plant species (i.e., container stock and hydroseed material) in landscaping palettes.
- Revegetate areas of exotic species removal with native species appropriate to the adjacent preserve area.

Table 4-2, below, from Section 7 of the draft Encinitas Subarea plan provides a partial list of attractive native landscape plants that are tolerant of some summer irrigation and are compatible with adjacent preserve areas.

Table 4-2
NATIVE LANDSCAPING SHRUBS SUITABLE FOR USE
ADJACENT TO PRESERVE AREAS

Scientific Name	Common Name
Adolphia californica	California adolphia
Atriplex lentiformis ssp. *lentiformis*	Big saltbush
Comarostaphylis diversifolia ssp. *diversifolia*	Summer holly
Encelia californica	Coastal sunflower
Heteromeles arbutifolia	Toyon
Malosma laurina	Laurel sumac
Mimulus auranticus	Red monkeyflower
Opuntia prolifera	Cholla cactus
Prunus ilicifolia ssp. *ilicifolia*	Hollyleaf cherry
Rhus integrifolia	Lemonadeberry
Rhus ovata	Sugar bush
Sambucus mexicana	Mexican elderberry

See also Table 7-1 from Section 7 (attached; Attachment ‘H’) of the draft Encinitas Subarea plan for a list of landscape plants not recommended within 1,000 feet of preserve areas.

The Project was also designed to control and monitor horticultural regimes (e.g., irrigation, fertilization, pest control, and pruning), which can alter site conditions in natural areas, to prevent shifts in species composition from native to nonnative flora. Irrigation runoff, for example, can alter natural areas that are adapted to xeric (dry) conditions, thereby promoting establishment of nonnative plants and displacement of native species. Irrigation can also carry pesticides into natural areas, adversely affecting both plants and wildlife. Irrigation shall be directed away from the preserve and fertilizer management programs shall be implemented that apply the minimal amount of fertilizer required for all public horticultural areas adjacent to the preserve.

Specifically, the following restrictions shall apply to the open space easement and shall be included as part of the Homeowner Association (HOA) Covenants, Restrictions, and Conditions (CC&Rs) or other legally-enforceable regulations. These restrictions shall not be amended without prior approval by the City of Encinitas:

- All landscaping within the project subdivision shall comply with the City's Invasive Plant Policy.
- Outside of the Preserved agricultural area (Figure 7), no invasive plant species shall be planted in or adjacent to the naturally vegetated areas open space easement, within the 100-foot buffer adjacent to the upland OS easement or within the temporary impacts associated with the improvements to the drainage outlets within the Batiquitos Lagoon. The Developer shall be responsible for any necessary removal of non-native invasive vegetation within the open space easement.
- Irrigation runoff shall be directed away from the open space easement and the Batiquitos Lagoon.

As a result of the implemented Project specific landscaping restrictions, and the distance of the Project footprint to the Preserve, specific additional measures, related to the adjacent Preserve, would not be warranted for the project.

Fire and Brush Management.

After review, the Fire Marshal is not requiring brush management for this Project. As a result of the distance of the Project footprint to the Preserve, specific additional measures, related to the adjacent Preserve, would not be warranted for the project.

6.4 Cumulative Impacts

The implementation of mitigation measures for direct/indirect impacts would avoid cumulatively considerable impacts. All native onsite habitat has been avoided and will be conserved. The permanent impact to the 0.08 acres of jurisdictional unvegetated, non-wetland, ephemeral waters and 12 sq. ft. of jurisdictional CDFW wetlands will be mitigated and no-net-loss of wetlands will be required along with the required additional agency permitting. All 777 sq. ft. of temporary impacts to the jurisdictional CDFW wetlands will be mitigated with the immediate restoration of the impacted areas (recontouring/seeding). As a result, the project will not have a cumulatively considerable or significant impact to biological resources.

7.0 LITERATURE CITED

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8.0 CERTIFICATION **and AGENCY CONSULTATION**

The following qualified Biologist completed the stated field survey(s) and preparation of this report:
Michael Jefferson – Senior Biologist, BLUE Consulting Group

The following Agency/staff have been consulted:
Batching Meeting (Jurisdictional Impacts): August 13, 2019 (latest meeting)

Led by CDFW staff Kelly Fisher Environmental Scientist; also attending were: EPA staff, additional CDFW staff, ACOE staff, RWQCB staff – Met 3 times for conceptual agreement of the Project as designed and mitigated

Nature Collective: Doug Gibson – Development team has consulted with Mr. Gibson on a regular basis to ensure that the Nature Collective is in support of the Project; including: OS, trails, jurisdictional impacts and mitigation requirements

CERTIFICATION: *I hereby certify that the statements furnished above and in the attached exhibits present data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.*

Signed:

Michael K. Jefferson
BLUE Consulting Group
Senior Biologist

Appendix A Plant Species Observed (Table 3)

TABLE 3
PLANT SPECIES OBSERVED

Scientific Name	Common Name	Habitat	Origin
Acacia ssp.	Acacia	DH, AG	I
Amaranthus blitoides S. Wats.	Pigweed, amaranth	DH, AG	I
Artemisia californica	California sagebrush	CSS	
Brassica nigra (L.) Koch.	Black mustard	DH, AG	I
Bromus hordaceus L.	Smooth brome	DH	I
Bromus madritensis L. ssp. rubens (L.) Husnot	Foxtail chess	DH	I
Centaurea melitensis L.	Tocolote, star-thistle	DH	I
Cuscuta salina	Salty dodder	FWM	N
Distichlis spicata	Saltgrass	FWM	N
Eriogonum fasciculatum	California buckwheat	CSS	N
Erodium cicutarium (L.) L. Her.	White-stemmed filaree	DH	I
Eucalyptus sp.	Eucalyptus sp.	DH	I
Frankenia grandifolia	Alkali heath	FWM	N
Foeniculum vulgare Mill.	Fennel	DH	I
Heteromeles arbutifolia	Toyon	CSS	N
Juncus acutus	Spiny Rush	FWM	N
Malosma laurina (Nutt.) Abrams	Laurel sumac	AG	N
Medicago polymorpha L.	California bur clover	DH, AG	I
Melilotus alba	White sweet clover	DH, AG	I
Nicotiana glauca Grah.	Tree tobacco	DH, AG	I
Rhus integrifolia (Nutt.) Brewer & Watson	Lemonadeberry	DH	N
Salicornia virginica	Pickleweed	FWM	N
Salsola tragus L.	Russian thistle, tumbleweed	DH, AG	I
Salvia spp.	Sages	CSS	N
Schinus terebinthifolius Raddi	Brazilian pepper tree	DH, AG	I
Tamarisk Sp.	Salt Cedar	DH, AG	I
Urtica urens L.	Dwarf nettle	DH, AG	I
Vulpia myuros (L.) var. hirsuta (Hackel.) Asch. & Graebr.	Rattail fescue	DH, AG	I
Xanthium strumarium L.	Cocklebur	DH, AG	N

<u>HABITATS</u> <u>OTHER TERMS</u>

DH = Disturbed/Ruderal habitat
AG = Agricultural
FWM = Freshwater Marsh
CSS = Coastal sage scrub

N = Native to locality
I = Introduced species from outside locality

Appendix B Wildlife Species Observed (Table 4)

TABLE 4
WILDLIFE SPECIES OBSERVED/DETECTED ONSITE

Common Name	Scientific Name	Occupied Habitat	Status	Evidence of Occurrence
Invertebrates (Nomenclature from Brown, Real, and Faulkner 1992)				
Cabbage white	*Pieris rapae*	DIS		O
Amphibians (Nomenclature from Collins 1997)				
N/A				
Reptiles (Nomenclature from Collins 1997)				
Western fence lizard	*Sceloporus occidentalis*	DIS		O
Birds (Nomenclature from American Ornithologists' Union)				
Mourning dove	*Zenaida macroura marginella*	all		O
Western scrub-jay	*Aphelocoma californica*	all		O
Common raven	*Corvus corax clarionensis*	all		O
House finch	*Carpodacus mexicanus frontalis*	all		O
Turkey vulture	*Cathertes aura*	all		O
Lesser goldfinch	*Carduelis psaltria hesperophilus*	all		O
Mammals (Nomenclature from Jones et al. 1982)				
N/A				

Habitats
DEV = Developed
DIS = Disturbed/Agriculture

Status
CSC = California Department of Fish and Game species of special concern
FT = Listed as threatened by the federal government

Appendix C Sensitive Plant Species with the Potential to Occur

SENSITIVE PLANT SPECIES
OBSERVED (†) OR WITH THE POTENTIAL FOR OCCURRENCE

Species	State/Federal Status	City Status	CNPS List/Code	Typical Habitat/Comments
Acanthomintha ilicifolia San Diego thornmint	CE/FT	NE, MHCP	1B/2-3-2	Chaparral, coastal sage scrub, valley and foothill grassland/ clay soils. No appropriate habitat, not expected to occur
Ambrosia pumila San Diego ambrosia	–/–	NE, MHCP	1B/3-2-2	Creekbeds, seasonally dry drainages, floodplains. No suitable habitat. no potential to occur.
Arctostaphylos glandulosa ssp. *crassifolia* Del Mar manzanita	–/FE	MHCP	1B/3-3-2	Southern maritime chaparral. No appropriate habitat, not expected to occur
Artemisia palmeri San Diego sagewort	–/–	–	2/2-2-1	Coastal sage scrub, chaparral, riparian. No appropriate habitat, not expected to occur
Baccharis vanessae Encinitas coyote bush	CE/FT	NE, MHCP	1B/2-3-3	Chaparral. No appropriate habitat, not expected to occur
Brodiaea filifolia Thread-leaved brodiaea	CE/FT	MHCP	1B/3-3-3	Valley and foothill grassland, vernal pools. No appropriate habitat, not expected to occur
Brodiaea orcuttii Orcutt's brodiaea	–/–	MHCP	1B/1-3-2	Closed-cone coniferous forest, meadows, cismontane woodland, valley and foothill grassland, vernal pools. No appropriate habitat, not expected to occur
Chorizanthe polygonoides var. *longispina* Long-spined spineflower	–/–	–	1B/2-2-2	Open chaparral, coastal sage scrub, montane meadows, valley and foothill grasslands; vernal pools/clay. No appropriate habitat, not expected to occur
Dichondra occidentalis Western dichondra	–/–	–	4/1-2-1	Chaparral, cismontane woodland, coastal sage scrub, valley and foothill grassland/generally post-burn. No appropriate habitat, not expected to occur

SENSITIVE PLANT SPECIES
OBSERVED (†) OR WITH THE POTENTIAL FOR OCCURRENCE
(continued)

Species	State/Federal Status	City Status	CNPS List/Code	Typical Habitat/Comments
Ferocactus viridescens Coast barrel cactus	–/–	MHCP	2/1-3-1	Chaparral, coastal sage scrub, valley and foothill grassland. Not observed, moderate potential to occur
Harpagonella palmeri var. *palmeri* Palmer's grappling hook	–/–	–	2/1-2-1	Chaparral, coastal sage scrub, valley and foothill grassland. No appropriate habitat, not expected to occur
Juncus acutus ssp. leopoldii Spiny rush	–/–	–	4/1-2-1	Coastal dunes (mesic) meadows (alkaline), coastal salt marsh. No appropriate habitat, not expected to occur
Lessingia filaginifolia var. *filaginifolia* (=*Corethrogyne filaginifolia* var. *incana*) San Diego sand aster	–/–	–	1B/2-2-2	Coastal sage scrub, chaparral. No appropriate habitat, not expected to occur
Muilla clevelandii San Diego goldenstar	–/–	MHCP	1B/2-2-2	Chaparral, coastal sage scrub, valley and foothill grassland, vernal pools. No appropriate habitat, not expected to occur
Quercus dumosua Nuttall's scrub oak	–/–	–	1B/2-3-2	Coastal chaparral. No appropriate habitat, not expected to occur
Tetracoccus dioicus Parry's tetracoccus	–/–	MHCP	1B/3-2-2	Chaparral, coastal sage scrub. No appropriate habitat, not expected to occur

NOTE: See Appendix E for explanation of sensitivity codes.

Appendix D Sensitive Wildlife Species with the Potential to Occur

SENSITIVE WILDLIFE SPECIES
OBSERVED (∞) OR WITH THE POTENTIAL FOR OCCURRENCE

Species	Status	Habitat	Occurrence/Comments[*]
Invertebrates (Nomenclature from Collins 1997)			
Quino checkerspot butterfly *Euphydryas editha quino*	CSC, MHCP	Chaparral, coastal sage scrub with coarse sandy soils and scattered brush and *plantago* sp.	Outside of USFWS potential habitat area. No potential to occur onsite.
Monarch *Danaus plexippus*	CSC, MHCP	Open fields and meadows with milkweed.	Appropriate habitat. Moderate potential to occur onsite.
Reptiles (Nomenclature from Collins 1997)			
Southwestern pond turtle *Clemmys marmorata pallida*	CSC, FSS, MHCP	Ponds, small lakes, marshes, slow-moving, sometimes brackish water.	No appropriate habitat. No potential to occur onsite.
San Diego horned lizard *Phrynosoma coronatum blainvillii*	CSC, MHCP, *	Chaparral, coastal sage scrub with fine, loose soil. Partially dependent on harvester ants for forage.	Appropriate habitat. Moderate potential to occur onsite.
Coastal rosy boa *Charina trivirgata roseofusca*	CSC, MHCP	Chaparral, coastal sage scrub with coarse sandy soils and scattered brush.	Appropriate habitat. Moderate potential to occur onsite.
San Diego banded gecko *Coleonyx variegates abbottii*	CSC, MHCP	Rocky areas in coastal sage and chaparral.	No appropriate habitat. No potential to occur onsite.
Coastal whiptail *Cnemidophorus tigris stejnegeri*	CSC, MHCP	Chaparral, coastal sage scrub with coarse sandy soils and scattered brush.	No appropriate habitat. No potential to occur onsite.
Belding's orangethroat whiptail *Cnemidophorus hyperythrus beldingi*	CSC, MHCP	Chaparral, coastal sage scrub with coarse sandy soils and scattered brush.	Appropriate habitat. Moderate potential to occur onsite.
Silvery legless lizard *Anniella pulchra pulchra*	CSC	Herbaceous layers with loose soil in coastal scrub, chaparral, and open riparian habitats. Prefers dunes and sandy washes near moist soil.	Low potential to occur onsite due to habitat. Not historically observed in the area, not expected to occur.

SENSITIVE WILDLIFE SPECIES
OBSERVED (∞) OR WITH THE POTENTIAL FOR OCCURRENCE
(continued)

Species	Status	Habitat	Occurrence/Comments*
Red diamond rattlesnake *Crotalus exsul (C. ruber ruber)*	CSC	Desert scrub and riparian habitats, coastal sage scrub, open chaparral, grassland, and agricultural fields.	Appropriate habitat. Moderate potential to occur onsite.
San Diego ring neck snake *Diadophis punctatus similis*	CSC	Moist habitats, including wet meadows, rocky hillsides, gardens, farmland, grassland, chaparral, mixed coniferous forests, woodlands.	No appropriate habitat. No potential to occur onsite.
Coast patch-nosed snake *Salvadora hexalepis virgultea*	CSC	Grasslands, chaparral, sagebrush, desert scrub. Found in sandy and rocky areas.	**Low potential to occur onsite due to habitat. Not historically observed in the area.**
<u>Birds</u> (Nomenclature from American Ornithologists' Union)			
Great blue heron (rookery site) *Ardea herodias*	*	Bays, lagoons, ponds, lakes. Non-breeding year-round visitor, some localized breeding.	No appropriate habitat. No potential to occur onsite.
Great egret (rookery site) *Ardea alba*	*	Lagoons, bays, estuaries. Ponds and lakes in the coastal lowland. Winter visitor, uncommon in summer.	No appropriate habitat. No potential to occur onsite.
White-tailed kite (nesting) *Elanus leucurus*	CFP, *	Nest in riparian woodland, oaks, sycamores. Forage in open, grassy areas. Year-round resident.	No appropriate habitat. No potential to occur onsite.
Northern harrier (nesting) *Circus cyaneus*	CSC, MHCP	Coastal lowland, marshes, grassland, agricultural fields. Migrant and winter resident, rare summer resident.	No appropriate habitat. No potential to occur onsite.
Sharp-shinned hawk (nesting) *Accipiter striatus*	CSC	Open deciduous woodlands, forests, edges, parks, residential areas. Migrant and winter visitor.	No appropriate habitat. No potential to occur onsite.

SENSITIVE WILDLIFE SPECIES
OBSERVED (∞) OR WITH THE POTENTIAL FOR OCCURRENCE
(continued)

Species	Status	Habitat	Occurrence/Comments[*]
Cooper's hawk (nesting) *Accipiter cooperii*	CSC, MHCP	Mature forest, open woodlands, wood edges, river groves. Parks and residential areas. Migrant and winter visitor.	No appropriate habitat. No potential to occur onsite.
Ferruginous hawk (wintering) *Buteo regalis*	CSC	Require large foraging areas. Grasslands, agricultural fields. Uncommon winter resident.	No appropriate habitat. No potential to occur onsite.
Golden eagle (nesting and wintering) *Aquila chrysaetos*	CSC, CFP, BEPA, MHCP	Require vast foraging areas in grassland, broken chaparral, or sage scrub. Nest in cliffs and boulders. Uncommon resident.	No appropriate habitat. No potential to occur onsite.
Merlin *Falco columbarius*	CSC	Rare winter visitor. Grasslands, agricultural fields, occasionally mud flats.	No appropriate habitat. No potential to occur onsite.
Prairie falcon (nesting) *Falco mexicanus*	CSC	Grassland, agricultural fields, desert scrub. Uncommon winter resident. Rare breeding resident. Breeds on cliffs.	Low potential to occur onsite.
Western yellow-billed cuckoo (breeding) *Coccyzus americanus occidentalis*	SE	Large riparian woodlands. Summer resident. Very localized breeding.	Low potential to occur onsite.
Western burrowing owl (burrow sites) *Speotyto cunicularia hypugaea*	CSC, MHCP	Grassland, agricultural land, coastal dunes. Require rodent burrows. Declining resident.	Low potential to occur onsite.
Southwestern willow flycatcher *Empidonax traillii extimus*	SE, FE, FSS, MHCP	Nesting restricted to willow thickets. Also occupies other woodlands. Rare spring and fall migrant, rare summer resident. Extremely localized breeding.	No appropriate habitat. No potential to occur onsite.
Turkey Vulture (∞) *Cathartes aura*	CSC, MHCP	Grassland, agricultural land, coastal sage, chaparral. Declining resident.	Observed flying overhead. Limited potential nesting onsite

SENSITIVE WILDLIFE SPECIES
OBSERVED (∞) OR WITH THE POTENTIAL FOR OCCURRENCE
(continued)

Species	Status	Habitat	Occurrence/Comments[*]
California horned lark *Eremophila alpestris actia*	CSC	Sandy shores, mesas, disturbed areas, grasslands, agricultural lands, sparse creosote bush scrub.	Low potential to occur onsite.
Coastal cactus wren *Campylorhynchus brunneicapillus couesi*	CSC, MHCP, *	Maritime succulent scrub, coastal sage scrub with *Opuntia* thickets. Rare localized resident.	Appropriate habitat. Moderate potential to occur onsite.
Coastal California gnatcatcher *Polioptila californica californica*	FT, CSC, MHCP	Coastal sage scrub, maritime succulent scrub. Resident.	Appropriate habitat. High potential to occur onsite.
Loggerhead shrike *Lanius ludovicianus*	CSC	Open foraging areas near scattered bushes and low trees.	Appropriate habitat. Moderate potential to occur onsite.
Least Bell's vireo (nesting) *Vireo bellii pusillus*	SE, FE, MHCP	Willow riparian woodlands. Summer resident.	Low potential to occur onsite.
Yellow warbler (nesting) *Dendroica petechia brewsteri*	CSC	Breeding restricted to riparian woodland. Spring and fall migrant, localized summer resident, rare winter visitor.	No appropriate habitat. No potential to occur onsite.
Yellow-breasted chat (nesting) *Icteria virens*	CSC, MHCP	Dense riparian woodland. Localized summer resident.	No appropriate habitat. No potential to occur onsite.
Southern California rufous-crowned sparrow *Aimophila ruficeps canescens*	CSC, MHCP	Coastal sage scrub, grassland. Resident.	Appropriate habitat. Moderate potential to occur onsite.
Bell's sage sparrow *Amphispiza belli belli*	CSC, MHCP	Chaparral, coastal sage scrub. Localized resident.	Appropriate habitat. Moderate potential to occur onsite.
Tricolored blackbird *Agelaius tricolor*	CSC, MHCP	Freshwater marshes, agricultural areas, lakeshores, parks. Localized resident.	Appropriate habitat. Moderate potential to occur onsite.
Blue grosbeak (nesting) *Guiraca caerulea*	*	Riparian woodland edges, mule fat thickets. Summer resident, spring and fall migrant, winter visitor.	Low potential to occur onsite.

SENSITIVE WILDLIFE SPECIES
OBSERVED (∞) OR WITH THE POTENTIAL FOR OCCURRENCE
(continued)

Species	Status	Habitat	Occurrence/Comments*
Mammals (Nomenclature from Jones et al. 1982)			Low potential to occur onsite.
Pallid bat *Antrozous pallidus*	CSC	Caves, mines, buildings. Found in a variety of habitats, arid and mesic.	Low to moderate potential to occur onsite due to habitat. Not historically observed in the area.
Ringtail cat *Bassariscus astutus*	CSC	Desert dune, rock outcrops, chaparral, forest (scrub) and mountains.	Low potential to occur onsite.
Pale big-eared bat *Corynorhinus townsendii pallescens*	CSC	Caves, mines, buildings. Found in a variety of habitats, arid and mesic.	Low to moderate potential to occur onsite due to habitat. Not historically observed in the area.
Townsend's western big-eared bat *Corynorhinus townsendii townsendii*	CSC, MHCP	Caves, mines, buildings. Found in a variety of habitats, arid and mesic.	Low to moderate potential to occur onsite due to habitat. Not historically observed in the area.
Californai leaf nosed bat *Macrotus californicus*	CSC, MHCP	Woodlands, rocky habitat, arid and semiarid lowlands, cliffs, crevices, buildings, tree hollows.	Low to moderate potential to occur onsite due to habitat. Not historically observed in the area.
Western mastiff bat *Eumops perotis californicus*	CSC, MHCP	Woodlands, rocky habitat, arid and semiarid lowlands, cliffs, crevices, buildings, tree hollows.	Low to moderate potential to occur onsite due to habitat. Not historically observed in the area.
Western small-footed myotis *Myotis ciliolabrum*	CSC, MHCP	Woodlands, rocky habitat, arid and semiarid lowlands, cliffs, crevices, buildings, tree hollows.	Low to moderate potential to occur onsite due to habitat. Not historically observed in the area.
Long-eared myotis *Myotis evotis*	CSC, MHCP	Woodlands, rocky habitat, arid and semiarid lowlands, cliffs, crevices, buildings, tree hollows.	Low to moderate potential to occur onsite due to habitat. Not historically observed in the area.
Yuma myotis *Myotis yumanensis*	CSC, MHCP	Woodlands, rocky habitat, arid and semiarid lowlands, cliffs, crevices, buildings, tree hollows.	Low to moderate potential to occur onsite due to habitat. Not historically observed in the area.

SENSITIVE WILDLIFE SPECIES OBSERVED (∞) OR WITH THE POTENTIAL FOR OCCURRENCE (continued)

Species	Status	Habitat	Occurrence/Comments*
Friged myotis *Eumops perotis californicus*	CSC, MHCP	Woodlands, rocky habitat, arid and semiarid lowlands, cliffs, crevices, buildings, tree hollows.	Low to moderate potential to occur onsite due to habitat. Not historically observed in the area.
Long legged myotis *Myotis volans*	CSC, MHCP	Woodlands, rocky habitat, arid and semiarid lowlands, cliffs, crevices, buildings, tree hollows.	Low to moderate potential to occur onsite due to habitat. Not historically observed in the area.
Big free-tailed bat *Nyctinomops macrotis*	CSC, MHCP	Woodlands, rocky habitat, arid and semiarid lowlands, cliffs, crevices, buildings, tree hollows.	Low to moderate potential to occur onsite due to habitat. Not historically observed in the area.
Pocketed free-tailed bat *Nyctinomops femorosacca*	CSC, MHCP	Woodlands, rocky habitat, arid and semiarid lowlands, cliffs, crevices, buildings, tree hollows.	Low to moderate potential to occur onsite due to habitat. Not historically observed in the area.
Californai leaf nosed bat *Macrotus californicus*	CSC, MHCP	Woodlands, rocky habitat, arid and semiarid lowlands, cliffs, crevices, buildings, tree hollows.	Low to moderate potential to occur onsite due to habitat. Not historically observed in the area.
Mountain lion *Felis concolor*	CSC, MHCP	Grassland, agricultural land, coastal sage, chaparral. Declining resident.	Low to moderate potential to occur onsite due to habitat. Not historically observed in the area.
Southern Mule Deer *Odocolleus hemionus*	CSC, MHCP	Grassland, agricultural land, coastal sage, chaparral. Declining resident.	Low to moderate potential to occur onsite due to habitat. Not historically observed in the area.
San Diego black-tailed jackrabbit *Lepus californicus bennettii*	CSC, MHCP	Open areas of scrub, grasslands, agricultural fields.	Low to moderate potential to occur onsite due to habitat. Not historically observed in the area.
Dulzura California pocket mouse *Chaetodipus californicus femoralis*	CSC, MHCP	San Diego County west of mountains in sparse, disturbed coastal sage scrub or grasslands with sandy soils.	No appropriate habitat, out of range, no potential to occur onsite.
Northwestern San Diego pocket mouse *Chaetodipus fallax fallax*	CSC, MHCP	San Diego County west of mountains in sparse, disturbed coastal sage scrub or grasslands with sandy soils.	No appropriate habitat, out of range, no potential to occur onsite.

SENSITIVE WILDLIFE SPECIES
OBSERVED (∞) OR WITH THE POTENTIAL FOR OCCURRENCE
(continued)

Species	Status	Habitat	Occurrence/Comments*
Stephen's kangaroo rat *Dipodomys stephensi*	CSC, MHCP	Sparse perennial plant cover is preferred (Thomas 1975). Burrows may be excavated in firm soil that is "neither extremely hard nor sandy" (Lackey 1967a)	No appropriate habitat, out of range, no potential to occur onsite.
San Diego desert woodrat *Neotoma lepida intermedia*	CSC	Coastal sage scrub and chaparral.	Low potential to occur onsite.
Southern grasshopper mouse *Onychomys torridus ramona*	FE, CSC, MHCP	Grasslands and sparse coastal sage scrub.	No appropriate habitat, out of range, no potential to occur onsite.
Los Angeles little pocket mouse *Perognathus longimembris brevinasus*	FE, CSC, MHCP	Fine, sandy soils, typically in arid grassland or coastal sage scrub habitats.	No appropriate habitat, out of range, no potential to occur onsite.
Pacific little pocket mouse *Perognathus longimembris pacificus*	FE, CSC, MHCP	Open coastal sage scrub; fine, alluvial sands near ocean.	No appropriate habitat, out of range, no potential to occur onsite.
American badger *Taxidea taxus*	MHCP	Dry, open grasslands, fields, and pastures.	No appropriate habitat, no potential to occur onsite.

Status Codes

Listed/Proposed
FE = Listed as endangered by the federal government
FT = Listed as threatened by the federal government
SE = Listed as endangered by the state of California

Other
BEPA = Bald and Golden Eagle Protection Act
CFP = California fully protected species
CSC = California Department of Fish and Game species of special concern
FC = Federal candidate for listing (taxa for which the U.S. Fish and Wildlife Service has on file sufficient information on biological vulnerability and threat(s) to support proposals to list as endangered or threatened; development and publication of proposed rules for these taxa are anticipated)
FSS = Federal (Bureau of Land Management and U.S. Forest Service) sensitive species
MHCP = Multiple Habitat Conservation Program target species list

SENSITIVE WILDLIFE SPECIES
OBSERVED (∞) OR WITH THE POTENTIAL FOR OCCURRENCE
(continued)

* = Taxa listed with an asterisk fall into one or more of the following categories:

- Taxa considered endangered or rare under Section 15380(d) of CEQA guidelines
- Taxa that are biologically rare, very restricted in distribution, or declining throughout their range
- Population(s) in California that may be peripheral to the major portion of a taxon’s range, but which are threatened with extirpation within California
- Taxa closely associated with a habitat that is declining in California at an alarming rate (e.g., wetlands, riparian, old growth forests, desert aquatic systems, native grasslands)

Appendix E Sensitivity Codes

APPENDIX E
SENSITIVITY CODES

FEDERAL CANDIDATES AND LISTED PLANTS

FE = Federally listed, endangered
FT = Federally listed, threatened
FPE = Federally proposed endangered
FPT = Federally proposed threatened

STATE LISTED PLANTS

CE = State listed, endangered
CR = State listed, rare
CT = State listed, threatened

CITY MHCP STATUS

NE = Narrow endemic species
CS = MHCP Covered Species List

CALIFORNIA NATIVE PLANT SOCIETY

LISTS

1A = Species presumed extinct.

1B = Species rare, threatened, or endangered in California and elsewhere. These species are eligible for state listing.

2 = Species rare, threatened, or endangered in California but which are more common elsewhere. These species are eligible for state listing.

3 = Species for which more information is needed. Distribution, endangerment, and/or taxonomic information is needed.

4 = A watch list of species of limited distribution. These species need to be monitored for changes in the status of their populations.

R-E-D CODES

R (Rarity)

1 = Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time.

2 = Occurrence confined to several populations or to one extended population.

3 = Occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported.

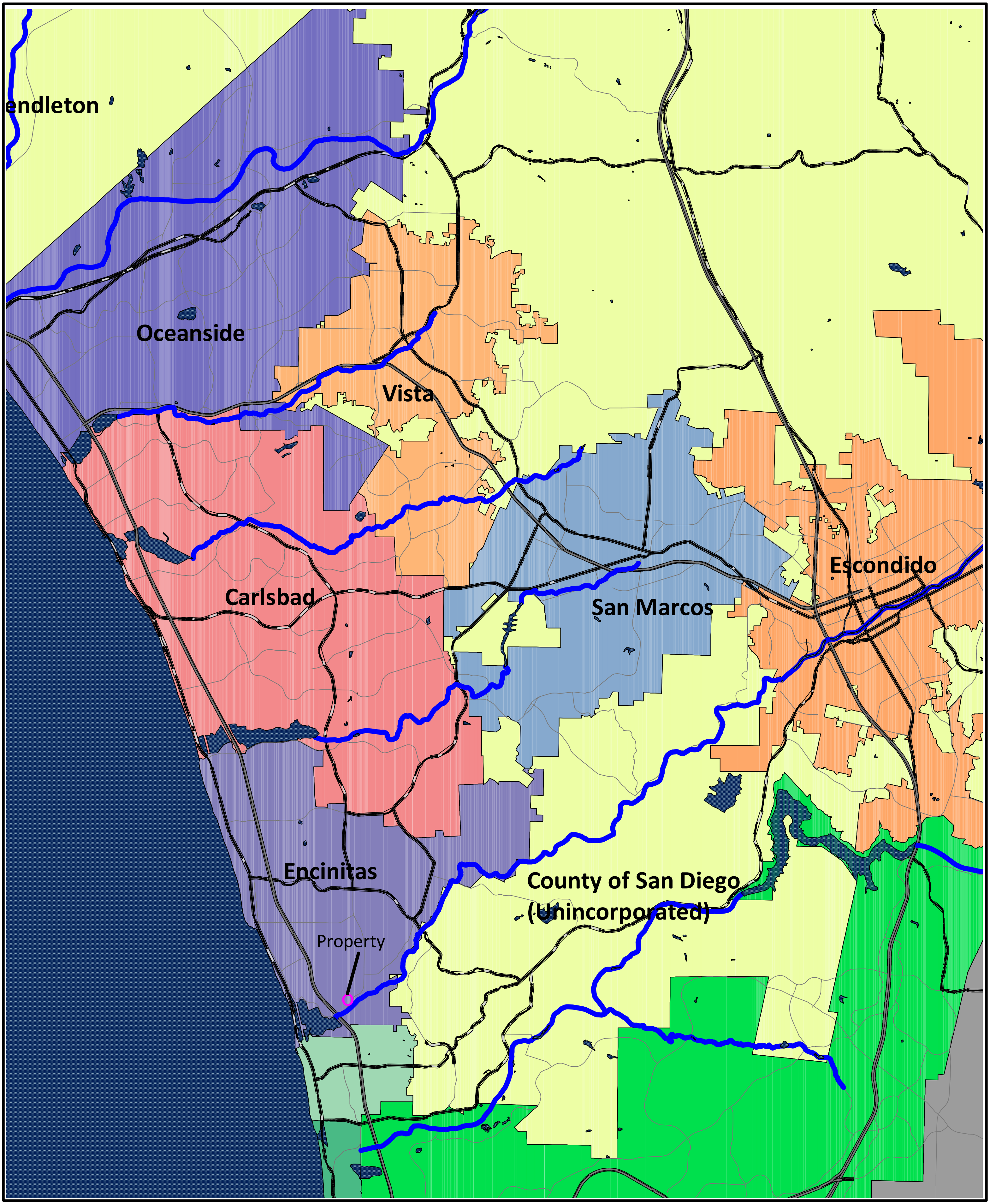
E (Endangerment)

1 = Not endangered
2 = Endangered in a portion of its range
3 = Endangered throughout its range

D (Distribution)

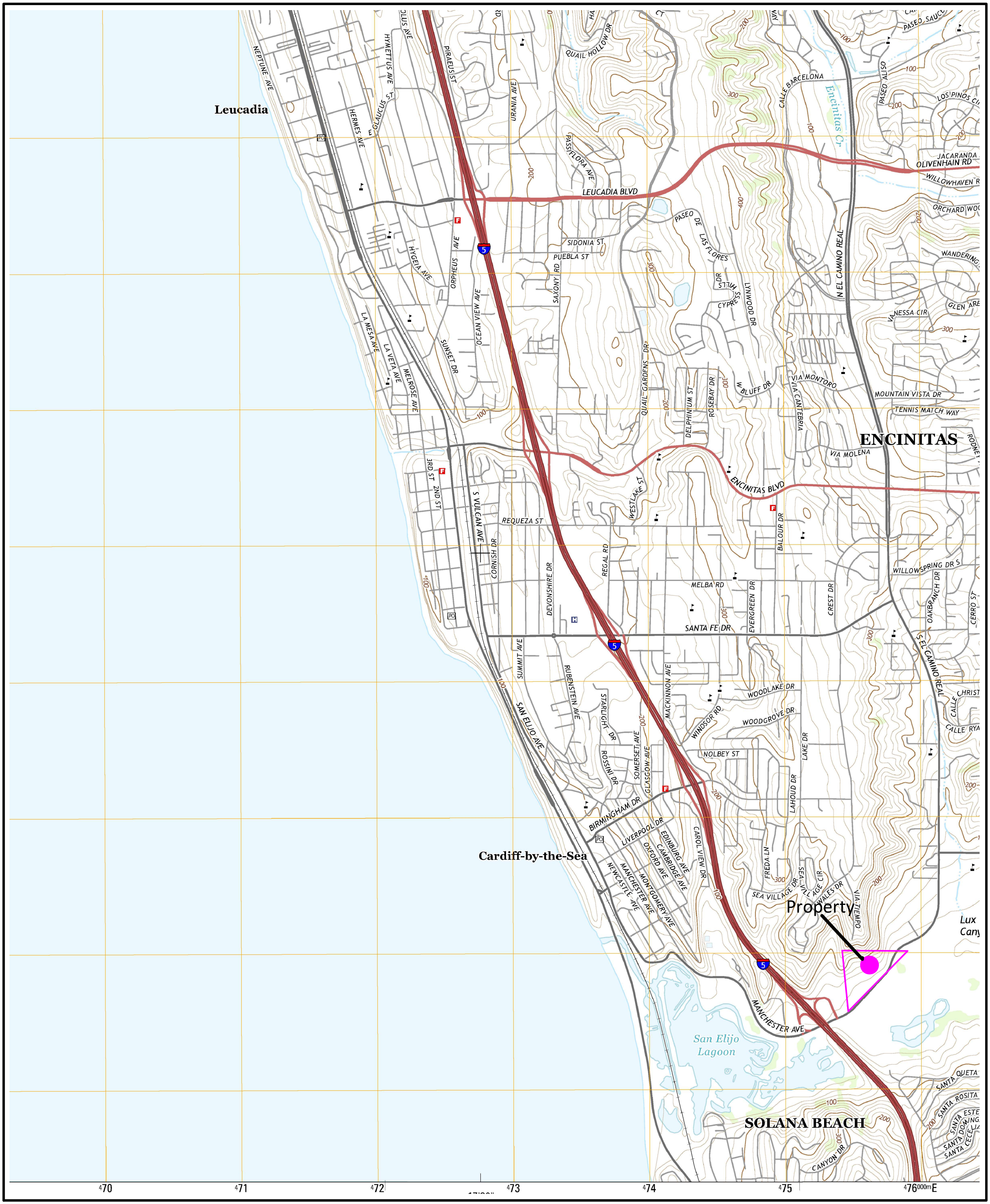
1 = More or less widespread outside California
2 = Rare outside California
3 = Endemic to California

Appendix F Figures 1-7



○ Encinitas 45 Property

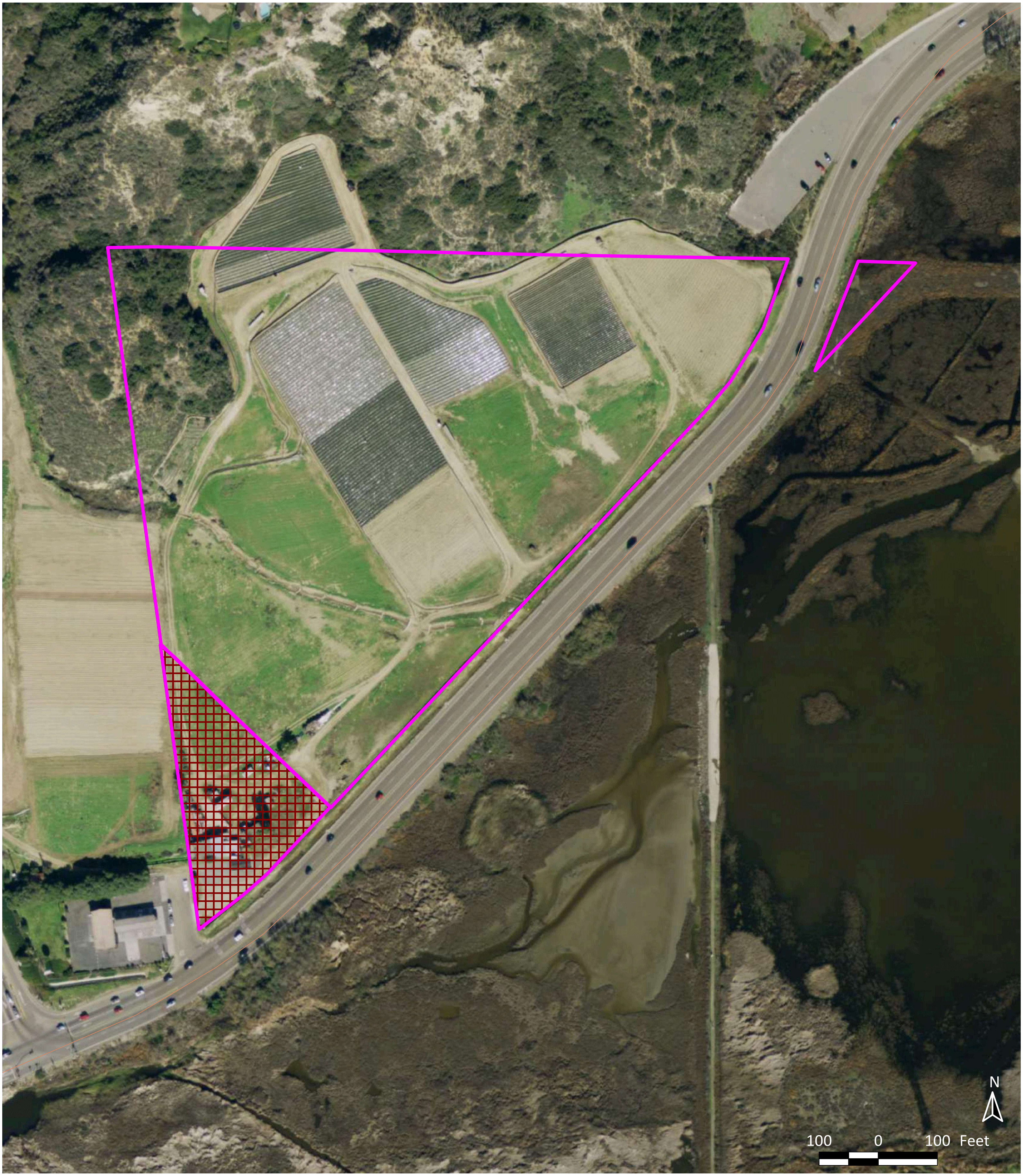
FIGURE 1
Regional Project
Location



● Property

FIGURE 2

USGS Topo Project Location



☐ Property

▦ Caltrans - Eminent domain; Park N Ride

FIGURE 3
Property Aerial

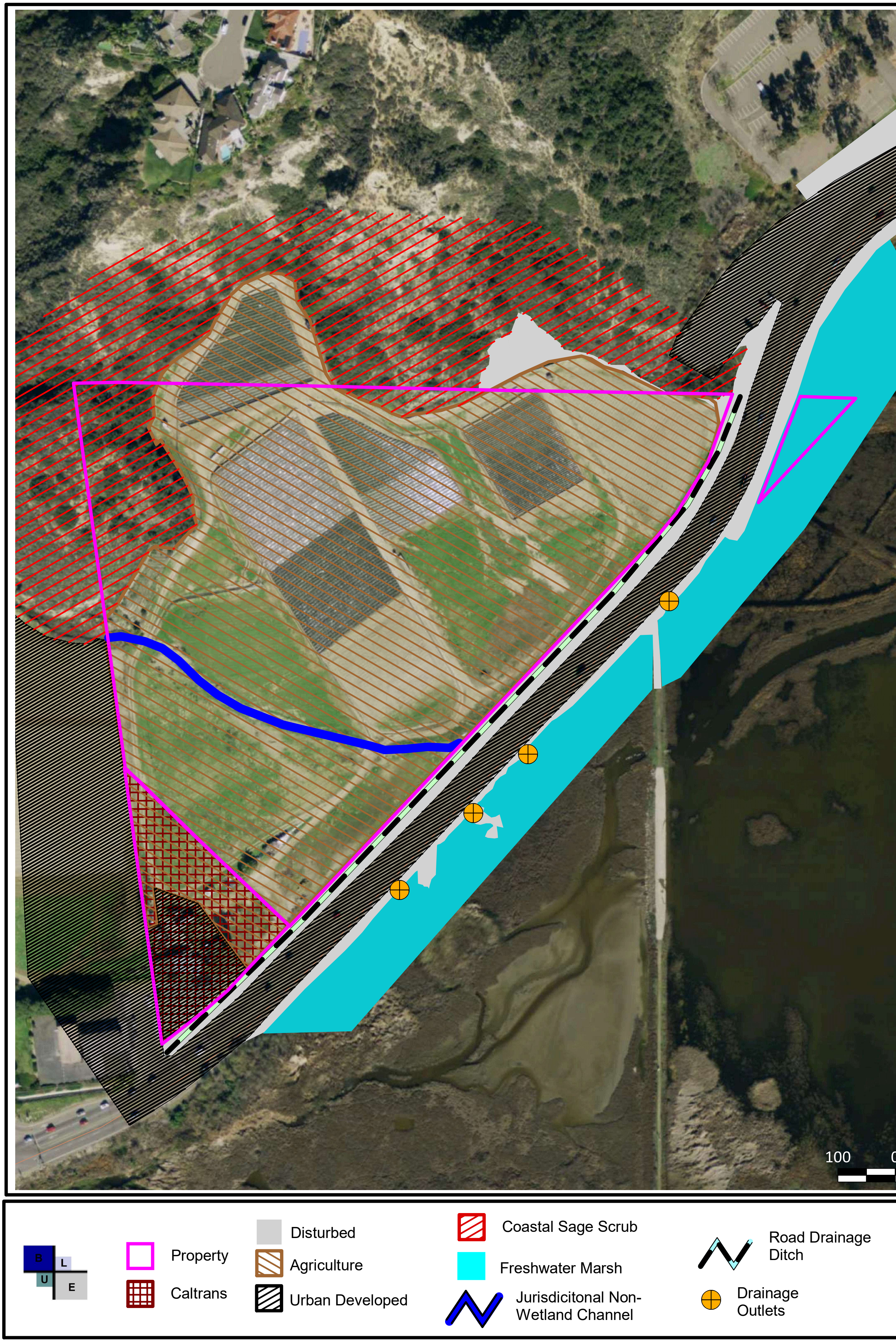


FIGURE 4
Vegetation Map

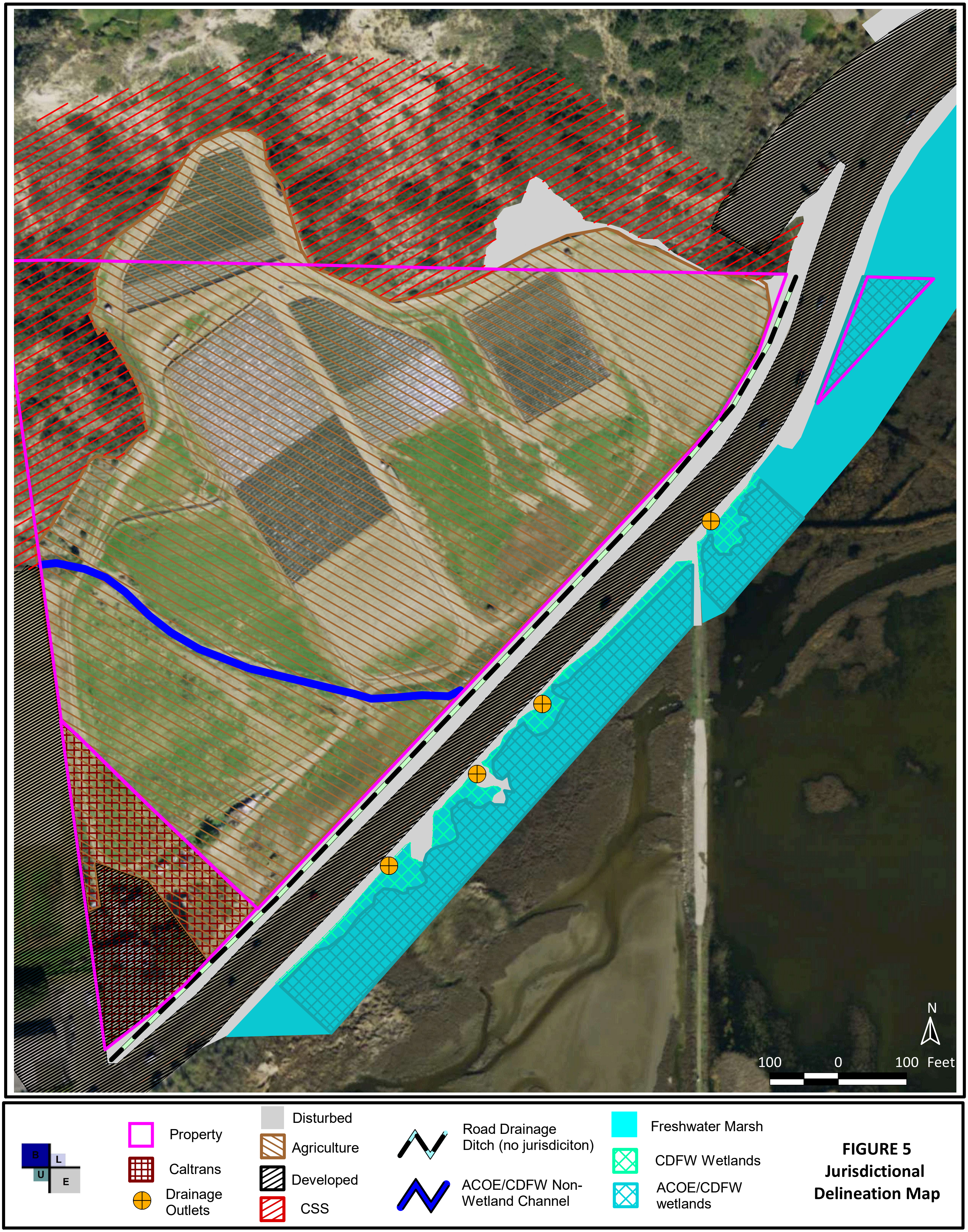
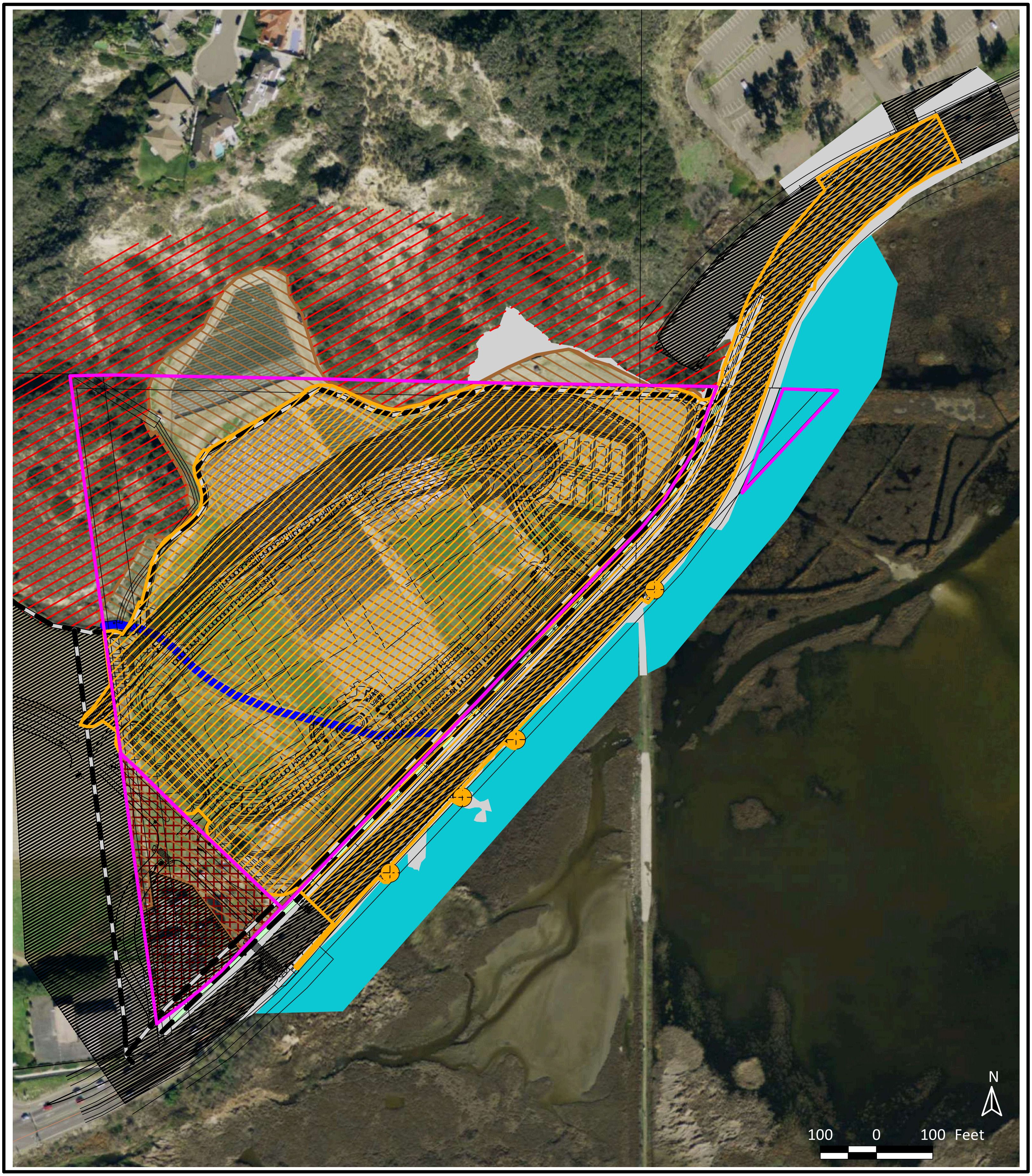


FIGURE 5
Jurisdictional Delineation Map

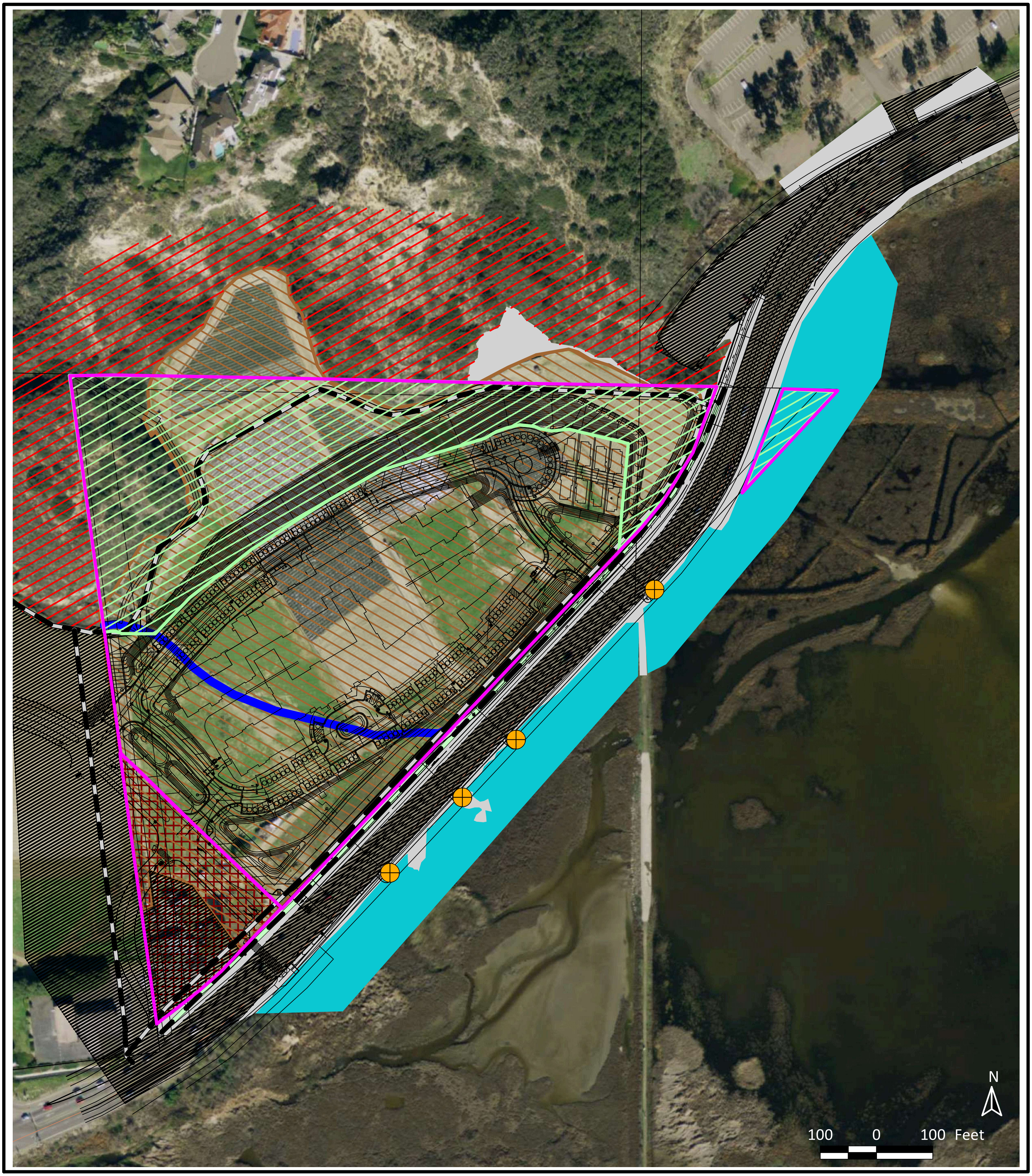


- ▢ Property
- ▦ Caltrans
- ▨ Grading Footprint
- ⊕ Drainage Outlets
- Road Drainage Ditch (no jurisdiciton)
- ACOE/CDFW Non-Wetland Channel
- ■ Freshwater Marsh
- ☒ CDFW Wetlands
- ☒ ACOE/CDFW wetlands

FIGURE 6
Project Impact Map

- ▢ Property
- ▦ Caltrans
- ▨ Grading Footprint
- ⊕ Drainage Outlets
- Road Drainage Ditch (no jurisdiciton)
- ACOE/CDFW Non-Wetland Channel
- ■ Marsh Habitat
- ⊠ ACOE/CDFW Wetlands
- ⊠ CDFW Wetlands

FIGURE 6a
Project Impact Map
(Drainage Improvements)



☐ Property

▦ Caltrans

🟦 Freshwater Marsh

▨ Coastal Sage Scrub

▨ Open Space

**FIGURE 7
Preserved Habitat
OS Map**

Appendix G RECON offsite Wetland Delineation

Jurisdictional Waters/ Wetland Delineation Report for the Encinitas Senior Housing Project, Encinitas, California

Prepared for
Greystar
444 South Cedros Avenue, Suite 172
Solana Beach, CA 92075
Contact: Mr. Beau Brand

Prepared by
RECON Environmental, Inc.
1927 Fifth Avenue
San Diego, CA 92101
P 619.308.9333

RECON Number 9525
August 21, 2019

Andrew Smisek, Biologist

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FIGURES

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TABLES

ATTACHMENTS

Acronyms and Abbreviations

CDFW	California Department Fish and Wildlife
FAC	Facultative
FACU	Facultative-Upland
FACW	Facultative-Wetland
NI	No Indicator
OBL	Obligate
OHWM	Ordinary High Water Mark
project	Encinitas Senior Housing Project
RWQCB	Regional Water Quality Control Board
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey

Summary of Findings

RECON Environmental, Inc. conducted a routine jurisdictional waters/wetland delineation in the 2.73-acre Encinitas Senior Housing Project (project) off-site survey areas on August 6, 2019. The methods for delineating wetlands adhered to the guidelines set forth by the U.S. Army Corps of Engineers (USACE) in the 1987 *Corps of Engineers Wetlands Delineation Manual* (USACE 1987), the 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008), and *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008).

A total of 0.021 acre and 142 linear feet of non-wetland waters of the U.S., and a total of 0.965 acres of wetland waters of the U.S. were delineated on-site.

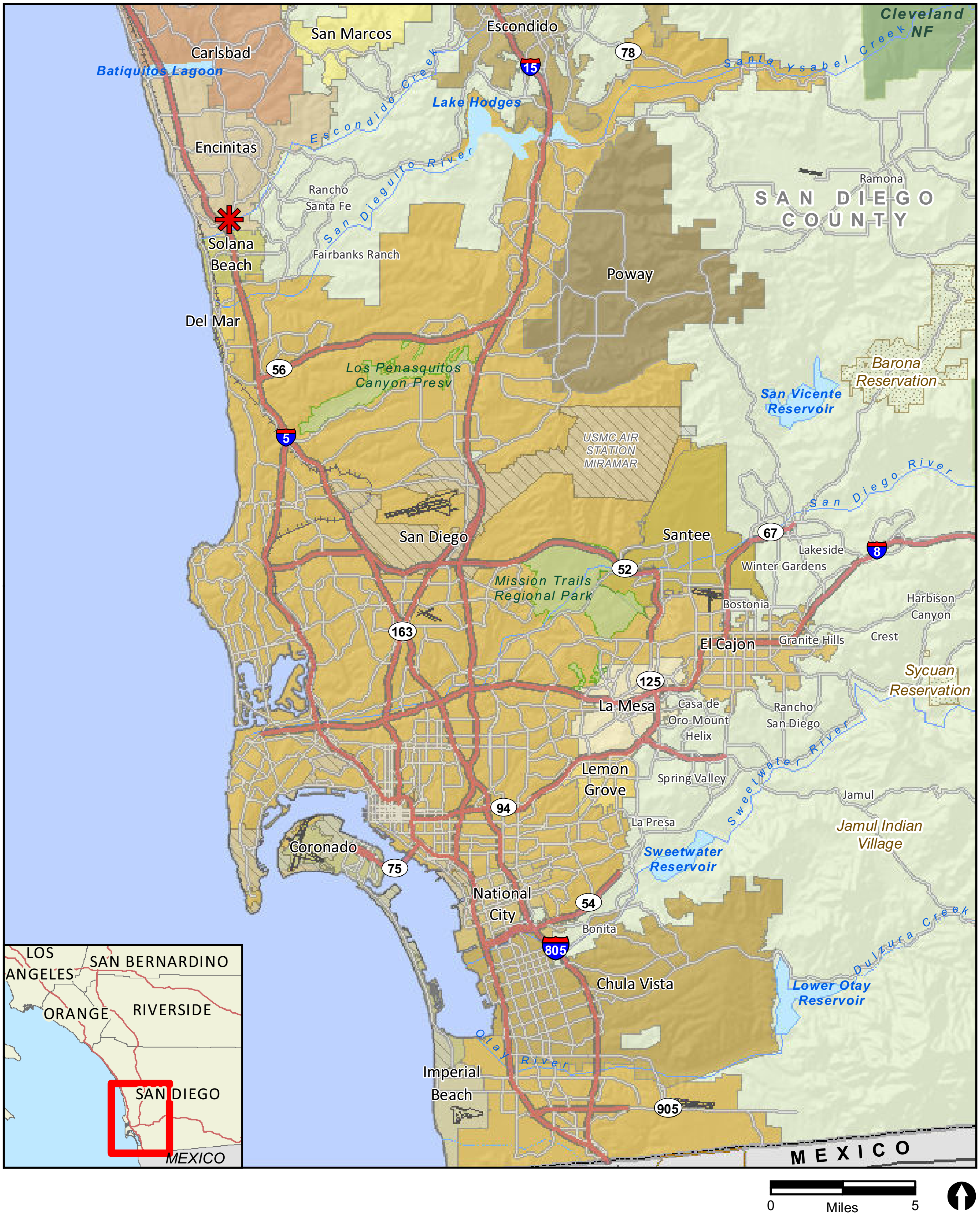
The California Department of Fish and Wildlife (CDFW) jurisdictional areas (waters of the state) consist of 1.275 acres of wetland waters of the state and 0.021 acre and 142 linear feet of streambed.

Regional Water Quality Control Board (RWQCB) jurisdictional areas total 1.275 acres of wetland waters of the state and 0.021 acre and 142 linear feet of non-wetland waters of the state.

1.0 Introduction

This report describes the results of a jurisdictional waters/wetland delineation conducted for the Encinitas Senior Housing Project (project). The project site is located at 3111 Manchester Avenue, Encinitas, California 92007 (Figure 1). The project would consist of the development of an approximately 19.03-acre property located north of Manchester Avenue that is currently utilized primarily as agricultural fields. In addition to this proposed development, the project would include improvements to four existing culverts that convey stormwater from the north side of Manchester Avenue to the south side. The focus of this report is the off-site project areas associated with the proposed improvements to these four culverts and associated dissipation areas south of Manchester Avenue (Figure 2).

The south side of Manchester Avenue generally contains a manufactured slope leading between two and four feet down from the paved road to the estuarine lowlands of the San Elijo lagoon. The work proposed at each culvert is still in the design phase but would generally include the removal of excess sediment and the installation of a Reinforced Concrete Box or Reinforced Concrete Pipe, a headwall and wingwalls, and rip rap. A small excavator and other small equipment and hand tools would be used during construction, accessing each culvert from the Manchester Avenue right-of-way. The four culverts are shown on the U.S. Geological Survey (USGS) 7.5-minute topographic map series, Encinitas quadrangle, Township 13 South, Range 4 West (Figure 3; USGS 1997).



✱ Project Location

RECON

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FIGURE 1
Regional Location

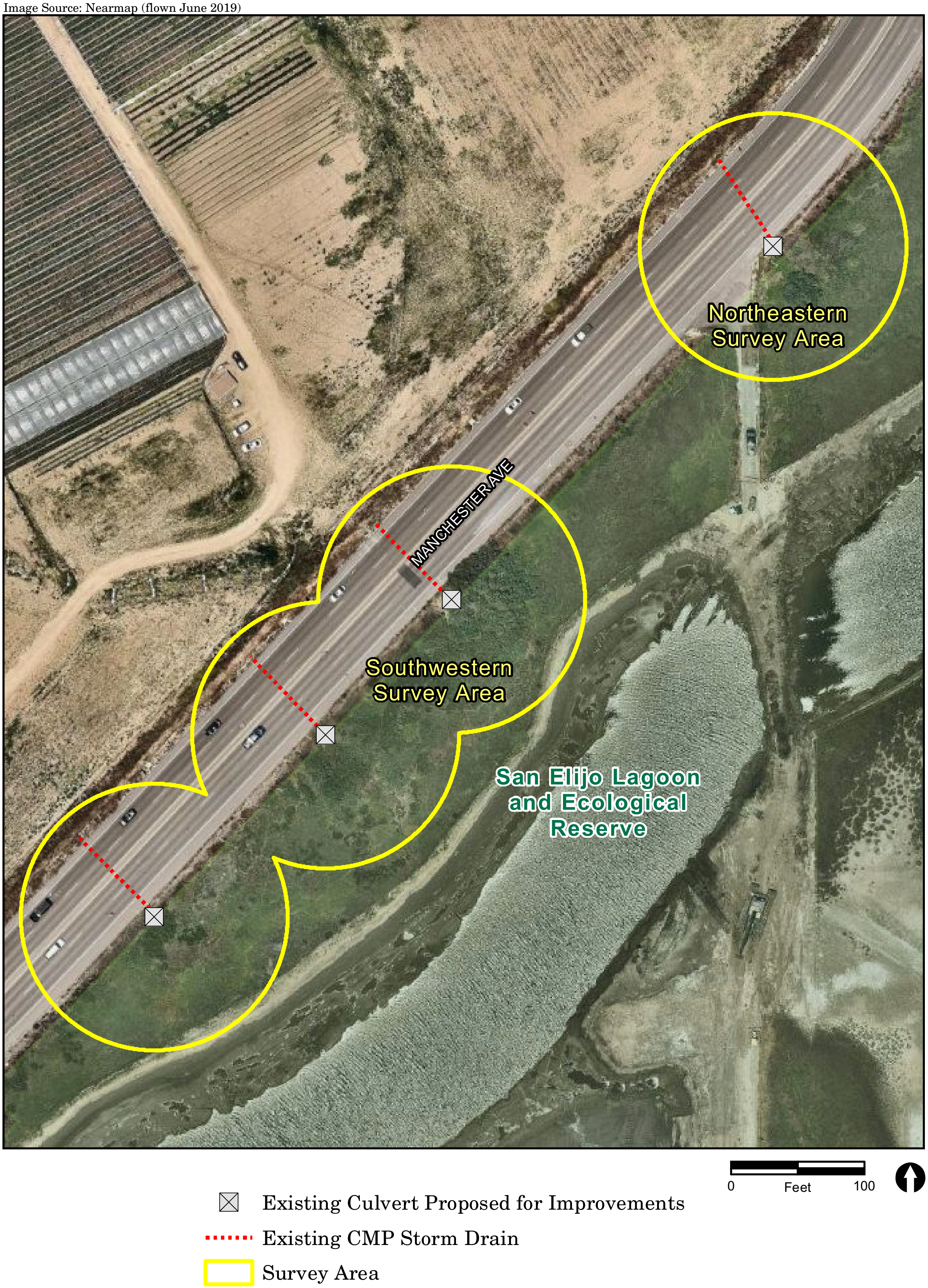

Image Source: Nearmap (flown June 2019)

FIGURE 2
Project Location on Aerial Photograph

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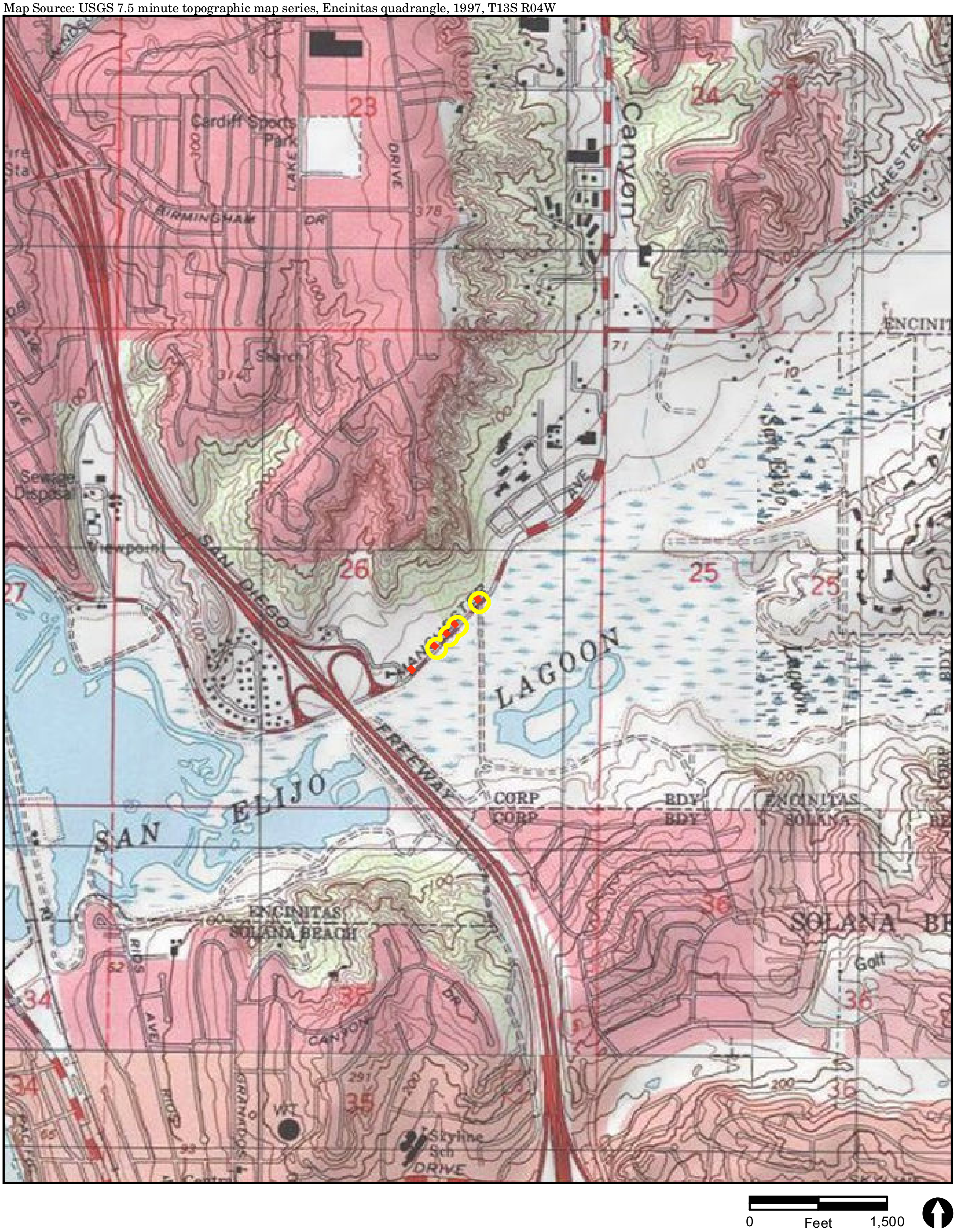
Map Source: USGS 7.5 minute topographic map series, Encinitas quadrangle, 1997, T13S R04W



🟥 Existing CMP Storm Drain

☐ Survey Area

FIGURE 3
Project Location on USGS Map

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2.0 Methods and Jurisdictions

A routine jurisdictional waters/wetland delineation, following the guidelines set forth by USACE (1987 and 2008), was performed to gather field data at locations with potential jurisdictional waters in the project survey areas. The survey areas for this study comprise the four culvert locations south of Manchester Avenue that are proposed to undergo improvements as part of this project, and a 100-foot buffer on each. Including the buffer creates two distinct survey areas the Northeastern Survey Area and the Southwestern Survey Area (see Figure 2). RECON biologist Andrew Smisek conducted the routine delineation fieldwork within the survey areas on August 6, 2019. Prior to conducting the delineation, aerial photographs, USGS topographic maps of the site, U.S. Department of Agriculture (USDA) soil maps of the site, and the U.S. Fish and Wildlife Service National Wetland Inventory were examined. Once on-site, the potential federal and state jurisdictional areas were examined to determine the presence and extent of any jurisdictional waters. A jurisdictional waters/wetland delineation was conducted by BLUE Consulting Group biologist Michael Jefferson on October 17, 2017 within the main project site (north of Manchester Avenue). The results of that delineation are reported in the biological assessment letter report prepared by Mr. Jefferson for this project, dated May 9, 2019.

2.1 USACE Methods and Waters of the U.S.

In accordance with Section 404 of the Clean Water Act, USACE regulates the discharge of dredged or fill material into waters of the U.S. Within southwestern U.S., both wetland and non-wetland waters are delineated in accordance with the 2008 Arid West Regional Supplement (USACE 2008). Mr. Smisek covered the survey areas on foot and inspected those areas exhibiting characteristics of potential jurisdictional waters or wetlands, including the presence of hydrophytic vegetation and any areas with the potential to pond or concentrate a substantial amount water. These methods are described in detail below.

2.1.1 Wetland Waters of the U.S.

Wetland waters of the U.S. were delineated using three parameters: hydrophytic vegetation, hydric soils, and wetland hydrology. According to USACE, indicators for all three parameters must be present to qualify an area as a wetland. The definition of a wetland includes the phrase “under normal circumstances,” because there are situations in which the vegetation of a wetland has been removed or altered as a result of a recent natural event or human activities (USACE 1987).

2.1.1.1 Hydrophytic Vegetation

Vegetation communities comprising partially or entirely hydrophytic plant species were examined, and data for each vegetation stratum (i.e., tree, shrub, herb, and vine) were recorded on the datasheet provided in the 2008 Arid West Regional Supplement (USACE

2008). The percent absolute cover of each species present was visually estimated and recorded.

First, the wetland indicator status of each species recorded within a vegetation community was determined by using the National Wetland Plant List (Lichvar et al. 2016). Dominant species with an indicator status of NI (No Indicator) or not listed in the 2016 National Wetland Plant List were evaluated as either wetland or upland indicator species based on local professional knowledge of where the species are most often observed in habitats that are characteristic in southern California.

The dominance test was then used to determine which vegetation community qualified as hydrophytic vegetation at each site. In situations where a site failed the dominance test but contained positive indicators of hydric soils and/or wetland hydrology, the prevalence index was used. The presence or absence of morphological adaptations was noted; however, none of the sampled wetland areas required an analysis of morphological adaptations to determine if the vegetation was hydrophytic.

2.1.1.2 Hydric Soils

Sample points were selected within potential wetland areas and where the apparent boundary between wetland and upland was inferred based on changes in the composition of the vegetation and topography. Soil pits were dug to a depth of at least 18 inches or to a depth necessary to determine soil color, evidence of soil saturation, depth to groundwater, and indicators of a reducing soil environment (e.g., mottling, gleying, or hydrogen sulfide odor). A Munsell Soil-Color Book (2009) was used to determine soil colors. The 2008 Arid West Regional Supplement (USACE 2008) and the Field Indicators of Hydric Soils in the United States guide (USDA 2017) were used to determine the presence of hydric soil indicators.

2.1.1.3 Wetland Hydrology

Hydrologic information for the site was obtained by reviewing USGS topographic maps and by directly observing hydrology indicators in the field. All portions of any potentially occurring wetlands or non-wetland waters within the survey areas were inspected for signs of hydrology as defined in the 2008 Arid West Regional Supplement (USACE 2008). The location of any water conveyance structures, such as culverts, that may influence the hydrology of any potentially jurisdictional resource were recorded and considered when making a hydrology determination.

2.1.2 Non-wetland Waters of the U.S.

Some areas delineated as non-wetland waters of the U.S. may lack wetland vegetation or hydric soil characteristics. Hydric soil indicators may be missing, because topographic position precludes ponding and subsequent development of hydric soils. Absence of wetland vegetation can result from frequent scouring due to rapid water flow. These types of jurisdictional waters are delineated by the lateral and upstream/downstream extent of the

OHWM of the particular drainage or depression, which is identified by the presence of hydrogeomorphic OHWM indicators.

2.2 CDFW Methods and Waters of the State

Under sections 1600–1607 of the California Fish and Game Code, the CDFW regulates activities that would divert or obstruct the natural flow or would substantially change the bed, channel, or bank of any river, stream, or lake that supports fish or wildlife. The CDFW has jurisdiction over riparian habitats that support hydrophytic vegetation associated with watercourses. The locations of hydrophytic vegetation and jurisdictional waters within the survey areas were determined using the methods described in Section 2.1, above. Waters of the state under CDFW jurisdiction were delineated at the outer edge of hydrophytic vegetation or at the top of bank, whichever is wider.

2.3 RWQCB Methods and Waters of the State

The RWQCB is the regional agency responsible for protecting water quality in California. The jurisdiction of this agency includes all waters of the state and all waters of the United States as mandated by Section 401 in the Clean Water Act and the California Porter-Cologne Water Quality Control Act. State waters under RWQCB jurisdiction are all waters that meet one of three criteria–hydrology, hydric soils, or wetland vegetation–and generally include, but are not limited to, all wetland and non-wetland waters under the jurisdiction of USACE. The presence and locations of hydrology, hydric soils, and wetland vegetation within the survey areas were determined using the methods described in Section 2.1, above.

3.0 Results of Field Data

The hydrophytic vegetation units, soil types, and hydrology observed in the survey areas are discussed below. The Wetland Determination Forms completed for each sample point are included as Attachment 1.

3.1 Vegetation

The following ten vegetation communities or land cover types were mapped within the survey areas: south coastal salt marsh, coastal brackish marsh, herbaceous wetland, southern willow scrub, mule fat scrub, coastal scrub, intertidal estuary, Diegan coastal sage scrub, disturbed habitat, and urban/developed land (Figure 4). These vegetation communities and land cover types, along with their corresponding Holland/Oberbauer code and acreage within the survey areas, are summarized in Table 1 below. A brief description of each community, including the dominant plant species observed, is also provided below.

Image Source: Nearmap (flown June 2019)

FIGURE 4
Existing Biological Resources

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Table 1
Vegetation Communities/Land Cover Types within the Survey Areas

Community or Type (Holland/Oberbauer Code)	Acres
south coastal salt marsh (52120)	0.806
coastal brackish marsh (52200)	0.042
herbaceous wetland (52510)	0.017
southern willow scrub (63320)	0.072
mule fat scrub (63310)	0.109
coastal scrub (32000)	0.228
intertidal estuary (64132)	0.021
Diegan coastal sage scrub (32500)	0.032
Disturbed habitat (11300)	0.365
Urban/developed land (12000)	1.038
Total	**2.730**

3.1.1 Areas with Hydrophytic Vegetation

The following six vegetation communities within the project area contain hydrophytic vegetation: south coastal salt marsh, coastal brackish marsh, herbaceous wetland, southern willow scrub, mule fat scrub, and coastal scrub.

South coastal salt marsh occurs within the majority of the survey areas southeast of the road (see Figure 4). It generally occurs within the low flat portions of the lagoon and extends as a large expanse throughout the lagoon outside the survey areas. The south coastal salt marsh areas are dominated by alkali heath (*Frankenia salina*; Facultative-Wetland [FACW]) and salty susan (*Jaumea carnosa*; Obligate [OBL]), which tend to separately dominate different portions of this vegetation community (Photograph 1). Other commonly occurring species include salt grass (*Distichlis spicata*; Facultative [FAC]), glasswort (*Arthrocnemum subterminale*; FACW), coastal goldenbush (*Isocoma menziesii*; FAC), and large-flower salt marsh dodder (*Cuscuta pacifica* var. *pacifica*; NI).

Coastal brackish marsh occurs as a small patch Northeastern Survey Area, generally occurring near the road (see Figure 4). This habitat consists of a dense stand of common tule (*Schoenoplectus acutus* var. *occidentalis*; OBL) with occasional great marsh evening-primrose (*Oenothera elata*; FACW) and coastal goldenbush.

Herbaceous wetland occurs as a small patch around the outfall of the existing culvert in the Northeastern Survey Area (see Figure 4). This patch is dominated by great marsh evening-primrose, which has a vegetation cover of approximately 50 percent here (Photograph 2).

Southern willow scrub occurs as two small patches, one in the central portion of the Northeastern Survey Area, just south of the herbaceous wetland described above, and the other in the northeastern portion of the Southwestern Survey Area, just northeast of an existing culvert outfall (see Figure 4). Both patches are dominated by mature arroyo willow (*Salix lasiolepis*; FACW). The patch in the Northeastern Survey Area is comprised of just

PHOTOGRAPH 1

View of South Coastal Salt Marsh, Facing Northeast

PHOTOGRAPH 2

View of Herbaceous Wetland, Facing Northwest

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one arroyo willow, with horseweed (*Erigeron canadensis*; FACU) and great marsh evening-primrose in the understory. Aside from being dominated by arroyo willow, the patch of southern willow scrub in the Southwestern Survey Area also contains scattered mule fat (*Baccharis salicifolia*; FAC; Photograph 3).

Mule fat scrub occurs as three patches in Southwestern Survey Area, generally occurring adjacent to the outfalls of the existing culverts (see Figure 4). All three patches of this vegetation community are dominated by mule fat (Photograph 4), with the two northeastern patches containing substantial vegetation cover of arroyo willow. The understory of the three mule fat scrub patches is sparse with occasional herbaceous species, such as western ragweed (*Ambrosia psilostachya*; FACU) and great marsh evening-primrose.

Coastal scrub occurs as patches interspersed within the Southwestern Survey Area, generally between the existing culvert outfalls and on slightly sloped areas between the disturbed habitat along the road and the expanses of southern coastal salt marsh (see Figure 4). These coastal scrub areas are dominated by coastal goldenbush and contain a variety of herbaceous species in the understory, including alkali heath and western ragweed (Photograph 5). They appear to occur along the transition between the upland habitats along the slope of the road and the lowlands within the lagoon.

3.1.2 Areas Lacking Hydrophytic Vegetation

Vegetation communities or land cover types within the project area that lack hydrophytic vegetation include areas mapped as intertidal estuary, Diegan coastal sage scrub, disturbed habitat, and urban/developed land. The small patch of Diegan coastal sage scrub is dominated by California buckwheat (*Eriogonum fasciculatum*; NI). Intertidal estuary was mapped within the unvegetated portions of the San Elijo Lagoon, which occurs in the eastern and southeastern portions of the Southwestern Survey Area (see Figure 4). Disturbed habitat was mapped mostly along the edge of the road and the top of the slope leading down from the road. These areas were dominated by a combination of native and non-native herbaceous species, such as horseweed, short-pod mustard (*Hirschfeldia incana*; NI), telegraph weed (*Heterotheca grandiflora*; NI), and occasional great marsh evening-primrose. The small portion of disturbed habitat in the central portion of the Southwestern Survey Area is dominated by freeway iceplant (*Carpobrotus edulis*; NI) and western ragweed and occurs on a small terrace extending southeast of the outfall of an existing culvert. The areas mapped as urban/developed areas include the paved roadway of Manchester Avenue (see Figure 4).

3.2 Soils

Information on the soil types occurring in the survey areas is summarized from the Soil Survey for San Diego County (USDA 1973) and the Hydric Soils of California list (hydric soil list) obtained from the Natural Resource Conservation Service (2015).

PHOTOGRAPH 3
View of Southern Willow Scrub, Facing Southwest

PHOTOGRAPH 4
View of Mule Fat Scrub, Facing Southwest

PHOTOGRAPH 5
View of Coastal Scrub, Facing East

Soil types mapped within the survey areas are shown on Figure 5 and include Corralitos loamy sand, 5 to 9 percent slopes; Lagoons of San Diego Area; and Tidal flats. Lagoons of San Diego Area and Tidal flats are both listed as hydric soils in San Diego County.

Hydric soil indicators were observed at Sample Points 3, 5, 6, 9, 10, and 11 (see Figure 4). Redox dark surface was observed at Sample Point 3, depleted matrix with redox concentrations was observed at Sample Point 5, and sandy redox was observed at Sample Points 6, 9, 10, and 11. No hydric soil indicators were observed at Sample Points 1, 4, 7, 8, or 13. Although some redox features were observed at Sample Points 2 and 12, these features occurred in a layer at least 10 inches below the soil surface. Due to the depth of these features, hydric soil indicator criteria were not met at these sample points.

3.3 Hydrology

Within the survey areas, hydrology indicators were met at Sample Points 3, 5, 6, 9, 10, and 11 (see Figure 4). The same indicator, surface soil cracks, was observed at all six of these sample points. These sample points all occur in the lowland areas within the lagoon, below the sloped areas associated with the elevated road and small alluviums associated with the outfalls of the existing culverts. The areas observed as having soil cracking occur above the intertidal zone of the lagoon; therefore, it is unlikely they are regularly inundated. However, they likely undergo regular saturation due to a combination of tidal influence and concentrated runoff from adjacent uplands. No sample points were taken within the portions of the survey area mapped as intertidal estuary. However, hydrology is assumed to occur in these areas based on the lack of vegetation and inundation observed on aerial imagery. These intertidal estuary areas occur as part of the San Elijo Lagoon, which has connectivity to the Pacific Ocean, a Traditionally Navigable Water.

The mouth of the four culvert outfalls exhibited small areas of hydrology indicators in the form of water staining and/or a small amount of drift deposit debris. However, these hydrology indicators did not extend beyond the mouth of the culverts, covering an area of only approximately 5 to 10 square feet. The indicators did not extend into the adjacent habitats, and therefore were not included in the hydrology section of the sample points in these areas (see Attachment 1). No OHWM indicators were detected beyond the mouths of these culverts; therefore, no active floodplains were observed in the survey areas.

4.0 Location of Jurisdictional Waters

Acreages of jurisdictional waters are provided in Table 2 by jurisdiction and resource type. Figure 6 shows the locations of the jurisdictional waters identified within the survey areas for each agency jurisdiction.

Image Source: Nearmap (flown June 2019)

FIGURE 5

Project Location on Soil Map

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Image Source: Nearmap (flown June 2019)

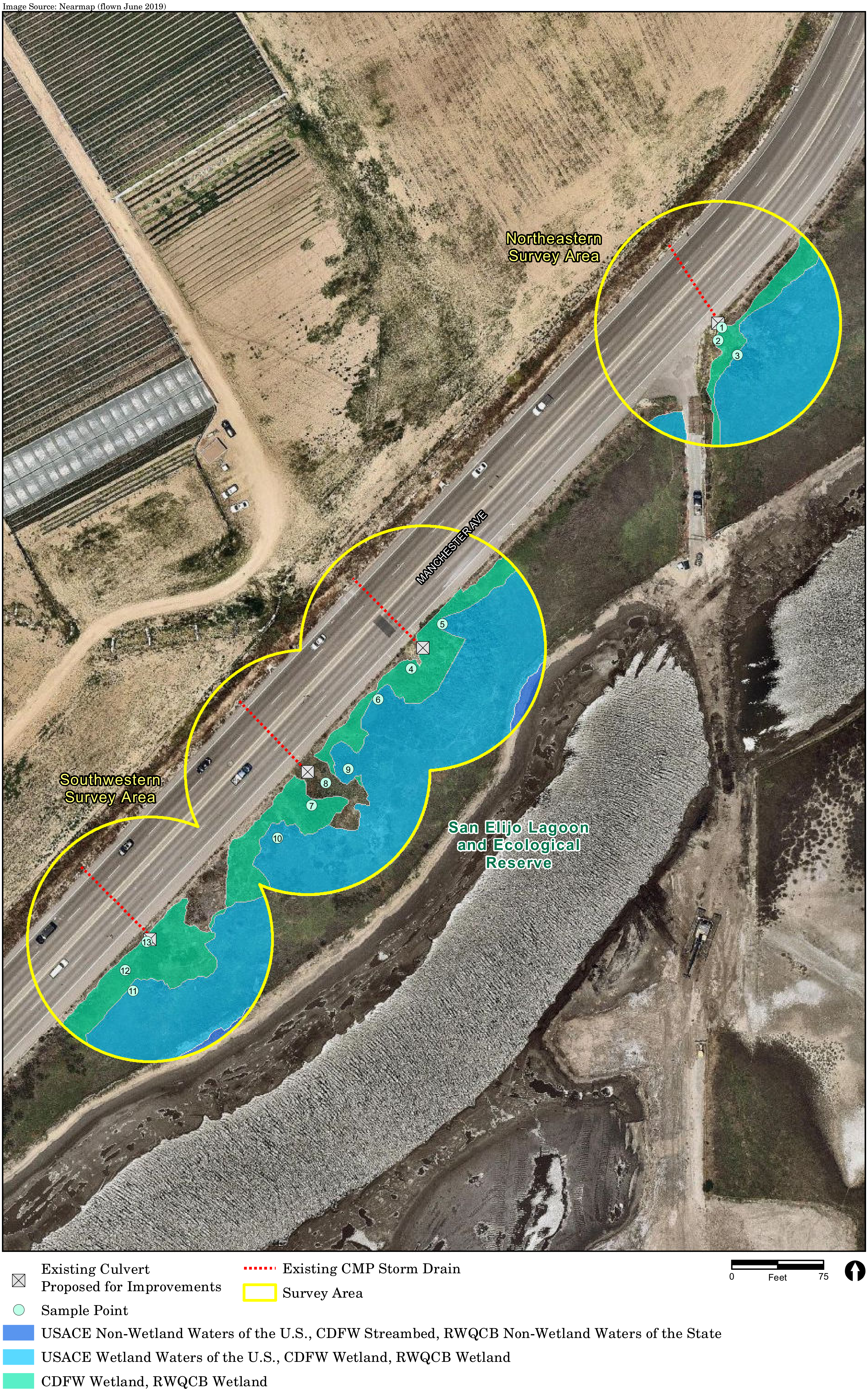

FIGURE 6
Jurisdictional Resources

RECON
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Table 2
Existing Jurisdictional Waters within the Survey Areas

Jurisdictional Areas	Total Acres (linear feet)
USACE Total Jurisdiction	**0.965 (142)**
Wetland Waters of the U.S.	0.944
Non-wetland Waters of the U.S.**	0.021 (142)
CDFW and RWQCB Total Jurisdictional Areas*	**1.296 (142)**
Wetland Waters of the State (Riparian Habitat)	1.275
Non-wetland Waters of the State (Streambed)**	0.021 (142)

*CDFW/RWQCB area of jurisdiction includes all USACE jurisdictional waters.
**Non-wetland waters/streambed area not included in the wetland/riparian areas so that no area is counted twice for the same jurisdiction.

4.1 USACE Waters of the U.S.

A total of 0.021 acre and 142 linear feet of non-wetland waters of the U.S. under the jurisdiction of USACE were delineated within the survey areas (see Figure 6). Jurisdictional non-wetland waters within the survey areas include unvegetated areas mapped as intertidal estuary. These estuary areas occur as part of the San Elijo Lagoon, which has connectivity to the Pacific Ocean, a Traditional Navigable Waterway.

Wetland waters of the U.S. total 0.944 acres on-site (see Figure 6). The wetland areas mostly follow topographic boundaries that generally coincide with changes in vegetation communities, and include areas mapped as south coastal salt marsh, southern willow scrub, and coastal scrub. Six of the sample points taken (Sample Points 3, 5, 6, 9, 10, and 11) each met all three wetland parameters (see Attachment 1).

4.2 CDFW Waters of the State

On-site areas delineated as waters of the state under the jurisdiction of the CDFW (under Fish and Game Code 1600–1607) include streambed and wetland and total 1.296 acres (see Figure 6). CDFW streambed delineated on-site comprises the unvegetated intertidal estuary areas. CDFW streambed on-site totals 0.021 acre and 142 linear feet.

CDFW wetland on-site totals 1.275 acres. This includes all portions of the survey areas mapped as south coastal salt marsh, coastal brackish marsh, herbaceous wetland, southern willow scrub, mule fat scrub, and coastal scrub, which all occur in association with the San Elijo Lagoon (see Figure 6).

4.3 RWQCB Waters of the State

On-site areas delineated as waters of the state under the jurisdiction of the RWQCB (under Clean Water Act Section 401) completely overlap with CDFW jurisdictional areas (see Figure 6) and comprise the 0.021 acre and 142 linear feet of streambed, as well as the 1.275 acres of hydrophytic vegetation mapped as south coastal salt marsh, coastal brackish marsh, herbaceous wetland, southern willow scrub, mule fat scrub, and coastal scrub. The other areas of vegetation on-site did not meet the criteria for hydrophytic vegetation and thus did not meet the wetland standard used by the RWQCB (see Figure 6).

5.0 Regulatory Issues

Due to a no net loss policy implemented by USACE, CDFW, and RWQCB, the first consideration in project planning should be avoidance of jurisdictional waters. USACE, CDFW, and RWQCB jurisdictional waters are regulated by the federal, state, and local governments. All impacts are considered significant and need to be avoided to the greatest extent possible.

Unavoidable impacts to jurisdictional waters may be authorized through permit authorizations from USACE through the Section 404 Permit Program from the CDFW through a 1602 Streambed Alteration Agreement, and from the RWQCB through a 401 State Water Quality Certification. Most utility projects are permitted through an USACE Nationwide Permit track. The CDFW and RWQCB also have a specialized permit track for utility projects. Approved impacts to USACE, CDFW, and RWQCB jurisdictional waters require mitigation through habitat creation and/or enhancement, and/or purchase of credits in a mitigation bank to achieve a no net loss of jurisdictional waters (as determined by a qualified restoration specialist in consultation with the regulatory agencies). In addition, regulatory agencies may require that a buffer be maintained between jurisdictional waters/wetlands and any development.

6.0 References Cited

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United States Geological Survey (USGS)

1997 Encinitas quadrangle, California 7.5-minute topographical map.

ATTACHMENT 1

Wetland Determination Forms

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Encinitas Senior Housing
City/County: Encinitas, CA
Sampling Date: August 6, 2019
Applicant/Owner: Greystar
State: CA
Sampling Point: 1
Investigator(s): Andrew Smisek
Section, Township, Range: Encinitas quadrangle, 1975, T13S, R04W
Landform (hillslope, terrace, etc.): small slope
Local relief (concave, convex, none): none
Slope (%): 20
Subregion (LRR): C - Mediterranean California
Lat: 33.01353769130
Long: -117.25982564400
Datum: WGS84
Soil Map Unit Name: Corralitos loamy sand, 5 to 9 percent slopes
NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ● No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ●
Hydric Soil Present?	Yes ○	No ●
Wetland Hydrology Present?	Yes ○	No ●

Is the Sampled Area within a Wetland? **Yes** ○ **No** ●

Remarks: This sample point occurs along the slope leading down from the road just east of the existing culvert.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Isocoma menziesii*	1	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	1 %		
Herb Stratum			
1. *Erigeron canadensis*	15	Yes	FACU
2. *Hirschfeldia incana*	12	Yes	NI
3. *Oenothera elata*	7	Yes	FACW
4. *Glebionis coronaria*	3	No	NI
5. *Raphinus sativus*	2	No	NI
6. *Heterotheca grandiflora*	1	No	NI
7.			
8.			
Total Cover:	40 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	7	x 2 =	14
FAC species	1	x 3 =	3
FACU species	15	x 4 =	60
UPL species	18	x 5 =	90
Column Totals:	41 (A)		167 (B)

Prevalence Index = B/A = 4.07

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ○ **No** ●

Remarks: Although Oenothera elata occurs along much of this slope along the road, the vegetation here does not meet the hydrophytic standard.

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture[3]	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-16	10YR 3/2	100					loamy sand	very coarse
16-18	10YR 4/3	100					loamy sand	fine sand

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3] Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ●

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):

Water Table Present? Yes ○ No ● Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators observed.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Encinitas Senior Housing City/County: Encinitas, CA Sampling Date: August 6, 2019
Applicant/Owner: Greystar State: CA Sampling Point: 2
Investigator(s): Andrew Smisek Section, Township, Range: Encinitas quadrangle, 1975, T13S, R04W
Landform (hillslope, terrace, etc.): small alluvium Local relief (concave, convex, none): concave Slope (%): 10
Subregion (LRR): C - Mediterranean California Lat: 33.01350833460 Long: -117.25983447500 Datum: WGS84
Soil Map Unit Name: Corralitos loamy sand, 5 to 9 percent slopes NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ● No ○ (If no, explain in Remarks.)
Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○
Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ●	No ○	**Is the Sampled Area within a Wetland?** Yes ○ No ●
Hydric Soil Present?	Yes ○	No ●	
Wetland Hydrology Present?	Yes ○	No ●	

Remarks: This sample point occurs in an area mapped as herbaceous wetland, which occurs adjacent to the outfall of an existing culvert.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Oenothera elata*	50	Yes	FACW
2. *Erigeron canadensis*	5	No	FACU
3. *Raphinus sativus*	3	No	NI
4.			
5.			
6.			
7.			
8.			
Total Cover:	58 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum %   % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply by:	
OBL species		x 1 =	0	
FACW species	50	x 2 =	100	
FAC species		x 3 =	0	
FACU species	5	x 4 =	20	
UPL species	3	x 5 =	15	
Column Totals:	58	(A)	135	(B)

Prevalence Index = B/A = 2.33

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%
☒ Prevalence Index is ≤3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ● No ○

Remarks: Area mapped as herbaceous wetland due to dominance of Oenothera. This area meets the hydrophytic vegetation standard.

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-4	10YR 2/2	100					loamy sand	
4-11	10YR 3/2	100					loamy sand	
11-18	10YR 3/2	95	10YR 4/6	5	C	M	loamy sand	scattered redox features

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3] Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ●

Remarks: Although some redox features were observed in the 11-18 inches layer, the depth of this layer does not meet any hydric soil criteria.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):

Water Table Present? Yes ○ No ● Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? Yes ○ No ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Although this sample point occurs downstream of the outfall of an existing culvert, no hydrology indicators were observed.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Encinitas Senior Housing City/County: Encinitas, CA Sampling Date: August 6, 2019

Applicant/Owner: Greystar State: CA Sampling Point: 3

Investigator(s): Andrew Smisek Section, Township, Range: Encinitas quadrangle, 1975, T13S, R04W

Landform (hillslope, terrace, etc.): lowland Local relief (concave, convex, none): none Slope (%): 3-5

Subregion (LRR): C - Mediterranean California Lat: 33.01347571330 Long: -117.25978273500 Datum: WGS84

Soil Map Unit Name: Corralitos loamy sand, 5 to 9 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ● No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ●	No ○
Hydric Soil Present?	Yes ●	No ○
Wetland Hydrology Present?	Yes ●	No ○

Is the Sampled Area within a Wetland? **Yes** ● **No** ○

Remarks: This sample point occurs under the canopy of an arroyo willow within a low and flat area east of the culvert outfall.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix lasiolepis*	50	Yes	FACW
2.			
3.			
4.			
Total Cover:	50 %		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Erigeron canadensis*	30	Yes	NI
2. *Oenothera elata*	10	Yes	FACW
3. *Frankenia salina*	5	No	FACW
4. *Arthrocnemum subterminale*	1	No	FACW
5.			
6.			
7.			
8.			
Total Cover:	46 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	66.7 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:		
OBL species		x 1 =	0	
FACW species	66	x 2 =	132	
FAC species		x 3 =	0	
FACU species		x 4 =	0	
UPL species	30	x 5 =	150	
Column Totals:	96	(A)	282	(B)

Prevalence Index = B/A = 2.94

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ● **No** ○

Remarks: Area mapped as southern willow scrub and vegetation meets hydrophytic standard.

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
0-6	10YR 3/2	98	7.5YR 4/6	2	C	M	sandy loam	
6-12	10YR 3/2	95	7.5YR 4/6	5	C	M	sandy loam	
12-18	10YR 4/1	90	7.5YR 4/6	10	C	M	loamy sand	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3] Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ● **No** ○

Remarks: Soils observed meet the criteria for the redox dark surface indicator.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):
Water Table Present? Yes ○ No ● Depth (inches):
Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? **Yes** ● **No** ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Soil cracks observed throughout this area.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Encinitas Senior Housing City/County: Encinitas, CA Sampling Date: August 6, 2019

Applicant/Owner: Greystar State: CA Sampling Point: 4

Investigator(s): Andrew Smisek Section, Township, Range: Encinitas quadrangle, 1975, T13S, R04W

Landform (hillslope, terrace, etc.): small terrace Local relief (concave, convex, none): none Slope (%): 10

Subregion (LRR): C - Mediterranean California Lat: 33.01276491610 Long: -117.26064485700 Datum: WGS84

Soil Map Unit Name: Corralitos loamy sand, 5 to 9 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ● No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ● No ○

Hydric Soil Present? Yes ○ No ●

Wetland Hydrology Present? Yes ○ No ●

Is the Sampled Area within a Wetland? **Yes** ○ **No** ●

Remarks: This sample point occurs in an area mapped as mule fat scrub occurring on a small terrace adjacent to the outfall of the existing culvert.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix lasiolepis*	20	Yes	FACW
2.			
3.			
4.			
Total Cover:	20 %		
Sapling/Shrub Stratum			
1. *Baccharis salicifolia*	60	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	60 %		
Herb Stratum			
1. *Oenothera elata*	2	Yes	FACW
2. *Brassica nigra*	2	Yes	NI
3. *Ambrosia psilostachya*	1	No	FACU
4. *Erigeron canadensis*	1	No	NI
5.			
6.			
7.			
8.			
Total Cover:	6 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum %   % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	75.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	22	x 2 =	44
FAC species	60	x 3 =	180
FACU species	1	x 4 =	4
UPL species	3	x 5 =	15
Column Totals:	86 (A)		243 (B)

Prevalence Index = B/A = 2.83

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ● **No** ○

Remarks: Vegetation mapped as mule fat scrub and meets the hydrophytic standard.

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture[3]	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-1	10YR 2/1	100					sandy loam	much organic material
1-18	10YR 4/3	100					loamy sand	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3] Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ **No** ●

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):

Water Table Present? Yes ○ No ● Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? Yes ○ **No** ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators observed.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Encinitas Senior Housing City/County: Encinitas, CA Sampling Date: August 6, 2019

Applicant/Owner: Greystar State: CA Sampling Point: 5

Investigator(s): Andrew Smisek Section, Township, Range: Encinitas quadrangle, 1975, T13S, R04W

Landform (hillslope, terrace, etc.): small alluvium Local relief (concave, convex, none): none Slope (%): 5-10

Subregion (LRR): C - Mediterranean California Lat: 33.01286602300 Long: -117.26056293300 Datum: WGS84

Soil Map Unit Name: Corralitos loamy sand, 5 to 9 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ● No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ●	No ○
Hydric Soil Present?	Yes ●	No ○
Wetland Hydrology Present?	Yes ●	No ○

Is the Sampled Area within a Wetland? **Yes** ● **No** ○

Remarks: This sample point occurs in lower elevations within an area mapped as southern willow scrub.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix lasiolepis*	80	Yes	FACW
2.			
3.			
4.			
Total Cover:	80 %		
Sapling/Shrub Stratum			
1. *Baccharis salicifolia*	10	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	10 %		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:		
OBL species		x 1 =	0	
FACW species	80	x 2 =	160	
FAC species	10	x 3 =	30	
FACU species		x 4 =	0	
UPL species		x 5 =	0	
Column Totals:	90	(A)	190	(B)

Prevalence Index = B/A = 2.11

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ● **No** ○

Remarks: Vegetation meets hydrophytic vegetation standard.

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features					
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
0-3	10YR 3/2	100					loamy sand	
3-18	10YR 4/2	90	10YR 4/6	10	C	M	sandy loam	redox features throughout

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ● No ○

Remarks: Soils meet the hydric soil standard for depleted matrix.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):
Water Table Present? Yes ○ No ● Depth (inches):
Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? Yes ● **No** ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Soil cracking observed throughout this area.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Encinitas Senior Housing
City/County: Encinitas, CA
Sampling Date: August 6, 2019
Applicant/Owner: Greystar
State: CA
Sampling Point: 6
Investigator(s): Andrew Smisek
Section, Township, Range: Encinitas quadrangle, 1975, T13S, R04W
Landform (hillslope, terrace, etc.): lowland
Local relief (concave, convex, none): concave
Slope (%): 1-3
Subregion (LRR): C - Mediterranean California
Lat: 33.01269539950
Long: -117.26073143200
Datum: WGS84
Soil Map Unit Name: Corralitos loamy sand, 5 to 9 percent slopes
NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ● No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ●	No ○
Hydric Soil Present?	Yes ●	No ○
Wetland Hydrology Present?	Yes ●	No ○

Is the Sampled Area within a Wetland? **Yes** ● **No** ○

Remarks: This sample point occurs in an area mapped as coastal scrub which occurs in the lower elevations downslope from the road and the culvert alluvium.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Isocoma menziesii*	30	Yes	FAC
2. *Baccharis salicifolia*	5	No	FAC
3.			
4.			
5.			
Total Cover:	35 %		
Herb Stratum			
1. *Frankenia salina*	15	Yes	FACW
2. *Ambrosia psilostachya*	5	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	20 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	66.7 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	15	x 2 =	30
FAC species	35	x 3 =	105
FACU species	5	x 4 =	20
UPL species		x 5 =	0
Column Totals:	55 (A)		155 (B)

Prevalence Index = B/A = 2.82

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ● **No** ○

Remarks: Vegetation mapped as coastal scrub and meets hydrophytic standard.

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture[3]	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-5	10YR 3/2	100					sandy loam	
5-18	10YR 5/2	90	10YR 4/6	10	C	M	loamy sand	redox features throughout

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3] Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☒ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ● No ○

Remarks: Soils meet sandy redox hydric soil indicator criteria.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):

Water Table Present? Yes ○ No ● Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? Yes ● No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Soil cracking observed throughout this low area.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Encinitas Senior Housing City/County: Encinitas, CA Sampling Date: August 6, 2019

Applicant/Owner: Greystar State: CA Sampling Point: 7

Investigator(s): Andrew Smisek Section, Township, Range: Encinitas quadrangle, 1975, T13S, R04W

Landform (hillslope, terrace, etc.): small alluvium Local relief (concave, convex, none): concave Slope (%): 3-5

Subregion (LRR): C - Mediterranean California Lat: Long: Datum: WGS84

Soil Map Unit Name: Corralitos loamy sand, 5 to 9 percent slopes NWI classification: Estuarine&Marinewetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ● No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ●	No ○
Hydric Soil Present?	Yes ○	No ●
Wetland Hydrology Present?	Yes ○	No ●

Is the Sampled Area within a Wetland? **Yes** ○ **No** ●

Remarks: This sample point occurs in an area mapped as mule fat scrub on a small alluvium at the outfall of an existing culvert.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix lasiolepis*	40	Yes	FACW
2.			
3.			
4.			
Total Cover:	40 %		
Sapling/Shrub Stratum			
1. *Baccharis salicifolia*	40	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	40 %		
Herb Stratum			
1. *Carpobrotus edulis*	5	Yes	NI
2. *Ambrosia psilostachya*	1	No	FACU
3. *Foeniculum vulgare*	1	No	NI
4.			
5.			
6.			
7.			
8.			
Total Cover:	7 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	40	x 2 =	80
FAC species	40	x 3 =	120
FACU species	1	x 4 =	4
UPL species	6	x 5 =	30
Column Totals:	87 (A)		234 (B)

Prevalence Index = B/A = 2.69

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ● **No** ○

Remarks: Vegetation mapped as mule fat scrub and meets hydrophytic vegetation standard.

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
0-18	10YR 3/2	100					loamy sand	no redox features

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3] Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ●

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):

Water Table Present? Yes ○ No ● Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators observed.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Encinitas Senior Housing
City/County: Encinitas, CA
Sampling Date: August 6, 2019
Applicant/Owner: Greystar
State: CA
Sampling Point: 8
Investigator(s): Andrew Smisek
Section, Township, Range: Encinitas quadrangle, 1975, T13S, R04W
Landform (hillslope, terrace, etc.): small alluvium
Local relief (concave, convex, none): none
Slope (%): 5-10
Subregion (LRR): C - Mediterranean California
Lat: 33.01250636010
Long: -117.26086886500
Datum: WGS84
Soil Map Unit Name: Corralitos loamy sand, 5 to 9 percent slopes
NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ● No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ○ No ●
Hydric Soil Present? Yes ○ No ●
Wetland Hydrology Present? Yes ○ No ●

Is the Sampled Area within a Wetland? Yes ○ No ●

Remarks: This sample point occurs in an area mapped as disturbed habitat occurring on a small alluvium adjacent to the existing culvert outfall.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Isocoma menziesii*	2	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	2 %		
Herb Stratum			
1. *Carpobrotus edulis*	50	Yes	NI
2. *Ambrosia psilostachya*	30	Yes	FACU
3. *Raphinus sativus*	5	No	NI
4. *Frankenia salina*	3	No	FACW
5.			
6.			
7.			
8.			
Total Cover:	88 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum %   % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	33.3 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	3	x 2 =	6
FAC species	2	x 3 =	6
FACU species	30	x 4 =	120
UPL species	55	x 5 =	275
Column Totals:	90 (A)		407 (B)

Prevalence Index = B/A = 4.52

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%
☐ Prevalence Index is ≤3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ●

Remarks: Vegetation did not meet hydrophytic criteria.

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-18	10YR 3/2	100					loamy sand	no redox features

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ **No** ●

Remarks: No hydric soils indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):
Water Table Present? Yes ○ No ● Depth (inches):
Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? Yes ○ **No** ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators observed.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Encinitas Senior Housing City/County: Encinitas, CA Sampling Date: August 6, 2019

Applicant/Owner: Greystar State: CA Sampling Point: 9

Investigator(s): Andrew Smisek Section, Township, Range: Encinitas quadrangle, 1975, T13S, R04W

Landform (hillslope, terrace, etc.): lowland Local relief (concave, convex, none): none Slope (%): 1-3

Subregion (LRR): C - Mediterranean California Lat: 33.01253776980 Long: -117.26081003700 Datum: WGS84

Soil Map Unit Name: Corralitos loamy sand, 5 to 9 percent slopes NWI classification: Estuarine&Marinewetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ● No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ●	No ○	
Hydric Soil Present?	Yes ●	No ○	**Is the Sampled Area**
Wetland Hydrology Present?	Yes ●	No ○	**within a Wetland?** **Yes** ● **No** ○

Remarks: This sample point occurs within an area mapped as coastal scrub at lower elevation adjacent to salt marsh habitat.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Isocoma menziesii*	60	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	60 %		
Herb Stratum			
1. *Frankenia salina*	25	Yes	FACW
2. *Ambrosia psilostachya*	15	Yes	FACU
3. *Rumex crispus*	2	No	FAC
4. *Erigeron canadensis*	1	No	FACU
5.			
6.			
7.			
8.			
Total Cover:	43 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	66.7 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	25	x 2 =	50
FAC species	62	x 3 =	186
FACU species	16	x 4 =	64
UPL species		x 5 =	0
Column Totals:	103 (A)		300 (B)

Prevalence Index = B/A = 2.91

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ● **No** ○

Remarks: Vegetation meets hyrdrophytic standard and mapped as coastal scrub.

SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-4	10YR 3/2	100					sandy loam	
4-18	10YR 5/2	90	10YR 4/6	10	C	M	loamy sand	redox features throughout

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3] Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☒ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ● **No** ○

Remarks: Soils meet hydric soil indicator criteria for sandy redox.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):

Water Table Present? Yes ○ No ● Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? **Yes** ● **No** ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Soil cracking observed throughout this low area.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Encinitas Senior Housing City/County: Encinitas, CA Sampling Date: August 6, 2019
Applicant/Owner: Greystar State: CA Sampling Point: 10
Investigator(s): Andrew Smisek Section, Township, Range: Encinitas quadrangle, 1975, T13S, R04W
Landform (hillslope, terrace, etc.): lowland Local relief (concave, convex, none): none Slope (%): 1-3
Subregion (LRR): C - Mediterranean California Lat: 33.01238173310 Long: -117.26099558900 Datum: WGS84
Soil Map Unit Name: Corralitos loamy sand, 5 to 9 percent slopes NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ● No ○ (If no, explain in Remarks.)
Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○
Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ● No ○
Hydric Soil Present? Yes ● No ○
Wetland Hydrology Present? Yes ● No ○

Is the Sampled Area within a Wetland? **Yes** ● **No** ○

Remarks: This sample point occurs in an area mapped as south coastal salt marsh within the low and flat areas southeast of the slopes along the road.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Isocoma menziesii*	10	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	10 %		
Herb Stratum			
1. *Frankenia salina*	60	Yes	FACW
2. *Cuscuta salina*	5	No	Not Listed
3. *Arthrocnemum subterminale*	1	No	FACW
4. *Distichlis spicata*	1	No	FAC
5.			
6.			
7.			
8.			
Total Cover:	67 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	61	x 2 =	122
FAC species	11	x 3 =	33
FACU species		x 4 =	0
UPL species	5	x 5 =	25
Column Totals:	77 (A)		180 (B)

Prevalence Index = B/A = 2.34

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%
☒ Prevalence Index is ≤3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ● **No** ○

Remarks: Vegetation mapped as south coastal salt marsh and meets hydrophytic vegetation standard.

SOIL

Sampling Point: 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-3	10YR 3/2	100					sandy loam	some organics mixed in
3-18	10YR 5/2	90	10YR 4/6	10	C	RC	loamy sand	redox features throughout

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3] Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☒ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ● No ○

Remarks: Soils meet sandy redox hydric soil indicator criteria.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ○ Depth (inches):

Water Table Present? Yes ○ No ○ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ○ Depth (inches):

Wetland Hydrology Present? Yes ● **No** ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Soil cracking occurs throughout this low area.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Encinitas Senior Housing
City/County: Encinitas, CA
Sampling Date: August 6, 2019
Applicant/Owner: Greystar
State: CA
Sampling Point: 11
Investigator(s): Andrew Smisek
Section, Township, Range: Encinitas quadrangle, 1975, T13S, R04W
Landform (hillslope, terrace, etc.): lowland
Local relief (concave, convex, none): none
Slope (%): 0
Subregion (LRR): C - Mediterranean California
Lat: 33.01203568390
Long: -117.26137713800
Datum: WGS84
Soil Map Unit Name: Lagoon Areas of San Diego
NWI classification: Estuarine&Marinewetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ● No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ● No ○
Hydric Soil Present? Yes ● No ○
Wetland Hydrology Present? Yes ● No ○

Is the Sampled Area within a Wetland? **Yes** ● **No** ○

Remarks: This sample point occurs in an area mapped as south coastal salt marsh within the low and flat areas of the lagoon, southeast of the slopes along the road.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Jaumea carnosa*	80	Yes	OBL
2. *Distichlis spicata*	5	No	FAC
3. *Frankenia salina*	5	No	FACW
4. *Ambrosia psilostachya*	5	No	FACU
5. *Arthrocnemum subterminale*	1	No	FACW
6.			
7.			
8.			
Total Cover:	96 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	80	x 1 =	80
FACW species	6	x 2 =	12
FAC species	5	x 3 =	15
FACU species	5	x 4 =	20
UPL species		x 5 =	0
Column Totals:	96 (A)		127 (B)

Prevalence Index = B/A = 1.32

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ● **No** ○

Remarks: Vegetation mapped as south coastal salt marsh and meets hydrophytic vegetation standard.

SOIL

Sampling Point: 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-4	10YR 3/2	100					sandy loam	
4-18	10YR 5/2	85	10YR 4/6	15	C	M	loamy sand	redox features throughout

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2] Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3] Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5) (**LRR C**)
☐ 1 cm Muck (A9) (**LRR D**)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1)
☐ Sandy Gleyed Matrix (S4)

☒ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Loamy Mucky Mineral (F1)
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

☐ 1 cm Muck (A9) (**LRR C**)
☐ 2 cm Muck (A10) (**LRR B**)
☐ Reduced Vertic (F18)
☐ Red Parent Material (TF2)
☐ Other (Explain in Remarks)

[4] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ● **No** ○

Remarks: Soils meet hydric soil indicator criteria for sandy redox.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

☐ Surface Water (A1)
☐ High Water Table (A2)
☐ Saturation (A3)
☐ Water Marks (B1) (**Nonriverine**)
☐ Sediment Deposits (B2) (**Nonriverine**)
☐ Drift Deposits (B3) (**Nonriverine**)
☒ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Water-Stained Leaves (B9)

☐ Salt Crust (B11)
☐ Biotic Crust (B12)
☐ Aquatic Invertebrates (B13)
☐ Hydrogen Sulfide Odor (C1)
☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Recent Iron Reduction in Plowed Soils (C6)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

☐ Water Marks (B1) (**Riverine**)
☐ Sediment Deposits (B2) (**Riverine**)
☐ Drift Deposits (B3) (**Riverine**)
☐ Drainage Patterns (B10)
☐ Dry-Season Water Table (C2)
☐ Thin Muck Surface (C7)
☐ Crayfish Burrows (C8)
☐ Saturation Visible on Aerial Imagery (C9)
☐ Shallow Aquitard (D3)
☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):

Water Table Present? Yes ○ No ● Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? **Yes** ● **No** ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Soil cracks observed throughout this low area.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Encinitas Senior Housing
City/County: Encinitas, CA
Sampling Date: August 6, 2019
Applicant/Owner: Greystar
State: CA
Sampling Point: 12
Investigator(s): Andrew Smisek
Section, Township, Range: Encinitas quadrangle, 1975, T13S, R04W
Landform (hillslope, terrace, etc.): small slope
Local relief (concave, convex, none): none
Slope (%): 10-15
Subregion (LRR): C - Mediterranean California
Lat: 33.01208122540
Long: -117.26139942800
Datum: WGS84
Soil Map Unit Name: Corralitos loamy sand, 5 to 9 percent slopes
NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ● No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ● No ○
Hydric Soil Present? Yes ○ No ●
Wetland Hydrology Present? Yes ○ No ●

Is the Sampled Area within a Wetland? **Yes** ○ **No** ●

Remarks: This sample point occurs in an area mapped as coastal scrub along a small slope extending down from the adjacent road to the salt marsh areas below.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Isocoma menziesii*	15	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	15 %		
Herb Stratum			
1. *Frankenia salina*	60	Yes	FACW
2. *Melilotus indicus*	5	No	FACU
3. *Ambrosia psilostachya*	5	No	FACU
4. *Erigeron canadensis*	3	No	FACU
5. *Heterotheca grandiflora*	1	No	NI
6.			
7.			
8.			
Total Cover:	74 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	60	x 2 =	120
FAC species	15	x 3 =	45
FACU species	13	x 4 =	52
UPL species	1	x 5 =	5
Column Totals:	89	(A)	222 (B)

Prevalence Index = B/A = 2.49

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ● **No** ○

Remarks: Vegetation mapped as coastal scrub and meets hydrophytic vegetation standard.

SOIL

Sampling Point: 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-2	10YR 3/2	100					sandy loam	some organics mixed in
2-10	10YR 3/2	100					loamy sand	no redox features
10-18	10YR 5/2	95	10YR 4/6	5	C	M	loamy sand	redox features

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ●

Remarks: Although some redox features were observed in the 10-18 inches layer, this layer occurs too deep to meet any hydric soil criteria.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):

Water Table Present? Yes ○ No ● Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators observed along this small slope, saturation unlikely here except deep below soil surface.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Encinitas Senior Housing City/County: Encinitas, CA Sampling Date: August 6, 2019
Applicant/Owner: Greystar State: CA Sampling Point: 13
Investigator(s): Andrew Smisek Section, Township, Range: Encinitas quadrangle, 1975, T13S, R04W
Landform (hillslope, terrace, etc.): small alluvium Local relief (concave, convex, none): concave Slope (%): 5-10
Subregion (LRR): C - Mediterranean California Lat: 33.01214600280 Long: -117.26134255600 Datum: WGS84
Soil Map Unit Name: Corralitos loamy sand, 5 to 9 percent slopes NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ● No ○ (If no, explain in Remarks.)
Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○
Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ●	No ○
Hydric Soil Present?	Yes ○	No ●
Wetland Hydrology Present?	Yes ○	No ●

Is the Sampled Area within a Wetland? **Yes** ○ **No** ●

Remarks: This sample point occurs in the small alluvium area occurring adjacent to the outfall of the existing culvert. This area is mapped as mule fat scrub.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Baccharis salicifolia*	90	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	90 %		
Herb Stratum			
1. *Ambrosia psilostachya*	5	Yes	FACU
2. *Oenothera elata*	3	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	8 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	66.7 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply by:	
OBL species		x 1 =	0	
FACW species	3	x 2 =	6	
FAC species	90	x 3 =	270	
FACU species	5	x 4 =	20	
UPL species		x 5 =	0	
Column Totals:	98	(A)	296	(B)

Prevalence Index = B/A = 3.02

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ● **No** ○

Remarks: Vegetation mapped as mule fat scrub and meets hyrdrophytic vegetation standard.

SOIL

Sampling Point: 13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-2	10YR 3/2	100					sandy loam	organics mixed in here
2-18	10YR 3/2	100					loamy sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5) (**LRR C**)
☐ 1 cm Muck (A9) (**LRR D**)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1)
☐ Sandy Gleyed Matrix (S4)

☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Loamy Mucky Mineral (F1)
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

☐ 1 cm Muck (A9) (**LRR C**)
☐ 2 cm Muck (A10) (**LRR B**)
☐ Reduced Vertic (F18)
☐ Red Parent Material (TF2)
☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ●

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

☐ Surface Water (A1)
☐ High Water Table (A2)
☐ Saturation (A3)
☐ Water Marks (B1) (**Nonriverine**)
☐ Sediment Deposits (B2) (**Nonriverine**)
☐ Drift Deposits (B3) (**Nonriverine**)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Water-Stained Leaves (B9)

☐ Salt Crust (B11)
☐ Biotic Crust (B12)
☐ Aquatic Invertebrates (B13)
☐ Hydrogen Sulfide Odor (C1)
☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Recent Iron Reduction in Plowed Soils (C6)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

☐ Water Marks (B1) (**Riverine**)
☐ Sediment Deposits (B2) (**Riverine**)
☐ Drift Deposits (B3) (**Riverine**)
☐ Drainage Patterns (B10)
☐ Dry-Season Water Table (C2)
☐ Thin Muck Surface (C7)
☐ Crayfish Burrows (C8)
☐ Saturation Visible on Aerial Imagery (C9)
☐ Shallow Aquitard (D3)
☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):
Water Table Present? Yes ○ No ● Depth (inches):
Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators observed on this small alluvium.

Appendix H Table 7-1, Section 7 of the draft Encinitas Subarea plan

Table 7-1

COMMON INVASIVE EXOTIC PLANT SPECIES

Acacia spp.
Acacia

Ailanthus altissima
Tree-of-heaven

Arundo donax
Giant reed

Atriplex semibaccata
Australian saltbush

Bambusa spp.
Bamboo

Brassica spp.
Mustard

Carduus spp.
Thistle

Carpobrotus edulis
Iceplant

Centaurea solstitialis
Yellow starthistle

Chenopodium spp.
Goosefoot, lambsquarter

Chrysanthemum spp.
Chrysanthemum

Cirsium spp.
Thistle

Conium maculatum
Poison hemlock

Conyza canadensis
Horseweed

Cortaderia jubata
Andean pampas grass

Cortaderia selloana
Pampas grass

Cotoneaster pannosa
Cotoneaster

Cynara cardunculus
Artichoke thistle

Cynodon dactylon
Bermuda grass

Dipsacus spp.
Teasel

Eucalyptus spp.
Gum, eucalyptus

Foeniculum vulgare
Fennel

Hedera helix
English ivy

Lepidium latifolium
Perennial pepperweed

Melilotus spp.
Sweet clover

Mesembryanthemum chilensis
(Ice plant)

Muehlenbeckia complexa
Mattress vine

Myoporum laetum
Myoporum

Nicotiana glauca
Tree tobacco

Pennisetum clandestinum
Kikuygrass

Pennisetum setaceum
Fountain grass

Phoenix canariensis
Canary Island palm

Phragmites communis
Common reed

Pyracantha angustifolia
Pyracantha

Raphanus sativus
Wild radish

Ricinus communis
Castor bean

Robinia pseudoacacia
Black locust

Salsola australis
Russian thistle

Schinus molle
California pepper

Schinus terebinthifolius
Brazilian pepper

Senecio mikanoides
German ivy

Silybum marianum
Milk thistle

Sparteum junceum
Spanish broom

Tamarix spp.
Tamarisk, salt cedar

Ulex europaeus
Gorse

Vinca major
Periwinkle

Washingtonia robusta
Fan palm

Xanthium strumarium
Cocklebur

Also refer to the California Exotic Pest Plant Council's *Exotic Pest Plants of Greatest Ecological Concern in California*. Nonnative grasses in San Diego County are too numerous to list individually.

Appendix I Protocol Gnatcatcher Survey Report

BLUE CONSULTING GROUP
BIOLOGY ▪ LAND USE & ▪ ENTITLEMENTS

July 30, 2019

Stacey Love
U.S. Fish and Wildlife Service
2177 Salk Avenue, Ste. 250
Carlsbad, CA 92008

Subject: Results (Negative) Of Focused Protocol Coastal California Gnatcatcher Surveys on Encinitas Senior Living; City of Encinitzas, County of San Diego

Ms. Love,
Due to the presence of appropriate habitat, three (3) protocol surveys for the coastal California gnatcatcher (*Polioptila californica californica*) were completed on the approximately 19.68-acre Property (Figures 1-3). The project includes Assessor's Parcel Numbers (APNs) 261-210-01-00 & 261-210-12-00. The property is situated on the southern edge of the city of Encinitas, east of Interstate 5, north of Manchester Blvd (a small portion of the site is south of Manchester), adjacent to San Elijo Lagoon, which lies along the southern boundary of the project..

Qualified biologist Alicia Hill (permit number TE-06145B) conducted the three protocol surveys. The purpose of the protocol surveys was to determine the presence/absence status of coastal California gnatcatchers (CAGN) on the Property, which is to be utilized as a Habitat Mitigation Preserve. This report describes the methods, results, and conclusions of the completed protocol surveys.

Site Location
The approximately 19.68-acre property is currently utilized as agricultural fields. The project is located on the 7.5-minute USGS Encinitas, California topographic quadrangle, in Section 33, Township 12 South, Range 4 West.

Vegetation Communities
The property is dominated by active agricultural fields and along the northern limit are areas of coastal sage scrub. The majority of the disturbed California sage-scrub with scattered California sage (Artemisia californica), Encelia californica, California buckwheat (Eriogonum fasciculatum) and laural sumac (Melosma laurina). The property included highly disturbed patches of habitat dominated by short-pod mustard (Hirschfeldia incana) and non-native grasses, as well as three small patches of higher quality sage scrub habitat less disturbed by invasive species, located within the along the northern border of the silt fencing.

Survey Methods
Alicia Hill (ACH; permit number TE-06145B) conducted the three (3) protocol surveys for the coastal California gnatcatcher according to the USFWS gnatcatcher survey protocol.

The survey specifics are described below:

Survey #1 5/17/19:
Start: 11:10, 68F, 2-4 mph, 15%cc
End: 11:40, 68F, 2-4 mph, 15%cc
ACH

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Start: 0945, 61F, 1-3 mph, 30%cc
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ACH

Survey #3 6/9/19:
Start: 0835, 64F, 0-1 mph, 100%cc
End: 0910, 64F, 0-1 mph, 100%cc
ACH

As described, all areas supporting coastal sage scrub on site, as well as within appropriate habitat and around the property (offsite) extending approximately 200 feet were carefully searched for the presence or absence of coastal California gnatcatchers.

Survey Results

The completed surveys are Negative for the presence of onsite coastal California gnatcatchers (Figure 4).

One CAGN family group was detected offsite to the northwest of the survey area during survey #2 in the northern portion of the survey area within high quality CSS. A single lone male CAGN was detected offsite immediately to the north of the Property in the far eastern area of the survey area during survey #3. This male most likely came from a nearby high-quality CSS area to the northeast of the property and was believed to be different than the male observed during survey #2.

In addition to the observed gnatcatchers, the following species were also observed:
Turkey Vulture, Red-tailed Hawk, Mourning Dove, Anna's Hummingbird, Black Phoebe, Say's Phoebe, California Scrub-Jay, American Crow, Common Raven, Cliff Swallow, Bushtit, House Wren, Bewick's Wren, California Gnatcatcher, Wrentit, California Thrasher, Northern Mockingbird, Spotted Towhee, California Towhee, Song Sparrow, Brown-headed Cowbird, Hooded Oriole, House Finch, Lesser Goldfinch, Westerm Kingbird, California Quail, European Starling, Snowy Egret, Great-blue Heron, Northern Rough-winged Swallow, Mallard, Allen's Hummingbird.

I certify that the information in this survey report and attached exhibits fully and accurately represents my work.

8/1/19

Alicia Hill Date

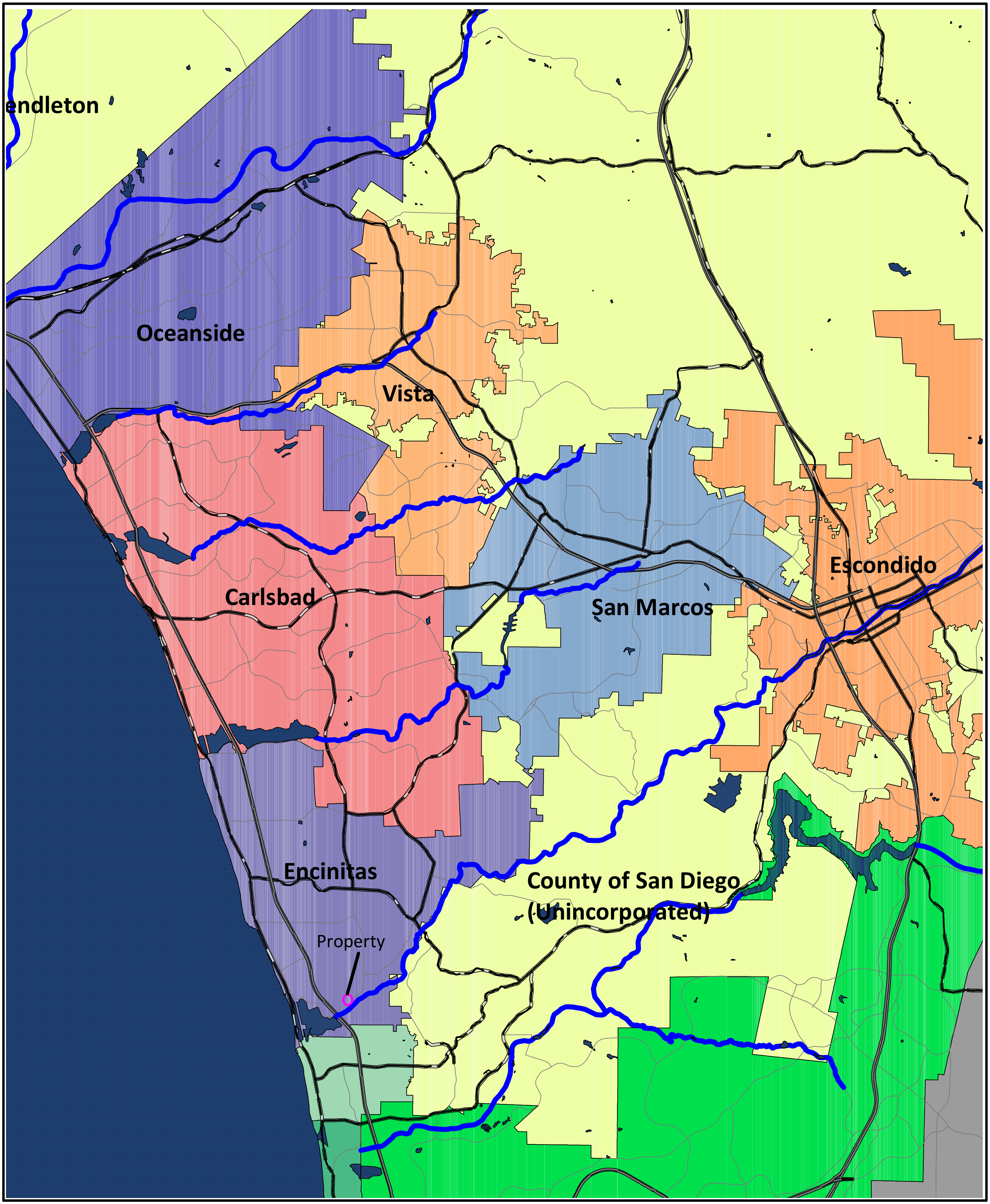
Should you have any questions or concerns regarding this survey, please do not hesitate to contact me.

Sincerely,

Michael Jefferson
President
BLUE Consulting Group

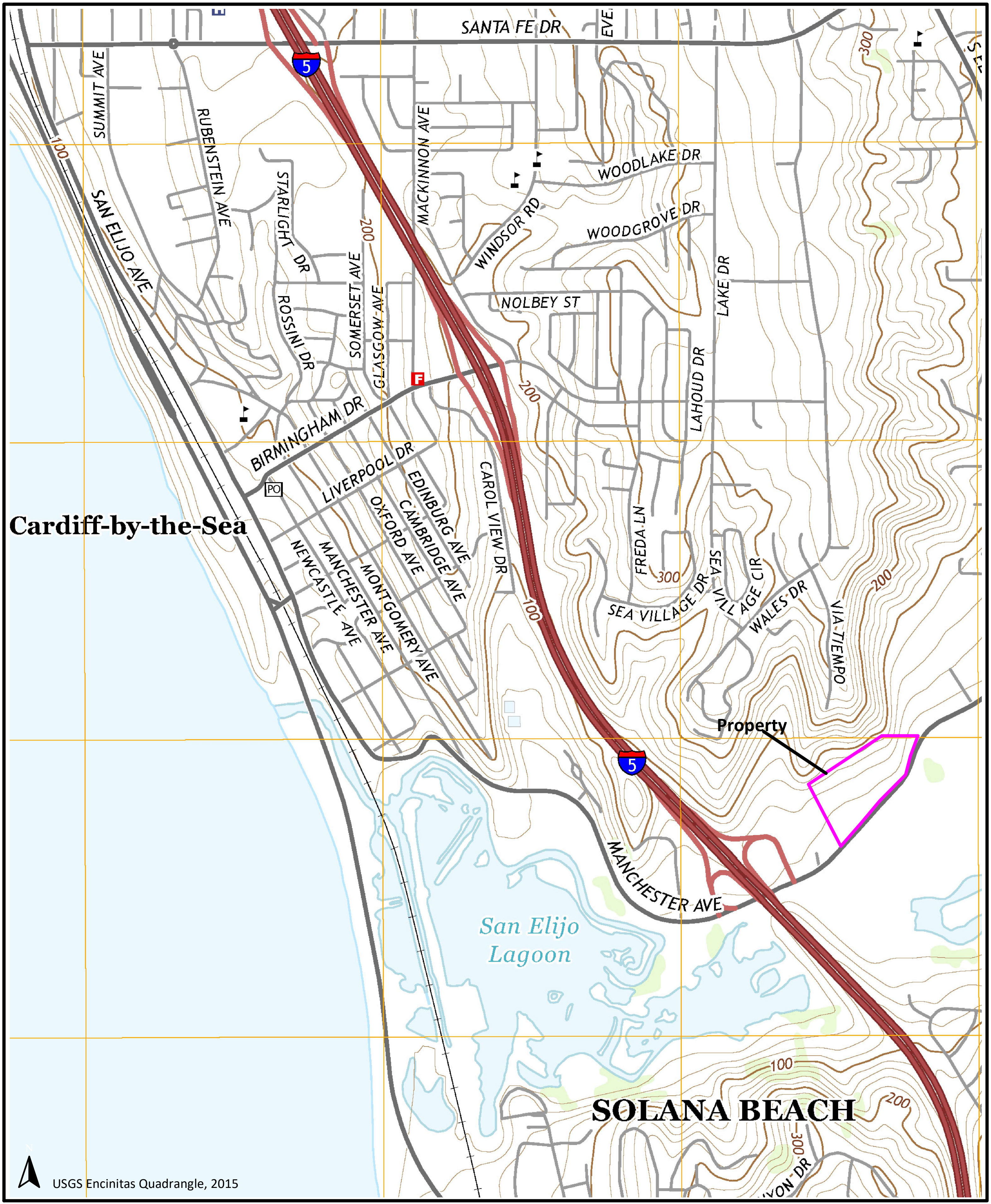
Attached: Figures 1-4
Pictures 1-4
CAGN Protocol Survey Notification

ATTACHMENTS



○ Encinitas 45 Property

FIGURE 1
Regional Project
Location



USGS Encinitas Quadrangle, 2015

▭ Property

FIGURE 2
Property Location
USGS Topo Map - Encinitas

FIGURE 3
Property Aerial

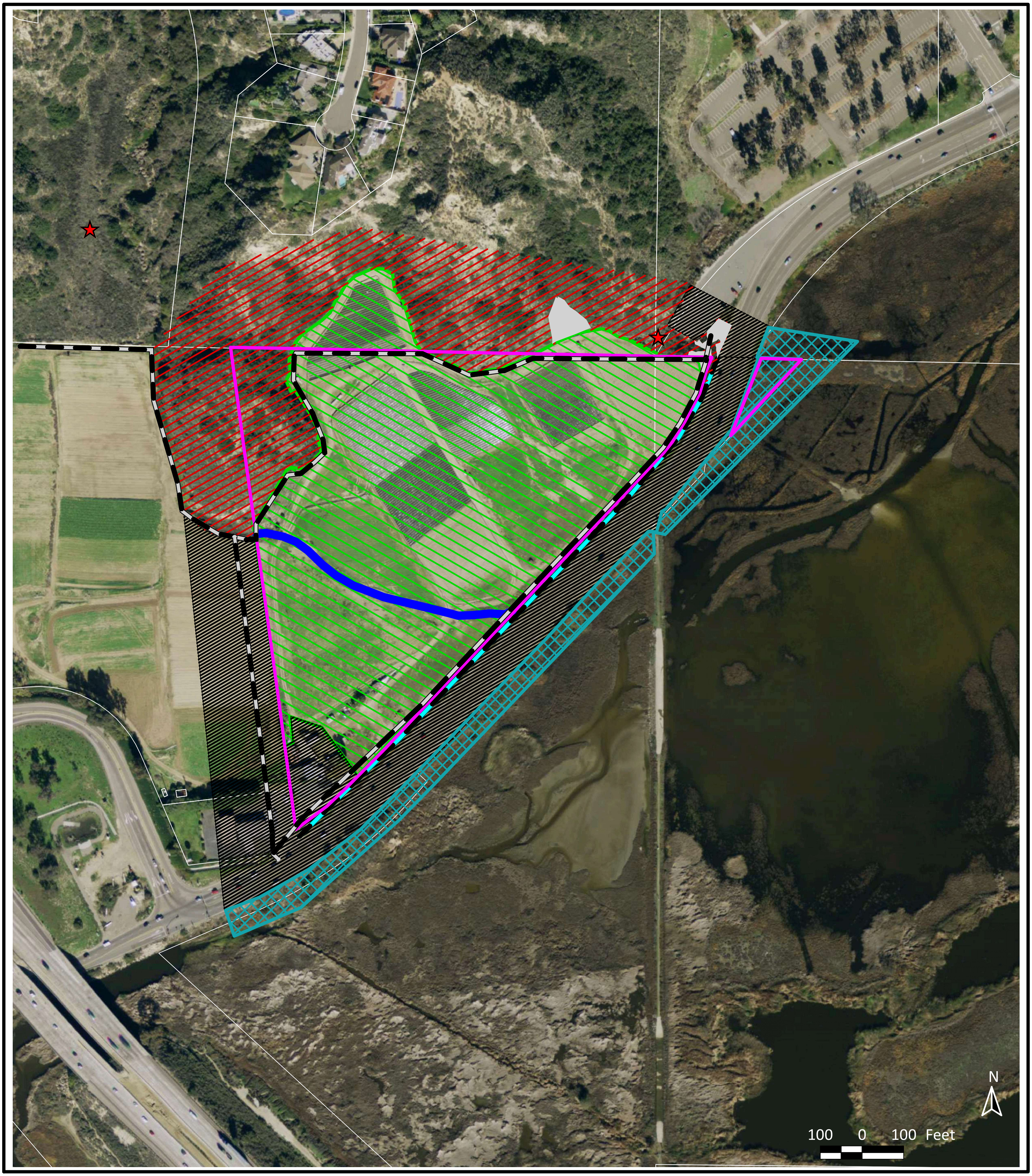


FIGURE 4
CAGN Observed

BLUE Consulting Group
PO BOX 501115
SAN DIEGO, CA 92150
(858) 391-8145

MEMORANDUM

TO: Stacey Love - U.S. FWS Carlsbad, Stacey_love@fws.com, Fax: 760-431-9624
CC: Alicia Cooper Hill (ahill@halcyonenv.com; t: 858.848.0368 I c: 760.533.9667)

FROM: Michael Jefferson, Mike@BLUEconsulting.com

DATE: 4/22/2019

RE: Encinitas Senior Living - Request to commence protocol surveys for the federally-listed coastal California gnatcatcher (CAGN) (*Polioptila californica californica*).

Comments:

Ms. Love,

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Three (3) protocol surveys are proposed, each a week apart; approximate survey dates initiating the week of May 6th and continuing for the next 2 consecutive weeks. The surveys are being conducted to determine the presence/absence status of the CAGN onsite for the purpose of making the 'occupied'/'un-occupied' determination for the coastal sage scrub habitat located along the norther limits of the Property.

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These surveys will be conducted according to USFWS protocol by Travis Cooper (Permit Number - TE-170389-5) and Alicia Hill, permit number TE-06145B. Permitted species include California gnatcatcher.

If you should have any questions regarding our intentions to conduct these surveys, please feel free to contact me at 858-391-8145 or by the email address above.

Sincerely,

Michael Jefferson
President
BLUE Consulting Group

Attachments:

- Regional Location Map
- USGS Topo Project Location Map
- Property Aerial

D-2

Results (Negative) of Focused Protocol Coastal California Gnatcatcher Surveys

BLUE CONSULTING GROUP
BIOLOGY ▪ LAND USE & ▪ ENTITLEMENTS

July 30, 2019

Stacey Love
U.S. Fish and Wildlife Service
2177 Salk Avenue, Ste. 250
Carlsbad, CA 92008

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Alicia Hill Date

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CAGN Protocol Survey Notification

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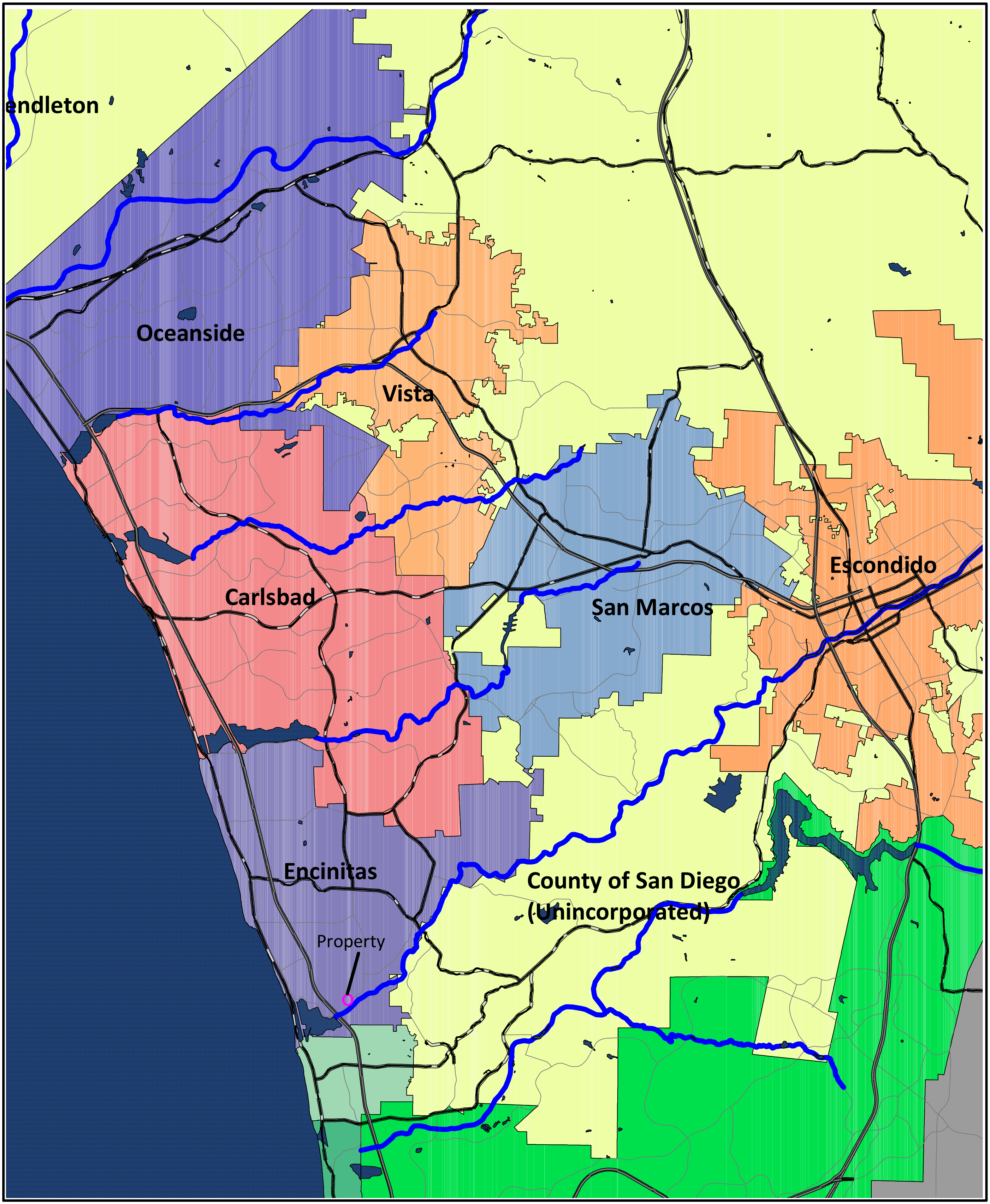

B L U E

○ Encinitas 45 Property

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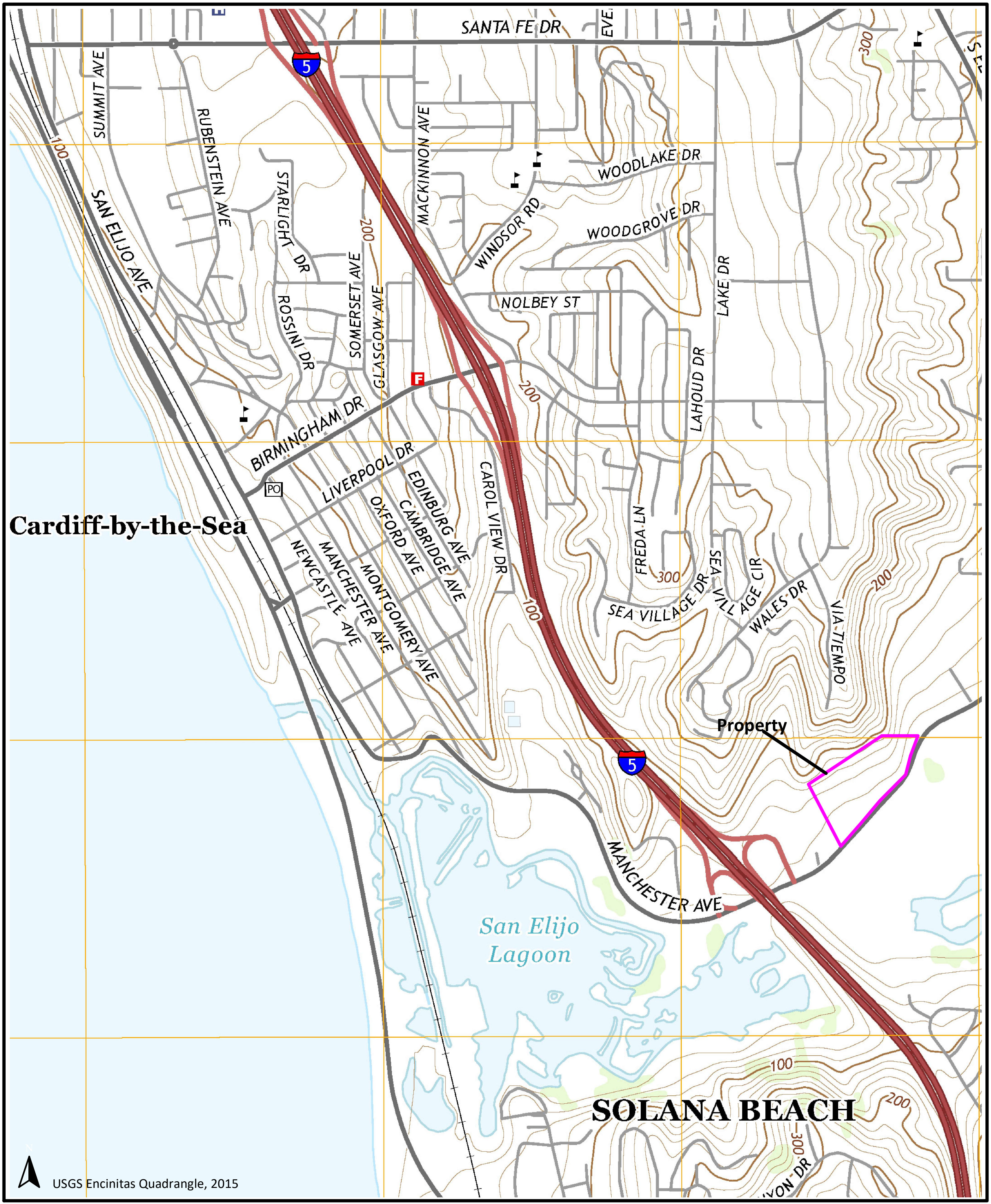
Regional Project
Location



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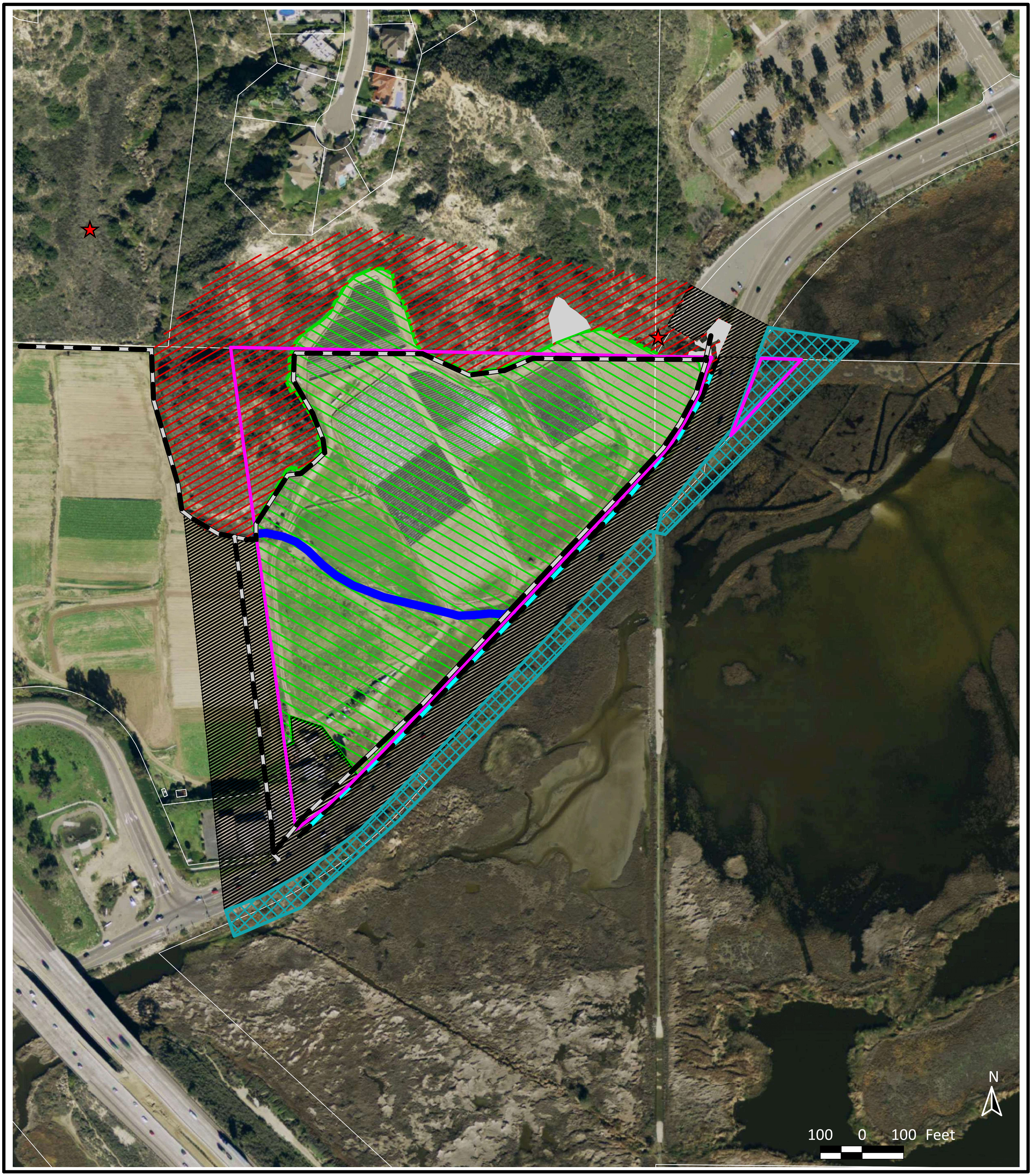

FIGURE 4
CAGN Observed

BLUE Consulting Group
PO BOX 501115
SAN DIEGO, CA 92150
(858) 391-8145

MEMORANDUM

TO:	Stacey Love - U.S. FWS Carlsbad, Stacey_love@fws.com, Fax: 760-431-9624 CC: Alicia Cooper Hill (ahill@halcyonenv.com; t: 858.848.0368 I c: 760.533.9667)
FROM:	Michael Jefferson, Mike@BLUEconsulting.com
DATE:	4/22/2019
RE:	Encinitas Senior Living - Request to commence protocol surveys for the federally-listed coastal California gnatcatcher (CAGN) (*Polioptila californica californica*).

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President
BLUE Consulting Group

Attachments:

- Regional Location Map
- USGS Topo Project Location Map
- Property Aerial

E-1 Phase I Cultural Resources Study

A PHASE I CULTURAL RESOURCE STUDY FOR THE 3111 MANCHESTER AVENUE PROJECT

ENCINITAS, CALIFORNIA

Submitted to:

City of Encinitas
Development Services Department
505 South Vulcan Avenue
Encinitas, California 92024

Prepared for:

Greystar
444 South Cedros Avenue, Suite 172
Solana Beach, California 92075

Prepared by:

Andrew J. Garrison, M.A. and
Brian F. Smith, M.A.
Brian F. Smith and Associates, Inc.
14010 Poway Road, Suite A
Poway, California 92064

August 28, 2018

Archaeological Database Information Page

Author(s):	Andrew J. Garrison, M.A. and Brian F. Smith, M.A.
Consulting Firm:	Brian F. Smith and Associates, Inc. 14010 Poway Road, Suite A Poway, California 92064 (858) 484-0915
Report Date:	August 28, 2018
Report Title:	A Phase I Cultural Resource Study for the 3111 Manchester Avenue Project, Encinitas, California
Prepared for:	Greystar 444 South Cedros Avenue, Suite 172 Solana Beach, California 92075
Submitted to:	City of Encinitas Development Services Department 505 South Vulcan Avenue Encinitas, California 92024
Submitted by:	Brian F. Smith and Associates, Inc. 14010 Poway Road, Suite A Poway, California 92064 (858) 484-0915
USGS Quadrangle:	*Encinitas, California* (7.5 minute)
Study Area:	Approximately 19 acres
Key Words:	USGS *Encinitas* Quadrangle (7.5 minute); archaeological survey; San Elijo Lagoon; prehistoric isolate identified-not significant; archaeological monitoring of grading recommended.

I. PROJECT DESCRIPTION AND LOCATION

As required by the City of Encinitas as part of an environmental review for a proposed land development project, Brian F. Smith and Associates, Inc. (BFSA) conducted a Phase I archaeological records search review and pedestrian survey of the approximately 19-acre 3111 Manchester Avenue Project, which is located on a property currently used for agriculture (Assessor's Parcel Numbers [APN] 261-210-01 and -12). The project is situated immediately east of Interstate 5 along Manchester Avenue just north of the San Elijo Lagoon in the city of Encinitas, San Diego County, California. The project is located in Section 26 in Township 13 South, Range 4 West of the *Encinitas, California* USGS Quadrangle (Figures 1 and 2 [Attachment B]). The applicant is proposing to construct a senior care facility and affordable housing units.

The records search was compiled from information gathered at the South Coastal Information Center (SCIC) at San Diego State University (SDSU) and the BFSA archives in order to determine whether any recorded cultural resources are present within the project. The SCIC records search identified the presence of 64 recorded resources within a one-mile radius of the project, four of which, all prehistoric isolates, have been recorded within the current project boundaries.

The archaeological survey was conducted on August 16, 2018. During the survey, a single isolate, a sandstone metate fragment, was identified. This isolate artifact was recorded on the appropriate Department of Parks and Recreation (DPR) site forms and filed at the SCIC (see Confidental Appendix). Due to the extensive agricultural use of the property the artifact does not retain any provenience, and is not considered significant under California Environmental Quality Act (CEQA) criteria. However, based upon the identification of isolated artifacts within the project Area of Potential Effect (APE), and the high cultural resource sensitivity surrounding San Elijo Lagoon, BFSA recommends the monitoring of all ground-disturbing activities by both an archaeologist and a Native American monitor, as grading will expose areas that may contain buried cultural deposits that could not be observed during the survey.

II. SETTING

Natural Environment

The study area is situated directly north of San Elijo Lagoon on the coastal plain of San Diego County in the Coastal Province and western Peninsular Ranges Province (Griner and Pride 1976:15). The coastal strip has a 130-kilometer-long shoreline and is comprised of raised Pleistocene marine and non-marine terraces ranging from five to 20 kilometers in width (Weber 1963). Cretaceous, Tertiary, and Quaternary marine and non-marine sedimentary deposits define these terraces, which have been extensively modified by erosion. Drainages of varied catchment size are closely spaced along the coast, and lagoons have formed at the mouths of many of these rivers. The southern third of the San Diego County coastline is dominated by Tijuana Lagoon, San Diego Bay, and Mission Bay, while the central portion includes six main drainages, mostly with small catchments and associated lagoons.

The northern third of the county's coastline extends from the San Luis Rey River to San Mateo Creek, encompassing the Marine Corps Base Camp Pendleton and three of the county's four largest drainage catchments. The Encinitas area is part of the central coastal plain, which is characterized by a Mediterranean semiarid steppe climate (Bowman 1973; Hines 1991:4).

Precipitation ranges from 225 to 400 millimeters per year, and is concentrated in the winter (from December to April). The prominent vegetation throughout the area is coastal sage scrub (Munz 1974), in addition to important associated species such as buckwheat (*Eriogonum fasciculatum*), black sage (*Salvia mellifera*), white sage (*Salvia apiana*), sugar bush (*Rhus ovata*), squaw bush (*Rhus trilobata*), and laurel sumac (*Malosma laurina*). On the valley floors, freshwater marsh species include: cattail (*Typha latifolia*), spike rush (*Eleocharis macrostachya*), and bulrush (*Scirpus* sp.). Common salt marsh plants include pickleweed (*Salicornia virginica*), saltgrass (*Distichlis spicata*), and sea lavender (*Limonium californicum*). Willow (*Salix* sp.), cottonwood (*Populus fremontii*), oak (Quercus), and sycamore (*Platanus racemosa*) trees are common in valley floor riparian habitats.

Cultural Environment

The area of western San Diego County has a very rich and extensive record of both prehistoric and historic activity. The cultures that have been identified in the general vicinity of the project area include the Paleo Indian Period manifestation of the San Dieguito Complex, the Early Archaic Period represented by the La Jolla Complex, and the Late Prehistoric Period represented by the Kumeyaay Indians. Following the Hispanic intrusion into the region, the Presidio of San Diego, the Mission San Diego de Alcalá, and the Pueblo of San Diego were established. The project area was possibly used in conjunction with the agricultural activities of the mission until the period of mission secularization. The pastoral activities of the Mexican Period (1822 to 1846) likely included use of the areas near the project for grazing purposes. Farming also blossomed and gradually replaced cattle ranching in many of the coastal areas. A brief discussion of the cultural elements present in the project area is provided in the following sections.

Prehistory

In general, the prehistoric record of San Diego County has been documented in many reports and studies, several of which represent the earliest scientific works concerning the recognition and interpretation of the archaeological manifestations present in this region. Geographer Malcolm Rogers initiated the recordation of sites in the area during the 1920s and 1930s, using his field notes to construct the first cultural sequences based upon artifact assemblages and stratigraphy (Rogers 1966). Subsequent scholars expanded the information gathered by Rogers and offered more academic interpretations of the prehistoric record. Moriarty (1966, 1967, 1969), Warren (1964, 1966), and True (1958, 1966) all produced seminal works that critically defined the various prehistoric cultural phenomena present in this region (Moratto 1984). Additional studies have sought to further refine these earlier works (Cardenas 1986; Moratto 1984; Moriarty 1966, 1967; True 1970, 1980, 1986; True and Beemer 1982; True and Pankey 1985; Waugh 1986). In sharp contrast, the current trend in San Diego prehistory has also resulted in a revisionist group that rejects the established cultural historical sequence for San Diego. This revisionist group (Warren et al. 1998) has replaced the concepts of La Jolla, San Dieguito, and all of their other manifestations with an extensive, all-encompassing, chronologically undifferentiated cultural unit that ranges from the initial occupation of southern California to around A.D. 1000 (Bull 1983, 1987; Ezell; 1983, 1987; Gallegos 1987; Kyle et al. 1990; Stropes 2007). For the present study, the prehistory of the region is divided into four major periods: Early Man, Paleo Indian, Early Archaic, and Late Prehistoric.

The Early Man Period (Prior to 8500 B.C.)

At the present time, there has been no concrete archaeological evidence to support the occupation of San Diego County prior to 10,500 years before the present (YBP). Some archaeologists, such as Carter (1957, 1980) and Minshall (1976), have been proponents of Native American occupation of the region as early as 100,000 YBP. However, their evidence for such claims is sparse at best, and has lost much support over the years as more precise dating techniques have become available for skeletal remains thought to represent early man in San Diego. In addition, many of the "artifacts" initially identified as products of early man in the region have since been rejected as natural products of geologic activity. Some of the local proposed Early Man Period sites include Texas Street, Buchanan Canyon, Brown, Mission Valley (San Diego River Valley), Del Mar, and La Jolla (Bada et al. 1974; Carter 1957, 1980; Minshall 1976, 1989; Moriarty and Minshall 1972; Reeves 1985; Reeves et al. 1986).

Paleo Indian Period (8500 to 6000 B.C.)

For the region, it is generally accepted that the earliest identifiable culture in the archaeological record is represented by the material remains of the Paleo-Indian Period San Dieguito Complex. The San Dieguito Complex was thought to represent the remains of a group of people who occupied sites in this region between 10,500 and 8,000 YBP, and who were related to or contemporaneous with groups in the Great Basin. As of yet, no absolute dates have been forthcoming to support the great age attributed to this cultural phenomenon. The artifacts recovered from San Dieguito sites duplicate the typology attributed to the Western Pluvial Lakes Tradition (Moratto 1984; Davis et al. 1969). These artifacts generally include scrapers, choppers, large bifaces, and large projectile points, with few milling tools. Tools recovered from San Dieguito Complex sites, along with the general pattern of their site locations, led early researchers to believe that the San Dieguito were a wandering, hunting, and gathering society (Moriarty 1969; Rogers 1966).

The San Dieguito Complex is the least understood of the cultures that have inhabited the

San Diego County region. This is due to an overall lack of stratigraphic information and/or datable materials recovered from sites identified as San Dieguito. Currently, controversy exists among researchers that centers upon the relationship between the San Dieguito and the subsequent cultural manifestation in the area, the La Jolla Complex. Although, firm evidence has not yet been discovered to indicate whether the San Dieguito "evolved" into the La Jolla Complex, the La Jolla Complex moved into the area and assimilated the people of the San Dieguito, or the San Dieguito retreated from the area due to environmental or cultural pressures.

Early Archaic Period (6000 B.C. to A.D. 0)

Based upon evidence suggesting climatic shifts and archaeologically observable changes in subsistence strategies, a new cultural pattern is believed to have emerged in the San Diego region around 6000 B.C. This Archaic Period pattern is believed by archaeologists to have evolved from or replaced the San Dieguito culture, resulting in a pattern referred to as the Encinitas Tradition. In San Diego, the Encinitas Tradition is thought to be represented by the coastal La Jolla Complex and its inland manifestation, the Pauma Complex. The La Jolla Complex is best recognized for its pattern of shell middens and grinding tools closely associated with marine resources and flexed burials (Shumway et al. 1961; Smith and Moriarty 1985). Increasing numbers of inland sites have been identified as dating to the Archaic Period, focusing upon terrestrial subsistence (Cardenas 1986; Smith 1996; Raven-Jennings and Smith 1999).

The tool typology of the La Jolla Complex displays a wide range of sophistication in the lithic manufacturing techniques used to create the tools found at their sites. Scrapers, the dominant flaked tool type, were created by either splitting cobbles or by finely flaking quarried material. Evidence suggests that after about 8,200 YBP, milling tools began to appear in La Jolla sites. Inland sites of the Encinitas Tradition (Pauma Complex) exhibit a reduced quantity of marine-related food refuse and contain large quantities of milling tools and food bone. The lithic tool assemblage shifts slightly to encompass the procurement and processing of terrestrial resources, suggesting seasonal migration from the coast to the inland valleys (Smith 1996). At the present time, the transition from the Archaic Period to the Late Prehistoric Period is not well understood. Many questions remain concerning cultural transformation between periods, possibilities of ethnic replacement, and/or a possible hiatus from the western portion of the county.

Late Prehistoric Period (A.D. 0 to 1769)

The transition into the Late Prehistoric Period in the project area is primarily represented by a marked change in archaeological patterning known as the Yuman Tradition. This tradition is primarily represented by the Cuyamaca Complex, which is believed to have derived from the mountains of southern San Diego County. The people of the Cuyamaca Complex are considered ancestral to the ethnohistoric Kumeyaay (Diegueño). Although several archaeologists consider the local Native American tribes to be latecomers, the traditional stories and histories passed down through oral tradition by the local Native American groups speak both presently and ethnographically to tribal presence in the region since the time of creation.

The Kumeyaay Native Americans were a seasonal hunting and gathering people with cultural elements that were very distinct from the La Jolla Complex. Noted variations in material culture included cremation, the use of bows and arrows, and adaptation to the use of acorns as a main food staple (Moratto 1984). Along the coast, the Kumeyaay made use of marine resources by fishing and collecting shellfish for food. Game and seasonally available plant food resources (including acorns) were sources of nourishment for the Kumeyaay. By far the most important food resource for these people was the acorn. The acorn represented a storable surplus, which in turn allowed for seasonal sedentism and its attendant expansion of social phenomena.

History

Exploration Period (1530 to 1769)

The historic period around San Diego Bay began with the landing of Juan Rodríguez Cabrillo and his men in 1542 (Chapman 1921). Sixty years after the Cabrillo expeditions (1602 to 1603), Sebastian Vizcaíno made an extensive and thorough exploration of the Pacific coast. Although the voyage did not extend beyond the northern limits of the Cabrillo track, Vizcaíno had the most lasting effect on the nomenclature of the coast. Many of the names Vizcaíno gave to various locations throughout the region have survived to the present time, whereas nearly every one of Cabrillo's has faded from use. For example, when Cabrillo first arrived in what is now the United States, he gave the port the name "San Miguel"; 60 years later, Vizcaíno renamed the port "San Diego" (Rolle 1969).

Spanish Colonial Period (1769 to 1821)

The Spanish occupation of the claimed territory of Alta California took place during the reign of King Carlos III of Spain (Engelhardt 1920). Jose de Gálvez, a representative of the king in Mexico, conceived the plan to colonize Alta California and thereby secure the area for the Spanish Crown (Rolle 1969). The effort involved both a military and religious contingent; the overall intent of establishing forts and missions was to gain control of the land and the native inhabitants through conversion. Actual colonization of the San Diego area began on July 16, 1769 when the first Spanish exploration party, commanded by Gaspar de Portolá with the accompaniment of Father Junípero Serra, arrived in San Diego by the overland route to secure California for the Spanish Crown (Palou 1926). Father Junípero Serra was in charge of religious conversion of the native populations. The natural attraction of the harbor at San Diego and the establishment of a military presence in the area solidified the importance of San Diego to the Spanish colonization of the region and to the growth of the civilian population. Missions were constructed from San Diego to the area as far north as San Francisco. The mission locations were based upon a number of important territorial, military, and religious considerations. Grants of land were made to persons who applied, but many tracts reverted back to the government for lack of use. As an extension of territorial control by the Spanish Empire, each mission was placed in a location that allowed for the command of as much territory and as large a population as possible. While primary access to California during the Spanish Period was by sea, the El Camino Real route served as the land route for transportation, commercial, and military activities within the colony. This route was considered the most direct path between the missions (Rolle 1969; Caughey 1970). As increasing numbers of Spanish and Mexican peoples settled in the area, along with later Americans during the Gold Rush, settled in the area, the Indian populations diminished as they were displaced or decimated by disease (Carrico and Taylor 1983).

Mexican Period (1821 to 1846)

On September 16, 1810, the priest Father Miguel Hidalgo y Costilla started a revolt against Spanish rule. He and his untrained Native American followers fought against the Spanish, but his revolt was unsuccessful, and Father Hidalgo was executed. After this setback, Father Jose Morales tried and failed to lead the revolutionaries, but was also ultimately executed. These two men are still symbols of Mexican liberty and patriotism today. After the Mexican-born Spanish and the Catholic Church joined the revolution, Spain was finally defeated in 1821. Mexican Independence Day is celebrated on September 16 of each year on the anniversary of the start of Father Hidalgo's revolt. The revolution had repercussions in the northern territories, and by 1834, all of the mission lands had been removed from the control of the Franciscan Order under the Acts of Secularization. Without proper maintenance, the missions quickly began to disintegrate, and after 1836, missionaries ceased making regular visits inland to minister to the needs of the Native Americans (Engelhardt 1920). Large tracts of land continued to be granted to persons who applied for them, or who had gained favor with the Mexican government. Grants of land were made to settle government debts and the Mexican government was also called upon to reaffirm some older Spanish land grants shortly before the Mexican-American War of 1846 (Moyer 1969).

Anglo-American Period (1846 to Present)

California was invaded by United States troops during the Mexican-American War from 1846 to 1848. The acquisition of strategic Pacific ports and California land was one of the principal objectives of the war (Price 1967). At the time, the inhabitants of California were practically defenseless, and they quickly surrendered to the United States Navy in July of 1847 (Bancroft 1885).

The cattle ranchers of the "counties" of southern California prospered during the cattle boom of the early 1850s. They were able to "reap windfall profit … pay taxes and lawyer's bills … and generally live according to custom" (Pitt 1966). However, raising cattle soon declined, contributing to the expansion of agriculture. With the passage of the "No Fence Act," San Diego's economy shifted from raising cattle to farming (Robinson 1948). The act allowed for the expansion of unfenced farms, which was crucial in an area where fencing material was practically unavailable. Five years after its passage, most of the arable lands in San Diego County had been patented as either ranchos or homesteads, and growing grain crops replaced raising cattle in many of the county's inland valleys (Blick 1976; Elliott 1883 [1965]).

By 1870, farmers had learned to dry farm and were coping with some of the peculiarities of San Diego County's climate (*San Diego Union*, February 6, 1868; Van Dyke 1886). Between 1869 and 1871, the amount of cultivated acreage in the county rose from less than 5,000 to more than 20,000 acres (*San Diego Union*, January 2, 1872). Of course, droughts continued to hinder the development of agriculture (Crouch 1915; *San Diego Union*, November 10, 1870; Shipek 1977). Large-scale farming in San Diego County was limited by a lack of water and the small size of arable valleys. The small urban population and poor roads also restricted commercial crop growing. Meanwhile, cattle continued to be grazed in parts of inland San Diego County; for example, in the Otay Mesa area, the "No Fence Act" had little effect on cattle farmers because ranches were spaced far apart and natural ridges kept the cattle out of nearby crops (Gordinier 1966).

During the first two decades of the twentieth century, the population of San Diego County continued to grow. The population of the inland county declined during the 1890s, but between 1900 and 1910, it rose by about 70 percent. The pioneering efforts were over, the railroads had broken the relative isolation of southern California, and life in San Diego County became similar to other communities throughout the west. After World War I, the history of San Diego County was primarily determined by the growth of San Diego Bay. In 1919, the United States Navy decided to make the bay the home base for the Pacific Fleet (Pourade 1967), as did the aircraft industry during the 1920s (Heiges 1976). The establishment of these industries led to the growth of the county as a whole; however, most of the civilian population growth occurred in the north county coastal areas, where the population almost tripled between 1920 and 1930. During this time period, the history of inland San Diego County was subsidiary to that of the city of San Diego, which had become a Navy center and an industrial city (Heiges 1976). In inland San Diego County, agriculture became specialized and recreational areas were established in the mountain and desert areas. Just before World War II, urbanization began to spread to the inland parts of the county.

A Brief History of Encinitas

The first historic occupation of the Encinitas area occurred in 1842 with a land grant given to Don Andrés Ybarra by Governor Juan Bautista Alvarado. Ybarra named his land Rancho Las Encinitas (little live oaks). The rancho was situated on 4,431 acres, sharing a southern boundary with the San Dieguito Rancho. Located just east of the current city of Encinitas, Rancho Las Encinitas was where the Ybarra family built their adobe (Moyer 1969). The adobe, whose remains are now part of Stagecoach Park, was located in the northeastern portion of the rancho (City of Encinitas 2010).

In 1860, Ybarra sold the rancho to merchants Joseph S. Mannasse and Marcus Schiller of San Diego. The merchants converted the adobe into a stage station that served travelers heading to San Diego from the north (City of Encinitas 2010).

Nathan Eaton and Hector MacKinnon both settled in coastal Encinitas in 1875. The men and their families were the first settlers in the Encinitas area, with Eaton settling on the southern shore of Batiquitos Lagoon and MacKinnon and his wife settling on the northern side of San Elijo Lagoon. Although the California Southern Railroad came to Encinitas in 1881, there were only 11 people living in Encinitas by 1883 (City of Encinitas 2010). Unfortunately, the inhabitants of Encinitas faced the problem of a usable water shortage. This hindered the growth of the community as rainwater had to be stored in cisterns, or inhabitants with wells had to boil their water (City of Encinitas 2010).

In 1884, devastating floods washed out the rail line from Encinitas to San Diego. It took several months to repair the lines and in 1885 Thomas Rattan was sent by the California Southern Railroad to secure a location for a permanent train station in Encinitas. Later that year, John Pitcher joined Rattan to lay out a street grid for the community. The community planning included increasing the population of Encinitas, as by 1887 there were 33 people living in the community (City of Encinitas 2010).

III. AREA OF POTENTIAL EFFECT (APE)

The project site includes APNs 261-210-01 and -12. Combined, the two parcels encompass approximately 19 acres. The property is characterized as a south-facing, sloped landform that has been cultivated for decades (Plates 1 and 2). The existing soil is sandy and represents erosional deposition from the cliffs along the north side of the property. With the exception of some areas along the margins of the parcels, no native vegetation remains and all areas have been involved in the agricultural.

IV. STUDY METHODS

An archaeological records search was conducted for the project based upon SCIC data (see Confidential Appendix) on August 21, 2018. The SCIC search identified 64 cultural resource locations within a one-mile radius of the project, four of which (P-37-025108, P-37-025109, P-37-025110, and P-37-025112), all prehistoric isolated marine shell fragments, have been recorded within the project boundaries. Of the 64 cultural resources found within a one-mile readius of the project, 58 are prehistoric resources. Of the prehistoric resources, 36 are recorded as either isolates or small sites consisting of lithic flakes, fire-affected rock, shell fragments, and/or Tizon Brown Ware fragments, while 22 are shell midden sites. The midden sites are mainly situated along the bluffs overlooking San Elijo Lagoon (south of the APE) and Escondido Creek (west of the APE). The prehistoric resources are mostly tied to extraction behavior, and are likely associated with the prehistoric exploitation of Escondido Creek and San Elijo Lagoon. The remaining six sites are historic, and include an old water line, an animal/pet grave marker, building foundations, and associated trash deposits.

Plate 1: Overview of the north end of the property, facing northwest.

Plate 2: Overview of the property, facing southwest towards Interstate-5 and San Elijo Lagoon.

In total, 58 cultural resource studies have been conducted within a one-mile radius of the proposed project. Nine of the previous studies identified within the SCIC holdings include the current project parcels (Kaldenberg 1974; Fink 1973; Fink and Hightower 1979; County of San Diego 1979; Polan 1980; Dolan 2004; Byrd 2003; Byrd et al. 2004; Caltrans 2013); however, the studies consist of large general overviews and do not directly address the current APE.

BFSA also reviewed the following historic sources:

- The National Register of Historic Places Index
- The Office of Historic Preservation, Archaeological Determinations of Eligibility
- The Office of Historic Preservation, Directory of Properties in the Historic Property Data File
- The 1:24,000 USGS *Encinitas* (1949 and 1968) topographic map
- San Diego County 1872 map
- Aerial photographs (1947 to 2012)

These sources did not indicate the presence of cultural resources within or immediately adjacent to the project.

BFSA also requested a records search of the Sacred Lands File (SLF) of the Native American Heritage Commission (NAHC). The SLF search did not indicate the presence of any sacred sites or locations of religious or ceremonial importance within the search radius; however, the search did indicate that the general area is sensitive for cultural resources. In accordance with the recommendations of the NAHC, BFSA contacted all Native Americans listed in the NAHC response letter. The results from the search can be found in the Confidential Appendix.

BFSA Principal Investigator Brian F. Smith conducted an intensive pedestrian survey of the project on August 16, 2018. Aerial photographs and development maps permitted orientation and location of project boundaries. Where possible, narrow transect paths were employed to ensure maximum survey coverage. All exposed ground was inspected for cultural materials. A survey form, field notes, and photographs documented the survey work undertaken. Photographs were taken to document field conditions during the investigations.

V. <u>RESULTS OF THE STUDY</u>

Background Research

The areas of Encinitas around the project have yielded substantial cultural remains that document prehistoric occupation. For example, a few miles to the east, sites such as SDI-12,209 represent large multicomponent habitation sites (Early Archaic La Jolla Complex and Late Prehistoric Kumeyaay) beginning approximately 5,000 YBP. Multiple prehistoric sites, including temporary camps, isolated artifacts, and surface scatters, are also recorded along an unnamed intermittent stream just east of the APE. Similar sites, as well as those containing shell middens, are located south and east of the project along the bluffs overlooking San Elijo Lagoon. Finally, east of the project, multiple prehistoric archaeological sites have been recorded along Escondido Creek.

Field Reconnaissance

The archaeological survey was conducted on August 16, 2018 by Brian Smith, Principal Investigator. No constraints were encountered during the survey and ground visibility was classified as excellent. The entire property has been recently plowed, which allowed for unobstructed ground visibility. The soil on the property is generally free of rocks. Contour plowing (generally east to west) over many decades has resulted in the gradual movement of the loose, sandy soil downslope toward Manchester Avenue. During the survey, three small fragments of marine shell were noted in the general area of P-37-025108. In addition, a sandstone metate fragment was documented in the relative center of the northern quarter of the property. The metate fragment was recorded as an isolate utilizing the appropriate DPR site forms, which will be filed at the SCIC. No evidence of an archaeological site was observed.

Evaluation

Although the margins of San Elijo Lagoon were occupied intensively during the Archaic and Late Prehistoric periods, the anticipated observation of evidence of this occupation was not realized during the survey. Overall, only three small fragments of marine shell and a single sandstone metate fragment was observed and noted. The survey did not locate any evidence of an archaeological site. Previously, isolate shell fragments were recorded within the APE. Whether or not the shells noted during the current survey are the same as P-37-025108, they, along with the metate fragment, have no importance as isolates and merely reflect long-term use of this area by Native Americans utilizing the lagoon environment for food procurement.

VI. RECOMMENDATIONS

The survey of the property did not identify any significant cultural resources. The isolate metate fragment was observed in the plowed field, and thus, does not retain any provenience. While the survey was negative for significant cultural resources, BFSA recommends monitoring of all ground-disturbing activities by an archaeologist and a Native American monitor, as grading will expose areas that may contain buried cultural deposits that could not be observed during the survey. The recommendation for archaeological monitoring is based upon the sensitivity of the area and the fact that soil movement downslope toward Manchester Avenue over many decades of plowing has created the potential for buried and covered archaeological sites that may have existed along the lagoon shoreline.

VII. SOURCES CONSULTED DATE

National Register of Historic Places ☒	Month and Year: August 2018
California Register of Historical Resources ☒	Month and Year: August 2018
City of San Diego Historical Resources Register ☒	Month and Year: August 2018
Archaeological/Historical Site Records: South Coastal Information Center ☒	Month and Year: August 2018
Other Sources Consulted: NAHC SLF Search (Confidental Appendix) References Cited (Attachment A)	

VIII. CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this archaeological report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief, and have been compiled in accordance with the CEQA criteria as defined in Section 15064.5 and City of Encinitas guidelines.

August 28, 2018

Brian F. Smith, M.A. Date
Principal Investigator

IX. ATTACHMENT A

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Brian F. Smith, MA

Owner, Principal Investigator

Brian F. Smith and Associates, Inc.
14010 Poway Road • Suite A •
Phone: (858) 679-8218 • Fax: (858) 679-9896 • E-Mail: bsmith@bfsa-ca.com

Education

Master of Arts, History, University of San Diego, California	**1982**
Bachelor of Arts, History, and Anthropology, University of San Diego, California	**1975**

Professional Memberships

Society for California Archaeology

Experience

Principal Investigator **1977–Present**
Brian F. Smith and Associates, Inc. **Poway, California**

Brian F. Smith is the owner and principal historical and archaeological consultant for Brian F. Smith and Associates. Over the past 32 years, he has conducted over 2,500 cultural resource studies in California, Arizona, Nevada, Montana, and Texas. These studies include every possible aspect of archaeology from literature searches and large-scale surveys to intensive data recovery excavations. Reports prepared by Mr. Smith have been submitted to all facets of local, state, and federal review agencies, including the US Army Crops of Engineers, the Bureau of Land Management, the Bureau of Reclamation, the Department of Defense, and the Department of Homeland Security. In addition, Mr. Smith has conducted studies for utility companies (Sempra Energy) and state highway departments (CalTrans).

Professional Accomplishments

These selected major professional accomplishments represent research efforts that have added significantly to the body of knowledge concerning the prehistoric life ways of cultures once present in the Southern California area and historic settlement since the late 18th century. Mr. Smith has been principal investigator on the following select projects, except where noted.

<u>Downtown San Diego Mitigation and Monitoring Reporting Programs</u>: Large numbers of downtown San Diego mitigation and monitoring projects submitted to the Centre City Development Corporation, some of which included Strata (2008), Hotel Indigo (2008), Lofts at 707 10th Avenue Project (2007), Breeza (2007), Bayside at the Embarcadero (2007), Aria (2007), Icon (2007), Vantage Pointe (2007), Aperture (2007), Sapphire Tower (2007), Lofts at 655 Sixth Avenue (2007), Metrowork (2007), The Legend (2006), The Mark (2006), Smart Corner (2006), Lofts at 677 7th Avenue (2005), Aloft on Cortez Hill (2005), Front and

Beech Apartments (2003), Bella Via Condominiums (2003), Acqua Vista Residential Tower (2003), Northblock Lofts (2003), Westin Park Place Hotel (2001), Parkloft Apartment Complex (2001), Renaissance Park (2001), and Laurel Bay Apartments (2001).

<u>Archaeology at the Padres Ballpark</u>: Involved the analysis of historic resources within a seven-block area of the "East Village" area of San Diego, where occupation spanned a period from the 1870s to the 1940s. Over a period of two years, BFSA recovered over 200,000 artifacts and hundreds of pounds of metal, construction debris, unidentified broken glass, and wood. Collectively, the Ballpark Project and the other downtown mitigation and monitoring projects represent the largest historical archaeological program anywhere in the country in the past decade (2000-2007).

<u>4S Ranch Archaeological and Historical Cultural Resources Study</u>: Data recovery program consisted of the excavation of over 2,000 square meters of archaeological deposits that produced over one million artifacts, containing primarily prehistoric materials. The archaeological program at 4S Ranch is the largest archaeological study ever undertaken in the San Diego County area and has produced data that has exceeded expectations regarding the resolution of long-standing research questions and regional prehistoric settlement patterns.

<u>Charles H. Brown Site</u>: Attracted international attention to the discovery of evidence of the antiquity of man in North America. Site located in Mission Valley, in the city of San Diego.

<u>Del Mar Man Site</u>: Study of the now famous Early Man Site in Del Mar, California, for the San Diego Science Foundation and the San Diego Museum of Man, under the direction of Dr. Spencer Rogers and Dr. James R. Moriarty.

<u>Old Town State Park Projects</u>: Consulting Historical Archaeologist. Projects completed in the Old Town State Park involved development of individual lots for commercial enterprises. The projects completed in Old Town include Archaeological and Historical Site Assessment for the Great Wall Cafe (1992), Archaeological Study for the Old Town Commercial Project (1991), and Cultural Resources Site Survey at the Old San Diego Inn (1988).

<u>Site W-20, Del Mar, California</u>: A two-year-long investigation of a major prehistoric site in the Del Mar area of the city of San Diego. This research effort documented the earliest practice of religious/ceremonial activities in San Diego County (circa 6,000 years ago), facilitated the projection of major non-material aspects of the La Jolla Complex, and revealed the pattern of civilization at this site over a continuous period of 5,000 years. The report for the investigation included over 600 pages, with nearly 500,000 words of text, illustrations, maps, and photographs documenting this major study.

<u>City of San Diego Reclaimed Water Distribution System</u>: A cultural resource study of nearly 400 miles of pipeline in the city and county of San Diego.

<u>Master Environmental Assessment Project, City of Poway</u>: Conducted for the City of Poway to produce a complete inventory of all recorded historic and prehistoric properties within the city. The information was used in conjunction with the City's General Plan Update to produce a map matrix of the city showing areas of high, moderate, and low potential for the presence of cultural resources. The effort also included the development of the City's Cultural Resource Guidelines, which were adopted as City policy.

<u>Draft of the City of Carlsbad Historical and Archaeological Guidelines</u>: Contracted by the City of Carlsbad to produce the draft of the City's historical and archaeological guidelines for use by the Planning Department of the City.

<u>The Mid-Bayfront Project for the City of Chula Vista</u>: Involved a large expanse of undeveloped agricultural land situated between the railroad and San Diego Bay in the northwestern portion of the city. The study included the analysis of some potentially historic features and numerous prehistoric sites.

Cultural Resources Survey and Test of Sites Within the Proposed Development of the Audie Murphy Ranch, Riverside County, California: Project manager/director of the investigation of 1,113.4 acres and 43 sites, both prehistoric and historic—included project coordination; direction of field crews; evaluation of sites for significance based on County of Riverside and CEQA guidelines; assessment of cupule, pictograph, and rock shelter sites, co-authoring of cultural resources project report. February-September 2002.

Cultural Resources Evaluation of Sites Within the Proposed Development of the Otay Ranch Village 13 Project, San Diego County, California: Project manager/director of the investigation of 1,947 acres and 76 sites, both prehistoric and historic—included project coordination and budgeting; direction of field crews; assessment of sites for significance based on County of San Diego and CEQA guidelines; co-authoring of cultural resources project report. May-November 2002.

Cultural Resources Survey for the Remote Video Surveillance Project, El Centro Sector, Imperial County: Project manager/director for a survey of 29 individual sites near the U.S./Mexico Border for proposed video surveillance camera locations associated with the San Diego Border barrier Project—project coordination and budgeting; direction of field crews; site identification and recordation; assessment of potential impacts to cultural resources; meeting and coordinating with U.S. Army Corps of Engineers, U.S. Border Patrol, and other government agencies involved; co-authoring of cultural resources project report. January, February, and July 2002.

Cultural Resources Survey and Test of Sites Within the Proposed Development of the Menifee West GPA, Riverside County, California: Project manager/director of the investigation of nine sites, both prehistoric and historic—included project coordination and budgeting; direction of field crews; assessment of sites for significance based on County of Riverside and CEQA guidelines; historic research; co-authoring of cultural resources project report. January-March 2002.

Mitigation of An Archaic Cultural Resource for the Eastlake III Woods Project for the City of Chula Vista, California: Project archaeologist/ director—included direction of field crews; development and completion of data recovery program including collection of material for specialized faunal and botanical analyses; assessment of sites for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; co-authoring of cultural resources project report, in prep. September 2001-March 2002.

Cultural Resources Survey and Test of Sites Within the Proposed French Valley Specific Plan/EIR, Riverside County, California: Project manager/director of the investigation of two prehistoric and three historic sites—included project coordination and budgeting; survey of project area; Native American consultation; direction of field crews; assessment of sites for significance based on CEQA guidelines; cultural resources project report in prep. July-August 2000.

Cultural Resources Survey and Test of Sites Within the Proposed Lawson Valley Project, San Diego County, California: Project manager/director of the investigation of 28 prehistoric and two historic sites—included project coordination; direction of field crews; assessment of sites for significance based on CEQA guidelines; cultural resources project report in prep. July-August 2000.

Cultural Resource Survey and Geotechnical Monitoring for the Mohyi Residence Project, La Jolla, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; field survey; assessment of parcel for potentially buried cultural deposits; monitoring of geotechnichal borings; authoring of cultural resources project report. Brian F. Smith and Associates, San Diego, California. June 2000.

Enhanced Cultural Resource Survey and Evaluation for the Prewitt/Schmucker/Cavadias Project, La Jolla, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; direction of field crews; assessment of parcel for potentially buried cultural deposits; authoring of cultural resources project report. June 2000.

Cultural Resources Survey and Test of Sites Within the Proposed Development of the Menifee Ranch, Riverside County, California: Project manager/director of the investigation of one prehistoric and five historic sites—included project coordination and budgeting; direction of field crews; feature recordation; historic structure assessments; assessment of sites for significance based on CEQA guidelines; historic research; co-authoring of cultural resources project report. February-June 2000.

Salvage Mitigation of a Portion of the San Diego Presidio Identified During Water Pipe Construction for the City of San Diego, California: Project archaeologist/director—included direction of field crews; development and completion of data recovery program; management of artifact collections cataloging and curation; data synthesis and authoring of cultural resources project report in prep. April 2000.

Enhanced Cultural Resource Survey and Evaluation for the Tyrian 3 Project, La Jolla, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; assessment of parcel for potentially buried cultural deposits; authoring of cultural resources project report. April 2000.

Enhanced Cultural Resource Survey and Evaluation for the Lamont 5 Project, Pacific Beach, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; assessment of parcel for potentially buried cultural deposits; authoring of cultural resources project report. April 2000.

Enhanced Cultural Resource Survey and Evaluation for the Reiss Residence Project, La Jolla, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; assessment of parcel for potentially buried cultural deposits; authoring of cultural resources project report. March-April 2000.

Salvage Mitigation of a Portion of Site SDM-W-95 (CA-SDI-211) for the Poinsettia Shores Santalina Development Project and Caltrans, Carlsbad, California: Project achaeologist/ director—included direction of field crews; development and completion of data recovery program; management of artifact collections cataloging and curation; data synthesis and authoring of cultural resources project report in prep. December 1999-January 2000.

Survey and Testing of Two Prehistoric Cultural Resources for the Airway Truck Parking Project, Otay Mesa, California: Project archaeologist/director—included direction of field crews; development and completion of testing recovery program; assessment of site for significance based on CEQA guidelines; authoring of cultural resources project report, in prep. December 1999-January 2000.

Cultural Resources Phase I and II Investigations for the Tin Can Hill Segment of the Immigration and Naturalization Services Triple Fence Project Along the International Border, San Diego County, California: Project manager/director for a survey and testing of a prehistoric quarry site along the border—NRHP eligibility assessment; project coordination and budgeting; direction of field crews; feature recordation; meeting and coordinating with U.S. Army Corps of Engineers; co-authoring of cultural resources project report. December 1999-January 2000.

Mitigation of a Prehistoric Cultural Resource for the Westview High School Project for the City of San Diego, California: Project archaeologist/ director—included direction of field crews; development and completion of data recovery program including collection of material for specialized faunal and botanical analyses; assessment of sites for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; co-authoring of cultural resources project report, in prep. October 1999-January 2000.

Mitigation of a Prehistoric Cultural Resource for the Otay Ranch SPA-One West Project for the City of Chula Vista, California: Project archaeologist/director—included direction of field crews; development of data recovery program; management of artifact collections cataloging and curation; assessment of site for significance based on CEQA guidelines; data synthesis; authoring of cultural resources project report, in prep. September 1999-January 2000.

Monitoring of Grading for the Herschel Place Project, La Jolla, California: Project archaeologist/ monitor—included monitoring of grading activities associated with the development of a single-dwelling parcel. September 1999.

Survey and Testing of a Historic Resource for the Osterkamp Development Project, Valley Center, California: Project archaeologist/ director—included direction of field crews; development and completion of data recovery program; budget development; assessment of site for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; authoring of cultural resources project report. July-August 1999.

Survey and Testing of a Prehistoric Cultural Resource for the Proposed College Boulevard Alignment Project, Carlsbad, California: Project manager/director —included direction of field crews; development and completion of testing recovery program; assessment of site for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; authoring of cultural resources project report, in prep. July-August 1999.

Survey and Evaluation of Cultural Resources for the Palomar Christian Conference Center Project, Palomar Mountain, California: Project archaeologist—included direction of field crews; assessment of sites for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; authoring of cultural resources project report. July-August 1999.

Survey and Evaluation of Cultural Resources at the Village 2 High School Site, Otay Ranch, City of Chula Vista, California: Project manager/director —management of artifact collections cataloging and curation; assessment of site for significance based on CEQA guidelines; data synthesis; authoring of cultural resources project report. July 1999.

Cultural Resources Phase I, II, and III Investigations for the Immigration and Naturalization Services Triple Fence Project Along the International Border, San Diego County, California: Project manager/director for the survey, testing, and mitigation of sites along border—supervision of multiple field crews, NRHP eligibility assessments, Native American consultation, contribution to Environmental Assessment document, lithic and marine shell analysis, authoring of cultural resources project report. August 1997-January 2000.

Phase I, II, and II Investigations for the Scripps Poway Parkway East Project, Poway California: Project archaeologist/project director—included recordation and assessment of multicomponent prehistoric and historic sites; direction of Phase II and III investigations; direction of laboratory analyses including prehistoric and historic collections; curation of collections; data synthesis; coauthorship of final cultural resources report. February 1994; March-September 1994; September-December 1995.

Archaeological Evaluation of Cultural Resources Within the Proposed Corridor for the San Elijo Water Reclamation System Project, San Elijo, California: Project manager/director —test excavations; direction of artifact identification and analysis; graphics production; coauthorship of final cultural resources report. December 1994-July 1995.

Evaluation of Cultural Resources for the Environmental Impact Report for the Rose Canyon Trunk Sewer Project, San Diego, California: Project manager/Director —direction of test excavations; identification and analysis of prehistoric and historic artifact collections; data synthesis; co-authorship of final cultural resources report, San Diego, California. June 1991-March 1992.

Reports/Papers

Author, coauthor, or contributor to over 2,500 cultural resources management publications, a selection of which are presented below.

2015	An Archaeological/Historical Study for the Safari Highlands Ranch Project, City of Escondido, County of San Diego.
2015	A Phase I and II Cultural Resources Assessment for the Decker Parcels II Project, Planning Case No. 36962, Riverside County, California.
2015	A Phase I and II Cultural Resources Assessment for the Decker Parcels I Project, Planning Case No. 36950, Riverside County, California.
2015	Cultural Resource Data Recovery and Mitigation Monitoring Program for Site SDI-10,237 Locus F, Everly Subdivision Project, El Cajon, California.
2015	Phase I Cultural Resource Survey for the Woodward Street Senior Housing Project, City of San Marcos, California (APN 218-120-31).
2015	An Updated Cultural Resource Survey for the Box Springs Project (TR 33410), APNs 255-230-010, 255-240-005, 255-240-006, and Portions of 257-180-004, 257-180-005, and 257-180-006.
2015	A Phase I and II Cultural Resource Report for the Lake Ranch Project, TR 36730, Riverside County, California.
2015	A Phase II Cultural Resource Assessment for the Munro Valley Solar Project, Inyo County, California.
2014	Cultural Resources Monitoring Report for the Diamond Valley Solar Project, Community of Winchester, County of Riverside.
2014	National Historic Preservation Act Section 106 Compliance for the Proposed Saddleback Estates Project, Riverside County, California.
2014	A Phase II Cultural Resource Evaluation Report for RIV-8137 at the Toscana Project, TR 36593, Riverside County, California.
2014	Cultural Resources Study for the Estates at Del Mar Project, City of Del Mar, San Diego, California (TTM 14-001).
2014	Cultural Resources Study for the Aliso Canyon Major Subdivision Project, Rancho Santa Fe, San Diego County, California.
2014	Cultural Resources Due Diligence Assessment of the Ocean Colony Project, City of Encinitas.
2014	A Phase I and Phase II Cultural Resource Assessment for the Citrus Heights II Project, TTM 36475, Riverside County, California.
2013	A Phase I Cultural Resource Assessment for the Modular Logistics Center, Moreno Valley, Riverside County, California.

2013 A Phase I Cultural Resources Survey of the Ivey Ranch Project, Thousand Palms, Riverside County, California.

2013 Cultural Resources Report for the Emerald Acres Project, Riverside County, California.

2013 A Cultural Resources Records Search and Review for the Pala Del Norte Conservation Bank Project, San Diego County, California.

2013 An Updated Phase I Cultural Resources Assessment for Tentative Tract Maps 36484 and 36485, Audie Murphy Ranch, City of Menifee, County of Riverside.

2013 El Centro Town Center Industrial Development Project (EDA Grant No. 07-01-06386); Result of Cultural Resource Monitoring.

2013 Cultural Resources Survey Report for the Renda Residence Project, 9521 La Jolla Farms Road, La Jolla, California.

2013 A Phase I Cultural Resource Study for the Ballpark Village Project, San Diego, California.

2013 Archaeological Monitoring and Mitigation Program, San Clemente Senior Housing Project, 2350 South El Camino Real, City of San Clemente, Orange County, California (CUP No. 06-065; APN-060-032-04).

2012 Mitigation Monitoring Report for the Los Peñasquitos Recycled Water Pipeline.

2012 Cultural Resources Report for Menifee Heights (Tract 32277).

2012 A Phase I Cultural Resource Study for the Altman Residence at 9696 La Jolla Farms Road, La Jolla, California 92037.

2012 Mission Ranch Project (TM 5290-1/MUP P87-036W3): Results of Cultural Resources Monitoring During Mass Grading.

2012 A Phase I Cultural Resource Study for the Payan Property Project, San Diego, California.

2012 Phase I Archaeological Survey of the Rieger Residence, 13707 Durango Drive, Del Mar, California 92014, APN 300-369-49.

2011 Mission Ranch Project (TM 5290-1/MUP P87-036W3): Results of Cultural Resources Monitoring During Mass Grading.

2011 Mitigation Monitoring Report for the 1887 Viking Way Project, La Jolla, California.

2011 Cultural Resource Monitoring Report for the Sewer Group 714 Project.

2011 Results of Archaeological Monitoring at the 10th Avenue Parking Lot Project, City of San Diego, California (APNs 534-194-02 and 03).

2011 Archaeological Survey of the Pelberg Residence for a Bulletin 560 Permit Application; 8335 Camino Del Oro; La Jolla, California 92037 APN 346-162-01-00 .

2011 A Cultural Resources Survey Update and Evaluation for the Robertson Ranch West Project and an Evaluation of National Register Eligibility of Archaeological sites for Sites for Section 106 Review (NHPA).

2011 Mitigation Monitoring Report for the 43rd and Logan Project.

2011 Mitigation Monitoring Report for the Sewer Group 682 M Project, City of San Diego Project #174116.

2011 A Phase I Cultural Resource Study for the Nooren Residence Project, 8001 Calle de la Plata, La Jolla, California, Project No. 226965.

2011 A Phase I Cultural Resource Study for the Keating Residence Project, 9633 La Jolla Farms Road, La Jolla, California 92037.

2010 Mitigation Monitoring Report for the 15th & Island Project, City of San Diego; APNs 535-365-01, 535-365-02 and 535-392-05 through 535-392-07.

2010 Archaeological Resource Report Form: Mitigation Monitoring of the Sewer and Water Group 772 Project, San Diego, California, W.O. Nos. 187861 and 178351.

2010 Pottery Canyon Site Archaeological Evaluation Project, City of San Diego, California, Contract No. H105126.

2010 Archaeological Resource Report Form: Mitigation Monitoring of the Racetrack View Drive Project, San Diego, California; Project No. 163216.

2010 A Historical Evaluation of Structures on the Butterfield Trails Property.

2010 Historic Archaeological Significance Evaluation of 1761 Haydn Drive, Encinitas, California (APN 260-276-07-00).

2010 Results of Archaeological Monitoring of the Heller/Nguyen Project, TPM 06-01, Poway, California.

2010 Cultural Resource Survey and Evaluation Program for the Sunday Drive Parcel Project, San Diego County, California, APN 189-281-14.

2010 Archaeological Resource Report Form: Mitigation Monitoring of the Emergency Garnet Avenue Storm Drain Replacement Project, San Diego, California, Project No. B10062

2010 An Archaeological Study for the 1912 Spindrift Drive Project

2009 Cultural Resource Assessment of the North Ocean Beach Gateway Project City of San Diego #64A-003A; Project #154116.

2009 Archaeological Constraints Study of the Morgan Valley Wind Assessment Project, Lake County, California.

2008 Results of an Archaeological Review of the Helen Park Lane 3.1-acre Property (APN 314-561-31), Poway, California.

2008 Archaeological Letter Report for a Phase I Archaeological Assessment of the Valley Park Condominium Project, Ramona, California; APN 282-262-75-00.

2007 Archaeology at the Ballpark. Brian F. Smith and Associates, San Diego, California. Submitted to the Centre City Development Corporation.

2007 Result of an Archaeological Survey for the Villages at Promenade Project (APNs 115-180-007-3,115-180-049-1, 115-180-042-4, 115-180-047-9) in the City of Corona, Riverside County.

2007 Monitoring Results for the Capping of Site CA-SDI-6038/SDM-W-5517 within the Katzer Jamul Center Project; P00-017.

2006 Archaeological Assessment for The Johnson Project (APN 322-011-10), Poway, California.

2005 Results of Archaeological Monitoring at the El Camino Del Teatro Accelerated Sewer Replacement Project (Bid No. K041364; WO # 177741; CIP # 46-610.6.

2005 Results of Archaeological Monitoring at the Baltazar Draper Avenue Project (Project No. 15857; APN: 351-040-09).

2004 TM 5325 ER #03-14-043 Cultural Resources.

2004 An Archaeological Survey and an Evaluation of Cultural Resources at the Salt Creek Project. Report on file at Brian F. Smith and Associates.

2003 An Archaeological Assessment for the Hidden Meadows Project, San Diego County, TM 5174, Log No. 99-08-033. Report on file at Brian F. Smith and Associates.

2003 An Archaeological Survey for the Manchester Estates Project, Coastal Development Permit #02-009, Encinitas, California. Report on file at Brian F. Smith and Associates.

2003 Archaeological Investigations at the Manchester Estates Project, Coastal Development Permit #02-009, Encinitas, California. Report on file at Brian F. Smith and Associates.

2003 Archaeological Monitoring of Geological Testing Cores at the Pacific Beach Christian Church Project. Report on file at Brian F. Smith and Associates.

2003 San Juan Creek Drilling Archaeological Monitoring. Report on file at Brian F. Smith and Associates.

2003 Evaluation of Archaeological Resources Within the Spring Canyon Biological Mitigation Area, Otay Mesa, San Diego County, California. Brian F. Smith and Associates, San Diego, California.

2002 An Archaeological/Historical Study for the Otay Ranch Village 13 Project (et al.). Brian F. Smith and Associates, San Diego, California.

2002 An Archaeological/Historical Study for the Audie Murphy Ranch Project (et al.). Brian F. Smith and Associates, San Diego, California.

2002 Results of an Archaeological Survey for the Remote Video Surveillance Project, El Centro Sector, Imperial County, California. Brian F. Smith and Associates, San Diego, California.

2002 A Cultural Resources Survey and Evaluation for the Proposed Robertson Ranch Project, City of Carlsbad. Brian F. Smith and Associates, San Diego, California.

2002 Archaeological Mitigation of Impacts to Prehistoric Site SDI-7976 for the Eastlake III Woods Project, Chula Vista, California. Brian F. Smith and Associates, San Diego, California.

2002 An Archaeological/Historical Study for Tract No. 29777, Menifee West GPA Project, Perris Valley, Riverside County. Brian F. Smith and Associates, San Diego, California.

2002 An Archaeological/Historical Study for Tract No. 29835, Menifee West GPA Project, Perris Valley, Riverside County. Brian F. Smith and Associates, San Diego, California.

2001 An Archaeological Survey and Evaluation of a Cultural Resource for the Moore Property, Poway. Brian F. Smith and Associates, San Diego, California.

2001 An Archaeological Report for the Mitigation, Monitoring, and Reporting Program at the Water and Sewer Group Job 530A, Old Town San Diego. Brian F. Smith and Associates, San Diego, California.

2001 A Cultural Resources Impact Survey for the High Desert Water District Recharge Site 6 Project, Yucca Valley. Brian F. Smith and Associates, San Diego, California.

2001 Archaeological Mitigation of Impacts to Prehistoric Site SDI-13,864 at the Otay Ranch SPA-One West Project. Brian F. Smith and Associates, San Diego, California.

2001 A Cultural Resources Survey and Site Evaluations at the Stewart Subdivision Project, Moreno Valley, County of San Diego. Brian F. Smith and Associates, San Diego, California.

2000 An Archaeological/Historical Study for the French Valley Specific Plan/EIR, French Valley, County of Riverside. Brian F. Smith and Associates, San Diego, California.

2000 Results of an Archaeological Survey and the Evaluation of Cultural Resources at The TPM#24003–Lawson Valley Project. Brian F. Smith and Associates, San Diego, California.

2000 Archaeological Mitigation of Impacts to Prehistoric Site SDI-5326 at the Westview High School Project for the Poway Unified School District. Brian F. Smith and Associates, San Diego, California.

2000 An Archaeological/Historical Study for the Menifee Ranch Project. Brian F. Smith and Associates, San Diego, California.

2000 An Archaeological Survey and Evaluation of Cultural Resources for the Bernardo Mountain Project, Escondido, California. Brian F. Smith and Associates, San Diego, California.

2000 A Cultural Resources Impact Survey for the Nextel Black Mountain Road Project, San Diego, California. Brian F. Smith and Associates, San Diego, California.

2000 A Cultural Resources Impact Survey for the Rancho Vista Project, 740 Hilltop Drive, Chula Vista, California. Brian F. Smith and Associates, San Diego, California.

2000 A Cultural Resources Impact Survey for the Poway Creek Project, Poway, California. Brian F. Smith and Associates, San Diego, California.

2000 Cultural Resource Survey and Geotechnical Monitoring for the Mohyi Residence Project. Brian F. Smith and Associates, San Diego, California.

2000 Enhanced Cultural Resource Survey and Evaluation for the Prewitt/Schmucker/ Cavadias Project. Brian F. Smith and Associates, San Diego, California.

2000 Enhanced Cultural Resource Survey and Evaluation for the Lamont 5 Project. Brian F. Smith and Associates, San Diego, California.

2000 Salvage Excavations at Site SDM-W-95 (CA-SDI-211) for the Poinsettia Shores Santalina Development Project, Carlsbad, California. Brian F. Smith and Associates, San Diego, California.

2000 Enhanced Cultural Resource Survey and Evaluation for the Reiss Residence Project, La Jolla, California. Brian F. Smith and Associates, San Diego, California.

2000 Enhanced Cultural Resource Survey and Evaluation for the Tyrian 3 Project, La Jolla, California. Brian F. Smith and Associates, San Diego, California.

2000 A Report for an Archaeological Evaluation of Cultural Resources at the Otay Ranch Village Two SPA, Chula Vista, California. Brian F. Smith and Associates, San Diego, California.

2000 An Archaeological Evaluation of Cultural Resources for the Airway Truck Parking Project, Otay Mesa, County of San Diego. Brian F. Smith and Associates, San Diego, California.

2000 Results of an Archaeological Survey and Evaluation of a Resource for the Tin Can Hill Segment of the Immigration and Naturalization and Immigration Service Border Road, Fence, and Lighting Project, San Diego County, California. Brian F. Smith and Associates, San Diego, California.

1999 An Archaeological Survey of the Home Creek Village Project, 4600 Block of Home Avenue, San Diego, California. Brian F. Smith and Associates, San Diego, California.

1999 An Archaeological Survey for the Sgobassi Lot Split, San Diego County, California. Brian F. Smith and Associates, San Diego, California.

1999 An Evaluation of Cultural Resources at the Otay Ranch Village 11 Project. Brian F. Smith and Associates, San Diego, California.

1999 An Archaeological/Historical Survey and Evaluation of a Cultural Resource for The Osterkamp Development Project, Valley Center, California. Brian F. Smith and Associates, San Diego, California.

1999 An Archaeological Survey and Evaluation of Cultural Resources for the Palomar Christian Conference Center Project, Palomar Mountain, California. Brian F. Smith and Associates, San Diego, California.

1999 An Archaeological Survey and Evaluation of a Cultural Resource for the Proposed College Boulevard Alignment Project. Brian F. Smith and Associates, San Diego, California.

1999 Results of an Archaeological Evaluation for the Anthony's Pizza Acquisition Project in Ocean Beach, City of San Diego (with L. Pierson and B. Smith). Brian F. Smith and Associates, San Diego, California.

1996 An Archaeological Testing Program for the Scripps Poway Parkway East Project. Brian F. Smith and Associates, San Diego, California.

1995 Results of a Cultural Resources Study for the 4S Ranch. Brian F. Smith and Associates, San Diego, California.

1995 Results of an Archaeological Evaluation of Cultural Resources Within the Proposed Corridor for the San Elijo Water Reclamation System. Brian F. Smith and Associates, San Diego, California.

1994 Results of the Cultural Resources Mitigation Programs at Sites SDI-11,044/H and SDI-12,038 at the Salt Creek Ranch Project . Brian F. Smith and Associates, San Diego, California.

1993 Results of an Archaeological Survey and Evaluation of Cultural Resources at the Stallion Oaks Ranch Project. Brian F. Smith and Associates, San Diego, California.

1992 Results of an Archaeological Survey and the Evaluation of Cultural Resources at the Ely Lot Split Project. Brian F. Smith and Associates, San Diego, California.

1991 The Results of an Archaeological Study for the Walton Development Group Project. Brian F. Smith and Associates, San Diego, California.

Andrew J. Garrison, M.A., RPA

Senior Project Archaeologist

Brian F. Smith and Associates, Inc.
14010 Poway Road • Suite A •
Phone: (858) 679-8218 • Fax: (858) 679-9896 • E-Mail: agarrison@bfsa-ca.com

Education

Master of Arts, Public History, University of California, Riverside **2009**

Bachelor of Science, Anthropology, University of California, Riverside **2005**

Bachelor of Arts, History, University of California, Riverside **2005**

Professional Memberships

Register of Professional Archaeologists
Society for California Archaeology
Society for American Archaeology
California Council for the Promotion of History
Society of Primitive Technology
Lithic Studies Society
California Preservation Foundation
Pacific Coast Archaeological Society

Experience

Senior Project Archaeologist **June 2017–Present**
Brian F. Smith and Associates, Inc. **Poway, California**

Project management of all phases of archaeological investigations for local, state, and federal agencies including National Register of Historic Places (NRHP) and California Environmental Quality Act (CEQA) level projects interacting with clients, sub-consultants, and lead agencies. Supervise and perform fieldwork including archaeological survey, monitoring, site testing, comprehensive site records checks, and historic building assessments. Perform and oversee technological analysis of prehistoric lithic assemblages. Author or co-author cultural resource management reports submitted to private clients and lead agencies.

Senior Archaeologist and GIS Specialist **2009–2017**
Scientific Resource Surveys, Inc. **Orange, California**

Served as Project Archaeologist or Principal Investigator on multiple projects, including archaeological monitoring, cultural resource surveys, test excavations, and historic building assessments. Directed projects from start to finish, including budget and personnel hours proposals, field and laboratory direction, report writing, technical editing, Native American consultation, and final report submittal. Oversaw all GIS projects including data collection, spatial analysis, and map creation.

Preservation Researcher **2009**
City of Riverside Modernism Survey **Riverside, California**

Completed DPR Primary, District, and Building, Structure and Object Forms for five sites for a grant-funded project to survey designated modern architectural resources within the City of Riverside.

Information Officer **2005, 2008–2009**
Eastern Information Center (EIC), University of California, Riverside **Riverside, California**

Processed and catalogued restricted and unrestricted archaeological and historical site record forms. Conducted research projects and records searches for government agencies and private cultural resource firms.

Reports/Papers

2017 A Phase I Cultural Resources Assessment for the Marbella Villa Project, City of Desert Hot Springs, Riverside County, California. Brian F. Smith and Associates, Inc.

2017 Phase I Cultural Resources Survey for TTM 37109, City of Jurupa Valley, County of Riverside. Brian F. Smith and Associates, Inc.

2017 A Phase I Cultural Resources Survey for the Jefferson & Ivy Project, City of Murrieta, California. Brian F. Smith and Associates, Inc.

2017 A Phase I Cultural Resources Assessment for the Nuevo Dollar General Store Project, Riverside County, California. Brian F. Smith and Associates, Inc.

2017 A Phase I Cultural Resource Study for the Westmont Project, Encinitas, California. Brian F. Smith and Associates, Inc.

2017 A Phase I Cultural Resources Assessment for the Winchester Dollar General Store Project, Riverside County, California. Brian F. Smith and Associates, Inc.

2017 Phase I Cultural Resource Assessment for TTM 31810 (42.42 acres) Predico Properties Olive Grove Project. Scientific Resource Surveys, Inc.

2016 John Wayne Airport Jet Fuel Pipeline and Tank Farm Archaeological Monitoring Plan. Scientific Resource Surveys, Inc. On file at the County of Orange, California.

2016 Phase I Cultural Resources Assessment: All Star Super Storage City of Menifee Project, 2015-156. Scientific Resource Surveys, Inc. On file at the Eastern Information Center, University of California, Riverside.

2016 Historic Resource Assessment for 220 South Batavia Street, Orange, CA 92868 Assessor's Parcel Number 041-064-4. Scientific Resource Surveys, Inc. Submitted to the City of Orange as part of Mills Act application.

2015 Historic Resource Report: 807-813 Harvard Boulevard, Los Angeles. Scientific Resource Surveys, Inc. On file at the South Central Coastal Information Center, California State University, Fullerton.

2015 Exploring a Traditional Rock Cairn: Test Excavation at CA-SDI-13/RBLI-26: The Rincon Indian Reservation, San Diego County, California. Scientific Resource Surveys, Inc.

2015 Class III Scientific Resource Surveys, Inc. Survey for The Lynx Cat Granite Quarry and Water Valley Road Widening Project County of San Bernardino, California, Near the Community of Hinkley. Scientific Resource Surveys, Inc. On file at the South Central Coastal Information Center, California State University, Fullerton.

2014 Archaeological Phase I: Cultural Resource Survey of the South West Quadrant of Fairview Park, Costa Mesa. Scientific Resource Surveys, Inc. On file at the South Central Coastal Information Center, California State University, Fullerton.

2014 Archaeological Monitoring Results: The New Los Angeles Federal Courthouse. Scientific Resource Surveys, Inc. On file at the South Central Coastal Information Center, California State University, Fullerton.

2012 Bolsa Chica Archaeological Project Volume 7, Technological Analysis of Stone Tools, Lithic Technology at Bolsa Chica: Reduction Maintenance and Experimentation. Scientific Resource Surveys, Inc.

2010 Phase II Cultural Resources Report Site CA=RIV-2160 PM No. 35164. Scientific Resource Surveys, Inc. On file at the Eastern Information Center, University of California, Riverside.

2009 Riverside Modernism Context Survey, contributing author. Available online at the City of Riverside.

Presentations

2017 "Repair and Replace: Lithic Production Behavior as Indicated by the Debitage Assemblage from CA-MRP-283 the Hackney Site." Presented at the Society for California Archaeology Annual Meeting, Fish Camp, California.

2016 "Bones, Stones, and Shell at Bolsa Chica: A Ceremonial Relationship?" Presented at the Society for California Archaeology Annual Meeting, Ontario, California.

2016 "Markers of Time: Exploring Transitions in the Bolsa Chica Assemblage." Presented at the Society for California Archaeology Annual Meeting, Ontario, California.

2016 "Dating Duress: Understanding Prehistoric Climate Change at Bolsa Chica." Presented at the Society for California Archaeology Annual Meeting, Ontario, California.

2015 "Successive Cultural Phasing Of Prehistoric Northern Orange County, California." Presented at the Society for California Archaeology Annual Meeting, Redding, California.

2015 "Southern California Cogged Stone Replication: Experimentation and Results." Presented at the Society for California Archaeology Annual Meeting, Redding, California.

2015 "Prehistoric House Keeping: Lithic Analysis of an Intermediate Horizon House Pit." Presented at the Society for California Archaeology Annual Meeting, Redding, California.

2015 "Pits and Privies: The Use and Disposal of Artifacts from Historic Los Angeles." Presented at the Society for California Archaeology Annual Meeting, Redding, California.

2015 "Grooving in the Past: A Demonstration of the Manufacturing of OGR beads and a look at Past SRS, Inc. Replicative Studies." Demonstration of experimental manufacturing techniques at the January meeting of The Pacific Coast Archaeological Society, Irvine, California.

2014 "From Artifact to Replication: Examining *Olivella* Grooved Bead Manufacturing." Presented at the Society for California Archaeology Annual Meeting, Visalia, California.

2014 "New Discoveries from an Old Collection: Comparing Recently Identified OGR Beads to Those Previously Analyzed from the Encino Village Site." Presented at the Society for California Archaeology Annual Meeting, Visalia, California.

2012 Bolsa Chica Archaeology: Part Seven: Culture and Chronology. Lithic demonstration of experimental manufacturing techniques at the April meeting of The Pacific Coast Archaeological Society, Irvine, California.

2012 "Expedient Flaked Tools from Bolsa Chica: Exploring the Lithic Technological Organization." Presented at the Society for California Archaeology Annual Meeting, San Diego, California.

2012 "Utilitarian and Ceremonial Ground Stone Production at Bolsa Chica Identified Through Production Tools." Presented at the Society for California Archaeology Annual Meeting, San Diego, California.

2012 "Connecting Production Industries at Bolsa Chica: Lithic Reduction and Bead Manufacturing." Presented at the Society for California Archaeology Annual Meeting, San Diego, California.

2011 Bolsa Chica Archaeology: Part Four: Mesa Production Industries. Co-presenter at the April meeting of The Pacific Coast Archaeological Society, Irvine, California.

2011 "Hammerstones from Bolsa Chica and Their Relationship towards Site Interpretation." Presented at the Society for California Archaeology Annual Meeting, Rohnert Park, California.

2011 "Exploring Bipolar Reduction at Bolsa Chica: Debitage Analysis and Replication." Presented at the Society for California Archaeology Annual Meeting, Rohnert Park, California.

X. ATTACHMENT B

Project Maps:

General Location Map
USGS Project Location Map

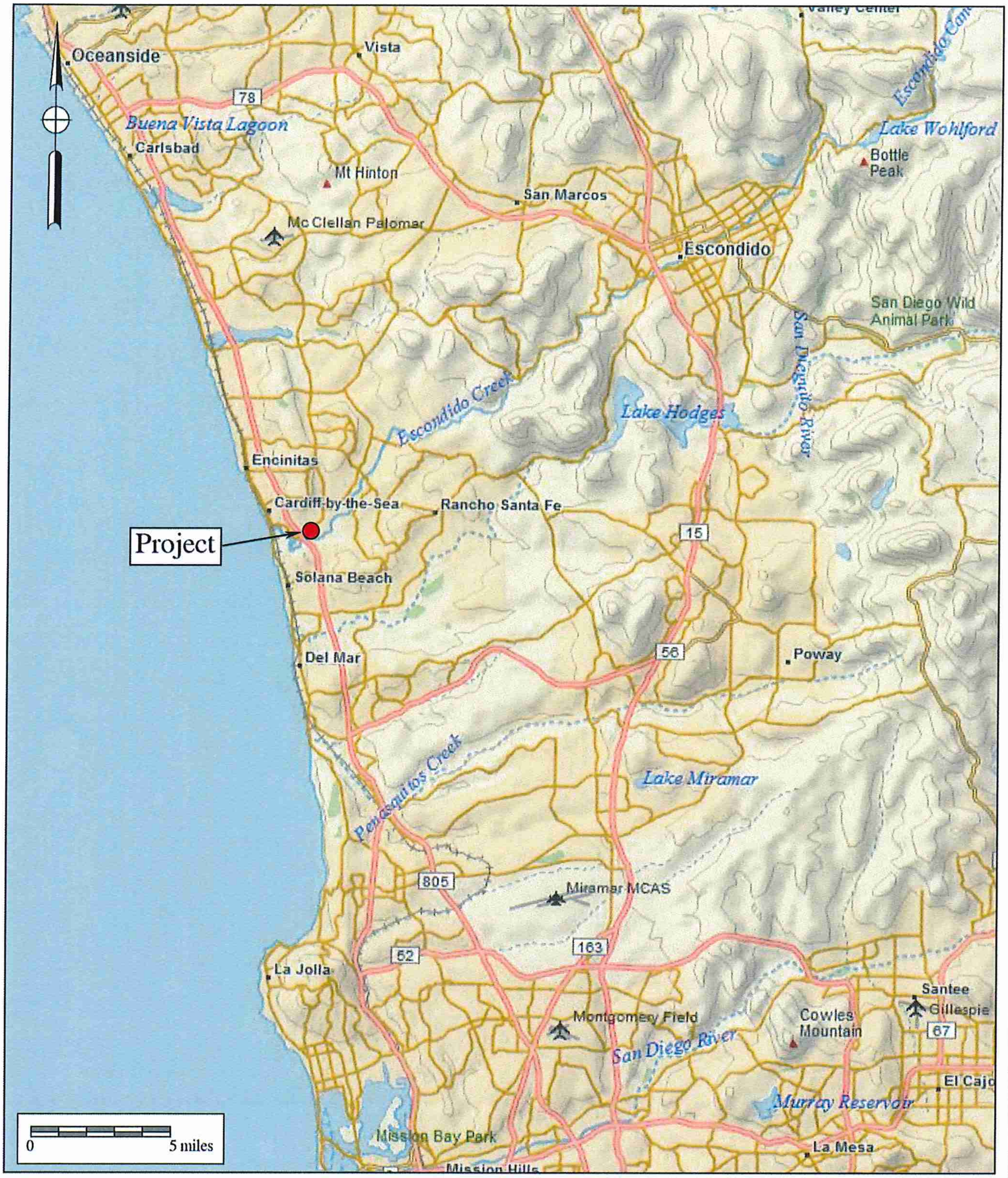

Figure 1

General Location Map

The 3111 Manchester Avenue Project

DeLorme (1:250,000)

Brian F. Smith & Associates, Inc.
Archaeology · History · Paleontology · Biology

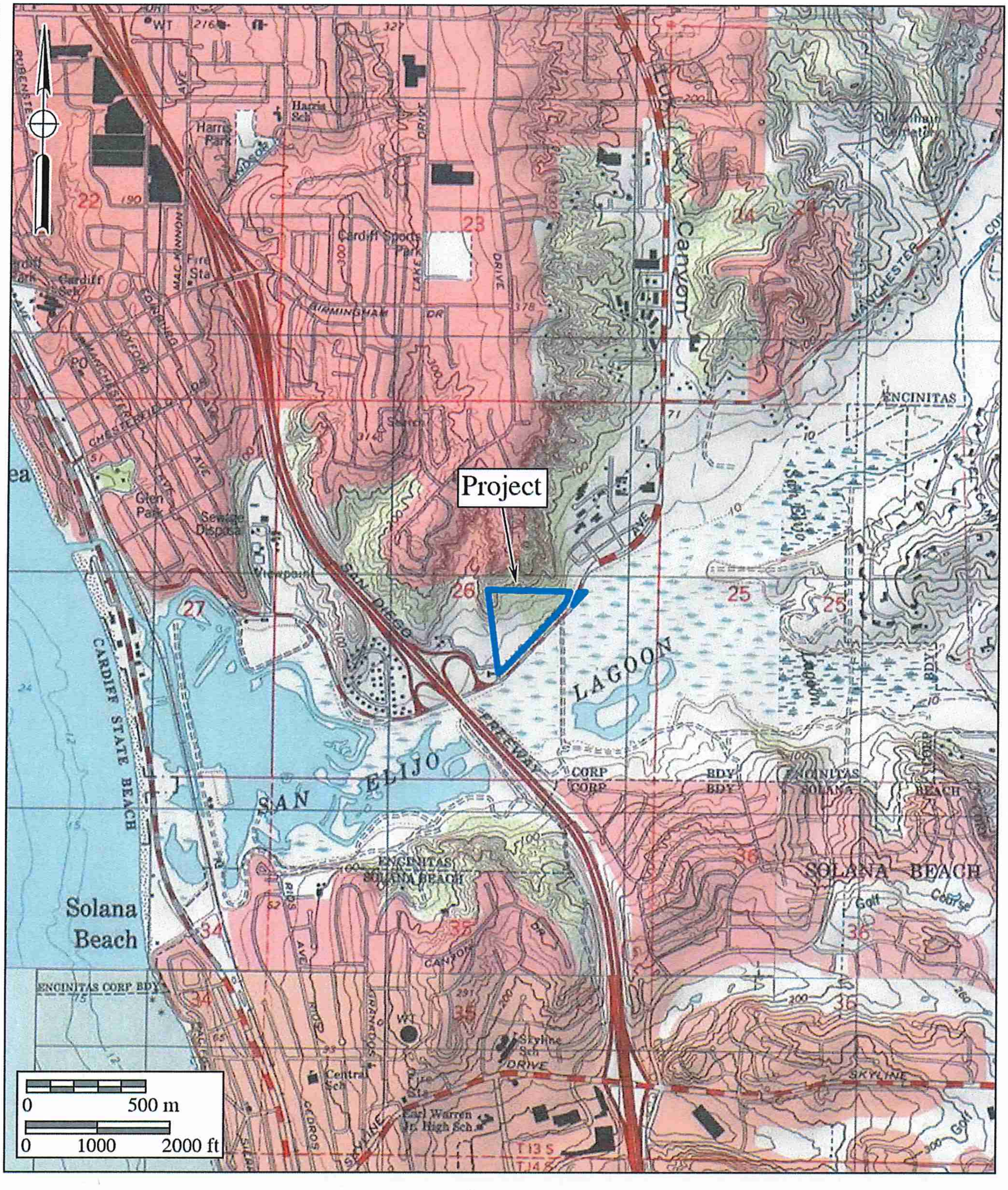

Figure 2

Project Location Map

The 3111 Manchester Avenue Project

USGS *Encinitas* Quadrangle (7.5-minute series)

XI. CONFIDENTIAL APPENDIX

Department of Parks and Recreation Site Form
Archaeological Records Search Results
NAHC Sacred Lands Search Results

(Deleted for Public Review; Bound Separately)

E-2

Phase I Cultural Resources Study Confidential Appendix

Not for public review. If you have questions about this appendix, please contact the City of Encinitas Planning Department.

E-3

Assembly Bill 52 Consultation

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City of Encinitas
Development Services Department
505 S. Vulcan Avenue, Encinitas, California 92024-3633

October 3, 2019

VIA ELECTRONIC MAIL
AND U.S. MAIL

Ms. Cami Mojado
Cultural Resources Manager
San Luis Rey Band of Mission Indians
1889 Sunset Drive
Vista, CA 92081

SUBJECT: AB 52 Notification for the Belmont Village Encinitas-by-the-Sea Project (City Case # 17-273)

Dear Ms. Mojado,

Pursuant to Public Resources Code Section 21080.3.1, this letter serves as formal notification of the above-referenced development application for tribal consultation purposes. The project site consists of vacant property (APN# 261-210-01-00) located at 3111 Manchester Avenue in the City of Encinitas (see attached location map). The project proposes the construction of a residential care facility and separate affordable housing units on 19.027 acres. Most of the project site has been utilized as active farmland.

The project applicant has retained the services of Brian F. Smith and Associates to conduct a Phase I Archaeological Survey for the project. The survey report, attached for your review, indicated that no significant cultural resources were observed on the project site. The consulting archaeologist recommended archaeological monitoring during construction activity.

If you wish to request consultation for this project, please contact me within 30 days. My contact information is:

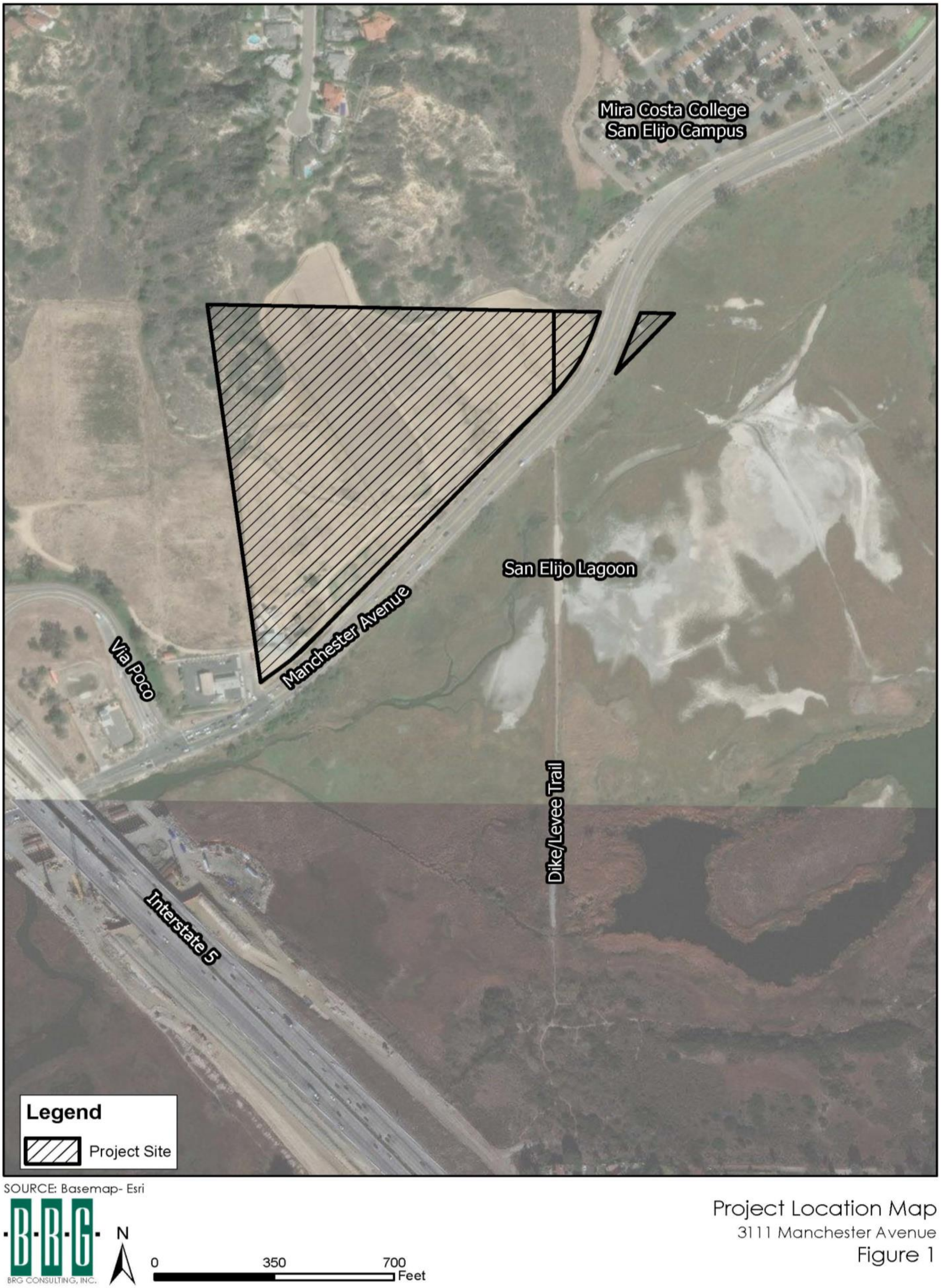
Scott Vurbeff
Environmental Project Manager
Encinitas Development Services Department
505 S. Vulcan Avenue
Encinitas, CA 92024
Ph. 760-633-2692
Email: svurbeff@encinitasca.gov

Please contact me if you need any additional information.

Sincerely,

Scott Vurbeff
Environmental Project Manager

Enclosures: 1. Project Location Map
2. Grading Plan (via email)
3. Geotechnical Study (via email)
4. Phase I Archaeological Study (via email)



SOURCE: Basemap- Esri

BRG CONSULTING, INC.

Project Location Map

3111 Manchester Avenue

Figure 1

F-1

Geotechnical Summary for Due Diligence

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ALTA CALIFORNIA
GEOTECHNICAL INC.

170 North Maple Street, Suite 108
Corona, CA 92880
www.altageotechnical.com

GRAYSTAR
44 South Cedros Ave., Suite 172
Solana Beach, California 92075

January 2, 2018
Project Number 2-0126

Attention: Mr. Beau Brand
Associate Development

Subject: **GEOTECHNICAL SUMMARY FOR DUE DILIGENCE**
3111 Manchester Avenue, Senior Housing Project
City of Encinitas, California

References: See Appendix A

Mr. Brand:

Presented herein is Alta California Geotechnical, Inc.'s (Alta's) geotechnical investigation and summary for due diligence for the property located at 3111 Manchester, a proposed senior housing project in the City of Encinitas, California. Alta's study is based on referenced literature, maps and air photos, the enclosed conceptual plan (Plate 1) with topography provided by Urban Resource and dated December 7, 2017, and our subsurface investigation and analyses. Based on this information, it is Alta's opinion that this project appears to be suitable for development provided that the recommendations resented herein are incorporated into the site planning, grading and construction. Presented below is a discussion of the site conditions, the soil characteristics and the most relevant geotechnical issues.

Project Description

The 3111 Manchester Avenue property consists of a trapezoid-shaped, 15±-acre parcel located approximately 1,100 feet northeast of the intersection of Manchester and Interstate 5 (Plate 1). Manchester Avenue forms the southeast site boundary. The north and west sides of the site are bounded largely by gently to steeply southward sloping open space. The terrain across the property ranges from flat to locally steep, while the proposed development areas have moderate to nearly flat inclinations.

The site is mostly vacant. Strawberry fields are currently planted in the central and northern portions of the site. A shed, irrigation lines, buried a buried water mainline lines and unimproved roads are present. Very sparse weeds occur over the site. A moderate cover of chaparral covers the steep hillsides in the north portion of the site.

Based on vintage air photos past land use has been agricultural since at least 1947 through 1953. Then, sometime before 1964 through at least 1980 the site was left fallow. By at least 1989 to present, the site has been used again for agriculture.

The proposed development concept is shown on enclosed Plate 1. We anticipate that conventional cut and fill grading techniques, coordinated with liquefaction mitigation techniques, would be used to develop the site for the support of wood-frame and stucco construction with shallow foundations and reinforced concrete slabs-on-grade, and associated improvements. Alta anticipates that retaining walls will be programmed into the site development.

Site Investigation

Alta conducted a subsurface investigation in December of 2017. Our subsurface investigation included the excavation, logging and sampling of six (6) hollow stem auger borings to depths of up to 51 feet at the approximate locations shown on enclosed Plate 1. The boring logs are presented in Appendix B. Laboratory testing has been performed on a bulk and ring samples obtained during the hollow stem drilling operations. Alta also commissioned the advancement of four (4) cone penetrometer (CPT) soundings by Gregg Drilling. The locations of the CPT soundings are shown on enclosed Plate 1 and the logs are presented in Appendix C.

Alta performed preliminary infiltration in the southwest portion of the site at the location shown on enclosed Plate 1.

Geologic Conditions

The site is underlain by Holocene- to late Pleistocene-age “young alluvial flood-plain deposits” that slope gently southward into the northern edge of San Elijo Lagoon. The sediments are sourced from the Eocene-age sandstone bluffs composed of Torrey Sandstone and Del Mar Formations along the northern portions of the site and offsite. The distribution of these geologic units is shown on enclosed Plate 1. Very minor prisms of artificial fill associated with agricultural practices occur throughout the site.

Landsliding and active faulting are not known to occur on the subject project. The southern portion of the site may be susceptible inundation from a tsunami. The FEMA flood limits are provided on the enclosed plan (Plate 1).

The groundwater surface was encountered during our subsurface investigation at elevations ranging from 2 to 6 feet above mean sea level.

Soil Characteristics

Hollow stem auger drilling and cone penetrometer soundings (CPT) easily penetrated the "young alluvial flood plain deposits" (alluvium) to depths of up to 51 feet.

The alluvium consists of largely of sands, silty sands, sandy silts and clayey silts. Clays and silty clays become predominant in the central portion of the site below 40 feet below the ground surface. Consistencies in the sands range from very loose to loose. Moistures range from slightly moist near the ground surface increasing to very moist to wet below groundwater surface.

The expansion potential of the alluvium appears to be largely "very low" based on our laboratory testing.

Soluble sulfate tests were performed as part of this investigation, and the results indicate that the soluble sulfate concentrations of the soils tested are classified as negligible (Class S0) per ACI 318-14. Negligible chloride levels were detected in the onsite soils. Resistivity testing indicated that the soils are "mildly corrosive" to buried metals.

Liquefaction

Seismic agitation of relatively loose saturated sands, silty sands, and some silts can result in a buildup of pore pressure. If the pore pressure exceeds the overburden stresses, a temporary quick condition known as liquefaction can occur. In general, the more recent that a sediment has been deposited, the more likely it will be susceptible to liquefaction. Other factors that must be considered are: groundwater, confining stresses, relative density, and the intensity and duration of seismically-induced ground shaking. Liquefaction effects can manifest in several ways including: 1) loss of bearing; 2) lateral spread; 3) dynamic settlement; and 4) flow failure. Lateral spreading has typically been the most damaging mode of failure.

Considering the relatively young age of the onsite alluvium, the relatively shallow onsite groundwater surface, and the potential for ground shaking in seismically active Southern California, Alta has undertaken a geotechnical liquefaction investigation and analysis with the use of SPT data obtained during hollow-stem auger drilling and CPT soundings.

Based on the historical and current depth to groundwater, it is Alta's opinion that the potential for liquefaction is very high at the 3111 Manchester Avenue site. Alta's liquefaction analysis is summarized in Appendix D. The results indicate that as much as eleven- (11) inches of settlement is possible for the subject project during a seismic event (earthquake). Typically, half to two-thirds of that settlement should be considered differential (California Division of Mines and Geology, 2008).

Qualitatively, given the anticipated grading concept that will result in a "free-face" fill slope along the site limits paralleling Manchester Avenue in the southern portions of the site, Alta anticipates that there also is a high probability for lateral spreading to occur.

As such, Alta recommends that the upper 30 feet of onsite alluvium be mitigated for liquefaction using specialized ground improvement techniques, such as dynamic compaction or stone columns. Alta recommends that a consultant who specializing in deep ground modification techniques for liquefaction be consulted for the liquefaction mitigation for this site. Mitigation techniques should be sufficient to yield a 4-inch or less potential for settlement and a maximum dynamic differential settlement of 2.0 inches or less over 40 feet.

Slope Analyses

Based on Alta's site investigation and our experience in coastal San Diego North County, it is anticipated that graded fill slopes will be stable to heights of at least 30 feet designed if designed at ratios of 2:1 (horizontal: vertical) or flatter, assuming they are graded to the City of Encinitas criteria and observed and tested by a qualified geotechnical consultant.

Alta anticipates that slopes cut in alluvium will not be surficially stable and, as such, will require replacement with a drained stabilization fill. Additionally, it is anticipated that slopes exposing bedrock Del Mar Formation or Torrey Sandstone will likely be grossly and surficially stable at ratios of 2:1 (horizontal: vertical) or flatter.

Detailed grading recommendations should be developed when grading plans become available. It is important that grading recommendations and liquefaction mitigation techniques be coordinated. All grading recommendations should conform to the City of Encinitas criteria.

Infiltration Testing and Storm Water Infiltration Systems

Preliminary infiltration testing was conducted in the southwest portion of the site, as indicated on enclosed Plate 1, using a double ring infiltrometer at a depth of 2 feet below the ground surface. The resulting infiltration rate from was approximately 2.0-inches per hour. No factor of safety has been applied to this rate.

From a geotechnical perspective, allowing storm water to infiltrate the onsite soil in concentrated areas increases the potential for settlement, liquefaction, and water-related damage to structures/improvements, such as wet slabs or pumping subgrade, and should be avoided where possible. If infiltration systems are required on this site, care should be taken in designing systems that control the storm water as much as possible.

Earthwork Adjustments

For the purposes of earthwork balance, it can be anticipated that that the alluvium will shrink approximately 15 to 20% when removed and recompacted as engineered fill.

Import Soils

Alta recommends that the expansion potential of import soils, if any are required, be low to very low in with negligible sulfate and chloride contents, as verified by appropriate laboratory testing.

Foundations

Given the anticipated differential settlement after site grading and liquefaction mitigation have been accomplished, the proposed structures will likely require post-tensioned or mat foundation systems.

Pavement Design

Pavement sections for the proposed streets should be designed based on laboratory testing conducted on samples taken from the soil subgrade after grading is completed.

Future Reports and Plan Reviews

This report represents a summary review of the most relevant geotechnical site issues. As the project design for the project progresses, site specific geologic and geotechnical issues should be considered in the design and construction of the project. Consequently, comprehensive reports plan reviews will be necessary. These reports and reviews may include reviews of:

- Tentative Maps
- Grading Plans
- Foundation Plans
- Utility Plans

These plans should be forwarded to the project Geotechnical Consultant for review.

Alta appreciates the opportunity to provide you with geotechnical consulting services. If you have any questions or should you require any additional information, please contact the undersigned at (619) 920-2694.

Sincerely,

Alta California Geotechnical, Inc.

DAVID A. MURPHY/CEG 1813
Reg. Exp.: 10-31-19
Engineering Geologist
President

DAVID A. MURPHY
No. 1813
Exp. 10-31-19

SCOTT A. GRAY/RGE 2857
Reg. Exp.: 12-31-18
Registered Geotechnical Engineer
Vice President

SCOTT A. GRAY
No. 2857
Exp. 12-31-18

Distribution: (1) Addressee

DAM: SAG: 2-0126, January 2, 2018 (Geo Summary for Due Diligence, Manchester Ave., Senior Housing)

APPENDIX A

References

APPENDIX A

References

Abbott, P.L., 1985, On the manner of deposition of the Eocene strata in northern San Diego County: San Diego Association of Geologists Guidebook, 98 p.

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APPENDIX B

Logs of Borings

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions		grf	ltr	Description
Coarse Grained Soils More than 50% retained on No. 200 sieve	Gravel and Gravelly Soils More than 50% of coarse fraction retained on No,. 4 sieve		GW	Well-graded gravels or gravel sand mixtures, little or no fines
			GP	Poorly-graded gravels or gravel sand mixture, little or no fines
			GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	Sand and Sandy Soils More than 50% of coarse fraction passes on No,. 4 sieve		SW	Well-graded sands or gravelly sands, little or no fines
			SP	Poorly-graded sands or gravelly sands, little or no fines
			SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, and-clay mixtures

Major Divisions		grf	ltr	
Fine Grained Soils More than 50% passes on No. 200 sieve	Silts And Clays LL,<50		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			OL	Organic silts and organic silt-clays of low plasticity
	Silts And Clays LL,<50		MH	Inorganic silts, micaceous or diatomaceous fine or silty soils, elastic silts
			VH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
Highly Organic Soils			PT	Peat and other highly organic soils

BOUNDARY CLASSIFICATION: Soils possessing characteristics of two groups are designated by combinations of group symbols.

PARTICLE SIZE LIMITS

U.S. STANDARD SERIES SIEVE — CLEAR SQUARE SIEVE OPENINGS

	200	40	10	4	3/4"	3"	12"
Silts and Clays	Sand			Gravel		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		

RELATIVE DENSITY

Sands and Gravels	Blows/Foot (SPT)
Very Loose	<4
Loose	4-10
Medium Dense	11-30
Dense	31-50
Very Dense	>50

CONSISTENCY CLASSIFICATION

Silts and Clays	Criteria
Very Soft	Thumb penetrates soil >1 in.
Soft	Thumb penetrates soil 1 in.
Firm	Thumb penetrates soil 1/4 in.
Stiff	Readily indented with thumbnail
Very Stiff	Thumbnail will not indent soil

HARDNESS

Bedrock
Soft
Moderately Hard
Hard
Very Hard

LABORATORY TESTS

Symbol	Test
DS	Direct Shear
DSR	Direct Shear (Remolded)
CON	
SA	Sieve Analysis
MAX	Maximum Density
RV	Resistance (R) Value
EI	Expansion Index
SE	Sand Equivalent
AL	Atterberg Limits
CHEM	Chemical Analysis
HY	Hydrometer Analysis

SOIL MOISTURE

Increasing Visual Moisture Content ↓

- Dry - Dry to touch
- Moist - Damp, but no visible free water
- wet - Visible free water

SIZE PROPORTIONS

Trace - <5%

Few - 5 to 10%

Some - 15 to 25%

KEY TO EXPLORATORY BORING LOGS

ALTA CALIFORNIA GEOTECHNICAL INC.

PLATE B

GEOTECHNICAL BORING LOG

SHEET 1 OF 2

PROJECT NO.	2-0126	PROJECT NAME	Manchester Ave.		
DATE STARTED	12/5/17	GROUND ELEV.	12	BORING DESIG.	B-01
DATE FINISHED	12/5/17	GW DEPTH (FT)	9	LOGGED BY	JC
DRILLER	Pacific Drilling Co.	DRIVE WT.	140 lbs.	NOTE	
TYPE OF DRILL RIG	8" Hollow Stem	DROP	30 in.		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SP	**ALLUVIUM** (Qal): SAND, fine to medium grained, tan, dry, loose, w/ roots.				
	10									
		R	4/5/6				3.5	96	13	
						@ 4.0 ft. slightly moist.				
5		R	2/2/1			@ 5.0 ft. brownish tan.	13.0			CON, HY
	5									
						▼ @ 9.0 ft. Groundwater encountered.				
10		R	11							
						@ 11.0 ft. wet, loose, some clay.				
	0									
15		S	1/3/3							
	-5									
20		S	Push/1/2		SM	@ 20.0 ft. SILTY SAND, very fine to fine grained, grayish tan, wet, loose, some clay.				
					SP	@ 21.0 ft. SAND, fine to medium grained, gray, wet, loose, rotten egg smell, some clay.				
	-10									
25		S	8/11/15		SM	@ 25.0 ft. SILTY SAND, very fine to fine grained, grey, wet, loose, slight egg smell, trace clay.				
	-15									
30		S	9/10/7			@ 30.0 ft. trace fine gravel up to 1/4" in diameter, trace sea shell fragments.				
	-20									
35		S	5/10/11			@ 35.0 ft. some sea shell fragments.				
	-25									
						Continued.				

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE   T TUBE SAMPLE

▼ GROUNDWATER
► SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

GEOTECHNICAL BORING LOG

SHEET 2 OF 2

PROJECT NO. 2-0126
DATE STARTED 12/5/17
DATE FINISHED 12/5/17
DRILLER Pacific Drilling Co.
TYPE OF DRILL RIG 8" Hollow Stem

PROJECT NAME Manchester Ave.
GROUND ELEV. 12
GW DEPTH (FT) 9
DRIVE WT. 140 lbs.
DROP 30 in.

BORING DESIG. B-01
LOGGED BY JC
NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
		S	6/6/11			**ALLUVIUM** (Qal): Continued;				
	-30									
45		S	7/6/9			@ 45.0 ft. trace sea shell fragments.				
	-35									
50		S	5/6/5			@ 50.0 ft. some sea shell fragments.				
						TOTAL DEPTH 51.5 FT. GROUNDWATER ENCOUNTERED AT 9 FT. CAVING OCCURRED				

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

▼ GROUNDWATER
➤ SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 2-0126 PLATE B-01

GEOTECHNICAL BORING LOG

SHEET 1 OF 1

PROJECT NO. 2-0126
DATE STARTED 12/5/17
DATE FINISHED 12/5/17
DRILLER Pacific Drilling Co.
TYPE OF DRILL RIG 8" Hollow Stem
PROJECT NAME Manchester Ave.
GROUND ELEV. 12
GW DEPTH (FT) 9
DRIVE WT. 140 lbs.
DROP 30 in.
BORING DESIG. B-02
LOGGED BY JC
NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SP	**ALLUVIUM** (Qal): SAND, fine grained, tan, dry, very loose, w/ roots.				
	10									
		B				@ 3.0 ft. slightly moist.				
5		R	8			@ 5.0 ft. loose.				DSR, MAX, EI, HY, CHEM
	5					@ 7.0 ft. trace silt.				
					▼	@ 9.0 ft. Groundwater encountered.				
10		R	6			@ 10.0 ft. wet.	28.3			
	0									
15		S	2/3/5							
	-5									
20		S	2/2/3							
	-10									
25		S	5/8/10			@ 25.0 ft. very fine to fine grained, grey, loose, some silt, trace clay.				
	-15									
30		S	3/7/13			@ 30.0 ft. trace sea shell fragments.				
	-20									
35		S	8/9/7			@ 35.0 ft. some sea shell fragments up to 1/4"				
						TOTAL DEPTH 36.5 FT. GROUNDWATER ENCOUNTERED AT 9 FT. CAVING OCCURRED.				

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE T TUBE SAMPLE

▼ GROUNDWATER
➤ SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 2-0126 PLATE B-02

GEOTECHNICAL BORING LOG

SHEET 1 OF 1

PROJECT NO.	2-0126	PROJECT NAME	Manchester Ave.		
DATE STARTED	12/5/17	GROUND ELEV.	23	BORING DESIG.	B-03
DATE FINISHED	12/5/17	GW DEPTH (FT)	20	LOGGED BY	JC
DRILLER	Pacific Drilling Co.	DRIVE WT.	140 lbs.	NOTE	
TYPE OF DRILL RIG	8" Hollow Stem	DROP	30 in.		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SP	**ALLUVIUM** (Qal): SAND, very fine to medium grained, tan, dry, loose, w/ roots.				
	20					@ 3.0 ft. slightly moist.				
5		R	4/5/8			@ 5.0 ft. very fine to fine grained.	9.4	99	37	
	15									
10		R	4/5/8			@ 10.0 ft. very fine to coarse grained, brownish tan.	7.1	100	29	
	10									
15		R	4/5/8				11.5	98	44	
	5									
20		R	2/3/6			▼ @ 20.0 ft. Groundwater encountered, wet.	23.9	100	97	
	0									
25		S	2/4/6							
	-5									
30		S	2/5/10							
	-10									
35		S	4/4/5			@ 35.0 ft. trace sea shell fragments.				

TOTAL DEPTH 36.5 FT.
GROUNDWATER ENCOUNTERED AT 20 FT.
CAVING OCCURRED.

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

▼ GROUNDWATER
➤ SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 2-0126

PLATE B-03

GEOTECHNICAL BORING LOG

SHEET 1 OF 2

PROJECT NO. 2-0126
DATE STARTED 12/6/17
DATE FINISHED 12/6/17
DRILLER Pacific Drilling Co.
TYPE OF DRILL RIG 8" Hollow Stem

PROJECT NAME Manchester Ave.
GROUND ELEV. 17
GW DEPTH (FT) 11
DRIVE WT. 140 lbs.
DROP 30 in.

BORING DESIG. B-04
LOGGED BY JC
NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SP	**ALLUVIUM** (Qal): SAND, fine to medium grained, tan, dry, very loose, w/roots. @ 1.0 ft. slightly moist.				
	15									
		R	8			@ 2.5 ft. loose.	7.7	94	27	
5		R	9			@ 5.0 ft. very moist.				
	10									
10		R	13			▼ @ 10.5 ft. Groundwater encountered.				
	5									
15		R	7			@ 15.0 ft. grey, strongly mottled orange.	26.6	94	92	
	0									
20		S	6/4/1			@ 20.0 ft. fine to coarse grained.				
	-5									
25		S	3/4/5			@ 25.0 ft. very fine to medium grained, trace clay.				
	-10									
						@ 28.0 ft. medium to coarse grained.				
30		S	5/5/7			@ 30.0 ft. very fine to medium grained, brown.				
	-15									
35		S	5/6/7							
	-20									
						Continued.				

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE T TUBE SAMPLE

▼ GROUNDWATER
➤ SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 2-0126 PLATE B-04

GEOTECHNICAL BORING LOG

SHEET 2 OF 2

PROJECT NO.	2-0126	PROJECT NAME	Manchester Ave.		
DATE STARTED	12/6/17	GROUND ELEV.	17	BORING DESIG.	B-04
DATE FINISHED	12/6/17	GW DEPTH (FT)	11	LOGGED BY	JC
DRILLER	Pacific Drilling Co.	DRIVE WT.	140 lbs.	NOTE	
TYPE OF DRILL RIG	8" Hollow Stem	DROP	30 in.		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
		S	5/6/7			**ALLUVIUM** (Qal): Continued; trace silt				
	-25									
45		S	4/5/5							
	-30									
50		S	3/3/4							
						TOTAL DEPTH 51.5 FT. GROUNDWATER ENCOUNTERED AT 10.5 FT. CAVING OCCURRED.				

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE T TUBE SAMPLE

▼ GROUNDWATER
➤ SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 2-0126 PLATE B-04

GEOTECHNICAL BORING LOG

SHEET 1 OF 1

PROJECT NO.	2-0126	PROJECT NAME	Manchester Ave.		
DATE STARTED	12/6/17	GROUND ELEV.	17	BORING DESIG.	B-05
DATE FINISHED	12/6/17	GW DEPTH (FT)	16	LOGGED BY	JC
DRILLER	Pacific Drilling Co.	DRIVE WT.	140 lbs.	NOTE	
TYPE OF DRILL RIG	8" Hollow Stem	DROP	30 in.		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SP	**ALLUVIUM** (Qal): SAND, fine to medium grained, tan, dry, very loose, w/ roots.				
	15					@ 2.0 ft. slightly moist, brownish tan.				
5		R	4/6/7			@ 5.0 ft. loose.	4.2	98	16	
	10									
10		R	15			@ 10.0 ft. fine to coarse grained, tan, moderately dense.	7.0	99	28	
	5									
15		R	13			▼ @ 15.0 ft. wet, trace gravel up to 1" in diameter. @ 15.5 ft. Groundwater encountered.	23.6	99	93	
	0									
20		S	2/4/5			@ 20.0 ft. medium to coarse grained, trace sea shell fragments.				
	-5									
25		S	3/4/4							

TOTAL DEPTH 26.5 FT.
GROUNDWATER ENCOUNTERED AT 15.5 FT.
CAVING OCCURRED.

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

▼ GROUNDWATER
➤ SEEPAGE
J: JOINTING C: CONTACT
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S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 2-0126

PLATE B-05

GEOTECHNICAL BORING LOG

SHEET 1 OF 1

PROJECT NO. 2-0126
DATE STARTED 12/6/17
DATE FINISHED 12/6/17
DRILLER Pacific Drilling Co.
TYPE OF DRILL RIG 8" Hollow Stem

PROJECT NAME Manchester Ave.
GROUND ELEV. 20
GW DEPTH (FT) 26
DRIVE WT. 140 lbs.
DROP 30 in.

BORING DESIG. B-06
LOGGED BY JC
NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
	20			░	SP	**ALLUVIUM** (Qal): SAND, fine to medium grained, tan, dry, very loose, w/ roots.				
		R	16	░		@ 2.5 ft. slightly moist, moderately dense, brown, trace roots.	5.0	96	18	
5	15	R B	13	░		@ 5.0 ft. tan, very fine to fine grained, trace roots.	5.4	97	20	EI, HY, CHEM
10	10	R	11	░		@ 10.0 ft. some mottled brown.	7.5	98	29	CON, HY
15	5	R	6	░		@ 15.0 ft. trace orange mottling.	7.8	95	28	
20	0			░						
25	-5	R	11	▨	CL	▼ @ 25.0 ft. SANDY CLAY, fine to medium grained, brown, moist to wet, moderately firm, trace mottled orange. @ 26.0 ft. Groundwater encountered.	22.9	102	97	
30	-10	S	Push/15/9	▨		@ 30.0 ft. very fine to fine grained, greenish grey, wet, soft.				

TOTAL DEPTH 31.5 FT.
GROUNDWATER ENCOUNTERED AT 26 FT.
CAVING OCCURRED.

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

▼ GROUNDWATER
► SEEPAGE
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Alta California Geotechnical, Inc.

P.N. 2-0126

PLATE B-06

GREGG

GREGG DRILLING & TESTING, INC.
GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION SERVICES

12/12/17

Alta California Geotechnical, Inc.
Attn: Dave Murphy

Subject: CPT Site Investigation
Manchester Encinitas
Encinitas, California
GREGG Project Number: 17-647SH

Dear Mr. Murphy:

The following report presents the results of GREGG Drilling & Testing's Cone Penetration Test investigation for the above referenced site. The following testing services were performed:

1	Cone Penetration Tests	(CPTU)	☒
2	Pore Pressure Dissipation Tests	(PPD)	☒
3	Seismic Cone Penetration Tests	(SCPTU)	☐
4	UVOST Laser Induced Fluorescence	(UVOST)	☐
5	Groundwater Sampling	(GWS)	☐
6	Soil Sampling	(SS)	☐
7	Vapor Sampling	(VS)	☐
8	Pressuremeter Testing	(PMT)	☐
9	Vane Shear Testing	(VST)	☐
10	Dilatometer Testing	(DMT)	☐

A list of reference papers providing additional background on the specific tests conducted is provided in the bibliography following the text of the report. If you would like a copy of any of these publications or should you have any questions or comments regarding the contents of this report, please do not hesitate to contact our office at (562) 427-6899.

Sincerely,
GREGG Drilling & Testing, Inc.

Frank Stolfi
HRSC Division Manager, Gregg Drilling & Testing, Inc.

GREGG DRILLING & TESTING, INC.
GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION SERVICES

Cone Penetration Test Sounding Summary

-Table 1-

CPT Sounding Identification	Date	Termination Depth (feet)	Depth of Groundwater Samples (feet)	Depth of Soil Samples (feet)	Depth of Pore Pressure Dissipation Tests (feet)
CPT-1	12/11/17	52	-	-	-
CPT-2	12/11/17	51	-	-	-
CPT-3	12/11/17	51	-	-	51.3
CPT-4	12/11/17	52	-	-	-

Bibliography

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Robertson, P.K., T. Lunne and J.J.M. Powell, "Geo-Environmental Application of Penetration Testing", Geotechnical Site Characterization, Robertson & Mayne (editors), 1998 Balkema, Rotterdam, ISBN 90 5410 939 4 pp 35-47.

Campanella, R.G. and I. Weemees, "Development and Use of An Electrical Resistivity Cone for Groundwater Contamination Studies", Canadian Geotechnical Journal, Vol. 27 No. 5, 1990 pp. 557-567.

DeGroot, D.J. and A.J. Lutenegger, "Reliability of Soil Gas Sampling and Characterization Techniques", International Site Characterization Conference - Atlanta, 1998.

Woeller, D.J., P.K. Robertson, T.J. Boyd and Dave Thomas, "Detection of Polyaromatic Hydrocarbon Contaminants Using the UVIF-CPT", 53rd Canadian Geotechnical Conference Montreal, QC October pp. 733-739, 2000.

Zemo, D.A., T.A. Delfino, J.D. Gallinatti, V.A. Baker and L.R. Hilpert, "Field Comparison of Analytical Results from Discrete-Depth Groundwater Samplers" BAT EnviroProbe and QED HydroPunch, Sixth national Outdoor Action Conference, Las Vegas, Nevada Proceedings, 1992, pp 299-312.

Copies of ASTM Standards are available through www.astm.org

Cone Penetration Testing Procedure (CPT)

Gregg Drilling carries out all Cone Penetration Tests (CPT) using an integrated electronic cone system, *Figure CPT.*

The cone takes measurements of tip resistance (q_c), sleeve resistance (f_s), and penetration pore water pressure (u_2). Measurements are taken at either 2.5 or 5 cm intervals during penetration to provide a nearly continuous profile. CPT data reduction and basic interpretation is performed in real time facilitating on-site decision making. The above mentioned parameters are stored electronically for further analysis and reference. All CPT soundings are performed in accordance with revised ASTM standards (D 5778-12).

The 5mm thick porous plastic filter element is located directly behind the cone tip in the u_2 location. A new saturated filter element is used on each sounding to measure both penetration pore pressures as well as measurements during a dissipation test (*PPDT*). Prior to each test, the filter element is fully saturated with oil under vacuum pressure to improve accuracy.

When the sounding is completed, the test hole is backfilled according to client specifications. If grouting is used, the procedure generally consists of pushing a hollow tremie pipe with a "knock out" plug to the termination depth of the CPT hole. Grout is then pumped under pressure as the tremie pipe is pulled from the hole. Disruption or further contamination to the site is therefore minimized.

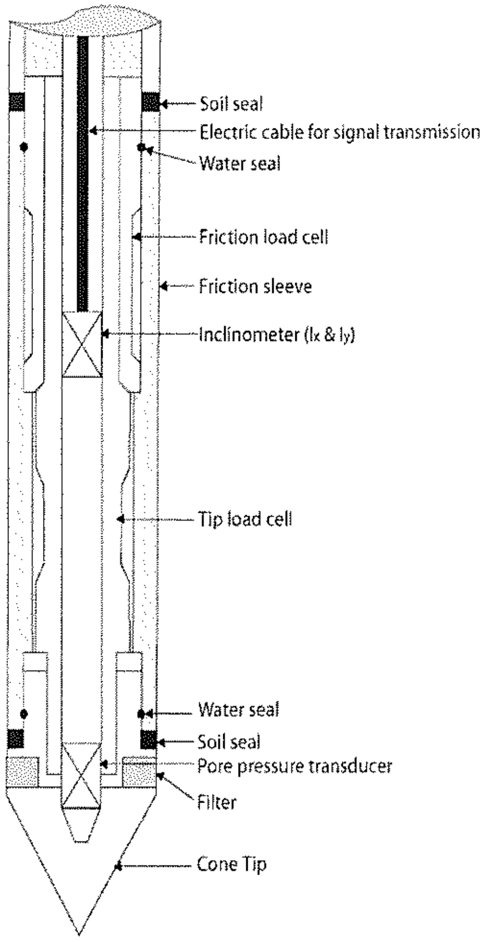


Figure CPT

Gregg 15cm^2 Standard Cone Specifications

Dimensions	
Cone base area	15 cm^2
Sleeve surface area	225 cm^2
Cone net area ratio	0.80
Specifications	
Cone load cell	
Full scale range	180 kN (20 tons)
Overload capacity	150%
Full scale tip stress	120 MPa (1,200 tsf)
Repeatability	120 kPa (1.2 tsf)
Sleeve load cell	
Full scale range	31 kN (3.5 tons)
Overload capacity	150%
Full scale sleeve stress	1,400 kPa (15 tsf)
Repeatability	1.4 kPa (0.015 tsf)
Pore pressure transducer	
Full scale range	7,000 kPa (1,000 psi)
Overload capacity	150%
Repeatability	7 kPa (1 psi)

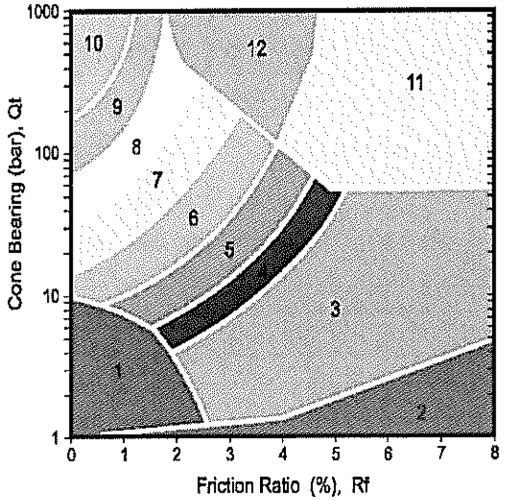
Note: The repeatability during field use will depend somewhat on ground conditions, abrasion, maintenance and zero load stability.

Cone Penetration Test Data & Interpretation

The Cone Penetration Test (CPT) data collected are presented in graphical and electronic form in the report. The plots include interpreted Soil Behavior Type (SBT) based on the charts described by Robertson (1990). Typical plots display SBT based on the non-normalized charts of Robertson et al (1986). For CPT soundings deeper than 30m, we recommend the use of the normalized charts of Robertson (1990) which can be displayed as SBTn, upon request. The report also includes spreadsheet output of computer calculations of basic interpretation in terms of SBT and SBTn and various geotechnical parameters using current published correlations based on the comprehensive review by Lunne, Robertson and Powell (1997), as well as recent updates by Professor Robertson (Guide to Cone Penetration Testing, 2015). The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed. Gregg Drilling & Testing Inc. does not warranty the correctness or the applicability of any of the geotechnical parameters interpreted by the software and does not assume any liability for use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used in the software. Some interpretation methods require input of the groundwater level to calculate vertical effective stress. An estimate of the in-situ groundwater level has been made based on field observations and/or CPT results, but should be verified by the user.

A summary of locations and depths is available in Table 1. Note that all penetration depths referenced in the data are with respect to the existing ground surface.

Note that it is not always possible to clearly identify a soil type based solely on q_t, f_s, and u_2. In these situations, experience, judgment, and an assessment of the pore pressure dissipation data should be used to infer the correct soil behavior type.



ZONE		SBT	
1		▨	Sensitive, fine grained
2		▨	Organic materials
3		▨	Clay
4		■	Silty clay to clay
5		▨	Clayey silt to silty clay
6		▨	Sandy silt to clayey silt
7		▨	Silty sand to sandy silt
8		▨	Sand to silty sand
9		▨	Sand
10		▨	Gravely sand to sand
11		▨	Very stiff fine grained*
12		▨	Sand to clayey sand*

*over consolidated or cemented

Figure SBT (After Robertson et al., 1986) – Note: Colors may vary slightly compared to plots

Cone Penetration Test (CPT) Interpretation

Gregg uses a proprietary CPT interpretation and plotting software. The software takes the CPT data and performs basic interpretation in terms of soil behavior type (SBT) and various geotechnical parameters using current published empirical correlations based on the comprehensive review by Lunne, Robertson and Powell (1997). The interpretation is presented in tabular format using MS Excel. The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed. Gregg does not warranty the correctness or the applicability of any of the geotechnical parameters interpreted by the software and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used in the software.

The following provides a summary of the methods used for the interpretation. Many of the empirical correlations to estimate geotechnical parameters have constants that have a range of values depending on soil type, geologic origin and other factors. The software uses 'default' values that have been selected to provide, in general, conservatively low estimates of the various geotechnical parameters.

Input:

1 Units for display (Imperial or metric) (atm. pressure, p_a = 0.96 tsf or 0.1 MPa)
2 Depth interval to average results (ft or m). Data are collected at either 0.02 or 0.05m and can be averaged every 1, 3 or 5 intervals.
3 Elevation of ground surface (ft or m)
4 Depth to water table, z_w (ft or m) – input required
5 Net area ratio for cone, a (default to 0.80)
6 Relative Density constant, C_{Dr} (default to 350)
7 Young's modulus number for sands, α (default to 5)
8 Small strain shear modulus number
  a. for sands, S_G (default to 180 for SBT_n 5, 6, 7)
  b. for clays, C_G (default to 50 for SBT_n 1, 2, 3 & 4)
9 Undrained shear strength cone factor for clays, N_{kt} (default to 15)
10 Over Consolidation ratio number, k_{ocr} (default to 0.3)
11 Unit weight of water, (default to γ_w = 62.4 lb/ft^3 or 9.81 kN/m^3)

Column

1 Depth, z, (m) – CPT data is collected in meters
2 Depth (ft)
3 Cone resistance, q_c (tsf or MPa)
4 Sleeve resistance, f_s (tsf or MPa)
5 Penetration pore pressure, u (psi or MPa), measured behind the cone (i.e. u_2)
6 Other – any additional data
7 Total cone resistance, q_t (tsf or MPa) $q_t = q_c + u\,(1-a)$

8	Friction Ratio, R_f (%)	$R_f = (f_s/q_t) \times 100\%$
9	Soil Behavior Type (non-normalized), SBT	see note
10	Unit weight, γ (pcf or kN/m^3)	based on SBT, see note
11	Total overburden stress, σ_v (tsf)	$\sigma_{vo} = \sigma\ z$
12	In-situ pore pressure, u_o (tsf)	$u_o = \gamma_w\ (z - z_w)$
13	Effective overburden stress, σ'_{vo} (tsf)	$\sigma'_{vo} = \sigma_{vo} - u_o$
14	Normalized cone resistance, Q_{t1}	$Q_{t1} = (q_t - \sigma_{vo}) / \sigma'_{vo}$
15	Normalized friction ratio, F_r (%)	$F_r = f_s / (q_t - \sigma_{vo}) \times 100\%$
16	Normalized Pore Pressure ratio, B_q	$B_q = u - u_o / (q_t - \sigma_{vo})$
17	Soil Behavior Type (normalized), SBT_n	see note
18	SBT_n Index, I_c	see note
19	Normalized Cone resistance, Q_{tn} (n varies with I_c)	see note
20	Estimated permeability, k_{SBT} (cm/sec or ft/sec)	see note
21	Equivalent SPT N_{60}, blows/ft	see note
22	Equivalent SPT $(N_1)_{60}$ blows/ft	see note
23	Estimated Relative Density, D_r, (%)	see note
24	Estimated Friction Angle, ϕ', (degrees)	see note
25	Estimated Young's modulus, E_s (tsf)	see note
26	Estimated small strain Shear modulus, Go (tsf)	see note
27	Estimated Undrained shear strength, s_u (tsf)	see note
28	Estimated Undrained strength ratio	s_u/σ_v'
29	Estimated Over Consolidation ratio, OCR	see note

Notes:

1 Soil Behavior Type (non-normalized), SBT (Lunne et al., 1997 and table below)

2 Unit weight, γ either constant at 119 pcf or based on Non-normalized SBT (Lunne et al., 1997 and table below)

3 Soil Behavior Type (Normalized), SBT_n Lunne et al. (1997)

4 SBT_n Index, I_c $I_c = ((3.47 - \log Q_{t1})^2 + (\log F_r + 1.22)^2)^{0.5}$

5 Normalized Cone resistance, Q_{tn} (n varies with Ic)

$Q_{tn} = ((q_t - \sigma_{vo})/pa)\ (pa/(\sigma'_{vo})^n$ and recalculate I_c, then iterate:

When $I_c < 1.64$, n = 0.5 (clean sand)
When $I_c > 3.30$, n = 1.0 (clays)
When $1.64 < I_c < 3.30$, $n = (I_c - 1.64)0.3 + 0.5$
Iterate until the change in n, $\Delta n < 0.01$

6 Estimated permeability, k_{SBT} based on Normalized SBT_n (Lunne et al., 1997 and table below)

7 Equivalent SPT N_{60}, blows/ft Lunne et al. (1997)

$$\frac{(q_t/p_a)}{N_{60}} = 8.5\left(1 - \frac{I_c}{4.6}\right)$$

8 Equivalent SPT $(N_1)_{60}$ blows/ft $(N_1)_{60} = N_{60}\,C_N$,
where $C_N = (pa/\sigma'_{vo})^{0.5}$

9 Relative Density, D_r, (%) $D_r^2 = Q_{tn} / C_{Dr}$
Only SBT_n 5, 6, 7 & 8 *Show 'N/A' in zones 1, 2, 3, 4 & 9*

10 Friction Angle, ϕ', (degrees) $\tan \phi' = \frac{1}{2.68}\left[\log\left(\frac{q_c}{\sigma'_{vo}}\right) + 0.29\right]$
Only SBT_n 5, 6, 7 & 8 *Show'N/A' in zones 1, 2, 3, 4 & 9*

11 Young's modulus, E_s $E_s = \alpha\, q_t$
Only SBT_n 5, 6, 7 & 8 *Show 'N/A' in zones 1, 2, 3, 4 & 9*

12 Small strain shear modulus, Go
a. $G_o = S_G\,(q_t\ \ \sigma'_{vo}\ pa)^{1/3}$ *For SBT_n 5, 6, 7*
b. $G_o = C_G\, q_t$ *For SBT_n 1, 2, 3& 4*
Show 'N/A' in zones 8 & 9

13 Undrained shear strength, s_u $s_u = (q_t - \sigma_{vo}) / N_{kt}$
Only SBT_n 1, 2, 3, 4 & 9 *Show 'N/A' in zones 5, 6, 7 & 8*

14 Over Consolidation ratio, OCR $OCR = k_{ocr}\, Q_{t1}$
Only SBT_n 1, 2, 3, 4 & 9 *Show 'N/A' in zones 5, 6, 7 & 8*

The following updated and simplified SBT descriptions have been used in the software:

SBT Zones		**SBT_n Zones**	
1	sensitive fine grained	1	sensitive fine grained
2	organic soil	2	organic soil
3	clay	3	clay
4	clay & silty clay	4	clay & silty clay
5	clay & silty clay		
6	sandy silt & clayey silt		

7	silty sand & sandy silt	5	silty sand & sandy silt
8	sand & silty sand	6	sand & silty sand
9	sand		
10	sand	7	sand
11	very dense/stiff soil*	8	very dense/stiff soil*
12	very dense/stiff soil*	9	very dense/stiff soil*

*heavily overconsolidated and/or cemented

Track when soils fall with zones of same description and print that description (i.e. if soils fall only within SBT zones 4 & 5, print 'clays & silty clays')

Estimated Permeability (see Lunne et al., 1997)

SBT_n	Permeability (ft/sec)	(m/sec)
1	3x 10^{-8}	1x 10^{-8}
2	3x 10^{-7}	1x 10^{-7}
3	1x 10^{-9}	3x 10^{-10}
4	3x 10^{-8}	1x 10^{-8}
5	3x 10^{-6}	1x 10^{-6}
6	3x 10^{-4}	1x 10^{-4}
7	3x 10^{-2}	1x 10^{-2}
8	3x 10^{-6}	1x 10^{-6}
9	1x 10^{-8}	3x 10^{-9}

Estimated Unit Weight (see Lunne et al., 1997)

SBT	Approximate Unit Weight (lb/ft^3)	(kN/m^3)
1	111.4	17.5
2	79.6	12.5
3	111.4	17.5
4	114.6	18.0
5	114.6	18.0
6	114.6	18.0
7	117.8	18.5
8	120.9	19.0
9	124.1	19.5
10	127.3	20.0
11	130.5	20.5
12	120.9	19.0

Pore Pressure Dissipation Tests (PPDT)

Pore Pressure Dissipation Tests (PPDT's) conducted at various intervals can be used to measure equilibrium water pressure (at the time of the CPT). If conditions are hydrostatic, the equilibrium water pressure can be used to determine the approximate depth of the ground water table. A PPDT is conducted when penetration is halted at specific intervals determined by the field representative. The variation of the penetration pore pressure (*u*) with time is measured behind the tip of the cone and recorded.

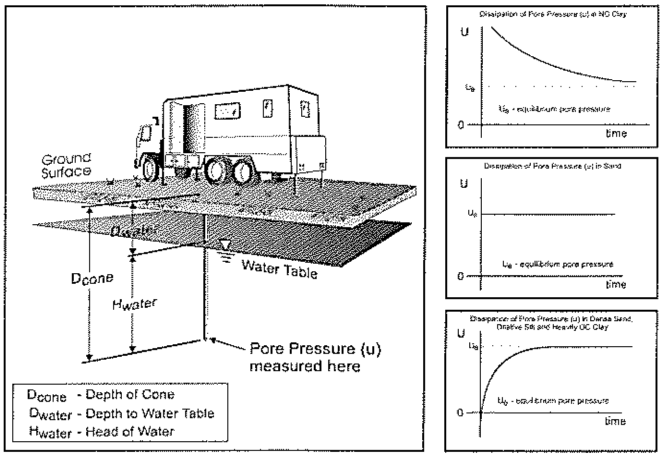
Pore pressure dissipation data can be interpreted to provide estimates of:

- Equilibrium piezometric pressure
- Phreatic Surface
- In situ horizontal coefficient of consolidation (c_h)
- In situ horizontal coefficient of permeability (k_h)

In order to correctly interpret the equilibrium piezometric pressure and/or the phreatic surface, the pore pressure must be monitored until it reaches equilibrium, *Figure PPDT*. This time is commonly referred to as t_{100}, the point at which 100% of the excess pore pressure has dissipated.

A complete reference on pore pressure dissipation tests is presented by Robertson et al. 1992 and Lunne et al. 1997.

A summary of the pore pressure dissipation tests are summarized in Table 1.



Water Table Calculation

$$D_{water} = D_{cone} - H_{water}$$

where $H_{water} = U_e$ (depth units)

Useful Conversion Factors:
1psi = 0.704m = 2.31 feet (water)
1tsf = 0.958 bar = 13.9 psi
1m = 3.28 feet

Figure PPDT

Seismic Cone Penetration Testing (SCPT)

Seismic Cone Penetration Testing (SCPT) can be conducted at various intervals during the Cone Penetration Test. Shear wave velocity (Vs) can then be calculated over a specified interval with depth. A small interval for seismic testing, such as 1-1.5m (3-5ft) allows for a detailed look at the shear wave profile with depth. Conversely, a larger interval such as 3-6m (10-20ft) allows for a more average shear wave velocity to be calculated. Gregg's cones have a horizontally active geophone located 0.2m (0.66ft) behind the tip.

To conduct the seismic shear wave test, the penetration of the cone is stopped and the rods are decoupled from the rig. An automatic hammer is triggered to send a shear wave into the soil. The distance from the source to the cone is calculated knowing the total depth of the cone and the horizontal offset distance between the source and the cone. To calculate an interval velocity, a minimum of two tests must be performed at two different depths. The arrival times between the two wave traces are compared to obtain the difference in time (Δt). The difference in depth is calculated (Δd) and velocity can be determined using the simple equation: $v = \Delta d/\Delta t$

Multiple wave traces can be recorded at the same depth to improve quality of the data.

A complete reference on seismic cone penetration tests is presented by Robertson et al. 1986 and Lunne et al. 1997.

A summary the shear wave velocities, arrival times and wave traces are provided with the report.

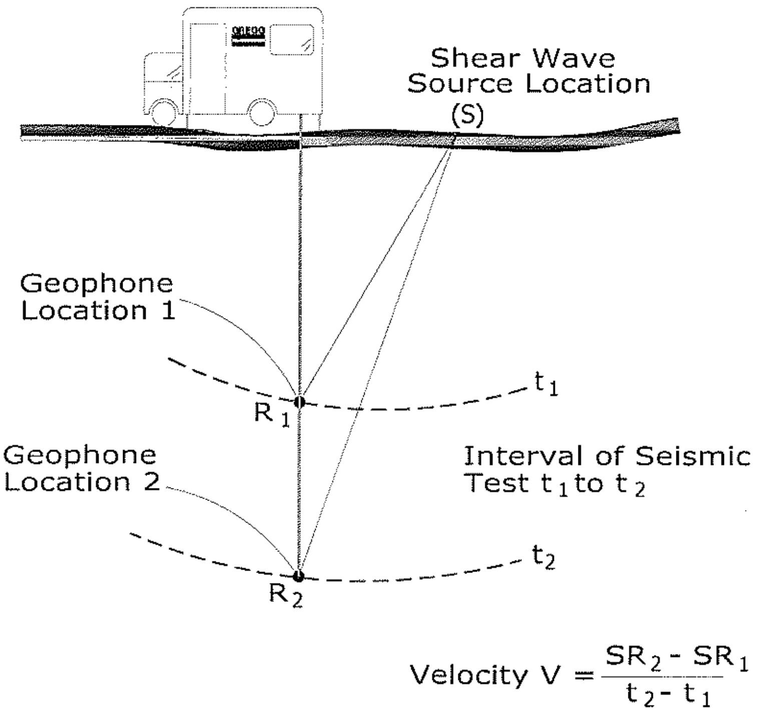


Figure SCPT

Groundwater Sampling

Gregg Drilling & Testing, Inc. conducts groundwater sampling using a sampler as shown in *Figure GWS*. The groundwater sampler has a retrievable stainless steel or disposable PVC screen with steel drop off tip. This allows for samples to be taken at multiple depth intervals within the same sounding location. In areas of slower water recharge, provisions may be made to set temporary PVC well screens during sampling to allow the pushing equipment to advance to the next sample location while the groundwater is allowed to infiltrate.

The groundwater sampler operates by advancing 44.5mm (1¾ inch) hollow push rods with the filter tip in a closed configuration to the base of the desired sampling interval. Once at the desired sample depth, the push rods are retracted; exposing the encased filter screen and allowing groundwater to infiltrate hydrostatically from the formation into the inlet screen. A small diameter bailer (approximately ½ or ¾ inch) is lowered through the push rods into the screen section for sample collection. The number of downhole trips with the bailer and time necessary to complete the sample collection at each depth interval is a function of sampling protocols, volume requirements, and the yield characteristics and storage capacity of the formation. Upon completion of sample collection, the push rods and sampler, with the exception of the PVC screen and steel drop off tip are retrieved to the ground surface, decontaminated and prepared for the next sampling event.

For a detailed reference on direct push groundwater sampling, refer to Zemo et. al., 1992.

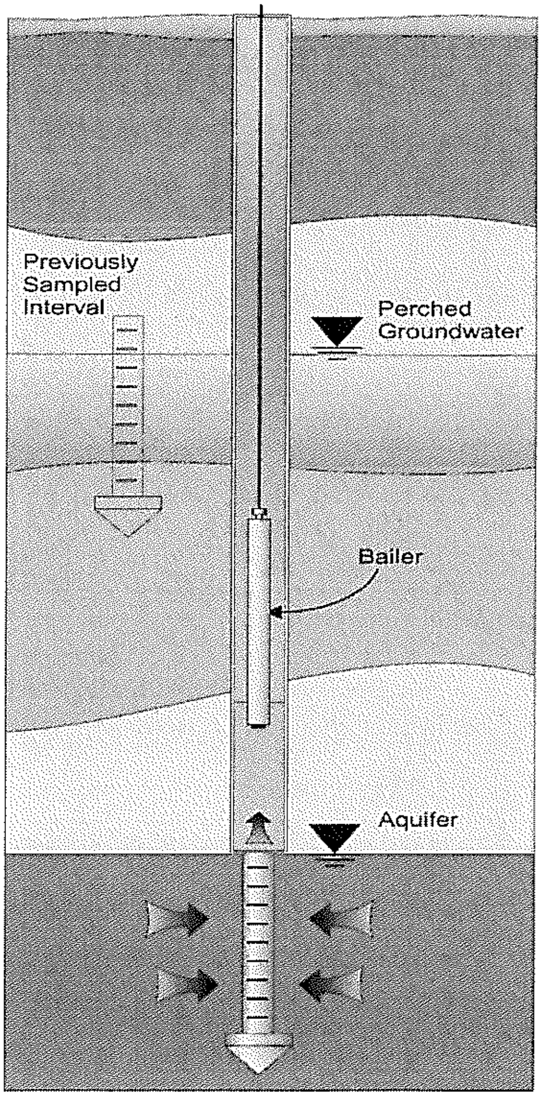


Figure GWS

Soil Sampling

Gregg Drilling & Testing, Inc. uses a piston-type push-in sampler to obtain small soil samples without generating any soil cuttings, *Figure SS*. Two different types of samplers (12 and 18 inch) are used depending on the soil type and density. The soil sampler is initially pushed in a "closed" position to the desired sampling interval using the CPT pushing equipment. Keeping the sampler closed minimizes the potential of cross contamination. The inner tip of the sampler is then retracted leaving a hollow soil sampler with inner 1¼" diameter sample tubes. The hollow sampler is then pushed in a locked "open" position to collect a soil sample. The filled sampler and push rods are then retrieved to the ground surface. Because the soil enters the sampler at a constant rate, the opportunity for 100% recovery is increased. For environmental analysis, the soil sample tube ends are sealed with Teflon and plastic caps. Often, a longer "split tube" can be used for geotechnical sampling.

For a detailed reference on direct push soil sampling, refer to Robertson et al, 1998.

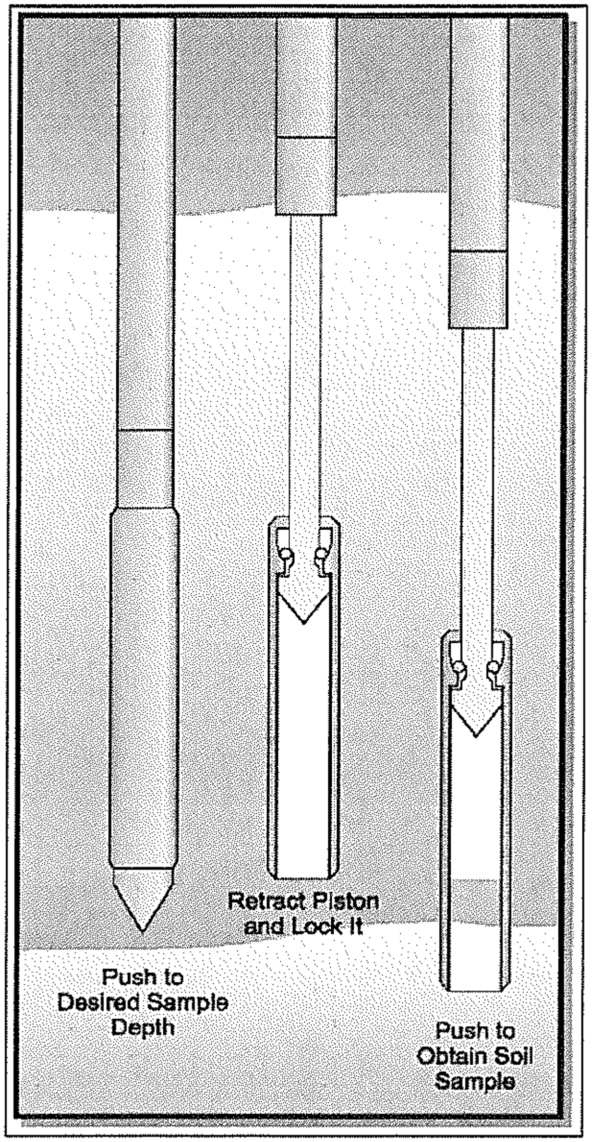
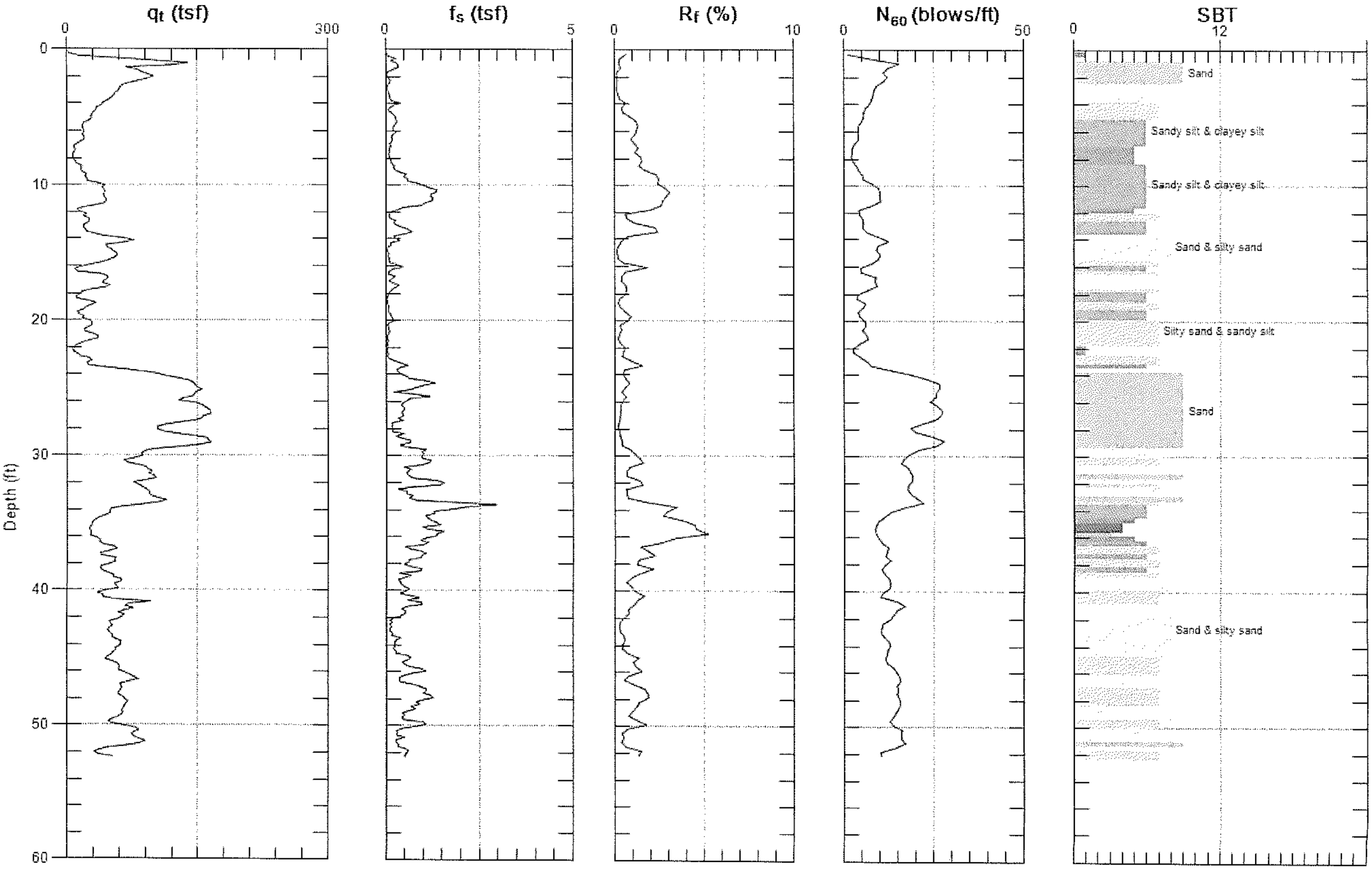


Figure SS

GREGG **ALTA**

Site: MANCHESTER ENCINITAS Engineer: DAVE MURPHY
Sounding: CPT-1 Date: 12/11/2017 08:26

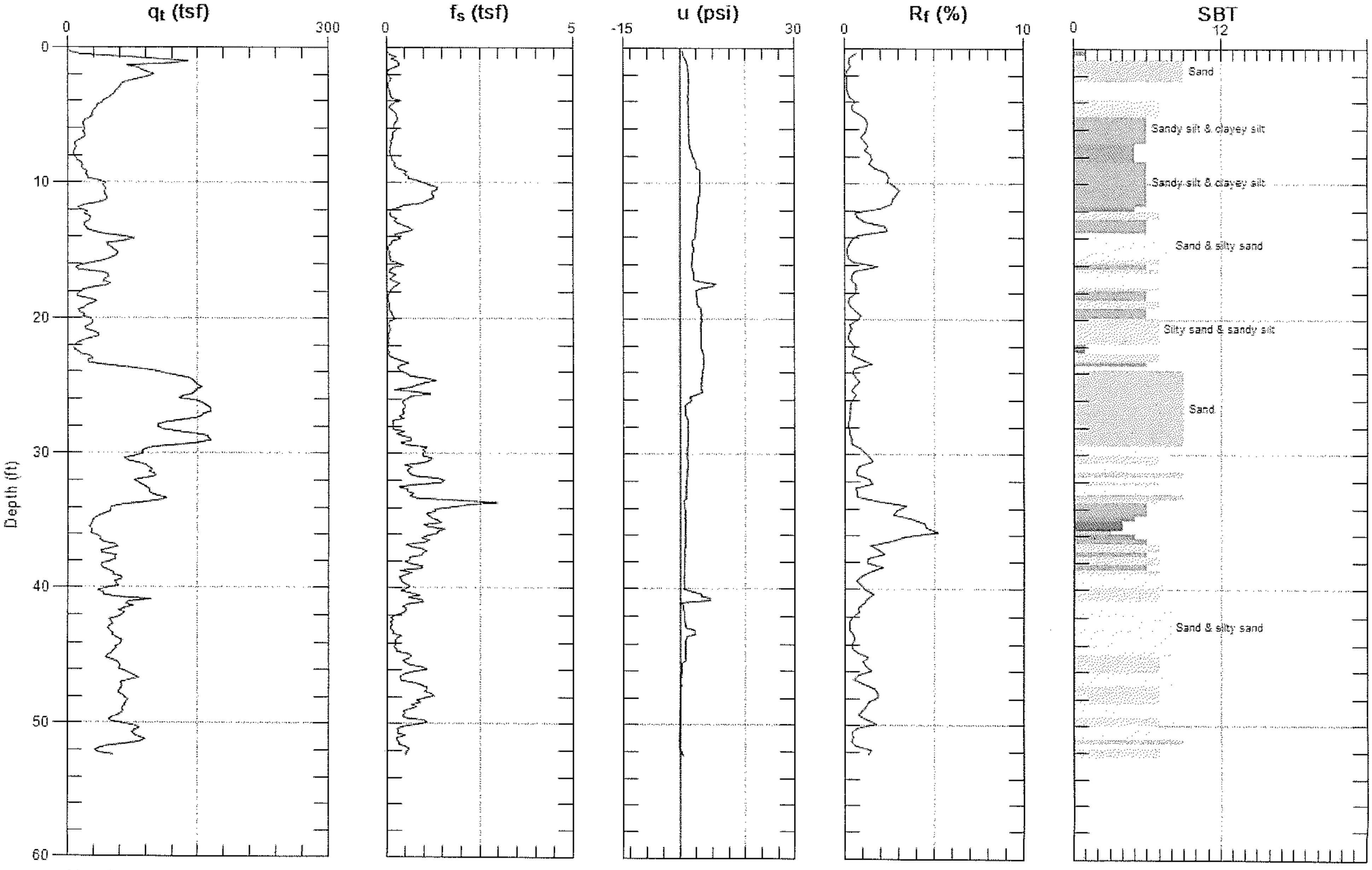


Max. Depth: 52.329 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG ALTA

Site: MANCHESTER ENCINITAS
Sounding: CPT-1
Engineer: DAVE MURPHY
Date: 12/11/2017 08:26

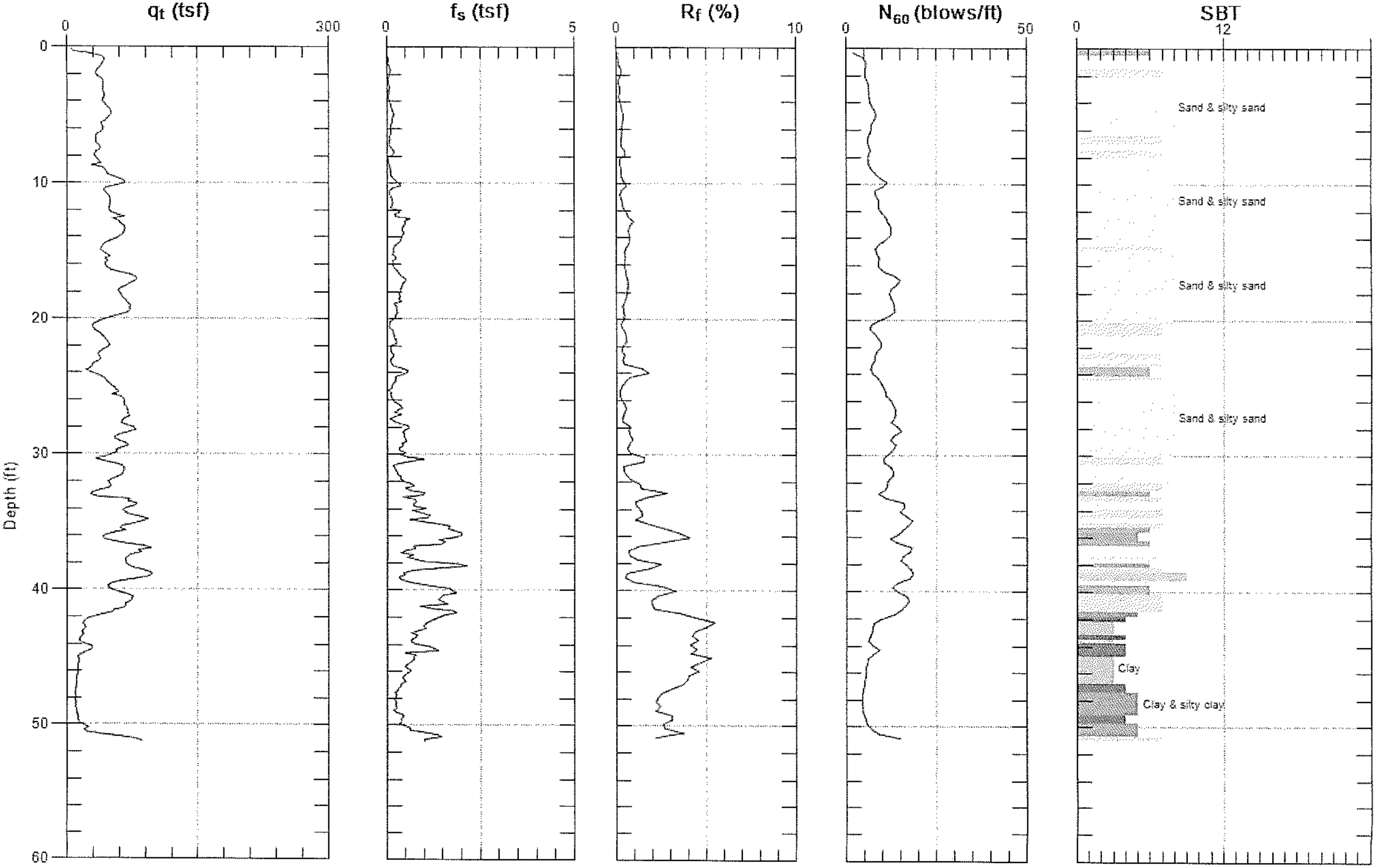


Max. Depth: 52.329 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG **ALTA**

Site: MANCHESTER ENCINITAS Engineer: DAVE MURPHY
Sounding: CPT-2 Date: 12/11/2017 09:08

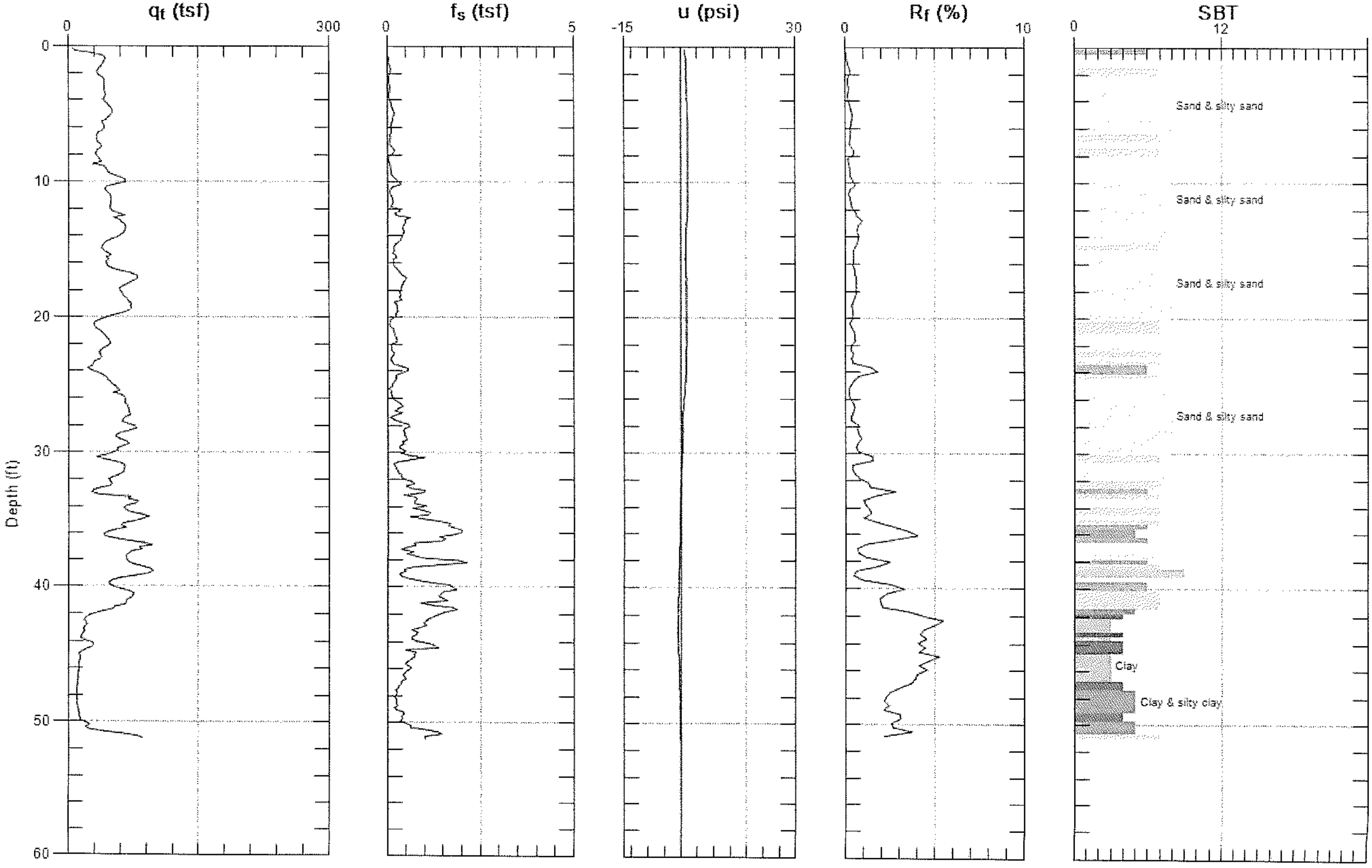


Max. Depth: 51.181 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG ALTA

Site: MANCHESTER ENCINITAS **Engineer:** DAVE MURPHY
Sounding: CPT-2 **Date:** 12/11/2017 09:08



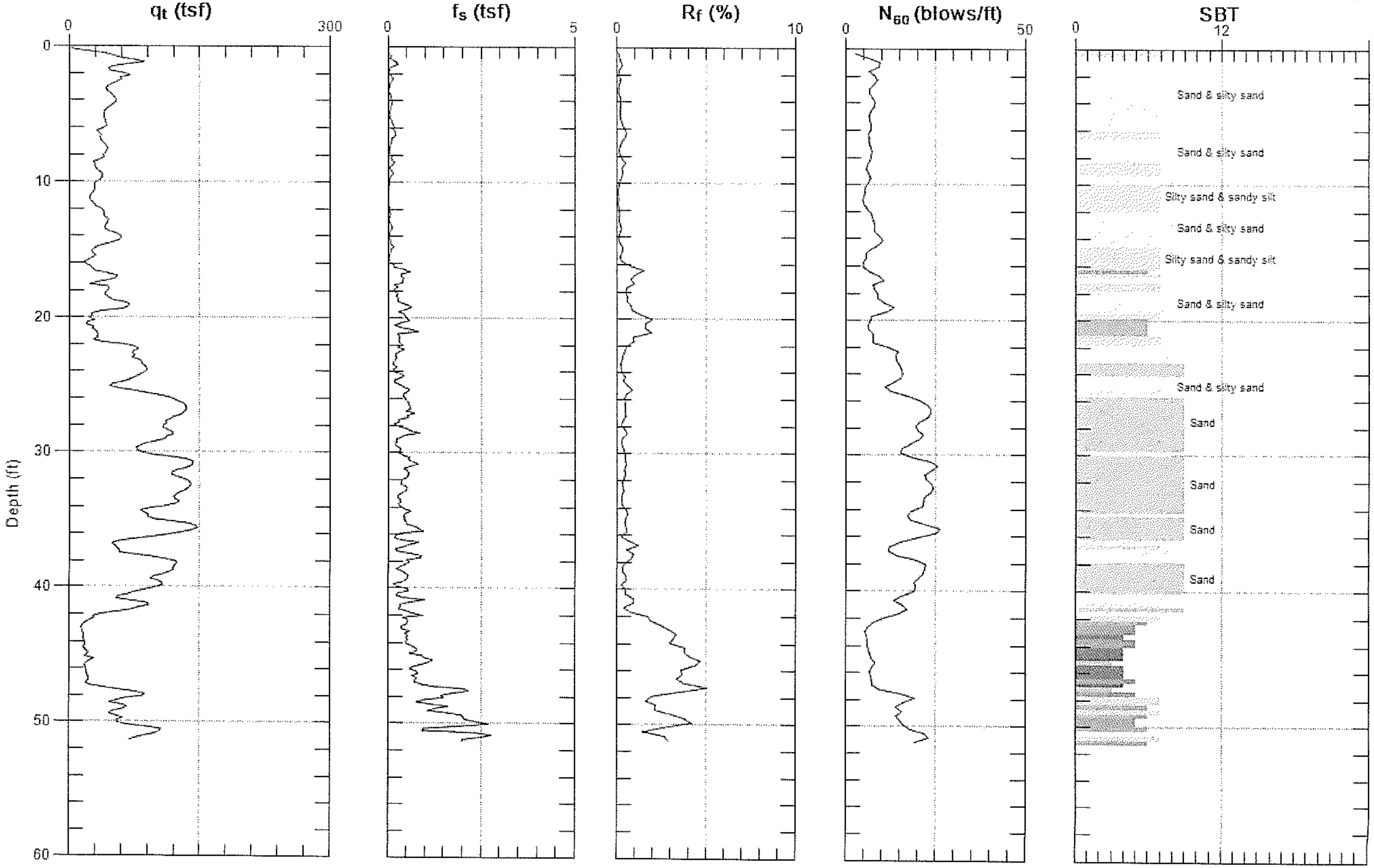
Max. Depth: 51.181 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

ALTA

Site: MANCHESTER ENCINITAS Engineer: DAVE MURPHY

Sounding: CPT-3 Date: 12/11/2017 09:57

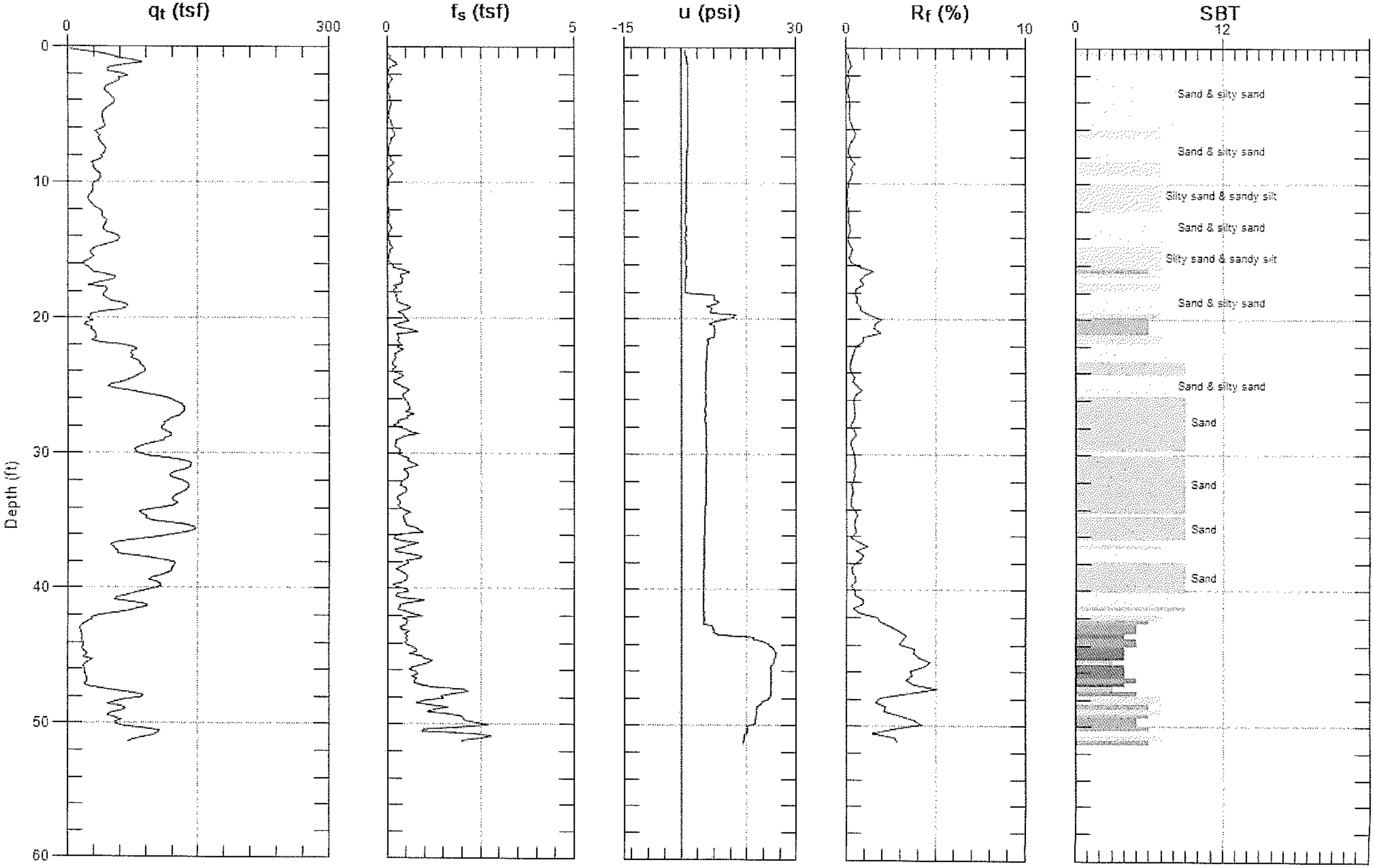


Max. Depth: 51.345 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG **ALTA**

Site: MANCHESTER ENCINITAS Engineer: DAVE MURPHY
Sounding: CPT-3 Date: 12/11/2017 09:57



Max. Depth: 51.345 (ft)
Avg. Interval: 0.328 (ft)

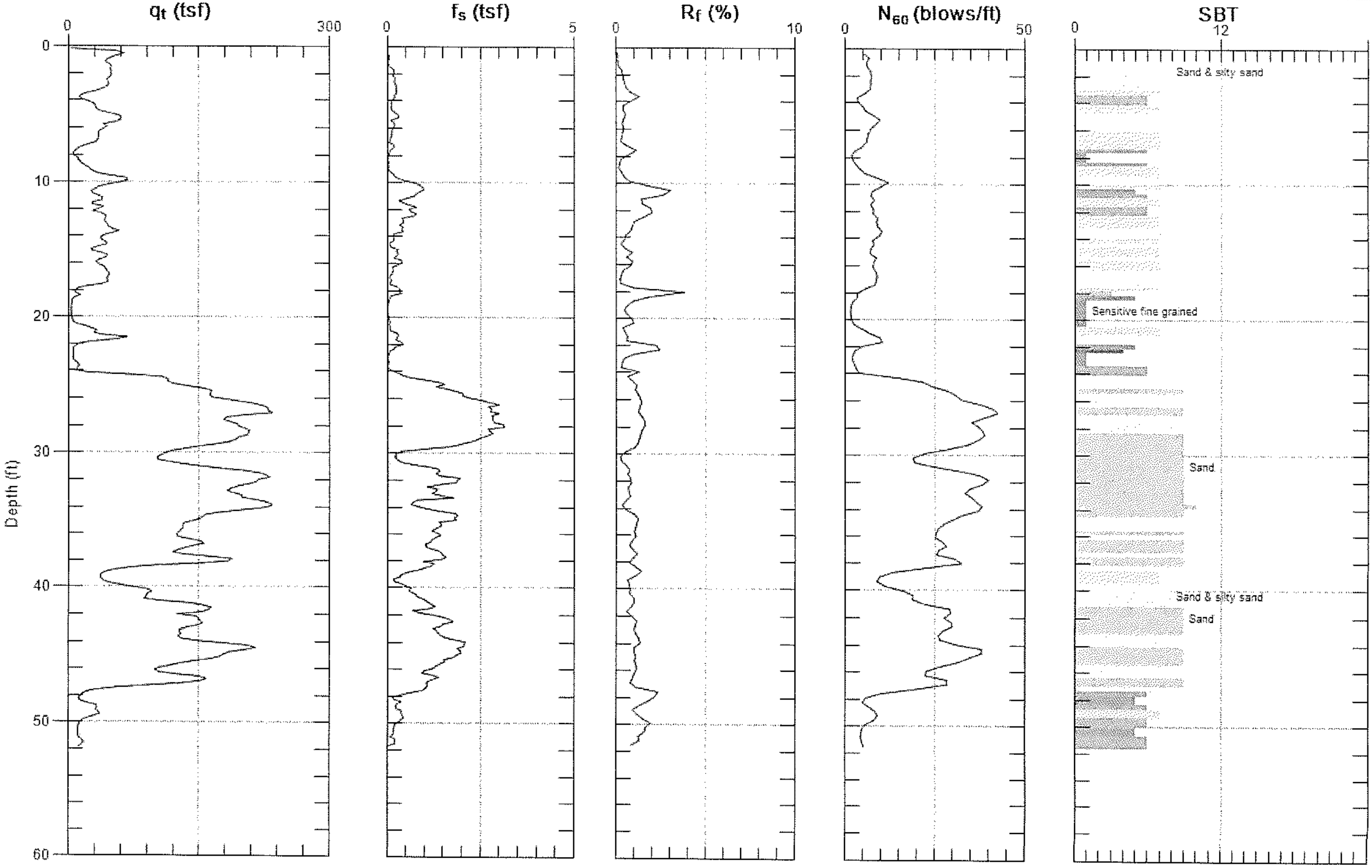
SBT: Soil Behavior Type (Robertson 1990)

GREGG

ALTA

Site: MANCHESTER ENCINITAS
Sounding: CPT-4

Engineer: DAVE MURPHY
Date: 12/11/2017 10:52

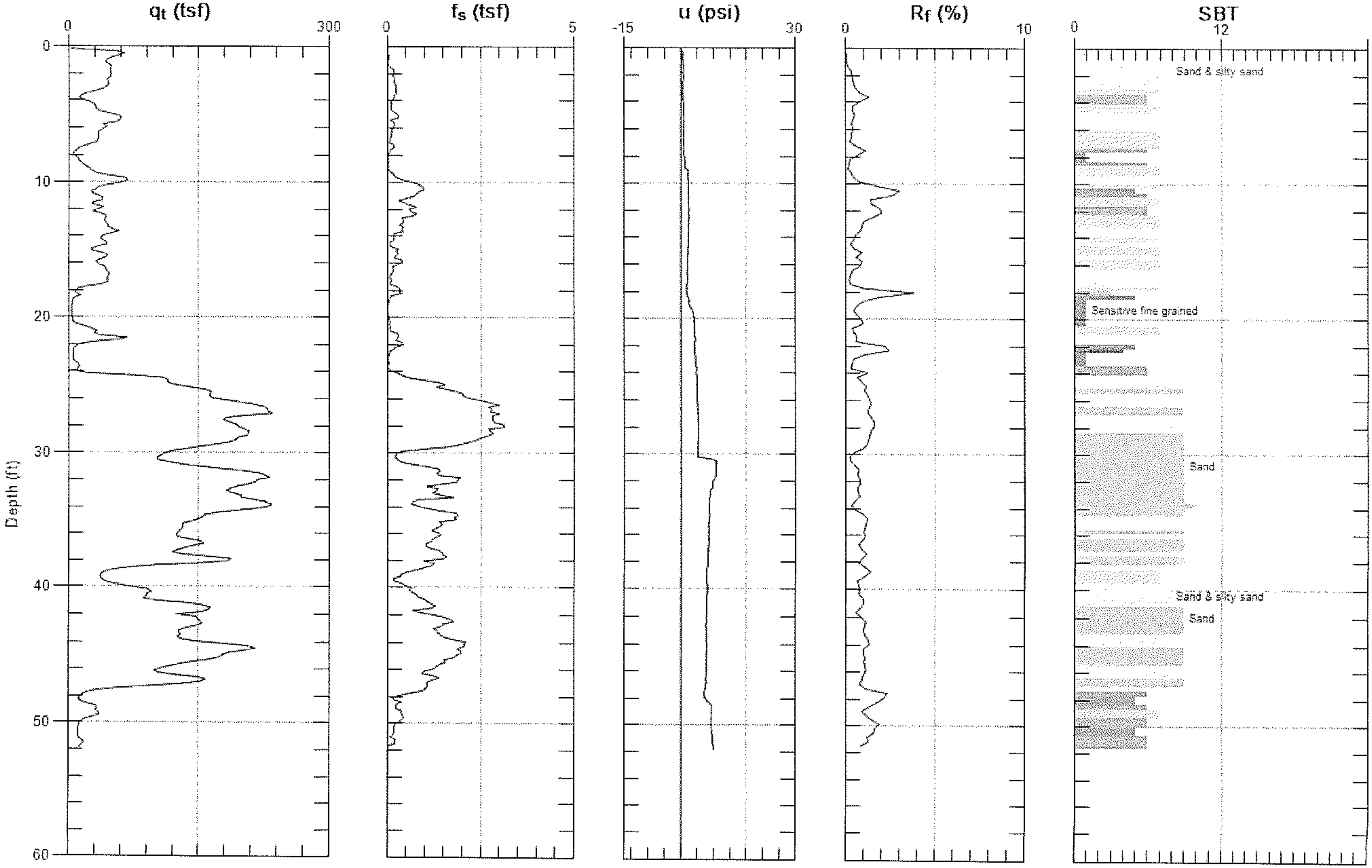


Max. Depth: 51.837 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG **ALTA**

Site: MANCHESTER ENCINITAS Engineer: DAVE MURPHY
Sounding: CPT-4 Date: 12/11/2017 10:52



Max. Depth: 51.837 (ft)
Avg. Interval: 0.328 (ft)

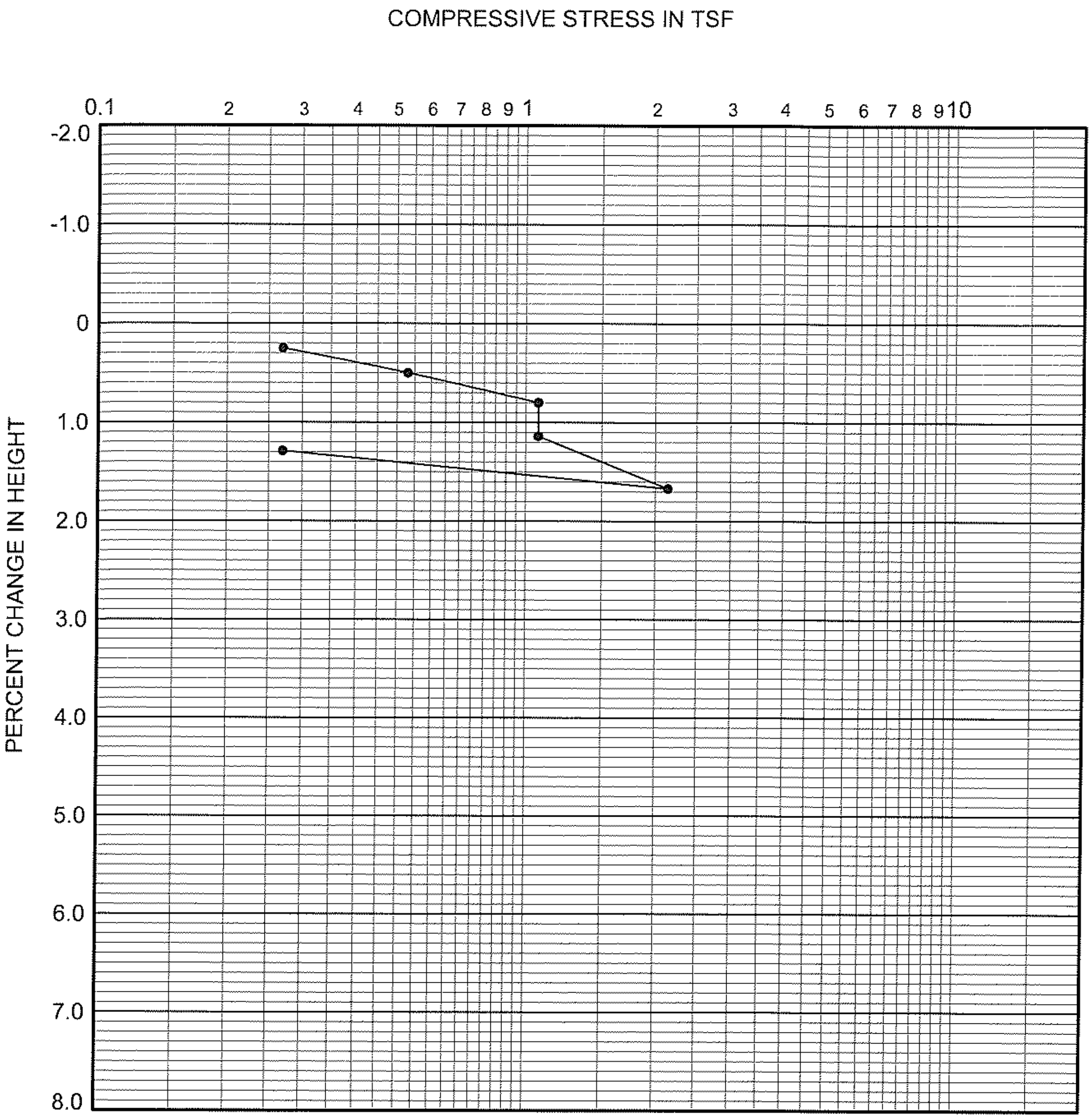
SBT: Soil Behavior Type (Robertson 1990)

APPENDIX C

Logs of Cone Penetrometer Soundings (CPT)

TABLE C
SUMMARY OF LABORATORY TEST DATA
P.N. 2-0126

BORING	DEPTH (FEET)	SOIL DESCRIPTION	GROUP SYMBOL	MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE CONTENT (%)	DIRECT SHEAR	PLUS NO.4 SEIVE (plus 4.76mm) (%)	SAND (4.76mm-0.075mm) (%)	SILT (0.075mm-0.005mm) (%)	CLAY (minus 0.005mm) (%)	EXPANSION INDEX UBC 18-2	CONSOL	OTHER TESTS REMARKS
B-02	4	Silty Sand (Qal)	SM	120.8	10.3	SEE PLATE C-3	0	80	10	10	0		Chem-Plate C-4
B-03	5	Clayey Sand (Qal)	SC				0	79	9	12		SEE PLATE C-1	
B-06	5	Silty Sand (Qal)	SM				0	77	12	11	1		Chem-Plate C-4
B-06	10	Silty Sand (Qal)	SM				0	83	10	7		SEE PLATE C-2	



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
B-03	5.0	99	9.4	37	21	SC	Clayey Sand (Qal)

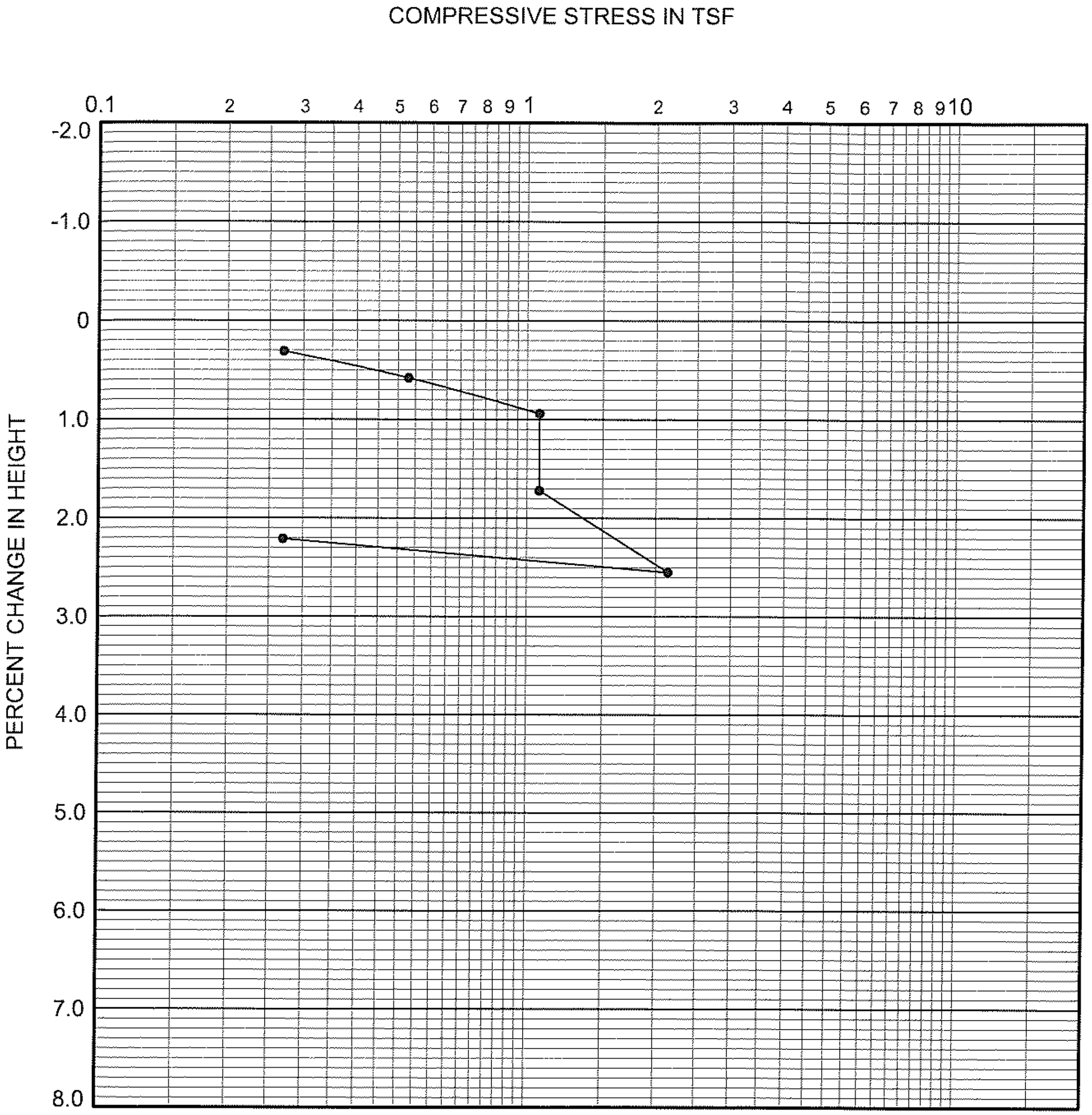
REMARKS: WATER ADDED AT 1.07 TSF

CONSOLIDATION CURVE

Alta California Geotechnical, Inc.

P.N. 2-0126

PLATE C-1



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
B-06	10.0	98	7.5	29	17	SM	Silty Sand (Qal)

REMARKS: WATER ADDED AT 1.07 TSF

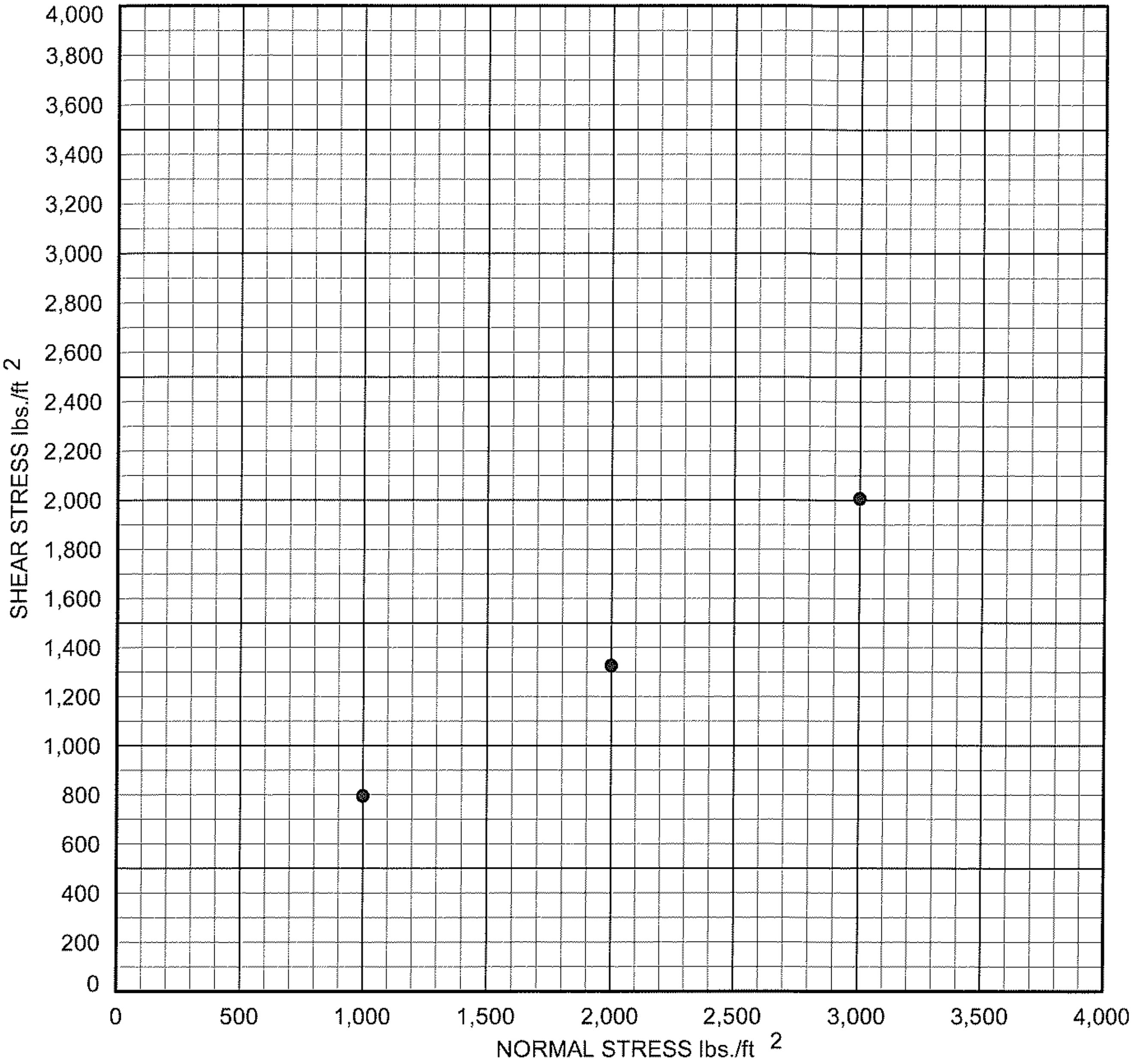
CONSOLIDATION CURVE

Alta California Geotechnical, Inc.

P.N. 2-0126

PLATE C-2

DIRECT SHEAR TEST



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	-200 sieve (%)	group symbol	typical names
B-02	4.0			20	SM	Silty Sand (Qal)

COHESION	170	psf.
FRICTION ANGLE	31.0	degrees

DIRECT SHEAR TEST

PACIFIC SOILS ENGINEERING, INC.

W.O. 2-0126

PLATE C-3

CORROSIVITY TEST RESULTS
(ASTM D516, CTM 643)

SAMPLE	pH	RESISTIVITY (OHM-CM)	SULFATE CONTENT (%)	CHLORIDE CONTENT (%)
WO #1-0126 / B-2 @ 5'	*7.55*	*5,034*	*< 0.01*	*< 0.01*
WO #1-0126 / B-6 @ 5'	*7.48*	*4,499*	*< 0.01*	*< 0.01*

CORROSIVITY PERAMETERS

SULFATE CONTENT (%)	SULFATE EXPOSURE	CEMENT TYPE
0.00 to 0.10	Negligible	--
0.10 to 0.20	Moderate	II, IP(MS), IS(MS)
0.20 to 2.00	Severe	V
Above 2.00	Very Severe	V plus pozzolan

SOIL RESISTIVITY (OHM-CM)	GENERAL DEGREE OF CORROSIVITY TO FERROUS METALS
0 to 1,000	Very Corrosive
1,000 to 2,000	Corrosive
2,000 to 5,000	Moderately Corrosive
5,000 to 10,000	Mildly Corrosive
Above 10,000	Slightly Corrosive

CHLORIDE (Cl) CONTENT (%)	GENERAL DEGREE OF CORROSIVITY TO METALS
0.00 to 0.03	Negligible
0.03 to 0.15	Corrosive
Above 0.15	Severely Corrosive

GROUP DELTA

GROUP DELTA CONSULTANTS
1320 South Simpson Circle
Anaheim, CA 92806
(714) 660-7500 office
(714) 660-7550 fax

Project Name: *ALTA Geotechnical*
Project Number: *AL-153A*
Laboratory Number: *SO.4835*
Sample Number: *WO #1-0126 / B-2 and B-6*
Report Date: *12/13/2017*

APPENDIX D

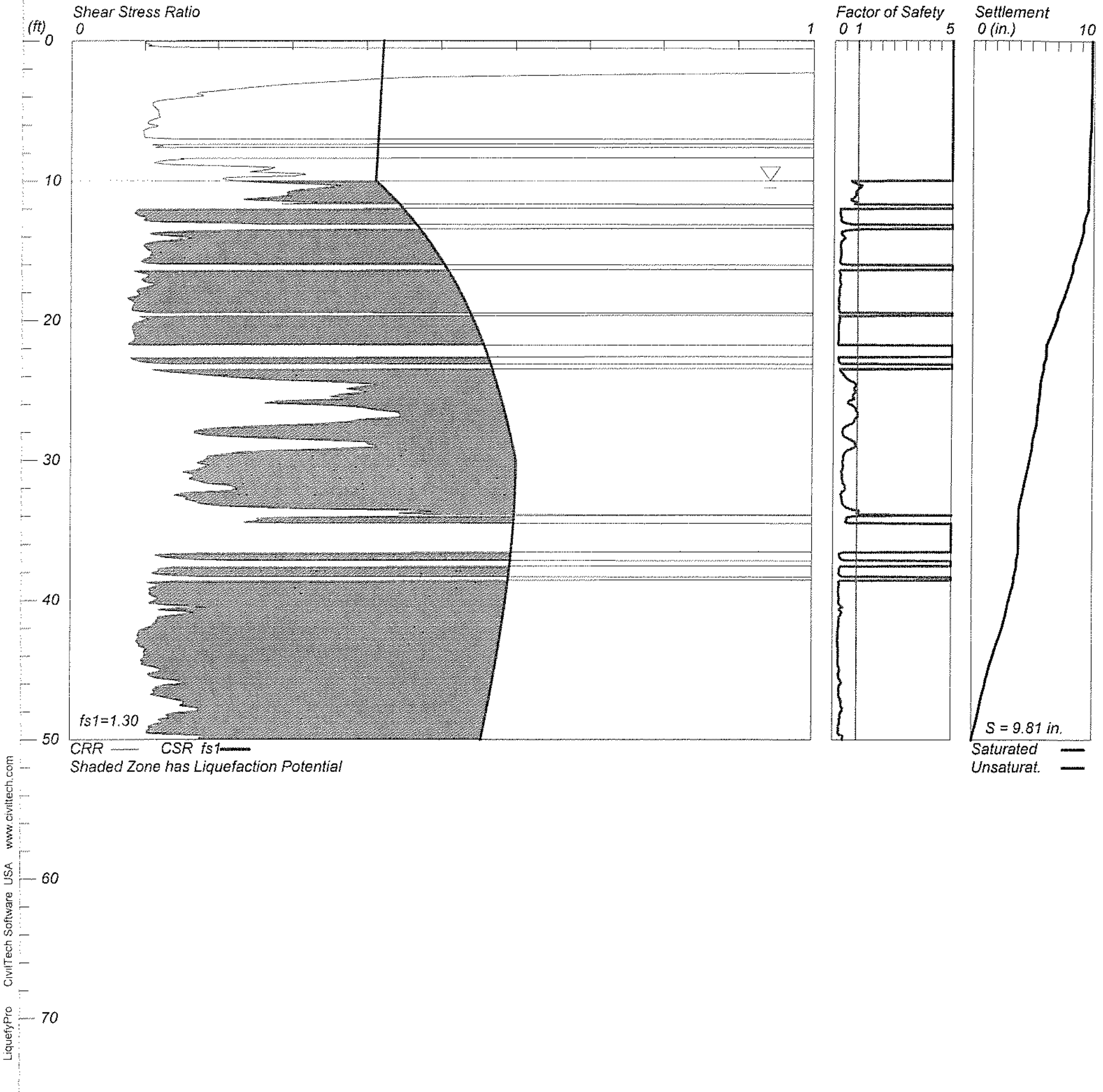
Liquefaction Analysis

LIQUEFACTION ANALYSIS

2-0126

Hole No.=CPT-1   Water Depth=10 ft

Magnitude=6.7
Acceleration=0.50g

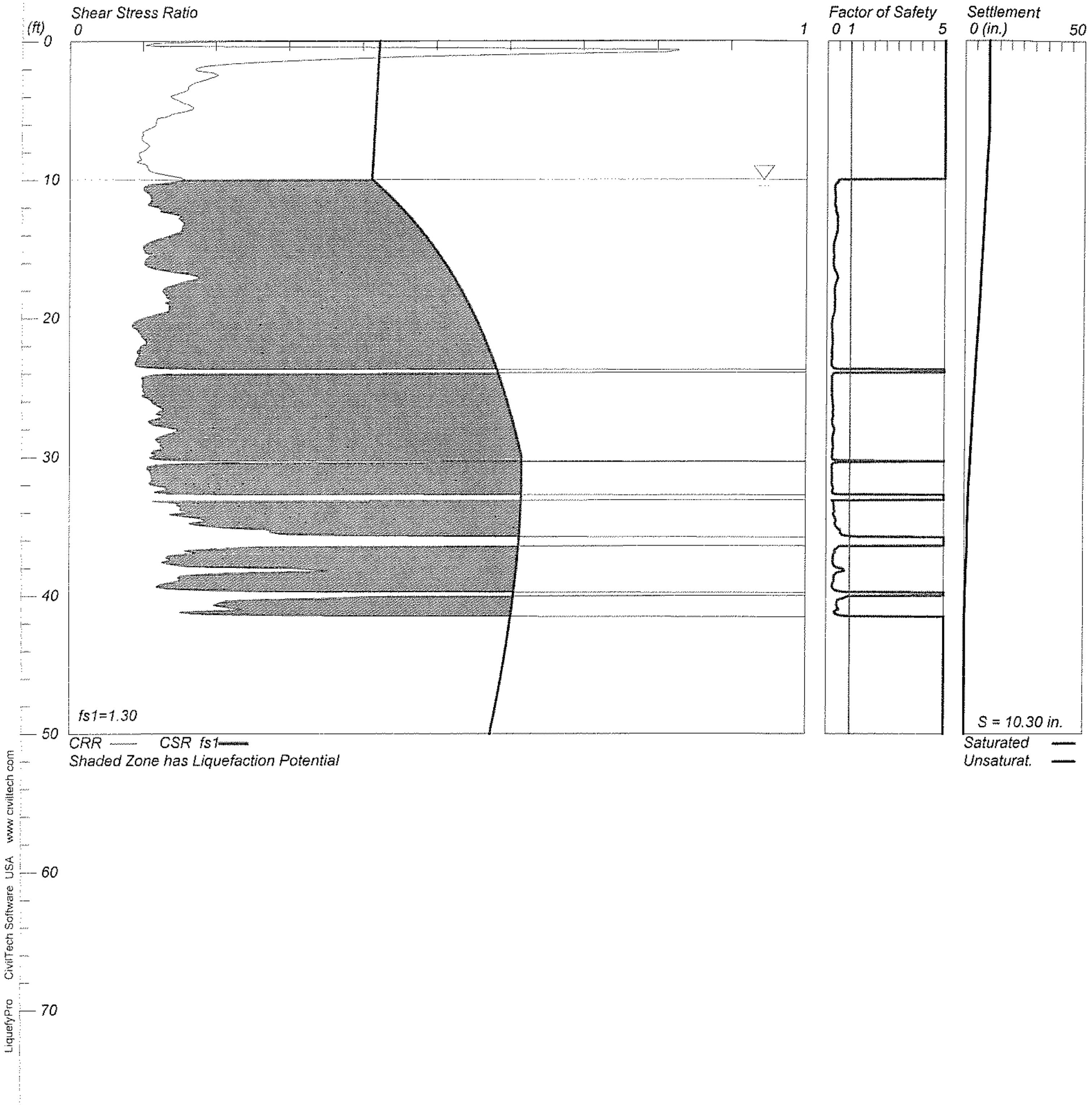


LIQUEFACTION ANALYSIS

2-0126

Hole No.=CPT-2 Water Depth=10 ft

Magnitude=6.7
Acceleration=0.50g



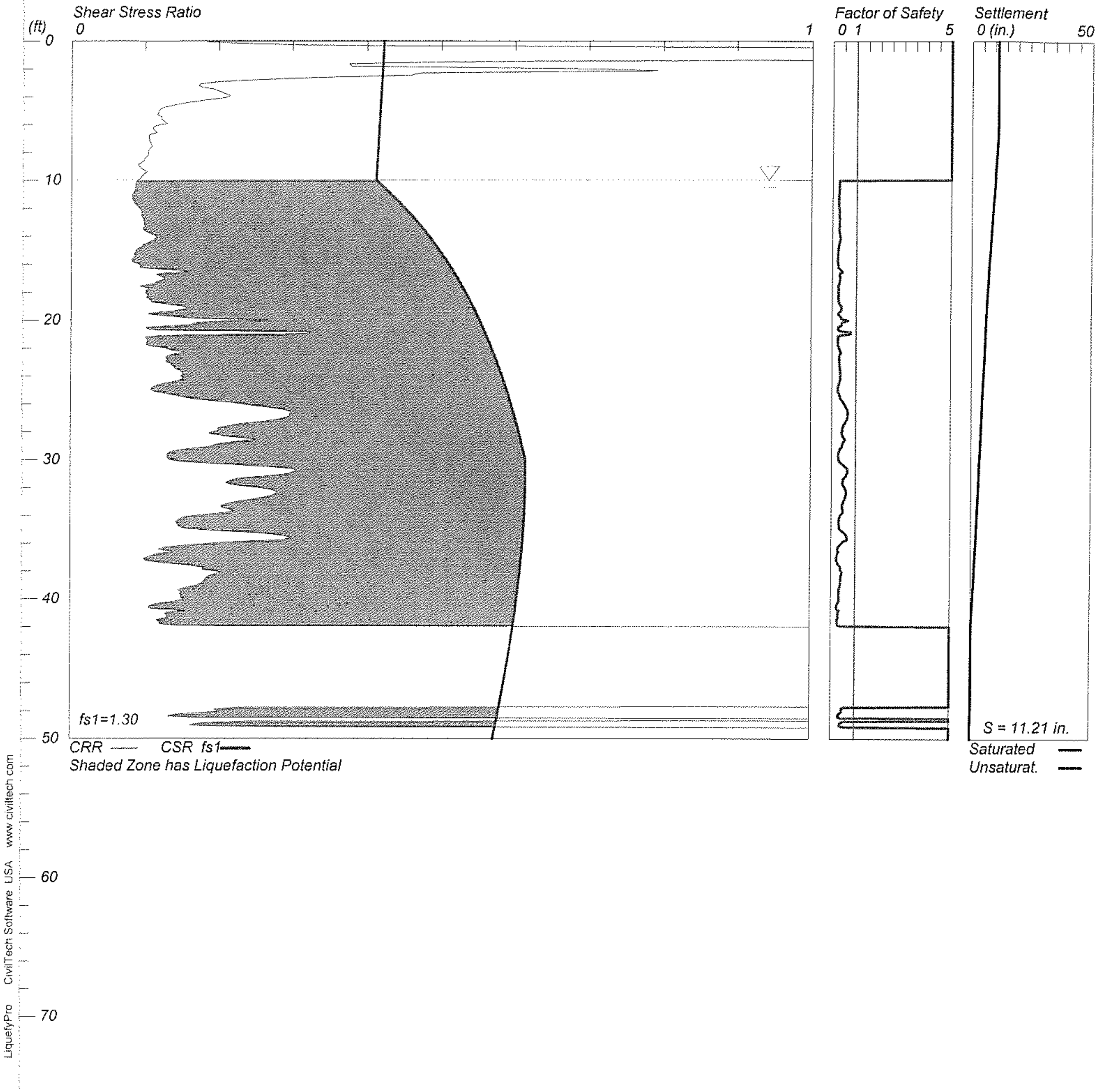
CivilTech Corporation **Encinitas** **Plate D-2**

LIQUEFACTION ANALYSIS

2-0126

Hole No.=CPT-3 Water Depth=10 ft

Magnitude=6.7
Acceleration=0.50g

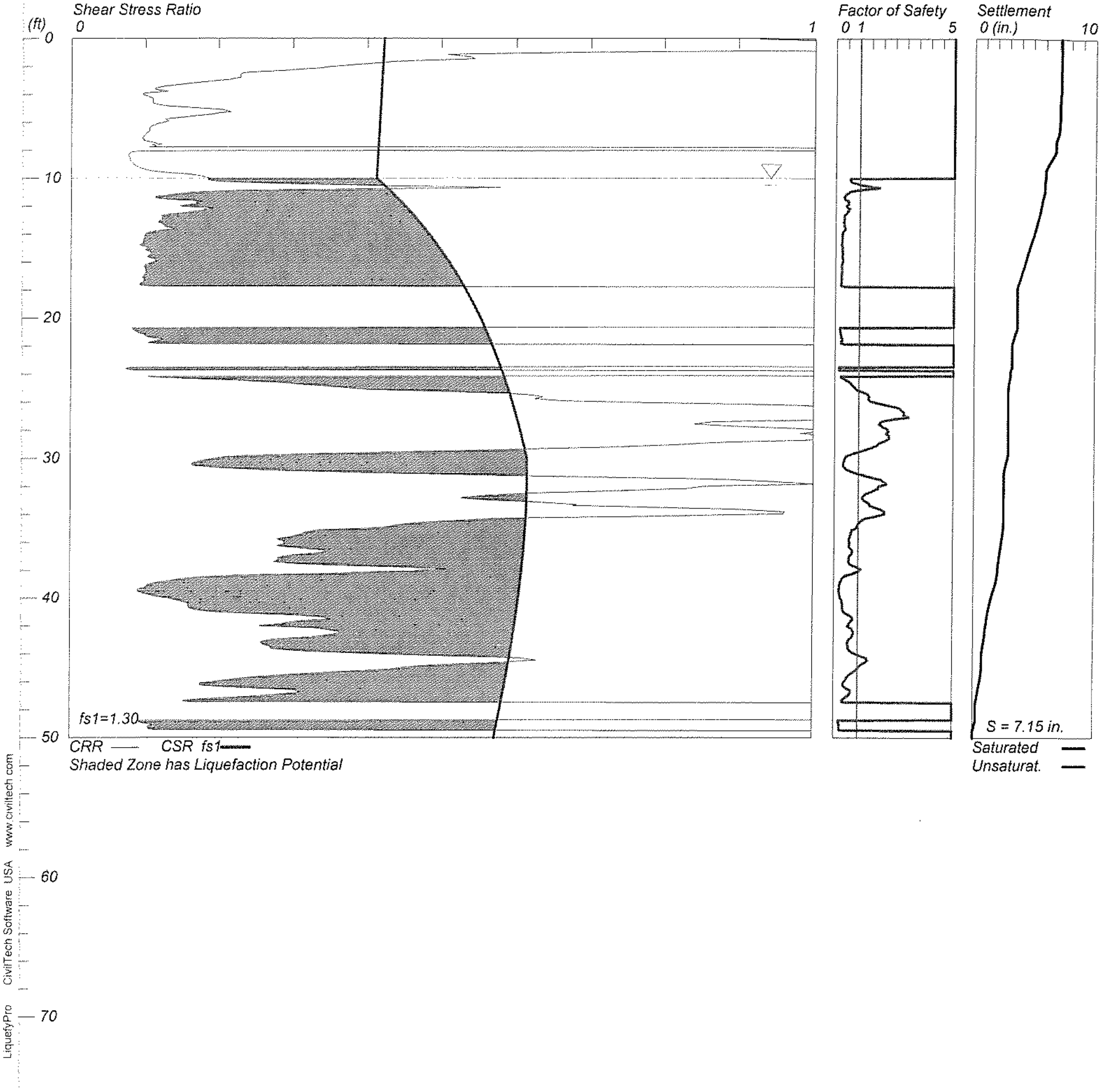


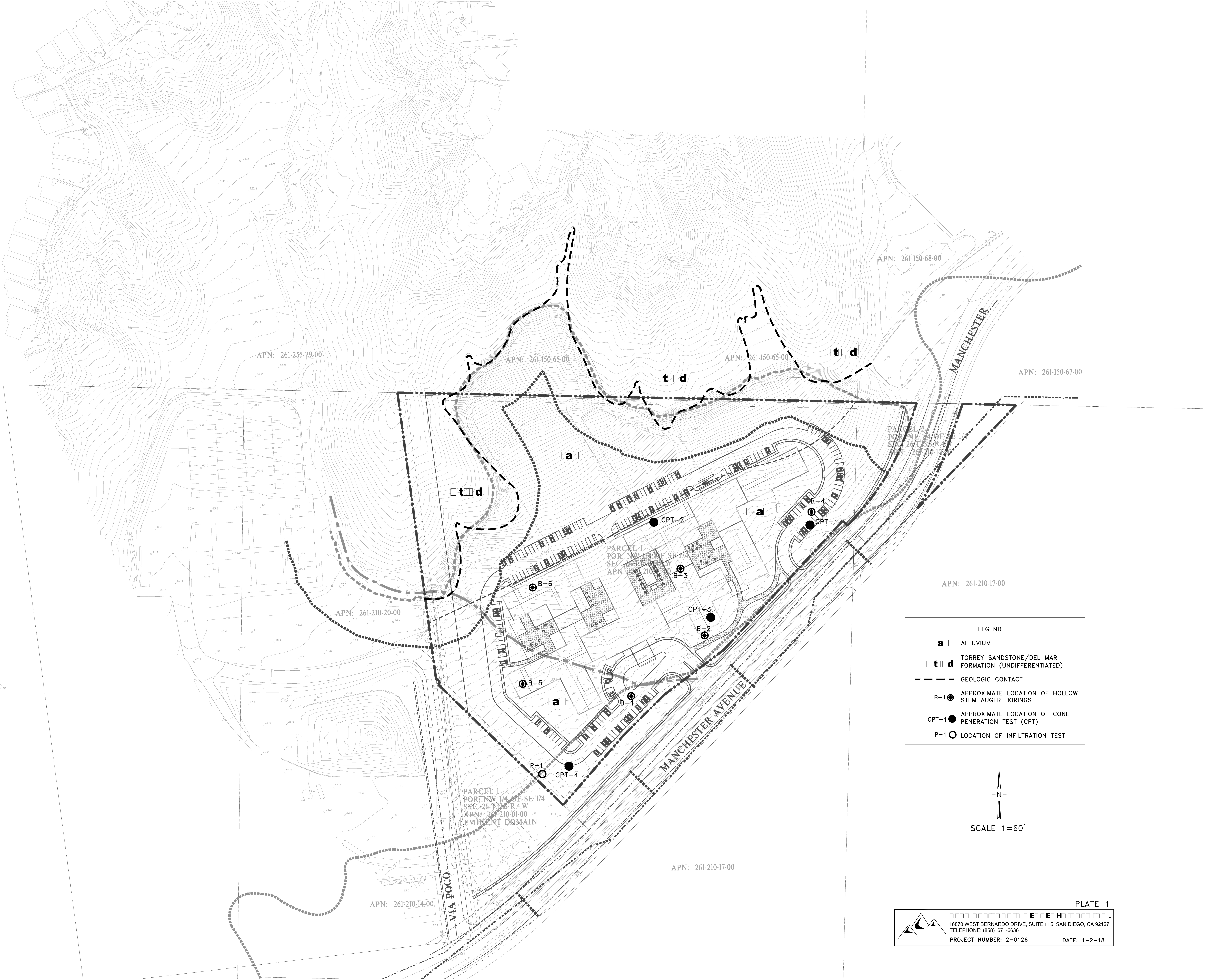
LIQUEFACTION ANALYSIS

2-0126

Hole No.=CPT-4   Water Depth=10 ft

Magnitude=6.7
Acceleration=0.50g





LEGEND

a	ALLUVIUM
td	TORREY SANDSTONE/DEL MAR FORMATION (UNDIFFERENTIATED)
— — —	GEOLOGIC CONTACT
B-1 ⊕	APPROXIMATE LOCATION OF HOLLOW STEM AUGER BORINGS
CPT-1 ●	APPROXIMATE LOCATION OF CONE PENERATION TEST (CPT)
P-1 ○	LOCATION OF INFILTRATION TEST

PLATE 1

[illegible] E E H [illegible].
16870 WEST BERNARDO DRIVE, SUITE [illegible]5, SAN DIEGO, CA 92127
TELEPHONE: (858) 67[illegible]-6636
PROJECT NUMBER: 2-0126
DATE: 1-2-18

F-2

Vibro Replacement Stone Columns

HAYWARD BAKER, INC.
Western Region
10303 Channel Rd
Lakeside, CA 92040
Phone – (619) 956-0850 / Fax – (619) 956-0831

February 16, 2018

Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

Attention: Mr. Beau Brand
Ph: (858) 735-7569
beau.brand@greystar.com

Reference: Vibro Replacement Stone Columns
3111 Manchester Avenue
Encinitas, CA
HB File No. OP-0033224

Dear Beau,

Hayward Baker, Inc. (HB) offers the following budget proposal for the installation of Vibro Replacement Stone Columns - soil improvement for proposed Senior housing at 3111 Manchester Ave., Encinitas, CA. HBI also looked at other geotechnical solutions and concluded that vibro replacement stone column solution is the most feasible and economical solution for this project with very high liquefaction induced settlement. This proposal is based upon information from various sources including:

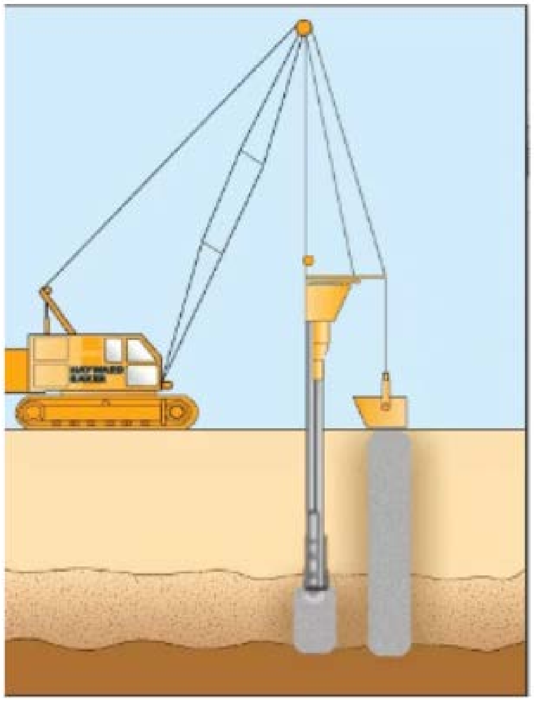
1. Soils report, CPT data files and architectural plans.
2. Allowable total settlement is 4 inches and differential settlement is 2 inch.

Vibro Replacement Stone Columns

This process densifies granular soils and reinforces all soils. Vibro replacement stone columns are constructed with either the wet top-feed process, or the dry bottom-feed process.

In the wet top-feed process, the vibrator penetrates to the design depth using the vibrator's weight and vibrations, as well as water jets located in the tip. The stone (crushed stone or recycled concrete) is then added at the ground surface to the annular space around the vibrator created by the jetting water. The stone falls through the space to the vibrator tip, and fills the void created as the vibrator is lifted several feet. The vibrator is lowered, densifying and displacing the underlying stone. The vibro replacement process is repeated in lifts until a dense stone column is constructed to the ground surface.

The dry bottom-feed process is similar, except that no water jets are used and the stone is fed to the vibrator tip through an attached feed pipe. Pre-drilling of dense strata at the column location may be required for the vibrator to penetrate to the design depth. Both methods of construction create a high modulus stone column that reinforces the treatment zone and densifies surrounding granular soils.



Vibro replacement rigs can be fully instrumented with an on-board Data Acquisition (DAQ) system to monitor specific parameters. Data from the system, such as amperage and lift rate, are recorded and displayed in real-time alongside specified target values on an in-cab monitor. Monitoring allows the operator to correct any deviations in real-time during the construction process to keep the stone column within project specifications.

HB’s price is contingent upon the following services provided at no extra charge.

1. All dust control on site.
2. Stable and level work area
3. Locate, clear and/or remove all below grade utilities in the ground improvement treatment area.
4. Reference survey control and off-sets as needed to layout HB installation pattern.
5. Excess soils caused by HBI’s operation should be managed and disposed by others.

We look forward to receiving an award so the design can be started and the work can begin as soon as possible. We trust the provided information is sufficient for your needs at this time, however if we can provide any additional information, please feel free to contact us at 619-956-0850. We look forward to being of service on this project.

Sincerely,
HAYWARD BAKER, INC.

Sunil Arora, P.E.
Sr. Project Manager

HAYWARD
BAKER
Geotechnical Construction

KELLER

SCHEDULE OF PRICES

Hayward Baker, Inc. (HB) proposes to perform the work described in the accompanying letter for the prices listed below. It is understood that final payment will be based on the actual quantities and that the estimated quantities listed below are for budgeting purposes only.

Item No.	Description	Est'd Quantity	Unit	Unit Price	Total Price
1	Design Submittal	1	LS	$25,000	$25,000
2	Mobilization (2 Cranes)	1	EA	$175,000	$175,000
3	Stone Columns (36" Diameter)	95,000	LF	$40	$3,800,000
	TOTAL				$4,000,000

SCHEDULE

1. *HB estimates 4 months necessary for installation of stone columns utilizing two crews working a single 10-hour shift, 5-days per week.*
2. *HB will need 2 weeks to provide design submittal after receiving notice to proceed and reference drawings and structural information.*
3. *HB will require 2 weeks minimum to mobilize to jobsite after receiving notice to proceed for construction.*

Hayward Baker Inc.

Accepted by:

Enclosures: Liquefaction analyses and draft layout plan.

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

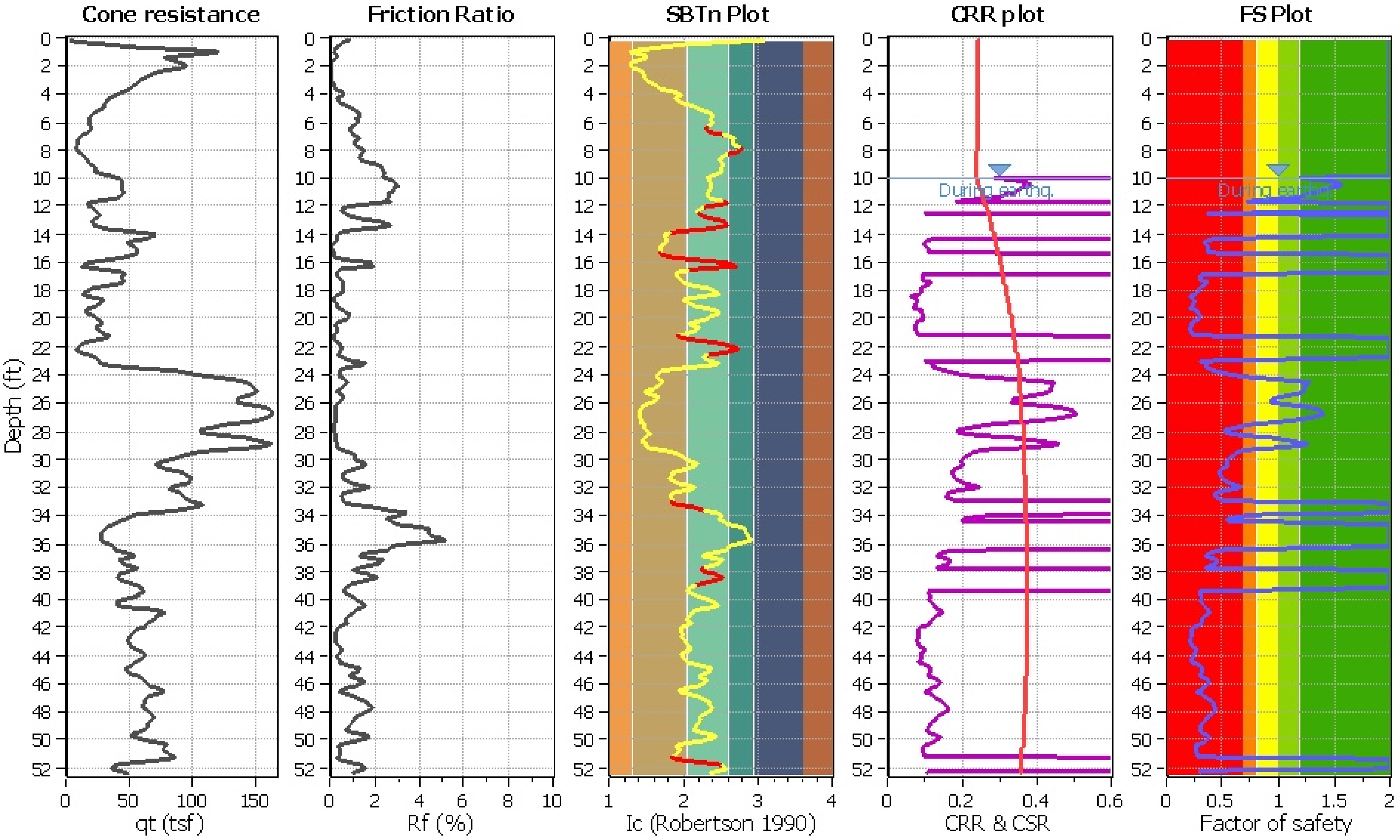
LIQUEFACTION ANALYSIS REPORT

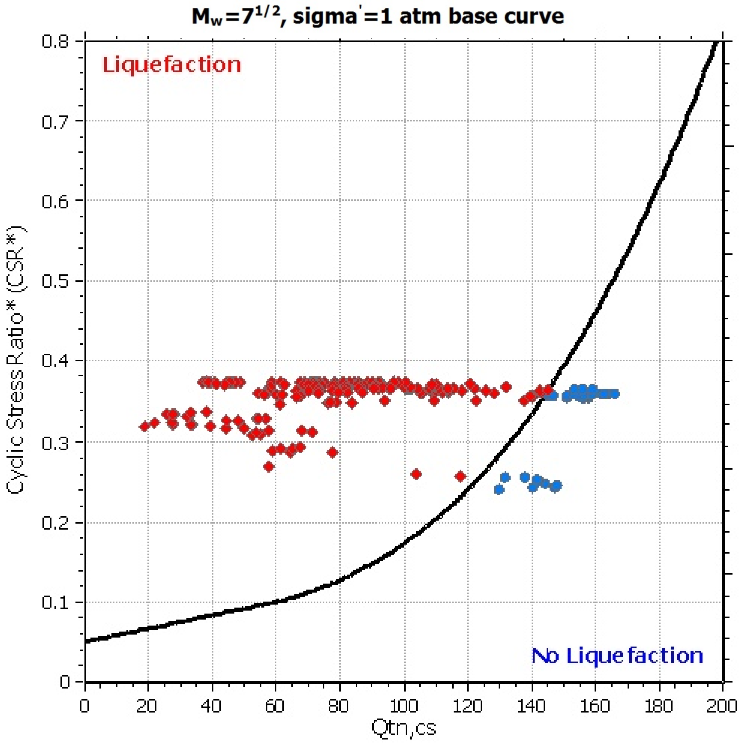
Project title : **Location :**

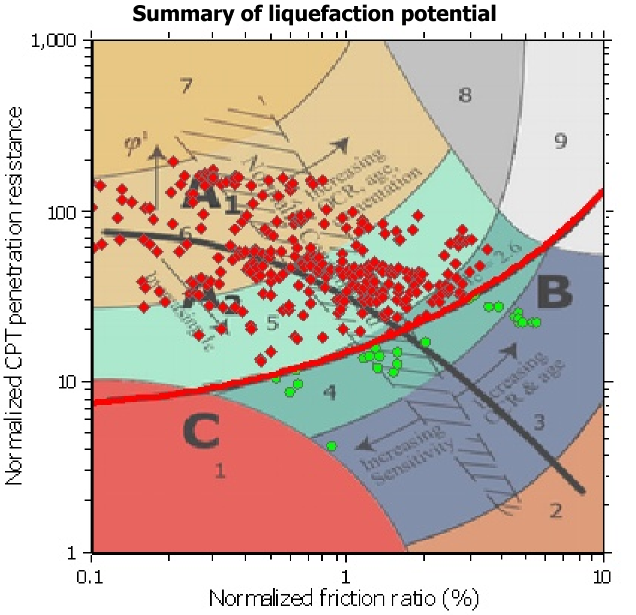
CPT file : CPT-1

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	10.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	10.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	6.70	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.50	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

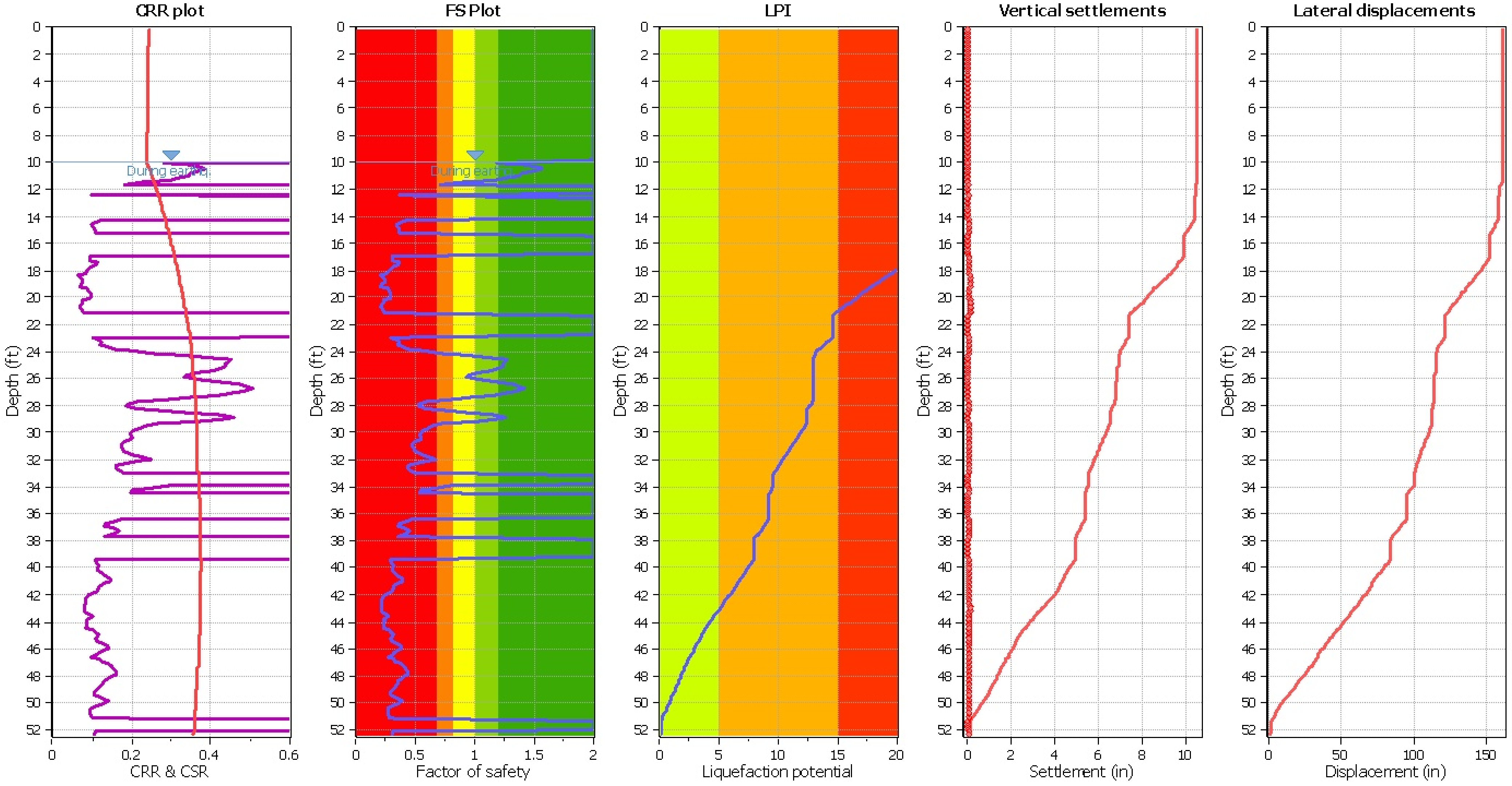






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Liquefaction analysis overall plot



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.50	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

- 🟥 Almost certain it will liquefy
- 🟧 Very likely to liquefy
- 🟨 Liquefaction and no liq. are equally likely
- 🟩 Unlike to liquefy
- 🟩 Almost certain it will not liquefy

LPI color scheme

- 🟥 Very high risk
- 🟧 High risk
- 🟩 Low risk

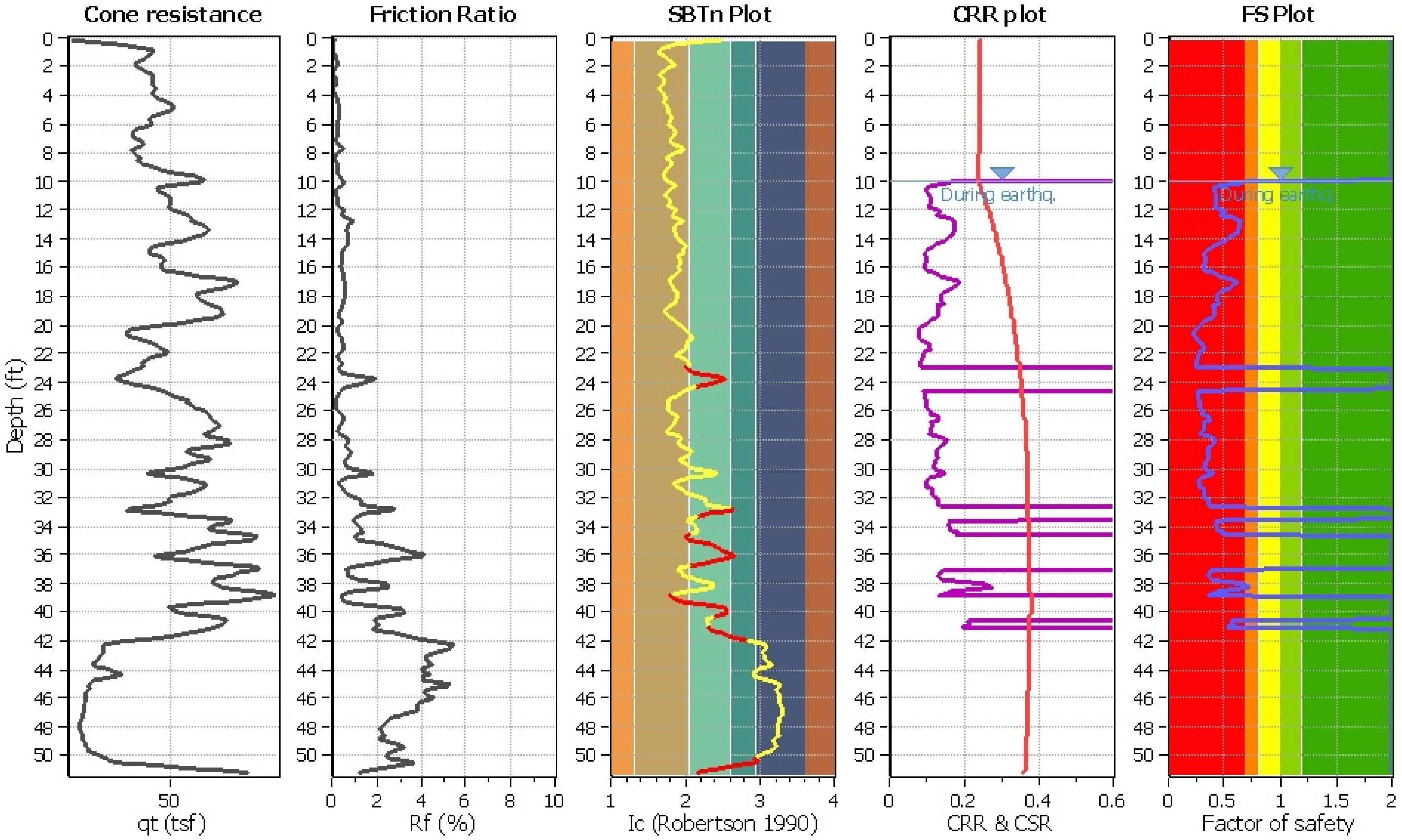
LIQUEFACTION ANALYSIS REPORT

Project title : **Location :**

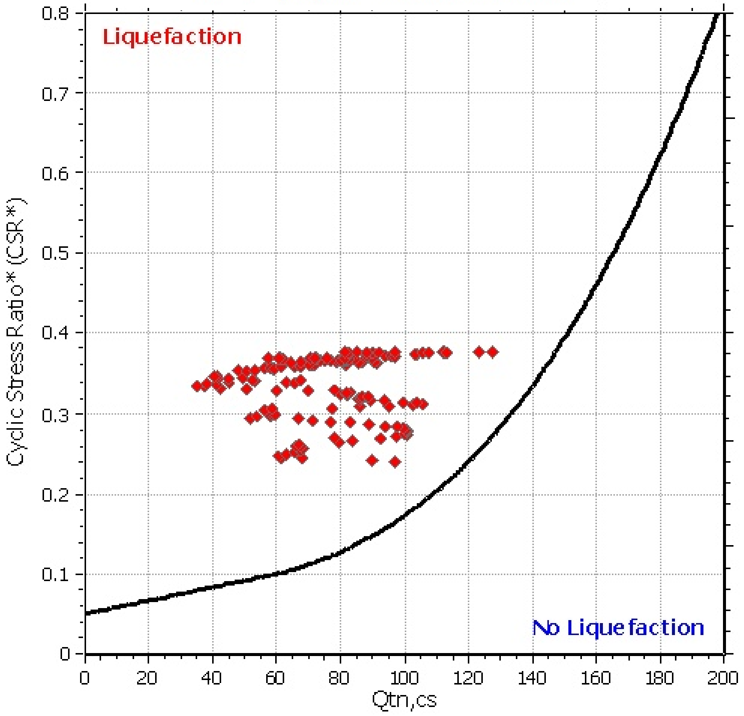
CPT file : CPT-2

Input parameters and analysis data

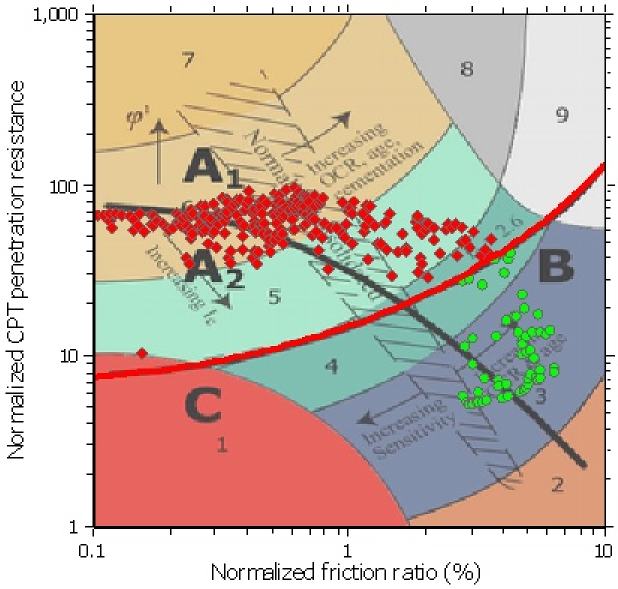
Analysis method:	NCEER (1998)	G.W.T. (in-situ):	10.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	10.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	6.70	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.50	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		



M_w=$7^{1/2}$, sigma'=1 atm base curve



Summary of liquefaction potential



Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
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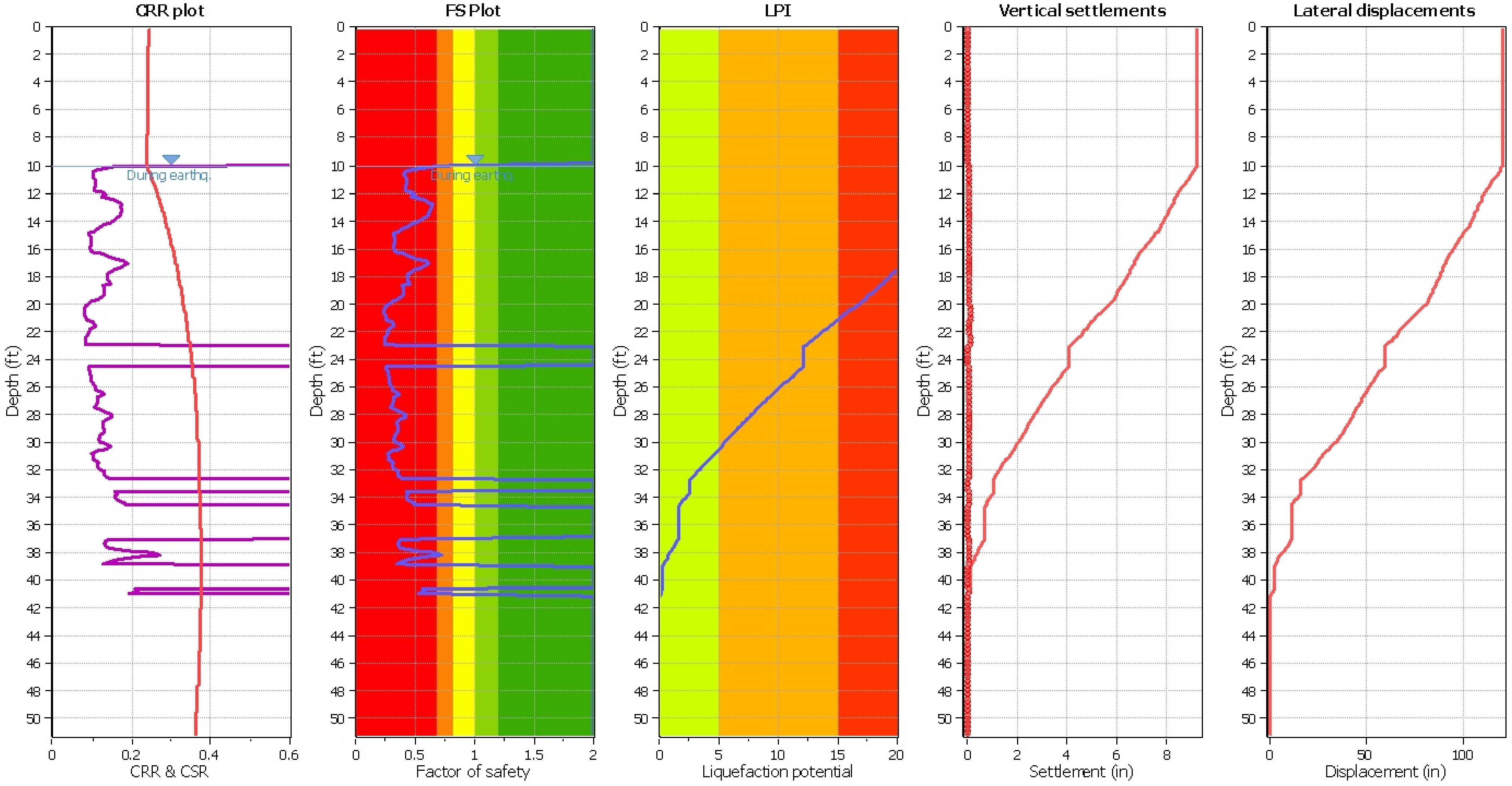
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Liquefaction analysis overall plot



Input parameters and analysis data

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Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.50	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

- 🟥 Almost certain it will liquefy
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LPI color scheme

- 🟥 Very high risk
- 🟧 High risk
- 🟩 Low risk

LIQUEFACTION ANALYSIS REPORT

Project title : **Location :**

CPT file : CPT-3

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	10.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
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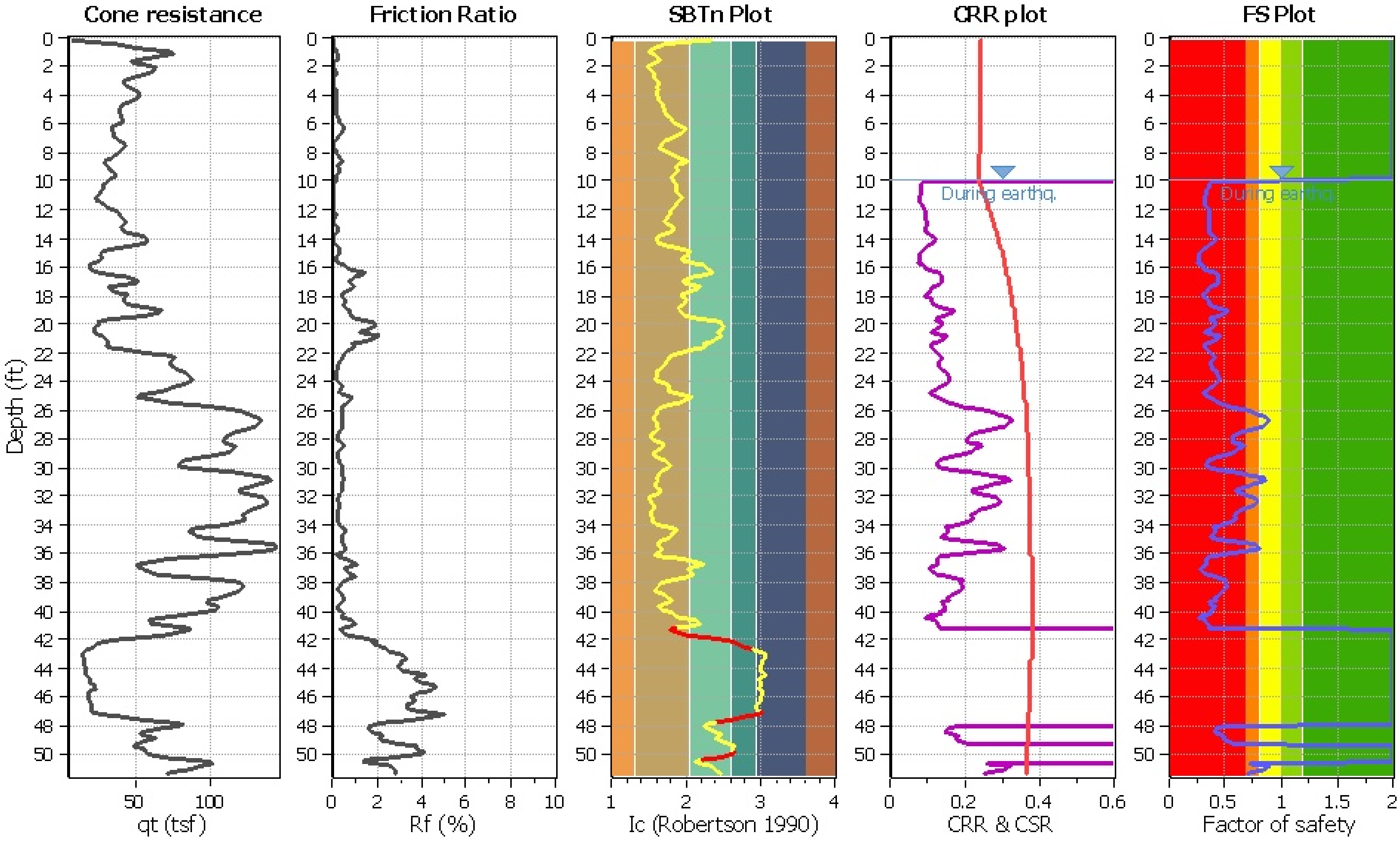

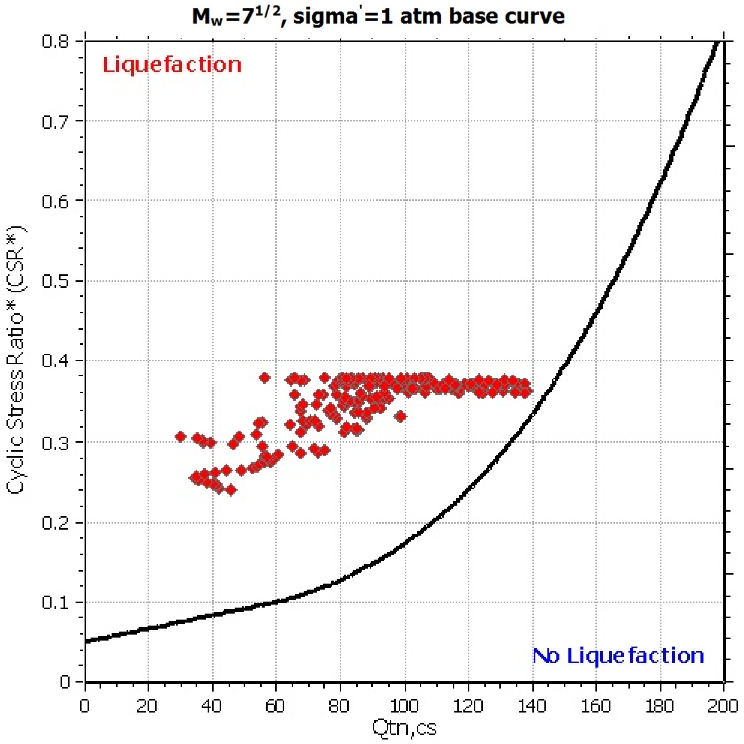

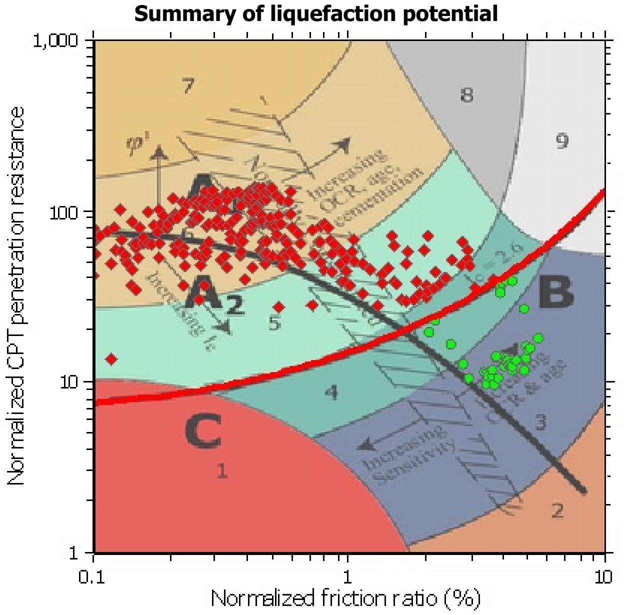

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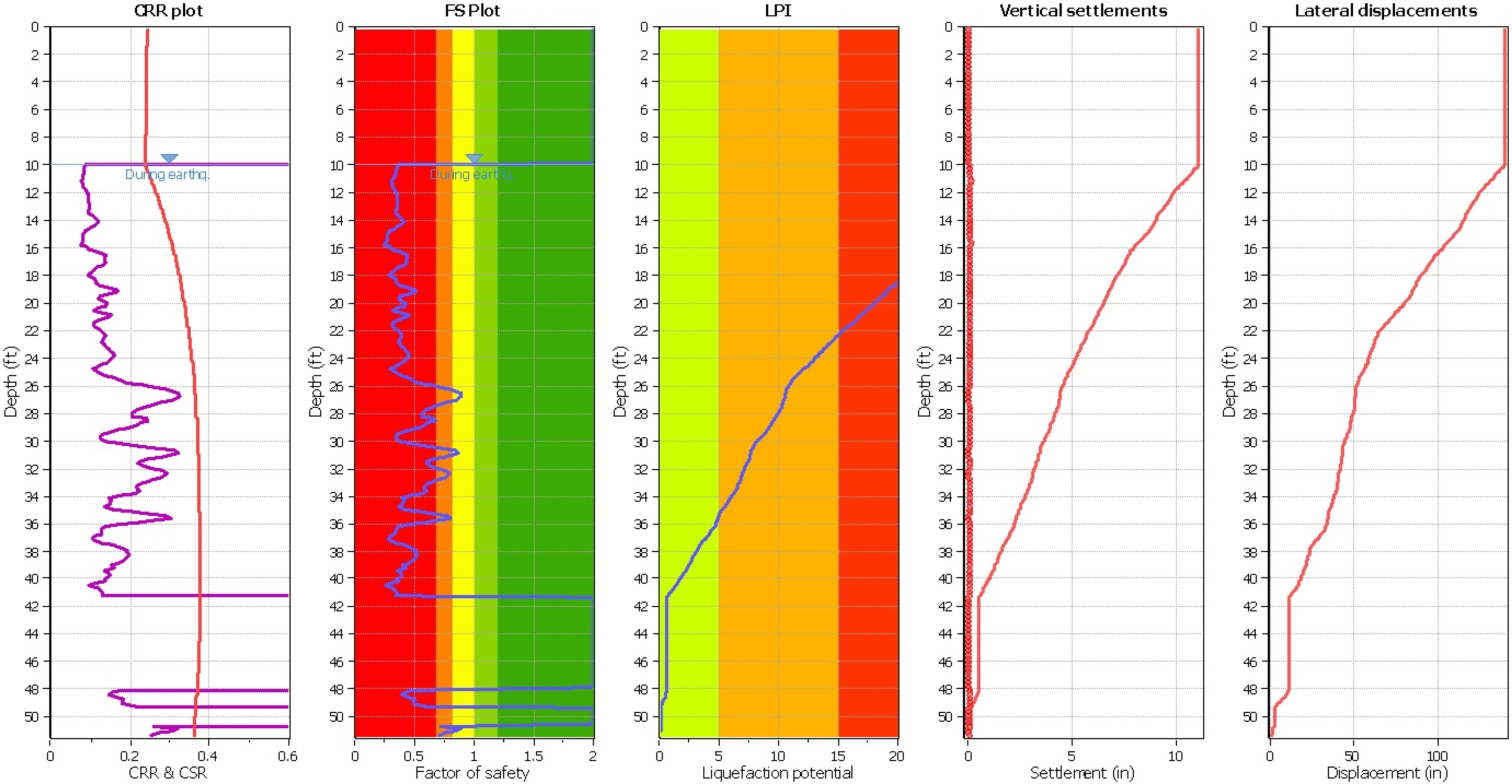
Liquefaction analysis overall plot



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GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

LIQUEFACTION ANALYSIS REPORT

Project title : **Location :**

CPT file : CPT-4

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	10.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
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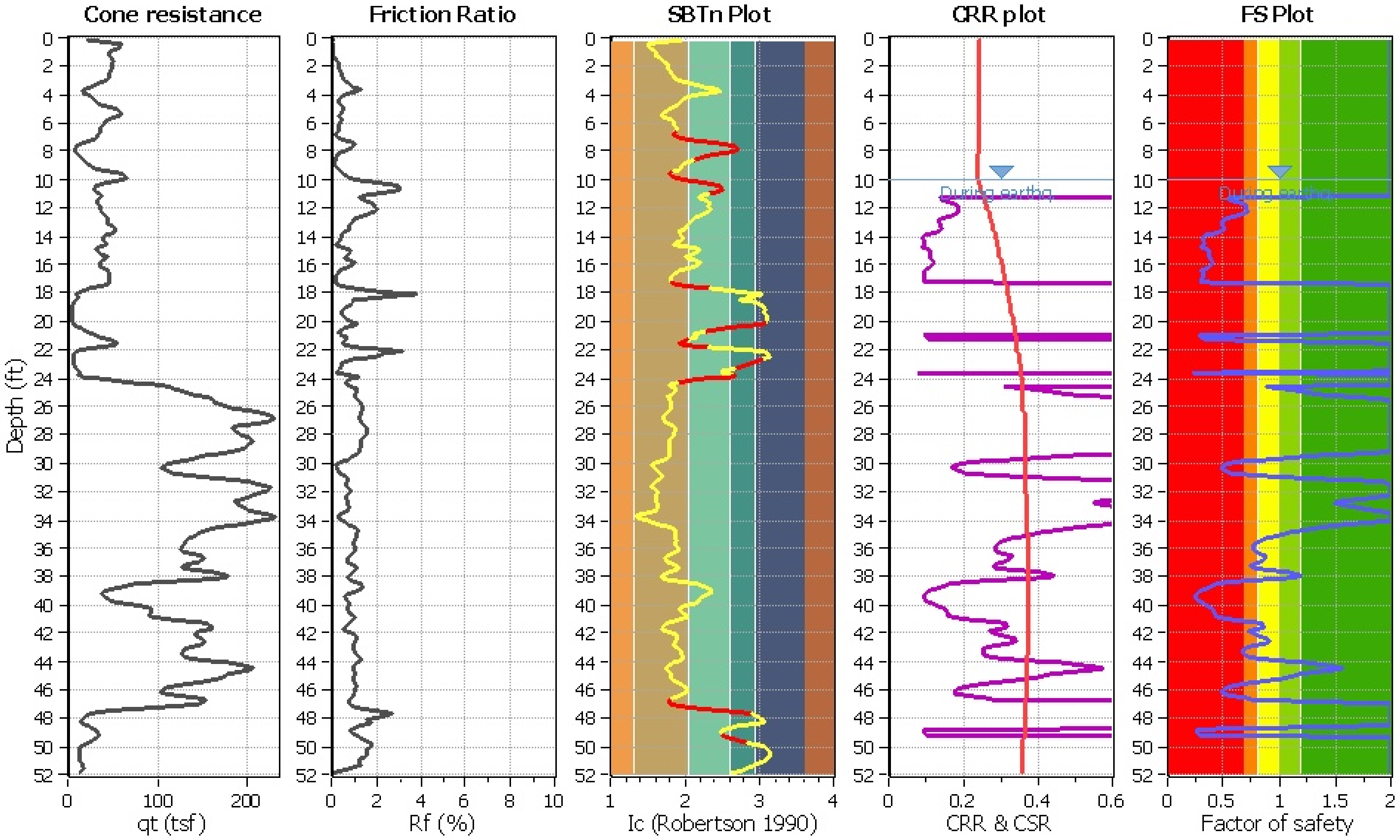
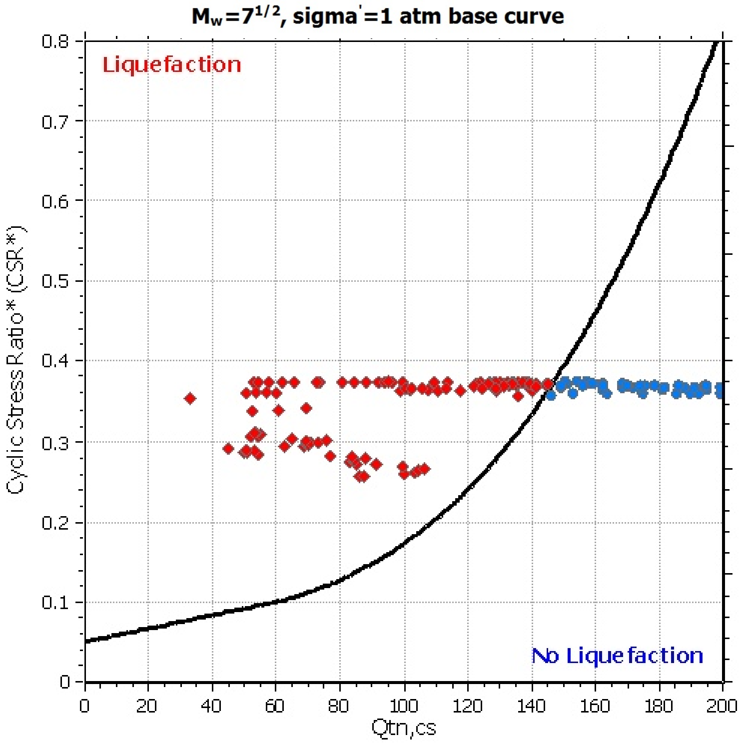
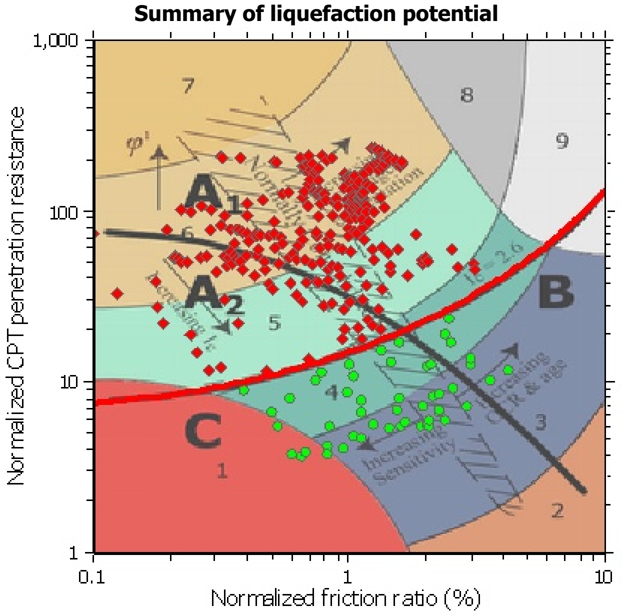
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude M_w:	6.70	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.50	Unit weight calculation:	Based on SBT	K_σ applied:	Yes	MSF method:	Method based







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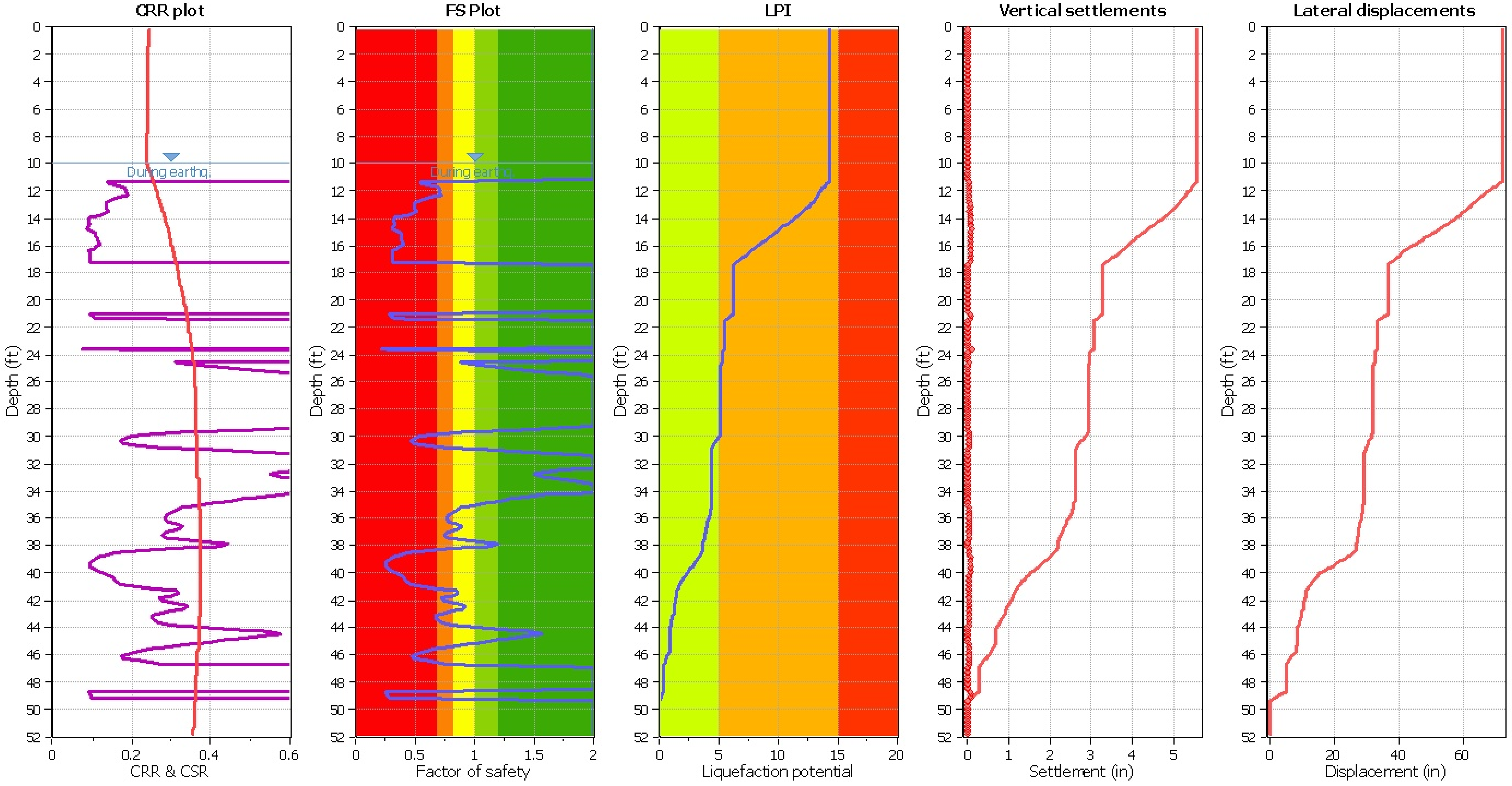
Liquefaction analysis overall plot



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Fill height: N/A

Fill weight: N/A
Transition detect. applied: Yes
K_σ applied: Yes
Clay like behavior applied: Sands only
Limit depth applied: No
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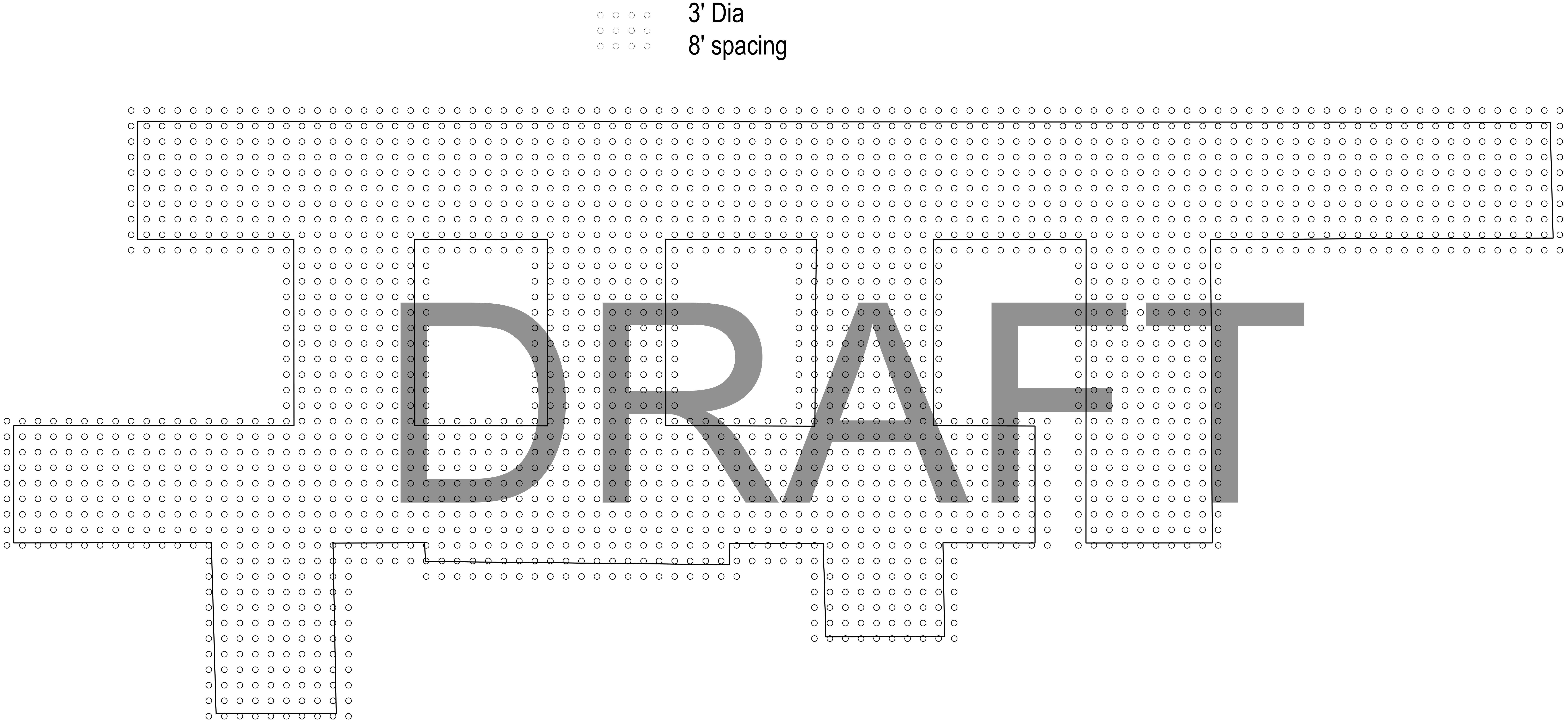

stone column 2255

HAYWARD BAKER
A KELLER COMPANY

10303 CHANNEL ROAD,
LAKESIDE, CALIFORNIA
PH: 619-956-0850
FX: 619-956-0863

Website:www.HaywardBaker.Com

ENGINEER OF RECORD:

HAYWARD BAKER INC.
CERTIFICATE OF AUTHORIZATION

References:

SHEET: **DATE:**

Senior Housing Estimate

PROJECT ADDRESS

REV. NO.	REVISION DESCRIPTION	DATE XX/XX/XX

PROJECT NUMBER: 00000
ISSUE DATE: 00/00/16

SHEET NUMBER:

HB-1

C:\Users\david.chae\Desktop\New Targets\senior house\Senior Housing Layout - Standard\Senior Housing Layout.dwg 2/14/2016

F-3

Review of Geotechnical Report and Development Plans

Geopacifica, Inc.

Memo

To: Anna Yentile, Planning

From: James Knowlton, Geotechnical Consultant

Date: 4/19/2018

Re: Review of Geotechnical Report and Development Plans, Proposed Senior Residential Care Facility , 3111 Manchester Avenue, Encinitas, CA, Application # 17-273 MUP/DR/CDP/EIR

Reference:

1. Geotechnical Summary for Due Diligence, 3111 Manchester Avenue, Senior Housing Project, City of Encinitas, CA, by Alta California Geotechnical, dated January 2, 2018
2. Vibro Replacement Stone Columns, 3111 Manchester Avenue, Encinitas, CA, by Hayward Baker, Inc., dated February 16, 2018
3. Development Plans, Encinitas Senior Housing, 3111 Manchester Avenue, Encinitas, CA, by VTBS Architects, dated 3/13/2018

In response to your request we have reviewed the referenced materials for conformance to the requirements of the City of Encinitas Municipal Code, Engineers Manual and the approved Local Coastal Plan(LCP). The submitted documents were for entitlement of the proposed development. In addition to reviewing the submitted geotechnical report, proposed stone column mitigation and development plans, I also visited the subject site of two occasions and worked on a City of Encinitas CIP project that involved widening of Manchester Avenue in the subject area.

Based upon my site review, review of the geotechnical investigation, development plans and the proposed stone column mitigation of the site the geotechnical consultant, Loma Alta Geotechnical, has provided all of the requirements of the City of Encinitas for geotechnical reports and the report has addressed all potential geotechnical hazards at the site and has presented mitigation measures for all identified geotechnical hazards. The referenced report #2 presents a proposal for the mitigation of the potential liquefaction hazards for the site as identified by the geotechnical consultant. The geotechnical report, stone column mitigation and development plans are approved for entitlement from a geotechnical standpoint.

G

Greenhouse Gas Study

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BELMONT VILLAGE ENCINITAS BY-THE-SEA SENIOR RESIDENTIAL CARE FACILITY PROJECT

GREENHOUSE GAS STUDY

Prepared for:

Greystar
444 South Cedros Avenue
Solana Beach, CA 92075

Prepared by:

BPG
BIRDSEYE
PLANNING GROUP

December 2019

BELMONT VILLAGE ENCINITAS BY-THE-SEA SENIOR RESIDENTIAL CARE FACILITY PROJECT
ENCINITAS, CALIFORNIA

GREENHOUSE GAS STUDY

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Appendices

BELMONT VILLAGE ENCINITAS VILLAGE BY-THE-SEA SENIOR RESIDENTIAL CARE FACLITY PROJECT ENCINITAS, CALIFORNIA

GREENHOUSE GAS STUDY

This report is an analysis of the potential greenhouse gas impacts associated with the proposed Belmont Village Encinitas By-The-Sea Senior Residential Care Facility Project in the City of Encinitas, California. This report has been prepared by Birdseye Planning Group (BPG) under contract to Greystar to support preparation of the environmental documentation pursuant to the California Environmental Quality Act (CEQA). This study analyzes the potential for temporary impacts associated with construction activity and long-term impacts associated with operation of the proposed project.

PROJECT DESCRIPTION

The Project is for Tentative Map Density Bonus, Planned Residential Development Permit, Major Use Permit, Design Review and Coastal Development Permit for a new, fully-licensed senior care facility and 8 single-family lots that would accommodate 16 affordable housing units located at 3111 Manchester Avenue in Cardiff-by-the-Sea, a community within the City of Encinitas, California.

The project site is owned by the Yasuda Family and consists of two lots in a RR-2 zone. The site is located within a California Coastal Appeal Jurisdiction, scenic/visual corridor, hillside/inland bluff overlay zone. The site totals 19.026 gross acres. Caltrans is in process of developing a new facility within an approximately 2.5-acre easement on the western edge of the site. The site has historically been used for agricultural production, primarily strawberries and Asian vegetables. The proposed senior care facility and affordable units are allowed on the site per current zoning provided a major use permit is approved.

The site is bordered by Mira Costa Community College to the east, the San Elijo Lagoon to the south, farm land and Caltrans park and ride to the west and a steep hillside leading into a single-family residential neighborhood to the north (see Figure 1).

Proposed primary vehicular access to the site will be from a new Caltrans spine road off of Manchester Avenue. Emergency vehicles will have access directly off of Manchester via a secondary access at the southeast corner of the site. Vegetation consists of coastal sage brush along the north and northeastern border of the site. As proposed, the facility would be two-stories in height and will accommodate a total of 200 units. The unit mix would be comprised of the following; 75 independent units, 67 assisted living units, 30 Circle of Friends (memory care light) units and 28 memory care units. The project will also include 16 affordable housing units each approximately 615 square feet in size. The community will be a fully licensed facility

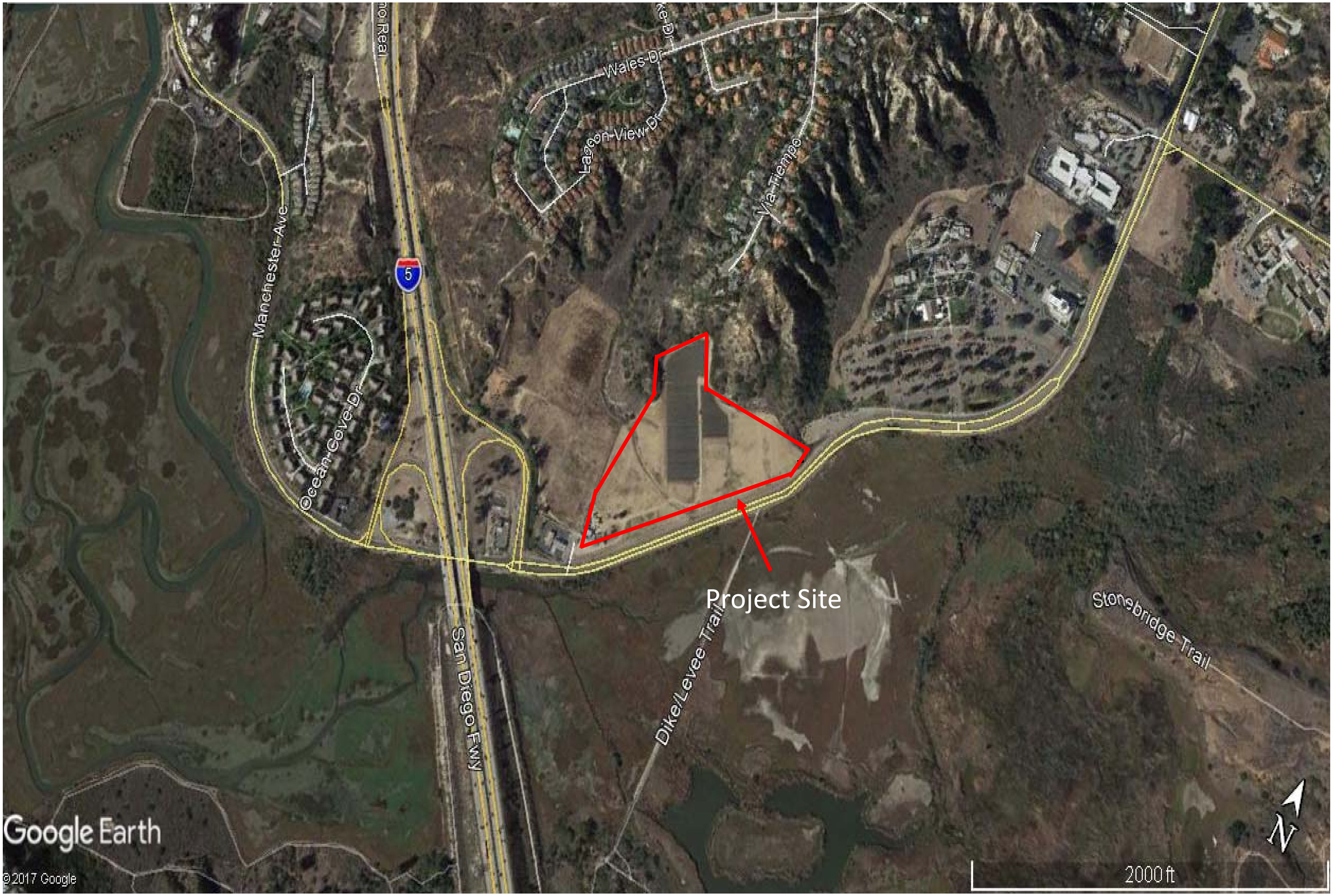


Figure 1—Project Site

operated by Belmont Village. The size of the senior care building is approximately 216,000 square feet (gross) with approximately 60,000 square feet of common area and 166 parking spaces. The building will be designed in an eclectic Craftsman style incorporating wood, stone and stucco elements. All design aspects will adhere to the City of Encinitas's Design Guidelines. The 16 affordable units will be located on the eastern side of the site. The units will be approximately 615 square feet and have 17 parking stalls. All design aspects will adhere to the City of Encinitas's Design Guidelines. Greystar is planning to dedicate approximately 6 acres of the site to the San Elijo Lagoon Conservancy as open space.

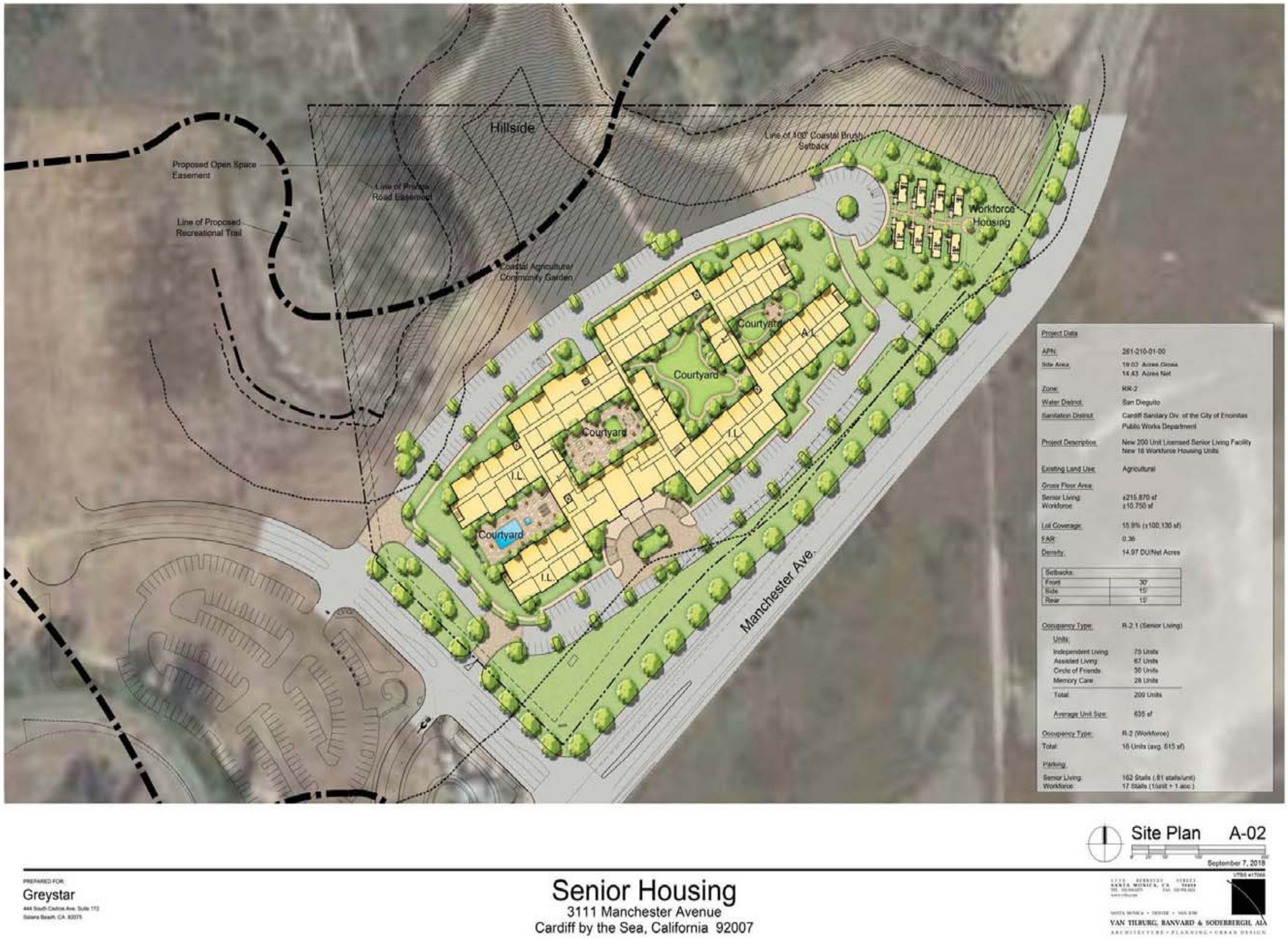
A non-wetland, unvegetated ephemeral channel is located onsite in the form of a managed and maintained soft bottom channel. The area impacted by the project would be 0.08 acres and comprises the historical course of the drainage feature. Impacts to the ephemeral channel would require a Section 1602 Streambed Alteration Agreement (SAA) from the California Department of Fish and Wildlife (CDFW), a Section 404 Clean Water Act (CWA) permit and a Section 401 Water Quality Certification in accordance with the CWA. Direct impacts to this feature would be mitigated off-site. No sensitive plants or animals were observed on-site.

Project construction would begin in early-2021 and the facility is expected to be fully operational by early 2023. A proposed site plan is shown as Figure 2.

GREENHOUSE GAS EMISSIONS

Gases that absorb and re-emit infrared radiation in the atmosphere are called greenhouse gases (GHGs). GHGs are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

GHGs are emitted by both natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills. Man-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and sulfur hexafluoride (SF_6) (California Environmental Protection Agency [CalEPA], 2006). Different types of GHGs have varying global warming potentials (GWPs). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas (CO_2) is used to relate the amount of heat absorbed to the amount of the gas emissions, referred to as "carbon dioxide equivalent" (CO_2E), and is the amount of a GHG emitted multiplied by its GWP. Carbon dioxide has a GWP of one. By contrast, methane (CH_4) has a GWP of 21, meaning its global warming effect is 21 times greater than carbon dioxide



Project Data

APN:	261-210-01-00
Site Area:	19.02 Acres Gross 14.43 Acres Net
Zone:	RR-2
Water District:	San Dieguito
Sanitation District:	Cardiff Sanitary Div. of the City of Encinitas Public Works Department
Project Description:	New 200 Unit Licensed Senior Living Facility New 16 Workforce Housing Units
Existing Land Use:	Agricultural
Gross Floor Area:	
Senior Living:	±215,870 sf
Workforce:	±10,750 sf
Lot Coverage:	15.9% (±100,130 sf)
FAR:	0.36
Density:	14.97 DU/Net Acres

Setbacks:	
Front	30'
Side	15'
Rear	15'

Occupancy Type:	R-2.1 (Senior Living)
Units:	
Independent Living	75 Units
Assisted Living:	67 Units
Circle of Friends	30 Units
Memory Care	28 Units
Total:	200 Units
Average Unit Size:	635 sf
Occupancy Type:	R-2 (Workforce)
Total:	16 Units (avg. 615 sf)
Parking:	
Senior Living:	162 Stalls (.81 stalls/unit)
Workforce:	17 Stalls (1/unit + 1 acc.)

Site Plan A-02

September 7, 2018

VTBS #17066

PREPARED FOR:

Greystar

444 South Cedros Ave. Suite 172
Solana Beach, CA 92075

Senior Housing

3111 Manchester Avenue
Cardiff by the Sea, California 92007

SANTA MONICA • DENVER • SAN JOSE

VAN TILBURG, BANVARD & SODERBERGH, AIA

ARCHITECTURE • PLANNING • URBAN DESIGN

Figure 2—Site Plan

on a molecule per molecule basis (IPCC, 1997). Total U.S. GHG emissions were 6,587 MMT CO_2E in 2015 (U.S. EPA, April 2017). Total U.S. emissions decreased over 2014 levels primarily as a result of less fossil fuel combustion. However, emissions vary annually. For example, emissions increased by 3.2 percent from 2009 to 2010. The increase was due in part to (1) an increase in economic output resulting in greater energy consumption across all sectors; and (2) warmer summer conditions resulting in an increase in electricity demand for air conditioning (U.S. EPA, April 2012). In 2015, electricity production and transportation accounted for 29 percent and 27 percent of CO_2 emissions from fossil fuel combustion, respectively. The residential and commercial end-use sectors accounted for 22 percent and 19 percent of CO_2 emissions from fossil fuel combustion, respectively, during 2010 (U.S. EPA, April 2012).

Based upon the California Air Resources Board (ARB) California Greenhouse Gas Inventory, 2016 edition, (ARB, June 2016), California produced 441.5 MMT CO_2E in 2014. The major source of GHG in California is transportation, contributing 37 percent of the state's total GHG emissions. The industrial sector is the second largest source, contributing 24 percent of the state's GHG emissions (ARB, June 2016). In 2013, the GHG emissions were 459.3 MMT of CO_2E. The major source of GHG in California was transportation, contributing 37 percent of the state's total GHG emissions. Industrial emissions replaced electricity generation as the second largest source, contributing 23 percent of the state's GHG emissions (ARB, June 2015).

California emissions result in part to its geographic size and large population compared to other states. However, a factor that reduces California's per capita fuel use and GHG emissions, as compared to other states, is its relatively mild climate. The ARB has projected statewide unregulated GHG emissions for the year 2020 is projected to be 509 MMT CO_2E (ARB, May 2014). These projections are based on Business As Usual (BAU) conditions and represent the emissions that would be expected to occur in the absence of any GHG reduction actions.

California Regulations

In 2005, former Governor Schwarzenegger issued Executive Order (EO) S-3-05, establishing statewide GHG emissions reduction targets. EO S-3-05 states that by 2020, emissions shall be reduced to 1990 levels; and by 2050, emissions shall be reduced to 80 percent of 1990 levels (CalEPA, 2006). In response to EO S-3-05, CalEPA created the Climate Action Team (CAT), which in March 2006 published the Climate Action Team Report (the "2006 CAT Report") (CalEPA, 2006). The 2006 CAT Report recommended various strategies that the state could pursue to reduce GHG emissions. These strategies could be implemented by various state agencies to ensure that the emission reduction targets in EO S-3-05 are met and can be met with existing authority of the state agencies. The strategies include the reduction of passenger and light duty truck emissions, the reduction of idling times for diesel trucks, an overhaul of shipping technology/infrastructure, increased use of alternative fuels, increased recycling, and landfill methane capture, etc.

California's major initiative for reducing GHG emissions is outlined in Assembly Bill 32 (AB 32), the "California Global Warming Solutions Act of 2006," signed into law in 2006. AB 32 codifies the Statewide goal of reducing GHG emissions to 1990 levels by 2020 (essentially a 15% reduction below 2005 emission levels; the same requirement as under S-3-05), and requires ARB to prepare a Scoping Plan that outlines the main State strategies for reducing GHGs to meet the 2020 deadline. In addition, AB 32 requires ARB to adopt regulations to require reporting and verification of statewide GHG emissions.

After completing a comprehensive review and update process, the ARB approved a 1990 statewide GHG level and 2020 limit of 427 MMT CO_2E. The Scoping Plan was approved by ARB on December 11, 2008, and includes measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures. The Scoping Plan includes a range of GHG reduction actions that may include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms.

Executive Order S-01-07 was enacted on January 18, 2007. The order mandates that a Low Carbon Fuel Standard ("LCFS") for transportation fuels be established for California to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020.

Other regulations affecting state and local GHG planning and policy development are summarized as follows:

Assembly Bill 939 and Senate Bill 1374
Assembly Bill 939 (AB 939) requires that each jurisdiction in California to divert at least 50 percent of its waste away from landfills, whether through waste reduction, recycling or other means. Senate Bill 1374 (SB 1374) requires the California Integrated Waste Management Board to adopt a model ordinance by March 1, 2004 suitable for adoption by any local agency to require 50 to 75 percent diversion of construction and demolition of waste materials from landfills.

Senate Bill 1368
Senate Bill 1368 (SB 1368) is the companion Bill of AB 32 and was adopted September, 2006. SB 1368 required the California Public Utilities Commission (CPUC) to establish a performance standard for baseload generation of GHG emissions by investor-owned utilities by February 1, 2007 and for local publicly owned utilities by June 30, 2007. These standards could not exceed the GHG emissions rate from a baseload combined-cycle, natural gas-fired plant. Furthermore, the legislation states that all electricity provided to the State, including imported electricity, must be generated by plants that meet the standards set by California Public Utilities Commission (CPUC) and California Energy Commission (CEC).

Senate Bill 97

Senate Bill 97 (SB 97) was adopted August 2007 and acknowledges that climate change is an environmental issue that requires analysis under CEQA. SB 97 directed the Governor's Office of Planning and Research (OPR), which is part of the State Natural Resources Agency, to prepare, develop, and transmit to CARB guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, by July 1, 2009. The Natural Resources Agency was required to certify and adopt those guidelines by January 1, 2010. Pursuant to the requirements of SB 97 as stated above, on December 30, 2009 the Natural Resources Agency adopted amendments to the state CEQA guidelines that address GHG emissions. The CEQA Guidelines Amendments changed sections of the CEQA Guidelines and incorporated GHG language throughout the Guidelines. However, no GHG emissions thresholds of significance were provided and no specific mitigation measures were identified. The GHG emission reduction amendments went into effect on March 18, 2010 and are summarized below:

- Climate action plans and other greenhouse gas reduction plans can be used to determine whether a project has significant impacts, based upon its compliance with the plan.

- Local governments are encouraged to quantify the greenhouse gas emissions of proposed projects, noting that they have the freedom to select the models and methodologies that best meet their needs and circumstances. The section also recommends consideration of several qualitative factors that may be used in the determination of significance, such as the extent to which the given project complies with state, regional, or local GHG reduction plans and policies. OPR does not set or dictate specific thresholds of significance. Consistent with existing CEQA Guidelines, OPR encourages local governments to develop and publish their own thresholds of significance for GHG impacts assessment.

- When creating their own thresholds of significance, local governments may consider the thresholds of significance adopted or recommended by other public agencies, or recommended by experts.

- New amendments include guidelines for determining methods to mitigate the effects of greenhouse gas emissions in Appendix F of the CEQA Guidelines.

- OPR is clear to state that "to qualify as mitigation, specific measures from an existing plan must be identified and incorporated into the project; general compliance with a plan, by itself, is not mitigation."

- OPR's emphasizes the advantages of analyzing GHG impacts on an institutional, programmatic level. OPR therefore approves tiering of environmental analyses and highlights some benefits of such an approach.

- Environmental impact reports (EIRs) must specifically consider a project's energy use and energy efficiency potential.

Senate Bills 1078, 107, and X1-2 and Executive Orders S-14-08 and S-21-09
Senate Bill 1078 (SB 1078) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. Senate Bill 107 (SB 107) changed the target date to 2010. Executive Order S-14-08 was signed on November 2008 and expands the State's Renewable Energy Standard to 33 percent renewable energy by 2020. Executive Order S-21-09 directed CARB to adopt regulations by July 31, 2010 to enforce S-14-08. Senate Bill X1-2 codifies the 33 percent renewable energy requirement by 2020.

California Code of Regulations (CCR) Title 24, Part 6
CCR Title 24, Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24) were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. Although it was not originally intended to reduce GHG emissions, electricity production by fossil fuels results in GHG emissions and energy efficient buildings require less electricity. Therefore, increased energy efficiency results in decreased GHG emissions.

The Energy Commission adopted 2008 Standards on April 23, 2008 and Building Standards Commission approved them for publication on September 11, 2008. These updates became effective on August 1, 2009. All buildings for which an application for a building permit is submitted on or after July 1, 2014 must follow the 2013 standards. The 2013 commercial standards are estimated to be 30 percent more efficient than the 2008 standards; 2013 residential standards are at least 25 percent more efficient. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases greenhouse gas emissions.

Senate Bill 375
Senate Bill 375 (SB 375) was adopted in September 2008 and aligns regional transportation planning efforts, regional GHG emission reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPO) to adopt a sustainable communities strategy (SCS) or alternate planning strategy (APS) that will prescribe land use allocation in that MPOs Regional Transportation Plan (RTP). CARB, in consultation with each MPO, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's sustainable community's strategy or alternate planning strategy for consistency with its assigned targets.

The San Diego Association of Governments (SANDAG) is the MPO for the San Diego region. SANDAG completed and adopted its SCS, San Diego Forward, in October 2015. CARB's targets for the SANDAG region call for a 7 percent reduction in GHG emissions per capita from automobiles and light-duty trucks compared to 2005 levels by 2020, and a 13 percent reduction by 2035. (The reduction targets are to be updated every eight years, but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets.) As stated by SANDAG, the strategy set forth in San Diego Forward is to "focus housing and job growth in the urbanized areas where there is existing and planned infrastructure, protect sensitive habitat and open space, invest in a network that gives residents and workers transportation options that reduce GHG emissions, promote equity for all and implement the Plan through incentives and collaboration." In December 2015, CARB–by executive order G-15-075–accepted SANDAG's GHG emissions quantification analysis and determination that, if implemented, the SCS would achieve CARB's 2020 and 2035 GHG emission reduction targets for the region.

City and County land use policies, including General Plans, are not required to be consistent with the RTP and associated SCS or APS. However, CEQA incentivizes, through streamlining and other provisions, qualified projects that are consistent with an approved SCS or APS and categorized as "transit priority projects."

Senate Bill X7-7

Senate Bill X7-7 (SB X7-7), enacted on November 9, 2009, mandates water conservation targets and efficiency improvements for urban and agricultural water suppliers. SB X7-7 requires the Department of Water Resources (DWR) to develop a task force and technical panel to develop alternative best management practices for the water sector. Additionally, SB X7-7 required the DWR to develop criteria for baseline uses for residential, commercial, and industrial uses for both indoor and landscaped area uses. The DWR was also required to develop targets and regulations that achieve a statewide 20 percent reduction in water usage.

California Green Building Standards

On January 12, 2010, the State Building Standards Commission unanimously adopted updates to the California Green Building Standards Code, which went into effect on January 1, 2011. The Code is a comprehensive and uniform regulatory code for all residential, commercial and school buildings. The California Green Building Standards Code does not prevent a local jurisdiction from adopting a more stringent code as state law provides methods for local enhancements. The Code recognizes that many jurisdictions have developed existing construction and demolition ordinances, and defers to them as the ruling guidance provided they provide a minimum 50-percent diversion requirement. The code also provides exemptions for areas not served by construction and demolition recycling infrastructure. State building code provides the minimum standard that buildings must meet for occupancy certification. Enforcement is generally through the local building official.

27 CCR Title 24, Part 11: California Green Building Standards (Title 24) became effective in 2001 in response to continued efforts to reduce GHG emissions associated with energy consumption. CCR Title 24, Part 11 now require that new buildings reduce water consumption, employ building commissioning to increase building system efficiencies, divert construction waste from landfills, and install low pollutant-emitting finish materials. One focus of CCR Title 24, Part 11 is water conservation measures, which reduce GHG emissions by reducing electrical consumption associated with pumping and treating water. CCR Title 24, Part 11 has approximately 52 nonresidential mandatory measures and an additional 130 provisions for optional use. Some key mandatory measures for commercial occupancies include specified parking for clean air vehicles, a 20 percent reduction of potable water use within buildings, a 50 percent construction waste diversion from landfills, use of building finish materials that emit low levels of volatile organic compounds, and commissioning for new, nonresidential buildings over 10,000 square feet.

Executive Order B-30-15

On April 29, 2015, Governor Brown issued an executive order to establish a California greenhouse gas reduction target of 40 percent below 1990 levels by 2030 - the most aggressive benchmark enacted by any government in North America to reduce dangerous carbon emissions over the next decade and a half. This executive action set the stage for the important work being done on climate change by the Legislature. The Governor's executive order aligns California's greenhouse gas reduction targets with those of leading international governments.

California is on track to meet or exceed the current target of reducing greenhouse gas emissions to 1990 levels by 2020, as established in the California Global Warming Solutions Act of 2006 (AB 32). California's new emission reduction target of 40 percent below 1990 levels by 2030 will make it possible to reach the ultimate goal of reducing emissions 80 percent from 1990 levels by 2050.

Senate Bill 32 and Assembly Bill 197

SB 32 and AB 197 (enacted in 2016) are companion bills that set new statewide GHG reduction targets, make changes to CARB’s membership, increase legislative oversight of CARB’s climate change–based activities and expand dissemination of GHG and other air quality–related emissions data to enhance transparency and accountability. More specifically, SB 32 codified the 2030 emissions reduction goal of EO B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40% below 1990 levels by 2030. AB 197 established the Joint Legislative Committee on Climate Change Policies which is comprised of at least three members of the Senate and three members of the Assembly that provide ongoing oversight over implementation of the state’s climate policies. AB 197 added two members of the Legislature to CARB as nonvoting members; requires CARB to make available and update (at least annually via its website) emissions data for GHGs, criteria air pollutants, and toxic air contaminants from reporting facilities; and requires CARB to identify specific information for GHG emissions reduction measures when updating the Scoping Plan.

Local Regulations and CEQA Requirements

As referenced, pursuant to the requirements of SB 97, the Resources Agency has adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted CEQA Guidelines provide general regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents, but contain no suggested thresholds of significance for GHG emissions. Instead, lead agencies are given the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts. The general approach to developing a Threshold of Significance for GHG emissions is to identify the emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions needed to move the state towards climate stabilization. If a project would generate GHG emissions above the threshold level, its contribution to cumulative impacts would be considered significant.

No GHG emission thresholds have been adopted by the San Diego Air Pollution Control District (SDAPCD) for development projects. The City of Encinitas approved a Climate Action Plan (CAP) in January 2018. No specific thresholds of significance for GHG have been adopted by the City of Encinitas for performing individual project analyses. Thus, the proposed project is evaluated herein based on the County of San Diego recommended/preferred threshold for all land use types of 900 metric tons (MT) CO2E annually. Projects generating less than 900 MT CO2E annually are not considered individually or cumulatively significant with respect to impact on climate change. For projects estimated to generate more than 900 MT CO2E annually, emission reduction measures are incorporated into CalEEMod to achieve a 41% or greater reduction over business as usual (BAU) conditions or that reduce emissions to below 900 MT of CO2E annually. A reduction of 41% is the statewide average necessary to achieve SB 32 GHG reduction goals.

CLIMATE CHANGE IMPACT ANALYSIS

Thresholds of Significance

Pursuant to the requirements of SB 97, the Resources Agency adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions in March 2010. These guidelines are used in evaluating the cumulative significance of GHG emissions from the proposed project. According to the adopted CEQA Guidelines, impacts related to GHG emissions from the proposed project would be significant if the project would:

- *Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; and/or*
- *Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.*

The vast majority of individual projects do not generate sufficient GHG emissions to create a project-specific impact through a direct influence to climate change; therefore, the issue of climate change typically involves an analysis of whether a project's contribution towards an impact is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines, Section 15355).

For future projects, the significance of GHG emissions may be evaluated based on locally adopted quantitative thresholds, or consistency with a regional GHG reduction plan (such as a Climate Action Plan). The proposed project is evaluated herein based on a 900 MT CO_2E significance threshold. To determine whether GHG emissions associated with the proposed project are "cumulatively considerable," consistency with applicable GHG emissions reductions strategies recommended by the City of Encinitas 2018 Climate Action Plan is discussed herein.

Methodology

GHG emissions associated with construction and operation of the proposed project and existing development have been estimated using California Emissions Estimator Model (CalEEMod) version 2016.3.2.

Construction Emissions

Construction of the proposed project would generate temporary GHG emissions primarily associated with the operation of construction equipment and truck trips. Site preparation and grading typically generate the greatest emission quantities because the use of heavy equipment is greatest during this phase of construction. Emissions associated with the construction period were estimated based on the projected maximum amount of equipment that would be used onsite at one time. Air districts have recommended amortizing construction-related emissions over a 30-year period to calculate annual emissions. Complete CalEEMod results and assumptions can be viewed in the Appendix.

Operational Emissions

Default values used in CalEEMod version 2016.3.2 are based on the California Energy Commission (CEC) sponsored California Commercial End Use Survey (CEUS) and Residential Appliance Saturation Survey (RASS) studies. CalEEMod provides operational emissions of CO_2, N_2O and CH_4. This methodology has been subjected to peer review by numerous public and private stakeholders, and in particular by the CEC; and therefore, is considered reasonable and reliable for use in GHG impact analysis pursuant to CEQA. It is also recommended by CAPCOA (January 2008).

Emissions associated with area sources (i.e., consumer products, landscape maintenance, and architectural coating) were calculated in CalEEMod based on standard emission rates from CARB, USEPA, and district supplied emission factor values (CalEEMod User Guide, 2016). Emissions from waste generation were also calculated in CalEEMod and are based on the IPCC's methods for quantifying GHG emissions from solid waste using the degradable organic content of waste (CalEEMod User Guide, 2016). Waste disposal rates by land use and overall composition of municipal solid waste in California was primarily based on data provided by the California Department of Resources Recycling and Recovery (CalRecycle).

Emissions from water and wastewater usage calculated in CalEEMod were based on the default electricity intensity from the CEC's 2006 Refining Estimates of Water-Related Energy Use in California using the average values for Northern and Southern California. Emissions from mobile sources were quantified based on trip generation estimates included in CalEEMod version 2016.3.2 for congregate care and residential facilities.

Estimate of GHG Emissions

Construction Emissions

Construction activity is assumed to occur over a period of 18-24 months beginning in early 2021 and concluding in December 2022. Based on CalEEMod results, construction activity for the project would generate an estimated 1,127 metric tons of carbon dioxide equivalent (CO_2E), as shown in Table 1. Amortized over a 30-year period (the assumed life of the project), construction of the proposed project would generate 38 metric tons of CO_2E per year.

Operational Indirect and Stationary Direct Emissions

Long-term emissions relate to energy use, solid waste, water use, and transportation. Each source is discussed below and includes the emissions associated with existing development and the anticipated emissions that would result from the proposed project.

For modeling purposes, it was assumed, that in addition to project features that reduce GHG emissions, the following measures recommended by the California Air Pollution Control Officers Association (CAPCOA) would be implemented to minimize GHG emissions:

- Improved transit connectivity to ensure pedestrian access to neighboring transit services;
- Exceed Title 24 standard by 15% (as required by City of Encinitas 2011 CAP);
- Install high efficency lighting to achieve a 95% reduction in electrical demand associated with lighting;
- Install energy efficient mechanical systems and appliances;
- Install low flow plumbing fixtures;
- Implement water conservation system to reduce demand by 20%; and
- Install water efficient irrigation system to achieve 6.1% reduction in water use.

Table 1
Estimated Construction Related Greenhouse Gas Emissions

Year	Annual Emissions (metric tons CO_2E)
2021	736
2022	391
Total	**1,127**
Amortized over 30 years	**38 metric tons per year**

See Appendix for CalEEMod software program output for new construction.

Energy Use. Operation of onsite development would consume both electricity and natural gas (see Appendix for CalEEMod results). The generation of electricity through combustion of fossil fuels typically yields CO_2, and to a smaller extent, N_2O and CH_4. Natural gas emissions can be calculated using default values from the CEC sponsored CEUS and RASS studies which are built into CalEEMod. As shown in Table 2, the overall net increase in energy use at the project site would result in approximately 316 metric tons of CO_2E per year.

Water Use Emissions**.** The CalEEMod results indicate that the project would use approximately 18.2 million gallons of water per year. Based on the amount of electricity generated to supply and convey this amount of water, as shown in Table 3, the project would generate approximately 89 metric tons of CO_2E per year.

Solid Waste Emissions. For solid waste generated onsite, it was assumed that the project would not achieve a 75% diversion rate at opening consistent with AB 341 (which amended the California Integrated Waste Management Act of 1989 (AB 939)). The CalEEMod results indicate that the project would result in approximately 24 metric tons of CO_2E per year associated with solid waste disposed within landfills.

Table 2
Estimated Annual Energy-Related Greenhouse Gas Emissions

Emission Source	Annual Emissions (CO_2E)
Natural Gas	83 metric tons
Electricity	233 metric tons
Total	**316 metric tons**

See Appendix for CalEEMod software program output.

Table 3
Estimated Annual Solid Waste and Water Use Greenhouse Gas Emissions

Emission Source	Annual Emissions (CO_2E)
Water	89 metric tons
Solid Waste	24 metric tons
Total Water and Solid Waste	**113 metric tons**

See Appendix for CalEEMod software program output (demolition and new construction).

Transportation Emissions. Mobile source GHG emissions were estimated using the average daily trips calculated by CalEEMod for the proposed project. Table 4 shows the estimated mitigated mobile emissions of GHGs for the project based on the estimated annual VMT of 971,786. CalEEMod does not calculate N_2O emissions related to mobile sources. As such, N_2O emissions were calculated based on the project's VMT using calculation methods provided by the California Climate Action Registry General Reporting Protocol (January 2009) and fleet mix percentages calculated by CalEEMod. As shown in Table 4, the project would generate approximately 425 metric tons of CO_2E associated with new vehicle trips.

Combined Construction, Stationary and Mobile Source Emissions

Table 5 combines the net new construction, operational, and mobile GHG emissions associated with the proposed project. As discussed above, temporary emissions associated with construction activity (approximately 852 metric tons CO_2E) are amortized over 30 years (the anticipated life of the project).

Table 4
Estimated Annual Mobile Emissions of Greenhouse Gases

Emission Source	Annual Emissions (CO_2E)
Proposed Project	
Mobile Emissions (CO_2 & CH_4)	405 metric tons
Mobile Emissions (N_2O) [1]	20 metric tons
Total	**425 metric tons**

See Appendix for CalEEMod software program output (demolitions and new construction).
[1] California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1,January 2009, page 30-35. See Appendix for calculations.

Table 5
Combined Annual Greenhouse Gas Emissions

Emission Source	Annual Emissions (CO_2E)
Construction	38 metric tons
Operational	
Energy	316 metric tons
Solid Waste	24 metric tons
Water	89 metric tons
Mobile	425 metric tons
Total	**892 metric tons**

See Appendix for CalEEMod software program output.

The combined annual emissions would total approximately 892 metric tons per year in CO2E. This total represents less than 0.001% of California's total 2016 emissions of 429.4 million metric tons. The majority (48%) of the project's GHG emissions are associated with mobile sources. As noted above, the City of Encinitas uses a 900 MT CO2E annual standard as the GHG emission threshold for land use projects. With implementation of the measures referenced above, project-related annual GHG emissions would not exceed the threshold of 900 metric tons per year. Impacts would be **less than significant** per the CEQA thresholds.

Climate Action Plan. The City of Encinitas adopted a Climate Action Plan (CAP) in January 2018. The following GHG reduction measures incorporated in the CAP that are relevant to new residential construction are listed below:

BE-2 Require New Single-Family Homes to Install Solar Water Heaters. Require all new single-family homes to install solar water heaters or other efficiency technology, unless the installation is impracticable due to poor solar resources. Other efficiency technology would include installation of a renewable energy technology system that uses renewable energy as the primary energy source for water heating.

RE-2 Require New Homes to install Solar Photovoltaic Systems. Require new single-family homes to install at least 1.5 Watt solar per square feet or minimum 2 kiloWatt (kW) per home. Require new multi-family homes to install at least 1 Watt solar per square foot or minimum 1 kW per unit, unless the installation is impracticable due to poor solar resources.

CET-4 Require Residential Electric Vehicle Charging Stations. Require new residential units to install EVCS equipment. For single family residence, install complete 40-Amp electrical circuit (EV Ready). For multi-family residences, install EVCS equipment at 5% of the total number of parking spaces.

ZW-1 Implement a Zero Waste Program. Implement a Zero Waste Program to reduce waste disposal from residents and businesses in the community. By 2020, divert 65% of total solid waste generated (equivalent to 5.3 pounds per capita per day waste disposal). By 2030, divert 80% of total solid waste generated (equivalent to 3 pounds per capita per day waste disposal).

The proposed project would be designed and constructed to comply with applicable policies in the CAP intended to reduce GHG emissions from new residential construction. With implementation of measures to reduce GHG emissions, the project would not exceed the 900 MT CO2E annual threshold.

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Appendix A

CalEEMod Air Quality and Greenhouse Gas Emissions Model Results – Annual, and N_2O from Mobile Emissions Sources

3111 Manchester Avenue Senior Housing Project

San Diego County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	181.00	Space	1.63	72,400.00	0
Apartments Low Rise	16.00	Dwelling Unit	1.00	16,000.00	46
Congregate Care (Assisted Living)	200.00	Dwelling Unit	12.50	200,000.00	572

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2022
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Painting phase extended to reduce daily ROG emissions

Grading - Assumes 9 acres graded. Remainder would be open space preserve.

Architectural Coating - Rule 67

Vehicle Trips - Trip rate modifed to show average trip rate per unit as provided in traffic report.

Woodstoves -

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Mobile Commute Mitigation -

Area Mitigation - SDAPCD Rule 67.0.1 requires 100 g/L VOCs for non-flat high gloss coatings
Pavement coating for parking lots assumed to be 100 g/L of VOC

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Trips and VMT - Assumes 40 yd capacity trucks

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	100.00
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	250	100
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	250	100
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblAreaMitigation	UseLowVOCPaintParkingValue	250	100
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	250	100
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	250	100
tblConstructionPhase	NumDays	20.00	40.00
tblConstructionPhase	NumDays	30.00	90.00
tblGrading	AcresOfGrading	225.00	14.00
tblGrading	AcresOfGrading	0.00	14.00
tblGrading	MaterialExported	0.00	118,000.00
tblTripsAndVMT	HaulingTripNumber	14,750.00	2,900.00
tblVehicleTrips	ST_TR	7.16	6.00
tblVehicleTrips	ST_TR	2.20	3.00
tblVehicleTrips	SU_TR	6.07	6.00
tblVehicleTrips	SU_TR	2.44	3.00
tblVehicleTrips	WD_TR	6.59	6.00
tblVehicleTrips	WD_TR	2.74	3.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.4405	4.4907	3.3855	8.1200e-003	0.5391	0.1847	0.7238	0.2432	0.1714	0.4146	0.0000	731.7740	731.7740	0.1510	0.0000	735.5483
2022	1.5904	1.6961	1.9296	4.3600e-003	0.1451	0.0734	0.2185	0.0390	0.0691	0.1080	0.0000	389.4470	389.4470	0.0594	0.0000	390.9316
Maximum	**1.5904**	**4.4907**	**3.3855**	**8.1200e-003**	**0.5391**	**0.1847**	**0.7238**	**0.2432**	**0.1714**	**0.4146**	**0.0000**	**731.7740**	**731.7740**	**0.1510**	**0.0000**	**735.5483**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.4405	4.4907	3.3855	8.1200e-003	0.3046	0.1847	0.4892	0.1203	0.1714	0.2917	0.0000	731.7735	731.7735	0.1510	0.0000	735.5478
2022	1.5904	1.6961	1.9296	4.3600e-003	0.1451	0.0734	0.2185	0.0390	0.0691	0.1080	0.0000	389.4467	389.4467	0.0594	0.0000	390.9313
Maximum	**1.5904**	**4.4907**	**3.3855**	**8.1200e-003**	**0.3046**	**0.1847**	**0.4892**	**0.1203**	**0.1714**	**0.2917**	**0.0000**	**731.7735**	**731.7735**	**0.1510**	**0.0000**	**735.5478**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**34.28**	**0.00**	**24.89**	**43.56**	**0.00**	**23.52**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
3	**12-1-2020**	**2-28-2021**	0.8094	0.8094
4	**3-1-2021**	**5-31-2021**	1.9463	1.9463
5	**6-1-2021**	**8-31-2021**	0.9994	0.9994
6	**9-1-2021**	**11-30-2021**	0.7850	0.7850
7	**12-1-2021**	**2-28-2022**	0.7294	0.7294
8	**3-1-2022**	**5-31-2022**	0.7169	0.7169
9	**6-1-2022**	**8-31-2022**	0.6438	0.6438
10	**9-1-2022**	**9-30-2022**	0.5196	0.5196
		Highest	1.9463	1.9463

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	14.7905	0.2832	18.3371	0.0304		2.3546	2.3546		2.3546	2.3546	223.1189	96.1959	319.3147	0.2084	0.0176	329.7556
Energy	8.9800e-003	0.0767	0.0327	4.9000e-004		6.2000e-003	6.2000e-003		6.2000e-003	6.2000e-003	0.0000	381.1118	381.1118	0.0135	4.0600e-003	382.6593
Mobile	0.1985	0.8880	2.3976	8.4500e-003	0.7489	7.0600e-003	0.7560	0.2006	6.6000e-003	0.2071	0.0000	779.8778	779.8778	0.0405	0.0000	780.8897
Waste						0.0000	0.0000		0.0000	0.0000	38.5399	0.0000	38.5399	2.2776	0.0000	95.4809
Water						0.0000	0.0000		0.0000	0.0000	4.4648	92.1009	96.5657	0.4623	0.0116	111.5782
Total	**14.9979**	**1.2479**	**20.7674**	**0.0393**	**0.7489**	**2.3678**	**3.1168**	**0.2006**	**2.3674**	**2.5679**	**266.1235**	**1,349.2864**	**1,615.4100**	**3.0023**	**0.0332**	**1,700.3635**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.0331	0.0185	1.6072	8.0000e-005		8.8800e-003	8.8800e-003		8.8800e-003	8.8800e-003	0.0000	2.6231	2.6231	2.5400e-003	0.0000	2.6865
Energy	8.3600e-003	0.0715	0.0304	4.6000e-004		5.7800e-003	5.7800e-003		5.7800e-003	5.7800e-003	0.0000	314.8196	314.8196	0.0109	3.4500e-003	316.1208
Mobile	0.1548	0.6234	1.4492	4.3800e-003	0.3662	3.8400e-003	0.3701	0.0981	3.5800e-003	0.1017	0.0000	404.7043	404.7043	0.0238	0.0000	405.3004
Waste						0.0000	0.0000		0.0000	0.0000	9.6350	0.0000	9.6350	0.5694	0.0000	23.8702
Water						0.0000	0.0000		0.0000	0.0000	3.5718	73.6808	77.2526	0.3698	9.2800e-003	89.2625
Total	**1.1962**	**0.7134**	**3.0868**	**4.9200e-003**	**0.3662**	**0.0185**	**0.3847**	**0.0981**	**0.0182**	**0.1163**	**13.2068**	**795.8277**	**809.0345**	**0.9766**	**0.0127**	**837.2404**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**92.02**	**42.83**	**85.14**	**87.49**	**51.10**	**99.22**	**87.66**	**51.10**	**99.23**	**95.47**	**95.04**	**41.02**	**49.92**	**67.47**	**61.66**	**50.76**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/4/2021	1/29/2021	5	20	
2	Site Preparation	Site Preparation	2/1/2021	2/12/2021	5	10	
3	Grading	Grading	2/15/2021	6/18/2021	5	90	
4	Building Construction	Building Construction	6/21/2021	8/12/2022	5	300	
5	Paving	Paving	8/15/2022	9/9/2022	5	20	
6	Architectural Coating	Architectural Coating	9/12/2022	11/4/2022	5	40	

Acres of Grading (Site Preparation Phase): 14

Acres of Grading (Grading Phase): 14

Acres of Paving: 1.63

Residential Indoor: 437,400; Residential Outdoor: 145,800; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 4,344 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	2,900.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	186.00	35.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	37.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0317	0.3144	0.2157	3.9000e-004		0.0155	0.0155		0.0144	0.0144	0.0000	34.0008	34.0008	9.5700e-003	0.0000	34.2400
Total	**0.0317**	**0.3144**	**0.2157**	**3.9000e-004**		**0.0155**	**0.0155**		**0.0144**	**0.0144**	**0.0000**	**34.0008**	**34.0008**	**9.5700e-003**	**0.0000**	**34.2400**

3.2 Demolition - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.7000e-004	3.7500e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.0508	1.0508	3.0000e-005	0.0000	1.0515
Total	**5.2000e-004**	**3.7000e-004**	**3.7500e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.0508**	**1.0508**	**3.0000e-005**	**0.0000**	**1.0515**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0317	0.3144	0.2157	3.9000e-004		0.0155	0.0155		0.0144	0.0144	0.0000	34.0007	34.0007	9.5700e-003	0.0000	34.2400
Total	**0.0317**	**0.3144**	**0.2157**	**3.9000e-004**		**0.0155**	**0.0155**		**0.0144**	**0.0144**	**0.0000**	**34.0007**	**34.0007**	**9.5700e-003**	**0.0000**	**34.2400**

3.2 Demolition - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.7000e-004	3.7500e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.0508	1.0508	3.0000e-005	0.0000	1.0515
Total	**5.2000e-004**	**3.7000e-004**	**3.7500e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.0508**	**1.0508**	**3.0000e-005**	**0.0000**	**1.0515**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0978	0.0000	0.0978	0.0505	0.0000	0.0505	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0194	0.2025	0.1058	1.9000e-004		0.0102	0.0102		9.4000e-003	9.4000e-003	0.0000	16.7179	16.7179	5.4100e-003	0.0000	16.8530
Total	**0.0194**	**0.2025**	**0.1058**	**1.9000e-004**	**0.0978**	**0.0102**	**0.1080**	**0.0505**	**9.4000e-003**	**0.0599**	**0.0000**	**16.7179**	**16.7179**	**5.4100e-003**	**0.0000**	**16.8530**

3.3 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1000e-004	2.2000e-004	2.2500e-003	1.0000e-005	7.2000e-004	1.0000e-005	7.3000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.6305	0.6305	2.0000e-005	0.0000	0.6309
Total	**3.1000e-004**	**2.2000e-004**	**2.2500e-003**	**1.0000e-005**	**7.2000e-004**	**1.0000e-005**	**7.3000e-004**	**1.9000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.6305**	**0.6305**	**2.0000e-005**	**0.0000**	**0.6309**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0381	0.0000	0.0381	0.0197	0.0000	0.0197	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0194	0.2025	0.1058	1.9000e-004		0.0102	0.0102		9.4000e-003	9.4000e-003	0.0000	16.7178	16.7178	5.4100e-003	0.0000	16.8530
Total	**0.0194**	**0.2025**	**0.1058**	**1.9000e-004**	**0.0381**	**0.0102**	**0.0483**	**0.0197**	**9.4000e-003**	**0.0291**	**0.0000**	**16.7178**	**16.7178**	**5.4100e-003**	**0.0000**	**16.8530**

3.3 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1000e-004	2.2000e-004	2.2500e-003	1.0000e-005	7.2000e-004	1.0000e-005	7.3000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.6305	0.6305	2.0000e-005	0.0000	0.6309
Total	**3.1000e-004**	**2.2000e-004**	**2.2500e-003**	**1.0000e-005**	**7.2000e-004**	**1.0000e-005**	**7.3000e-004**	**1.9000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.6305**	**0.6305**	**2.0000e-005**	**0.0000**	**0.6309**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2867	0.0000	0.2867	0.1510	0.0000	0.1510	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1886	2.0880	1.3895	2.7900e-003		0.0893	0.0893		0.0822	0.0822	0.0000	245.2274	245.2274	0.0793	0.0000	247.2102
Total	**0.1886**	**2.0880**	**1.3895**	**2.7900e-003**	**0.2867**	**0.0893**	**0.3761**	**0.1510**	**0.0822**	**0.2332**	**0.0000**	**245.2274**	**245.2274**	**0.0793**	**0.0000**	**247.2102**

3.4 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0109	0.3787	0.0934	1.1100e-003	0.0248	1.1400e-003	0.0260	6.8100e-003	1.0900e-003	7.9100e-003	0.0000	110.4351	110.4351	9.9700e-003	0.0000	110.6842
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1300e-003	2.2300e-003	0.0225	7.0000e-005	7.2200e-003	5.0000e-005	7.2700e-003	1.9200e-003	5.0000e-005	1.9600e-003	0.0000	6.3047	6.3047	1.8000e-004	0.0000	6.3092
Total	**0.0140**	**0.3809**	**0.1159**	**1.1800e-003**	**0.0320**	**1.1900e-003**	**0.0332**	**8.7300e-003**	**1.1400e-003**	**9.8700e-003**	**0.0000**	**116.7398**	**116.7398**	**0.0102**	**0.0000**	**116.9935**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1118	0.0000	0.1118	0.0589	0.0000	0.0589	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1886	2.0880	1.3895	2.7900e-003		0.0893	0.0893		0.0822	0.0822	0.0000	245.2271	245.2271	0.0793	0.0000	247.2099
Total	**0.1886**	**2.0880**	**1.3895**	**2.7900e-003**	**0.1118**	**0.0893**	**0.2012**	**0.0589**	**0.0822**	**0.1411**	**0.0000**	**245.2271**	**245.2271**	**0.0793**	**0.0000**	**247.2099**

3.4 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0109	0.3787	0.0934	1.1100e-003	0.0248	1.1400e-003	0.0260	6.8100e-003	1.0900e-003	7.9100e-003	0.0000	110.4351	110.4351	9.9700e-003	0.0000	110.6842
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1300e-003	2.2300e-003	0.0225	7.0000e-005	7.2200e-003	5.0000e-005	7.2700e-003	1.9200e-003	5.0000e-005	1.9600e-003	0.0000	6.3047	6.3047	1.8000e-004	0.0000	6.3092
Total	**0.0140**	**0.3809**	**0.1159**	**1.1800e-003**	**0.0320**	**1.1900e-003**	**0.0332**	**8.7300e-003**	**1.1400e-003**	**9.8700e-003**	**0.0000**	**116.7398**	**116.7398**	**0.0102**	**0.0000**	**116.9935**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1331	1.2203	1.1603	1.8800e-003		0.0671	0.0671		0.0631	0.0631	0.0000	162.1461	162.1461	0.0391	0.0000	163.1241
Total	**0.1331**	**1.2203**	**1.1603**	**1.8800e-003**		**0.0671**	**0.0671**		**0.0631**	**0.0631**	**0.0000**	**162.1461**	**162.1461**	**0.0391**	**0.0000**	**163.1241**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.5800e-003	0.2518	0.0671	6.6000e-004	0.0163	5.3000e-004	0.0168	4.6900e-003	5.1000e-004	5.2000e-003	0.0000	64.0528	64.0528	4.7500e-003	0.0000	64.1717
Worker	0.0453	0.0323	0.3253	1.0100e-003	0.1044	7.4000e-004	0.1052	0.0277	6.8000e-004	0.0284	0.0000	91.2081	91.2081	2.6100e-003	0.0000	91.2734
Total	**0.0528**	**0.2841**	**0.3924**	**1.6700e-003**	**0.1207**	**1.2700e-003**	**0.1219**	**0.0324**	**1.1900e-003**	**0.0336**	**0.0000**	**155.2609**	**155.2609**	**7.3600e-003**	**0.0000**	**155.4451**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1331	1.2203	1.1603	1.8800e-003		0.0671	0.0671		0.0631	0.0631	0.0000	162.1459	162.1459	0.0391	0.0000	163.1239
Total	**0.1331**	**1.2203**	**1.1603**	**1.8800e-003**		**0.0671**	**0.0671**		**0.0631**	**0.0631**	**0.0000**	**162.1459**	**162.1459**	**0.0391**	**0.0000**	**163.1239**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.5800e-003	0.2518	0.0671	6.6000e-004	0.0163	5.3000e-004	0.0168	4.6900e-003	5.1000e-004	5.2000e-003	0.0000	64.0528	64.0528	4.7500e-003	0.0000	64.1717
Worker	0.0453	0.0323	0.3253	1.0100e-003	0.1044	7.4000e-004	0.1052	0.0277	6.8000e-004	0.0284	0.0000	91.2081	91.2081	2.6100e-003	0.0000	91.2734
Total	**0.0528**	**0.2841**	**0.3924**	**1.6700e-003**	**0.1207**	**1.2700e-003**	**0.1219**	**0.0324**	**1.1900e-003**	**0.0336**	**0.0000**	**155.2609**	**155.2609**	**7.3600e-003**	**0.0000**	**155.4451**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1365	1.2493	1.3091	2.1500e-003		0.0647	0.0647		0.0609	0.0609	0.0000	185.3802	185.3802	0.0444	0.0000	186.4905
Total	**0.1365**	**1.2493**	**1.3091**	**2.1500e-003**		**0.0647**	**0.0647**		**0.0609**	**0.0609**	**0.0000**	**185.3802**	**185.3802**	**0.0444**	**0.0000**	**186.4905**

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0500e-003	0.2717	0.0727	7.4000e-004	0.0186	5.2000e-004	0.0191	5.3700e-003	5.0000e-004	5.8700e-003	0.0000	72.5100	72.5100	5.2600e-003	0.0000	72.6416
Worker	0.0490	0.0337	0.3451	1.1100e-003	0.1193	8.3000e-004	0.1202	0.0317	7.6000e-004	0.0325	0.0000	100.4166	100.4166	2.7400e-003	0.0000	100.4851
Total	**0.0570**	**0.3054**	**0.4178**	**1.8500e-003**	**0.1379**	**1.3500e-003**	**0.1393**	**0.0371**	**1.2600e-003**	**0.0383**	**0.0000**	**172.9266**	**172.9266**	**8.0000e-003**	**0.0000**	**173.1266**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1365	1.2493	1.3091	2.1500e-003		0.0647	0.0647		0.0609	0.0609	0.0000	185.3800	185.3800	0.0444	0.0000	186.4903
Total	**0.1365**	**1.2493**	**1.3091**	**2.1500e-003**		**0.0647**	**0.0647**		**0.0609**	**0.0609**	**0.0000**	**185.3800**	**185.3800**	**0.0444**	**0.0000**	**186.4903**

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0500e-003	0.2717	0.0727	7.4000e-004	0.0186	5.2000e-004	0.0191	5.3700e-003	5.0000e-004	5.8700e-003	0.0000	72.5100	72.5100	5.2600e-003	0.0000	72.6416
Worker	0.0490	0.0337	0.3451	1.1100e-003	0.1193	8.3000e-004	0.1202	0.0317	7.6000e-004	0.0325	0.0000	100.4166	100.4166	2.7400e-003	0.0000	100.4851
Total	**0.0570**	**0.3054**	**0.4178**	**1.8500e-003**	**0.1379**	**1.3500e-003**	**0.1393**	**0.0371**	**1.2600e-003**	**0.0383**	**0.0000**	**172.9266**	**172.9266**	**8.0000e-003**	**0.0000**	**173.1266**

3.6 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0110	0.1113	0.1458	2.3000e-004		5.6800e-003	5.6800e-003		5.2200e-003	5.2200e-003	0.0000	20.0276	20.0276	6.4800e-003	0.0000	20.1895
Paving	2.1400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0132**	**0.1113**	**0.1458**	**2.3000e-004**		**5.6800e-003**	**5.6800e-003**		**5.2200e-003**	**5.2200e-003**	**0.0000**	**20.0276**	**20.0276**	**6.4800e-003**	**0.0000**	**20.1895**

3.6 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.9000e-004	3.4000e-004	3.4800e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.0123	1.0123	3.0000e-005	0.0000	1.0130
Total	**4.9000e-004**	**3.4000e-004**	**3.4800e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.0123**	**1.0123**	**3.0000e-005**	**0.0000**	**1.0130**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0110	0.1113	0.1458	2.3000e-004		5.6800e-003	5.6800e-003		5.2200e-003	5.2200e-003	0.0000	20.0275	20.0275	6.4800e-003	0.0000	20.1895
Paving	2.1400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0132**	**0.1113**	**0.1458**	**2.3000e-004**		**5.6800e-003**	**5.6800e-003**		**5.2200e-003**	**5.2200e-003**	**0.0000**	**20.0275**	**20.0275**	**6.4800e-003**	**0.0000**	**20.1895**

3.6 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.9000e-004	3.4000e-004	3.4800e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.0123	1.0123	3.0000e-005	0.0000	1.0130
Total	**4.9000e-004**	**3.4000e-004**	**3.4800e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.0123**	**1.0123**	**3.0000e-005**	**0.0000**	**1.0130**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.3767					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.0900e-003	0.0282	0.0363	6.0000e-005		1.6300e-003	1.6300e-003		1.6300e-003	1.6300e-003	0.0000	5.1065	5.1065	3.3000e-004	0.0000	5.1148
Total	**1.3808**	**0.0282**	**0.0363**	**6.0000e-005**		**1.6300e-003**	**1.6300e-003**		**1.6300e-003**	**1.6300e-003**	**0.0000**	**5.1065**	**5.1065**	**3.3000e-004**	**0.0000**	**5.1148**

3.7 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4300e-003	1.6700e-003	0.0172	6.0000e-005	5.9300e-003	4.0000e-005	5.9800e-003	1.5800e-003	4.0000e-005	1.6100e-003	0.0000	4.9938	4.9938	1.4000e-004	0.0000	4.9972
Total	**2.4300e-003**	**1.6700e-003**	**0.0172**	**6.0000e-005**	**5.9300e-003**	**4.0000e-005**	**5.9800e-003**	**1.5800e-003**	**4.0000e-005**	**1.6100e-003**	**0.0000**	**4.9938**	**4.9938**	**1.4000e-004**	**0.0000**	**4.9972**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.3767					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.0900e-003	0.0282	0.0363	6.0000e-005		1.6300e-003	1.6300e-003		1.6300e-003	1.6300e-003	0.0000	5.1065	5.1065	3.3000e-004	0.0000	5.1148
Total	**1.3808**	**0.0282**	**0.0363**	**6.0000e-005**		**1.6300e-003**	**1.6300e-003**		**1.6300e-003**	**1.6300e-003**	**0.0000**	**5.1065**	**5.1065**	**3.3000e-004**	**0.0000**	**5.1148**

3.7 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4300e-003	1.6700e-003	0.0172	6.0000e-005	5.9300e-003	4.0000e-005	5.9800e-003	1.5800e-003	4.0000e-005	1.6100e-003	0.0000	4.9938	4.9938	1.4000e-004	0.0000	4.9972
Total	**2.4300e-003**	**1.6700e-003**	**0.0172**	**6.0000e-005**	**5.9300e-003**	**4.0000e-005**	**5.9800e-003**	**1.5800e-003**	**4.0000e-005**	**1.6100e-003**	**0.0000**	**4.9938**	**4.9938**	**1.4000e-004**	**0.0000**	**4.9972**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Improve Walkability Design

Improve Destination Accessibility

Increase Transit Accessibility

Integrate Below Market Rate Housing

Improve Pedestrian Network

Implement NEV Network

Expand Transit Network

Increase Transit Frequency

Employee Vanpool/Shuttle

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1548	0.6234	1.4492	4.3800e-003	0.3662	3.8400e-003	0.3701	0.0981	3.5800e-003	0.1017	0.0000	404.7043	404.7043	0.0238	0.0000	405.3004
Unmitigated	0.1985	0.8880	2.3976	8.4500e-003	0.7489	7.0600e-003	0.7560	0.2006	6.6000e-003	0.2071	0.0000	779.8778	779.8778	0.0405	0.0000	780.8897

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	96.00	96.00	96.00	274,109	134,039
Congregate Care (Assisted Living)	600.00	600.00	600.00	1,713,182	837,746
Parking Lot	0.00	0.00	0.00		
Total	696.00	696.00	696.00	1,987,291	971,786

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	41.60	18.80	39.60	86	11	3
Congregate Care (Assisted	10.80	7.30	7.50	41.60	18.80	39.60	86	11	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.598645	0.040929	0.181073	0.106149	0.015683	0.005479	0.016317	0.023976	0.001926	0.001932	0.006016	0.000753	0.001122
Congregate Care (Assisted Living)	0.598645	0.040929	0.181073	0.106149	0.015683	0.005479	0.016317	0.023976	0.001926	0.001932	0.006016	0.000753	0.001122
Parking Lot	0.598645	0.040929	0.181073	0.106149	0.015683	0.005479	0.016317	0.023976	0.001926	0.001932	0.006016	0.000753	0.001122

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	232.0531	232.0531	9.3400e-003	1.9300e-003	232.8625
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	292.2421	292.2421	0.0118	2.4300e-003	293.2614
NaturalGas Mitigated	8.3600e-003	0.0715	0.0304	4.6000e-004		5.7800e-003	5.7800e-003		5.7800e-003	5.7800e-003	0.0000	82.7664	82.7664	1.5900e-003	1.5200e-003	83.2583
NaturalGas Unmitigated	8.9800e-003	0.0767	0.0327	4.9000e-004		6.2000e-003	6.2000e-003		6.2000e-003	6.2000e-003	0.0000	88.8697	88.8697	1.7000e-003	1.6300e-003	89.3978

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	179608	9.7000e-004	8.2800e-003	3.5200e-003	5.0000e-005		6.7000e-004	6.7000e-004		6.7000e-004	6.7000e-004	0.0000	9.5846	9.5846	1.8000e-004	1.8000e-004	9.6415
Congregate Care (Assisted Living)	1.48575e+006	8.0100e-003	0.0685	0.0291	4.4000e-004		5.5400e-003	5.5400e-003		5.5400e-003	5.5400e-003	0.0000	79.2852	79.2852	1.5200e-003	1.4500e-003	79.7563
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**8.9800e-003**	**0.0767**	**0.0327**	**4.9000e-004**		**6.2100e-003**	**6.2100e-003**		**6.2100e-003**	**6.2100e-003**	**0.0000**	**88.8697**	**88.8697**	**1.7000e-003**	**1.6300e-003**	**89.3978**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	162699	8.8000e-004	7.5000e-003	3.1900e-003	5.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004	0.0000	8.6822	8.6822	1.7000e-004	1.6000e-004	8.7338
Congregate Care (Assisted Living)	1.38829e+006	7.4900e-003	0.0640	0.0272	4.1000e-004		5.1700e-003	5.1700e-003		5.1700e-003	5.1700e-003	0.0000	74.0842	74.0842	1.4200e-003	1.3600e-003	74.5245
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**8.3700e-003**	**0.0715**	**0.0304**	**4.6000e-004**		**5.7800e-003**	**5.7800e-003**		**5.7800e-003**	**5.7800e-003**	**0.0000**	**82.7664**	**82.7664**	**1.5900e-003**	**1.5200e-003**	**83.2583**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	67903.7	22.1915	8.9000e-004	1.8000e-004	22.2689
Congregate Care (Assisted Living)	800986	261.7693	0.0105	2.1800e-003	262.6823
Parking Lot	25340	8.2813	3.3000e-004	7.0000e-005	8.3102
Total		**292.2421**	**0.0118**	**2.4300e-003**	**293.2614**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	54960.1	17.9615	7.2000e-004	1.5000e-004	18.0241
Congregate Care (Assisted Living)	653831	213.6776	8.6000e-003	1.7800e-003	214.4229
Parking Lot	1267	0.4141	2.0000e-005	0.0000	0.4155
Total		**232.0531**	**9.3400e-003**	**1.9300e-003**	**232.8625**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.0331	0.0185	1.6072	8.0000e-005		8.8800e-003	8.8800e-003		8.8800e-003	8.8800e-003	0.0000	2.6231	2.6231	2.5400e-003	0.0000	2.6865
Unmitigated	14.7905	0.2832	18.3371	0.0304		2.3546	2.3546		2.3546	2.3546	223.1189	96.1959	319.3147	0.2084	0.0176	329.7556

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.3404					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.8483					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	13.5532	0.2647	16.7299	0.0303		2.3457	2.3457		2.3457	2.3457	223.1189	93.5728	316.6917	0.2059	0.0176	327.0691
Landscaping	0.0487	0.0185	1.6072	8.0000e-005		8.8800e-003	8.8800e-003		8.8800e-003	8.8800e-003	0.0000	2.6231	2.6231	2.5400e-003	0.0000	2.6865
Total	**14.7905**	**0.2832**	**18.3372**	**0.0304**		**2.3546**	**2.3546**		**2.3546**	**2.3546**	**223.1189**	**96.1959**	**319.3147**	**0.2084**	**0.0176**	**329.7556**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1362					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.8483					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0487	0.0185	1.6072	8.0000e-005		8.8800e-003	8.8800e-003		8.8800e-003	8.8800e-003	0.0000	2.6231	2.6231	2.5400e-003	0.0000	2.6865
Total	**1.0331**	**0.0185**	**1.6072**	**8.0000e-005**		**8.8800e-003**	**8.8800e-003**		**8.8800e-003**	**8.8800e-003**	**0.0000**	**2.6231**	**2.6231**	**2.5400e-003**	**0.0000**	**2.6865**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Turf Reduction

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	77.2526	0.3698	9.2800e-003	89.2625
Unmitigated	96.5657	0.4623	0.0116	111.5782

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	1.04246 / 0.657206	7.1530	0.0342	8.6000e-004	8.2651
Congregate Care (Assisted Living)	13.0308 / 8.21507	89.4127	0.4280	0.0107	103.3131
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**96.5657**	**0.4623**	**0.0116**	**111.5782**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	0.833972 / 0.525765	5.7224	0.0274	6.9000e-004	6.6120
Congregate Care (Assisted Living)	10.4246 / 6.57206	71.5302	0.3424	8.5900e-003	82.6505
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**77.2526**	**0.3698**	**9.2800e-003**	**89.2625**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	9.6350	0.5694	0.0000	23.8702
Unmitigated	38.5399	2.2776	0.0000	95.4809

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	7.36	1.4940	0.0883	0.0000	3.7014
Congregate Care (Assisted Living)	182.5	37.0459	2.1894	0.0000	91.7795
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**38.5399**	**2.2776**	**0.0000**	**95.4809**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	1.84	0.3735	0.0221	0.0000	0.9253
Congregate Care (Assisted Living)	45.625	9.2615	0.5473	0.0000	22.9449
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**9.6350**	**0.5694**	**0.0000**	**23.8702**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Greenhouse Gas Emission Worksheet

N20 Mobile Emissions

3111 Manchester

From URBEMIS 2015 Vehicle Fleet Mix Output:

Annual VMT: 971,786

Vehicle Type	Percent Type	CH4 Emission Factor (g/mile)*	CH4 Emission (g/mile)**	N2O Emission Factor (g/mile)*	N2O Emission (g/mile)**
Light Auto	53.3%	0.04	0.02132	0.04	0.02132
Light Truck < 3750 lbs	4.0%	0.05	0.002	0.06	0.0024
Light Truck 3751-5750 lbs	18.3%	0.05	0.00915	0.06	0.01098
Med Truck 5751-8500 lbs	12.6%	0.12	0.01512	0.2	0.0252
Lite-Heavy Truck 8501-10,000 lbs	1.8%	0.12	0.00216	0.2	0.0036
Lite-Heavy Truck 10,001-14,000 lbs	0.5%	0.09	0.00045	0.125	0.000625
Med-Heavy Truck 14,001-33,000 lbs	1.7%	0.06	0.00102	0.05	0.00085
Heavy-Heavy Truck 33,001-60,000 lbs	6.2%	0.06	0.00372	0.05	0.0031
Other Bus	0.1%	0.06	0.00006	0.05	0.00005
Urban Bus	0.1%	0.06	0.00006	0.05	0.00005
Motorcycle	0.4%	0.09	0.00036	0.01	0.00004
School Bus	0.9%	0.06	0.00054	0.05	0.00045
Motor Home	0.1%	0.09	0.00009	0.125	0.000125
Total	**100.0%**		**0.05605**		**0.06879**

Total Emissions (metric tons) =
Emission Factor by Vehicle Mix (g/mi) x Annual VMT(mi) x 0.000001 metric tons/g

Conversion to Carbon Dioxide Equivalency (CO2e) Units based on Global Warming Potential (GWP)

CH4	25	GWP
N2O	298	GWP
1 ton (short, US) =	0.90718474	metric ton

Annual Mobile Emissions:

	Total Emissions		Total CO2e units	
N20 Emissions:	0.0668	metric tons N2O	**19.92**	metric tons CO2e
		Project Total:	***19.92***	***metric tons CO2e***

References

* from Table C.4: Methane and Nitrous Oxide Emission Factors for Mobile Sources by Vehicle and Fuel Type (g/mile).
in California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009.
Assume Model year 2000-present, gasoline fueled.

** Source: California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009.

*** From URBEMIS 2007 results for mobile sources

H-1

Stormwater Intake Form & Priority Development Project Stormwater Quality Management Plan

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CITY OF ENCINITAS
STORMWATER INTAKE FORM AND PRIORITY DEVELOPMENT PROJECT STORMWATER QUALITY MANAGEMENT PLAN (SWQMP)

FOR:
ENCINITIS SENIOR APARTMENTS
17-273 MUP/DR/EIR/CDP

3111 MANCHESTER AVENUE
ENCINITAS, CA 92024
APN: 261-210-01-00, 261-210-12-00

PREPARED BY:
TERRY AU, P.E.
URBAN RESOURCE CORPORATION
23 MAUCHLY, SUITE 110
IRVINE, CA 92618
949-727-9095

PREPARED FOR:
GREYSTAR
444 SOUTH CEDROS AVENUE, SUITE 172
SOLANA BEACH, CA 92075
858-735-7569

DATE OF SWQMP:
06/17/2019
REVISION #0

GRADING PLAN PREPARED BY:
URBAN RESOURCE CORPORATION
23 MAUCHLY, SUITE 110
IRVINE, CA 92618
949-727-9095

TABLE OF CONTENTS

PREPARER'S CERTIFICATION

I hereby declare that I am the Engineer in Responsible Charge of design of storm water best management practices (BMPs) for this project, and that I have exercised responsible charge over the design of the BMPs as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the Priority Development Project (PDP) requirements of the City of Encinitas BMP Design Manual, which is a design manual for compliance with local City of Encinitas and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2015-0100) requirements for storm water management.

I have read and understand that the City Engineer has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the BMP Design Manual. I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP Storm Water Quality Management Plan (SWQMP) by the City Engineer is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

C68466
Engineer of Work's Signature, PE Number

TERRY AU, P.E.
Print Name

URBAN RESOURCE CORP.
Company

6-10-19
Date

Engineer's Seal

REGISTERED PROFESSIONAL ENGINEER
TERRY P. AU
C 68466
EXP. 9-30-19
CIVIL
STATE OF CALIFORNIA

PROJECT OWNER'S CERTIFICATION

This PDP SWQMP has been prepared for GREYSTAR by URBAN RESOURCE CORPORATION. The PDP SWQMP is intended to comply with the PDP requirements of the City of Encinitas BMP Design Manual, which is a design manual for compliance with local City of Encinitas and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2015-0100) requirements for storm water management.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan. Once the undersigned transfers its interests in the property, its successor-in-interest shall bear the aforementioned responsibility to implement the best management practices (BMPs) described within this plan, including ensuring on-going operation and maintenance of structural BMPs. A signed copy of this document shall be available on the subject property into perpetuity.

____
Project Owner's Signature

____
Print Name

____
Company

____
Date

SUBMITTAL RECORD

Use this table to keep a record of submittals of this PDP SWQMP. Each time the PDP SWQMP is re-submitted, provide the date and status of the project. In the fourth column, summarize the changes that have been made or indicate if response to plancheck comments is included. When applicable, insert response to plancheck comments behind this page.

Submittal Number	Date	Project Status	Summary of Changes
1	9-28-18	X Preliminary Design / Planning/ CEQA ☐ Final Design	Initial Submittal
2	6-17-19	X Preliminary Design / Planning/ CEQA ☐ Final Design	
3		☐ Preliminary Design / Planning/ CEQA ☐ Final Design	
4		☐ Preliminary Design / Planning/ CEQA ☐ Final Design	

PROJECT IDENTIFICATION

Project/Applicant Name: Encinitas Senior Apartments/Greystar	
Permit/Application Number: 17-273 MUP/DR/EIR/CDP	Date: 6-17-19
Site Address: 3111 Manchester Avenue	APN: 261-210-01-00, 261-210-12-00
Scope of work/project description: The proposed project is for a 200 unit licensed senior living facility and 16 workforce housing units. Onsite amenities include, but is not limited to, senior living and work force parking stalls, and four courtyards including a pool courtyard and a lounging courtyard. Proposed work for the project will include demolition, grading, infrastructure improvements, street improvements, and vertical construction of buildings.	

DETERMINATION OF PROJECT STATUS AND REQUIREMENTS

This form will identify permanent, post construction BMP requirements. Refer to City of Encinitas Stormwater BMP Design Manual for guidance.		
Step 1: Is the project a "development project"? Development projects are defined as "construction, rehabilitation, redevelopment, or reconstruction of any public or private projects". See Section 1.3 and Table 1-2 of the manual for guidance. For example, interior remodels, roof replacements, and electrical and plumbing work are not development projects.	x Yes	***Go to Step 2.***
	☐ No	***Stop.*** Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.
If "No", provide discussion / justification explaining why the project is not a "development project":		
Step 2: Complete questions below for Project Type Determination. The project is (select one): **X**New Development ☐ Redevelopment		
The total proposed, newly created and/or replaced impervious area is: Approximately 223,898 ft²		
Is the project in any of the following categories, (a) through (f) below?		

Yes **x**	No ☐	(a)	New development projects or redevelopment projects that create and/or replaced 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects.
Yes ☐	No **x**	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects.

Yes X	No ☐	(c)	New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812). (ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. (iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.
Yes X	No ☐	(d)	New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharge directly to an Environmentally Sensitive Area (ESA). “Discharge directly to” includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and SDRWQCB; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and SDRWQCB; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. See manual Section 1.4.2 for additional guidance.
Yes ☐	No X	(e)	New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses: (i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. (ii) Retail gasoline outlets. This category includes retail gasoline outlets that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic of 100 or more vehicles per day.
Yes X	No ☐	(f)	New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. *Note: See manual Section 1.4.2 for additional guidance.*

Does the project meet the definition of one or more of the PDP categories (a) through (f) listed above?

X Yes – **The project is a Priority Development Project, the applicant shall provide PDP Post Construction BMPs and *continue to Step 3*.**

☐No – **The project is a Standard or Basic Project.** ***Stop here and complete the “City of Encinitas Stormwater Intake Form for All Developments and Standard Projects SWQMP”.***

The following is for *redevelopment PDPs* only:

The area of existing (pre-project) impervious area at the project site is: ________ ft^2 (A)
The total proposed newly created or replaced impervious area is: ________ ft^2 (B)
Percent impervious surface created or replaced (B/A)*100: _______%
The percent impervious surface created or replaced is (select one based on the above calculation):

☐ Less than or equal to fifty percent (50%) – only new and/or replaced impervious areas are considered PDP subject to treatment and HMP criteria

OR ☐ Greater than fifty percent (50%) – the entire site is a PDP; treatment and HMP criteria apply to entire site regardless of whether it is replaced

Step 3 (PDPs only): Do hydromodification control requirements apply? See Section 1.6 of the BMP Design Manual for guidance.	**X** Yes	PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6). ***Go to Step 4.***
	☐ No	PDP structural BMPs required for pollutant control (Chapter 5) only. Provide brief discussion of exemption to hydromodification control below. ***Go to "Site Information Checklist"***
Discussion / justification if hydromodification control requirements do not apply:		
Step 4 (PDPs subject to treatment and hydromodification controls): Does protection of critical coarse sediment yield areas apply based on review of City of Encinitas Potential Critical Coarse Sediment Yield Area Map? See Section 6.2 of the BMP Design Manual for guidance.	**X** Yes	Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2). ***Go to "Site Information Checklist"***
	☐ No	Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. ***Go to "Site Information Checklist"***
Discussion / justification if management measures not required for protection of critical coarse sediment yield areas:		

SITE INFORMATION CHECKLIST

Project's Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	HU 904.00, 211mi2, Carlsbad Watershed Management Area; Drains into San Elijo Lagoon
Parcel Area (Total area of Assessor's Parcel(s) associated with the project)	19.03 Acres (828,947 Square Feet)
Area to be Disturbed by the Project (Project Area)	9.97 Acres (434,293 Square Feet)
Project Proposed Impervious Area (Subset of Project Area)	5.14 Acres (223,898 Square Feet)
Project Proposed Pervious Area (Subset of Project Area)	4.83 Acres (210,395 Square Feet)

Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Parcel Area.

Description of Existing Site Condition

Current status of the site (select all that apply):

☐ Existing development

☐ Previously graded but not built out

☐ Demolition completed without new construction

X Agricultural or other non-impervious use

X Vacant, undeveloped/natural

Description / Additional Information:
The existing site is vacant and the existing general land use is agriculture. The site contains a gently sloped section as well as portions with steep topography on the north side. Site elevations range from approximately 7 to 67 at the rear of the sloped sections of the property and continue to approximately elevation 150 on the steep slopes of the hillside ridge portion.

Existing Land Cover includes (select all that apply):

X Vegetative Cover

X Non-Vegetated Pervious Areas

☐ Impervious Areas

Description / Additional Information:
Existing land cover consists of strawberry fields, native vegetative cover and dirt.

Underlying soil belongs to Hydrologic Soil Group (select all that apply):

X NRCS Type A

☐ NRCS Type B

☐ NRCS Type C

☐ NRCS Type D

Approximate Depth to Groundwater (GW):

☐ GW Depth < 5 feet
X 5 feet < GW Depth < 10 feet
☐ 10 feet < GW Depth < 20 feet
☐ GW Depth > 20 feet

Existing Natural Hydrologic Features (select all that apply):

☐ Watercourses
☐ Seeps
☐ Springs
☐ Wetlands
X None

Description / Additional Information:
The existing drainage is collected within a natural graded channel along the north side of Manchester Avenue, and then is collected via several storm drain inlets and conveyed to the south side of Manchester via storm drain culvert crossings that discharge into the San Eligo Lagoon Regional Park drainage area. A significant area offsite, including residential areas, and mountainous terrain, ultimately drains into the natural graded channel.

Description of Existing Site Drainage Patterns

How is storm water runoff conveyed from the site? At a minimum, this description should answer:

1) Is existing drainage conveyance natural or urban?
2) Is runoff from offsite conveyed through the site? If yes, quantify all offsite drainage areas, design flows, and locations where offsite flows enter the project site, and summarize how such flows are conveyed through the site.
3) Provide details regarding existing project site drainage conveyance network, including any existing storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels. And
4) Identify all discharge locations from the existing project site along with a summary of conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.

Describe existing site drainage patterns:
The existing drainage is collected within a natural graded channel along the north side of Manchester Avenue, and then is collected via several storm drain inlets and conveyed to the south side of Manchester via 18” and 24” CMP storm drain culvert crossings that discharge into the San Eligo Lagoon Regional Park drainage area. A significant area offsite, including residential areas, and mountainous terrain, ultimately drains into the natural graded channel.

Description of Proposed Site Development

Project Description / Proposed Land Use and/or Activities:
The proposed project is for a 200 unit licensed senior living facility and 16 workforce housing units. Onsite amenities include, but is not limited to, senior living and work force parking stalls, and four courtyards including a pool courtyard and a lounging courtyard.

Proposed work for the project will include demolition, grading, infrastructure improvements, street improvements, and vertical construction of buildings.

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):

Proposed impervious features of the project include the senior living facility, the workforce unit buildings, streets, parking stalls, sidewalk, and the proposed hardscape within the four courtyard that include, but is not limited to, the pool deck, sidewalk, pavers, etc.

List/describe proposed pervious features of the project (e.g., landscape areas):
Pervious features of the project will primarily consist of landscape areas and bioretention areas.

Does the project include grading and changes to site topography?

X Yes

☐ No

Description / Additional Information:

The project will be graded around the proposed senior living facility, with the streets on the back (north side) of the building elevated to the level of the second floor of the building, and with the streets on the front (south side) of the building graded at the ground level of the building. Drainage will be designed to drain away from the building and conveyed in the streets around the building to low points, where inlets are proposed to capture stormwater, and conveyed in below grade storm drains. The site elevations will range from approximately 14.5EL at the south side, to 26.0EL at the north side, with landscaped slopes along the northern edge that slope up until grades daylight to the existing grades.

Description of Proposed Site Drainage Patterns

Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)?

X Yes

☐ No

If yes, provide details regarding the proposed project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels, and the method for conveying offsite flows through or around the proposed project site. Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide a summary of pre- and post-project drainage areas and design flows to each of the runoff discharge locations. Reference the drainage study for detailed calculations.

Describe proposed site drainage patterns:

The project onsite stormwater management system will consist of area drain and catch basin inlets, PVC area drain lines, RCP/RCB storm drain lines, and bioretention basins. To meet water quality, hydromodification, and detention requirements that are necessary to develop the existing site, onsite stormwater mitigation measures will, at a minimum, include bioretention basins onsite that comprise of mulch, engineered soil media, and gravel. The proposed development will increase peak storm flows in the developed condition, and onsite stormwater detention is proposed to mitigate the increase in peak storm flows for the 100 year storm frequency. Mitigation of increased peak flows for the 100 year storm frequency will be addressed with the proposed bioretention basins, and if necessary, underground storage pipes, or approved similar. Refer to the Preliminary Hydrology Report for additional details.

Identification and Narrative of Receiving Water and Pollutants of Concern

Describe flow path of storm water from the project site discharge location(s), through urban storm conveyance systems as applicable, to receiving creeks, rivers, and lagoons as applicable, and ultimate discharge to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable):

Stormwater runoff from the project's discharge locations will be conveyed by RCP storm drain lines that cross Manchester Avenue, and outlet into the San Elijo Lagoon. Additionally, a RCB (and/or multiple RCP pipes) will convey offsite flows across Manchester Avenue, and outlet the offsite flows into the San Elijo Lagoon. The San Elijo Lagoon outlets into the Pacific Ocean.

List any 303(d) impaired water bodies within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:

303(d) Impaired Water Body	Pollutant(s)/Stressor(s)	TMDLs / WQIP Highest Priority Pollutant
San Elijo Lagoon	Eutrophic, Indicator Bacteria, Sedimentation/Siltation	

Identification of Project Site Pollutants*

***Identification of project site pollutants is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs (note the project must also participate in an alternative compliance program unless prior lawful approval to meet earlier PDP requirements is demonstrated)**

Identify pollutants expected from the project site based on all proposed use(s) of the site (see BMP Design Manual Appendix B.6):

Pollutant	Not Applicable to the Project Site	Expected from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment			
Nutrients			
Heavy Metals			
Organic Compounds			
Trash & Debris			
Oxygen Demanding Substances			
Oil & Grease			
Bacteria & Viruses			
Pesticides			

Hydromodification Management Requirements
Do hydromodification management requirements apply (see Section 1.6 of the BMP Design Manual)? **X** Yes, hydromodification management flow control structural BMPs required. ☐ No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. ☐ No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. ☐ No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA for the watershed in which the project resides. Description / Additional Information (to be provided if a 'No' answer has been selected above):

Critical Coarse Sediment Yield Areas*

*This section only required if hydromodification management requirements apply

Based on the maps provided within the WMAA, do potential critical coarse sediment yield areas exist within the project drainage boundaries?

X Yes

☐ No, no critical coarse sediment yield areas to be protected based on WMAA maps

If yes, have any of the optional analyses presented in Section 6.2 of the BMP Design Manual been performed?

☐ 6.2.1 Verification of Geomorphic Landscape Units (GLUs) Onsite

☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment

☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite

X No optional analyses performed, the project will avoid critical coarse sediment yield areas identified based on WMAA maps

If optional analyses were performed, what was the final result?

☐ No critical coarse sediment yield areas to be protected based on verification of GLUs onsite

☐ Critical coarse sediment yield areas exist but additional analysis has determined that protection is not required. Documentation attached in Attachment 2.b of the SWQMP.

X Critical coarse sediment yield areas exist and require protection. The project will implement management measures described in Sections 6.2.4 and 6.2.5 as applicable, and the areas are identified on the SWQMP Exhibit.

Discussion / Additional Information:

The project will install a RCP storm drain system to collect offsite flows and these flows will be conveyed directly to the San Elijo lagoon, bypassing onsite bioretention basins. Flows from the project area, which will be treated onsite, will be captured by a separate onsite RCP storm drain system to address water quality and hydromodification requirements.

Flow Control for Post-Project Runoff*

*This section only required if hydromodification management requirements apply

List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit.

For the purpose of hydromodification analysis, there is one POC, denoted POC-1, for the predeveloped condition, and one POC, denoted POC-1, for the proposed mitigated condition. A total area of approximately 9.97 acres is analyzed in the existing and proposed condition. This area is the area within the limits of grading. The developed condition is broken into three subareas, each outletting into a bioretention basin. Each of the three bioretention basins then outlet to POC-1, for modeling purposes, so that the proposed mitigated condition can be evaluated in comparison to the predeveloped condition.

Has a geomorphic assessment been performed for the receiving channel(s)?

X No, the low flow threshold is 0.1Q2 (default low flow threshold)

☐ Yes, the result is low flow threshold 0.1Q2

☐ Yes, the result is low flow threshold 0.3Q2

☐ Yes, the result is low flow threshold 0.5Q2

If a geomorphic assessment has been performed, provide title, date, and preparer:

Discussion / Additional Information: (optional)

Other Site Requirements and Constraints

When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.

Optional Additional Information or Continuation of Previous Sections As Needed
This space provided for additional information or continuation of information from previous sections as needed.

SOURCE CONTROL BMP CHECKLIST

All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. See Chapter 4 and Appendix E of the manual for information to implement source control BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.

Source Control Requirement	**Applied?**		
SC-1 Prevention of Illicit Discharges into the MS4	☐ **X** Yes	☐ No	☐ N/A
SC-2 Storm Drain Stenciling or Signage	**X**Yes	☐ No	☐ N/A
SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	**X** N/A
SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	**X** N/A
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	**X**Yes	☐ No	☐ N/A
SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
☐ Onsite storm drain inlets ………………………………………………	☐ **X** Yes	☐ No	☐ N/A
☐ Interior floor drains and elevator shaft sump pumps drain to sewer…	☐ **X** Yes	☐ No	☐ N/A
☐ Interior parking garages drain to sewer………………………………	☐ Yes	☐ No	☐ **X** N/A
☐ Need for future indoor & structural pest control………………………..	☐ Yes	☐ No	☐ **X** N/A
☐ Landscape/outdoor pesticide use………………………………………	☐ **X** Yes	☐ No	☐ N/A
☐ Pools, spas, ponds, decorative fountains, and other water features...	☐ **X** Yes	☐ No	☐ N/A
☐ Food service…………………………………………………………	☐ Yes	☐ No	☐ **X** N/A
☐ Refuse/Trash areas must be covered…………………………………..	☐ **X** Yes	☐ No	☐ N/A
☐ Industrial processes……………………………………………………	☐ Yes	☐ No	☐ **X** N/A
☐ Outdoor storage of equipment or materials must be covered………..	☐ Yes	☐ No	☐ **X** N/A
☐ Vehicle and equipment cleaning………………………………………	☐ Yes	☐ No	☐ **X** N/A
☐ Vehicle/equipment repair and maintenance……………………………	☐ Yes	☐ No	☐ **X** N/A
☐ Fuel dispensing areas…………………………………………………	☐ Yes	☐ No	☐ **X** N/A
☐ Loading docks………………………………………………………….	☐ Yes	☐ No	☐ **X** N/A
☐ Fire sprinkler test water………………………………………………..	☐ Yes	☐ No	☐ **X** N/A
☐ Miscellaneous drain or wash water…………………………………...	☐ **X** Yes	☐ No	☐ N/A
☐ Plazas, sidewalks, and parking lots…………………………………..	☐ **X** Yes	☐ No	☐ N/A

Discussion / justification if <u>SC-1 through SC-6</u> not implemented. Justification must be provided for <u>ALL</u> "No" answers shown above.

SITE DESIGN BMP CHECKLIST

All development projects must implement site design BMPs SD-1 through SD-8 where applicable and feasible. See Chapter 4 and Appendix E of the manual for information to implement site design BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided.

Source Control Requirement	**Applied?**		
SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	☐ **X** Yes	☐ No	☐ N/A
SD-2 Conserve Natural Areas, Soils, and Vegetation	☐ **X** Yes	☐ No	☐ N/A
SD-3 Minimize Impervious Area	☐ **X** Yes	☐ No	☐ N/A
SD-4 Minimize Soil Compaction	☐ Yes	☐ **X** No	☐ N/A
SD-5 Impervious Area Dispersion - Directly Connected Impervious Areas (e.g. roof downspouts connected to street) are not allowed	☐ **X** Yes	☐ No	☐ N/A
SD-6 Runoff Collection	☐ **X** Yes	☐ No	☐ N/A
SD-7 Landscaping with Native or Drought Tolerant Species	☐ **X** Yes	☐ No	☐ N/A
SD-8 Harvesting and Using Precipitation	☐ Yes	☐ **X** No	☐ N/A

Discussion / justification if <u>SD-1 through SD-8</u> not implemented. Justification must be provided for <u>ALL</u> "No" answers shown above.

The project will require grading and all areas within the limits of grading, including landscaped areas, will be subject to soil compaction per geotechnical recommendations. Harvest and Use is not feasible for this project. Refer to Form I-7 included in Attachment 1.

PDP STRUCTURAL BMPS

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).

PDP structural BMPs must be verified by the local jurisdiction at the completion of construction. This may include requiring the project owner or project owner's representative and engineer of record to certify construction of the structural BMPs (see Section 1.12 of the BMP Design Manual). PDP structural BMPs must be maintained into perpetuity (see Section 7 of the BMP Design Manual). The local jurisdiction will confirm the maintenance annually.

Use this section to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP).

Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate.

Harvest and Use for the project is infeasible. Refer to Form I-7, included in Attachment 1. Additionally, Form I-8 has been completed with input from the project Geotechnical Engineer, and infiltration is NOT feasible for the project due to the depth of the groundwater, relative to the bottom of proposed bioretention basins (ie. Bottom of gravel layer). Therefore, this project will propose biofiltration basins (BF-1). Form I-8 and supporting documents for infiltration infeasibility are included in Attachment 1.

The current site plan divides the site into three drainage management areas, each with a proposed biofiltration basin for water quality treatment and for hydromodification control.

Site runoff will be routed to the three proposed bioretention basin via onsite RCP storm drain. Only runoff from the disturbed areas within the limits of grading will be captured and conveyed to the bioretention basins for treatment. Offsite runoff will be collected by proposed concrete trapezoidal channels and conveyed through the site via proposed RCP/RCB storm drain, directly to the San Elijo Lagoon. The landscaped parkway and proposed public sidewalk along Manchester, along with a small portion of fire access driveway, which is proposed to drain towards Manchester Avenue, is considered a Self-Mitigating Area, and De Minimis DMA per Sections 5.2.1 and 5.2.2, respectively, of the Encinitas BMP Design Manual.

Manchester Avenue Improvements – Improvements in Manchester Avenue include widening of the street on the north side, striping, and installation of culvert crossings into the San Elijo Lagoon. Additionally, a vegetated swale will be provided in the parkway along the project frontage, with curb openings, to allow street flows to enter into the vegetated swale for some natural treatment, prior to outletting into the Lagoon.

STRUCTURAL BMP SUMMARY INFORMATION

Copy this page as necessary to provide information on each individual proposed structural BMP

Structural BMP ID No: BIO-1	DMA No: DMA-1

Construction Plan Sheet No:

Type of structural BMP:

☐ Retention by harvest and use (HU-1)

☐ Retention by infiltration basin (INF-1)

☐ Retention by bioretention (INF-2)

☐ Retention by permeable pavement (INF-3)

☐ Partial retention by biofiltration with partial retention (PR-1)
X Biofiltration (BF-1)

☐ Biofiltration with Nutrient Sensitive Media Design (BF-2)

☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F

☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below)

☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below)

☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below)

☐ Detention pond or vault for hydromodification management

☐ Other (describe in discussion section below)

Purpose:

☐ Pollutant control only

☐ Hydromodification control only
X Combined pollutant control and hydromodification control

☐ Pre-treatment/forebay for another structural BMP

☐ Other (describe in discussion section below)

Who will inspect and certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms required by the City Engineer (See Section 1.12 of the BMP Design Manual)	Urban Resource Corporation 23 Mauchly, Suite 110 Irvine, CA 92618 949-727-9095
Who will be the final owner of this BMP?	Greystar
Who will maintain this BMP into perpetuity?	Greystar
What is the funding mechanism for maintenance?	Greystar

Discussion (as needed):

Biofiltration Basin Bottom Area=11,300SF
Sideslopes=3H:1V
Ponding Depth=15”
Media: 3” Mulch, 18” Engineered Soil Media, 18” Gravel
Underdrain Size: 6”
Other: Impermeable Liner per Geotechnical recommendation
*See Attachment 1 for Sizing Calculations (Provided Footprint Greater than Min. Required Footprint)
*See Attachment 2 for Hydromodifications Calculations (PASSED) via SDHM 3.1

STRUCTURAL BMP SUMMARY INFORMATION

Copy this page as necessary to provide information on each individual proposed structural BMP

Structural BMP ID No: BIO-2	DMA No: DMA-2
Construction Plan Sheet No:	
Type of structural BMP: ☐ Retention by harvest and use (HU-1) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) **X** Biofiltration (BF-1) ☐ Biofiltration with Nutrient Sensitive Media Design (BF-2) ☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☐ Hydromodification control only **X** Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will inspect and certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms required by the City Engineer (See Section 1.12 of the BMP Design Manual)	Urban Resource Corporation 23 Mauchly, Suite 110 Irvine, CA 92618 949-727-9095
Who will be the final owner of this BMP?	Greystar
Who will maintain this BMP into perpetuity?	Greystar
What is the funding mechanism for maintenance?	Greystar
Discussion (as needed): Biofiltration Basin Bottom Area=4,230SF Sideslopes=3H:1V Ponding Depth=15” Media: 3” Mulch, 18” Engineered Soil Media, 18” Gravel Underdrain Size: 6” Other: Impermeable Liner per Geotechnical recommendation *See Attachment 1 for Sizing Calculations (Provided Footprint Greater than Min. Required Footprint) *See Attachment 2 for Hydromodifications Calculations (PASSED) via SDHM 3.1	

STRUCTURAL BMP SUMMARY INFORMATION

Copy this page as necessary to provide information on each individual proposed structural BMP

Structural BMP ID No: BIO-3	DMA No: DMA-3
Construction Plan Sheet No:	

Type of structural BMP:

☐ Retention by harvest and use (HU-1)

☐ Retention by infiltration basin (INF-1)

☐ Retention by bioretention (INF-2)

☐ Retention by permeable pavement (INF-3)

☐ Partial retention by biofiltration with partial retention (PR-1)
X Biofiltration (BF-1)

☐ Biofiltration with Nutrient Sensitive Media Design (BF-2)

☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F

☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below)

☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below)

☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below)

☐ Detention pond or vault for hydromodification management

☐ Other (describe in discussion section below)

Purpose:

☐ Pollutant control only

☐ Hydromodification control only
X Combined pollutant control and hydromodification control

☐ Pre-treatment/forebay for another structural BMP

☐ Other (describe in discussion section below)

Who will inspect and certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms required by the City Engineer (See Section 1.12 of the BMP Design Manual)	Urban Resource Corporation 23 Mauchly, Suite 110 Irvine, CA 92618 949-727-9095
Who will be the final owner of this BMP?	Greystar
Who will maintain this BMP into perpetuity?	Greystar
What is the funding mechanism for maintenance?	Greystar

Discussion (as needed):
Biofiltration Basin Bottom Area=2,425SF (Upper Terrace=1,347SF; Lower Terrace=1,078SF)
Sideslopes=3H:1V
Ponding Depth=15”
Media: 3” Mulch, 18” Engineered Soil Media, 18” Gravel
Underdrain Size: 6”
Other: Impermeable Liner per Geotechnical recommendation
*See Attachment 1 for Sizing Calculations (Provided Footprint Greater than Min. Required Footprint; **Majority of treatment provided by Upper Terrace**)

*See Attachment 2 for Hydromodifications Calculations (PASSED) via SDHM 3.1

ATTACHMENT 1 - BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

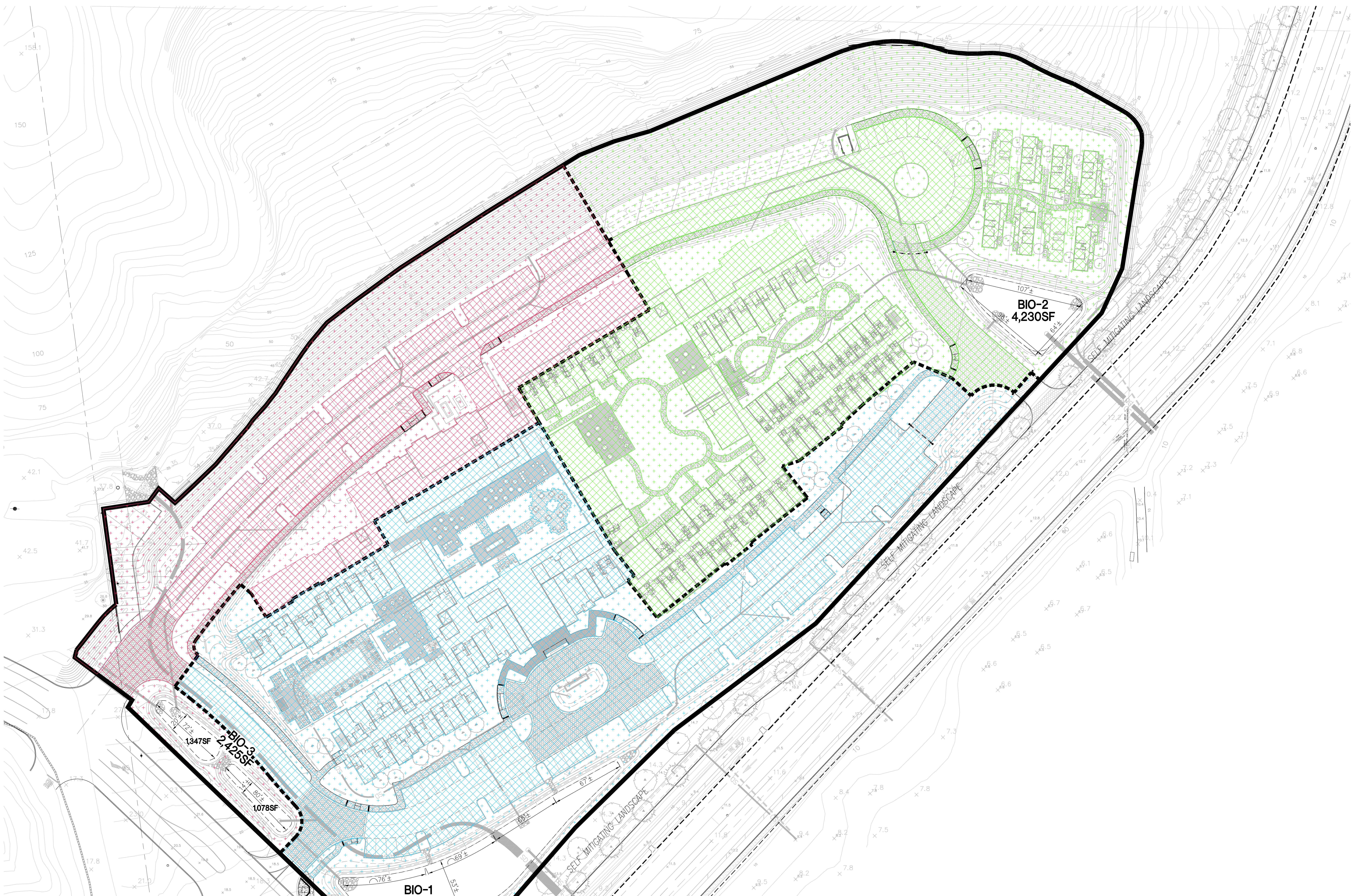
Indicate which items are included behind this cover sheet:

Attachment	**Contents**	**Checklist**
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist on the back of this Attachment cover sheet.	☐ **X** Included
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)* *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	☐ **X** Included on DMA Exhibit in Attachment 1a ☐ Included as Attachment 1b, separate from DMA Exhibit
Attachment 1c	Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs) Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7.	☐ **X** Included ☐ Not included because the entire project will use infiltration BMPs
Attachment 1d	Form I-8, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs) Refer to Appendices C and D of the BMP Design Manual to complete Form I-8.	☐ **X** Included ☐ Not included because the entire project will use harvest and use BMPs
Attachment 1e	Pollutant Control BMP Design Worksheets / Calculations (Required) Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines	☐ **X** Included

Use this checklist to ensure the required information has been included on the DMA Exhibit:

The DMA Exhibit must identify:

☐ Underlying hydrologic soil group
☐ Approximate depth to groundwater
☐ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
☐ Critical coarse sediment yield areas to be protected
☐ Existing topography and impervious areas
☐ Existing and proposed site drainage network and connections to drainage offsite
☐ Proposed demolition
☐ Proposed grading
☐ Proposed impervious features
☐ Proposed design features and surface treatments used to minimize imperviousness
☐ Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
☐ Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Form I-3B)
☐ Structural BMPs (identify location, type of BMP, and size/detail)



LEGEND

▬	WATERSHED BOUNDARY
■ ■ ■ ■	DMA BOUNDARY
— - - →	FLOWLINE AND DIRECTION OF FLOW
BIO-X	BIOFILTRATION BASIN DESIGNATION (BF-1) *AREA PROVIDED IS BASIN BOTTOM AT SURFACE

DMA-1 (3.51 AC.)

▨	IMPERVIOUS SURFACE (ROOF/STREET/HARDSCAPE) A=2.20AC.
+	PERVIOUS SURFACE (LANDSCAPE) A=1.31AC.

DMA-2 (3.74 AC.)

▨	IMPERVIOUS SURFACE (ROOF/STREET/HARDSCAPE) A=1.84AC.
+	PERVIOUS SURFACE (LANDSCAPE) A=1.90AC.

DMA-3 (2.18 AC.)

▨	IMPERVIOUS SURFACE (ROOF/STREET/HARDSCAPE) A=1.10AC.
+	PERVIOUS SURFACE (LANDSCAPE) A=1.08AC.

HYDROLOGIC FEATURES

- EXISTING SITE IS AGRICULTURAL, UNDEVELOPED/NATURAL
- GROUNDWATER IS SHALLOW, AND ENCOUNTERED AT DEPTH OF 2FT TO 6FT ABOVE SEA LEVEL DURING GEOTECHNICAL FIELD EXPLORATION
- INFILTRATION DEEMED INFEASIBLE
- HYDROLOGIC SOIL TYPE 'A' AND 'D'

GEOTECHNICAL NOTES

REFERENCES

GEOTECHNICAL SUMMARY FOR DUE DILIGENCE FOR 3111 MANCHESTER AVENUE, SENIOR HOUSING PROJECT, PREPARED BY ALTA CALIFORNIA GEOTECHNICAL, INC., DATED JANUARY 2, 2018, PROJECT NUMBER 2-0126.

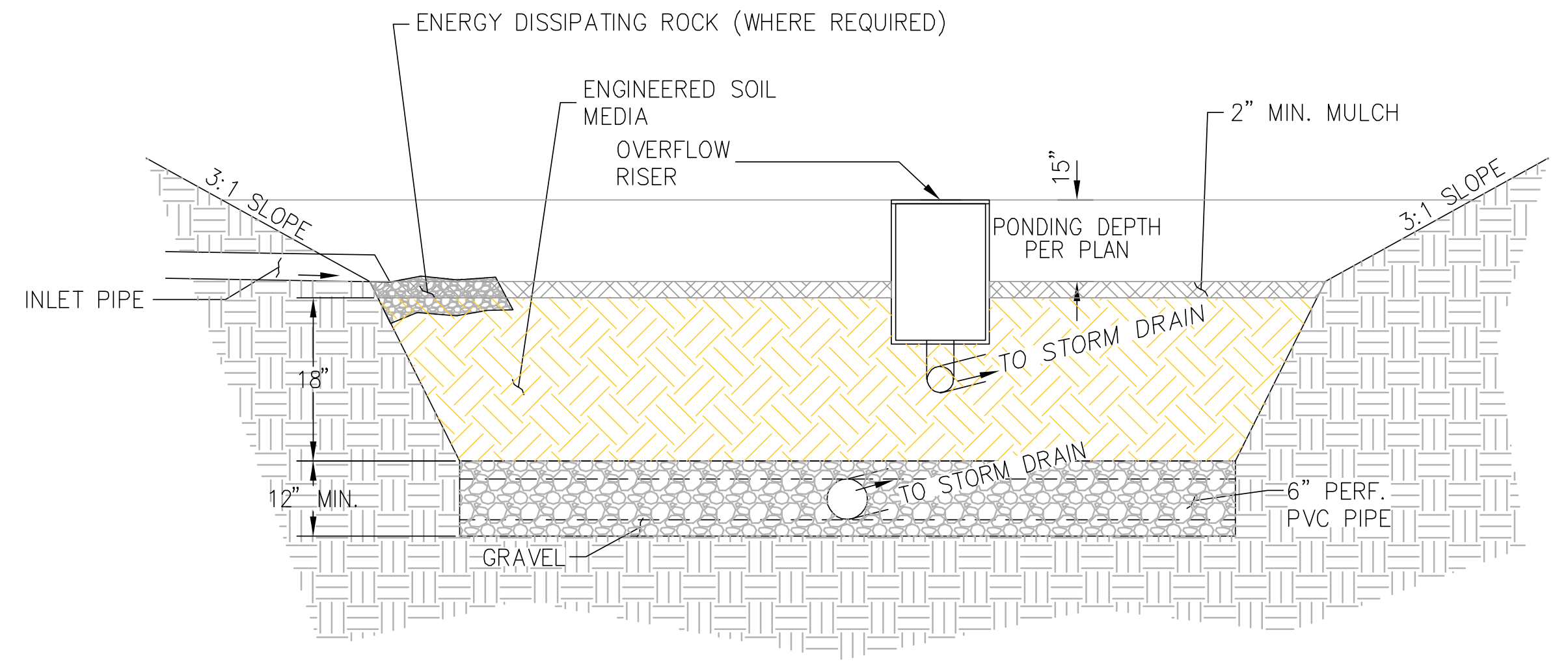
GEOTECHNICAL CRITERIA RESPONSE CORRESPONDENCE EMAIL FOR INFILTRATION FEASIBILITY BY ALTA CALIFORNIA GEOTECHNICAL INC., EMAIL DATED SEPTEMBER 25, 2018.

SEDIMENT NOTES

- OFFSITE CRITICAL COURSE SEDIMENT AREAS NEED TO BE PROTECTED, PER THE CITY OF ENCINITAS.
- OFFSITE RUNOFF WILL BE COLLECTED AND CONVEYED IN A SEPARATE STORM DRAIN SYSTEM, AND WILL BYPASS THE SITE, AND OUTLET DIRECTLY INTO SAN ELIJO LAGOON

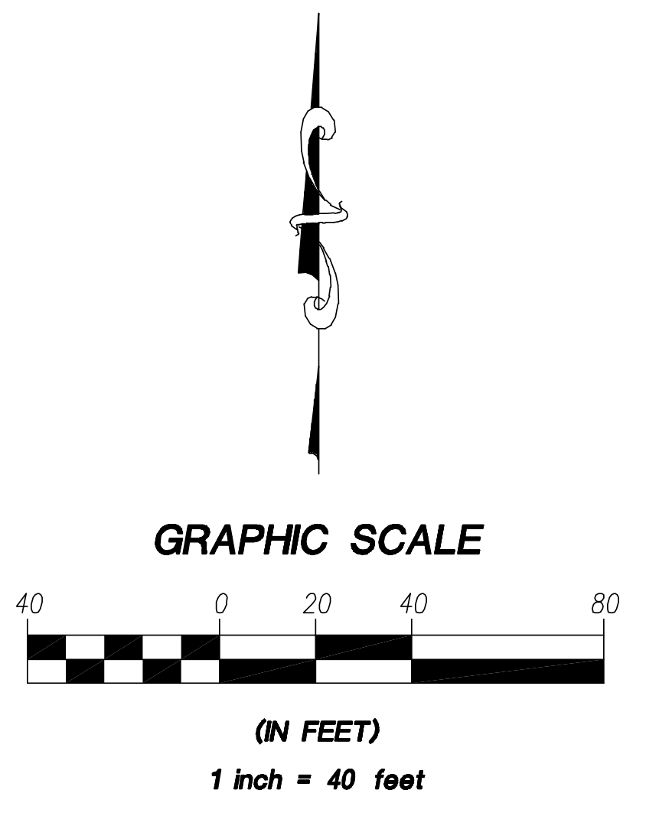
POLLUTION NOTES

- NO MATERIALS TO BE EXPOSED TO STORMWATER RUNOFF
- NO BUILDING OR POLLUTANT GENERATING ACTIVITY AREAS ARE PROPOSED (FUELING, WASH RACKS, HAZARDOUS MATERIALS)
- NO EXISTING DRINKING WATER WELLS



BIOFILTRATION BASIN BMP

NOT TO SCALE
BASIN DIMENSIONS PER PLAN VIEW



June 17, 2019

PREPARED FOR:

Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

PREPARED BY:

URBAN RESOURCE
CONSULTING CIVIL ENGINEERS
23 MAUCHLY, SUITE 110
IRVINE, CA 92618
PHONE: 949-727-9095
FAX: 949-727-9098

TERRY P. AI
C 68466
EXP. 9-30-19

Senior Housing

3111 Manchester Avenue
Cardiff by the Sea, California 92007

DATE: JUNE 17, 2019
SWQMP - DMA AND HMP EXHIBIT
C-15

B10-1

Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs

Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMPs	3,899	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	—	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	—	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4/ Line 5]	0	inches
7	Assumed surface area of the biofiltration BMP	11,300	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)]/12] x Line 7	1,695	cubic-feet
10	DCV that requires biofiltration [Line 1 – Line 9]	2,204	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	15	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) – use 0 inches for sizing if the aggregate is not over the entire bottom surface area	18	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	25.8	inches
19	Total Depth Treated [Line 17 + Line 18]	55.8	inches
Option 1 – Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	3,306	cubic-feet
21	Required Footprint [Line 20/ Line 19] x 12	711	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	1,653	cubic-feet
23	Required Footprint [Line 22/ Line 18] x 12	769	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	152,896	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.60	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	2,752	sq-ft
25	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	2,752	sq-ft

Note: Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23)

*Provided Footprint=11,300 SF ✓

B10-2

Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs

Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMPs	3,393	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	—	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	—	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4/ Line 5]	0	inches
7	Assumed surface area of the biofiltration BMP	4,230	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)]/12] x Line 7	635	cubic-feet
10	DCV that requires biofiltration [Line 1 – Line 9]	2,758	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	15	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) – use 0 inches for sizing if the aggregate is not over the entire bottom surface area	18	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	25.8	inches
19	Total Depth Treated [Line 17 + Line 18]	55.8	inches
Option 1 – Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	4,137	cubic-feet
21	Required Footprint [Line 20/ Line 19] x 12	890	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	2,069	cubic-feet
23	Required Footprint [Line 22/ Line 18] x 12	962	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	162,914	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.49	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	2,395	sq-ft
25	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	2,395	sq-ft

Note: Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23)

* Provided Footprint = 4,230 SF ✓

B10-3

Worksheet B.5-1: Simple Sizing Method for Biofiltration BMPs

	Simple Sizing Method for Biofiltration BMPs	**Worksheet B.5-1**	
1	Remaining DCV after implementing retention BMPs	2,018	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	—	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36	hours
4	Depth of runoff that can be infiltrated [Line 2 x Line 3]	—	inches
5	Aggregate pore space	0.40	in/in
6	Required depth of gravel below the underdrain [Line 4/ Line 5]	0	inches
7	Assumed surface area of the biofiltration BMP	2,425	sq-ft
8	Media retained pore space	0.1	in/in
9	Volume retained by BMP [[Line 4 + (Line 12 x Line 8)]/12] x Line 7	364	cubic-feet
10	DCV that requires biofiltration [Line 1 – Line 9]	1,654	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	15	inches
12	Media Thickness [18 inches minimum]	18	inches
13	Aggregate Storage above underdrain invert (12 inches typical) – use 0 inches for sizing if the aggregate is not over the entire bottom surface area	18	inches
14	Media available pore space	0.2	in/in
15	Media filtration rate to be used for sizing	5	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6	hours
17	Depth filtered during storm [Line 15 x Line 16]	30	inches
18	Depth of Detention Storage [Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5)]	25.8	inches
19	Total Depth Treated [Line 17 + Line 18]	55.8	inches
Option 1 – Biofilter 1.5 times the DCV			
20	Required biofiltered volume [1.5 x Line 10]	2,481	cubic-feet
21	Required Footprint [Line 20/ Line 19] x 12	534	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume [0.75 x Line 10]	1,241	cubic-feet
23	Required Footprint [Line 22/ Line 18] x 12	577	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	94,961	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.50	
26	Minimum BMP Footprint [Line 24 x Line 25 x 0.03]	1,424	sq-ft
25	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	1,424	sq-ft

Note: Line 7 is used to estimate the amount of volume retained by the BMP. Update assumed surface area in Line 7 until its equivalent to the required biofiltration footprint (either Line 21 or Line 23)

* Provided Footprint = 2,425SF ✓

Upper Terrace= 1,347SF (Provide Majority Treatment)

Lower Terrace =1,078SF

DMA-1

Worksheet B.2-1. DCV

Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.51	inches
2	Area tributary to BMP (s)	A=	3.51	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.60	unitless
4	Street trees volume reduction	TCV=	–	cubic-feet
5	Rain barrels volume reduction (1 cubic foot=7.48 gallons)	RCV=	–	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	3,899	cubic-feet

Surface	Cx	Approx Total Area
Roof, Asphalt	0.9	2.20
Landscape	0.1	1.31

$$C = \frac{0.9 \times 2.20 + 0.1 \times 1.31}{3.51} = 0.60$$

DMA-2

Worksheet B.2-1. DCV

Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.51	inches
2	Area tributary to BMP (s)	A=	3.74	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.49	unitless
4	Street trees volume reduction	TCV=	—	cubic-feet
5	Rain barrels volume reduction (1 cubic foot=7.48 gallons)	RCV=	—	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	3,393	cubic-feet

Surface	C_x	Appnx. Total Area
Roof, Asphalt	0.90	1.84
Landscape	0.10	1.90

$$C = \frac{0.9 \times 1.84 + 0.1 \times 1.90}{3.74} = 0.49$$

DMA-3

Worksheet B.2-1. DCV

Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.51	inches
2	Area tributary to BMP (s)	A=	2.18	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.50	unitless
4	Street trees volume reduction	TCV=	—	cubic-feet
5	Rain barrels volume reduction (1 cubic foot=7.48 gallons)	RCV=	—	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	2,018	cubic-feet

Surface	C_x	Approx Total Area
Roof, Asphalt	0.90	1.10
Landscape	0.10	1.08

$$C = \frac{0.9 \times 1.10 + 0.1 \times 1.08}{2.18} = 0.50$$

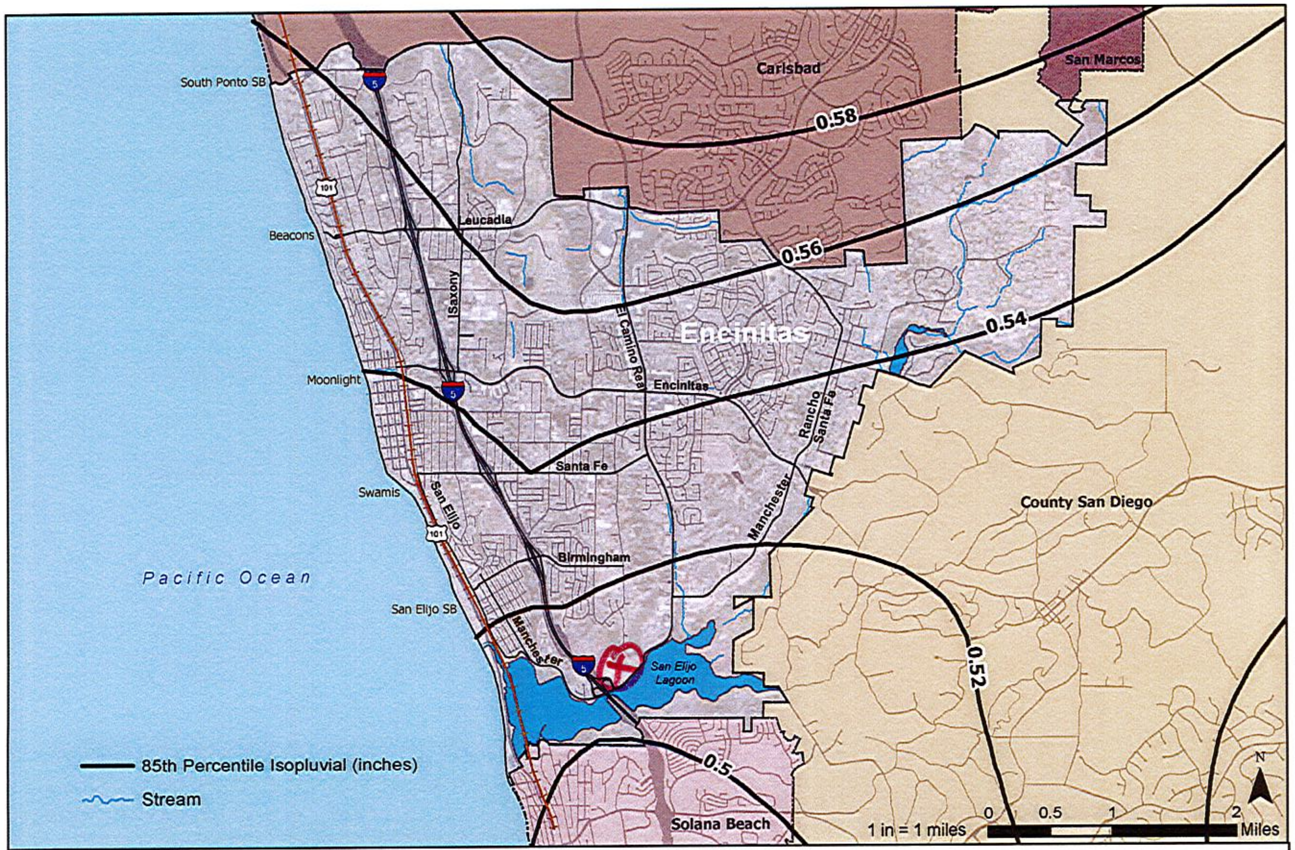
Culmulative

Worksheet B.2-1. DCV

Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.51	inches
2	Area tributary to BMP (s)	A=	9.97	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.51	unitless
4	Street trees volume reduction	TCV=	—	cubic-feet
5	Rain barrels volume reduction (1 cubic foot=7.48 gallons)	RCV=	—	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	9,413	cubic-feet

Surface	Cx	Approx Total Area
Roof, Asphalt	0.90	5.14
Landscape	0.10	4.83

$$C = \frac{0.9 \times 5.14 + 0.1 \times 4.83}{9.97} = 0.51$$



85th Percentile Isopluvials of 24-hr Precipitation

This map shows the 85th percentile isopluvial contour lines. The 85th percentile is a 24-hr rainfall total. It represents a value such that 85% of the observed 24-hr rainfall totals will be less than the value indicated on the specified contour line.

Data Source: Fred McCamic, County of San Diego, Department of Public Works, Cartographic Services. Rand Allan, County of San Diego, Department of Public Works, Flood Control Engineering. SanGIS 2015.

DISCLAIMER: **This map should not be used for Engineering, Survey, or Site-Specific Analysis.**
Every reasonable effort has been made to assure the accuracy of the data provided; nevertheless, some information may not be accurate. The City of Encinitas assumes no liability or responsibility arising from the use of or reliance upon this information.
Map Coordinates: Stateplane NAD83 Feet, CA Zone 6. Photo date: 7/2009. 4in pixel resolution. Digital true color. Ortho and Topo positional accuracy meets precision adequate to support NMAS, 1"=100' mapping.

City of Encinitas

Figure B.1-1: 85th Percentile 24-hour Isopluvial Map

Harvest and Use Feasibility Checklist	Form I-7

1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?

☒ Toilet and urinal flushing
☒ Landscape irrigation
☐ Other:_______________

2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.

[Provide a summary of calculations here]

Toilet Flushing: Assume fully occupied facility
200 units → 200 residents,
16 workforce units → 16 residents
216 × 9.3 gal/resident = 2,009 gal

Irrigation: 4.8 ac. × 1470 (Med) = 7,056 gal
Total: 9,065 gallons

3. Calculate the DCV using worksheet B-2.1.

DCV = 9,347 (cubic feet) = 69,920 gallons ; 0.25DCV = 17,480 gallons

3a. Is the 36 hour demand greater than or equal to the DCV? ☐ Yes / ☒ No ⇨ ⇩	3b. Is the 36 hour demand greater than 0.25DCV but less than the full DCV? ☐ Yes / ☒ No ⇨ ⇩	3c. Is the 36 hour demand less than 0.25DCV? ☒ Yes ⇩
Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.	Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.	Harvest and use is considered to be infeasible. ✱

Is harvest and use feasible based on further evaluation?

☐ Yes, refer to Appendix E to select and size harvest and use BMPs.

☒ No, select alternate BMPs.

Categorization of Infiltration Feasibility Condition			Form I-8
Part 1 - Full Infiltration Feasibility Screening Criteria **Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?**			
Criteria	Screening Question	Yes	No
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X
Provide basis: See enclosed geotech response. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
2	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		X
Provide basis: See enclosed geotech response Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			

Form I-8 Page 2 of 4

Criteria	Screening Question	Yes	No
3	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, stormwater pollutants or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		X

Provide basis:

See enclosed geotech response.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

4	**Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

Part 1 Result *	If all answers to rows 1 - 4 are "**Yes**" a full infiltration design is potentially feasible. The feasibility screening category is **Full Infiltration** If any answer from row 1-4 is "**No**", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2	

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Part 2 →

Form I-8 Page 3 of 4

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	**Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X

Provide basis:

See enclosed geotech response.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

6	**Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		X

Provide basis:

See enclosed geotech response.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

Form I-8 Page 4 of 4

Criteria	Screening Question	Yes	No
7	**Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, stormwater pollutants or other factors)?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		X

Provide basis:

See enclosed geotech response.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

8	**Can infiltration be allowed without violating downstream water rights**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**	No Infiltration

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Part 1 – Full Infiltration Feasibility Screening Criteria

Criteria 1.
No. The estimated reliable infiltration rate is likely not greater than 0.5 inches/hour.

As a background summary, based on the geotechnical feasibility report by Alta California Geotechnical, Inc. (dated January 2, 2018) the site is underlain by "young alluvial flood plain deposits". Alta (2018) measured an unfactored infiltration rate of 2 inches per hour, which yields 0.67 inches per hour with the applied 1/3 Factor of Safety. This rate is based on one Double Ring Infiltrometer Test (ASTM 3385) preformed in the southeast corner of the site at a point 2 feet below the existing ground surface (elevation 13). Based on 4 hollow stem auger borings excavated in the areas of the proposed facilities the groundwater surface was found to range between approximately 9 to 15 feet below the ground surface or msl elevations 5 to 6. The proposed bottom of the basin excavation (existing uncompacted) beneath the proposed combined additions of engineered soil, filter and aggregate course is tentatively designed at approximate elevations 6 to 9. Alta (2018) found that the potential for site liquefaction is very high based on cone penetrometer soundings (CPT) and laboratory testing.

It is expected that the bottom of the basin excavation will be at or within 3 feet of the groundwater surface, and as such, will likely result in a rapid, significant reduction in storm water infiltration rates. Additionally, the high potential for liquefaction during a seismic event would result in a volume reduction that would further decrease the infiltration rate.

Criteria 2
No. Geotechnical hazards due to the high groundwater surface (water table) and resulting ground water mounding are present. Possible effects include increased liquefaction potential and possible increased flows through storm drain trenches resulting in piping and sinkholes. Geotechnical hazards are discussed in our report dated January 2, 2018.

Criteria 3
No. As previously noted, the groundwater surface is shallow, which will increase the potential for groundwater contamination.

Criteria 4
To be completed by the Project Design Engineer.

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Criteria 5
No. Due to the existing high groundwater surface condition it is anticipated that there would be in a rapid, significant reduction in infiltration rates. Additionally, the high potential for liquefaction during a seismic event would result in a volume reduction that would further decrease the infiltration rate.

Criteria 6
No. It is expected that infiltration in any appreciable quantity may result in significant geotechnical hazards stemming from the relatively high groundwater conditions as previously described.

Criteria 7
No. It is expected that infiltration in any appreciable quantity may result in significant risk for groundwater related concerns due to the relatively high groundwater conditions as previously described.

Criteria 8
To be completed by the Project Design Engineer.

From:	dave.murphy@altageotech.com
Sent:	Tuesday, September 25, 2018 11:13 AM
To:	Terry Au
Subject:	RE: Encinitas Senior Housing - Infiltration Feasibility Form
Attachments:	Criteria Responses for Encintas.docx
Follow Up Flag:	Follow up
Flag Status:	Flagged

Here it is, Terry.

Thank you,

Dave Murphy

Alta California Geotechnical, Inc.
16870 West Bernardo Drive, Suite 400
San Diego, CA 92127
619-920-2694 (cell)
858-674-6636 (office)
dave.murphy@altageotech.com

From: Terry Au [mailto:Terry@urbresource.com]
Sent: Tuesday, September 25, 2018 9:51 AM
To: dave.murphy@altageotech.com; scott.gray@altageotech.com
Subject: RE: Encinitas Senior Housing - Infiltration Feasibility Form

Dave,

Can you please give me an update on the status of the feasibility form? Thanks.

TERRY P. AU, P.E.
URBAN RESOURCE
CONSULTING CIVIL ENGINEERS

23 Mauchly, Suite 110
Irvine, CA 92618
949-727-9095 Phone
949-679-4218 Direct
949-727-9098 Fax
terry@urbresource.com

From: Terry Au
Sent: Tuesday, September 18, 2018 9:46 AM

To: 'dave.murphy@altageotech.com' <dave.murphy@altageotech.com>
Cc: scott.gray@altageotech.com; Jay Ruby <Jay@urbresource.com>
Subject: RE: Encinitas Senior Housing - Infiltration Feasibility Form

Dave,

Assuming an underdrain is not required for the bioretention areas, the approximate elevations for the basin bottoms is approximately 10.0EL for the two basins adjacent to Manchester, and approximately 13.0EL for the long skinny basin that sits between the two proposed entry drives to the site. Note that the elevations could go up or down by a foot or two during final engineering. Hopefully these elevations are OK for now. As a point of reference, the basin bottoms (or underdrains if applicable) cannot be lower than the outlet pipes that will cross Manchester Avenue, and that elevation is approximately 9.0EL. The basins would consist of 2" of mulch, 18" min. of engineered soil media (min. filtration rate of 5in/hr), a filter course, and an optional aggregate course. See attached sample. I am considering the basin bottoms as the "top of mulch" elevation. The bioretention basins would be designed with a ponding depth of 6" to 12" for treatment of the water quality volume. There will be an overflow outlet for peak flows that exceed the water quality volume that needs to be treated. Please call or email with any questions. Thanks.

TERRY P. AU, P.E.
URBAN RESOURCE
CONSULTING CIVIL ENGINEERS

23 Mauchly, Suite 110
Irvine, CA 92618
949-727-9095 Phone
949-679-4218 Direct
949-727-9098 Fax
terry@urbresource.com

From: dave.murphy@altageotech.com <dave.murphy@altageotech.com>
Sent: Tuesday, September 18, 2018 8:48 AM
To: Terry Au <Terry@urbresource.com>
Cc: scott.gray@altageotech.com; Jay Ruby <Jay@urbresource.com>
Subject: RE: Encinitas Senior Housing - Infiltration Feasibility Form

Terry,

Can you give us the approximate elevations of the basin bottoms ?

Thank you,

Dave Murphy

Alta California Geotechnical, Inc.
16870 West Bernardo Drive, Suite 400
San Diego, CA 92127
619-920-2694 (cell)
858-674-6636 (office)
dave.murphy@altageotech.com

From: Terry Au [mailto:Terry@urbresource.com]
Sent: Monday, September 17, 2018 6:02 PM
To: dave.murphy@altageotech.com
Cc: scott.gray@altageotech.com; Jay Ruby <Jay@urbresource.com>
Subject: Encinitas Senior Housing - Infiltration Feasibility Form

Dave,

Please find attached the infiltration feasibility form, per the Encinitas BMP Design Manual, that I need ALTA to complete for the Preliminary WQMP report I am preparing. Your project number is 2-0126. I am also attaching city comments. Comment 6 pertains to the infiltration requirement for the project. Also attached is the current site plan, with the preliminary bioretention sizing/locations highlighted. Underdrains can be added if recommended for partial infiltration if full infiltration is not feasible. Please call or email with any questions, or if you need additional information. Thanks.

TERRY P. AU, P.E.
URBAN RESOURCE
CONSULTING CIVIL ENGINEERS

23 Mauchly, Suite 110
Irvine, CA 92618
949-727-9095 Phone
949-679-4218 Direct
949-727-9098 Fax
terry@urbresource.com

ATTACHMENT 2 - BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

☐ Mark this box if this attachment is not included because the project is exempt from PDP hydromodification management requirements.

Indicate which items are included behind this cover sheet:

Attachment	**Contents**	**Checklist**
Attachment 2a	Hydromodification Management Exhibit (Required)	☐ **X** Included **(DMA and HMP Exhibit are on the same plan; See Attachment 1)** See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet.
Attachment 2b	Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional) See Section 6.2 of the BMP Design Manual.	☐ **X** Exhibit showing project drainage boundaries marked on WMAA Critical Coarse Sediment Yield Area Map (Required) Optional analyses for Critical Coarse Sediment Yield Area Determination ☐ 6.2.1 Verification of Geomorphic Landscape Units Onsite ☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment ☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
Attachment 2c	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	**X** Not performed ☐ Included ☐ Submitted as separate stand-alone document
Attachment 2d	Flow Control Facility Design, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required) See Chapter 6 and Appendix G of the BMP Design Manual	☐ **X** Included ☐ Submitted as separate stand-alone document
Attachment 2e	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	☐ Included **X** Not required because BMPs will drain in less than 96 hours

ENCINITAS SENIOR APARTMENTS
BIOFILTRATION BASIN SUMMARY
***FOR HYDROMODIFICATION CONTROL**

BIOFILTRATION BASIN #1 (BIO-1)

BASIN FLOOR AREA (SF)	11,300
SIDESLOPES	3H:1V
PONDING DEPTH (IN.)	15
RISER DIAMETER (IN.)	18
MULCH DEPTH (IN.)	3
ENGINEERED SOIL MEDIA (IN.)	18
GRAVEL DEPTH (IN.)	18
UNDERDRAIN DIAMETER (IN.)	4
UNDERDRAIN ORIFICE DIAMETER (IN.)	1.08
IMPERMEABLE LINER	YES

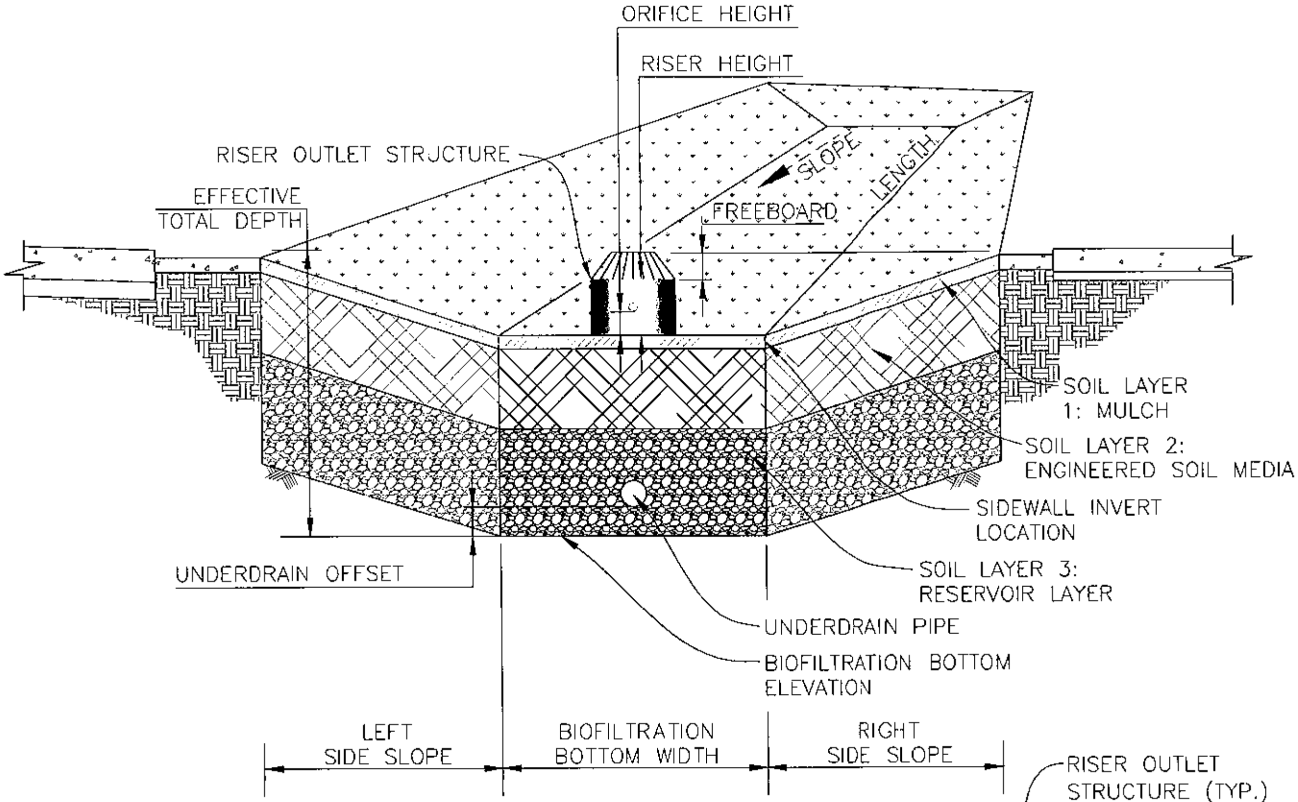
BIOFILTRATION BASIN #2 (BIO-2)

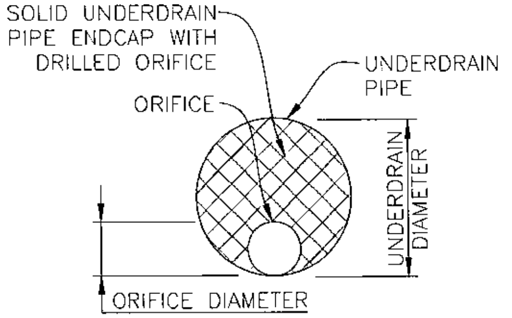
BASIN FLOOR AREA (SF)	4,230
SIDESLOPES	3H:1V
PONDING DEPTH (IN.)	15
RISER DIAMETER (IN.)	18
MULCH DEPTH (IN.)	3
ENGINEERED SOIL MEDIA (IN.)	18
GRAVEL DEPTH (IN.)	18
UNDERDRAIN DIAMETER (IN.)	6
UNDERDRAIN ORIFICE DIAMETER (IN.)	1
IMPERMEABLE LINER	YES

BIOFILTRATION BASIN #3 (BIO-3)

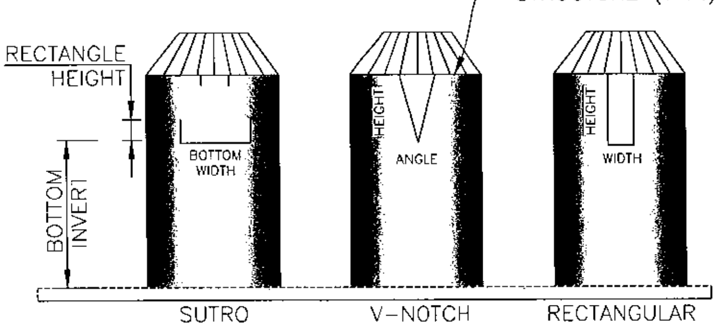
BASIN FLOOR AREA (SF)	2,425
SIDESLOPES	3H:1V
PONDING DEPTH (IN.)	15
RISER DIAMETER (IN.)	18
MULCH DEPTH (IN.)	3
ENGINEERED SOIL MEDIA (IN.)	18
GRAVEL DEPTH (IN.)	18
UNDERDRAIN DIAMETER (IN.)	6
UNDERDRAIN ORIFICE DIAMETER (IN.)	0.9
IMPERMEABLE LINER	YES

***SEE DMA EXHIBIT FOR BIOFILTRATION BASIN LOCATIONS AND ADDITIONAL HMP INFORMATION**





UNDERDRAIN WITH ORIFICE OPTION



RISER NOTCH OPTIONS

* Refer to Table provided in Attachment 2 for data

NOTES:

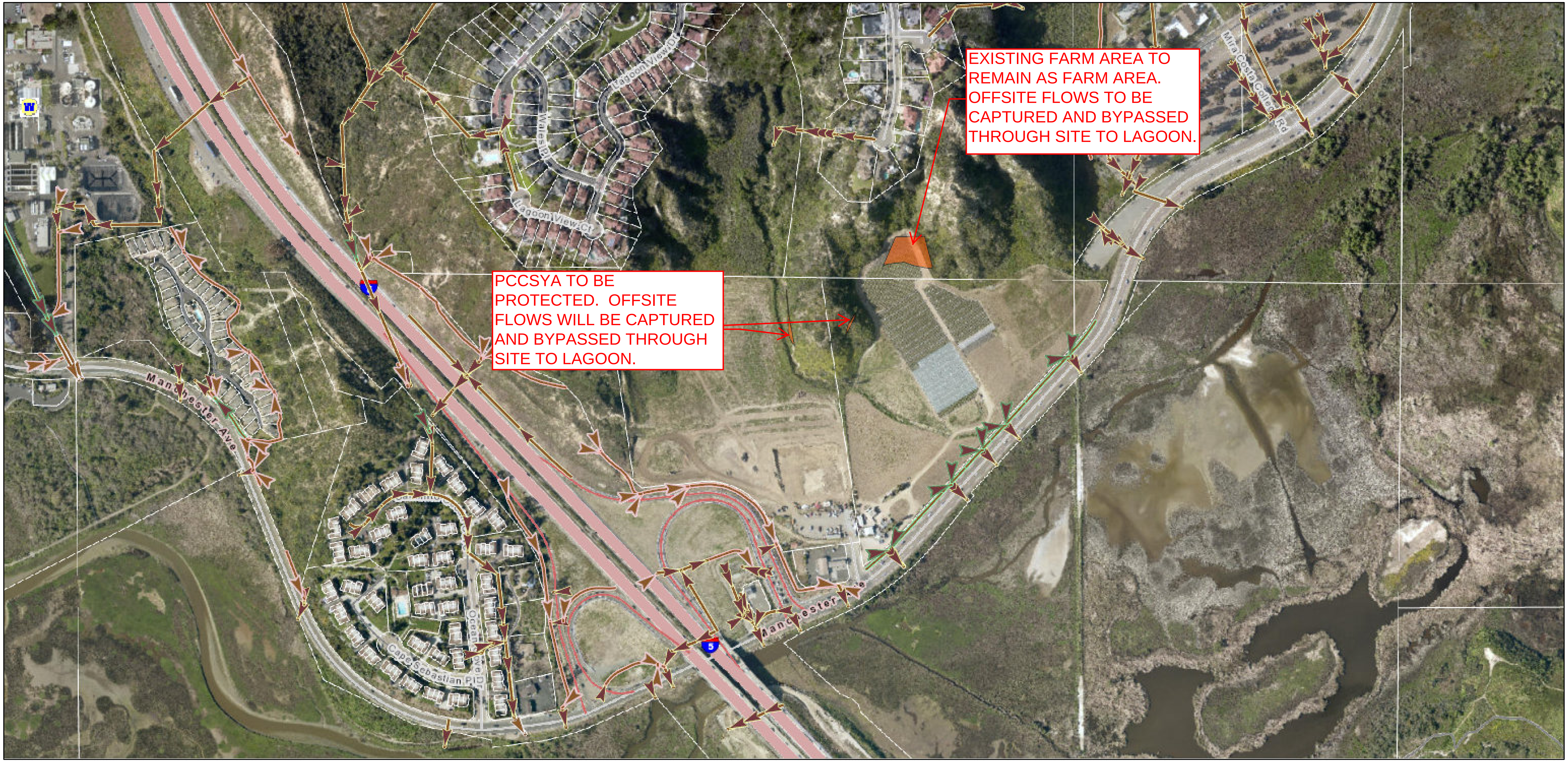
1. ONLY SOIL WITHIN "BIOFILTRATION BOTTOM WIDTH" WILL BE MODELED IF "EXCLUDE AREA UNDER SIDE SLOPES" IS SELECTED.

DRAWING NOT TO SCALE

BIOFILTRATION ELEMENT
IN SDHM 3.1

03-20-2017

Potential Critical Coarse Sand Yield Areas Exhibit



EXISTING FARM AREA TO REMAIN AS FARM AREA. OFFSITE FLOWS TO BE CAPTURED AND BYPASSED THROUGH SITE TO LAGOON.

PCCSYA TO BE PROTECTED. OFFSITE FLOWS WILL BE CAPTURED AND BYPASSED THROUGH SITE TO LAGOON.

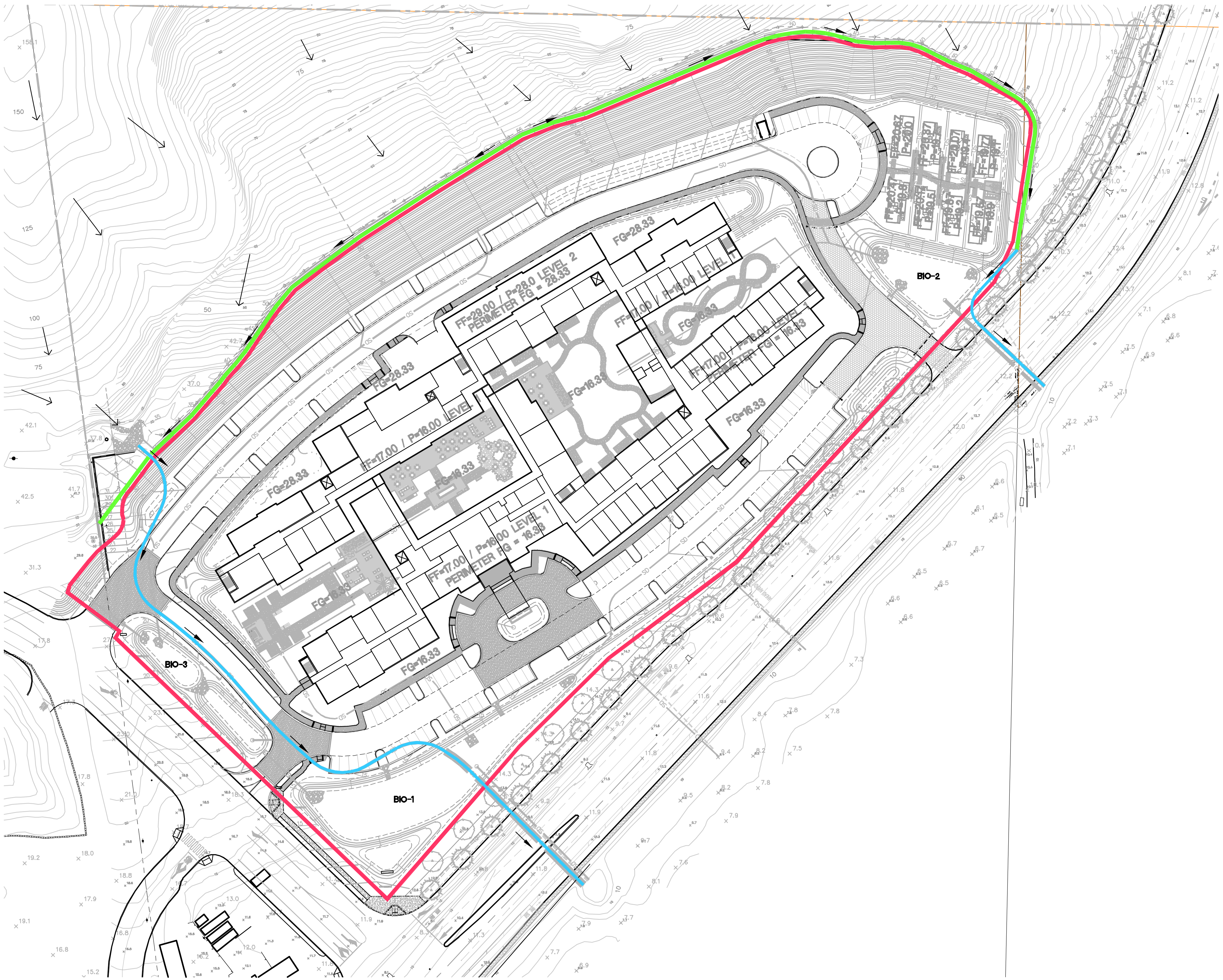
June 3, 2019

1 inch = 466 feet

0 475 950 Feet

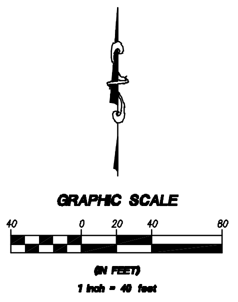
N

Eagleview



LEGEND

🟥	BOUNDARY LINE
🟦	PROPOSED RCP OR RCB BYPASS SD (FOR OFFSITE RUNOFF)
🟩	PROPOSED CONCRETE CHANNEL (FOR OFFSITE RUNOFF)
➤	SD FLOW DIRECTION
→	OFFSITE RUNOFF FLOW DIRECTION
BIO-X	BIOFILTRATION BASIN (BF-1)



June 5, 2019

PREPARED FOR:

Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

PREPARED BY:

URBAN RESOURCE
CONSULTING CIVIL ENGINEERS
23 MAUCHLY, SUITE 110
IRVINE, CA 92618
PHONE: 949-727-9095
FAX: 949-727-9098

TERRY P. AU
C 68466
EXP. 9-30-19
CIVIL

Senior Housing

3111 Manchester Avenue
Cardiff by the Sea, California 92007

DATE: JUNE 5, 2019
SEDIMENT COARSE BYPASS EXHIBIT

SDHM 3.1

PROJECT REPORT

General Model Information

Project Name:	624ENC-WQ
Site Name:	ENCINITAS SENIOR APARTMENTS
Site Address:	3111 MANCHESTER AVE
City:	ENCINITAS
Report Date:	6/7/2019
Gage:	ENCINITA
Data Start:	10/01/1963
Data End:	09/30/2004
Timestep:	Hourly
Precip Scale:	1.000
Version Date:	2018/07/12

POC Thresholds

Low Flow Threshold for POC1:	10 Percent of the 2 Year
High Flow Threshold for POC1:	10 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1 - PREDEVELOPED

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A,NatVeg,Steep	2
A,Dirt,Moderate	2.4
A,Dirt,Steep	5.5
Pervious Total	9.9
Impervious Land Use	acre
Impervious Total	0
Basin Total	9.9

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A,Urban,Flat	1.31
Pervious Total	1.31
Impervious Land Use	acre
IMPERVIOUS-FLAT	2.2
Impervious Total	2.2
Basin Total	3.51

Element Flows To:

Surface	Interflow	Groundwater
Surface iltration 1	Surface iltration 1	

Basin 2

Bypass: No

GroundWater: No

Pervious Land Use	acre
A,Urban,Steep	0.64
A,Urban,Flat	1.26
Pervious Total	1.9

Impervious Land Use	acre
IMPERVIOUS-FLAT	1.84
Impervious Total	1.84

Basin Total	3.74

Element Flows To:

Surface	Interflow	Groundwater
Surface iltration 2	Surface iltration 2	

Basin 3

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A,Urban,Steep	0.5
A,Urban,Flat	0.58
Pervious Total	1.08

Impervious Land Use	acre
IMPERVIOUS-FLAT	1.1
Impervious Total	1.1
Basin Total	2.18

Element Flows To:

Surface	Interflow	Groundwater
Surface iltration 3	Surface iltration 3	

Routing Elements

Predeveloped Routing

Mitigated Routing

Biofiltration 1

Bottom Length:	226.00 ft.
Bottom Width:	50.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	1.5
Material type for third layer:	GRAVEL
Underdrain used	
Underdrain Diameter (feet):	0.33
Orifice Diameter (in.):	1.08
Offset (in.):	0
Flow Through Underdrain (ac-ft.):	58.833
Total Outflow (ac-ft.):	61.034
Percent Through Underdrain:	96.39

Discharge Structure

Riser Height:	1.33 ft.
Riser Diameter:	18 in.

Element Flows To:

Outlet 1	Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.3917	0.0000	0.0000	0.0000
0.0522	0.3911	0.0041	0.0000	0.0000
0.1044	0.3888	0.0082	0.0000	0.0000
0.1566	0.3866	0.0123	0.0000	0.0000
0.2088	0.3843	0.0165	0.0000	0.0000
0.2610	0.3821	0.0207	0.0000	0.0000
0.3132	0.3798	0.0249	0.0000	0.0000
0.3654	0.3776	0.0292	0.0000	0.0000
0.4176	0.3754	0.0335	0.0000	0.0000
0.4698	0.3731	0.0378	0.0000	0.0000
0.5220	0.3709	0.0422	0.0000	0.0000
0.5742	0.3687	0.0466	0.0000	0.0000
0.6264	0.3665	0.0510	0.0000	0.0000
0.6786	0.3643	0.0555	0.0000	0.0000
0.7308	0.3621	0.0599	0.0000	0.0000
0.7830	0.3599	0.0645	0.0000	0.0000
0.8352	0.3577	0.0690	0.0000	0.0000
0.8874	0.3555	0.0736	0.0000	0.0000
0.9396	0.3533	0.0782	0.0000	0.0000
0.9918	0.3511	0.0829	0.0000	0.0000
1.0440	0.3489	0.0876	0.0000	0.0000
1.0962	0.3467	0.0923	0.0000	0.0000
1.1484	0.3446	0.0970	0.0000	0.0000
1.2005	0.3424	0.1018	0.0000	0.0000
1.2527	0.3402	0.1066	0.0000	0.0000
1.3049	0.3381	0.1115	0.0000	0.0000
1.3571	0.3359	0.1163	0.0000	0.0000
1.4093	0.3338	0.1212	0.0000	0.0000
1.4615	0.3316	0.1262	0.0000	0.0000

1.5137	0.3295	0.1312	0.0000	0.0000
1.5659	0.3273	0.1362	0.0000	0.0000
1.6181	0.3252	0.1412	0.0000	0.0000
1.6703	0.3231	0.1463	0.0000	0.0000
1.7225	0.3210	0.1514	0.0000	0.0000
1.7747	0.3189	0.1585	0.0000	0.0000
1.8269	0.3167	0.1657	0.0000	0.0000
1.8791	0.3146	0.1729	0.0000	0.0000
1.9313	0.3125	0.1801	0.0000	0.0000
1.9835	0.3104	0.1874	0.0000	0.0000
2.0357	0.3083	0.1948	0.0000	0.0000
2.0879	0.3062	0.2022	0.0000	0.0000
2.1401	0.3042	0.2096	0.0000	0.0000
2.1923	0.3021	0.2171	0.0000	0.0000
2.2445	0.3000	0.2246	0.0000	0.0000
2.2967	0.2979	0.2322	0.0000	0.0000
2.3489	0.2959	0.2398	0.0000	0.0000
2.4011	0.2938	0.2475	0.0000	0.0000
2.4533	0.2917	0.2552	0.0000	0.0000
2.5055	0.2897	0.2630	0.0000	0.0000
2.5577	0.2876	0.2708	0.0000	0.0000
2.6099	0.2856	0.2787	0.0000	0.0000
2.6621	0.2835	0.2866	0.0000	0.0000
2.7143	0.2815	0.2946	0.0000	0.0000
2.7665	0.2795	0.3026	0.0000	0.0000
2.8187	0.2775	0.3106	0.0000	0.0000
2.8709	0.2754	0.3188	0.0000	0.0000
2.9231	0.2734	0.3269	0.0000	0.0000
2.9753	0.2714	0.3351	0.0000	0.0000
3.0275	0.2694	0.3434	0.0000	0.0000
3.0797	0.2674	0.3517	0.0000	0.0000
3.1319	0.2654	0.3600	0.0000	0.0000
3.1841	0.2634	0.3684	0.0000	0.0000
3.2363	0.2614	0.3769	0.0000	0.0000
3.2500	0.2594	0.3791	0.0000	0.0000

Biofilter Hydraulic Table

Stage(feet)	**Area(ac.)**	**Volume(ac-ft.)**	**Discharge(cfs)**	**To Amended(cfs)**	**Infilt(cfs)**
3.2500	0.3917	0.3791	0.0000	0.0375	0.0000
3.3022	0.3940	0.3996	0.0000	0.0375	0.0000
3.3544	0.3962	0.4202	0.0000	0.0375	0.0000
3.4066	0.3985	0.4410	0.0000	0.0375	0.0000
3.4588	0.4008	0.4618	0.0000	0.0375	0.0000
3.5110	0.4031	0.4828	0.0024	0.0375	0.0000
3.5632	0.4054	0.5039	0.0055	0.0375	0.0000
3.6154	0.4077	0.5251	0.0063	0.0375	0.0000
3.6676	0.4100	0.5465	0.0067	0.0375	0.0000
3.7198	0.4123	0.5679	0.0077	0.0375	0.0000
3.7720	0.4146	0.5895	0.0083	0.0375	0.0000
3.8242	0.4169	0.6112	0.0092	0.0375	0.0000
3.8764	0.4192	0.6330	0.0097	0.0375	0.0000
3.9286	0.4215	0.6550	0.0106	0.0375	0.0000
3.9808	0.4238	0.6770	0.0110	0.0375	0.0000
4.0330	0.4262	0.6992	0.0118	0.0375	0.0000
4.0852	0.4285	0.7215	0.0122	0.0375	0.0000
4.1374	0.4308	0.7439	0.0129	0.0375	0.0000
4.1896	0.4332	0.7665	0.0133	0.0375	0.0000
4.2418	0.4355	0.7892	0.0139	0.0375	0.0000

4.2940	0.4379	0.8120	0.0142	0.0375	0.0000
4.3462	0.4402	0.8349	0.0149	0.0375	0.0000
4.3984	0.4426	0.8579	0.0152	0.0375	0.0000
4.4505	0.4450	0.8811	0.0157	0.0375	0.0000
4.5027	0.4473	0.9044	0.0160	0.0375	0.0000
4.5549	0.4497	0.9278	0.0166	0.0375	0.0000
4.6071	0.4521	0.9513	0.0168	0.0375	0.0000
4.6593	0.4545	0.9750	0.0173	0.0375	0.0000
4.7115	0.4569	0.9988	0.0176	0.0375	0.0000
4.7500	0.4586	1.0164	0.0181	0.0375	0.0000

Surface iltration 1

Element Flows To:

Outlet 1	Outlet 2
	Biofiltration 1

Biofiltration 2

Bottom Length:	94.00 ft.
Bottom Width:	45.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	1.5
Material type for third layer:	GRAVEL
Underdrain used	
Underdrain Diameter (feet):	0.5
Orifice Diameter (in.):	1
Offset (in.):	0
Flow Through Underdrain (ac-ft.):	48.685
Total Outflow (ac-ft.):	54.183
Percent Through Underdrain:	89.85

Discharge Structure

Riser Height:	1.33 ft.
Riser Diameter:	18 in.

Element Flows To:

Outlet 1	Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.1681	0.0000	0.0000	0.0000
0.0522	0.1677	0.0015	0.0000	0.0000
0.1044	0.1664	0.0031	0.0000	0.0000
0.1566	0.1652	0.0046	0.0000	0.0000
0.2088	0.1639	0.0062	0.0000	0.0000
0.2610	0.1626	0.0078	0.0000	0.0000
0.3132	0.1614	0.0094	0.0000	0.0000
0.3654	0.1601	0.0110	0.0000	0.0000
0.4176	0.1589	0.0127	0.0000	0.0000
0.4698	0.1576	0.0143	0.0000	0.0000
0.5220	0.1564	0.0160	0.0000	0.0000
0.5742	0.1552	0.0177	0.0000	0.0000
0.6264	0.1539	0.0194	0.0000	0.0000
0.6786	0.1527	0.0211	0.0000	0.0000
0.7308	0.1515	0.0229	0.0000	0.0000
0.7830	0.1503	0.0246	0.0000	0.0000
0.8352	0.1491	0.0264	0.0000	0.0000
0.8874	0.1478	0.0282	0.0000	0.0000
0.9396	0.1466	0.0300	0.0000	0.0000
0.9918	0.1454	0.0318	0.0000	0.0000
1.0440	0.1442	0.0336	0.0000	0.0000
1.0962	0.1431	0.0355	0.0000	0.0000
1.1484	0.1419	0.0374	0.0000	0.0000
1.2005	0.1407	0.0393	0.0000	0.0000
1.2527	0.1395	0.0412	0.0000	0.0000
1.3049	0.1383	0.0431	0.0000	0.0000
1.3571	0.1372	0.0450	0.0000	0.0000
1.4093	0.1360	0.0470	0.0000	0.0000
1.4615	0.1348	0.0490	0.0000	0.0000
1.5137	0.1337	0.0510	0.0000	0.0000
1.5659	0.1325	0.0530	0.0000	0.0000

1.6181	0.1314	0.0550	0.0000	0.0000
1.6703	0.1303	0.0571	0.0000	0.0000
1.7225	0.1291	0.0591	0.0000	0.0000
1.7747	0.1280	0.0620	0.0000	0.0000
1.8269	0.1269	0.0649	0.0000	0.0000
1.8791	0.1257	0.0679	0.0000	0.0000
1.9313	0.1246	0.0708	0.0000	0.0000
1.9835	0.1235	0.0738	0.0000	0.0000
2.0357	0.1224	0.0768	0.0000	0.0000
2.0879	0.1213	0.0798	0.0000	0.0000
2.1401	0.1202	0.0829	0.0000	0.0000
2.1923	0.1191	0.0860	0.0000	0.0000
2.2445	0.1180	0.0891	0.0000	0.0000
2.2967	0.1169	0.0922	0.0000	0.0000
2.3489	0.1158	0.0954	0.0000	0.0000
2.4011	0.1147	0.0986	0.0000	0.0000
2.4533	0.1137	0.1018	0.0000	0.0000
2.5055	0.1126	0.1050	0.0000	0.0000
2.5577	0.1115	0.1083	0.0000	0.0000
2.6099	0.1105	0.1116	0.0000	0.0000
2.6621	0.1094	0.1149	0.0000	0.0000
2.7143	0.1084	0.1183	0.0000	0.0000
2.7665	0.1073	0.1217	0.0000	0.0000
2.8187	0.1063	0.1251	0.0000	0.0000
2.8709	0.1052	0.1285	0.0000	0.0000
2.9231	0.1042	0.1319	0.0000	0.0000
2.9753	0.1032	0.1354	0.0000	0.0000
3.0275	0.1022	0.1389	0.0000	0.0000
3.0797	0.1011	0.1425	0.0000	0.0000
3.1319	0.1001	0.1460	0.0000	0.0000
3.1841	0.0991	0.1496	0.0000	0.0000
3.2363	0.0981	0.1532	0.0000	0.0000
3.2500	0.0971	0.1542	0.0000	0.0000

Biofilter Hydraulic Table

Stage(feet)	**Area(ac.)**	**Volume(ac-ft.)**	**Discharge(cfs)**	**To Amended(cfs)**	**Infilt(cfs)**
3.2500	0.1681	0.1542	0.0000	0.0322	0.0000
3.3022	0.1693	0.1630	0.0000	0.0322	0.0000
3.3544	0.1706	0.1719	0.0000	0.0322	0.0000
3.4066	0.1719	0.1808	0.0000	0.0322	0.0000
3.4588	0.1732	0.1898	0.0000	0.0322	0.0000
3.5110	0.1745	0.1989	0.0009	0.0322	0.0000
3.5632	0.1758	0.2080	0.0021	0.0322	0.0000
3.6154	0.1771	0.2173	0.0040	0.0322	0.0000
3.6676	0.1784	0.2265	0.0050	0.0322	0.0000
3.7198	0.1798	0.2359	0.0055	0.0322	0.0000
3.7720	0.1811	0.2453	0.0065	0.0322	0.0000
3.8242	0.1824	0.2548	0.0070	0.0322	0.0000
3.8764	0.1837	0.2643	0.0079	0.0322	0.0000
3.9286	0.1851	0.2740	0.0083	0.0322	0.0000
3.9808	0.1864	0.2837	0.0091	0.0322	0.0000
4.0330	0.1878	0.2934	0.0095	0.0322	0.0000
4.0852	0.1891	0.3033	0.0101	0.0322	0.0000
4.1374	0.1905	0.3132	0.0105	0.0322	0.0000
4.1896	0.1918	0.3232	0.0111	0.0322	0.0000
4.2418	0.1932	0.3332	0.0114	0.0322	0.0000
4.2940	0.1946	0.3433	0.0119	0.0322	0.0000
4.3462	0.1959	0.3535	0.0122	0.0322	0.0000

4.3984	0.1973	0.3638	0.0127	0.0322	0.0000
4.4505	0.1987	0.3741	0.0130	0.0322	0.0000
4.5027	0.2001	0.3845	0.0135	0.0322	0.0000
4.5549	0.2015	0.3950	0.0137	0.0322	0.0000
4.6071	0.2029	0.4055	0.0142	0.0322	0.0000
4.6593	0.2043	0.4162	0.0144	0.0322	0.0000
4.7115	0.2057	0.4269	0.0149	0.0322	0.0000
4.7500	0.2067	0.4348	0.0151	0.0322	0.0000

Surface iltration 2

Element Flows To:

Outlet 1	Outlet 2
	Biofiltration 2

Biofiltration 3

Bottom Length:	162.00 ft.
Bottom Width:	15.00 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	1.5
Material type for third layer:	GRAVEL
Underdrain used	
Underdrain Diameter (feet):	0.5
Orifice Diameter (in.):	0.9
Offset (in.):	0
Flow Through Underdrain (ac-ft.):	31.418
Total Outflow (ac-ft.):	33.135
Percent Through Underdrain:	94.82

Discharge Structure

Riser Height:	1.33 ft.
Riser Diameter:	18 in.

Element Flows To:

Outlet 1	Outlet 2

Biofilter Hydraulic Table

Stage(feet)	**Area(ac.)**	**Volume(ac-ft.)**	**Discharge(cfs)**	**Infilt(cfs)**
0.0000	0.1438	0.0000	0.0000	0.0000
0.0522	0.1433	0.0009	0.0000	0.0000
0.1044	0.1418	0.0018	0.0000	0.0000
0.1566	0.1402	0.0027	0.0000	0.0000
0.2088	0.1387	0.0037	0.0000	0.0000
0.2610	0.1372	0.0046	0.0000	0.0000
0.3132	0.1356	0.0056	0.0000	0.0000
0.3654	0.1341	0.0066	0.0000	0.0000
0.4176	0.1326	0.0076	0.0000	0.0000
0.4698	0.1311	0.0087	0.0000	0.0000
0.5220	0.1296	0.0097	0.0000	0.0000
0.5742	0.1280	0.0108	0.0000	0.0000
0.6264	0.1265	0.0119	0.0000	0.0000
0.6786	0.1250	0.0131	0.0000	0.0000
0.7308	0.1235	0.0142	0.0000	0.0000
0.7830	0.1221	0.0154	0.0000	0.0000
0.8352	0.1206	0.0166	0.0000	0.0000
0.8874	0.1191	0.0178	0.0000	0.0000
0.9396	0.1176	0.0190	0.0000	0.0000
0.9918	0.1161	0.0203	0.0000	0.0000
1.0440	0.1147	0.0216	0.0000	0.0000
1.0962	0.1132	0.0228	0.0000	0.0000
1.1484	0.1117	0.0242	0.0000	0.0000
1.2005	0.1103	0.0255	0.0000	0.0000
1.2527	0.1088	0.0269	0.0000	0.0000
1.3049	0.1074	0.0283	0.0000	0.0000
1.3571	0.1060	0.0297	0.0000	0.0000
1.4093	0.1045	0.0311	0.0000	0.0000
1.4615	0.1031	0.0325	0.0000	0.0000
1.5137	0.1017	0.0340	0.0000	0.0000
1.5659	0.1002	0.0355	0.0000	0.0000

1.6181	0.0988	0.0370	0.0000	0.0000
1.6703	0.0974	0.0385	0.0000	0.0000
1.7225	0.0960	0.0401	0.0000	0.0000
1.7747	0.0946	0.0423	0.0000	0.0000
1.8269	0.0932	0.0445	0.0000	0.0000
1.8791	0.0918	0.0468	0.0000	0.0000
1.9313	0.0904	0.0490	0.0000	0.0000
1.9835	0.0890	0.0513	0.0000	0.0000
2.0357	0.0876	0.0537	0.0000	0.0000
2.0879	0.0862	0.0561	0.0000	0.0000
2.1401	0.0849	0.0585	0.0000	0.0000
2.1923	0.0835	0.0609	0.0000	0.0000
2.2445	0.0821	0.0634	0.0000	0.0000
2.2967	0.0808	0.0659	0.0000	0.0000
2.3489	0.0794	0.0684	0.0000	0.0000
2.4011	0.0781	0.0710	0.0000	0.0000
2.4533	0.0767	0.0736	0.0000	0.0000
2.5055	0.0754	0.0762	0.0000	0.0000
2.5577	0.0740	0.0788	0.0000	0.0000
2.6099	0.0727	0.0815	0.0000	0.0000
2.6621	0.0714	0.0843	0.0000	0.0000
2.7143	0.0701	0.0870	0.0000	0.0000
2.7665	0.0687	0.0898	0.0000	0.0000
2.8187	0.0674	0.0926	0.0000	0.0000
2.8709	0.0661	0.0955	0.0000	0.0000
2.9231	0.0648	0.0984	0.0000	0.0000
2.9753	0.0635	0.1013	0.0000	0.0000
3.0275	0.0622	0.1043	0.0000	0.0000
3.0797	0.0609	0.1072	0.0000	0.0000
3.1319	0.0596	0.1103	0.0000	0.0000
3.1841	0.0583	0.1133	0.0000	0.0000
3.2363	0.0571	0.1164	0.0000	0.0000
3.2500	0.0558	0.1172	0.0000	0.0000

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
3.2500	0.1438	0.1172	0.0000	0.0260	0.0000
3.3022	0.1453	0.1248	0.0000	0.0260	0.0000
3.3544	0.1469	0.1324	0.0000	0.0260	0.0000
3.4066	0.1484	0.1401	0.0000	0.0260	0.0000
3.4588	0.1500	0.1479	0.0000	0.0260	0.0000
3.5110	0.1516	0.1558	0.0005	0.0260	0.0000
3.5632	0.1531	0.1637	0.0012	0.0260	0.0000
3.6154	0.1547	0.1718	0.0023	0.0260	0.0000
3.6676	0.1563	0.1799	0.0038	0.0260	0.0000
3.7198	0.1579	0.1881	0.0044	0.0260	0.0000
3.7720	0.1595	0.1964	0.0046	0.0260	0.0000
3.8242	0.1611	0.2047	0.0054	0.0260	0.0000
3.8764	0.1627	0.2132	0.0057	0.0260	0.0000
3.9286	0.1643	0.2217	0.0064	0.0260	0.0000
3.9808	0.1659	0.2303	0.0068	0.0260	0.0000
4.0330	0.1676	0.2390	0.0074	0.0260	0.0000
4.0852	0.1692	0.2478	0.0077	0.0260	0.0000
4.1374	0.1708	0.2567	0.0082	0.0260	0.0000
4.1896	0.1724	0.2657	0.0085	0.0260	0.0000
4.2418	0.1741	0.2747	0.0090	0.0260	0.0000
4.2940	0.1757	0.2838	0.0092	0.0260	0.0000
4.3462	0.1774	0.2930	0.0097	0.0260	0.0000

4.3984	0.1790	0.3023	0.0099	0.0260	0.0000
4.4505	0.1807	0.3117	0.0103	0.0260	0.0000
4.5027	0.1823	0.3212	0.0105	0.0260	0.0000
4.5549	0.1840	0.3308	0.0109	0.0260	0.0000
4.6071	0.1856	0.3404	0.0111	0.0260	0.0000
4.6593	0.1873	0.3501	0.0115	0.0260	0.0000
4.7115	0.1890	0.3600	0.0117	0.0260	0.0000
4.7500	0.1902	0.3673	0.0120	0.0260	0.0000

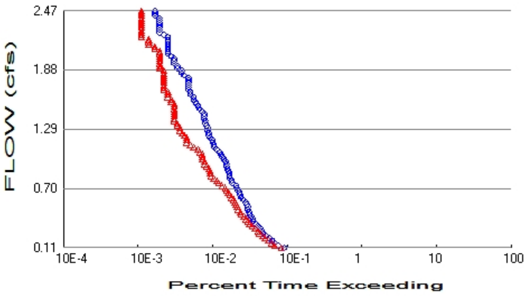
Surface iltration 3

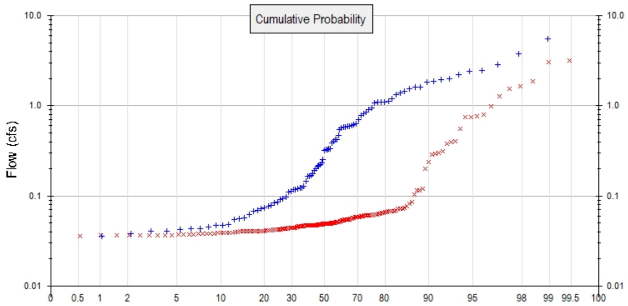
Element Flows To:

Outlet 1	Outlet 2
	Biofiltration 3

Analysis Results

POC 1





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1

Total Pervious Area:	9.9
Total Impervious Area:	0

Mitigated Landuse Totals for POC #1

Total Pervious Area:	4.29
Total Impervious Area:	5.14

Flow Frequency Method: Weibull

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	1.087691
5 year	1.914959
10 year	2.472948
25 year	4.119877

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.198765
5 year	0.7809
10 year	1.637747
25 year	3.056156

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1088	328	299	91	Pass
0.1326	271	243	89	Pass
0.1565	246	223	90	Pass
0.1804	223	202	90	Pass
0.2043	205	180	87	Pass
0.2282	186	168	90	Pass
0.2521	174	152	87	Pass
0.2759	165	144	87	Pass
0.2998	157	133	84	Pass
0.3237	144	122	84	Pass
0.3476	135	113	83	Pass
0.3715	128	107	83	Pass
0.3953	125	101	80	Pass
0.4192	119	95	79	Pass
0.4431	113	86	76	Pass
0.4670	111	84	75	Pass
0.4909	107	80	74	Pass
0.5147	106	77	72	Pass
0.5386	103	74	71	Pass
0.5625	100	72	72	Pass
0.5864	92	69	75	Pass
0.6103	87	65	74	Pass
0.6341	83	61	73	Pass
0.6580	82	58	70	Pass
0.6819	79	55	69	Pass
0.7058	75	53	70	Pass
0.7297	74	48	64	Pass
0.7535	66	43	65	Pass
0.7774	65	41	63	Pass
0.8013	62	37	59	Pass
0.8252	60	34	56	Pass
0.8491	60	33	55	Pass
0.8729	58	33	56	Pass
0.8968	56	32	57	Pass
0.9207	55	30	54	Pass
0.9446	55	28	50	Pass
0.9685	53	28	52	Pass
0.9924	51	26	50	Pass
1.0162	48	26	54	Pass
1.0401	47	26	55	Pass
1.0640	45	24	53	Pass
1.0879	41	23	56	Pass
1.1118	38	20	52	Pass
1.1356	37	18	48	Pass
1.1595	36	16	44	Pass
1.1834	35	16	45	Pass
1.2073	33	16	48	Pass
1.2312	32	15	46	Pass
1.2550	32	14	43	Pass
1.2789	31	13	41	Pass
1.3028	31	13	41	Pass
1.3267	30	12	40	Pass
1.3506	29	12	41	Pass

1.3744	29	11	37	Pass
1.3983	28	11	39	Pass
1.4222	28	11	39	Pass
1.4461	28	11	39	Pass
1.4700	26	11	42	Pass
1.4938	24	11	45	Pass
1.5177	23	11	47	Pass
1.5416	22	11	50	Pass
1.5655	21	10	47	Pass
1.5894	20	10	50	Pass
1.6132	20	9	45	Pass
1.6371	18	9	50	Pass
1.6610	18	9	50	Pass
1.6849	17	8	47	Pass
1.7088	17	8	47	Pass
1.7326	17	8	47	Pass
1.7565	17	8	47	Pass
1.7804	17	8	47	Pass
1.8043	17	8	47	Pass
1.8282	15	8	53	Pass
1.8521	14	8	57	Pass
1.8759	14	8	57	Pass
1.8998	12	7	58	Pass
1.9237	12	7	58	Pass
1.9476	11	7	63	Pass
1.9715	11	7	63	Pass
1.9953	11	7	63	Pass
2.0192	10	7	70	Pass
2.0431	9	7	77	Pass
2.0670	9	7	77	Pass
2.0909	9	6	66	Pass
2.1147	9	6	66	Pass
2.1386	9	5	55	Pass
2.1625	9	5	55	Pass
2.1864	9	5	55	Pass
2.2103	9	4	44	Pass
2.2341	8	4	50	Pass
2.2580	7	4	57	Pass
2.2819	7	4	57	Pass
2.3058	7	4	57	Pass
2.3297	7	4	57	Pass
2.3535	7	4	57	Pass
2.3774	7	4	57	Pass
2.4013	7	4	57	Pass
2.4252	6	4	66	Pass
2.4491	6	4	66	Pass
2.4729	6	4	66	Pass

Water Quality

POC 2

POC #2 was not reported because POC must exist in both scenarios and both scenarios must have been run.

POC 3

POC #3 was not reported because POC must exist in both scenarios and both scenarios must have been run.

POC 4

POC #4 was not reported because POC must exist in both scenarios and both scenarios must have been run.

POC 5

POC #5 was not reported because POC must exist in both scenarios and both scenarios must have been run.

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

No PERLND changes have been made.

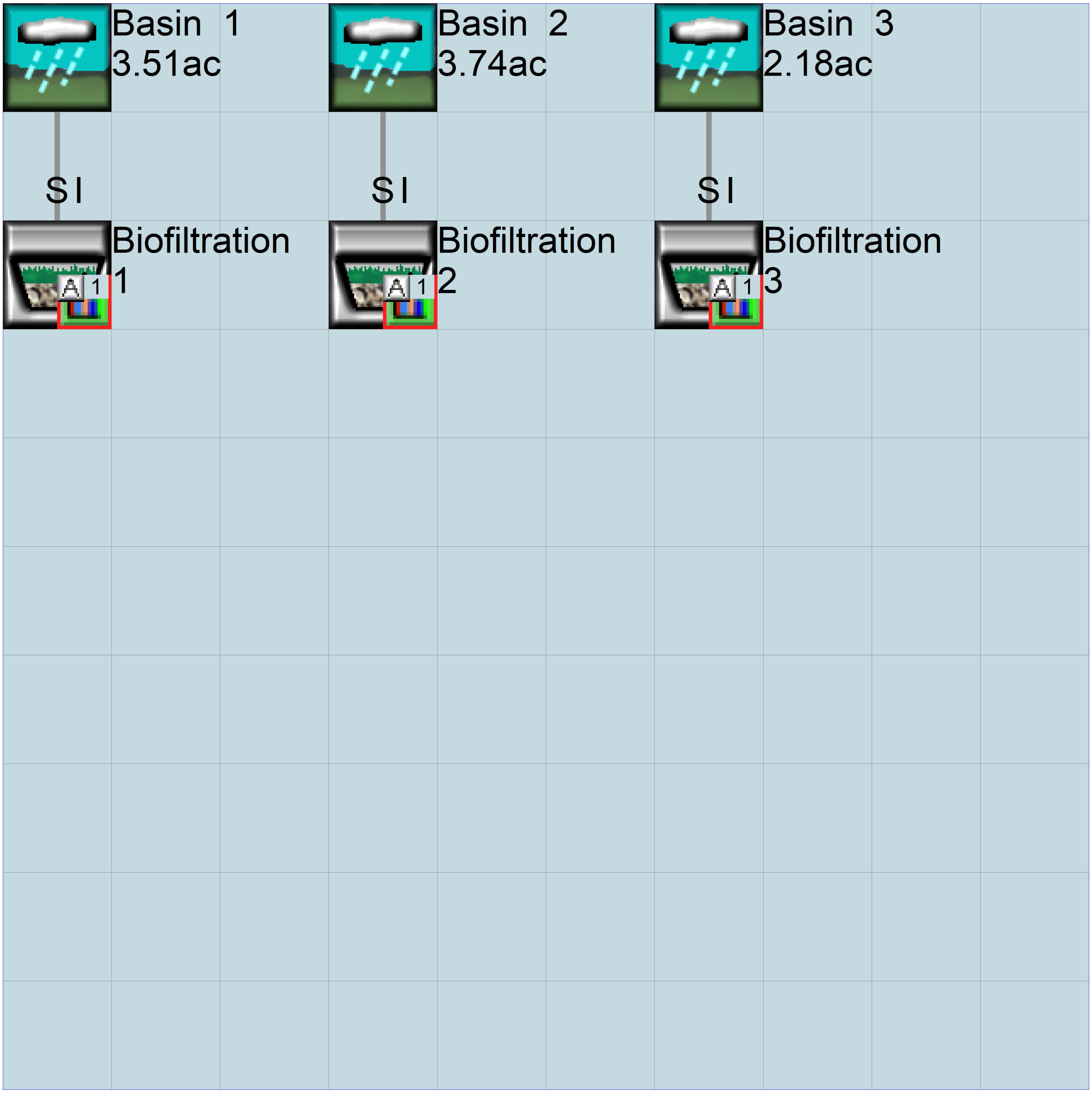
IMPLND Changes

No IMPLND changes have been made.

Appendix

Predeveloped Schematic

Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1963 10 01        END    2004 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                             ***
WDM        26   624ENC-WQ.wdm
MESSU      25   Pre624ENC-WQ.MES
           27   Pre624ENC-WQ.L61
           28   Pre624ENC-WQ.L62
           30   POC624ENC-WQ1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:60
      PERLND       3
      PERLND       5
      PERLND       6
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1 - PREDEVELOPED     MAX                   1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                            User  t-series Engl Metr ***
                                            in  out          ***
    3      A,NatVeg,Steep         1    1    1    1   27    0
    5      A,Dirt,Moderate        1    1    1    1   27    0
    6      A,Dirt,Steep           1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
    3         0    0    1    0    0    0    0    0    0    0    0    0
    5         0    0    1    0    0    0    0    0    0    0    0    0
    6         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY
```

```
  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
    3         0    0    4    0    0    0    0    0    0    0    0    0    1    9
    5         0    0    4    0    0    0    0    0    0    0    0    0    1    9
    6         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
    3         0    1    1    1    0    0    0    0    1    1    0
    5         0    1    1    1    0    0    0    0    1    1    0
    6         0    1    1    1    0    0    0    0    1    1    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
    3              0       3.5     0.045        75      0.15       2.5     0.915
    5              0       3.8      0.07        80       0.1       2.5     0.915
    6              0       3.5     0.045        75      0.15       2.5     0.915
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
    3              0         0         2         2         0      0.05      0.05
    5              0         0         2         2         0      0.05      0.05
    6              0         0         2         2         0      0.05      0.05
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                               ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
    3              0       0.6      0.04         1       0.3         0
    5              0       0.6     0.017         1       0.3         0
    6              0       0.6     0.017         1       0.3         0
  END PWAT-PARM4
  MON-LZETPARM
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
    3       0.4  0.4  0.4  0.4  0.6  0.6  0.6  0.6  0.6  0.4  0.4  0.4
    5       0.4  0.4  0.4  0.4  0.4  0.4  0.4  0.4  0.4  0.4  0.4  0.4
    6       0.4  0.4  0.4  0.4  0.4  0.4  0.4  0.4  0.4  0.4  0.4  0.4
  END MON-LZETPARM
  MON-INTERCEP
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
    3       0.1  0.1  0.1  0.1 0.06 0.06 0.06 0.06 0.06  0.1  0.1  0.1
    5       0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1
    6       0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1
  END MON-INTERCEP

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
              ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
    3              0         0      0.01         0       0.4      0.01         0
    5              0         0      0.01         0       0.4      0.01         0
    6              0         0      0.01         0       0.4      0.01         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                      in  out           ***
  END GEN-INFO
```

```
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1 - PREDEVELOPED***
PERLND   3                           2     COPY   501     12
PERLND   3                           2     COPY   501     13
PERLND   5                         2.4     COPY   501     12
PERLND   5                         2.4     COPY   501     13
PERLND   6                         5.5     COPY   501     12
PERLND   6                         5.5     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   12.1        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer               ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG          ***
                                         in  out                           ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
```

```
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                      ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1               PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1               IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1               PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1               IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     12.1      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1963 10 01        END    2004 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                             ***
WDM        26   624ENC-WQ.wdm
MESSU      25   Mit624ENC-WQ.MES
           27   Mit624ENC-WQ.L61
           28   Mit624ENC-WQ.L62
           30   POC624ENC-WQ1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:60
      PERLND      37
      IMPLND       1
      PERLND      39
      RCHRES       1
      RCHRES       2
      RCHRES       3
      RCHRES       4
      RCHRES       5
      RCHRES       6
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Surface iltration  1        MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1        1    1
  501        1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out            ***
   37      A,Urban,Flat           1    1    1    1   27    0
   39      A,Urban,Steep          1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
```

```
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   37         0    0    1    0    0    0    0    0    0    0    0    0
   39         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   37         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   39         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   37         0    1    1    1    0    0    0    0    1    1    0
   39         0    1    1    1    0    0    0    0    1    1    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   37              0       4.2      0.09        50      0.05       2.5     0.915
   39              0       3.5     0.045        50      0.15       2.5     0.915
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   37              0         0         2         2         0      0.05      0.05
   39              0         0         2         2         0      0.05      0.05
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                               ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   37              0       0.6      0.03         1       0.3         0
   39              0       0.6      0.03         1       0.3         0
  END PWAT-PARM4
  MON-LZETPARM
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   37       0.6  0.6  0.6  0.6  0.7  0.7  0.7  0.7  0.7  0.6  0.6  0.6
   39       0.6  0.6  0.6  0.6  0.7  0.7  0.7  0.7  0.7  0.6  0.6  0.6
  END MON-LZETPARM
  MON-INTERCEP
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   37       0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1
   39       0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1
  END MON-INTERCEP

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
              ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   37              0         0      0.15         0         1      0.05         0
   39              0         0      0.15         0         1      0.05         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                      in  out           ***
    1      IMPERVIOUS-FLAT        1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***
```

```
  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    1
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            100      0.05     0.011       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  37                        1.31     RCHRES   1      2
PERLND  37                        1.31     RCHRES   1      3
IMPLND   1                         2.2     RCHRES   1      5
Basin  2***
PERLND  39                        0.64     RCHRES   3      2
PERLND  39                        0.64     RCHRES   3      3
PERLND  37                        1.26     RCHRES   3      2
PERLND  37                        1.26     RCHRES   3      3
IMPLND   1                        1.84     RCHRES   3      5
Basin  3***
PERLND  39                         0.5     RCHRES   5      2
PERLND  39                         0.5     RCHRES   5      3
PERLND  37                        0.58     RCHRES   5      2
PERLND  37                        0.58     RCHRES   5      3
IMPLND   1                         1.1     RCHRES   5      5

******Routing******
PERLND  37                        1.31     COPY     1     12
IMPLND   1                         2.2     COPY     1     15
PERLND  37                        1.31     COPY     1     13
PERLND  39                        0.64     COPY     1     12
PERLND  37                        1.26     COPY     1     12
IMPLND   1                        1.84     COPY     1     15
PERLND  39                        0.64     COPY     1     13
PERLND  37                        1.26     COPY     1     13
PERLND  39                         0.5     COPY     1     12
PERLND  37                        0.58     COPY     1     12
IMPLND   1                         1.1     COPY     1     15
```

```
PERLND  39                         0.5     COPY     1     13
PERLND  37                        0.58     COPY     1     13
RCHRES   1                           1     RCHRES   2      8
RCHRES   3                           1     RCHRES   4      8
RCHRES   5                           1     RCHRES   6      8
RCHRES   2                           1     COPY   501     16
RCHRES   1                           1     COPY   501     17
RCHRES   4                           1     COPY   501     16
RCHRES   3                           1     COPY   501     17
RCHRES   6                           1     COPY   501     16
RCHRES   5                           1     COPY   501     17
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   12.1        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG              ***
                                           in  out                          ***
    1     Surface iltratio-027    3    1    1    1   28    0    1
    2     Biofiltration  1-026    1    1    1    1   28    0    1
    3     Surface iltratio-029    3    1    1    1   28    0    1
    4     Biofiltration  2-028    1    1    1    1   28    0    1
    5     Surface iltratio-031    3    1    1    1   28    0    1
    6     Biofiltration  3-030    1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
    2         1    0    0    0    0    0    0    0    0    0
    3         1    0    0    0    0    0    0    0    0    0
    4         1    0    0    0    0    0    0    0    0    0
    5         1    0    0    0    0    0    0    0    0    0
    6         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
    2         4    0    0    0    0    0    0    0    0    0    1    9
    3         4    0    0    0    0    0    0    0    0    0    1    9
    4         4    0    0    0    0    0    0    0    0    0    1    9
    5         4    0    0    0    0    0    0    0    0    0    1    9
    6         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                     ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
    1        0  1  0  0    4  5  6  0  0       0  0  0  0  0       2  2  2  2  2
    2        0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
    3        0  1  0  0    4  5  6  0  0       0  0  0  0  0       2  2  2  2  2
    4        0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
    5        0  1  0  0    4  5  6  0  0       0  0  0  0  0       2  2  2  2  2
```

```
    6       0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50        ***
  <------><--------><--------><--------><--------><--------><-------->        ***
    1              1      0.01       0.0       0.0       0.5       0.0
    2              2      0.04       0.0       0.0       0.5       0.0
    3              3      0.01       0.0       0.0       0.5       0.0
    4              4      0.02       0.0       0.0       0.5       0.0
    5              5      0.01       0.0       0.0       0.5       0.0
    6              6      0.03       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                          ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit       for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1            0         4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2            0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    3            0         4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    4            0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    5            0         4.0  5.0  6.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    6            0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE       2
   64    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)    (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.391695  0.000000  0.000000
  0.052198  0.391100  0.004078  0.000000
  0.104396  0.388838  0.008187  0.000000
  0.156593  0.386581  0.012327  0.000000
  0.208791  0.384329  0.016498  0.000000
  0.260989  0.382081  0.020701  0.002370
  0.313187  0.379838  0.024935  0.005518
  0.365385  0.377599  0.029201  0.006282
  0.417582  0.375365  0.033498  0.006663
  0.469780  0.373135  0.037827  0.007725
  0.521978  0.370910  0.042188  0.008256
  0.574176  0.368689  0.046580  0.009240
  0.626374  0.366472  0.051004  0.009732
  0.678571  0.364261  0.055461  0.010603
  0.730769  0.362053  0.059949  0.011038
  0.782967  0.359851  0.064469  0.011817
  0.835165  0.357652  0.069021  0.012206
  0.887363  0.355458  0.073606  0.012913
  0.939560  0.353269  0.078223  0.013267
  0.991758  0.351084  0.082872  0.013920
  1.043956  0.348904  0.087553  0.014246
  1.096154  0.346728  0.092268  0.014854
  1.148352  0.344557  0.097014  0.015159
  1.200549  0.342390  0.101793  0.015731
  1.252747  0.340228  0.106605  0.016017
  1.304945  0.338070  0.111450  0.016560
  1.357143  0.335917  0.116328  0.016831
  1.409341  0.333768  0.121238  0.017347
  1.461538  0.331624  0.126182  0.017605
  1.513736  0.329484  0.131158  0.018099
  1.565934  0.327349  0.136168  0.018346
  1.618132  0.325218  0.141210  0.018821
  1.670330  0.323092  0.146286  0.019058
  1.722527  0.320970  0.151396  0.019515
  1.774725  0.318853  0.158510  0.019743
  1.826923  0.316740  0.165671  0.020184
```

```
  1.879121  0.314632  0.172877  0.020405
  1.931319  0.312528  0.180131  0.020832
  1.983516  0.310429  0.187431  0.021045
  2.035714  0.308334  0.194777  0.021459
  2.087912  0.306244  0.202171  0.021666
  2.140110  0.304158  0.209611  0.022068
  2.192308  0.302077  0.217099  0.022270
  2.244505  0.300001  0.224633  0.022661
  2.296703  0.297928  0.232215  0.022689
  2.348901  0.295861  0.239844  0.023140
  2.401099  0.293798  0.247520  0.023914
  2.453297  0.291739  0.255244  0.024825
  2.505495  0.289685  0.263015  0.025785
  2.557692  0.287635  0.270834  0.026750
  2.609890  0.285590  0.278701  0.027702
  2.662088  0.283549  0.286615  0.028632
  2.714286  0.281513  0.294578  0.029538
  2.766484  0.279481  0.302588  0.030420
  2.818681  0.277454  0.310647  0.031277
  2.870879  0.275431  0.318754  0.032113
  2.923077  0.273413  0.326910  0.032929
  2.975275  0.271400  0.335113  0.033725
  3.027473  0.269390  0.343366  0.034505
  3.079670  0.267386  0.351667  0.035269
  3.131868  0.265386  0.360017  0.036019
  3.184066  0.263390  0.368415  0.036759
  3.236264  0.261399  0.376863  0.037505
  3.250000  0.259412  0.796097  0.057062
  END FTABLE  2
  FTABLE      1
   30    6
     Depth      Area    Volume  Outflow1  Outflow2  outflow 3 Velocity  Travel
Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.259412  0.000000  0.000000  0.000000  0.000000
  0.052198  0.393962  0.020505  0.000000  0.037505  0.000000
  0.104396  0.396234  0.041128  0.000000  0.037505  0.000000
  0.156593  0.398510  0.061870  0.000000  0.037505  0.000000
  0.208791  0.400791  0.082731  0.000000  0.037505  0.000000
  0.260989  0.403076  0.103711  0.000000  0.037505  0.000000
  0.313187  0.405365  0.124810  0.000000  0.037505  0.000000
  0.365385  0.407659  0.146029  0.000000  0.037505  0.000000
  0.417582  0.409958  0.167368  0.000000  0.037505  0.000000
  0.469780  0.412261  0.188827  0.000000  0.037505  0.000000
  0.521978  0.414568  0.210407  0.000000  0.037505  0.000000
  0.574176  0.416880  0.232106  0.000000  0.037505  0.000000
  0.626374  0.419197  0.253927  0.000000  0.037505  0.000000
  0.678571  0.421518  0.275869  0.000000  0.037505  0.000000
  0.730769  0.423844  0.297932  0.000000  0.037505  0.000000
  0.782967  0.426174  0.320116  0.000000  0.037505  0.000000
  0.835165  0.428508  0.342423  0.000000  0.037505  0.000000
  0.887363  0.430847  0.364851  0.000000  0.037505  0.000000
  0.939560  0.433191  0.387401  0.000000  0.037505  0.000000
  0.991758  0.435539  0.410074  0.000000  0.037505  0.000000
  1.043956  0.437892  0.432870  0.000000  0.037505  0.000000
  1.096154  0.440249  0.455788  0.000000  0.037505  0.000000
  1.148352  0.442610  0.478830  0.000000  0.037505  0.000000
  1.200549  0.444976  0.501995  0.000000  0.037505  0.000000
  1.252747  0.447347  0.525284  0.000000  0.037505  0.000000
  1.304945  0.449722  0.548696  0.000000  0.037505  0.000000
  1.357143  0.452102  0.572233  0.071179  0.037505  0.000000
  1.409341  0.454486  0.595894  0.355200  0.037505  0.000000
  1.461538  0.456875  0.619679  0.756053  0.037505  0.000000
  1.500000  0.458638  0.637285  1.240304  0.037505  0.000000
  END FTABLE  1
  FTABLE      4
   64    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
```

```
  0.000000  0.168061  0.000000  0.000000
  0.052198  0.167725  0.001528  0.000000
  0.104396  0.166448  0.003073  0.000000
  0.156593  0.165176  0.004633  0.000000
  0.208791  0.163909  0.006209  0.000000
  0.260989  0.162646  0.007800  0.000887
  0.313187  0.161388  0.009408  0.002066
  0.365385  0.160134  0.011032  0.003951
  0.417582  0.158885  0.012672  0.004995
  0.469780  0.157640  0.014328  0.005518
  0.521978  0.156400  0.016001  0.006526
  0.574176  0.155164  0.017690  0.007030
  0.626374  0.153933  0.019395  0.007897
  0.678571  0.152706  0.021117  0.008331
  0.730769  0.151483  0.022855  0.009084
  0.782967  0.150266  0.024610  0.009460
  0.835165  0.149052  0.026382  0.010129
  0.887363  0.147844  0.028170  0.010464
  0.939560  0.146639  0.029975  0.011071
  0.991758  0.145440  0.031798  0.011374
  1.043956  0.144244  0.033637  0.011934
  1.096154  0.143053  0.035493  0.012213
  1.148352  0.141867  0.037367  0.012735
  1.200549  0.140685  0.039257  0.012996
  1.252747  0.139508  0.041165  0.013487
  1.304945  0.138335  0.043090  0.013732
  1.357143  0.137167  0.045033  0.014197
  1.409341  0.136003  0.046993  0.014430
  1.461538  0.134844  0.048971  0.014872
  1.513736  0.133689  0.050966  0.015094
  1.565934  0.132539  0.052979  0.015517
  1.618132  0.131393  0.055010  0.015729
  1.670330  0.130252  0.057058  0.016136
  1.722527  0.129115  0.059125  0.016339
  1.774725  0.127983  0.062008  0.016731
  1.826923  0.126855  0.064917  0.016926
  1.879121  0.125732  0.067850  0.017305
  1.931319  0.124613  0.070809  0.017494
  1.983516  0.123499  0.073793  0.017860
  2.035714  0.122390  0.076802  0.017610
  2.087912  0.121284  0.079837  0.017646
  2.140110  0.120184  0.082898  0.017780
  2.192308  0.119087  0.085984  0.018003
  2.244505  0.117996  0.089095  0.018226
  2.296703  0.116909  0.092233  0.018732
  2.348901  0.115826  0.095396  0.019479
  2.401099  0.114748  0.098586  0.020322
  2.453297  0.113674  0.101802  0.021193
  2.505495  0.112605  0.105044  0.022061
  2.557692  0.111540  0.108312  0.022912
  2.609890  0.110480  0.111607  0.023739
  2.662088  0.109424  0.114928  0.024542
  2.714286  0.108373  0.118276  0.025321
  2.766484  0.107326  0.121650  0.026078
  2.818681  0.106284  0.125052  0.026815
  2.870879  0.105247  0.128480  0.027532
  2.923077  0.104213  0.131935  0.028231
  2.975275  0.103185  0.135418  0.028914
  3.027473  0.102161  0.138927  0.029582
  3.079670  0.101141  0.142464  0.030237
  3.131868  0.100126  0.146028  0.030880
  3.184066  0.099115  0.149620  0.031515
  3.236264  0.098109  0.153240  0.032154
  3.250000  0.097107  0.323813  0.048922
  END FTABLE  4
  FTABLE      3
   30    6
     Depth      Area    Volume  Outflow1  Outflow2  outflow 3 Velocity  Travel
Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)     (cfs)   (ft/sec)
```

```
(Minutes)***
  0.000000  0.097107  0.000000  0.000000  0.000000  0.000000
  0.052198  0.169343  0.008806  0.000000  0.032154  0.000000
  0.104396  0.170630  0.017679  0.000000  0.032154  0.000000
  0.156593  0.171921  0.026619  0.000000  0.032154  0.000000
  0.208791  0.173216  0.035627  0.000000  0.032154  0.000000
  0.260989  0.174516  0.044702  0.000000  0.032154  0.000000
  0.313187  0.175821  0.053846  0.000000  0.032154  0.000000
  0.365385  0.177130  0.063057  0.000000  0.032154  0.000000
  0.417582  0.178444  0.072337  0.000000  0.032154  0.000000
  0.469780  0.179762  0.081686  0.000000  0.032154  0.000000
  0.521978  0.181084  0.091104  0.000000  0.032154  0.000000
  0.574176  0.182411  0.100591  0.000000  0.032154  0.000000
  0.626374  0.183743  0.110147  0.000000  0.032154  0.000000
  0.678571  0.185079  0.119773  0.000000  0.032154  0.000000
  0.730769  0.186420  0.129468  0.000000  0.032154  0.000000
  0.782967  0.187765  0.139234  0.000000  0.032154  0.000000
  0.835165  0.189114  0.149070  0.000000  0.032154  0.000000
  0.887363  0.190468  0.158977  0.000000  0.032154  0.000000
  0.939560  0.191827  0.168954  0.000000  0.032154  0.000000
  0.991758  0.193190  0.179003  0.000000  0.032154  0.000000
  1.043956  0.194558  0.189123  0.000000  0.032154  0.000000
  1.096154  0.195930  0.199314  0.000000  0.032154  0.000000
  1.148352  0.197306  0.209577  0.000000  0.032154  0.000000
  1.200549  0.198687  0.219912  0.000000  0.032154  0.000000
  1.252747  0.200073  0.230319  0.000000  0.032154  0.000000
  1.304945  0.201463  0.240799  0.000000  0.032154  0.000000
  1.357143  0.202858  0.251351  0.071179  0.032154  0.000000
  1.409341  0.204257  0.261977  0.355200  0.032154  0.000000
  1.461538  0.205661  0.272675  0.756053  0.032154  0.000000
  1.500000  0.206698  0.280605  1.240304  0.032154  0.000000
  END FTABLE  3
  FTABLE      6
   64    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.143750  0.000000  0.000000
  0.052198  0.143341  0.000884  0.000000
  0.104396  0.141792  0.001787  0.000000
  0.156593  0.140247  0.002711  0.000000
  0.208791  0.138706  0.003654  0.000000
  0.260989  0.137170  0.004618  0.000510
  0.313187  0.135639  0.005603  0.001187
  0.365385  0.134112  0.006607  0.002270
  0.417582  0.132589  0.007632  0.003824
  0.469780  0.131071  0.008678  0.004358
  0.521978  0.129558  0.009744  0.004626
  0.574176  0.128049  0.010830  0.005364
  0.626374  0.126544  0.011938  0.005733
  0.678571  0.125044  0.013066  0.006416
  0.730769  0.123549  0.014215  0.006758
  0.782967  0.122058  0.015385  0.007363
  0.835165  0.120571  0.016576  0.007665
  0.887363  0.119089  0.017788  0.008206
  0.939560  0.117612  0.019021  0.008476
  0.991758  0.116139  0.020275  0.008968
  1.043956  0.114670  0.021551  0.009213
  1.096154  0.113206  0.022848  0.009666
  1.148352  0.111747  0.024166  0.009893
  1.200549  0.110292  0.025506  0.010316
  1.252747  0.108841  0.026867  0.010527
  1.304945  0.107395  0.028250  0.010924
  1.357143  0.105954  0.029655  0.011123
  1.409341  0.104517  0.031081  0.011500
  1.461538  0.103084  0.032530  0.011688
  1.513736  0.101656  0.034000  0.012047
  1.565934  0.100233  0.035492  0.012226
  1.618132  0.098814  0.037006  0.012569
  1.670330  0.097399  0.038542  0.012741
  1.722527  0.095989  0.040101  0.013070
```

```
  1.774725  0.094584  0.042287  0.013235
  1.826923  0.093183  0.044505  0.013552
  1.879121  0.091787  0.046754  0.013710
  1.931319  0.090395  0.049033  0.014017
  1.983516  0.089007  0.051344  0.014170
  2.035714  0.087624  0.053686  0.014466
  2.087912  0.086246  0.056059  0.014615
  2.140110  0.084872  0.058464  0.014902
  2.192308  0.083503  0.060901  0.015046
  2.244505  0.082138  0.063369  0.015206
  2.296703  0.080777  0.065869  0.015394
  2.348901  0.079421  0.068401  0.015888
  2.401099  0.078070  0.070964  0.016516
  2.453297  0.076723  0.073560  0.017194
  2.505495  0.075381  0.076188  0.017883
  2.557692  0.074043  0.078848  0.018565
  2.609890  0.072709  0.081541  0.019232
  2.662088  0.071380  0.084266  0.019881
  2.714286  0.070056  0.087023  0.020511
  2.766484  0.068736  0.089813  0.021124
  2.818681  0.067421  0.092636  0.021720
  2.870879  0.066110  0.095492  0.022301
  2.923077  0.064804  0.098381  0.022867
  2.975275  0.063502  0.101302  0.023420
  3.027473  0.062204  0.104257  0.023962
  3.079670  0.060912  0.107245  0.024492
  3.131868  0.059623  0.110266  0.025013
  3.184066  0.058339  0.113321  0.025527
  3.236264  0.057060  0.116409  0.026045
  3.250000  0.055785  0.246178  0.039626
  END FTABLE  6
  FTABLE      5
   30    6
     Depth      Area    Volume  Outflow1  Outflow2  outflow 3 Velocity  Travel
Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)     (cfs)   (ft/sec)
(Minutes)***
  0.000000  0.055785  0.000000  0.000000  0.000000  0.000000
  0.052198  0.145305  0.007544  0.000000  0.026045  0.000000
  0.104396  0.146865  0.015169  0.000000  0.026045  0.000000
  0.156593  0.148429  0.022876  0.000000  0.026045  0.000000
  0.208791  0.149998  0.030665  0.000000  0.026045  0.000000
  0.260989  0.151571  0.038535  0.000000  0.026045  0.000000
  0.313187  0.153149  0.046488  0.000000  0.026045  0.000000
  0.365385  0.154731  0.054524  0.000000  0.026045  0.000000
  0.417582  0.156318  0.062642  0.000000  0.026045  0.000000
  0.469780  0.157909  0.070843  0.000000  0.026045  0.000000
  0.521978  0.159505  0.079127  0.000000  0.026045  0.000000
  0.574176  0.161105  0.087494  0.000000  0.026045  0.000000
  0.626374  0.162710  0.095946  0.000000  0.026045  0.000000
  0.678571  0.164319  0.104481  0.000000  0.026045  0.000000
  0.730769  0.165933  0.113100  0.000000  0.026045  0.000000
  0.782967  0.167552  0.121804  0.000000  0.026045  0.000000
  0.835165  0.169174  0.130592  0.000000  0.026045  0.000000
  0.887363  0.170802  0.139465  0.000000  0.026045  0.000000
  0.939560  0.172433  0.148423  0.000000  0.026045  0.000000
  0.991758  0.174070  0.157466  0.000000  0.026045  0.000000
  1.043956  0.175711  0.166595  0.000000  0.026045  0.000000
  1.096154  0.177356  0.175810  0.000000  0.026045  0.000000
  1.148352  0.179006  0.185110  0.000000  0.026045  0.000000
  1.200549  0.180660  0.194497  0.000000  0.026045  0.000000
  1.252747  0.182319  0.203971  0.000000  0.026045  0.000000
  1.304945  0.183982  0.213531  0.000000  0.026045  0.000000
  1.357143  0.185650  0.223178  0.071179  0.026045  0.000000
  1.409341  0.187322  0.232912  0.355200  0.026045  0.000000
  1.461538  0.188999  0.242733  0.756053  0.026045  0.000000
  1.500000  0.190238  0.250026  1.240304  0.026045  0.000000
  END FTABLE  5
END FTABLES
```

```
EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP
WDM     22 IRRG     ENGL    0.7       SAME PERLND  37     EXTNL  SURLI
WDM     22 IRRG     ENGL    0.7       SAME PERLND  39     EXTNL  SURLI
WDM      2 PREC     ENGL    1              RCHRES   1     EXTNL  PREC
WDM      2 PREC     ENGL    1              RCHRES   3     EXTNL  PREC
WDM      2 PREC     ENGL    1              RCHRES   5     EXTNL  PREC
WDM      1 EVAP     ENGL    0.5            RCHRES   1     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES   2     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES   3     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES   4     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES   5     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.7            RCHRES   6     EXTNL  POTEV

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   2 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   2 HYDR   STAGE  1 1        1      WDM   1003 STAG     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1004 STAG     ENGL      REPL
RCHRES   1 HYDR   O      1 1        1      WDM   1005 FLOW     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     12.1      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     12.1      WDM    801 FLOW     ENGL      REPL
RCHRES   4 HYDR   RO     1 1        1      WDM   1006 FLOW     ENGL      REPL
RCHRES   4 HYDR   STAGE  1 1        1      WDM   1009 STAG     ENGL      REPL
RCHRES   3 HYDR   STAGE  1 1        1      WDM   1010 STAG     ENGL      REPL
RCHRES   3 HYDR   O      1 1        1      WDM   1011 FLOW     ENGL      REPL
RCHRES   6 HYDR   RO     1 1        1      WDM   1012 FLOW     ENGL      REPL
RCHRES   6 HYDR   STAGE  1 1        1      WDM   1015 STAG     ENGL      REPL
RCHRES   5 HYDR   STAGE  1 1        1      WDM   1016 STAG     ENGL      REPL
RCHRES   5 HYDR   O      1 1        1      WDM   1017 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK        8
RCHRES     OFLOW  OVOL   2                 RCHRES         INFLOW IVOL
  END MASS-LINK    8

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15
```

```
  MASS-LINK        16
RCHRES     ROFLOW                         COPY           INPUT  MEAN
  END MASS-LINK   16

  MASS-LINK        17
RCHRES     OFLOW  OVOL   1                COPY           INPUT  MEAN
  END MASS-LINK   17


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1978/ 1/16 24: 0

RCHRES:     1

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
30 2.6993E+04 2.7760E+04 2.7997E+04
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1978/ 1/16 24: 0

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
7.6797E+01 3.9803E+04 -5.218E+04    1.3076  1.3075E+00      3
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1980/ 2/20 21: 0

RCHRES:     1

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
30 2.6993E+04 2.7760E+04 2.8499E+04
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1980/ 2/20 21: 0

RCHRES:     1

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
7.6797E+01 3.9803E+04 -7.831E+04    1.9602  1.9601E+00      3
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1978/ 1/16 21: 0

RCHRES:     3
```

```
The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
30 1.1878E+04 1.2223E+04 1.2591E+04
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1978/ 1/16 21: 0

RCHRES:     3

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
4.5172E+01 1.7917E+04 -3.711E+04    2.0603  2.0603E+00      3
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1978/ 1/16 24: 0

RCHRES:     3

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
30 1.1878E+04 1.2223E+04 1.2428E+04
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1978/ 1/16 24: 0

RCHRES:     3

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
4.5172E+01 1.7917E+04 -2.862E+04    1.5907  1.5907E+00      3
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1980/ 1/29  6: 0

RCHRES:     3

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
30 1.1878E+04 1.2223E+04 1.2407E+04
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1980/ 1/29  6: 0

RCHRES:     3

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
4.5172E+01 1.7917E+04 -2.754E+04    1.5310     1.5310       3
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1980/ 2/18  8: 0

RCHRES:     3

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
30 1.1878E+04 1.2223E+04 1.2468E+04
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1980/ 2/18  8: 0

RCHRES:     3

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
4.5172E+01 1.7917E+04 -3.071E+04    1.7064  1.7064E+00      3
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1980/ 2/20 21: 0

RCHRES:     3

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
30 1.1878E+04 1.2223E+04 1.2872E+04
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1980/ 2/20 21: 0

RCHRES:     3

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
```

```
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
4.5172E+01 1.7917E+04 -5.168E+04    2.8636  2.8636E+00      3
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1980/ 2/20 21: 0

RCHRES:     5

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
30 1.0573E+04 1.0891E+04 1.0906E+04
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1980/ 2/20 21: 0

RCHRES:     5

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
5.3972E+01 1.6466E+04 -1.729E+04    1.0476     1.0466       2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1983/ 3/ 2 19: 0

RCHRES:     3

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
30 1.1878E+04 1.2223E+04 1.2235E+04
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1983/ 3/ 2 19: 0

RCHRES:     3

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
4.5172E+01 1.7917E+04 -1.857E+04    1.0342  1.0335E+00      2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1995/ 1/ 4 20: 0
```

```
RCHRES:     3

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
30 1.1878E+04 1.2223E+04 1.2314E+04
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1995/ 1/ 4 20: 0

RCHRES:     3

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
4.5172E+01 1.7917E+04 -2.270E+04    1.2628  1.2628E+00      3
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1997/ 1/13  5: 0

RCHRES:     3

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
30 1.1878E+04 1.2223E+04 1.2310E+04
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1997/ 1/13  5: 0

RCHRES:     3

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
4.5172E+01 1.7917E+04 -2.248E+04    1.2505  1.2505E+00      3
```

Disclaimer

Legal Notice

Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:

The Hydromodification Management Exhibit must identify:

☐ Underlying hydrologic soil group
☐ Approximate depth to groundwater
☐ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
☐ Critical coarse sediment yield areas to be protected
☐ Existing topography
☐ Existing and proposed site drainage network and connections to drainage offsite
☐ Proposed grading
☐ Proposed impervious features
☐ Proposed design features and surface treatments used to minimize imperviousness
☐ Point(s) of Compliance (POC) for Hydromodification Management
☐ Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)
☐ Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail)

ATTACHMENT 3 - STRUCTURAL BMP MAINTENANCE INFORMATION

This is the cover sheet for Attachment 3.

Indicate which items are included behind this cover sheet:

Attachment	**Contents**	**Checklist**
Attachment 3a	Structural BMP Maintenance Thresholds and Actions (Required)	☐ **X** Included See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet.
Attachment 3b	Draft Maintenance Agreement (when applicable)	☐ Included **X** Not Applicable (Preliminary SWQMP)

Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:

☐ **X Preliminary Design / Planning / CEQA level submittal:**

Attachment 3a must identify:

☐ **X** Typical maintenance indicators and actions for proposed structural BMP(s) based on Section 7.7 of the BMP Design Manual

Attachment 3b is not required for preliminary design / planning / CEQA level submittal.

☐ **Final Design level submittal:**

Attachment 3a must identify:

☐ Specific maintenance indicators and actions for proposed structural BMP(s). This shall be based on Section 7.7 of the BMP Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
☐ How to access the structural BMP(s) to inspect and perform maintenance
☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
☐ Recommended equipment to perform maintenance
☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

Attachment 3b: For private entity operation and maintenance, Attachment 3b shall include a draft maintenance agreement in the local jurisdiction's standard format (PDP applicant to contact the City Engineer to obtain the current maintenance agreement forms).

During inspection, the inspector checks the maintenance indicators. If one or more thresholds are met or exceeded, maintenance must be performed to ensure the structural BMP will function as designed during the next storm event. At a minimum, maintenance shall be performed once annually.

7.7.1 Maintenance of ~~Vegetated Infiltration~~ or Filtration BMPs (BF-1)

"Vegetated infiltration or filtration BMPs" are BMPs that include vegetation as a component of the BMP. Applicable Fact Sheets may include INF-2 (bioretention), PR-1 (biofiltration with partial retention), BF-1 (biofiltration) or FT-1 (vegetated swale). The vegetated BMP may or may not include amended soils, subsurface gravel layer, underdrain, and/or impermeable liner. Maintenance indicators and associated actions for vegetated infiltration and filtration BMPs are presented below.

TABLE 7-3. Maintenance Indicators and Actions for Vegetated BMPs

Typical Maintenance Indicator(s) for Vegetated BMPs	Maintenance Actions
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation. Examine the DMA draining to the BMP to determine the source of the sediment. Implement corrective measures as applicable to minimize the sediment supply.
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans. Evaluate proper functioning of irrigation system, if applicable.
Overgrown vegetation	Mow or trim as appropriate, but not less than the design height of the vegetation per original plans when applicable (e.g. a vegetated swale may require a minimum vegetation height).
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas. If necessary, perform minor re-grading to restore proper drainage according to the original plan. Adjust the irrigation system to prevent further erosion.
Erosion due to concentrated stormwater runoff flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, contact the City Engineer prior to any additional repairs or reconstruction.
Standing water in vegetated swales	Make appropriate corrective measures such as adjusting the irrigation system, removing obstructions of debris or invasive vegetation, loosening or replacing top soil to allow for better infiltration, or minor re-grading, to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, contact the City Engineer prior to any additional repairs or reconstruction. Repair/re-seed/re-plant per the original plans any damaged vegetation in need of replacement.

A
(Applicable)

Typical Maintenance Indicator(s) for Vegetated BMPs	Maintenance Actions
Standing water in bioretention, biofiltration with partial retention, or biofiltration areas, or flow-through planter boxes for longer than 96 hours following a storm event*	Make appropriate corrective measures such as adjusting the irrigation system, removing obstructions of debris or invasive vegetation, loosening or replacing top soil to allow for better infiltration, clearing any underdrains, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, contact the City Engineer prior to any additional repairs or reconstruction. Repair/re-seed/re-plant per the original plans any damaged vegetation in need of replacement.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as appropriate.
*These BMPs typically include a surface ponding layer as part of their function which may take 96 hours to drain following a storm event.	

A

7.7.2 Maintenance of Non-Vegetated Infiltration BMPs N/A

"Non-vegetated infiltration BMPs" are BMPs that store stormwater runoff until it infiltrates into the ground, and do not include vegetation as a component of the BMP (refer to the "vegetated BMPs" category for infiltration BMPs that include vegetation). Non-vegetated infiltration BMPs generally include non-vegetated infiltration trenches and infiltration basins, dry wells, underground infiltration galleries, and permeable pavement with underground infiltration gallery. Applicable Fact Sheets may include INF-1 (infiltration basin) or INF-3 (permeable pavement). The non-vegetated infiltration BMP may or may not include a pre-treatment device, and may or may not include above-ground storage of runoff. Maintenance indicators and associated actions for non-vegetated infiltration BMPs are presented below.

TABLE 7-4. Maintenance Indicators and Actions for Non-Vegetated Infiltration BMPs

~~Typical Maintenance Indicator(s) for Non-Vegetated Infiltration BMPs~~	~~Maintenance Actions~~
~~Accumulation of sediment, litter, or debris in infiltration basin, pre-treatment device, or on permeable pavement surface~~	~~Remove and properly dispose accumulated materials. Examine the DMA draining to the BMP to determine the source of the sediment. Implement corrective measures as applicable to minimize the sediment supply.~~
~~Standing water in infiltration basin without subsurface infiltration gallery for longer than 96 hours following a storm event~~	~~Remove and replace clogged surface soils.~~

~~Standing water in subsurface infiltration gallery for longer than 96 hours following a storm event~~	~~This condition requires investigation of why infiltration is not occurring. If feasible, corrective action shall be taken to restore infiltration (e.g. flush fine sediment or remove and replace clogged soils). BMP may require retrofit if infiltration cannot be restored. If retrofit is necessary, the City Engineer shall be contacted prior to any repairs or reconstruction.~~
~~Standing water in permeable paving area~~	~~Flush fine sediment from paving and subsurface gravel. Provide routine vacuuming of permeable paving areas to prevent clogging.~~
~~Damage to permeable paving surface~~	~~Repair or replace damaged surface as appropriate.~~

7.7.3 Maintenance of Non-Vegetated Filtration BMPs N/A

"Non-vegetated filtration BMPs" include media filters (FT-2). These BMPs function by passing runoff through the media to remove pollutants. Maintenance indicators and associated actions for non-vegetated filtration BMPs are presented below.

TABLE 7-5. Maintenance Indicators and Actions for Filtration BMPs

Typical Maintenance Indicator(s) for Filtration BMPs	Maintenance Actions
~~Accumulation of sediment, litter, or debris~~	~~Remove and properly dispose accumulated materials. Examine the DMA draining to the BMP to determine the source of the sediment. Implement corrective measures as applicable to minimize the sediment supply.~~
~~Obstructed inlet or outlet structure~~	~~Clear obstructions.~~
~~Clogged filter media~~	~~Remove and properly dispose of filter media, and replace with fresh media.~~
~~Damage to components of the filtration system~~	~~Repair or replace as appropriate.~~
~~**Note:** For proprietary media filters, refer to the manufacturer's maintenance guide.~~	

7.7.4 Maintenance of Detention BMPs (BF-1)

"Detention BMPs" include basins, cisterns, vaults, and underground galleries that are primarily designed to store runoff for controlled release to downstream systems. For the purpose of the maintenance discussion, this category does not include an infiltration component (refer to "vegetated infiltration or filtration BMPs" or "non-vegetated infiltration BMPs" above). Applicable Fact Sheets may include HU-1 (cistern) or FT-4 (extended detention basin). Maintenance indicators and associated actions for detention BMPs are presented below.

TABLE 7-6. Maintenance Indicators and Actions for Detention BMPs

Typical Maintenance Indicator(s) for Detention Basins	Maintenance Actions
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans. Evaluate proper functioning of irrigation system, if applicable.
Overgrown vegetation	Mow or trim as appropriate, but not less than the design height of

}A

	the vegetation per original plans when applicable (e.g. effective function may require a minimum vegetation height).
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas. If necessary, perform minor re-grading to restore proper drainage according to the original plan. Adjust the irrigation system to prevent further erosion.
Erosion due to concentrated stormwater runoff flow	Repair/re-seed/re-plant eroded areas and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, contact the City Engineer prior to any additional repairs or reconstruction.
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials. Examine the DMA draining to the BMP to determine the source of the sediment. Implement corrective measures as applicable to minimize the sediment supply.
Standing water	Make appropriate corrective measures such as adjusting the irrigation system, removing obstructions of debris or invasive vegetation, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, contact the City Engineer prior to any additional repairs or reconstruction. Repair/re-seed/re-plant per the original plans any damaged vegetation in need of replacement.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as appropriate.

A

ATTACHMENT 4 - COPY OF PLAN SHEETS SHOWING PERMANENT STORM WATER BMPS

*PLAN SHEETS TO BE PROVIDED IN THE FINAL PROJECT SWQMP

Use this checklist to ensure the required information has been included on the plans:

The plans must identify:

☐ Structural BMP(s) with ID numbers matching Form I-6 Summary of PDP Structural BMPs
☐ The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
☐ Details and specifications for construction of structural BMP(s)
☐ Signage indicating the location and boundary of structural BMP(s) as required by the [City Engineer]
☐ How to access the structural BMP(s) to inspect and perform maintenance
☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
☐ Recommended equipment to perform maintenance
☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
☐ Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
☐ All BMPs must be fully dimensioned on the plans
☐ When proprietary BMPs are used, site-specific cross section with outflow, inflow, and model number shall be provided. Photocopies of general brochures are not acceptable.

H-2

Preliminary Hydrology Report

ENCINITAS SENIOR APARTMENTS
3111 Manchester Avenue
City of Encinitas, CA

PRELIMINARY HYDROLOGY REPORT

Prepared For:

Greystar
444 South Cedros Avenue, Suite 172
Solana Beach, CA 92075

Prepared By:

URBAN RESOURCE
CONSULTING CIVIL ENGINEERS

Urban Resource Corporation
23 Mauchly, Suite 110
Irvine, CA 92618

June 17, 2019

ENCINITAS SENIOR APARTMENTS
3111 Manchester Avenue
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23 Mauchly, Suite 110
Irvine, CA 92618

Terry P. Au, P.E.
State of California No. 68466

TABLE OF CONTENTS

OVERVIEW

The following site is located at 3111 Manchester Avenue in the City of San Clemente, California. The project site is located within a parcel with an area of 19.03 acres, which consists of an existing strawberry farm and agricultural field. The approximate area within the proposed limits of work is 9.9 acres.

The site is bound by Manchester Avenue to the southeast, and existing mountainous terrain and open space are located to the north and the west.

Offsite run-on in the existing condition and proposed condition is a major tributary drainage area through the existing site. Approximately 28 acres of existing residential development outlet into the mountainous terrain and open space area located to the north of the project, and approximately 39 acres of the existing mountainous terrain and open space to the north currently passes through the existing site towards Manchester Avenue via an existing earthen channel. Flows are then conveyed across Manchester Avenue in existing 18” and 24” CMP storm drain lines, and into San Elijo Lagoon.

In the developed condition, offsite run-on from the north will be collected by proposed concrete channels and/or v-ditches to located along the northerly, easterly, and westerly limits of work for the project, and routed to outlets, and conveyed through the project via proposed RCP storm drain lines, which will bypass the onsite biofiltrations, and outlet to new RCB and/or RCP pipes that will run beneath Manchester Avenue, and into the San Elijo Lagoon. Onsite stormwater flows within the limits of work will be collected into a separate onsite storm drain system to allow for water quality treatment of the disturbed project areas.

A portion of the project is located in Flood Zone A per FEMA FIRM Map 006073C1045G, dated May 16, 2012, and an evaluation pertaining to the base flood elevation for the site is included herewith.

Purpose

The preliminary hydrology analysis herewith is prepared to analyze the existing hydrology of the site, including the existing offsite areas north of the site, and to analyze the developed condition hydrology, to determine if the development significantly increases storm flows in the ultimate condition. A comparison of storm flows from this preliminary analysis is summarized herewith. The 100 year storm flows will be evaluated for the existing condition and developed condition, to evaluate the preliminary sizing of the biofiltration basins, and the potential need for additional storage to reduce post development storm volumes to the predeveloped condition volumes.

Additionally, an analysis of the available flood zone information for the site location will be conducted to estimate the base flood elevation for the site.

Methodology

Hydrology analysis of Encinitas Senior Apartments is based on the County of San Diego Hydrology Manual. The Rational Method is utilized to determine peak flow rates for a drainage area of less than 1 square mile. The Modified Rational Method (MRM) is utilized in the hydrology study for junction confluence of flow streams per the County of San Diego Hydrology Manual guidelines.

The Advanced Engineering Software (AES) package for San Diego County is utilized for the Rational Method hydrology analysis.

Parameters used for the rational method analysis are listed below.

1) Storm Events – 25 year and 100 year
2) Precipitation (100 year event): P_6=2.5” (See appendix C for supporting documents)
3) Precipitation (25 year event): P_6=2.0” (See appendix C for supporting documents)
4) Soil Type A and D per NRCS Soils Map and per San Diego County Hydrology Manual
5) Land Use – Mountain Brush, Good Cover (existing offsite condition)
6) Land Use – 7.3 Dwellings/Acres or Less (proposed condition landscaped slope; conservative)
7) Land Use – Urban Newly Graded Areas (proposed condition landscape slope)
8) Land Use – 14.5 Dwellings/Acres or Less (existing offsite residential)
9) Land Use – 43.0 Dwellings/Acres or Less (proposed onsite residential)
10) Land Use – Fallow Bare Soil (existing agriculture)

Storm volumes for the 100 year storm event utilizes the equation below per Section 6 of the County of San Diego Hydrology Manual. Runoff coefficient, C values utilized are selected from Table 3-1 in Section 3 of the Hydrology Manual.

$$V=C*(P_6/12)*A*43{,}560$$

Where: V=Volume of Runoff (cf)
C=runoff coefficient
P_6=6-hour rainfall (inches, 100 year storm)
A=Drainage Area Analyzed (acres)

All calculations are provided in the Appendix.

Hydraulic Analysis

The Water Surface Pressure Grading (WSPGW) software by CivilDesign Corporation is used for hydraulic analysis.

Hydraulic Analysis of the existing CMP culvert crossings have been conducted to analyze the flow velocity into the San Elijo Lagoon, at the existing culvert outlets. There are 6 CMP pipes that convey flows from the existing site, as well as flows offsite to the north, into the San Elijo Lagoon. The six existing pipe crossings are summarized in the table below, including the storm drain line label, and pipe sizes specified in the Manchester Widening Improvement Plan As-built drawings No. SI-0021. The maximum water surface elevation utilized is the street gutter flow line high point in Manchester Avenue, at Station 5+50, obtained from the as-built plan sheet 3A. That elevation is 10.44EL. Any storm water above that elevation will overflow and be contained in Manchester Avenue. Hydraulic analysis results will indicate whether the water surface elevation utilized is suitable for estimating the maximum flow velocities at the existing outlets into the lagoon. The as-built plan is included in Appendix D for reference. A summary table of parameters utilized, and the results, is included in Appendix C. The velocity values obtained from the hydraulic analysis of the existing CMP pipes are utilized as a control velocity at the existing outlet location.

Existing CMP Storm Drain Table

SD Line	SIZE	NO. OF PIPES
B	24	2
C	24	1
D	18	1
E	18	1
F	18	1

Preliminary hydraulic analysis for the proposed condition is included in this report for the purpose of preliminary storm drain sizing of the proposed culverts in Manchester Avenue. Hydraulic calculations with varying pipe and box sizes were run utilizing WSPG to evaluate the outlet velocity into the lagoon. Note that the storm drain alignments in the analysis are dummy models of the culvert crossings, and the models during final engineering will be refined to accurately model the final proposed storm drain design. The purpose of the analysis is to approximate sizing for the culvert crossings to reduce the flow velocity at the outlets into the lagoon, such that they are at or below the existing condition velocity at the outlet location into the lagoon. A summary of the proposed storm drain crossings in Manchester Avenue is provided in the following table. Additionally, the proposed storm drain is located such that they are at or very close to the vicinity of the existing storm drain crossings in Manchester Avenue, so the corresponding existing storm drain line is indicated in the table below for location reference. Refer to the Preliminary Manchester Avenue Storm Drain Exhibit provided in Appendix D for existing and proposed storm drain in Manchester Avenue.

Proposed Storm Drain Table

SD Line	Type/Size	Ex. SD Location
A	2 - 4'Wx1.5'H RCB	B
B	18	B
C	18	C
D	18	D
E	5'Wx1.5'H RCB	E
F	5'Wx1.5'H RCB	E

Note: Refer to Preliminary Manchester Storm Drain Exhibit for storm drain location (Appendix D)

Flood Zone Analysis

A portion of the project front Manchester Avenue and located in Flood Zone A per FEMA FIRM Map, with no specified base flood elevation. An analysis of the FEMA Firm Map, as well as the City of Encinitas online FIRM Viewer and Escondido Floodway Data Table, shows that there is a downstream Flood Elevation of 9.0EL (Zone AE), and an upstream Flood Elevation of 15.4EL (AE). Additional research was conducted utilizing the Final EIR report for the San Elijo Lagoon Restoration Project. Data obtained from the report indicates that the Base Flood Elevation in the vicinity of this project is 12.4EL in the existing condition. Furthermore, once restoration of the Lagoon is complete the flood elevation in the vicinity of this project will be lowered to 9.0EL, for Alternative 1B. Per the San Elijo Lagoon Restoration webpage's Frequently Asked Questions page, the plan adopted is a Modified Alternative Plan 1B Reduced. Supporting documents obtained from the Final EIR and the San Elijo Lagoon webpage are included in Appendix E.

Refer to the markup in the ArcGIS Web Map included in Appendix E for more information. The FEMA FIRM Map and Escondido Creek Floodway Data is included in Appendix E for reference.

Conclusion

Based on the preliminary hydrology analysis for the existing and proposed condition, there will be an increase in peak flowrate of approximately 17% for the 100 year and 25 year storm events, due to the proposed development. Further analysis of the storm runoff volume for the 100 year storm event indicates an increase in runoff volume due to the proposed development. Three biofiltration basins will be provided for the purpose of water quality treatment and hydromodification control but will also act to reduce and slow the release of the volume, as the basins provide 15" of ponding, and subsurface media pore space, and gravel void space for storage. Additionally, the underdrain flow control system will restrict flow release with an orifice. Based on preliminary evaluation of the sizes and storage volumes available in the three biofiltration basins, additional storage is not necessary, and any increase in storm volumes for the 100 year storm event would be mitigated by the proposed biofiltration basins. Calculations are provided in Appendix D.

A comparison of peak flow rates is provided in the table below. Note that these flows do not include the street flows from Manchester Avenue, as the street flow is considered offsetting between the existing and proposed condition. Additional hydrology analysis will be conducted during final engineering.

Peak Flowrate Summary Table

Existing Condition			Proposed Condition		
Node	**Q100 (cfs)**	**Q25 (cfs)**	**Node**	**Q100 (cfs)**	**Q25 (cfs)**
13	70.64	55.02	15	66.77	52.00
21	12.26	9.78	23	8.63	6.89
Total:	82.90	64.80	33	4.76	3.79
			43	12.94	10.31
			53	7.28	5.75
			Total:	100.38	78.74

Results of the preliminary hydraulic analysis are provided in the following tables. Preliminary sizing of the Manchester Avenue culvert crossings is also provided. Note that the locations of the proposed culvert crossings are set such that they are outletting into the lagoon at or very close to the existing outlet locations. Preliminary hydraulic analysis of the proposed storm drain crossings in Manchester Avenue show that the outlet flow velocity at the proposed outlets do not exceed the flow velocity at the existing outlets, except for proposed Storm Drain Line ‘E’, which has a small increase of 3%. Based on the results of the preliminary hydraulic analysis, it is feasible to reduce outlet flow velocities to at or below existing condition outlet flow velocities with the appropriate storm drain sizing. Additional design considerations may also be incorporated onsite, during final engineering design, such as onsite detention systems, in order to reduce outlet flow velocity, if necessary.

Hydraulic calculations are provided in Appendix C.

Hydraulic Results Table – Existing Storm Drain

EX. SD	MAX WSE	MAX HEAD (ft)	OUTLET ELEV. (EL)	Q OUT (cfs)	Velocity (fps)	CMP SIZE (in.)	No. of Pipes
B	10.44	3.53	6.91	23.90	8.27	24	2
C	10.44	2.23	8.21	17.64	6.92⁽¹⁾	24	1
D	10.44	1.50	8.94	8.10	5.82⁽¹⁾	18	1
E	10.44	1.44	9.00	7.12	5.49⁽¹⁾	18	1
F	10.44	0.85	9.59	3.55	4.24⁽¹⁾	18	1
			Total:	84.21⁽²⁾			

Notes:

1. These velocities for the existing storm drain crossings are used as the maximum allowable velocities at the existing outlet locations into the lagoon.
2. The total peak flow conveyed by the six existing CMP pipes is 84.21cfs based on the parameters of the analysis. The total existing condition flows per Hydrology Map nodes 14 and 21, including street flows, is Q100=85.07cfs; therefore, since the max WSE of 10.44cfs resulted in very similar peak flows into the lagoon, it can be concluded that the WSE utilized is suitable for estimation of the existing storm drain outlet maximum velocities into the lagoon.

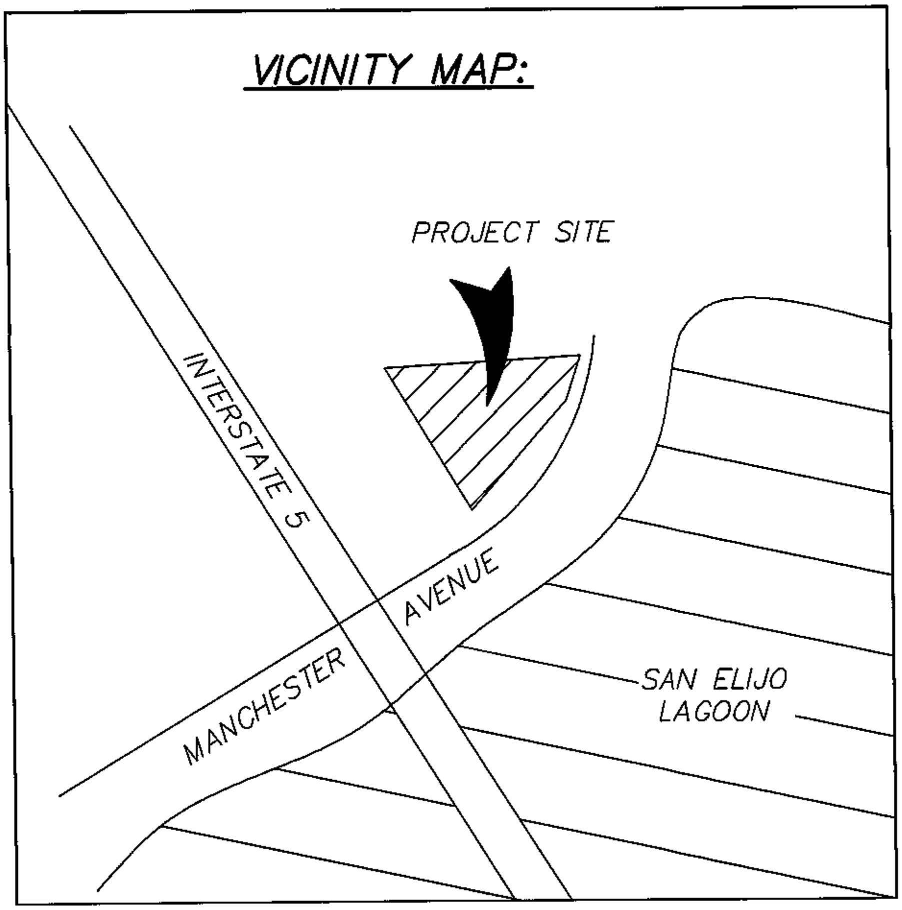
Hydraulic Results Table – Proposed Storm Drain

SD Line	Q100 (cfs)	Proposed Outlet Velocity (fps)	Existing Outlet Velocity (fps)	Type/Size
A (offsite)	66.77	6.45	6.92	2 - 4'Wx1.5'H RCB
B	7.28	5.54	6.92	18
C	7.03	5.46	5.82	18
D	2.26	3.68	5.49	18
E	12.94	4.37 ⁽²⁾	4.24	5'Wx1.5'H RCB
F (offsite)	11.44	4.19	4.24	5'Wx1.5'H RCB

Notes:

1. Line A and F convey offsite/undeveloped flows only.
2. Line E outlet velocity is higher than existing control velocity by 3%. Additional analysis to be conducted during final engineering to upsize and/or provide mitigation (ie. detention system or other) onsite.
3. Hydraulic analysis for Line B and E utilizes Q100 for a conservative analysis.
4. Hydraulic model of each storm drain is a dummy model for preliminary analysis purposes, and will be updated to match the final design during final engineering.

The base flood elevation estimated for the site is approximately 12.4EL, and is based on the available information, included herewith. The building finish floor elevation is currently set to no lower than 17.0EL for the senior care facility, and 19.57EL and higher for the work force units. Therefore, the buildings are not located in the 100 year flood zone.



VICINITY MAP:

II. REFERENCES

1. Hydrology Manual, County of San Diego, June 2003.
2. RATSCx (Rational Method Analysis), Advanced Engineering Software (AES), 2011.
3. HELE I (Hydraulic Elements I), Advanced Engineering Software (AES), 2011.
4. WSPGW (Water Surface Pressure Gradient Software), CivilDesign Corporation, Version 12.99.
5. San Elijo Lagoon Restoration Webpage, https://thenaturecollective.org/project/san-elijo-lagoon-restoration/.
6. Final Environmental Impact Report, San Elijo Lagoon Restoration Project SCH#2011111013, Volume 2 of 4, February 2016.

APPENDIX A – EXISTING RATIONAL METHOD HYDROLOGY
25, 100 YEAR STORM EVENT

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          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                     2003,1985,1981 HYDROLOGY MANUAL
        (c) Copyright 1982-2011 Advanced Engineering Software (aes)
           Ver. 18.0 Release Date: 07/01/2011  License ID 1585

                       Analysis prepared by:

                     Urban Resource Corporation
                       23 Mauchly, Suite 110
                          Irvine, CA 92618

 ************************** DESCRIPTION OF STUDY **************************
 * ENCINITAS SENIOR LIVING                                                 *
 * EXISTING CONDITION HYDROLOGY                                            *
 * 100 YEAR STORM EVENT                                                    *
 **************************************************************************

  FILE NAME: 624EX100.100
  TIME/DATE OF STUDY: 10:48 05/31/2019
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   4.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:  CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.  (FT)     (FT)     SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
   *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
    OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE       1.00 TO NODE       3.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  89
  INITIAL SUBAREA FLOW-LENGTH(FEET) =     70.00
  UPSTREAM ELEVATION(FEET) =    380.00
  DOWNSTREAM ELEVATION(FEET) =    379.30
  ELEVATION DIFFERENCE(FEET) =      0.70
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.821
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    65.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.391
  SUBAREA RUNOFF(CFS) =      1.70
  TOTAL AREA(ACRES) =      0.50   TOTAL RUNOFF(CFS) =       1.70

****************************************************************************
  FLOW PROCESS FROM NODE       3.00 TO NODE       5.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =    379.30
  DOWNSTREAM NODE ELEVATION(FEET) =    326.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1750.00
```

```
 "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.050
 PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
 PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
 MAXIMUM DEPTH(FEET) =   0.50
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.475
 RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  89
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     10.10
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.38
 AVERAGE FLOW DEPTH(FEET) =   0.22   FLOOD WIDTH(FEET) =   21.24
 "V" GUTTER FLOW TRAVEL TIME(MIN.) =   6.66   Tc(MIN.) =   13.48
 SUBAREA AREA(ACRES) =    7.50       SUBAREA RUNOFF(CFS) =   16.42
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.630
 TOTAL AREA(ACRES) =        8.0         PEAK FLOW RATE(CFS) =      17.51

 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  0.27   FLOOD WIDTH(FEET) =   26.40
 FLOW VELOCITY(FEET/SEC.) =   4.95   DEPTH*VELOCITY(FT*FT/SEC) =   1.36
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      5.00 =    1820.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      5.00 TO NODE      7.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  326.00  DOWNSTREAM ELEVATION(FEET) =  248.00
 STREET LENGTH(FEET) =  1125.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 16.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.19
   ***STREET FLOW SPLITS OVER STREET-CROWN***
   FULL DEPTH(FEET) =    0.45   FLOOD WIDTH(FEET) =   16.00
   FULL HALF-STREET VELOCITY(FEET/SEC.) =     7.77
   SPLIT DEPTH(FEET) =    0.29   SPLIT FLOOD WIDTH(FEET) =    8.34
   SPLIT FLOW(CFS) =    4.39   SPLIT VELOCITY(FEET/SEC.) =    5.39
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.45
   HALFSTREET FLOOD WIDTH(FEET) =   16.00
   AVERAGE FLOW VELOCITY(FEET/SEC.) =     7.77
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =     3.47
 STREET FLOW TRAVEL TIME(MIN.) =   2.41   Tc(MIN.) =   15.89
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.124
 RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  89
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.630
 SUBAREA AREA(ACRES) =    7.80      SUBAREA RUNOFF(CFS) =   15.35
 TOTAL AREA(ACRES) =       15.8        PEAK FLOW RATE(CFS) =      31.10

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  16.00
 FLOW VELOCITY(FEET/SEC.) =  7.77   DEPTH*VELOCITY(FT*FT/SEC.) =   3.47
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      7.00 =    2945.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      7.00 TO NODE      9.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   243.00  DOWNSTREAM(FEET) =   160.00
 FLOW LENGTH(FEET) =   324.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  30.02
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      31.10
 PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   16.07
```

```
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      9.00 =    3269.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      9.00 TO NODE     11.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    160.00  DOWNSTREAM(FEET) =     35.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1800.00   CHANNEL SLOPE =  0.0694
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .0694 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  CHANNEL FLOW THRU SUBAREA(CFS) =      31.10
  FLOW VELOCITY(FEET/SEC) =   4.64 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   6.47   Tc(MIN.) =   22.54
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE     11.00 =    5069.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.494
  OAK-ASPEN-MOUNTAIN BRUSH GOOD COVER RUNOFF COEFFICIENT = .3500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  48
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4612
  SUBAREA AREA(ACRES) =    24.00   SUBAREA RUNOFF(CFS) =   20.95
  TOTAL AREA(ACRES) =        39.8   TOTAL RUNOFF(CFS) =      45.77
  TC(MIN.) =   22.54

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.494
  RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  89
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5015
  SUBAREA AREA(ACRES) =    12.50   SUBAREA RUNOFF(CFS) =   19.64
  TOTAL AREA(ACRES) =        52.3   TOTAL RUNOFF(CFS) =      65.40
  TC(MIN.) =   22.54

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     13.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     35.00  DOWNSTREAM(FEET) =     10.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   654.00   CHANNEL SLOPE =  0.0382
  CHANNEL FLOW THRU SUBAREA(CFS) =      65.40
  FLOW VELOCITY(FEET/SEC) =   8.18 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   1.33   Tc(MIN.) =   23.88
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE     13.00 =    5723.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     12.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  FALLOW (BARE SOIL) POOR COVER RUNOFF COEFFICIENT = .2000
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  77
  INITIAL SUBAREA FLOW-LENGTH(FEET) =     80.00
  UPSTREAM ELEVATION(FEET) =    115.00
  DOWNSTREAM ELEVATION(FEET) =    100.00
  ELEVATION DIFFERENCE(FEET) =     15.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.726
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
```

```
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.440
 SUBAREA RUNOFF(CFS) =      0.33
 TOTAL AREA(ACRES) =      0.30   TOTAL RUNOFF(CFS) =      0.33

****************************************************************************
 FLOW PROCESS FROM NODE     12.00 TO NODE     13.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    100.00  DOWNSTREAM(FEET) =     10.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   800.00   CHANNEL SLOPE =  0.1125
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.33
 FLOW VELOCITY(FEET/SEC) =   4.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.81   Tc(MIN.) =    9.54
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     880.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.343
 FALLOW (BARE SOIL) POOR COVER RUNOFF COEFFICIENT = .2000
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  77
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2000
 SUBAREA AREA(ACRES) =   10.60   SUBAREA RUNOFF(CFS) =    9.21
 TOTAL AREA(ACRES) =       10.9   TOTAL RUNOFF(CFS) =       9.47
 TC(MIN.) =    9.54

****************************************************************************
 FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
    1         9.47      9.54       4.343        10.90
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     880.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
    1        65.40     23.88       2.403        52.30
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE     13.00 =    5723.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc       INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
    1       35.59       9.54        4.343
    2       70.64      23.88        2.403

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      70.64   Tc(MIN.) =    23.88
 TOTAL AREA(ACRES) =       63.2

****************************************************************************
 FLOW PROCESS FROM NODE     13.00 TO NODE     14.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     10.00  DOWNSTREAM(FEET) =      9.50
 CHANNEL LENGTH THRU SUBAREA(FEET) =    50.00   CHANNEL SLOPE =  0.0100
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.392
 FALLOW (BARE SOIL) POOR COVER RUNOFF COEFFICIENT = .2000
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  77
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      70.94
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.83
 AVERAGE FLOW DEPTH(FEET) =   1.19   TRAVEL TIME(MIN.) =   0.17
```

```
 Tc(MIN.) =   24.05
 SUBAREA AREA(ACRES) =     1.24       SUBAREA RUNOFF(CFS) =    0.59
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.445
 TOTAL AREA(ACRES) =        64.4         PEAK FLOW RATE(CFS) =      70.64

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  1.19   FLOW VELOCITY(FEET/SEC.) =   4.82
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE     14.00 =    5773.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     14.00 TO NODE     14.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.392
 STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8700
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  98
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4578
 SUBAREA AREA(ACRES) =     2.05   SUBAREA RUNOFF(CFS) =    4.27
 TOTAL AREA(ACRES) =        66.5   TOTAL RUNOFF(CFS) =      72.81
 TC(MIN.) =   24.05

****************************************************************************
 FLOW PROCESS FROM NODE     15.00 TO NODE     17.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 OAK-ASPEN-MOUNTAIN BRUSH GOOD COVER RUNOFF COEFFICIENT = .3500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  48
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =     260.00
 DOWNSTREAM ELEVATION(FEET) =    255.00
 ELEVATION DIFFERENCE(FEET) =      5.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.895
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.906
 SUBAREA RUNOFF(CFS) =      0.69
 TOTAL AREA(ACRES) =      0.40   TOTAL RUNOFF(CFS) =      0.69

****************************************************************************
 FLOW PROCESS FROM NODE     17.00 TO NODE     19.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    255.00  DOWNSTREAM(FEET) =     60.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   610.00   CHANNEL SLOPE =  0.3197
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1999 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.69
 FLOW VELOCITY(FEET/SEC) =   2.50 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.06   Tc(MIN.) =   11.96
 LONGEST FLOWPATH FROM NODE     15.00 TO NODE     19.00 =     710.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     19.00 TO NODE     19.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.754
 OAK-ASPEN-MOUNTAIN BRUSH GOOD COVER RUNOFF COEFFICIENT = .3500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  48
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =     7.00   SUBAREA RUNOFF(CFS) =    9.20
 TOTAL AREA(ACRES) =        7.4   TOTAL RUNOFF(CFS) =       9.72
 TC(MIN.) =   11.96

****************************************************************************
 FLOW PROCESS FROM NODE     19.00 TO NODE     21.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     60.00  DOWNSTREAM(FEET) =     10.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   405.00   CHANNEL SLOPE =  0.1235
```

```
  NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =        9.72
  FLOW VELOCITY(FEET/SEC) =   7.85 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.86   Tc(MIN.) =   12.82
  LONGEST FLOWPATH FROM NODE      15.00 TO NODE      21.00 =    1115.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      21.00 TO NODE      21.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.589
  OAK-ASPEN-MOUNTAIN BRUSH GOOD COVER RUNOFF COEFFICIENT = .2500
  SOIL CLASSIFICATION IS "B"
  S.C.S. CURVE NUMBER (AMC II) =  30
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3192
  SUBAREA AREA(ACRES) =     3.30   SUBAREA RUNOFF(CFS) =     2.96
  TOTAL AREA(ACRES) =       10.7   TOTAL RUNOFF(CFS) =       12.26
  TC(MIN.) =   12.82
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =       10.7  TC(MIN.) =      12.82
  PEAK FLOW RATE(CFS)    =      12.26
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                     2003,1985,1981 HYDROLOGY MANUAL
       (c) Copyright 1982-2011 Advanced Engineering Software (aes)
           Ver. 18.0 Release Date: 07/01/2011  License ID 1585

                       Analysis prepared by:

                     Urban Resource Corporation
                       23 Mauchly, Suite 110
                          Irvine, CA 92618

 ************************** DESCRIPTION OF STUDY **************************
 * ENCINITAS SENIOR LIVING                                                  *
 * EXISTING CONDITION HYDROLOGY                                             *
 * 25 YEAR STORM EVENT                                                      *
 **************************************************************************

  FILE NAME: 624EX25.25
  TIME/DATE OF STUDY: 10:45 05/31/2019
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) =  25.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.000
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   4.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO  STREET-CROSSFALL:  CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN- / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.  (FT)    (FT)     SIDE / SIDE/ WAY   (FT)   (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  =====  ======  =====  =======
  1  30.0     20.0    0.018/0.018/0.020  0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
   *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
    OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      3.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  89
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    380.00
  DOWNSTREAM ELEVATION(FEET) =    379.30
  ELEVATION DIFFERENCE(FEET) =      0.70
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.821
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    65.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.313
  SUBAREA RUNOFF(CFS) =      1.36
  TOTAL AREA(ACRES) =      0.50   TOTAL RUNOFF(CFS) =      1.36

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      5.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =    379.30
  DOWNSTREAM NODE ELEVATION(FEET) =    326.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1750.00
```

```
 "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.050
 PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
 PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
 MAXIMUM DEPTH(FEET) =   0.50
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.732
 RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  89
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      7.98
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.15
 AVERAGE FLOW DEPTH(FEET) =   0.20   FLOOD WIDTH(FEET) =   19.35
 "V" GUTTER FLOW TRAVEL TIME(MIN.) =   7.03   Tc(MIN.) =   13.85
 SUBAREA AREA(ACRES) =    7.50       SUBAREA RUNOFF(CFS) =   12.91
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.630
 TOTAL AREA(ACRES) =        8.0         PEAK FLOW RATE(CFS) =      13.77

 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  0.25   FLOOD WIDTH(FEET) =   23.99
 FLOW VELOCITY(FEET/SEC.) =   4.70   DEPTH*VELOCITY(FT*FT/SEC) =   1.18
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      5.00 =   1820.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      5.00 TO NODE      7.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  326.00  DOWNSTREAM ELEVATION(FEET) =  248.00
 STREET LENGTH(FEET) =  1125.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 16.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.82
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.44
   HALFSTREET FLOOD WIDTH(FEET) =   15.72
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.65
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =     3.37
 STREET FLOW TRAVEL TIME(MIN.) =   2.45   Tc(MIN.) =   16.30
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.459
 RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  89
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.630
 SUBAREA AREA(ACRES) =    7.80      SUBAREA RUNOFF(CFS) =   12.08
 TOTAL AREA(ACRES) =       15.8        PEAK FLOW RATE(CFS) =      24.48

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  16.00
 FLOW VELOCITY(FEET/SEC.) =  7.77   DEPTH*VELOCITY(FT*FT/SEC.) =   3.47
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      7.00 =   2945.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      7.00 TO NODE      9.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   243.00  DOWNSTREAM(FEET) =   160.00
 FLOW LENGTH(FEET) =   324.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  28.01
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      24.48
 PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =   16.49
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      9.00 =   3269.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      9.00 TO NODE     11.00 IS CODE =  53
----------------------------------------------------------------------------
```

```
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    160.00  DOWNSTREAM(FEET) =     35.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1800.00   CHANNEL SLOPE =  0.0694
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0694 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      24.48
 FLOW VELOCITY(FEET/SEC) =   4.28 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   7.01   Tc(MIN.) =   23.50
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE     11.00 =    5069.00 FEET.

******************************************************************************
 FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =  81
------------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.942
 OAK-ASPEN-MOUNTAIN BRUSH GOOD COVER RUNOFF COEFFICIENT = .3500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  48
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4612
 SUBAREA AREA(ACRES) =   24.00   SUBAREA RUNOFF(CFS) =   16.31
 TOTAL AREA(ACRES) =        39.8   TOTAL RUNOFF(CFS) =      35.65
 TC(MIN.) =   23.50

******************************************************************************
 FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =  81
------------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.942
 RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  89
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5015
 SUBAREA AREA(ACRES) =   12.50   SUBAREA RUNOFF(CFS) =   15.29
 TOTAL AREA(ACRES) =        52.3   TOTAL RUNOFF(CFS) =      50.94
 TC(MIN.) =   23.50

******************************************************************************
 FLOW PROCESS FROM NODE     11.00 TO NODE     13.00 IS CODE =  52
------------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     35.00  DOWNSTREAM(FEET) =     10.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   654.00   CHANNEL SLOPE =  0.0382
 CHANNEL FLOW THRU SUBAREA(CFS) =      50.94
 FLOW VELOCITY(FEET/SEC) =   7.61 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   1.43   Tc(MIN.) =   24.93
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE     13.00 =    5723.00 FEET.

******************************************************************************
 FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =  10
------------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==============================================================================

******************************************************************************
 FLOW PROCESS FROM NODE     10.00 TO NODE     12.00 IS CODE =  21
------------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
 FALLOW (BARE SOIL) POOR COVER RUNOFF COEFFICIENT = .2000
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  77
 INITIAL SUBAREA FLOW-LENGTH(FEET) =     80.00
 UPSTREAM ELEVATION(FEET) =    115.00
 DOWNSTREAM ELEVATION(FEET) =    100.00
 ELEVATION DIFFERENCE(FEET) =     15.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =     6.726
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.352
 SUBAREA RUNOFF(CFS) =       0.26
 TOTAL AREA(ACRES) =      0.30   TOTAL RUNOFF(CFS) =      0.26

******************************************************************************
```

```
 FLOW PROCESS FROM NODE      12.00 TO NODE      13.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    100.00  DOWNSTREAM(FEET) =     10.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   800.00   CHANNEL SLOPE = 0.1125
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.26
 FLOW VELOCITY(FEET/SEC) =   4.74 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   2.81   Tc(MIN.) =    9.54
 LONGEST FLOWPATH FROM NODE      10.00 TO NODE      13.00 =     880.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      13.00 TO NODE      13.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.474
 FALLOW (BARE SOIL) POOR COVER RUNOFF COEFFICIENT = .2000
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  77
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.2000
 SUBAREA AREA(ACRES) =   10.60   SUBAREA RUNOFF(CFS) =    7.37
 TOTAL AREA(ACRES) =       10.9   TOTAL RUNOFF(CFS) =       7.57
 TC(MIN.) =    9.54

****************************************************************************
 FLOW PROCESS FROM NODE      13.00 TO NODE      13.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY     AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
    1         7.57      9.54       3.474       10.90
 LONGEST FLOWPATH FROM NODE      10.00 TO NODE      13.00 =     880.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY     AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
    1        50.94     24.93       1.869       52.30
 LONGEST FLOWPATH FROM NODE       1.00 TO NODE      13.00 =    5723.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF        Tc      INTENSITY
 NUMBER     (CFS)      (MIN.)   (INCH/HOUR)
    1      27.06        9.54        3.474
    2      55.02       24.93        1.869

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       55.02   Tc(MIN.) =   24.93
 TOTAL AREA(ACRES) =       63.2

****************************************************************************
 FLOW PROCESS FROM NODE      13.00 TO NODE      14.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     10.00  DOWNSTREAM(FEET) =      9.50
 CHANNEL LENGTH THRU SUBAREA(FEET) =     50.00   CHANNEL SLOPE =  0.0100
 CHANNEL BASE(FEET) =   10.00    "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =    2.00
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.860
 FALLOW (BARE SOIL) POOR COVER RUNOFF COEFFICIENT = .2000
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  77
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      55.25
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.43
 AVERAGE FLOW DEPTH(FEET) =   1.03   TRAVEL TIME(MIN.) =   0.19
 Tc(MIN.) =   25.12
 SUBAREA AREA(ACRES) =     1.24       SUBAREA RUNOFF(CFS) =    0.46
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.445
 TOTAL AREA(ACRES) =       64.4        PEAK FLOW RATE(CFS) =       55.02
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.03   FLOW VELOCITY(FEET/SEC.) =   4.44
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE     14.00 =    5773.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     14.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.860
  STREETS & ROADS (CURBS/STORM DRAINS) RUNOFF COEFFICIENT = .8700
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  98
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4578
  SUBAREA AREA(ACRES) =     2.05   SUBAREA RUNOFF(CFS) =     3.32
  TOTAL AREA(ACRES) =       66.5   TOTAL RUNOFF(CFS) =      56.63
  TC(MIN.) =   25.12

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     17.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  OAK-ASPEN-MOUNTAIN BRUSH GOOD COVER RUNOFF COEFFICIENT = .3500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  48
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    260.00
  DOWNSTREAM ELEVATION(FEET) =    255.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.895
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.925
  SUBAREA RUNOFF(CFS) =      0.55
  TOTAL AREA(ACRES) =      0.40   TOTAL RUNOFF(CFS) =      0.55

****************************************************************************
  FLOW PROCESS FROM NODE     17.00 TO NODE     19.00 IS CODE =  53
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    255.00  DOWNSTREAM(FEET) =     60.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   610.00   CHANNEL SLOPE =  0.3197
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1999 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.55
  FLOW VELOCITY(FEET/SEC) =   2.50 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.06    Tc(MIN.) =   11.96
  LONGEST FLOWPATH FROM NODE     15.00 TO NODE     19.00 =     710.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     19.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.003
  OAK-ASPEN-MOUNTAIN BRUSH GOOD COVER RUNOFF COEFFICIENT = .3500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  48
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =    7.00   SUBAREA RUNOFF(CFS) =     7.36
  TOTAL AREA(ACRES) =        7.4   TOTAL RUNOFF(CFS) =       7.78
  TC(MIN.) =   11.96

****************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     21.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     60.00  DOWNSTREAM(FEET) =     10.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   405.00   CHANNEL SLOPE =  0.1235
  NOTE: CHANNEL SLOPE OF .1 WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       7.78
  FLOW VELOCITY(FEET/SEC) =   7.42 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.91    Tc(MIN.) =   12.87
  LONGEST FLOWPATH FROM NODE     15.00 TO NODE     21.00 =    1115.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE      21.00 TO NODE      21.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.864
  OAK-ASPEN-MOUNTAIN BRUSH GOOD COVER RUNOFF COEFFICIENT = .2500
  SOIL CLASSIFICATION IS "B"
  S.C.S. CURVE NUMBER (AMC II) =  30
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3192
  SUBAREA AREA(ACRES) =    3.30   SUBAREA RUNOFF(CFS) =    2.36
  TOTAL AREA(ACRES) =       10.7   TOTAL RUNOFF(CFS) =       9.78
  TC(MIN.) =   12.87
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =       10.7  TC(MIN.) =     12.87
  PEAK FLOW RATE(CFS)    =       9.78
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS

↑
```

APPENDIX B – PROPOSED RATIONAL METHOD HYDROLOGY
25 YR, 100 YR STORM EVENT

```
****************************************************************************

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                       2003,1985,1981 HYDROLOGY MANUAL
        (c) Copyright 1982-2011 Advanced Engineering Software (aes)
           Ver. 18.0 Release Date: 07/01/2011  License ID 1585

                        Analysis prepared by:

                      Urban Resource Corporation
                        23 Mauchly, Suite 110
                          Irvine, CA 92618

 ************************** DESCRIPTION OF STUDY **************************
* ENCINITAS SENIOR LIVING                                                  *
* PROPOSED CONDITION HYDROLOGY                                             *
* 25 YEAR STORM EVENT                                                      *
 **************************************************************************

  FILE NAME: 624PR25.25
  TIME/DATE OF STUDY: 09:34 06/06/2019
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) =  25.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.000
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   4.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.  (FT)     (FT)     SIDE / SIDE/ WAY    (FT)   (FT)  (FT)  (FT)    (n)
===  =====  =========  ================= ======  ===== ====== ===== =======
  1  30.0     20.0     0.018/0.018/0.020  0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      3.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  89
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    380.00
  DOWNSTREAM ELEVATION(FEET) =    379.30
  ELEVATION DIFFERENCE(FEET) =      0.70
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.821
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    65.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.313
  SUBAREA RUNOFF(CFS) =      1.36
  TOTAL AREA(ACRES) =      0.50   TOTAL RUNOFF(CFS) =      1.36

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      5.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =    379.30
  DOWNSTREAM NODE ELEVATION(FEET) =    326.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1750.00
```

```
 "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.050
 PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
 PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
 MAXIMUM DEPTH(FEET) =   0.50
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.732
 RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  89
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      7.98
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.15
 AVERAGE FLOW DEPTH(FEET) =   0.20   FLOOD WIDTH(FEET) =   19.35
 "V" GUTTER FLOW TRAVEL TIME(MIN.) =   7.03   Tc(MIN.) =   13.85
 SUBAREA AREA(ACRES) =    7.50       SUBAREA RUNOFF(CFS) =   12.91
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.630
 TOTAL AREA(ACRES) =        8.0         PEAK FLOW RATE(CFS) =      13.77

 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  0.25   FLOOD WIDTH(FEET) =   23.99
 FLOW VELOCITY(FEET/SEC.) =   4.70   DEPTH*VELOCITY(FT*FT/SEC) =   1.18
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      5.00 =    1820.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      5.00 TO NODE      7.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  326.00  DOWNSTREAM ELEVATION(FEET) =  248.00
 STREET LENGTH(FEET) =  1125.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 16.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.82
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.44
   HALFSTREET FLOOD WIDTH(FEET) =   15.72
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.65
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.37
 STREET FLOW TRAVEL TIME(MIN.) =   2.45   Tc(MIN.) =   16.30
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.459
 RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  89
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.630
 SUBAREA AREA(ACRES) =    7.80      SUBAREA RUNOFF(CFS) =   12.08
 TOTAL AREA(ACRES) =       15.8        PEAK FLOW RATE(CFS) =      24.48

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  16.00
 FLOW VELOCITY(FEET/SEC.) =  7.77   DEPTH*VELOCITY(FT*FT/SEC.) =   3.47
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      7.00 =    2945.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      7.00 TO NODE      9.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   243.00  DOWNSTREAM(FEET) =   160.00
 FLOW LENGTH(FEET) =   324.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  28.01
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      24.48
 PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =   16.49
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      9.00 =    3269.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      9.00 TO NODE     11.00 IS CODE =  53
----------------------------------------------------------------------------
```

```
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    160.00  DOWNSTREAM(FEET) =     35.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1800.00   CHANNEL SLOPE =  0.0694
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0694 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      24.48
 FLOW VELOCITY(FEET/SEC) =   4.28 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   7.01   Tc(MIN.) =   23.50
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE     11.00 =    5069.00 FEET.

******************************************************************************
 FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =  81
------------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.942
 OAK-ASPEN-MOUNTAIN BRUSH GOOD COVER RUNOFF COEFFICIENT = .3500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  48
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4612
 SUBAREA AREA(ACRES) =   24.00   SUBAREA RUNOFF(CFS) =   16.31
 TOTAL AREA(ACRES) =        39.8   TOTAL RUNOFF(CFS) =      35.65
 TC(MIN.) =   23.50

******************************************************************************
 FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =  81
------------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.942
 RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  89
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5015
 SUBAREA AREA(ACRES) =   12.50   SUBAREA RUNOFF(CFS) =   15.29
 TOTAL AREA(ACRES) =        52.3   TOTAL RUNOFF(CFS) =      50.94
 TC(MIN.) =   23.50

******************************************************************************
 FLOW PROCESS FROM NODE     11.00 TO NODE     13.00 IS CODE =  31
------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     31.00  DOWNSTREAM(FEET) =     29.00
 FLOW LENGTH(FEET) =    23.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  22.40
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      50.94
 PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =   23.52
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE     13.00 =    5092.00 FEET.

******************************************************************************
 FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =  81
------------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.941
 FALLOW (BARE SOIL) POOR COVER RUNOFF COEFFICIENT = .2000
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  77
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4862
 SUBAREA AREA(ACRES) =    2.80   SUBAREA RUNOFF(CFS) =     1.09
 TOTAL AREA(ACRES) =        55.1   TOTAL RUNOFF(CFS) =      52.00
 TC(MIN.) =   23.52

******************************************************************************
 FLOW PROCESS FROM NODE     13.00 TO NODE     15.00 IS CODE =  31
------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     29.00  DOWNSTREAM(FEET) =      9.00
 FLOW LENGTH(FEET) =   541.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.4 INCHES
```

```
 PIPE-FLOW VELOCITY(FEET/SEC.) =  16.12
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       52.00
 PIPE TRAVEL TIME(MIN.) =   0.56     Tc(MIN.) =   24.08
 LONGEST FLOWPATH FROM NODE       1.00 TO NODE      15.00 =    5633.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      17.00 TO NODE      19.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 OAK-ASPEN-MOUNTAIN BRUSH GOOD COVER RUNOFF COEFFICIENT = .3500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  48
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =    260.00
 DOWNSTREAM ELEVATION(FEET) =    255.00
 ELEVATION DIFFERENCE(FEET) =      5.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.895
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.925
 SUBAREA RUNOFF(CFS) =       0.55
 TOTAL AREA(ACRES) =       0.40   TOTAL RUNOFF(CFS) =       0.55

****************************************************************************
 FLOW PROCESS FROM NODE      19.00 TO NODE      21.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     255.00  DOWNSTREAM(FEET) =     46.50
 CHANNEL LENGTH THRU SUBAREA(FEET) =    703.00   CHANNEL SLOPE =  0.2966
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .1941 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
 CHANNEL FLOW THRU SUBAREA(CFS) =        0.55
 FLOW VELOCITY(FEET/SEC) =   2.47 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   4.75   Tc(MIN.) =   12.64
 LONGEST FLOWPATH FROM NODE      17.00 TO NODE      21.00 =     803.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      21.00 TO NODE      21.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.897
 OAK-ASPEN-MOUNTAIN BRUSH GOOD COVER RUNOFF COEFFICIENT = .3500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  48
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
 SUBAREA AREA(ACRES) =     5.80   SUBAREA RUNOFF(CFS) =     5.88
 TOTAL AREA(ACRES) =         6.2   TOTAL RUNOFF(CFS) =       6.29
 TC(MIN.) =   12.64

****************************************************************************
 FLOW PROCESS FROM NODE      21.00 TO NODE      23.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     46.50  DOWNSTREAM(FEET) =     14.50
 CHANNEL LENGTH THRU SUBAREA(FEET) =    385.00   CHANNEL SLOPE =  0.0831
 CHANNEL BASE(FEET) =     2.00   "Z" FACTOR =    1.000
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =    1.50
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.810
 FALLOW (BARE SOIL) POOR COVER RUNOFF COEFFICIENT = .2000
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  77
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.68
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.57
 AVERAGE FLOW DEPTH(FEET) =   0.28   TRAVEL TIME(MIN.) =   0.61
 Tc(MIN.) =   13.25
 SUBAREA AREA(ACRES) =     1.40        SUBAREA RUNOFF(CFS) =    0.79
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.322
 TOTAL AREA(ACRES) =         7.6         PEAK FLOW RATE(CFS) =       6.89

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =  10.81
 LONGEST FLOWPATH FROM NODE      17.00 TO NODE      23.00 =    1188.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE      23.00 TO NODE      24.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     14.50  DOWNSTREAM(FEET) =      9.10
  FLOW LENGTH(FEET) =     95.00    MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.53
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =        6.89
  PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =    13.39
  LONGEST FLOWPATH FROM NODE      17.00 TO NODE      24.00 =    1283.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      24.00 TO NODE      24.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.792
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .8200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  95
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3802
  SUBAREA AREA(ACRES) =     1.00   SUBAREA RUNOFF(CFS) =     2.29
  TOTAL AREA(ACRES) =         8.6   TOTAL RUNOFF(CFS) =        9.13
  TC(MIN.) =    13.39

****************************************************************************
  FLOW PROCESS FROM NODE      25.00 TO NODE      27.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  63
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    100.00
  UPSTREAM ELEVATION(FEET) =      27.80
  DOWNSTREAM ELEVATION(FEET) =      26.60
  ELEVATION DIFFERENCE(FEET) =       1.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.660
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =     68.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.697
  SUBAREA RUNOFF(CFS) =        0.71
  TOTAL AREA(ACRES) =       0.40   TOTAL RUNOFF(CFS) =       0.71

****************************************************************************
  FLOW PROCESS FROM NODE      27.00 TO NODE      29.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     23.10  DOWNSTREAM(FEET) =     22.84
  FLOW LENGTH(FEET) =     26.00    MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   4.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.47
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =        0.71
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =     8.79
  LONGEST FLOWPATH FROM NODE      25.00 TO NODE      29.00 =     126.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      29.00 TO NODE      29.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.663
  STREETS & ROADS (HARD SURFACE) RUNOFF COEFFICIENT = .6600
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  74
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5665
  SUBAREA AREA(ACRES) =     0.37   SUBAREA RUNOFF(CFS) =     0.89
  TOTAL AREA(ACRES) =         0.8   TOTAL RUNOFF(CFS) =        1.60
```

```
 TC(MIN.) =    8.79

****************************************************************************
 FLOW PROCESS FROM NODE     29.00 TO NODE     31.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    22.84  DOWNSTREAM(FEET) =    21.44
 FLOW LENGTH(FEET) =   139.00   MANNING'S N = 0.013
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.25
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =        1.60
 PIPE TRAVEL TIME(MIN.) =   0.54    Tc(MIN.) =    9.33
 LONGEST FLOWPATH FROM NODE     25.00 TO NODE     31.00 =     265.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     31.00 TO NODE     31.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.524
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  63
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5324
 SUBAREA AREA(ACRES) =    0.50   SUBAREA RUNOFF(CFS) =    0.85
 TOTAL AREA(ACRES) =        1.3   TOTAL RUNOFF(CFS) =       2.38
 TC(MIN.) =    9.33

****************************************************************************
 FLOW PROCESS FROM NODE     31.00 TO NODE     33.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    21.44  DOWNSTREAM(FEET) =    16.00
 FLOW LENGTH(FEET) =   380.00   MANNING'S N = 0.013
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.35
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =        2.38
 PIPE TRAVEL TIME(MIN.) =   1.18    Tc(MIN.) =   10.51
 LONGEST FLOWPATH FROM NODE     25.00 TO NODE     33.00 =     645.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.263
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  63
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5092
 SUBAREA AREA(ACRES) =    1.01   SUBAREA RUNOFF(CFS) =    1.58
 TOTAL AREA(ACRES) =        2.3   TOTAL RUNOFF(CFS) =       3.79
 TC(MIN.) =   10.51

****************************************************************************
 FLOW PROCESS FROM NODE     35.00 TO NODE     37.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .6600
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  77
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
 UPSTREAM ELEVATION(FEET) =     26.80
 DOWNSTREAM ELEVATION(FEET) =     19.70
 ELEVATION DIFFERENCE(FEET) =      7.10
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.235
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    87.60
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.116
```

```
 SUBAREA RUNOFF(CFS) =      1.62
 TOTAL AREA(ACRES) =     0.48   TOTAL RUNOFF(CFS) =      1.62

****************************************************************************
  FLOW PROCESS FROM NODE     37.00 TO NODE     39.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    16.20  DOWNSTREAM(FEET) =    15.70
  FLOW LENGTH(FEET) =    53.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.17
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.62
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =    5.45
  LONGEST FLOWPATH FROM NODE     35.00 TO NODE     39.00 =     303.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     39.00 TO NODE     39.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.987
  STREETS & ROADS (HARD SURFACE) RUNOFF COEFFICIENT = .6600
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  74
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6600
  SUBAREA AREA(ACRES) =     0.11   SUBAREA RUNOFF(CFS) =    0.36
  TOTAL AREA(ACRES) =        0.6   TOTAL RUNOFF(CFS) =       1.94
  TC(MIN.) =    5.45

****************************************************************************
  FLOW PROCESS FROM NODE     39.00 TO NODE     41.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    15.70  DOWNSTREAM(FEET) =    14.85
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.18
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.94
  PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =    5.85
  LONGEST FLOWPATH FROM NODE     35.00 TO NODE     41.00 =     403.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.764
  STREETS & ROADS (HARD SURFACE) RUNOFF COEFFICIENT = .6600
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  74
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6600
  SUBAREA AREA(ACRES) =     1.25   SUBAREA RUNOFF(CFS) =    3.93
  TOTAL AREA(ACRES) =        1.8   TOTAL RUNOFF(CFS) =       5.79
  TC(MIN.) =    5.85

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     43.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    14.85  DOWNSTREAM(FEET) =    14.50
  FLOW LENGTH(FEET) =    36.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  11.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.60
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.79
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    5.95
  LONGEST FLOWPATH FROM NODE     35.00 TO NODE     43.00 =     439.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     43.00 TO NODE     43.00 IS CODE =  81
```

```
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.709
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  63
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5774
  SUBAREA AREA(ACRES) =    1.56   SUBAREA RUNOFF(CFS) =    3.53
  TOTAL AREA(ACRES) =        3.4   TOTAL RUNOFF(CFS) =       9.24
  TC(MIN.) =    5.95

****************************************************************************
  FLOW PROCESS FROM NODE     43.00 TO NODE     43.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.709
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  63
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5656
  SUBAREA AREA(ACRES) =    0.47   SUBAREA RUNOFF(CFS) =    1.06
  TOTAL AREA(ACRES) =        3.9   TOTAL RUNOFF(CFS) =      10.31
  TC(MIN.) =    5.95

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     47.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  63
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   170.00
  UPSTREAM ELEVATION(FEET) =      16.10
  DOWNSTREAM ELEVATION(FEET) =      14.20
  ELEVATION DIFFERENCE(FEET) =       1.90
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =     8.787
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    66.76
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.663
  SUBAREA RUNOFF(CFS) =      0.86
  TOTAL AREA(ACRES) =      0.49   TOTAL RUNOFF(CFS) =       0.86

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     49.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     11.70  DOWNSTREAM(FEET) =     10.85
  FLOW LENGTH(FEET) =   168.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS    5.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.79
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =        0.86
  PIPE TRAVEL TIME(MIN.) =   1.00    Tc(MIN.) =     9.79
  LONGEST FLOWPATH FROM NODE     45.00 TO NODE     49.00 =     338.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     49.00 TO NODE     49.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.416
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  63
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.4800
  SUBAREA AREA(ACRES) =    0.27   SUBAREA RUNOFF(CFS) =    0.44
  TOTAL AREA(ACRES) =        0.8   TOTAL RUNOFF(CFS) =       1.25
  TC(MIN.) =    9.79

****************************************************************************
  FLOW PROCESS FROM NODE     49.00 TO NODE     51.00 IS CODE =  31
```

```
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    10.85  DOWNSTREAM(FEET) =    10.00
 FLOW LENGTH(FEET) =   170.00   MANNING'S N = 0.013
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.07
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.25
 PIPE TRAVEL TIME(MIN.) =   0.92    Tc(MIN.) =   10.71
 LONGEST FLOWPATH FROM NODE     45.00 TO NODE     51.00 =     508.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     51.00 TO NODE     53.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     10.00  DOWNSTREAM(FEET) =      9.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   135.00   CHANNEL SLOPE =  0.0074
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   3.00
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.838
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  63
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.65
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.96
 AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   2.34
 Tc(MIN.) =   13.05
 SUBAREA AREA(ACRES) =     2.06       SUBAREA RUNOFF(CFS) =    2.81
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.480
 TOTAL AREA(ACRES) =         2.8         PEAK FLOW RATE(CFS) =       3.84

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.19   FLOW VELOCITY(FEET/SEC.) =   1.07
 LONGEST FLOWPATH FROM NODE     45.00 TO NODE     53.00 =     643.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     53.00 TO NODE     53.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.838
 STREETS & ROADS (HARD SURFACE) RUNOFF COEFFICIENT = .6600
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  74
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5278
 SUBAREA AREA(ACRES) =    1.02   SUBAREA RUNOFF(CFS) =     1.91
 TOTAL AREA(ACRES) =         3.8   TOTAL RUNOFF(CFS) =        5.75
 TC(MIN.) =   13.05

****************************************************************************
 FLOW PROCESS FROM NODE     55.00 TO NODE     56.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GENERAL COMMERCIAL RUNOFF COEFFICIENT = .8200
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  95
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
 UPSTREAM ELEVATION(FEET) =     11.24
 DOWNSTREAM ELEVATION(FEET) =     11.15
 ELEVATION DIFFERENCE(FEET) =      0.09
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.490
 WARNING: THE MINIMUM OVERLAND FLOW SLOPE, 0.5%, IS USED IN Tc CALCULATION!
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.269
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.43
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.43

****************************************************************************
 FLOW PROCESS FROM NODE     56.00 TO NODE     57.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
```

```
 UPSTREAM ELEVATION(FEET) =   11.15  DOWNSTREAM ELEVATION(FEET) =   10.24
 STREET LENGTH(FEET) =   300.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 30.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.08
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.43
   HALFSTREET FLOOD WIDTH(FEET) =   13.63
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.50
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.65
 STREET FLOW TRAVEL TIME(MIN.) =   3.32   Tc(MIN.) =    7.81
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.951
 GENERAL COMMERCIAL RUNOFF COEFFICIENT = .8200
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  95
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
 SUBAREA AREA(ACRES) =     1.61      SUBAREA RUNOFF(CFS) =    5.22
 TOTAL AREA(ACRES) =        1.7        PEAK FLOW RATE(CFS) =       5.54

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.51   HALFSTREET FLOOD WIDTH(FEET) =  17.38
 FLOW VELOCITY(FEET/SEC.) =  1.73   DEPTH*VELOCITY(FT*FT/SEC.) =   0.87
 LONGEST FLOWPATH FROM NODE     55.00 TO NODE     57.00 =     350.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     59.00 TO NODE     60.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GENERAL COMMERCIAL RUNOFF COEFFICIENT = .8200
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  95
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
 UPSTREAM ELEVATION(FEET) =     12.50
 DOWNSTREAM ELEVATION(FEET) =     12.40
 ELEVATION DIFFERENCE(FEET) =      0.10
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.490
 WARNING: THE MINIMUM OVERLAND FLOW SLOPE, 0.5%, IS USED IN Tc CALCULATION!
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.269
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =       0.22
 TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.22

****************************************************************************
 FLOW PROCESS FROM NODE     60.00 TO NODE     61.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =   12.40  DOWNSTREAM ELEVATION(FEET) =   11.25
 STREET LENGTH(FEET) =   310.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 30.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.04
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.32
   HALFSTREET FLOOD WIDTH(FEET) =    7.91
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.28
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.40
 STREET FLOW TRAVEL TIME(MIN.) =   4.04   Tc(MIN.) =    8.53
```

```
  25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.733
 GENERAL COMMERCIAL RUNOFF COEFFICIENT = .8200
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  95
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
 SUBAREA AREA(ACRES) =    0.53      SUBAREA RUNOFF(CFS) =    1.62
 TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       1.78

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  10.20
 FLOW VELOCITY(FEET/SEC.) =  1.44   DEPTH*VELOCITY(FT*FT/SEC.) =   0.52
 LONGEST FLOWPATH FROM NODE     59.00 TO NODE     61.00 =     360.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)       =        0.6  TC(MIN.) =      8.53
 PEAK FLOW RATE(CFS)     =       1.78
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS

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____________________________________________________________________________
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            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
         (c) Copyright 1982-2011 Advanced Engineering Software (aes)
             Ver. 18.0 Release Date: 07/01/2011  License ID 1585

                           Analysis prepared by:

                         Urban Resource Corporation
                           23 Mauchly, Suite 110
                              Irvine, CA 92618

 ************************* DESCRIPTION OF STUDY *************************
* ENCINITAS SENIOR LIVING                                                  *
* PROPOSED CONDITION HYDROLOGY                                             *
* 100 YEAR STORM EVENT                                                     *
 ************************************************************************

  FILE NAME: 624PR100.100
  TIME/DATE OF STUDY: 09:36 06/06/2019
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   4.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:  CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN- / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.  (FT)     (FT)     SIDE / SIDE/ WAY   (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020  0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
   *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
    OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      3.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  89
  INITIAL SUBAREA FLOW-LENGTH(FEET) =     70.00
  UPSTREAM ELEVATION(FEET) =    380.00
  DOWNSTREAM ELEVATION(FEET) =    379.30
  ELEVATION DIFFERENCE(FEET) =      0.70
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.821
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    65.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.391
  SUBAREA RUNOFF(CFS) =      1.70
  TOTAL AREA(ACRES) =      0.50   TOTAL RUNOFF(CFS) =      1.70

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      5.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =    379.30
  DOWNSTREAM NODE ELEVATION(FEET) =    326.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1750.00
```

```
 "V" GUTTER WIDTH(FEET) =    5.00   GUTTER HIKE(FEET) =  0.050
 PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
 PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
 MAXIMUM DEPTH(FEET) =   0.50
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.475
 RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  89
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     10.10
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.38
 AVERAGE FLOW DEPTH(FEET) =   0.22   FLOOD WIDTH(FEET) =   21.24
 "V" GUTTER FLOW TRAVEL TIME(MIN.) =   6.66   Tc(MIN.) =   13.48
 SUBAREA AREA(ACRES) =     7.50       SUBAREA RUNOFF(CFS) =   16.42
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.630
 TOTAL AREA(ACRES) =        8.0         PEAK FLOW RATE(CFS) =      17.51

 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  0.27   FLOOD WIDTH(FEET) =   26.40
 FLOW VELOCITY(FEET/SEC.) =   4.95   DEPTH*VELOCITY(FT*FT/SEC) =   1.36
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      5.00 =    1820.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      5.00 TO NODE      7.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  326.00  DOWNSTREAM ELEVATION(FEET) =  248.00
 STREET LENGTH(FEET) =  1125.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 16.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   8.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.19
   ***STREET FLOW SPLITS OVER STREET-CROWN***
   FULL DEPTH(FEET) =    0.45   FLOOD WIDTH(FEET) =   16.00
   FULL HALF-STREET VELOCITY(FEET/SEC.) =    7.77
   SPLIT DEPTH(FEET) =    0.29   SPLIT FLOOD WIDTH(FEET) =    8.34
   SPLIT FLOW(CFS) =    4.39   SPLIT VELOCITY(FEET/SEC.) =    5.39
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.45
   HALFSTREET FLOOD WIDTH(FEET) =   16.00
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.77
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.47
 STREET FLOW TRAVEL TIME(MIN.) =   2.41   Tc(MIN.) =   15.89
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.124
 RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  89
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.630
 SUBAREA AREA(ACRES) =    7.80       SUBAREA RUNOFF(CFS) =   15.35
 TOTAL AREA(ACRES) =       15.8        PEAK FLOW RATE(CFS) =      31.10

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  16.00
 FLOW VELOCITY(FEET/SEC.) =  7.77   DEPTH*VELOCITY(FT*FT/SEC.) =   3.47
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      7.00 =    2945.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      7.00 TO NODE      9.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    243.00  DOWNSTREAM(FEET) =   160.00
 FLOW LENGTH(FEET) =   324.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  30.02
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      31.10
 PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   16.07
```

```
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      9.00 =    3269.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      9.00 TO NODE     11.00 IS CODE =  53
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    160.00  DOWNSTREAM(FEET) =     35.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1800.00   CHANNEL SLOPE =  0.0694
 SLOPE ADJUSTMENT CURVE USED:
 EFFECTIVE SLOPE = .0694 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 CHANNEL FLOW THRU SUBAREA(CFS) =      31.10
 FLOW VELOCITY(FEET/SEC) =   4.64 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   6.47   Tc(MIN.) =   22.54
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE     11.00 =    5069.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.494
 OAK-ASPEN-MOUNTAIN BRUSH GOOD COVER RUNOFF COEFFICIENT = .3500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  48
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4612
 SUBAREA AREA(ACRES) =   24.00   SUBAREA RUNOFF(CFS) =   20.95
 TOTAL AREA(ACRES) =        39.8   TOTAL RUNOFF(CFS) =      45.77
 TC(MIN.) =   22.54

****************************************************************************
 FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.494
 RESIDENTIAL (14.5 DU/AC OR LESS) RUNOFF COEFFICIENT = .6300
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  89
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5015
 SUBAREA AREA(ACRES) =   12.50   SUBAREA RUNOFF(CFS) =   19.64
 TOTAL AREA(ACRES) =        52.3   TOTAL RUNOFF(CFS) =      65.40
 TC(MIN.) =   22.54

****************************************************************************
 FLOW PROCESS FROM NODE     11.00 TO NODE     13.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    31.00  DOWNSTREAM(FEET) =    29.00
 FLOW LENGTH(FEET) =    23.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  23.94
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      65.40
 PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =   22.56
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE     13.00 =    5092.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.492
 FALLOW (BARE SOIL) POOR COVER RUNOFF COEFFICIENT = .2000
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  77
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4862
 SUBAREA AREA(ACRES) =    2.80   SUBAREA RUNOFF(CFS) =    1.40
 TOTAL AREA(ACRES) =        55.1   TOTAL RUNOFF(CFS) =      66.77
 TC(MIN.) =   22.56

****************************************************************************
 FLOW PROCESS FROM NODE     13.00 TO NODE     15.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    29.00  DOWNSTREAM(FEET) =     9.00
  FLOW LENGTH(FEET) =   541.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  22.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.23
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      66.77
  PIPE TRAVEL TIME(MIN.) =   0.52    Tc(MIN.) =   23.08
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE     15.00 =    5633.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE     17.00 TO NODE     19.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  OAK-ASPEN-MOUNTAIN BRUSH GOOD COVER RUNOFF COEFFICIENT = .3500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  48
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    260.00
  DOWNSTREAM ELEVATION(FEET) =    255.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.895
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.906
  SUBAREA RUNOFF(CFS) =      0.69
  TOTAL AREA(ACRES) =      0.40   TOTAL RUNOFF(CFS) =      0.69

******************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     21.00 IS CODE =  53
------------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL MOUNTAIN CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    255.00  DOWNSTREAM(FEET) =     46.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =    703.00   CHANNEL SLOPE =  0.2966
  SLOPE ADJUSTMENT CURVE USED:
  EFFECTIVE SLOPE = .1941 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.69
  FLOW VELOCITY(FEET/SEC) =   2.47 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   4.75    Tc(MIN.) =   12.64
  LONGEST FLOWPATH FROM NODE     17.00 TO NODE     21.00 =     803.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     21.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.621
  OAK-ASPEN-MOUNTAIN BRUSH GOOD COVER RUNOFF COEFFICIENT = .3500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  48
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3500
  SUBAREA AREA(ACRES) =     5.80   SUBAREA RUNOFF(CFS) =     7.35
  TOTAL AREA(ACRES) =          6.2   TOTAL RUNOFF(CFS) =       7.86
  TC(MIN.) =   12.64

******************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     23.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     46.50  DOWNSTREAM(FEET) =     14.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   385.00   CHANNEL SLOPE =  0.0831
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.521
  FALLOW (BARE SOIL) POOR COVER RUNOFF COEFFICIENT = .2000
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  77
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.42
  AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   0.56
  Tc(MIN.) =   13.21
  SUBAREA AREA(ACRES) =     1.40       SUBAREA RUNOFF(CFS) =     0.99
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.322
```

```
 TOTAL AREA(ACRES) =        7.6         PEAK FLOW RATE(CFS) =       8.63

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =  11.48
 LONGEST FLOWPATH FROM NODE     17.00 TO NODE     23.00 =    1188.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE     24.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    14.50  DOWNSTREAM(FEET) =     9.10
  FLOW LENGTH(FEET) =    95.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.40
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =        8.63
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =    13.33
  LONGEST FLOWPATH FROM NODE     17.00 TO NODE     24.00 =    1283.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     24.00 TO NODE     24.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.499
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .8200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  95
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.3802
  SUBAREA AREA(ACRES) =     1.00   SUBAREA RUNOFF(CFS) =     2.87
  TOTAL AREA(ACRES) =        8.6   TOTAL RUNOFF(CFS) =      11.44
  TC(MIN.) =    13.33

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     27.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  63
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =      27.80
  DOWNSTREAM ELEVATION(FEET) =      26.60
  ELEVATION DIFFERENCE(FEET) =       1.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.660
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    68.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.622
  SUBAREA RUNOFF(CFS) =       0.89
  TOTAL AREA(ACRES) =       0.40   TOTAL RUNOFF(CFS) =       0.89

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     29.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    23.10  DOWNSTREAM(FEET) =    22.84
  FLOW LENGTH(FEET) =    26.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   4.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.67
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =        0.89
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =     8.78
  LONGEST FLOWPATH FROM NODE     25.00 TO NODE     29.00 =     126.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     29.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.582
  STREETS & ROADS (HARD SURFACE) RUNOFF COEFFICIENT = .6600
```

```
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  74
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5665
 SUBAREA AREA(ACRES) =     0.37   SUBAREA RUNOFF(CFS) =    1.12
 TOTAL AREA(ACRES) =        0.8   TOTAL RUNOFF(CFS) =       2.00
 TC(MIN.) =    8.78

****************************************************************************
 FLOW PROCESS FROM NODE     29.00 TO NODE     31.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    22.84  DOWNSTREAM(FEET) =    21.44
 FLOW LENGTH(FEET) =   139.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.49
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =        2.00
 PIPE TRAVEL TIME(MIN.) =   0.52    Tc(MIN.) =     9.29
 LONGEST FLOWPATH FROM NODE     25.00 TO NODE     31.00 =     265.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     31.00 TO NODE     31.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.416
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  63
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5324
 SUBAREA AREA(ACRES) =     0.50   SUBAREA RUNOFF(CFS) =    1.06
 TOTAL AREA(ACRES) =        1.3   TOTAL RUNOFF(CFS) =       2.99
 TC(MIN.) =    9.29

****************************************************************************
 FLOW PROCESS FROM NODE     31.00 TO NODE     33.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    21.44  DOWNSTREAM(FEET) =    16.00
 FLOW LENGTH(FEET) =   380.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.63
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =        2.99
 PIPE TRAVEL TIME(MIN.) =   1.12    Tc(MIN.) =    10.42
 LONGEST FLOWPATH FROM NODE     25.00 TO NODE     33.00 =     645.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.102
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  63
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5092
 SUBAREA AREA(ACRES) =     1.01   SUBAREA RUNOFF(CFS) =    1.99
 TOTAL AREA(ACRES) =        2.3   TOTAL RUNOFF(CFS) =       4.76
 TC(MIN.) =   10.42

****************************************************************************
 FLOW PROCESS FROM NODE     35.00 TO NODE     37.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .6600
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  77
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
 UPSTREAM ELEVATION(FEET) =      26.80
 DOWNSTREAM ELEVATION(FEET) =      19.70
 ELEVATION DIFFERENCE(FEET) =       7.10
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.235
```

```
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    87.60
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.395
 SUBAREA RUNOFF(CFS) =       2.03
 TOTAL AREA(ACRES) =       0.48   TOTAL RUNOFF(CFS) =       2.03

****************************************************************************
  FLOW PROCESS FROM NODE      37.00 TO NODE      39.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     16.20  DOWNSTREAM(FEET) =     15.70
  FLOW LENGTH(FEET) =     53.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.40
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.03
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =     5.44
  LONGEST FLOWPATH FROM NODE      35.00 TO NODE      39.00 =     303.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      39.00 TO NODE      39.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.241
  STREETS & ROADS (HARD SURFACE) RUNOFF COEFFICIENT = .6600
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  74
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6600
  SUBAREA AREA(ACRES) =    0.11   SUBAREA RUNOFF(CFS) =    0.45
  TOTAL AREA(ACRES) =        0.6   TOTAL RUNOFF(CFS) =       2.43
  TC(MIN.) =    5.44

****************************************************************************
  FLOW PROCESS FROM NODE      39.00 TO NODE      41.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     15.70  DOWNSTREAM(FEET) =     14.85
  FLOW LENGTH(FEET) =    100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.39
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.43
  PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =     5.82
  LONGEST FLOWPATH FROM NODE      35.00 TO NODE      41.00 =     403.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      41.00 TO NODE      41.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.975
  STREETS & ROADS (HARD SURFACE) RUNOFF COEFFICIENT = .6600
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  74
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6600
  SUBAREA AREA(ACRES) =    1.25   SUBAREA RUNOFF(CFS) =    4.93
  TOTAL AREA(ACRES) =        1.8   TOTAL RUNOFF(CFS) =       7.26
  TC(MIN.) =    5.82

****************************************************************************
  FLOW PROCESS FROM NODE      41.00 TO NODE      43.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     14.85  DOWNSTREAM(FEET) =     14.50
  FLOW LENGTH(FEET) =     36.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.08
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.26
```

```
 PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    5.91
 LONGEST FLOWPATH FROM NODE     35.00 TO NODE     43.00 =     439.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     43.00 TO NODE     43.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.911
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  63
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5774
 SUBAREA AREA(ACRES) =    1.56   SUBAREA RUNOFF(CFS) =    4.43
 TOTAL AREA(ACRES) =        3.4   TOTAL RUNOFF(CFS) =      11.60
 TC(MIN.) =    5.91

****************************************************************************
 FLOW PROCESS FROM NODE     43.00 TO NODE     43.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.911
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  63
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5656
 SUBAREA AREA(ACRES) =    0.47   SUBAREA RUNOFF(CFS) =    1.33
 TOTAL AREA(ACRES) =        3.9   TOTAL RUNOFF(CFS) =      12.94
 TC(MIN.) =    5.91

****************************************************************************
 FLOW PROCESS FROM NODE     45.00 TO NODE     47.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  63
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   170.00
 UPSTREAM ELEVATION(FEET) =      16.10
 DOWNSTREAM ELEVATION(FEET) =      14.20
 ELEVATION DIFFERENCE(FEET) =       1.90
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.787
 WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
          THE MAXIMUM OVERLAND FLOW LENGTH =    66.76
          (Reference: Table 3-1B of Hydrology Manual)
          THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.579
 SUBAREA RUNOFF(CFS) =       1.08
 TOTAL AREA(ACRES) =       0.49   TOTAL RUNOFF(CFS) =       1.08

****************************************************************************
 FLOW PROCESS FROM NODE     47.00 TO NODE     49.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     11.70  DOWNSTREAM(FEET) =     10.85
 FLOW LENGTH(FEET) =   168.00   MANNING'S N = 0.013
 DEPTH OF FLOW IN   9.0 INCH PIPE IS   7.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   2.87
 ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.08
 PIPE TRAVEL TIME(MIN.) =   0.98    Tc(MIN.) =    9.76
 LONGEST FLOWPATH FROM NODE     45.00 TO NODE     49.00 =     338.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     49.00 TO NODE     49.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.278
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  63
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.4800
 SUBAREA AREA(ACRES) =    0.27   SUBAREA RUNOFF(CFS) =    0.55
```

```
 TOTAL AREA(ACRES) =        0.8   TOTAL RUNOFF(CFS) =       1.56
 TC(MIN.) =    9.76

****************************************************************************
 FLOW PROCESS FROM NODE     49.00 TO NODE     51.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     10.85  DOWNSTREAM(FEET) =     10.00
 FLOW LENGTH(FEET) =   170.00   MANNING'S N = 0.013
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.24
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.56
 PIPE TRAVEL TIME(MIN.) =   0.88    Tc(MIN.) =   10.64
 LONGEST FLOWPATH FROM NODE     45.00 TO NODE     51.00 =     508.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     51.00 TO NODE     53.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     10.00  DOWNSTREAM(FEET) =      9.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   135.00   CHANNEL SLOPE =  0.0074
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   3.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.592
 RESIDENTIAL (7.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  63
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.34
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.04
 AVERAGE FLOW DEPTH(FEET) =   0.17   TRAVEL TIME(MIN.) =   2.16
 Tc(MIN.) =   12.80
 SUBAREA AREA(ACRES) =     2.06       SUBAREA RUNOFF(CFS) =     3.55
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.480
 TOTAL AREA(ACRES) =         2.8          PEAK FLOW RATE(CFS) =       4.86

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.21   FLOW VELOCITY(FEET/SEC.) =   1.14
 LONGEST FLOWPATH FROM NODE     45.00 TO NODE     53.00 =     643.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     53.00 TO NODE     53.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.592
 STREETS & ROADS (HARD SURFACE) RUNOFF COEFFICIENT = .6600
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  74
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.5278
 SUBAREA AREA(ACRES) =     1.02   SUBAREA RUNOFF(CFS) =     2.42
 TOTAL AREA(ACRES) =         3.8   TOTAL RUNOFF(CFS) =       7.28
 TC(MIN.) =   12.80

****************************************************************************
 FLOW PROCESS FROM NODE     55.00 TO NODE     56.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GENERAL COMMERCIAL RUNOFF COEFFICIENT = .8200
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  95
 INITIAL SUBAREA FLOW-LENGTH(FEET) =     50.00
 UPSTREAM ELEVATION(FEET) =      11.24
 DOWNSTREAM ELEVATION(FEET) =      11.15
 ELEVATION DIFFERENCE(FEET) =       0.09
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =     4.490
 WARNING: THE MINIMUM OVERLAND FLOW SLOPE, 0.5%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.587
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =       0.54
 TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.54

****************************************************************************
```

```
 FLOW PROCESS FROM NODE      56.00 TO NODE      57.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =    11.15  DOWNSTREAM ELEVATION(FEET) =    10.24
 STREET LENGTH(FEET) =   300.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 30.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =        3.89
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.46
   HALFSTREET FLOOD WIDTH(FEET) =   15.04
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.59
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.73
  STREET FLOW TRAVEL TIME(MIN.) =    3.15   Tc(MIN.) =     7.64
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.012
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .8200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  95
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
  SUBAREA AREA(ACRES) =     1.61       SUBAREA RUNOFF(CFS) =     6.62
  TOTAL AREA(ACRES) =         1.7         PEAK FLOW RATE(CFS) =        7.03

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.54   HALFSTREET FLOOD WIDTH(FEET) =  19.10
  FLOW VELOCITY(FEET/SEC.) =  1.83   DEPTH*VELOCITY(FT*FT/SEC.) =   0.99
  LONGEST FLOWPATH FROM NODE      55.00 TO NODE      57.00 =     350.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      59.00 TO NODE      60.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GENERAL COMMERCIAL RUNOFF COEFFICIENT = .8200
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  95
  INITIAL SUBAREA FLOW-LENGTH(FEET) =     50.00
  UPSTREAM ELEVATION(FEET) =      12.50
  DOWNSTREAM ELEVATION(FEET) =      12.40
  ELEVATION DIFFERENCE(FEET) =       0.10
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =     4.490
  WARNING: THE MINIMUM OVERLAND FLOW SLOPE, 0.5%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.587
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =       0.27
  TOTAL AREA(ACRES) =       0.05   TOTAL RUNOFF(CFS) =       0.27

****************************************************************************
  FLOW PROCESS FROM NODE      60.00 TO NODE      61.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =    12.40  DOWNSTREAM ELEVATION(FEET) =    11.25
  STREET LENGTH(FEET) =   310.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =        1.32
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

```
   STREET FLOW DEPTH(FEET) =  0.34
   HALFSTREET FLOOD WIDTH(FEET) =    8.84
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.35
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.45
 STREET FLOW TRAVEL TIME(MIN.) =    3.81   Tc(MIN.) =    8.30
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.749
 GENERAL COMMERCIAL RUNOFF COEFFICIENT = .8200
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  95
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.820
 SUBAREA AREA(ACRES) =    0.53      SUBAREA RUNOFF(CFS) =    2.06
 TOTAL AREA(ACRES) =        0.6       PEAK FLOW RATE(CFS) =       2.26

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.39   HALFSTREET FLOOD WIDTH(FEET) =  11.37
 FLOW VELOCITY(FEET/SEC.) =  1.52   DEPTH*VELOCITY(FT*FT/SEC.) =   0.59
 LONGEST FLOWPATH FROM NODE     59.00 TO NODE     61.00 =     360.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =        0.6  TC(MIN.) =      8.30
 PEAK FLOW RATE(CFS)   =       2.26
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

APPENDIX C – HYDRAULIC CALCULATIONS

3111 MANCHESTER AVE
EXISTING CMP STORM DRAIN - HYDRAULIC ANALYSIS
REFERENCE PLAN: DRAWING NO. SI-0021 AS-BUILT DRAWING PREPARED BY NOLTE AND ASSOCIATES, INC. DATED 6-18-01
SOFTWARE: CIVILDESIGN CORPORATION WATER SURFACE AND PRESSURE GRADIENT (WSPGW)

EX. SD	MAX WSE	MAX HEAD (ft)	OUTLET ELEV. (EL)	Q OUT (cfs)	Velocity (fps)	CMP SIZE (in.)	No. of Pipes	n	S (%)	L (ft)
B	10.44	3.53	6.91	23.90	8.27	24	2	0.022	0.70%	65.91
C	10.44	2.23	8.21	17.64	6.92(1)	24	1	0.022	0.98%	69.07
D	10.44	1.50	8.94	8.10	5.82(1)	18	1	0.022	1.28%	68.08
E	10.44	1.44	9.00	7.12	5.49(1)	18	1	0.022	0.93%	66.55
F	10.44	0.85	9.59	3.55	4.24(1)	18	1	0.022	0.86%	71.55
			Total:	84.21(2)						

Notes:

1. These velocities for the existing storm drain crossings are used as the maximum allowable velocities at the existing outlet locations into the lagoon
2. The total peak flow conveyed by the six existing CMP pipes is 84.21cfs based on the parameters of the anaysis. The total existing condition flows per Hydrology Map nodes 14 and 21, including street flows, is Q100=85.07cfs; therefore, since the max WSE of 10.44EL resulted in very similar peak flows estimation of the existing storm drain outlet maximum velocities into the lagoon.

3111 MANCHESTER AVE
PROPOSED STORM DRAIN - PRELIMINARY HYDRAULIC ANALYSIS

SD Line	Q100 (cfs)	Proposed Outlet Velocity (fps)	Existing Outlet Velocity (fps)	Type/Size	Max Water Depth (ft)	Notes
A (offsite)	66.77	6.45	6.92	2 - 4'Wx1.5'H RCB	1.46	624_PR-A2.OUT; Two Piers of 4x1.5
B	7.28	5.54	6.92	18	1.58	624_PR-18C.OUT
C	7.03	5.46	5.82	18	1.54	624_PR-18C.OUT
D	2.26	3.68	5.49	18	0.79	624_PR-18C.OUT
E	12.94	4.37 (2)	4.24	5'Wx1.5'H RCB	0.82	624_PR-5X15C.OUT
F (offsite)	11.44	4.19	4.24	5'Wx1.5'H RCB	0.76	624_PR-5X15C.OUT

Notes:

1. Line A and F convey offsite/undeveloped flows only
2. Line E outlet velocity is higher than existing control velocity by 3%. Additional analysis to be conducted during final engineering to upsize and/or provide mitigation (ie. detention or other) onsite.
3. Hydraulic analysis for Line B and E utilizes the Q100 for a conservative analysis.
4. Hydraulic model of each storm drain is a dummy model for preliminary analysis purposes, and will be updated to match the final design during final engineering.

```
                                                                                             624_EX-B.EDT
FILE: 624_EX-B.WSW                                  W S P G W  - EDIT LISTING - Version 14.06            Date: 5-31-2019  Time:11:29: 1
                                                WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING                             PAGE    1
 CARD  SECT  CHN   NO OF  AVE PIER  HEIGHT 1  BASE    ZL    ZR   INV   Y(1)  Y(2)  Y(3)  Y(4)  Y(5)  Y(6)  Y(7)  Y(8)  Y(9)  Y(10)
 CODE   NO   TYPE PIER/PIP WIDTH    DIAMETER  WIDTH              DROP

 CD      1    4      1              2.000
 CD      2    4      1              1.500
 CD      3    4      1              1.000
                                                                W S P G W                                                  PAGE NO   1
                                        WATER SURFACE PROFILE - TITLE CARD LISTING
HEADING LINE NO 1 IS -
                                          "3111 MANCHESTER" HYDRAULICS                               0
HEADING LINE NO 2 IS -
                                          Prepared By: URBAN RESOURCE CORPORATION
HEADING LINE NO 3 IS -
                                          Detention Outlet - 24" CMP             Filename: 624_EX-B.wsw
                                                                W S P G W                                                  PAGE NO   2
                                        WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO   1 IS A SYSTEM OUTLET     *         *     *
                    U/S DATA   STATION    INVERT  SECT                                            W S ELEV
                               1000.000    6.450    1                                                6.450
 ELEMENT NO   2 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                                   RADIUS    ANGLE     ANG PT  MAN H
                               1065.910    6.910    1              .022                                  .000     .000      .000     0
 ELEMENT NO   3 IS A  WALL  ENTRANCE                   *
                    U/S DATA   STATION    INVERT  SECT              FP
                               1065.910    6.910    1              .022
 ELEMENT NO   4 IS A SYSTEM HEADWORKS                  *                    *
                    U/S DATA   STATION    INVERT  SECT                                            W S ELEV
                               1065.910    6.910    1                                              6.910
```

```
 FILE: 624_EX-B.WSW                    W S P G W - CIVILDESIGN Version 14.06                                  PAGE    1
                              Program Package Serial Number: 1841
                                                WATER SURFACE PROFILE LISTING                Date: 5-31-2019  Time:11:29: 3
                         "3111 MANCHESTER" HYDRAULICS                                0
                           Prepared By: URBAN RESOURCE CORPORATION
                             Detention Outlet - 24" CMP          Filename: 624_EX-B.wsw
************************************************************************************************************ ********
         | Invert  |  Depth | Water   |    Q    |  Vel     Vel  |  Energy | Super  |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)   Head  | Grd.El.|  Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
        -|-       -|-      -|-       -|-       -|-      -|-    -|-      -|-      -|-      -|-      -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |        |         |         |        SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****  |*******
         |         |        |         |         |              |         |        |        |        |       |       |       |
 1000.000    6.450   1.606     8.056     20.00     7.40     .85     8.91     .00     1.61     1.59    2.000    .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-      -|-    -|-      -|-      -|-      -|-      -|-     -|-     -|-      |-
     .627    .0070                                         .0222      .01    1.61     1.00     2.00    .022      .00   .00  PIPE
         |         |        |         |         |              |         |        |        |        |       |       |       |
 1000.627    6.454   1.693     8.147     20.00     7.05     .77     8.92     .00     1.61     1.44    2.000    .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-      -|-    -|-      -|-      -|-      -|-      -|-     -|-     -|-      |-
    2.504    .0070                                         .0205      .05    1.69      .89     2.00    .022      .00   .00  PIPE
         |         |        |         |         |              |         |        |        |        |       |       |       |
 1003.131    6.472   1.797     8.269     20.00     6.72     .70     8.97     .00     1.61     1.21    2.000    .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-      -|-    -|-      -|-      -|-      -|-      -|-     -|-     -|-      |-
    6.826    .0070                                         .0198      .14    1.80      .76     2.00    .022      .00   .00  PIPE
         |         |        |         |         |              |         |        |        |        |       |       |       |
 1009.957    6.519   1.948     8.468     20.00     6.41     .64     9.11     .00     1.61      .64    2.000    .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-      -|-    -|-      -|-      -|-      -|-      -|-     -|-     -|-      |-
    3.197    .0070                                         .0204      .07    1.95      .51     2.00    .022      .00   .00  PIPE
         |         |        |         |         |              |         |        |        |        |       |       |       |
 1013.154    6.542   2.000     8.542     20.00     6.37     .63     9.17     .00     1.61      .00    2.000    .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-      -|-    -|-      -|-      -|-      -|-      -|-     -|-     -|-      |-
   52.756    .0070                                         .0217     1.15    2.00      .00     2.00    .022      .00   .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |              |         |        |        |        |       |       |       |
 1065.910    6.910   2.813     9.723     20.00     6.37     .63    10.35     .00     1.61      .00    2.000    .000   .00   0    .0
        -|-       -|-      -|-       -|-       -|-      -|-    -|-      -|-      -|-      -|-      -|-     -|-     -|-      |-

 FILE: 624_EX-B.WSW                    W S P G W - CIVILDESIGN Version 14.06                                  PAGE    1
                              Program Package Serial Number: 1841
                                                WATER SURFACE PROFILE LISTING                Date: 5-31-2019  Time:11:29: 3
                         "3111 MANCHESTER" HYDRAULICS                                0
                           Prepared By: URBAN RESOURCE CORPORATION
                             Detention Outlet - 24" CMP          Filename: 624_EX-B.wsw
************************************************************************************************************ ********
         | Invert  |  Depth | Water   |    Q    |  Vel     Vel  |  Energy | Super  |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)   Head  | Grd.El.|  Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
        -|-       -|-      -|-       -|-       -|-      -|-    -|-      -|-      -|-      -|-      -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |        |         |         |        SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****  |*******
         |         |        |         |         |              |         |        |        |        |       |       |       |
 1000.000    6.450   1.642     8.092     21.00     7.61     .90     8.99     .00     1.64     1.53    2.000    .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-      -|-    -|-      -|-      -|-      -|-      -|-     -|-     -|-      |-
     .671    .0070                                         .0236      .02    1.64     1.00     2.00    .022      .00   .00  PIPE
         |         |        |         |         |              |         |        |        |        |       |       |       |
 1000.671    6.455   1.735     8.189     21.00     7.26     .82     9.01     .00     1.64     1.36    2.000    .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-      -|-    -|-      -|-      -|-      -|-      -|-     -|-     -|-      |-
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    2.805    .0070                                                   .0220     .06    1.73     .88    2.00    .022       .00    .00  PIPE
          |         |        |         |         |              |         |        |        |        |        |       |       |
  1003.476     6.474    1.851     8.325     21.00    6.92      .74     9.07     .00    1.64    1.05    2.000     .000    .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-       -|-      -|-      -|-      -|-      -|-      -|-     |-
    6.513    .0070                                                   .0223     .15    1.85     .72    2.00    .022       .00    .00  PIPE
          |         |        |         |         |              |         |        |        |        |        |       |       |
  1009.988     6.520    2.000     8.520     21.00    6.68      .69     9.21     .00    1.64     .00    2.000     .000    .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-       -|-      -|-      -|-      -|-      -|-      -|-     |-
   55.922    .0070                                                   .0239    1.34    2.00     .00    2.00    .022       .00    .00  PIPE
  WALL   ENTRANCE
          |         |        |         |         |              |         |        |        |        |        |       |       |
  1065.910     6.910    2.990     9.900     21.00    6.68      .69    10.59     .00    1.64     .00    2.000     .000    .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-       -|-      -|-      -|-      -|-      -|-      -|-     |-
↑
↑ FILE: 624_EX-B.WSW                         W S P G W - CIVILDESIGN Version 14.06                                PAGE    1
                            Program Package Serial Number: 1841
                                              WATER SURFACE PROFILE LISTING                     Date: 5-31-2019  Time:11:29: 3
                      "3111 MANCHESTER" HYDRAULICS                                  0
                        Prepared By: URBAN RESOURCE CORPORATION
                          Detention Outlet - 24" CMP            Filename: 624_EX-B.wsw
************************************************************************************************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head | Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-      -|-       -|-      -|-      -|-      -|-      -|-      -|-    -|
  L/Elem  |Ch Slope |        |         |         |        SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall| ZR   |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
          |         |        |         |         |              |         |        |        |        |        |       |       |
  1000.000     6.450    1.675     8.125     22.00    7.83      .95     9.08     .00    1.68    1.48    2.000     .000    .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-       -|-      -|-      -|-      -|-      -|-      -|-     |-
     .725    .0070                                                   .0251     .02    1.68    1.00    2.00    .022       .00    .00  PIPE
          |         |        |         |         |              |         |        |        |        |        |       |       |
  1000.725     6.455    1.775     8.230     22.00    7.47      .87     9.10     .00    1.68    1.26    2.000     .000    .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-       -|-      -|-      -|-      -|-      -|-      -|-     |-
    3.313    .0070                                                   .0238     .08    1.77     .86    2.00    .022       .00    .00  PIPE
          |         |        |         |         |              |         |        |        |        |        |       |       |
  1004.038     6.478    1.909     8.387     22.00    7.12      .79     9.17     .00    1.68     .83    2.000     .000    .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-       -|-      -|-      -|-      -|-      -|-      -|-     |-
    3.743    .0070                                                   .0245     .09    1.91     .65    2.00    .022       .00    .00  PIPE
          |         |        |         |         |              |         |        |        |        |        |       |       |
  1007.781     6.504    2.000     8.504     22.00    7.00      .76     9.27     .00    1.68     .00    2.000     .000    .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-       -|-      -|-      -|-      -|-      -|-      -|-     |-
   58.129    .0070                                                   .0263    1.53    2.00     .00    2.00    .022       .00    .00  PIPE
  WALL   ENTRANCE
          |         |        |         |         |              |         |        |        |        |        |       |       |
  1065.910     6.910    3.169    10.079     22.00    7.00      .76    10.84     .00    1.68     .00    2.000     .000    .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-       -|-      -|-      -|-      -|-      -|-      -|-     |-
↑
↑ FILE: 624_EX-B.WSW                         W S P G W - CIVILDESIGN Version 14.06                                PAGE    1
                            Program Package Serial Number: 1841
                                              WATER SURFACE PROFILE LISTING                     Date: 5-31-2019  Time:11:29: 3
                      "3111 MANCHESTER" HYDRAULICS                                  0
                        Prepared By: URBAN RESOURCE CORPORATION
                          Detention Outlet - 24" CMP            Filename: 624_EX-B.wsw
************************************************************************************************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head | Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
```

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         -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     -|
 L/Elem  |Ch Slope |        |         |         |       |SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1000.000    6.450   1.706    8.156     23.00    8.06    1.01     9.16      .00    1.71     1.42     2.000    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
     .794   .0070                                       .0268      .02     1.71    1.00     2.00     .022     .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1000.794    6.456   1.813    8.269     23.00    7.68     .92     9.19      .00    1.71     1.16     2.000    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
    4.739   .0070                                       .0270      .13     1.81     .84     2.00     .022     .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1005.533    6.489   1.991    8.480     23.00    7.32     .83     9.31      .00    1.71      .26     2.000    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
     .372   .0070                                       .0279      .01     1.99     .37     2.00     .022     .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1005.905    6.491   2.000    8.491     23.00    7.32     .83     9.32      .00    1.71      .00     2.000    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
   60.005   .0070                                       .0287     1.72     2.00     .00     2.00     .022     .00   .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1065.910    6.910   3.358   10.268     23.00    7.32     .83    11.10      .00    1.71      .00     2.000    .000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
↑
↑ FILE: 624_EX-B.WSW                   W S P G W - CIVILDESIGN Version 14.06                                PAGE    1
                              Program Package Serial Number: 1841
                                          WATER SURFACE PROFILE LISTING               Date: 5-31-2019  Time:11:29: 3
                         "3111 MANCHESTER" HYDRAULICS                         0
                          Prepared By: URBAN RESOURCE CORPORATION
                           Detention Outlet - 24" CMP         Filename: 624_EX-B.wsw
************************************************************************************************************** ********
         | Invert  | Depth  | Water   |    Q    | Vel    Vel   | Energy  | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)  Head  | Grd.El. | Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL |Prs/Pip
         -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     -|
 L/Elem  |Ch Slope |        |         |         |       |SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1000.000    6.450   1.718    8.168     23.40    8.15    1.03     9.20      .00    1.72     1.39     2.000    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
     .829   .0070                                       .0276      .02     1.72    1.00     2.00     .022     .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1000.829    6.456   1.829    8.284     23.40    7.77     .94     9.22      .00    1.72     1.12     2.000    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
    4.587   .0070                                       .0277      .13     1.83     .83     2.00     .022     .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1005.415    6.488   2.000    8.488     23.40    7.45     .86     9.35      .00    1.72      .00     2.000    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
   60.495   .0070                                       .0297     1.80     2.00     .00     2.00     .022     .00   .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1065.910    6.910   3.431   10.341     23.40    7.45     .86    11.20      .00    1.72      .00     2.000    .000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
↑
↑ FILE: 624_EX-B.WSW                   W S P G W - CIVILDESIGN Version 14.06                                PAGE    1
                              Program Package Serial Number: 1841
                                          WATER SURFACE PROFILE LISTING               Date: 5-31-2019  Time:11:29: 3
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                                                                     624_EX-B.OUT
                        "3111 MANCHESTER" HYDRAULICS                          0
                         Prepared By: URBAN RESOURCE CORPORATION
                          Detention Outlet - 24" CMP          Filename: 624_EX-B.wsw
************************************************************************************************** ********
         | Invert  |  Depth | Water   |    Q    |  Vel     Vel   |  Energy  | Super  |Critical|Flow Top|Height/|Base Wt|     |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head  | Grd.El.| Elev   | Depth  | Width  |Dia.-FT|or I.D.|  ZL |Prs/Pip
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-   -|
 L/Elem  |Ch Slope |        |         |         |               SF Ave|   HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |               |         |        |        |        |       |       |     |
 1000.000    6.450    1.721    8.171     23.50     8.17    1.04     9.21     .00     1.72     1.39    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-   |-
    .844   .0070                                         .0277      .02     1.72    1.00     2.00    .022     .00   .00  PIPE
         |         |        |         |         |               |         |        |        |        |       |       |     |
 1000.844    6.456    1.833    8.289     23.50     7.79     .94     9.23     .00     1.72     1.11    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-   |-
   4.446   .0070                                         .0280      .12     1.83     .83     2.00    .022     .00   .00  PIPE
         |         |        |         |         |               |         |        |        |        |       |       |     |
 1005.291    6.487    2.000    8.487     23.50     7.48     .87     9.36     .00     1.72      .00    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-   |-
  60.619   .0070                                         .0300     1.82     2.00     .00     2.00    .022     .00   .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |               |         |        |        |        |       |       |     |
 1065.910    6.910    3.450   10.360     23.50     7.48     .87    11.23     .00     1.72      .00    2.000    .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-   |-

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↑ FILE: 624_EX-B.WSW                    W S P G W - CIVILDESIGN Version 14.06                                PAGE    1
                             Program Package Serial Number: 1841
                                         WATER SURFACE PROFILE LISTING                Date: 5-31-2019  Time:11:29: 3
                        "3111 MANCHESTER" HYDRAULICS                          0
                         Prepared By: URBAN RESOURCE CORPORATION
                          Detention Outlet - 24" CMP          Filename: 624_EX-B.wsw
************************************************************************************************** ********
         | Invert  |  Depth | Water   |    Q    |  Vel     Vel   |  Energy  | Super  |Critical|Flow Top|Height/|Base Wt|     |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head  | Grd.El.| Elev   | Depth  | Width  |Dia.-FT|or I.D.|  ZL |Prs/Pip
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-   -|
 L/Elem  |Ch Slope |        |         |         |               SF Ave|   HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |               |         |        |        |        |       |       |     |
 1000.000    6.450    1.723    8.173     23.60     8.20    1.04     9.22     .00     1.72     1.38    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-   |-
    .841   .0070                                         .0279      .02     1.72    1.00     2.00    .022     .00   .00  PIPE
         |         |        |         |         |               |         |        |        |        |       |       |     |
 1000.841    6.456    1.836    8.292     23.60     7.82     .95     9.24     .00     1.72     1.10    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-   |-
   4.327   .0070                                         .0282      .12     1.84     .83     2.00    .022     .00   .00  PIPE
         |         |        |         |         |               |         |        |        |        |       |       |     |
 1005.168    6.486    2.000    8.486     23.60     7.51     .88     9.36     .00     1.72      .00    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-   |-
  60.742   .0070                                         .0302     1.84     2.00     .00     2.00    .022     .00   .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |               |         |        |        |        |       |       |     |
 1065.910    6.910    3.469   10.379     23.60     7.51     .88    11.26     .00     1.72      .00    2.000    .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-   |-

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↑ FILE: 624_EX-B.WSW                    W S P G W - CIVILDESIGN Version 14.06                                PAGE    1
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                    Program Package Serial Number: 1841
                                   WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11:29: 4
                 "3111 MANCHESTER" HYDRAULICS                          0
                   Prepared By: URBAN RESOURCE CORPORATION
                    Detention Outlet - 24" CMP           Filename: 624_EX-B.wsw
************************************************************************************************************ ********
         | Invert  | Depth  | Water   |   Q     | Vel     Vel   | Energy  | Super  |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station | Elev    | (FT)   | Elev    | (CFS)   | (FPS)   Head  | Grd.El. | Elev   | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     -|
 L/Elem  |Ch Slope |        |         |         |       SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |             |         |        |        |        |       |       |       |
 1000.000    6.450   1.727     8.177     23.70    8.22    1.05     9.23      .00     1.73     1.37    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
    .861   .0070                                        .0281      .02     1.73     1.00     2.00    .022      .00   .00  PIPE
         |         |        |         |         |             |         |        |        |        |       |       |       |
 1000.861    6.456   1.840     8.296     23.70    7.84     .95     9.25      .00     1.73     1.08    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
   4.190   .0070                                        .0284      .12     1.84      .83     2.00    .022      .00   .00  PIPE
         |         |        |         |         |             |         |        |        |        |       |       |       |
 1005.051    6.485   2.000     8.485     23.70    7.54     .88     9.37      .00     1.73      .00    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
  60.859   .0070                                        .0305     1.86     2.00      .00     2.00    .022      .00   .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |             |         |        |        |        |       |       |       |
 1065.910    6.910   3.488    10.398     23.70    7.54     .88    11.28      .00     1.73      .00    2.000    .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
↑
↑ FILE: 624_EX-B.WSW                W S P G W - CIVILDESIGN Version 14.06                                    PAGE    1
                    Program Package Serial Number: 1841
                                   WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11:29: 4
                 "3111 MANCHESTER" HYDRAULICS                          0
                   Prepared By: URBAN RESOURCE CORPORATION
                    Detention Outlet - 24" CMP           Filename: 624_EX-B.wsw
************************************************************************************************************ ********
         | Invert  | Depth  | Water   |   Q     | Vel     Vel   | Energy  | Super  |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station | Elev    | (FT)   | Elev    | (CFS)   | (FPS)   Head  | Grd.El. | Elev   | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     -|
 L/Elem  |Ch Slope |        |         |         |       SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |             |         |        |        |        |       |       |       |
 1000.000    6.450   1.729     8.179     23.80    8.24    1.06     9.23      .00     1.73     1.37    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
    .871   .0070                                        .0283      .02     1.73     1.00     2.00    .022      .00   .00  PIPE
         |         |        |         |         |             |         |        |        |        |       |       |       |
 1000.871    6.456   1.844     8.300     23.80    7.86     .96     9.26      .00     1.73     1.07    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
   4.064   .0070                                        .0286      .12     1.84      .82     2.00    .022      .00   .00  PIPE
         |         |        |         |         |             |         |        |        |        |       |       |       |
 1004.935    6.484   2.000     8.484     23.80    7.58     .89     9.38      .00     1.73      .00    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
  60.975   .0070                                        .0308     1.88     2.00      .00     2.00    .022      .00   .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |             |         |        |        |        |       |       |       |
 1065.910    6.910   3.507    10.417     23.80    7.58     .89    11.31      .00     1.73      .00    2.000    .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
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↑
↑ FILE: 624_EX-B.WSW                   W S P G W - CIVILDESIGN Version 14.06                             PAGE    1
                          Program Package Serial Number: 1841
                                        WATER SURFACE PROFILE LISTING                Date: 5-31-2019  Time:11:29: 4
                     "3111 MANCHESTER" HYDRAULICS                               0
                       Prepared By: URBAN RESOURCE CORPORATION
                         Detention Outlet - 24" CMP           Filename: 624_EX-B.wsw
************************************************************************************************************************ ********
         | Invert  | Depth  | Water   |    Q    |  Vel     Vel   |  Energy  | Super  |Critical|Flow Top|Height/|Base Wt|     |No Wth
 Station |  Elev   | (FT)   |  Elev   |  (CFS)  | (FPS)    Head  | Grd.El.| Elev   | Depth  | Width  |Dia.-FT|or I.D.| ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-   -|
 L/Elem  |Ch Slope |        |         |         |           SF Ave|   HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall| ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |               |          |        |        |        |       |       |     |
 1000.000    6.450   1.732     8.182     23.90     8.27    1.06      9.24     .00     1.73     1.36    2.000     .000   .00  1   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
    .878   .0070                                               .0285      .03     1.73     1.00     2.00    .022      .00   .00 PIPE
         |         |        |         |         |               |          |        |        |        |       |       |     |
 1000.878    6.456   1.847     8.304     23.90     7.88     .96      9.27     .00     1.73     1.06    2.000     .000   .00  1   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
   3.943   .0070                                               .0289      .11     1.85      .82     2.00    .022      .00   .00 PIPE
         |         |        |         |         |               |          |        |        |        |       |       |     |
 1004.821    6.484   2.000     8.484     23.90     7.61     .90      9.38     .00     1.73      .00    2.000     .000   .00  1   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
  61.089   .0070                                               .0310     1.89     2.00      .00     2.00    .022      .00   .00 PIPE
 WALL  ENTRANCE
         |         |        |         |         |               |          |        |        |        |       |       |     |
 1065.910    6.910   3.526    10.436     23.90     7.61     .90     11.34     .00     1.73      .00    2.000     .000   .00  0   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
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                                                                            624_EX-C.EDT
FILE: 624_EX-C.WSW                          W S P G W  - EDIT LISTING - Version 14.06            Date: 5-31-2019  Time:11:29:14
                                        WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING                             PAGE    1
 CARD  SECT  CHN   NO OF  AVE PIER  HEIGHT 1  BASE    ZL     ZR    INV   Y(1)  Y(2)  Y(3)  Y(4)  Y(5)  Y(6)  Y(7)  Y(8)  Y(9)  Y(10)
 CODE   NO   TYPE PIER/PIP WIDTH    DIAMETER  WIDTH                DROP

 CD      1    4      1             2.000
 CD      2    4      1             1.500
 CD      3    4      1             1.000
                                                   W S P G W                                                PAGE NO   1
                              WATER SURFACE PROFILE - TITLE CARD LISTING
HEADING LINE NO 1 IS -
                                "3111 MANCHESTER" HYDRAULICS                                  0
HEADING LINE NO 2 IS -
                                Prepared By: URBAN RESOURCE CORPORATION
HEADING LINE NO 3 IS -
                                Detention Outlet - 24" CMP            Filename: 624_EX-C.wsw
                                                   W S P G W                                                PAGE NO   2
                              WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO    1 IS A SYSTEM OUTLET     *         *     *
                      U/S DATA   STATION    INVERT  SECT                                         W S ELEV
                                 1000.000    7.530    1                                             7.530
 ELEMENT NO    2 IS A REACH             *         *     *
                      U/S DATA   STATION    INVERT  SECT              N                                RADIUS    ANGLE     ANG PT  MAN H
                                 1069.070    8.210    1              .022                               .000      .000      .000     0
 ELEMENT NO    3 IS A  WALL  ENTRANCE                   *
                      U/S DATA   STATION    INVERT  SECT              FP
                                 1069.070    8.210    1              .022
 ELEMENT NO    4 IS A SYSTEM HEADWORKS                  *                      *
                      U/S DATA   STATION    INVERT  SECT                                         W S ELEV
                                 1069.070    8.210    1                                           8.210
```

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↑ FILE: 624_EX-C.WSW                          W S P G W - CIVILDESIGN Version 14.06                                  PAGE    1
                               Program Package Serial Number: 1841
                                                   WATER SURFACE PROFILE LISTING                 Date: 5-31-2019  Time:11:29:16
                         "3111 MANCHESTER" HYDRAULICS                                 0
                           Prepared By: URBAN RESOURCE CORPORATION
                             Detention Outlet - 24" CMP           Filename: 624_EX-C.wsw
 ************************************************************************************************************************** ********
          | Invert  | Depth  | Water   |    Q    |  Vel     Vel  |  Energy | Super  |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station  |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
         -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-      -|-      -|-      -|-     -|-     -|-     -|
 L/Elem   |Ch Slope |        |         |         |         SF Ave|   HF    |SE Dpth |Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
 *********|*********|********|*********|*********|*******|*******|*********|********|********|********|*******|*******|*****  |*******
          |         |        |         |         |       |       |         |        |        |        |       |       |       |
 1000.000     7.530    1.396     8.926     15.00    6.41     .64      9.56      .00     1.40     1.84    2.000     .000    .00   1    .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
     .723     .0098                                       .0171       .01     1.40     1.00     2.00     .022      .00    .00  PIPE
          |         |        |         |         |       |       |         |        |        |        |       |       |       |
 1000.723     7.537    1.459     8.996     15.00    6.11     .58      9.58      .00     1.40     1.78    2.000     .000    .00   1    .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
    2.954     .0098                                       .0153       .05     1.46      .92     2.00     .022      .00    .00  PIPE
          |         |        |         |         |       |       |         |        |        |        |       |       |       |
 1003.678     7.566    1.528     9.094     15.00    5.82     .53      9.62      .00     1.40     1.70    2.000     .000    .00   1    .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
    7.171     .0098                                       .0138       .10     1.53      .83     2.00     .022      .00    .00  PIPE
          |         |        |         |         |       |       |         |        |        |        |       |       |       |
 1010.849     7.637    1.604     9.241     15.00    5.55     .48      9.72      .00     1.40     1.59    2.000     .000    .00   1    .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
   16.088     .0098                                       .0125       .20     1.60      .75     2.00     .022      .00    .00  PIPE
          |         |        |         |         |       |       |         |        |        |        |       |       |       |
 1026.937     7.795    1.691     9.486     15.00    5.29     .44      9.92      .00     1.40     1.45    2.000     .000    .00   1    .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
   37.896     .0098                                       .0115       .44     1.69      .67     2.00     .022      .00    .00  PIPE
          |         |        |         |         |       |       |         |        |        |        |       |       |       |
 1064.833     8.168    1.795     9.963     15.00    5.05     .40     10.36      .00     1.40     1.21    2.000     .000    .00   1    .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
    4.236     .0098                                       .0111       .05     1.79      .57     2.00     .022      .00    .00  PIPE
 WALL   ENTRANCE
          |         |        |         |         |       |       |         |        |        |        |       |       |       |
 1069.070     8.210    1.803    10.013     15.00    5.03     .39     10.41      .00     1.40     1.19    2.000     .000    .00   0    .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
↑
↑ FILE: 624_EX-C.WSW                          W S P G W - CIVILDESIGN Version 14.06                                  PAGE    1
                               Program Package Serial Number: 1841
                                                   WATER SURFACE PROFILE LISTING                 Date: 5-31-2019  Time:11:29:16
                         "3111 MANCHESTER" HYDRAULICS                                 0
                           Prepared By: URBAN RESOURCE CORPORATION
                             Detention Outlet - 24" CMP           Filename: 624_EX-C.wsw
 ************************************************************************************************************************** ********
          | Invert  | Depth  | Water   |    Q    |  Vel     Vel  |  Energy | Super  |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station  |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
         -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-      -|-      -|-      -|-     -|-     -|-     -|
 L/Elem   |Ch Slope |        |         |         |         SF Ave|   HF    |SE Dpth |Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
 *********|*********|********|*********|*********|*******|*******|*********|********|********|********|*******|*******|*****  |*******
          |         |        |         |         |       |       |         |        |        |        |       |       |       |
 1000.000     7.530    1.442     8.972     16.00    6.60     .68      9.65      .00     1.44     1.79    2.000     .000    .00   1    .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
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    .706    .0098                                             .0180     .01   1.44   1.00    2.00   .022      .00   .00  PIPE
          |         |        |         |         |                 |          |        |        |         |        |       |      |
  1000.706    7.537    1.509     9.046     16.00     6.29      .61     9.66    .00   1.44    1.72   2.000    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-      -|-    -|-     -|-     -|-     -|-     -|-     |-
    2.906   .0098                                             .0162     .05   1.51    .91    2.00   .022      .00   .00  PIPE
          |         |        |         |         |                 |          |        |        |         |        |       |      |
  1003.612    7.566    1.583     9.149     16.00     6.00      .56     9.71    .00   1.44    1.62   2.000    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-      -|-    -|-     -|-     -|-     -|-     -|-     |-
    6.833   .0098                                             .0146     .10   1.58    .83    2.00   .022      .00   .00  PIPE
          |         |        |         |         |                 |          |        |        |         |        |       |      |
  1010.445    7.633    1.667     9.299     16.00     5.72      .51     9.81    .00   1.44    1.49   2.000    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-      -|-    -|-     -|-     -|-     -|-     -|-     |-
   14.604   .0098                                             .0134     .20   1.67    .74    2.00   .022      .00   .00  PIPE
          |         |        |         |         |                 |          |        |        |         |        |       |      |
  1025.049    7.777    1.765     9.541     16.00     5.45      .46    10.00    .00   1.44    1.29   2.000    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-      -|-    -|-     -|-     -|-     -|-     -|-     |-
   31.319   .0098                                             .0126     .40   1.76    .64    2.00   .022      .00   .00  PIPE
          |         |        |         |         |                 |          |        |        |         |        |       |      |
  1056.367    8.085    1.894     9.978     16.00     5.20      .42    10.40    .00   1.44     .90   2.000    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-      -|-    -|-     -|-     -|-     -|-     -|-     |-
   12.703   .0098                                             .0125     .16   1.89    .50    2.00   .022      .00   .00  PIPE
 WALL  ENTRANCE
          |         |        |         |         |                 |          |        |        |         |        |       |      |
  1069.070    8.210    1.937    10.147     16.00     5.14      .41    10.56    .00   1.44     .70   2.000    .000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-      -|-    -|-     -|-     -|-     -|-     -|-     |-
↑
↑ FILE: 624_EX-C.WSW                      W S P G W - CIVILDESIGN Version 14.06                              PAGE    1
                           Program Package Serial Number: 1841
                                          WATER SURFACE PROFILE LISTING                     Date: 5-31-2019   Time:11:29:16
                       "3111 MANCHESTER" HYDRAULICS                                   0
                         Prepared By: URBAN RESOURCE CORPORATION
                           Detention Outlet - 24" CMP            Filename: 624_EX-C.wsw
************************************************************************************************************************** ********
          | Invert  | Depth  |  Water  |    Q    |  Vel     Vel   |  Energy  | Super  |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station  |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head  | Grd.El.| Elev   | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
         -|-       -|-      -|-       -|-       -|-      -|-      -|-      -|-    -|-     -|-     -|-     -|-     -|-     -|
 L/Elem   |Ch Slope |        |         |         |         SF Ave|    HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
          |         |        |         |         |                 |          |        |        |         |        |       |      |
  1000.000    7.530    1.486     9.016     17.00     6.79      .72     9.73    .00   1.49    1.75   2.000    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-      -|-    -|-     -|-     -|-     -|-     -|-     |-
    .718    .0098                                             .0189     .01   1.49   1.00    2.00   .022      .00   .00  PIPE
          |         |        |         |         |                 |          |        |        |         |        |       |      |
  1000.718    7.537    1.558     9.095     17.00     6.48      .65     9.75    .00   1.49    1.66   2.000    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-      -|-    -|-     -|-     -|-     -|-     -|-     |-
    2.891   .0098                                             .0170     .05   1.56    .91    2.00   .022      .00   .00  PIPE
          |         |        |         |         |                 |          |        |        |         |        |       |      |
  1003.609    7.566    1.638     9.203     17.00     6.17      .59     9.80    .00   1.49    1.54   2.000    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-      -|-    -|-     -|-     -|-     -|-     -|-     |-
    6.732   .0098                                             .0155     .10   1.64    .81    2.00   .022      .00   .00  PIPE
          |         |        |         |         |                 |          |        |        |         |        |       |      |
  1010.341    7.632    1.730     9.362     17.00     5.89      .54     9.90    .00   1.49    1.37   2.000    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-      -|-    -|-     -|-     -|-     -|-     -|-     |-
   14.325   .0098                                             .0144     .21   1.73    .71    2.00   .022      .00   .00  PIPE
          |         |        |         |         |                 |          |        |        |         |        |       |      |
  1024.666    7.773    1.845     9.617     17.00     5.61      .49    10.11    .00   1.49    1.07   2.000    .000   .00   1   .0
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         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-      -|-      -|-      |-
  25.350    .0098                                            .0146      .37     1.84      .59     2.00     .022      .00    .00  PIPE
           |          |        |         |         |                |         |        |        |        |        |        |      |
 1050.016     8.022    2.000    10.022     17.00    5.41       .45    10.48      .00     1.49      .00    2.000     .000    .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-      -|-      -|-      |-
  19.054    .0098                                            .0157      .30     2.00      .00     2.00     .022      .00    .00  PIPE
 WALL  ENTRANCE
           |          |        |         |         |                |         |        |        |        |        |        |      |
 1069.070     8.210    2.121    10.331     17.00    5.41       .45    10.79      .00     1.49      .00    2.000     .000    .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-      -|-      -|-      |-

 FILE: 624_EX-C.WSW                   W S P G W - CIVILDESIGN Version 14.06                                          PAGE    1
                          Program Package Serial Number: 1841
                                         WATER SURFACE PROFILE LISTING                      Date: 5-31-2019  Time:11:29:17
                      "3111 MANCHESTER" HYDRAULICS                                 0
                         Prepared By: URBAN RESOURCE CORPORATION
                           Detention Outlet - 24" CMP              Filename: 624_EX-C.wsw
*********************************************************************************************************************** ********
           | Invert  | Depth  | Water   |    Q    |  Vel     Vel   | Energy  | Super  |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station   |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head  | Grd.El. | Elev   | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-      -|-      -|-     -|
 L/Elem    |Ch Slope |        |         |         |        SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
           |          |        |         |         |                |         |        |        |        |        |        |      |
 1000.000     7.530    1.491     9.021     17.10    6.81       .72     9.74      .00     1.49     1.74    2.000     .000    .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-      -|-      -|-      |-
    .723    .0098                                            .0190      .01     1.49     1.00     2.00     .022      .00    .00  PIPE
           |          |        |         |         |                |         |        |        |        |        |        |      |
 1000.723     7.537    1.563     9.100     17.10    6.49       .65     9.75      .00     1.49     1.65    2.000     .000    .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-      -|-      -|-      |-
   2.894    .0098                                            .0171      .05     1.56      .91     2.00     .022      .00    .00  PIPE
           |          |        |         |         |                |         |        |        |        |        |        |      |
 1003.617     7.566    1.643     9.209     17.10    6.19       .60     9.80      .00     1.49     1.53    2.000     .000    .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-      -|-      -|-      |-
   6.778    .0098                                            .0156      .11     1.64      .81     2.00     .022      .00    .00  PIPE
           |          |        |         |         |                |         |        |        |        |        |        |      |
 1010.395     7.632    1.737     9.369     17.10    5.90       .54     9.91      .00     1.49     1.35    2.000     .000    .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-      -|-      -|-      |-
  14.367    .0098                                            .0146      .21     1.74      .71     2.00     .022      .00    .00  PIPE
           |          |        |         |         |                |         |        |        |        |        |        |      |
 1024.763     7.774    1.854     9.627     17.10    5.63       .49    10.12      .00     1.49     1.04    2.000     .000    .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-      -|-      -|-      |-
  23.250    .0098                                            .0148      .34     1.85      .58     2.00     .022      .00    .00  PIPE
           |          |        |         |         |                |         |        |        |        |        |        |      |
 1048.013     8.003    2.000    10.003     17.10    5.44       .46    10.46      .00     1.49      .00    2.000     .000    .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-      -|-      -|-      |-
  21.057    .0098                                            .0159      .33     2.00      .00     2.00     .022      .00    .00  PIPE
 WALL  ENTRANCE
           |          |        |         |         |                |         |        |        |        |        |        |      |
 1069.070     8.210    2.137    10.347     17.10    5.44       .46    10.81      .00     1.49      .00    2.000     .000    .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-      -|-      -|-      |-

 FILE: 624_EX-C.WSW                   W S P G W - CIVILDESIGN Version 14.06                                          PAGE    1
                          Program Package Serial Number: 1841
                                         WATER SURFACE PROFILE LISTING                      Date: 5-31-2019  Time:11:29:17
                      "3111 MANCHESTER" HYDRAULICS                                 0
```

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                   Prepared By: URBAN RESOURCE CORPORATION
                     Detention Outlet - 24" CMP            Filename: 624_EX-C.wsw
******************************************************************************************************** ********
         | Invert  | Depth  | Water   |    Q    |  Vel   Vel   | Energy  | Super  |Critical|Flow Top|Height/|Base Wt|      |No Wth
Station  |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)  Head  | Grd.El. | Elev   | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-      -|-      -|-      -|-     -|-     -|-    -|
L/Elem   |Ch Slope |        |         |         |        SF Ave|   HF    |SE Dpth |Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |              |         |        |        |        |       |       |      |
1000.000    7.530    1.495     9.025     17.20    6.83     .72     9.75     .00      1.49     1.74    2.000    .000   .00    1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    |-
   .726    .0098                                          .0191     .01     1.49     1.00     2.00    .022      .00   .00  PIPE
         |         |        |         |         |              |         |        |        |        |       |       |      |
1000.726    7.537    1.568     9.105     17.20    6.51     .66     9.76     .00      1.49     1.65    2.000    .000   .00    1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    |-
  2.908    .0098                                          .0172     .05     1.57      .91     2.00    .022      .00   .00  PIPE
         |         |        |         |         |              |         |        |        |        |       |       |      |
1003.634    7.566    1.649     9.215     17.20    6.21     .60     9.81     .00      1.49     1.52    2.000    .000   .00    1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    |-
  6.785    .0098                                          .0157     .11     1.65      .81     2.00    .022      .00   .00  PIPE
         |         |        |         |         |              |         |        |        |        |       |       |      |
1010.418    7.633    1.743     9.376     17.20    5.92     .54     9.92     .00      1.49     1.34    2.000    .000   .00    1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    |-
 14.454    .0098                                          .0147     .21     1.74      .71     2.00    .022      .00   .00  PIPE
         |         |        |         |         |              |         |        |        |        |       |       |      |
1024.872    7.775    1.863     9.637     17.20    5.64     .49    10.13     .00      1.49     1.01    2.000    .000   .00    1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    |-
 21.239    .0098                                          .0149     .32     1.86      .57     2.00    .022      .00   .00  PIPE
         |         |        |         |         |              |         |        |        |        |       |       |      |
1046.111    7.984    2.000     9.984     17.20    5.47     .47    10.45     .00      1.49      .00    2.000    .000   .00    1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    |-
 22.959    .0098                                          .0161     .37     2.00      .00     2.00    .022      .00   .00  PIPE
WALL  ENTRANCE
         |         |        |         |         |              |         |        |        |        |       |       |      |
1069.070    8.210    2.154    10.364     17.20    5.47     .47    10.83     .00      1.49      .00    2.000    .000   .00    0   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    |-
↑
↑ FILE: 624_EX-C.WSW                       W S P G W - CIVILDESIGN Version 14.06                                   PAGE    1
                        Program Package Serial Number: 1841
                                           WATER SURFACE PROFILE LISTING                      Date: 5-31-2019  Time:11:29:17
                  "3111 MANCHESTER" HYDRAULICS                         0
                   Prepared By: URBAN RESOURCE CORPORATION
                     Detention Outlet - 24" CMP            Filename: 624_EX-C.wsw
******************************************************************************************************** ********
         | Invert  | Depth  | Water   |    Q    |  Vel   Vel   | Energy  | Super  |Critical|Flow Top|Height/|Base Wt|      |No Wth
Station  |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)  Head  | Grd.El. | Elev   | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-      -|-      -|-      -|-     -|-     -|-    -|
L/Elem   |Ch Slope |        |         |         |        SF Ave|   HF    |SE Dpth |Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |              |         |        |        |        |       |       |      |
1000.000    7.530    1.499     9.029     17.30    6.85     .73     9.76     .00      1.50     1.73    2.000    .000   .00    1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    |-
   .726    .0098                                          .0192     .01     1.50     1.00     2.00    .022      .00   .00  PIPE
         |         |        |         |         |              |         |        |        |        |       |       |      |
1000.726    7.537    1.572     9.109     17.30    6.53     .66     9.77     .00      1.50     1.64    2.000    .000   .00    1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    |-
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   2.899    .0098                                         .0173     .05     1.57     .91    2.00    .022      .00   .00 PIPE
        |         |        |         |         |       |       |         |       |        |        |       |       |      |
1003.625     7.566    1.654     9.220     17.30    6.23      .60     9.82     .00     1.50     1.51    2.000      .000   .00   1    .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   6.758    .0098                                         .0158     .11     1.65     .81    2.00    .022      .00   .00 PIPE
        |         |        |         |         |       |       |         |       |        |        |       |       |      |
1010.383     7.632    1.749     9.381     17.30    5.94      .55     9.93     .00     1.50     1.32    2.000      .000   .00   1    .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  14.503    .0098                                         .0148     .22     1.75     .71    2.00    .022      .00   .00 PIPE
        |         |        |         |         |       |       |         |       |        |        |       |       |      |
1024.887     7.775    1.871     9.646     17.30    5.66      .50    10.14     .00     1.50      .98    2.000      .000   .00   1    .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  19.398    .0098                                         .0151     .29     1.87     .57    2.00    .022      .00   .00 PIPE
        |         |        |         |         |       |       |         |       |        |        |       |       |      |
1044.284     7.966    2.000     9.966     17.30    5.51      .47    10.44     .00     1.50      .00    2.000      .000   .00   1    .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  24.786    .0098                                         .0162     .40     2.00     .00    2.00    .022      .00   .00 PIPE
WALL  ENTRANCE
        |         |        |         |         |       |       |         |       |        |        |       |       |      |
1069.070     8.210    2.171    10.381     17.30    5.51      .47    10.85     .00     1.50      .00    2.000      .000   .00   0    .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-

↑
↑ FILE: 624_EX-C.WSW                          W S P G W - CIVILDESIGN Version 14.06                                 PAGE    1
                              Program Package Serial Number: 1841
                                                    WATER SURFACE PROFILE LISTING                 Date: 5-31-2019  Time:11:29:17
                        "3111 MANCHESTER" HYDRAULICS                                      0
                          Prepared By: URBAN RESOURCE CORPORATION
                            Detention Outlet - 24" CMP          Filename: 624_EX-C.wsw
************************************************************************************************************************ ********
        | Invert |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|       |No Wth
Station |  Elev  |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head | Grd.El. | Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
       -|-      -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|
L/Elem  |Ch Slope|        |         |         |        SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****  |*******
        |         |        |         |         |       |       |         |       |        |        |       |       |      |
1000.000     7.530    1.504     9.034     17.40    6.87      .73     9.77     .00     1.50     1.73    2.000      .000   .00   1    .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
    .729    .0098                                         .0193     .01     1.50    1.00    2.00    .022      .00   .00 PIPE
        |         |        |         |         |       |       |         |       |        |        |       |       |      |
1000.729     7.537    1.577     9.114     17.40    6.55      .67     9.78     .00     1.50     1.63    2.000      .000   .00   1    .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   2.915    .0098                                         .0174     .05     1.58     .90    2.00    .022      .00   .00 PIPE
        |         |        |         |         |       |       |         |       |        |        |       |       |      |
1003.644     7.566    1.660     9.225     17.40    6.24      .61     9.83     .00     1.50     1.50    2.000      .000   .00   1    .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   6.814    .0098                                         .0159     .11     1.66     .81    2.00    .022      .00   .00 PIPE
        |         |        |         |         |       |       |         |       |        |        |       |       |      |
1010.458     7.633    1.756     9.389     17.40    5.95      .55     9.94     .00     1.50     1.31    2.000      .000   .00   1    .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  14.630    .0098                                         .0150     .22     1.76     .70    2.00    .022      .00   .00 PIPE
        |         |        |         |         |       |       |         |       |        |        |       |       |      |
1025.088     7.777    1.881     9.658     17.40    5.68      .50    10.16     .00     1.50      .95    2.000      .000   .00   1    .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  17.473    .0098                                         .0153     .27     1.88     .56    2.00    .022      .00   .00 PIPE
        |         |        |         |         |       |       |         |       |        |        |       |       |      |
1042.562     7.949    2.000     9.949     17.40    5.54      .48    10.43     .00     1.50      .00    2.000      .000   .00   1    .0
```

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         -|-       -|-      -|-       -|-       -|-      -|-      -|-      -|-      -|-      -|-      -|-      -|-      -|-      |-
  26.508    .0098                                                .0164     .44     2.00     .00     2.00     .022       .00    .00  PIPE
WALL  ENTRANCE
          |         |        |         |         |               |        |        |        |        |        |        |        |
1069.070     8.210    2.188    10.398     17.40    5.54     .48    10.87     .00     1.50      .00    2.000     .000    .00  0   .0
         -|-       -|-      -|-       -|-       -|-      -|-      -|-      -|-      -|-      -|-      -|-      -|-      -|-      |-
↑
↑ FILE: 624_EX-C.WSW                          W S P G W - CIVILDESIGN Version 14.06                                  PAGE    1
                             Program Package Serial Number: 1841
                                                WATER SURFACE PROFILE LISTING                     Date: 5-31-2019  Time:11:29:17
                       "3111 MANCHESTER" HYDRAULICS                                      0
                         Prepared By: URBAN RESOURCE CORPORATION
                           Detention Outlet - 24" CMP            Filename: 624_EX-C.wsw
*************************************************************************************************************************** ********
         | Invert  | Depth | Water   |    Q    |  Vel     Vel  |  Energy  | Super |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station |  Elev   | (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
        -|-       -|-     -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|
 L/Elem  |Ch Slope |       |         |         |        SF Ave|    HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |              |         |        |         |        |        |       |       |
1000.000     7.530   1.507     9.037     17.50    6.89     .74     9.77     .00     1.51     1.72    2.000     .000    .00   1   .0
        -|-       -|-     -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
    .724     .0098                                              .0194     .01     1.51     1.00     2.00     .022      .00    .00  PIPE
         |         |        |         |         |              |         |        |         |        |        |       |       |
1000.724     7.537   1.581     9.118     17.50    6.57     .67     9.79     .00     1.51     1.63    2.000     .000    .00   1   .0
        -|-       -|-     -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   2.903     .0098                                              .0175     .05     1.58      .90     2.00     .022      .00    .00  PIPE
         |         |        |         |         |              |         |        |         |        |        |       |       |
1003.627     7.566   1.665     9.230     17.50    6.26     .61     9.84     .00     1.51     1.49    2.000     .000    .00   1   .0
        -|-       -|-     -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   6.779     .0098                                              .0160     .11     1.66      .81     2.00     .022      .00    .00  PIPE
         |         |        |         |         |              |         |        |         |        |        |       |       |
1010.407     7.632   1.762     9.394     17.50    5.97     .55     9.95     .00     1.51     1.30    2.000     .000    .00   1   .0
        -|-       -|-     -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  14.694     .0098                                              .0151     .22     1.76      .70     2.00     .022      .00    .00  PIPE
         |         |        |         |         |              |         |        |         |        |        |       |       |
1025.101     7.777   1.890     9.667     17.50    5.69     .50    10.17     .00     1.51      .91    2.000     .000    .00   1   .0
        -|-       -|-     -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  15.803     .0098                                              .0155     .24     1.89      .55     2.00     .022      .00    .00  PIPE
         |         |        |         |         |              |         |        |         |        |        |       |       |
1040.904     7.933   2.000     9.933     17.50    5.57     .48    10.41     .00     1.51      .00    2.000     .000    .00   1   .0
        -|-       -|-     -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  28.166     .0098                                              .0166     .47     2.00      .00     2.00     .022      .00    .00  PIPE
WALL  ENTRANCE
         |         |        |         |         |              |         |        |         |        |        |       |       |
1069.070     8.210   2.205    10.415     17.50    5.57     .48    10.90     .00     1.51      .00    2.000     .000    .00   0   .0
        -|-       -|-     -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
↑
↑ FILE: 624_EX-C.WSW                          W S P G W - CIVILDESIGN Version 14.06                                  PAGE    1
                             Program Package Serial Number: 1841
                                                WATER SURFACE PROFILE LISTING                     Date: 5-31-2019  Time:11:29:17
                       "3111 MANCHESTER" HYDRAULICS                                      0
                         Prepared By: URBAN RESOURCE CORPORATION
                           Detention Outlet - 24" CMP            Filename: 624_EX-C.wsw
*************************************************************************************************************************** ********
         | Invert  | Depth | Water   |    Q    |  Vel     Vel  |  Energy  | Super |Critical|Flow Top|Height/|Base Wt|       |No Wth
```

```
 Station |  Elev    |  (FT)  |  Elev    |  (CFS)   | (FPS)    Head |  Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-        -|-      -|-        -|-        -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|
 L/Elem  |Ch Slope  |        |          |          |         SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1000.000    7.530    1.511     9.041     17.60    6.91     .74     9.78     .00    1.51     1.72    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
     .716    .0098                                         .0195      .01    1.51    1.00     2.00    .022     .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1000.716    7.537    1.586     9.123     17.60    6.59     .67     9.80     .00    1.51     1.62    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
    2.906    .0098                                         .0176      .05    1.59     .90     2.00    .022     .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1003.623    7.566    1.670     9.235     17.60    6.28     .61     9.85     .00    1.51     1.49    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
    6.781    .0098                                         .0162      .11    1.67     .81     2.00    .022     .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1010.403    7.632    1.768     9.401     17.60    5.99     .56     9.96     .00    1.51     1.28    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
   14.793    .0098                                         .0153      .23    1.77     .70     2.00    .022     .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1025.196    7.778    1.899     9.677     17.60    5.71     .51    10.18     .00    1.51      .88    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
   14.123    .0098                                         .0157      .22    1.90     .54     2.00    .022     .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1039.319    7.917    2.000     9.917     17.60    5.60     .49    10.40     .00    1.51      .00    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
   29.750    .0098                                         .0168      .50    2.00     .00     2.00    .022     .00   .00  PIPE
 WALL   ENTRANCE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1069.070    8.210    2.223    10.433     17.60    5.60     .49    10.92     .00    1.51      .00    2.000    .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-

^
^ FILE: 624_EX-C.WSW                  W S P G W - CIVILDESIGN Version 14.06                            PAGE     1
                           Program Package Serial Number: 1841
                                        WATER SURFACE PROFILE LISTING                Date: 5-31-2019  Time:11:29:17
                        "3111 MANCHESTER" HYDRAULICS                           0
                          Prepared By: URBAN RESOURCE CORPORATION
                           Detention Outlet - 24" CMP          Filename: 624_EX-C.wsw
************************************************************************************************************** ********
         | Invert  | Depth  | Water    |    Q     |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev    |  (CFS)   | (FPS)    Head |  Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-        -|-      -|-        -|-        -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|
 L/Elem  |Ch Slope  |        |          |          |         SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1000.000    7.530    1.513     9.043     17.63    6.92     .74     9.79     .00    1.51     1.72    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
     .725    .0098                                         .0195      .01    1.51    1.00     2.00    .022     .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1000.725    7.537    1.587     9.124     17.63    6.59     .68     9.80     .00    1.51     1.62    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
    2.897    .0098                                         .0177      .05    1.59     .90     2.00    .022     .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1003.622    7.566    1.671     9.237     17.63    6.29     .61     9.85     .00    1.51     1.48    2.000    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
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    6.814    .0098                                                 .0162      .11     1.67      .81    2.00     .022       .00    .00  PIPE
         |         |        |         |         |                       |         |       |        |        |        |       |      |
 1010.436     7.633    1.770     9.403     17.63     5.99       .56     9.96      .00     1.51     1.28    2.000     .000    .00   1    .0
        -|-       -|-      -|-       -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-      -|-      |-
   14.869    .0098                                                 .0153      .23     1.77      .70    2.00     .022       .00    .00  PIPE
         |         |        |         |         |                       |         |       |        |        |        |       |      |
 1025.305     7.779    1.902     9.681     17.63     5.71       .51    10.19      .00     1.51      .86    2.000     .000    .00   1    .0
        -|-       -|-      -|-       -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-      -|-      |-
   13.554    .0098                                                 .0157      .21     1.90      .53    2.00     .022       .00    .00  PIPE
         |         |        |         |         |                       |         |       |        |        |        |       |      |
 1038.860     7.913    2.000     9.913     17.63     5.61       .49    10.40      .00     1.51      .00    2.000     .000    .00   1    .0
        -|-       -|-      -|-       -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-      -|-      |-
   30.210    .0098                                                 .0169      .51     2.00      .00    2.00     .022       .00    .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |                       |         |       |        |        |        |       |      |
 1069.070     8.210    2.228    10.438     17.63     5.61       .49    10.93      .00     1.51      .00    2.000     .000    .00   0    .0
        -|-       -|-      -|-       -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-      -|-      |-
↑
↑ FILE: 624_EX-C.WSW                          W S P G W - CIVILDESIGN Version 14.06                                 PAGE    1
                                  Program Package Serial Number: 1841
                                                 WATER SURFACE PROFILE LISTING                       Date: 5-31-2019  Time:11:29:17
                             "3111 MANCHESTER" HYDRAULICS                                      0
                               Prepared By: URBAN RESOURCE CORPORATION
                                 Detention Outlet - 24" CMP            Filename: 624_EX-C.wsw
****************************************************************************************************************** ********
         | Invert  | Depth  | Water   |    Q    | Vel     Vel  | Energy  | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)   Head | Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-      -|-   -|-      -|-    -|-      -|-      -|-     -|-     -|-   -|
 L/Elem  |Ch Slope |        |         |         |       SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |                       |         |       |        |        |        |       |      |
 1000.000     7.530    1.513     9.043     17.64     6.92       .74     9.79      .00     1.51     1.72    2.000     .000    .00   1    .0
        -|-       -|-      -|-       -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-      -|-      |-
     .720    .0098                                                 .0195      .01     1.51     1.00    2.00     .022       .00    .00  PIPE
         |         |        |         |         |                       |         |       |        |        |        |       |      |
 1000.720     7.537    1.588     9.125     17.64     6.60       .68     9.80      .00     1.51     1.62    2.000     .000    .00   1    .0
        -|-       -|-      -|-       -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-      -|-      |-
    2.914    .0098                                                 .0177      .05     1.59      .90    2.00     .022       .00    .00  PIPE
         |         |        |         |         |                       |         |       |        |        |        |       |      |
 1003.634     7.566    1.672     9.238     17.64     6.29       .61     9.85      .00     1.51     1.48    2.000     .000    .00   1    .0
        -|-       -|-      -|-       -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-      -|-      |-
    6.796    .0098                                                 .0162      .11     1.67      .81    2.00     .022       .00    .00  PIPE
         |         |        |         |         |                       |         |       |        |        |        |       |      |
 1010.430     7.633    1.771     9.404     17.64     6.00       .56     9.96      .00     1.51     1.27    2.000     .000    .00   1    .0
        -|-       -|-      -|-       -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-      -|-      |-
   14.892    .0098                                                 .0153      .23     1.77      .70    2.00     .022       .00    .00  PIPE
         |         |        |         |         |                       |         |       |        |        |        |       |      |
 1025.323     7.779    1.903     9.683     17.64     5.72       .51    10.19      .00     1.51      .86    2.000     .000    .00   1    .0
        -|-       -|-      -|-       -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-      -|-      |-
   13.382    .0098                                                 .0157      .21     1.90      .53    2.00     .022       .00    .00  PIPE
         |         |        |         |         |                       |         |       |        |        |        |       |      |
 1038.705     7.911    2.000     9.911     17.64     5.61       .49    10.40      .00     1.51      .00    2.000     .000    .00   1    .0
        -|-       -|-      -|-       -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-      -|-      |-
   30.365    .0098                                                 .0169      .51     2.00      .00    2.00     .022       .00    .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |                       |         |       |        |        |        |       |      |
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 1069.070    8.210    2.230   10.440    17.64   5.61    .49    10.93    .00   1.51     .00   2.000    .000   .00  0   .0
        -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-      -|-     -|-     -|-     -|-    |-
↑
↑ FILE: 624_EX-C.WSW                  W S P G W - CIVILDESIGN Version 14.06                                 PAGE     1
                          Program Package Serial Number: 1841
                                     WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11:29:17
                    "3111 MANCHESTER" HYDRAULICS                               0
                     Prepared By: URBAN RESOURCE CORPORATION
                      Detention Outlet - 24" CMP          Filename: 624_EX-C.wsw
******************************************************************************************************************** ********
          | Invert  | Depth  | Water   |   Q     |  Vel    Vel   |  Energy  | Super  |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station  |  Elev   | (FT)   |  Elev   | (CFS)   | (FPS)   Head  | Grd.El.| Elev   | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    -|
 L/Elem   |Ch Slope |        |         |         |         SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
          |         |        |         |         |               |         |        |        |        |       |       |       |
 1000.000    7.530    1.514    9.044    17.65   6.92    .74     9.79    .00   1.51    1.72   2.000    .000   .00  1   .0
        -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-      -|-     -|-     -|-     -|-    |-
    .730   .0098                                      .0195     .01    1.51   1.00    2.00    .022     .00   .00  PIPE
          |         |        |         |         |               |         |        |        |        |       |       |       |
 1000.730    7.537    1.589    9.126    17.65   6.60    .68     9.80    .00   1.51    1.62   2.000    .000   .00  1   .0
        -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-      -|-     -|-     -|-     -|-    |-
   2.926   .0098                                      .0177     .05    1.59    .90    2.00    .022     .00   .00  PIPE
          |         |        |         |         |               |         |        |        |        |       |       |       |
 1003.656    7.566    1.673    9.239    17.65   6.29    .61     9.85    .00   1.51    1.48   2.000    .000   .00  1   .0
        -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-      -|-     -|-     -|-     -|-    |-
   6.823   .0098                                      .0162     .11    1.67    .80    2.00    .022     .00   .00  PIPE
          |         |        |         |         |               |         |        |        |        |       |       |       |
 1010.479    7.633    1.772    9.405    17.65   6.00    .56     9.96    .00   1.51    1.27   2.000    .000   .00  1   .0
        -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-      -|-     -|-     -|-     -|-    |-
  14.980   .0098                                      .0153     .23    1.77    .69    2.00    .022     .00   .00  PIPE
          |         |        |         |         |               |         |        |        |        |       |       |       |
 1025.459    7.781    1.905    9.686    17.65   5.72    .51    10.19    .00   1.51     .85   2.000    .000   .00  1   .0
        -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-      -|-     -|-     -|-     -|-    |-
  13.102   .0098                                      .0158     .21    1.91    .53    2.00    .022     .00   .00  PIPE
          |         |        |         |         |               |         |        |        |        |       |       |       |
 1038.561    7.910    2.000    9.910    17.65   5.62    .49    10.40    .00   1.51     .00   2.000    .000   .00  1   .0
        -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-      -|-     -|-     -|-     -|-    |-
  30.509   .0098                                      .0169     .52    2.00    .00    2.00    .022     .00   .00  PIPE
 WALL  ENTRANCE
          |         |        |         |         |               |         |        |        |        |       |       |       |
 1069.070    8.210    2.231   10.441    17.65   5.62    .49    10.93    .00   1.51     .00   2.000    .000   .00  0   .0
        -|-      -|-      -|-      -|-      -|-     -|-     -|-      -|-     -|-      -|-     -|-     -|-     -|-    |-
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                                                                       624_EX-D.EDT
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                                       WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING                        PAGE    1
 CARD  SECT  CHN   NO OF  AVE PIER  HEIGHT 1  BASE     ZL     ZR    INV   Y(1)  Y(2)  Y(3)  Y(4)  Y(5)  Y(6)  Y(7)  Y(8)  Y(9)  Y(10)
 CODE   NO   TYPE PIER/PIP WIDTH    DIAMETER  WIDTH                 DROP

 CD      1    4      1             2.000
 CD      2    4      1             1.500
 CD      3    4      1             1.000
                                                 W S P G W                                                      PAGE NO   1
                              WATER SURFACE PROFILE - TITLE CARD LISTING
HEADING LINE NO 1 IS -
                                "3111 MANCHESTER" HYDRAULICS                                0
HEADING LINE NO 2 IS -
                                Prepared By: URBAN RESOURCE CORPORATION
HEADING LINE NO 3 IS -
                                Detention Outlet - 18" CMP           Filename: 624_EX-D.wsw
                                                 W S P G W                                                      PAGE NO   2
                              WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO   1 IS A SYSTEM OUTLET     *         *     *
                     U/S DATA   STATION    INVERT  SECT                                      W S ELEV
                                1000.000    8.070    2                                          8.070
 ELEMENT NO   2 IS A REACH             *         *     *
                     U/S DATA   STATION    INVERT  SECT             N                              RADIUS    ANGLE     ANG PT  MAN H
                                1068.080    8.940    2             .022                              .000     .000      .000     0
 ELEMENT NO   3 IS A  WALL  ENTRANCE                   *
                     U/S DATA   STATION    INVERT  SECT             FP
                                1068.080    8.940    2             .022
 ELEMENT NO   4 IS A SYSTEM HEADWORKS                  *                     *
                     U/S DATA   STATION    INVERT  SECT                                      W S ELEV
                                1068.080    8.940    2                                        8.940
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↑ FILE: 624_EX-D.WSW                       W S P G W - CIVILDESIGN Version 14.06                           PAGE    1
                                  Program Package Serial Number: 1841
                                                WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11:29:29
                              "3111 MANCHESTER" HYDRAULICS                          0
                                Prepared By: URBAN RESOURCE CORPORATION
                                  Detention Outlet - 18" CMP          Filename: 624_EX-D.wsw
************************************************************************************************************ ********
         | Invert  |  Depth | Water   |    Q    |  Vel    Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)   Head |  Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.| ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   -|
 L/Elem  |Ch Slope |        |         |         |       SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |             |         |       |        |        |       |       |     |
 1000.000    8.070    1.024     9.094      7.00   5.45    .46      9.55     .00    1.02     1.40    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
    .654    .0128                                       .0183      .01    1.02    1.00     1.23    .022      .00   .00  PIPE
         |         |        |         |         |             |         |       |        |        |       |       |     |
 1000.654    8.078    1.070     9.148      7.00   5.19    .42      9.57     .00    1.02     1.36    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
   3.141    .0128                                       .0164      .05    1.07     .92     1.23    .022      .00   .00  PIPE
         |         |        |         |         |             |         |       |        |        |       |       |     |
 1003.795    8.118    1.119     9.238      7.00   4.95    .38      9.62     .00    1.02     1.31    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
  10.155    .0128                                       .0147      .15    1.12     .84     1.23    .022      .00   .00  PIPE
         |         |        |         |         |             |         |       |        |        |       |       |     |
 1013.950    8.248    1.173     9.421      7.00   4.72    .35      9.77     .00    1.02     1.24    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
  49.015    .0128                                       .0133      .65    1.17     .76     1.23    .022      .00   .00  PIPE
         |         |        |         |         |             |         |       |        |        |       |       |     |
 1062.965    8.875    1.226    10.101      7.00   4.53    .32     10.42     .00    1.02     1.16    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
   5.115    .0128                                       .0126      .06    1.23     .69     1.23    .022      .00   .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |             |         |       |        |        |       |       |     |
 1068.080    8.940    1.227    10.167      7.00   4.52    .32     10.48     .00    1.02     1.16    1.500    .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
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↑ FILE: 624_EX-D.WSW                       W S P G W - CIVILDESIGN Version 14.06                           PAGE    1
                                  Program Package Serial Number: 1841
                                                WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11:29:29
                              "3111 MANCHESTER" HYDRAULICS                          0
                                Prepared By: URBAN RESOURCE CORPORATION
                                  Detention Outlet - 18" CMP          Filename: 624_EX-D.wsw
************************************************************************************************************ ********
         | Invert  |  Depth | Water   |    Q    |  Vel    Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)   Head |  Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.| ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   -|
 L/Elem  |Ch Slope |        |         |         |       SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |             |         |       |        |        |       |       |     |
 1000.000    8.070    1.061     9.131      7.50   5.61    .49      9.62     .00    1.06     1.37    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
    .638    .0128                                       .0192      .01    1.06    1.00     1.36    .022      .00   .00  PIPE
         |         |        |         |         |             |         |       |        |        |       |       |     |
 1000.638    8.078    1.109     9.187      7.50   5.35    .44      9.63     .00    1.06     1.32    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
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   2.865    .0128                                                 .0172      .05     1.11      .91     1.36    .022       .00   .00  PIPE
         |         |        |         |         |               |        |       |        |        |       |       |     |
 1003.503     8.115    1.163     9.277      7.50    5.10      .40     9.68     .00     1.06     1.25    1.500     .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-      -|-      -|-     -|-     -|-    |-
   8.123    .0128                                                 .0155      .13     1.16      .83     1.36    .022       .00   .00  PIPE
         |         |        |         |         |               |        |       |        |        |       |       |     |
 1011.626     8.219    1.222     9.440      7.50    4.87      .37     9.81     .00     1.06     1.17    1.500     .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-      -|-      -|-     -|-     -|-    |-
  25.295    .0128                                                 .0141      .36     1.22      .75     1.36    .022       .00   .00  PIPE
         |         |        |         |         |               |        |       |        |        |       |       |     |
 1036.920     8.542    1.290     9.832      7.50    4.64      .33    10.17     .00     1.06     1.04    1.500     .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-      -|-      -|-     -|-     -|-    |-
  31.160    .0128                                                 .0133      .42     1.29      .66     1.36    .022       .00   .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |               |        |       |        |        |       |       |     |
 1068.080     8.940    1.320    10.260      7.50    4.55      .32    10.58     .00     1.06      .97    1.500     .000   .00   0    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-      -|-      -|-     -|-     -|-    |-
↑
↑ FILE: 624_EX-D.WSW                           W S P G W - CIVILDESIGN Version 14.06                                  PAGE    1
                            Program Package Serial Number: 1841
                                                 WATER SURFACE PROFILE LISTING                     Date: 5-31-2019  Time:11:29:29
                      "3111 MANCHESTER" HYDRAULICS                                  0
                        Prepared By: URBAN RESOURCE CORPORATION
                          Detention Outlet - 18" CMP            Filename: 624_EX-D.wsw
************************************************************************************************************** ********
         | Invert  | Depth  |  Water   |    Q    |  Vel    Vel   |  Energy  | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
 Station |  Elev   |  (FT)  |  Elev    |  (CFS)  |  (FPS)  Head  |  Grd.El. | Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-      -|-      -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |        |          |         |         SF Ave|    HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |               |        |       |        |        |       |       |     |
 1000.000     8.070    1.096     9.166      8.00    5.78      .52     9.69     .00     1.10     1.33    1.500     .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-      -|-      -|-     -|-     -|-    |-
    .614    .0128                                                 .0202      .01     1.10     1.00     1.50    .022       .00   .00  PIPE
         |         |        |         |         |               |        |       |        |        |       |       |     |
 1000.614     8.078    1.147     9.225      8.00    5.52      .47     9.70     .00     1.10     1.27    1.500     .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-      -|-      -|-     -|-     -|-    |-
   2.681    .0128                                                 .0182      .05     1.15      .91     1.50    .022       .00   .00  PIPE
         |         |        |         |         |               |        |       |        |        |       |       |     |
 1003.295     8.112    1.205     9.317      8.00    5.26      .43     9.75     .00     1.10     1.19    1.500     .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-      -|-      -|-     -|-     -|-    |-
   7.046    .0128                                                 .0165      .12     1.20      .82     1.50    .022       .00   .00  PIPE
         |         |        |         |         |               |        |       |        |        |       |       |     |
 1010.341     8.202    1.270     9.472      8.00    5.01      .39     9.86     .00     1.10     1.08    1.500     .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-      -|-      -|-     -|-     -|-    |-
  17.689    .0128                                                 .0152      .27     1.27      .73     1.50    .022       .00   .00  PIPE
         |         |        |         |         |               |        |       |        |        |       |       |     |
 1028.029     8.428    1.348     9.776      8.00    4.78      .35    10.13     .00     1.10      .91    1.500     .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-      -|-      -|-     -|-     -|-    |-
  40.051    .0128                                                 .0146      .59     1.35      .62     1.50    .022       .00   .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |               |        |       |        |        |       |       |     |
 1068.080     8.940    1.453    10.393      8.00    4.57      .32    10.72     .00     1.10      .52    1.500     .000   .00   0    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-      -|-      -|-     -|-     -|-    |-
↑
↑ FILE: 624_EX-D.WSW                           W S P G W - CIVILDESIGN Version 14.06                                  PAGE    1
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                     Program Package Serial Number: 1841
                                 WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11:29:29
                "3111 MANCHESTER" HYDRAULICS                          0
                  Prepared By: URBAN RESOURCE CORPORATION
                   Detention Outlet - 18" CMP          Filename: 624_EX-D.wsw
********************************************************************************************************** ********
         | Invert  | Depth | Water   |   Q     | Vel     Vel  | Energy | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
Station  |  Elev   | (FT)  | Elev    | (CFS)   | (FPS)   Head | Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.| ZL  |Prs/Pip
        -|-       -|-     -|-       -|-       -|-     -|-     -|-     -|-     -|-      -|-      -|-     -|-     -|-   -|
L/Elem   |Ch Slope |       |         |         |        SF Ave|   HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall| ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |       |         |         |              |        |       |        |        |       |       |     |
1000.000    8.070   1.099    9.169     8.05     5.80     .52     9.69     .00    1.10     1.33    1.500    .000   .00   1   .0
        -|-       -|-     -|-       -|-       -|-     -|-     -|-     -|-     -|-      -|-      -|-     -|-     -|-   |-
   .610    .0128                                       .0203      .01    1.10    1.00     1.50    .022      .00   .00  PIPE
         |         |       |         |         |              |        |       |        |        |       |       |     |
1000.610    8.078   1.151    9.229     8.05     5.53     .48     9.70     .00    1.10     1.27    1.500    .000   .00   1   .0
        -|-       -|-     -|-       -|-       -|-     -|-     -|-     -|-     -|-      -|-      -|-     -|-     -|-   |-
  2.658    .0128                                       .0183      .05    1.15     .91     1.50    .022      .00   .00  PIPE
         |         |       |         |         |              |        |       |        |        |       |       |     |
1003.268    8.112   1.209    9.321     8.05     5.27     .43     9.75     .00    1.10     1.19    1.500    .000   .00   1   .0
        -|-       -|-     -|-       -|-       -|-     -|-     -|-     -|-     -|-      -|-      -|-     -|-     -|-   |-
  6.978    .0128                                       .0166      .12    1.21     .82     1.50    .022      .00   .00  PIPE
         |         |       |         |         |              |        |       |        |        |       |       |     |
1010.246    8.201   1.275    9.476     8.05     5.03     .39     9.87     .00    1.10     1.07    1.500    .000   .00   1   .0
        -|-       -|-     -|-       -|-       -|-     -|-     -|-     -|-     -|-      -|-      -|-     -|-     -|-   |-
 17.255    .0128                                       .0153      .26    1.27     .73     1.50    .022      .00   .00  PIPE
         |         |       |         |         |              |        |       |        |        |       |       |     |
1027.501    8.421   1.354    9.776     8.05     4.79     .36    10.13     .00    1.10      .89    1.500    .000   .00   1   .0
        -|-       -|-     -|-       -|-       -|-     -|-     -|-     -|-     -|-      -|-      -|-     -|-     -|-   |-
 40.346    .0128                                       .0150      .60    1.35     .61     1.50    .022      .00   .00  PIPE
         |         |       |         |         |              |        |       |        |        |       |       |     |
1067.847    8.937   1.475   10.412     8.05     4.57     .32    10.74     .00    1.10      .38    1.500    .000   .00   1   .0
        -|-       -|-     -|-       -|-       -|-     -|-     -|-     -|-     -|-      -|-      -|-     -|-     -|-   |-
   .233    .0128                                       .0152      .00    1.48     .38     1.50    .022      .00   .00  PIPE
WALL  ENTRANCE
         |         |       |         |         |              |        |       |        |        |       |       |     |
1068.080    8.940   1.477   10.417     8.05     4.57     .32    10.74     .00    1.10      .37    1.500    .000   .00   0   .0
        -|-       -|-     -|-       -|-       -|-     -|-     -|-     -|-     -|-      -|-      -|-     -|-     -|-   |-
↑
↑ FILE: 624_EX-D.WSW                           W S P G W - CIVILDESIGN Version 14.06                        PAGE    1
                     Program Package Serial Number: 1841
                                 WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11:29:29
                "3111 MANCHESTER" HYDRAULICS                          0
                  Prepared By: URBAN RESOURCE CORPORATION
                   Detention Outlet - 18" CMP          Filename: 624_EX-D.wsw
********************************************************************************************************** ********
         | Invert  | Depth | Water   |   Q     | Vel     Vel  | Energy | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
Station  |  Elev   | (FT)  | Elev    | (CFS)   | (FPS)   Head | Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.| ZL  |Prs/Pip
        -|-       -|-     -|-       -|-       -|-     -|-     -|-     -|-     -|-      -|-      -|-     -|-     -|-   -|
L/Elem   |Ch Slope |       |         |         |        SF Ave|   HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall| ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |       |         |         |              |        |       |        |        |       |       |     |
1000.000    8.070   1.100    9.170     8.06     5.81     .52     9.69     .00    1.10     1.33    1.500    .000   .00   1   .0
        -|-       -|-     -|-       -|-       -|-     -|-     -|-     -|-     -|-      -|-      -|-     -|-     -|-   |-
   .609    .0128                                       .0203      .01    1.10    1.00     1.50    .022      .00   .00  PIPE
```

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         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1000.609    8.078   1.152     9.230      8.06    5.54     .48     9.71     .00     1.10     1.27   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|-  |-
    2.655    .0128                                            .0183      .05    1.15      .91     1.50   .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1003.265    8.112   1.210     9.321      8.06    5.28     .43     9.75     .00     1.10     1.19   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|-  |-
    6.950    .0128                                            .0166      .12    1.21      .82     1.50   .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1010.215    8.201   1.276     9.476      8.06    5.03     .39     9.87     .00     1.10     1.07   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|-  |-
   17.184    .0128                                            .0153      .26    1.28      .72     1.50   .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1027.399    8.420   1.355     9.775      8.06    4.80     .36    10.13     .00     1.10      .89   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|-  |-
   39.788    .0128                                            .0151      .60    1.36      .61     1.50   .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1067.187    8.929   1.478    10.407      8.06    4.57     .32    10.73     .00     1.10      .36   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|-  |-
     .893    .0128                                            .0153      .01    1.48      .36     1.50   .022      .00   .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1068.080    8.940   1.482    10.422      8.06    4.57     .32    10.75     .00     1.10      .33   1.500    .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|-  |-

↑
↑ FILE: 624_EX-D.WSW                          W S P G W - CIVILDESIGN Version 14.06                        PAGE    1
                                    Program Package Serial Number: 1841
                                                 WATER SURFACE PROFILE LISTING                 Date: 5-31-2019  Time:11:29:29
                               "3111 MANCHESTER" HYDRAULICS                           0
                                 Prepared By: URBAN RESOURCE CORPORATION
                                   Detention Outlet - 18" CMP          Filename: 624_EX-D.wsw
****************************************************************************************************************** ********
         | Invert | Depth  |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev  |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-      -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |        |         |         |          SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1000.000    8.070   1.101     9.171      8.07    5.81     .52     9.69     .00     1.10     1.33   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|-  |-
     .615    .0128                                            .0203      .01    1.10     1.00     1.50   .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1000.615    8.078   1.153     9.231      8.07    5.54     .48     9.71     .00     1.10     1.27   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|-  |-
    2.680    .0128                                            .0183      .05    1.15      .91     1.50   .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1003.295    8.112   1.211     9.323      8.07    5.28     .43     9.76     .00     1.10     1.18   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|-  |-
    6.943    .0128                                            .0166      .12    1.21      .82     1.50   .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1010.238    8.201   1.277     9.478      8.07    5.03     .39     9.87     .00     1.10     1.07   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|-  |-
   17.167    .0128                                            .0153      .26    1.28      .72     1.50   .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1027.405    8.420   1.357     9.777      8.07    4.80     .36    10.13     .00     1.10      .88   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|-  |-
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    39.306    .0128                                         .0152      .60    1.36     .61     1.50    .022       .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |      |
  1066.711     8.923    1.483    10.405      8.07    4.58     .33    10.73     .00    1.10      .32    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
     1.369    .0128                                         .0156      .02    1.48     .34     1.50    .022       .00   .00  PIPE
  WALL  ENTRANCE
          |         |        |         |         |               |         |       |        |        |       |       |      |
  1068.080     8.940    1.488    10.428      8.07    4.57     .32    10.75     .00    1.10      .27    1.500     .000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
↑
↑ FILE: 624_EX-D.WSW                          W S P G W - CIVILDESIGN Version 14.06                                         PAGE    1
                                Program Package Serial Number: 1841
                                                    WATER SURFACE PROFILE LISTING                    Date: 5-31-2019  Time:11:29:29
                          "3111 MANCHESTER" HYDRAULICS                                0
                            Prepared By: URBAN RESOURCE CORPORATION
                              Detention Outlet - 18" CMP             Filename: 624_EX-D.wsw
 ************************************************************************************************************************** ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |  Depth | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
 *********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|***** |*******
          |         |        |         |         |               |         |       |        |        |       |       |      |
  1000.000     8.070    1.101     9.171      8.08    5.81     .52     9.70     .00    1.10     1.33    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
      .623    .0128                                         .0203      .01    1.10    1.00     1.50    .022       .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |      |
  1000.623     8.078    1.154     9.232      8.08    5.54     .48     9.71     .00    1.10     1.26    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
     2.660    .0128                                         .0183      .05    1.15     .91     1.50    .022       .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |      |
  1003.283     8.112    1.212     9.324      8.08    5.28     .43     9.76     .00    1.10     1.18    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
     6.945    .0128                                         .0167      .12    1.21     .82     1.50    .022       .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |      |
  1010.228     8.201    1.278     9.479      8.08    5.04     .39     9.87     .00    1.10     1.07    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
    17.098    .0128                                         .0154      .26    1.28     .72     1.50    .022       .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |      |
  1027.326     8.419    1.358     9.777      8.08    4.80     .36    10.14     .00    1.10      .88    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
    38.619    .0128                                         .0153      .59    1.36     .61     1.50    .022       .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |      |
  1065.945     8.913    1.487    10.399      8.08    4.58     .33    10.72     .00    1.10      .28    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
     2.135    .0128                                         .0159      .03    1.49     .32     1.50    .022       .00   .00  PIPE
  WALL  ENTRANCE
          |         |        |         |         |               |         |       |        |        |       |       |      |
  1068.080     8.940    1.495    10.435      8.08    4.57     .32    10.76     .00    1.10      .18    1.500     .000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
↑
↑ FILE: 624_EX-D.WSW                          W S P G W - CIVILDESIGN Version 14.06                                         PAGE    1
                                Program Package Serial Number: 1841
                                                    WATER SURFACE PROFILE LISTING                    Date: 5-31-2019  Time:11:29:29
                          "3111 MANCHESTER" HYDRAULICS                                0
                            Prepared By: URBAN RESOURCE CORPORATION
```

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                                                                                  624_EX-D.OUT
                                   Detention Outlet - 18" CMP          Filename: 624_EX-D.wsw
************************************************************************************************** ********
          | Invert  | Depth  | Water  |    Q    |  Vel     Vel   | Energy  | Super  |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station  |  Elev   |  (FT)  |  Elev  |  (CFS)  | (FPS)    Head  | Grd.El. |  Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-      -|-       -|-      -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    -|
 L/Elem   |Ch Slope |        |        |         |              SF Ave|   HF    |SE Dpth |Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |               |         |        |        |        |       |       |      |
 1000.000    8.070   1.102     9.172      8.09    5.82     .53     9.70      .00     1.10     1.32    1.500    .000   .00    1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    |-
    .611    .0128                                            .0204     .01     1.10     1.00     1.50    .022     .00   .00  PIPE
         |         |        |         |         |               |         |        |        |        |       |       |      |
 1000.611    8.078   1.154     9.232      8.09    5.54     .48     9.71      .00     1.10     1.26    1.500    .000   .00    1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    |-
   2.654    .0128                                            .0184     .05     1.15      .91     1.50    .022     .00   .00  PIPE
         |         |        |         |         |               |         |        |        |        |       |       |      |
 1003.265    8.112   1.212     9.324      8.09    5.29     .43     9.76      .00     1.10     1.18    1.500    .000   .00    1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    |-
   6.908    .0128                                            .0167     .12     1.21      .82     1.50    .022     .00   .00  PIPE
         |         |        |         |         |               |         |        |        |        |       |       |      |
 1010.174    8.200   1.279     9.479      8.09    5.04     .39     9.87      .00     1.10     1.06    1.500    .000   .00    1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    |-
  16.972    .0128                                            .0154     .26     1.28      .72     1.50    .022     .00   .00  PIPE
         |         |        |         |         |               |         |        |        |        |       |       |      |
 1027.146    8.417   1.359     9.776      8.09    4.81     .36    10.13      .00     1.10      .88    1.500    .000   .00    1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    |-
  37.891    .0128                                            .0154     .58     1.36      .61     1.50    .022     .00   .00  PIPE
         |         |        |         |         |               |         |        |        |        |       |       |      |
 1065.036    8.901   1.490    10.391      8.09    4.58     .33    10.72      .00     1.10      .25    1.500    .000   .00    1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    |-
   3.044    .0128                                            .0158     .05     1.49      .30     1.50    .022     .00   .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |               |         |        |        |        |       |       |      |
 1068.080    8.940   1.491    10.431      8.09    4.58     .33    10.76      .00     1.10      .24    1.500    .000   .00    0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    |-
↑
↑ FILE: 624_EX-D.WSW                     W S P G W - CIVILDESIGN Version 14.06                                PAGE    1
                                Program Package Serial Number: 1841
                                           WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11:29:29
                         "3111 MANCHESTER" HYDRAULICS                                 0
                          Prepared By: URBAN RESOURCE CORPORATION
                                   Detention Outlet - 18" CMP          Filename: 624_EX-D.wsw
************************************************************************************************** ********
          | Invert  | Depth  | Water  |    Q    |  Vel     Vel   | Energy  | Super  |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station  |  Elev   |  (FT)  |  Elev  |  (CFS)  | (FPS)    Head  | Grd.El. |  Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-      -|-       -|-      -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    -|
 L/Elem   |Ch Slope |        |        |         |              SF Ave|   HF    |SE Dpth |Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |               |         |        |        |        |       |       |      |
 1000.000    8.070   1.102     9.172      8.10    5.82     .53     9.70      .00     1.10     1.32    1.500    .000   .00    1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    |-
    .614    .0128                                            .0204     .01     1.10     1.00     1.50    .022     .00   .00  PIPE
         |         |        |         |         |               |         |        |        |        |       |       |      |
 1000.614    8.078   1.155     9.233      8.10    5.55     .48     9.71      .00     1.10     1.26    1.500    .000   .00    1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    |-
   2.654    .0128                                            .0184     .05     1.15      .91     1.50    .022     .00   .00  PIPE
```

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        |         |        |         |         |               |         |       |        |        |       |       |      |
1003.268     8.112    1.213     9.325      8.10    5.29     .43     9.76     .00    1.10     1.18    1.500     .000   .00   1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   6.888    .0128                                         .0167      .12     1.21     .82    1.50    .022       .00   .00  PIPE
        |         |        |         |         |               |         |       |        |        |       |       |      |
1010.156     8.200    1.280     9.479      8.10    5.04     .39     9.87     .00    1.10     1.06    1.500     .000   .00   1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  16.922    .0128                                         .0154      .26     1.28     .72    1.50    .022       .00   .00  PIPE
        |         |        |         |         |               |         |       |        |        |       |       |      |
1027.077     8.416    1.360     9.776      8.10    4.81     .36    10.14     .00    1.10      .87    1.500     .000   .00   1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  36.607    .0128                                         .0156      .57     1.36     .61    1.50    .022       .00   .00  PIPE
        |         |        |         |         |               |         |       |        |        |       |       |      |
1063.685     8.884    1.495    10.379      8.10    4.58     .33    10.71     .00    1.10      .17    1.500     .000   .00   1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   1.376    .0128                                         .0160      .02     1.50     .25    1.50    .022       .00   .00  PIPE
        |         |        |         |         |               |         |       |        |        |       |       |      |
1065.061     8.901    1.500    10.401      8.10    4.58     .33    10.73     .00    1.10      .00    1.500     .000   .00   1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   3.019    .0128                                         .0164      .05     1.50     .00    1.50    .022       .00   .00  PIPE
WALL  ENTRANCE
        |         |        |         |         |               |         |       |        |        |       |       |      |
1068.080     8.940    1.513    10.453      8.10    4.58     .33    10.78     .00    1.10      .00    1.500     .000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
```

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                                                                          624_EX-E.EDT
FILE: 624_EX-E.WSW                        W S P G W  - EDIT LISTING - Version 14.06             Date: 5-31-2019  Time:11:29:39
                                      WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING                            PAGE    1
 CARD  SECT  CHN   NO OF  AVE PIER  HEIGHT 1  BASE     ZL     ZR    INV   Y(1)  Y(2)  Y(3)  Y(4)  Y(5)  Y(6)  Y(7)  Y(8)  Y(9)  Y(10)
 CODE   NO   TYPE PIER/PIP WIDTH    DIAMETER  WIDTH                 DROP

 CD      1    4      1             2.000
 CD      2    4      1             1.500
 CD      3    4      1             1.000
                                                 W S P G W                                                 PAGE NO   1
                            WATER SURFACE PROFILE - TITLE CARD LISTING
HEADING LINE NO 1 IS -
                              "3111 MANCHESTER" HYDRAULICS                              0
HEADING LINE NO 2 IS -
                              Prepared By: URBAN RESOURCE CORPORATION
HEADING LINE NO 3 IS -
                              Detention Outlet - 18" CMP            Filename: 624_EX-E.wsw
                                                 W S P G W                                                 PAGE NO   2
                            WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO    1 IS A SYSTEM OUTLET      *         *     *
                        U/S DATA   STATION    INVERT  SECT                                   W S ELEV
                                   1000.000    8.380    2                                        8.380
 ELEMENT NO    2 IS A REACH          *         *     *
                        U/S DATA   STATION    INVERT  SECT             N                           RADIUS    ANGLE     ANG PT  MAN H
                                   1066.550    9.000    2             .022                          .000     .000      .000     0
 ELEMENT NO    3 IS A  WALL  ENTRANCE                *
                        U/S DATA   STATION    INVERT  SECT            FP
                                   1066.550    9.000    2             .022
 ELEMENT NO    4 IS A SYSTEM HEADWORKS               *                      *
                        U/S DATA   STATION    INVERT  SECT                                   W S ELEV
                                   1066.550    9.000    2                                      9.000
```

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↑ FILE: 624_EX-E.WSW                      W S P G W - CIVILDESIGN Version 14.06                                  PAGE    1
                               Program Package Serial Number: 1841
                                          WATER SURFACE PROFILE LISTING                       Date: 5-31-2019  Time:11:29:41
                          "3111 MANCHESTER" HYDRAULICS                                0
                            Prepared By: URBAN RESOURCE CORPORATION
                              Detention Outlet - 18" CMP           Filename: 624_EX-E.wsw
************************************************************************************************************ ********
         | Invert  | Depth  | Water   |    Q    | Vel     Vel   | Energy  | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
Station  |  Elev   | (FT)   | Elev    |  (CFS)  | (FPS)   Head  | Grd.El. | Elev  | Depth  | Width  |Dia.-FT|or I.D.| ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   -|
L/Elem   |Ch Slope |        |         |         |              SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall| ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |               |         |       |        |        |       |       |     |
1000.000    8.380     .986     9.366      6.50    5.28     .43      9.80     .00      .99     1.42    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
    .401    .0093                                        .0175      .01      .99    1.00     1.50    .022      .00   .00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |     |
1000.401    8.384    1.029     9.412      6.50    5.03     .39      9.81     .00      .99     1.39    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
   1.628    .0093                                        .0156      .03     1.03      .92     1.50    .022      .00   .00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |     |
1002.028    8.399    1.075     9.474      6.50    4.80     .36      9.83     .00      .99     1.35    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
   3.723    .0093                                        .0140      .05     1.07      .84     1.50    .022      .00   .00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |     |
1005.751    8.434    1.125     9.558      6.50    4.57     .32      9.88     .00      .99     1.30    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
   7.833    .0093                                        .0125      .10     1.12      .77     1.50    .022      .00   .00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |     |
1013.584    8.507    1.179     9.686      6.50    4.36     .30      9.98     .00      .99     1.23    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
  17.145    .0093                                        .0113      .19     1.18      .70     1.50    .022      .00   .00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |     |
1030.730    8.666    1.241     9.907      6.50    4.16     .27     10.18     .00      .99     1.13    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
  35.820    .0093                                        .0104      .37     1.24      .62     1.50    .022      .00   .00  PIPE
WALL  ENTRANCE
         |         |        |         |         |               |         |       |        |        |       |       |     |
1066.550    9.000    1.302    10.302      6.50    3.99     .25     10.55     .00      .99     1.02    1.500    .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
↑
↑ FILE: 624_EX-E.WSW                      W S P G W - CIVILDESIGN Version 14.06                                  PAGE    1
                               Program Package Serial Number: 1841
                                          WATER SURFACE PROFILE LISTING                       Date: 5-31-2019  Time:11:29:41
                          "3111 MANCHESTER" HYDRAULICS                                0
                            Prepared By: URBAN RESOURCE CORPORATION
                              Detention Outlet - 18" CMP           Filename: 624_EX-E.wsw
************************************************************************************************************ ********
         | Invert  | Depth  | Water   |    Q    | Vel     Vel   | Energy  | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
Station  |  Elev   | (FT)   | Elev    |  (CFS)  | (FPS)   Head  | Grd.El. | Elev  | Depth  | Width  |Dia.-FT|or I.D.| ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   -|
L/Elem   |Ch Slope |        |         |         |              SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall| ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |               |         |       |        |        |       |       |     |
1000.000    8.380     .994     9.374      6.60    5.31     .44      9.81     .00      .99     1.42    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
```

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     .403    .0093                                          .0177      .01      .99    1.00    1.50    .022       .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |      |
 1000.403     8.384    1.037     9.421       6.60    5.06     .40     9.82     .00     .99     1.39    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
    1.609    .0093                                          .0158      .03     1.04     .92    1.50    .022       .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |      |
 1002.012     8.399    1.084     9.482       6.60    4.83     .36     9.84     .00     .99     1.34    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
    3.707    .0093                                          .0141      .05     1.08     .84    1.50    .022       .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |      |
 1005.719     8.433    1.134     9.567       6.60    4.60     .33     9.90     .00     .99     1.29    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
    7.678    .0093                                          .0127      .10     1.13     .77    1.50    .022       .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |      |
 1013.397     8.505    1.190     9.695       6.60    4.39     .30     9.99     .00     .99     1.21    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   16.499    .0093                                          .0115      .19     1.19     .70    1.50    .022       .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |      |
 1029.896     8.659    1.253     9.912       6.60    4.19     .27    10.18     .00     .99     1.11    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   36.654    .0093                                          .0106      .39     1.25     .62    1.50    .022       .00   .00  PIPE
 WALL  ENTRANCE
          |         |        |         |         |               |         |       |        |        |       |       |      |
 1066.550     9.000    1.322    10.322       6.60    4.00     .25    10.57     .00     .99      .97    1.500     .000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-

↑
↑ FILE: 624_EX-E.WSW                          W S P G W - CIVILDESIGN Version 14.06                                         PAGE    1
                               Program Package Serial Number: 1841
                                                   WATER SURFACE PROFILE LISTING                     Date: 5-31-2019  Time:11:29:41
                         "3111 MANCHESTER" HYDRAULICS                                 0
                           Prepared By: URBAN RESOURCE CORPORATION
                             Detention Outlet - 18" CMP             Filename: 624_EX-E.wsw
*************************************************************************************************************************** ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station  |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|
 L/Elem   |Ch Slope |        |         |         |         SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
**********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|***** |*******
          |         |        |         |         |               |         |       |        |        |       |       |      |
 1000.000     8.380    1.001     9.381       6.70    5.35     .44     9.83     .00    1.00     1.41    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
     .405    .0093                                          .0179      .01     1.00    1.00    1.50    .022       .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |      |
 1000.405     8.384    1.045     9.429       6.70    5.10     .40     9.83     .00    1.00     1.38    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
    1.592    .0093                                          .0159      .03     1.05     .92    1.50    .022       .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |      |
 1001.997     8.399    1.092     9.491       6.70    4.86     .37     9.86     .00    1.00     1.33    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
    3.673    .0093                                          .0143      .05     1.09     .84    1.50    .022       .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |      |
 1005.671     8.433    1.144     9.577       6.70    4.63     .33     9.91     .00    1.00     1.28    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
    7.591    .0093                                          .0128      .10     1.14     .77    1.50    .022       .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |      |
 1013.262     8.504    1.201     9.704       6.70    4.42     .30    10.01     .00    1.00     1.20    1.500     .000   .00   1   .0
```

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        -|-        -|-       -|-        -|-        -|-      -|-      -|-        -|-      -|-      -|-       -|-      -|-      -|-     |-
  15.955     .0093                                                .0116      .19     1.20      .69     1.50    .022      .00   .00  PIPE
         |          |         |          |          |                  |          |        |        |         |       |        |     |
 1029.217     8.652    1.265     9.918       6.70     4.21      .28    10.19      .00     1.00     1.09    1.500     .000   .00   1    .0
        -|-        -|-       -|-        -|-        -|-      -|-      -|-        -|-      -|-      -|-       -|-      -|-      -|-     |-
  37.333     .0093                                                .0107      .40     1.27      .61     1.50    .022      .00   .00  PIPE
 WALL  ENTRANCE
         |          |         |          |          |                  |          |        |        |         |       |        |     |
 1066.550     9.000    1.343    10.343       6.70     4.01      .25    10.59      .00     1.00      .92    1.500     .000   .00   0    .0
        -|-        -|-       -|-        -|-        -|-      -|-      -|-        -|-      -|-      -|-       -|-      -|-      -|-     |-
↑
↑ FILE: 624_EX-E.WSW                    W S P G W - CIVILDESIGN Version 14.06                                    PAGE    1
                              Program Package Serial Number: 1841
                                          WATER SURFACE PROFILE LISTING                       Date: 5-31-2019  Time:11:29:41
                          "3111 MANCHESTER" HYDRAULICS                               0
                           Prepared By: URBAN RESOURCE CORPORATION
                            Detention Outlet - 18" CMP          Filename: 624_EX-E.wsw
 ************************************************************************************************************************* ********
          | Invert  | Depth  |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|       |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head | Grd.El.|  Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
         -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |        SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
 *********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
          |         |        |         |         |               |         |       |        |        |       |       |       |
 1000.000     8.380    1.024     9.404      7.00     5.45      .46      9.86     .00     1.02     1.40   1.500    .000   .00   1    .0
         -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-      |-
    .403     .0093                                            .0183       .01    1.02     1.00     1.50    .022      .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |       |
 1000.403     8.384    1.070     9.453      7.00     5.19      .42      9.87     .00     1.02     1.36   1.500    .000   .00   1    .0
         -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-      |-
   1.603     .0093                                            .0164       .03    1.07      .92     1.50    .022      .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |       |
 1002.006     8.399    1.119     9.518      7.00     4.95      .38      9.90     .00     1.02     1.31   1.500    .000   .00   1    .0
         -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-      |-
   3.635     .0093                                            .0147       .05    1.12      .84     1.50    .022      .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |       |
 1005.641     8.433    1.173     9.606      7.00     4.72      .35      9.95     .00     1.02     1.24   1.500    .000   .00   1    .0
         -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-      |-
   7.345     .0093                                            .0133       .10    1.17      .76     1.50    .022      .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |       |
 1012.985     8.501    1.234     9.735      7.00     4.50      .31     10.05     .00     1.02     1.15   1.500    .000   .00   1    .0
         -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-      |-
  14.860     .0093                                            .0121       .18    1.23      .68     1.50    .022      .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |       |
 1027.845     8.639    1.304     9.944      7.00     4.29      .29     10.23     .00     1.02     1.01   1.500    .000   .00   1    .0
         -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-      |-
  31.330     .0093                                            .0113       .35    1.30      .60     1.50    .022      .00   .00  PIPE
          |         |        |         |         |               |         |       |        |        |       |       |       |
 1059.175     8.931    1.393    10.324      7.00     4.09      .26     10.58     .00     1.02      .77   1.500    .000   .00   1    .0
         -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-      |-
   7.375     .0093                                            .0110       .08    1.39      .48     1.50    .022      .00   .00  PIPE
 WALL  ENTRANCE
          |         |        |         |         |               |         |       |        |        |       |       |       |
 1066.550     9.000    1.410    10.410      7.00     4.06      .26     10.67     .00     1.02      .71   1.500    .000   .00   0    .0
         -|-       -|-      -|-       -|-       -|-      -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-      |-
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↑ FILE: 624_EX-E.WSW                     W S P G W - CIVILDESIGN Version 14.06                                PAGE     1
                               Program Package Serial Number: 1841
                                              WATER SURFACE PROFILE LISTING                    Date: 5-31-2019  Time:11:29:41
                           "3111 MANCHESTER" HYDRAULICS                                 0
                             Prepared By: URBAN RESOURCE CORPORATION
                               Detention Outlet - 18" CMP          Filename: 624_EX-E.wsw
********************************************************************************************************************** ********
          | Invert  |  Depth |  Water   |    Q     |  Vel     Vel   |  Energy  | Super  |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station  |  Elev   |  (FT)  |  Elev    |  (CFS)   | (FPS)    Head  | Grd.El.  | Elev   | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
         -|-       -|-      -|-        -|-        -|-      -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     -|
 L/Elem   |Ch Slope |        |          |          |        SF Ave  |   HF     |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****  |*******
         |         |        |         |         |               |          |        |        |        |       |       |       |
1000.000    8.380    1.032     9.412      7.10    5.48     .47      9.88     .00     1.03     1.39    1.500    .000    .00    1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-      -|-     -|-      |-
    .410   .0093                                        .0185      .01     1.03     1.00     1.50    .022      .00    .00   PIPE
         |         |        |         |         |               |          |        |        |        |       |       |       |
1000.410    8.384    1.078     9.462      7.10    5.22     .42      9.89     .00     1.03     1.35    1.500    .000    .00    1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-      -|-     -|-      |-
   1.618   .0093                                        .0165      .03     1.08      .92     1.50    .022      .00    .00   PIPE
         |         |        |         |         |               |          |        |        |        |       |       |       |
1002.028    8.399    1.128     9.527      7.10    4.98     .39      9.91     .00     1.03     1.30    1.500    .000    .00    1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-      -|-     -|-      |-
   3.624   .0093                                        .0149      .05     1.13      .84     1.50    .022      .00    .00   PIPE
         |         |        |         |         |               |          |        |        |        |       |       |       |
1005.652    8.433    1.183     9.616      7.10    4.75     .35      9.97     .00     1.03     1.22    1.500    .000    .00    1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-      -|-     -|-      |-
   7.319   .0093                                        .0134      .10     1.18      .76     1.50    .022      .00    .00   PIPE
         |         |        |         |         |               |          |        |        |        |       |       |       |
1012.971    8.501    1.245     9.746      7.10    4.53     .32     10.06     .00     1.03     1.13    1.500    .000    .00    1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-      -|-     -|-      |-
  14.626   .0093                                        .0123      .18     1.25      .68     1.50    .022      .00    .00   PIPE
         |         |        |         |         |               |          |        |        |        |       |       |       |
1027.596    8.637    1.318     9.955      7.10    4.32     .29     10.24     .00     1.03      .98    1.500    .000    .00    1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-      -|-     -|-      |-
  30.277   .0093                                        .0116      .35     1.32      .59     1.50    .022      .00    .00   PIPE
         |         |        |         |         |               |          |        |        |        |       |       |       |
1057.874    8.919    1.412    10.331      7.10    4.12     .26     10.59     .00     1.03      .71    1.500    .000    .00    1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-      -|-     -|-      |-
   8.676   .0093                                        .0113      .10     1.41      .46     1.50    .022      .00    .00   PIPE
WALL  ENTRANCE
         |         |        |         |         |               |          |        |        |        |       |       |       |
1066.550    9.000    1.435    10.435      7.10    4.08     .26     10.69     .00     1.03      .61    1.500    .000    .00    0    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-      -|-     -|-      |-
↑
↑ FILE: 624_EX-E.WSW                     W S P G W - CIVILDESIGN Version 14.06                                PAGE     1
                               Program Package Serial Number: 1841
                                              WATER SURFACE PROFILE LISTING                    Date: 5-31-2019  Time:11:29:41
                           "3111 MANCHESTER" HYDRAULICS                                 0
                             Prepared By: URBAN RESOURCE CORPORATION
                               Detention Outlet - 18" CMP          Filename: 624_EX-E.wsw
********************************************************************************************************************** ********
          | Invert  |  Depth |  Water   |    Q     |  Vel     Vel   |  Energy  | Super  |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station  |  Elev   |  (FT)  |  Elev    |  (CFS)   | (FPS)    Head  | Grd.El.  | Elev   | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
         -|-       -|-      -|-        -|-        -|-      -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     -|
 L/Elem   |Ch Slope |        |          |          |        SF Ave  |   HF     |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
```

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*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****  |*******
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1000.000     8.380    1.032     9.412      7.11    5.48     .47      9.88     .00     1.03     1.39   1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
    .403     .0093                                           .0185       .01    1.03     1.00     1.50    .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1000.403     8.384    1.079     9.462      7.11    5.23     .42      9.89     .00     1.03     1.35   1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
   1.605     .0093                                           .0166       .03    1.08      .92     1.50    .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1002.008     8.399    1.129     9.527      7.11    4.98     .39      9.91     .00     1.03     1.29   1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
   3.637     .0093                                           .0149       .05    1.13      .84     1.50    .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1005.645     8.433    1.184     9.617      7.11    4.75     .35      9.97     .00     1.03     1.22   1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
   7.293     .0093                                           .0135       .10    1.18      .76     1.50    .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1012.938     8.501    1.246     9.747      7.11    4.53     .32     10.07     .00     1.03     1.12   1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
  14.540     .0093                                           .0123       .18    1.25      .68     1.50    .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1027.478     8.636    1.319     9.955      7.11    4.32     .29     10.24     .00     1.03      .98   1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
  30.119     .0093                                           .0116       .35    1.32      .59     1.50    .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1057.597     8.917    1.413    10.330      7.11    4.12     .26     10.59     .00     1.03      .70   1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
   8.953     .0093                                           .0114       .10    1.41      .46     1.50    .022      .00   .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1066.550     9.000    1.438    10.438      7.11    4.08     .26     10.70     .00     1.03      .60   1.500     .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
↑
↑ FILE: 624_EX-E.WSW                         W S P G W - CIVILDESIGN Version 14.06                                   PAGE     1
                               Program Package Serial Number: 1841
                                              WATER SURFACE PROFILE LISTING                     Date: 5-31-2019  Time:11:29:41
                          "3111 MANCHESTER" HYDRAULICS                                  0
                           Prepared By: URBAN RESOURCE CORPORATION
                            Detention Outlet - 18" CMP              Filename: 624_EX-E.wsw
*******************************************************************************************************************  ********
         | Invert  | Depth  |  Water  |    Q    |  Vel    Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)   Head |  Grd.El.|  Elev |  Depth |  Width |Dia.-FT|or I.D.|  ZL   |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|
 L/Elem  |Ch Slope |        |         |         |       | SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****  |*******
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1000.000     8.380    1.033     9.413      7.12    5.49     .47      9.88     .00     1.03     1.39   1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
    .402     .0093                                           .0185       .01    1.03     1.00     1.50    .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1000.402     8.384    1.079     9.463      7.12    5.23     .42      9.89     .00     1.03     1.35   1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
   1.606     .0093                                           .0166       .03    1.08      .92     1.50    .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1002.008     8.399    1.130     9.528      7.12    4.99     .39      9.91     .00     1.03     1.29   1.500     .000   .00   1   .0
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      -|-        -|-       -|-        -|-        -|-      -|-      -|-        -|-      -|-      -|-       -|-       -|-      -|-       -|-      |-
   3.615     .0093                                                .0149       .05     1.13      .84      1.50      .022       .00     .00  PIPE
          |         |         |          |          |                  |          |        |         |         |         |         |        |
 1005.623     8.432     1.185      9.617       7.12     4.76      .35      9.97      .00     1.03      1.22      1.500      .000     .00   1    .0
      -|-        -|-       -|-        -|-        -|-      -|-      -|-        -|-      -|-      -|-       -|-       -|-      -|-       -|-      |-
   7.296     .0093                                                .0135       .10     1.18      .76      1.50      .022       .00     .00  PIPE
          |         |         |          |          |                  |          |        |         |         |         |         |        |
 1012.920     8.500     1.247      9.747       7.12     4.53      .32     10.07      .00     1.03      1.12      1.500      .000     .00   1    .0
      -|-        -|-       -|-        -|-        -|-      -|-      -|-        -|-      -|-      -|-       -|-       -|-      -|-       -|-      |-
  14.491     .0093                                                .0123       .18     1.25      .68      1.50      .022       .00     .00  PIPE
          |         |         |          |          |                  |          |        |         |         |         |         |        |
 1027.411     8.635     1.320      9.955       7.12     4.32      .29     10.25      .00     1.03       .98      1.500      .000     .00   1    .0
      -|-        -|-       -|-        -|-        -|-      -|-      -|-        -|-      -|-      -|-       -|-       -|-      -|-       -|-      |-
  29.953     .0093                                                .0116       .35     1.32      .59      1.50      .022       .00     .00  PIPE
          |         |         |          |          |                  |          |        |         |         |         |         |        |
 1057.364     8.914     1.415     10.329       7.12     4.12      .26     10.59      .00     1.03       .69      1.500      .000     .00   1    .0
      -|-        -|-       -|-        -|-        -|-      -|-      -|-        -|-      -|-      -|-       -|-       -|-      -|-       -|-      |-
   9.186     .0093                                                .0114       .10     1.41      .46      1.50      .022       .00     .00  PIPE
WALL  ENTRANCE
          |         |         |          |          |                  |          |        |         |         |         |         |        |
 1066.550     9.000     1.441     10.441       7.12     4.08      .26     10.70      .00     1.03       .59      1.500      .000     .00   0    .0
      -|-        -|-       -|-        -|-        -|-      -|-      -|-        -|-      -|-      -|-       -|-       -|-      -|-       -|-      |-
↑
↑ FILE: 624_EX-E.WSW                     W S P G W - CIVILDESIGN Version 14.06                                      PAGE    1
                                Program Package Serial Number: 1841
                                             WATER SURFACE PROFILE LISTING                        Date: 5-31-2019  Time:11:29:41
                            "3111 MANCHESTER" HYDRAULICS                                 0
                             Prepared By: URBAN RESOURCE CORPORATION
                              Detention Outlet - 18" CMP           Filename: 624_EX-E.wsw
********************************************************************************************************************** ********
          | Invert  |  Depth  |  Water   |    Q     |  Vel     Vel   |  Energy  | Super  |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station  |  Elev   |  (FT)   |  Elev    |  (CFS)   | (FPS)    Head  | Grd.El.  | Elev   | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
      -|-        -|-       -|-        -|-        -|-      -|-      -|-        -|-      -|-      -|-       -|-       -|-      -|-       -|-      |
 L/Elem   |Ch Slope |         |          |          |        SF Ave|    HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
          |         |         |          |          |                  |          |        |         |         |         |         |        |
 1000.000     8.380     1.034      9.414       7.13     5.49      .47      9.88      .00     1.03      1.39      1.500      .000     .00   1    .0
      -|-        -|-       -|-        -|-        -|-      -|-      -|-        -|-      -|-      -|-       -|-       -|-      -|-       -|-      |-
    .401     .0093                                                .0186       .01     1.03     1.00      1.50      .022       .00     .00  PIPE
          |         |         |          |          |                  |          |        |         |         |         |         |        |
 1000.401     8.384     1.080      9.464       7.13     5.23      .43      9.89      .00     1.03      1.35      1.500      .000     .00   1    .0
      -|-        -|-       -|-        -|-        -|-      -|-      -|-        -|-      -|-      -|-       -|-       -|-      -|-       -|-      |-
   1.610     .0093                                                .0166       .03     1.08      .92      1.50      .022       .00     .00  PIPE
          |         |         |          |          |                  |          |        |         |         |         |         |        |
 1002.011     8.399     1.130      9.529       7.13     4.99      .39      9.92      .00     1.03      1.29      1.500      .000     .00   1    .0
      -|-        -|-       -|-        -|-        -|-      -|-      -|-        -|-      -|-      -|-       -|-       -|-      -|-       -|-      |-
   3.615     .0093                                                .0149       .05     1.13      .84      1.50      .022       .00     .00  PIPE
          |         |         |          |          |                  |          |        |         |         |         |         |        |
 1005.626     8.432     1.186      9.618       7.13     4.76      .35      9.97      .00     1.03      1.22      1.500      .000     .00   1    .0
      -|-        -|-       -|-        -|-        -|-      -|-      -|-        -|-      -|-      -|-       -|-       -|-      -|-       -|-      |-
   7.283     .0093                                                .0135       .10     1.19      .76      1.50      .022       .00     .00  PIPE
          |         |         |          |          |                  |          |        |         |         |         |         |        |
 1012.909     8.500     1.248      9.748       7.13     4.54      .32     10.07      .00     1.03      1.12      1.500      .000     .00   1    .0
      -|-        -|-       -|-        -|-        -|-      -|-      -|-        -|-      -|-      -|-       -|-       -|-      -|-       -|-      |-
  14.462     .0093                                                .0124       .18     1.25      .68      1.50      .022       .00     .00  PIPE
          |         |         |          |          |                  |          |        |         |         |         |         |        |
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1027.371     8.635    1.321     9.956      7.13    4.33     .29    10.25     .00    1.03       .97   1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-       -|-     -|-     -|-      -|-     |-
  29.896    .0093                                           .0116      .35    1.32     .59    1.50    .022      .00   .00  PIPE
        |         |        |         |         |                |        |       |        |       |       |        |      |
1057.267     8.914    1.417    10.330      7.13    4.12     .26    10.59     .00    1.03       .69   1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-       -|-     -|-     -|-      -|-     |-
   9.283    .0093                                           .0115      .11    1.42     .46    1.50    .022      .00   .00  PIPE
WALL  ENTRANCE
        |         |        |         |         |                |        |       |        |       |       |        |      |
1066.550     9.000    1.443    10.443      7.13    4.09     .26    10.70     .00    1.03       .57   1.500     .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-       -|-     -|-     -|-      -|-     |-
^
^ FILE: 624_EX-E.WSW                      W S P G W - CIVILDESIGN Version 14.06                            PAGE    1
                           Program Package Serial Number: 1841
                                            WATER SURFACE PROFILE LISTING                 Date: 5-31-2019  Time:11:29:41
                      "3111 MANCHESTER" HYDRAULICS                                0
                        Prepared By: URBAN RESOURCE CORPORATION
                          Detention Outlet - 18" CMP            Filename: 624_EX-E.wsw
******************************************************************************************************************** ********
         | Invert  |  Depth | Water   |    Q     |  Vel     Vel   |  Energy  | Super  |Critical|Flow Top|Height/|Base Wt|      |No Wth
Station  |  Elev   |  (FT)  |  Elev   |  (CFS)   | (FPS)    Head  | Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-       -|-     -|-     -|-      -|-     -|
 L/Elem  |Ch Slope |        |         |          |        SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|**********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
        |         |        |         |         |                |        |       |        |       |       |        |      |
1000.000     8.380    1.035     9.415      7.14    5.49     .47     9.88     .00    1.03      1.39   1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-       -|-     -|-     -|-      -|-     |-
    .413    .0093                                           .0186      .01    1.03    1.00    1.50    .022      .00   .00  PIPE
        |         |        |         |         |                |        |       |        |       |       |        |      |
1000.413     8.384    1.081     9.465      7.14    5.24     .43     9.89     .00    1.03      1.35   1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-       -|-     -|-     -|-      -|-     |-
   1.604    .0093                                           .0166      .03    1.08     .92    1.50    .022      .00   .00  PIPE
        |         |        |         |         |                |        |       |        |       |       |        |      |
1002.017     8.399    1.132     9.530      7.14    4.99     .39     9.92     .00    1.03      1.29   1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-       -|-     -|-     -|-      -|-     |-
   3.640    .0093                                           .0149      .05    1.13     .84    1.50    .022      .00   .00  PIPE
        |         |        |         |         |                |        |       |        |       |       |        |      |
1005.658     8.433    1.187     9.620      7.14    4.76     .35     9.97     .00    1.03      1.22   1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-       -|-     -|-     -|-      -|-     |-
   7.283    .0093                                           .0135      .10    1.19     .76    1.50    .022      .00   .00  PIPE
        |         |        |         |         |                |        |       |        |       |       |        |      |
1012.941     8.501    1.250     9.750      7.14    4.54     .32    10.07     .00    1.03      1.12   1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-       -|-     -|-     -|-      -|-     |-
  14.519    .0093                                           .0124      .18    1.25     .67    1.50    .022      .00   .00  PIPE
        |         |        |         |         |                |        |       |        |       |       |        |      |
1027.459     8.636    1.323     9.959      7.14    4.33     .29    10.25     .00    1.03       .97   1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-       -|-     -|-     -|-      -|-     |-
  29.886    .0093                                           .0117      .35    1.32     .58    1.50    .022      .00   .00  PIPE
        |         |        |         |         |                |        |       |        |       |       |        |      |
1057.345     8.914    1.420    10.334      7.14    4.13     .26    10.60     .00    1.03       .68   1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-       -|-     -|-     -|-      -|-     |-
   9.205    .0093                                           .0115      .11    1.42     .45    1.50    .022      .00   .00  PIPE
WALL  ENTRANCE
        |         |        |         |         |                |        |       |        |       |       |        |      |
1066.550     9.000    1.445    10.445      7.14    4.09     .26    10.70     .00    1.03       .56   1.500     .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-      -|-     -|-       -|-     -|-     -|-      -|-     |-
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↑
↑ FILE: 624_EX-E.WSW                    W S P G W - CIVILDESIGN Version 14.06                              PAGE    1
                                Program Package Serial Number: 1841
                                           WATER SURFACE PROFILE LISTING                    Date: 5-31-2019  Time:11:29:41
                            "3111 MANCHESTER" HYDRAULICS                            0
                             Prepared By: URBAN RESOURCE CORPORATION
                              Detention Outlet - 18" CMP          Filename: 624_EX-E.wsw
**************************************************************************************************************** ********
         | Invert  | Depth  | Water   |    Q    |  Vel    Vel  | Energy  | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)   Head |  Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.| ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-      -|-   -|-       -|-     -|-      -|-      -|-     -|-     -|-   -|
 L/Elem  |Ch Slope |        |         |         |        SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall| ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |             |         |       |        |        |       |       |     |
 1000.000    8.380    1.035    9.415      7.15    5.50     .47     9.88     .00    1.04     1.39    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-   -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
    .404    .0093                                        .0186      .01    1.04    1.00     1.50    .022     .00   .00  PIPE
         |         |        |         |         |             |         |       |        |        |       |       |     |
 1000.404    8.384    1.082    9.465      7.15    5.24     .43     9.89     .00    1.04     1.35    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-   -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
   1.603    .0093                                        .0166      .03    1.08     .92     1.50    .022     .00   .00  PIPE
         |         |        |         |         |             |         |       |        |        |       |       |     |
 1002.007    8.399    1.132    9.531      7.15    5.00     .39     9.92     .00    1.04     1.29    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-   -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
   3.614    .0093                                        .0149      .05    1.13     .84     1.50    .022     .00   .00  PIPE
         |         |        |         |         |             |         |       |        |        |       |       |     |
 1005.621    8.432    1.188    9.620      7.15    4.76     .35     9.97     .00    1.04     1.22    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-   -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
   7.276    .0093                                        .0135      .10    1.19     .76     1.50    .022     .00   .00  PIPE
         |         |        |         |         |             |         |       |        |        |       |       |     |
 1012.897    8.500    1.250    9.751      7.15    4.54     .32    10.07     .00    1.04     1.12    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-   -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
  14.420    .0093                                        .0124      .18    1.25     .67     1.50    .022     .00   .00  PIPE
         |         |        |         |         |             |         |       |        |        |       |       |     |
 1027.318    8.634    1.324    9.958      7.15    4.33     .29    10.25     .00    1.04      .97    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-   -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
  29.698    .0093                                        .0117      .35    1.32     .58     1.50    .022     .00   .00  PIPE
         |         |        |         |         |             |         |       |        |        |       |       |     |
 1057.016    8.911    1.421   10.332      7.15    4.13     .26    10.60     .00    1.04      .67    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-   -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
   9.534    .0093                                        .0115      .11    1.42     .45     1.50    .022     .00   .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |             |         |       |        |        |       |       |     |
 1066.550    9.000    1.448   10.448      7.15    4.09     .26    10.71     .00    1.04      .55    1.500    .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-      -|-   -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
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                                                                             624_EX-F.EDT
FILE: 624_EX-F.WSW                          W S P G W  - EDIT LISTING - Version 14.06           Date: 5-31-2019  Time:11:29:52
                                        WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING                          PAGE    1
 CARD  SECT  CHN   NO OF  AVE PIER  HEIGHT 1  BASE     ZL     ZR    INV   Y(1)  Y(2)  Y(3)  Y(4)  Y(5)  Y(6)  Y(7)  Y(8)  Y(9)  Y(10)
 CODE   NO   TYPE PIER/PIP WIDTH    DIAMETER  WIDTH                 DROP

 CD      1    4      1             2.000
 CD      2    4      1             1.500
 CD      3    4      1             1.000
                                                       W S P G W                                             PAGE NO   1
                            WATER SURFACE PROFILE - TITLE CARD LISTING
HEADING LINE NO 1 IS -
                              "3111 MANCHESTER" HYDRAULICS                            0

HEADING LINE NO 2 IS -
                              Prepared By: URBAN RESOURCE CORPORATION

HEADING LINE NO 3 IS -
                              Detention Outlet - 18" CMP            Filename: 624_EX-F.wsw
                                                       W S P G W                                             PAGE NO   2
                            WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO   1 IS A SYSTEM OUTLET     *         *     *
                    U/S DATA   STATION    INVERT  SECT                                        W S ELEV
                               1000.000    8.970    2                                             8.970
 ELEMENT NO   2 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT             N                                RADIUS    ANGLE     ANG PT  MAN H
                               1071.550    9.590    2             .022                               .000     .000      .000     0
 ELEMENT NO   3 IS A  WALL  ENTRANCE                   *
                    U/S DATA   STATION    INVERT  SECT            FP
                               1071.550    9.590    2             .022
 ELEMENT NO   4 IS A SYSTEM HEADWORKS                  *                       *
                    U/S DATA   STATION    INVERT  SECT                                        W S ELEV
                               1071.550    9.590    2                                           9.590
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↑ FILE: 624_EX-F.WSW                    W S P G W - CIVILDESIGN Version 14.06                              PAGE    1
                          Program Package Serial Number: 1841
                                     WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11:29:54
                      "3111 MANCHESTER" HYDRAULICS                               0
                       Prepared By: URBAN RESOURCE CORPORATION
                        Detention Outlet - 18" CMP           Filename: 624_EX-F.wsw
*********************************************************************************************************** ********
         | Invert  | Depth  | Water   |    Q    |  Vel    Vel   |  Energy  | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)   Head  | Grd.El.  | Elev  | Depth  | Width  |Dia.-FT|or I.D.| ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-     -|-        -|-     -|-      -|-      -|-     -|-     -|-   -|
 L/Elem  |Ch Slope |        |         |         |       SF Ave|    HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall| ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |              |          |       |        |        |       |       |     |
 1000.000    8.970    .714     9.684      3.50    4.22     .28     9.96     .00     .71     1.50    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-        -|-     -|-      -|-      -|-     -|-     -|-   |-
    .315    .0087                                         .0142     .00     .71    1.00      .84    .022     .00   .00  PIPE
         |         |        |         |         |              |          |       |        |        |       |       |     |
 1000.315    8.973    .741     9.713      3.50    4.03     .25     9.96     .00     .71     1.50    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-        -|-     -|-      -|-      -|-     -|-     -|-   |-
   1.421    .0087                                         .0125     .02     .74     .93      .84    .022     .00   .00  PIPE
         |         |        |         |         |              |          |       |        |        |       |       |     |
 1001.736    8.985    .769     9.754      3.50    3.84     .23     9.98     .00     .71     1.50    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-        -|-     -|-      -|-      -|-     -|-     -|-   |-
   3.815    .0087                                         .0110     .04     .77     .87      .84    .022     .00   .00  PIPE
         |         |        |         |         |              |          |       |        |        |       |       |     |
 1005.552    9.018    .799     9.817      3.50    3.66     .21    10.02     .00     .71     1.50    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-        -|-     -|-      -|-      -|-     -|-     -|-   |-
  11.975    .0087                                         .0097     .12     .80     .81      .84    .022     .00   .00  PIPE
         |         |        |         |         |              |          |       |        |        |       |       |     |
 1017.526    9.122    .830     9.952      3.50    3.49     .19    10.14     .00     .71     1.49    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-        -|-     -|-      -|-      -|-     -|-     -|-   |-
  33.951    .0087                                         .0088     .30     .83     .75      .84    .022     .00   .00  PIPE
         |         |        |         |         |              |          |       |        |        |       |       |     |
 1051.477    9.416    .842    10.258      3.50    3.43     .18    10.44     .00     .71     1.49    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-        -|-     -|-      -|-      -|-     -|-     -|-   |-
  20.073    .0087                                         .0086     .17     .84     .73      .84    .022     .00   .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |              |          |       |        |        |       |       |     |
 1071.550    9.590    .843    10.433      3.50    3.42     .18    10.62     .00     .71     1.49    1.500    .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-        -|-     -|-      -|-      -|-     -|-     -|-   |-
↑
↑ FILE: 624_EX-F.WSW                    W S P G W - CIVILDESIGN Version 14.06                              PAGE    1
                          Program Package Serial Number: 1841
                                     WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11:29:55
                      "3111 MANCHESTER" HYDRAULICS                               0
                       Prepared By: URBAN RESOURCE CORPORATION
                        Detention Outlet - 18" CMP           Filename: 624_EX-F.wsw
*********************************************************************************************************** ********
         | Invert  | Depth  | Water   |    Q    |  Vel    Vel   |  Energy  | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)   Head  | Grd.El.  | Elev  | Depth  | Width  |Dia.-FT|or I.D.| ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-     -|-        -|-     -|-      -|-      -|-     -|-     -|-   -|
 L/Elem  |Ch Slope |        |         |         |       SF Ave|    HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall| ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |              |          |       |        |        |       |       |     |
 1000.000    8.970    .715     9.685      3.51    4.23     .28     9.96     .00     .71     1.50    1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-        -|-     -|-      -|-      -|-     -|-     -|-   |-
```

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     .325    .0087                                           .0142     .00     .71   1.00     .84   .022      .00   .00  PIPE
         |         |        |         |         |        |        |         |       |       |       |       |       |     |
 1000.325    8.973     .742     9.715      3.51    4.03     .25     9.97     .00     .71    1.50   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-       -|-     -|-     -|-     -|-     -|-     -|-   |-
    1.435    .0087                                           .0125     .02     .74    .93     .84   .022      .00   .00  PIPE
         |         |        |         |         |        |        |         |       |       |       |       |       |     |
 1001.760    8.985     .770     9.755      3.51    3.84     .23     9.98     .00     .71    1.50   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-       -|-     -|-     -|-     -|-     -|-     -|-   |-
    3.791    .0087                                           .0110     .04     .77    .87     .84   .022      .00   .00  PIPE
         |         |        |         |         |        |        |         |       |       |       |       |       |     |
 1005.550    9.018     .800     9.818      3.51    3.66     .21    10.03     .00     .71    1.50   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-       -|-     -|-     -|-     -|-     -|-     -|-   |-
   11.889    .0087                                           .0097     .12     .80    .81     .84   .022      .00   .00  PIPE
         |         |        |         |         |        |        |         |       |       |       |       |       |     |
 1017.439    9.121     .831     9.952      3.51    3.49     .19    10.14     .00     .71    1.49   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-       -|-     -|-     -|-     -|-     -|-     -|-   |-
   34.183    .0087                                           .0088     .30     .83    .75     .84   .022      .00   .00  PIPE
         |         |        |         |         |        |        |         |       |       |       |       |       |     |
 1051.623    9.417     .844    10.261      3.51    3.43     .18    10.44     .00     .71    1.49   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-       -|-     -|-     -|-     -|-     -|-     -|-   |-
   19.927    .0087                                           .0086     .17     .84    .73     .84   .022      .00   .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |        |        |         |       |       |       |       |       |     |
 1071.550    9.590     .845    10.435      3.51    3.42     .18    10.62     .00     .71    1.49   1.500    .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-       -|-     -|-     -|-     -|-     -|-     -|-   |-
↑
↑ FILE: 624_EX-F.WSW                         W S P G W - CIVILDESIGN Version 14.06                             PAGE    1
                              Program Package Serial Number: 1841
                                                 WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11:29:55
                        "3111 MANCHESTER" HYDRAULICS                                  0
                          Prepared By: URBAN RESOURCE CORPORATION
                            Detention Outlet - 18" CMP            Filename: 624_EX-F.wsw
************************************************************************************************************************** ********
         | Invert  |  Depth  |  Water  |    Q    |  Vel    Vel   |  Energy | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
 Station |  Elev   |  (FT)   |  Elev   |  (CFS)  | (FPS)   Head  | Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL |Prs/Pip
        -|-       -|-       -|-       -|-       -|-     -|-     -|-      -|-     -|-      -|-      -|-     -|-     -|-   -|
 L/Elem  |Ch Slope |         |         |         |        SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR |Type Ch
*********|*********|*********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |        |        |         |       |       |       |       |       |     |
 1000.000    8.970     .716     9.686      3.52    4.23     .28     9.96     .00     .72    1.50   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-       -|-     -|-     -|-     -|-     -|-     -|-   |-
     .315    .0087                                           .0142     .00     .72   1.00     .85   .022      .00   .00  PIPE
         |         |        |         |         |        |        |         |       |       |       |       |       |     |
 1000.315    8.973     .743     9.715      3.52    4.03     .25     9.97     .00     .72    1.50   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-       -|-     -|-     -|-     -|-     -|-     -|-   |-
    1.444    .0087                                           .0125     .02     .74    .93     .85   .022      .00   .00  PIPE
         |         |        |         |         |        |        |         |       |       |       |       |       |     |
 1001.759    8.985     .771     9.756      3.52    3.85     .23     9.99     .00     .72    1.50   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-       -|-     -|-     -|-     -|-     -|-     -|-   |-
    3.798    .0087                                           .0110     .04     .77    .87     .85   .022      .00   .00  PIPE
         |         |        |         |         |        |        |         |       |       |       |       |       |     |
 1005.557    9.018     .801     9.819      3.52    3.67     .21    10.03     .00     .72    1.50   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-      -|-       -|-     -|-     -|-     -|-     -|-     -|-   |-
   11.744    .0087                                           .0097     .11     .80    .81     .85   .022      .00   .00  PIPE
         |         |        |         |         |        |        |         |       |       |       |       |       |     |
 1017.301    9.120     .832     9.952      3.52    3.50     .19    10.14     .00     .72    1.49   1.500    .000   .00   1   .0
```

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        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
  34.215   .0087                                          .0088     .30     .83     .75     .85   .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1051.516    9.416    .845   10.262      3.52    3.43     .18   10.44     .00     .72    1.49   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
  20.034   .0087                                          .0086     .17     .85     .73     .85   .022      .00   .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1071.550    9.590    .846   10.436      3.52    3.42     .18   10.62     .00     .72    1.49   1.500    .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
^
^ FILE: 624_EX-F.WSW                     W S P G W - CIVILDESIGN Version 14.06                              PAGE    1
                              Program Package Serial Number: 1841
                                          WATER SURFACE PROFILE LISTING                     Date: 5-31-2019  Time:11:29:55
                        "3111 MANCHESTER" HYDRAULICS                                 0
                          Prepared By: URBAN RESOURCE CORPORATION
                            Detention Outlet - 18" CMP            Filename: 624_EX-F.wsw
************************************************************************************************************************** ********
         | Invert  | Depth  |  Water  |    Q    |  Vel    Vel  |  Energy  | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  |  (FPS)  Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |        |         |         |        SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1000.000    8.970    .717    9.687      3.53    4.23     .28    9.97     .00     .72    1.50   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
    .327   .0087                                          .0142     .00     .72    1.00     .85   .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1000.327    8.973    .744    9.717      3.53    4.04     .25    9.97     .00     .72    1.50   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
   1.436   .0087                                          .0125     .02     .74     .93     .85   .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1001.763    8.985    .773    9.758      3.53    3.85     .23    9.99     .00     .72    1.50   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
   3.829   .0087                                          .0110     .04     .77     .87     .85   .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1005.592    9.018    .802    9.821      3.53    3.67     .21   10.03     .00     .72    1.50   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
  11.812   .0087                                          .0097     .11     .80     .81     .85   .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1017.405    9.121    .834    9.955      3.53    3.50     .19   10.14     .00     .72    1.49   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
  34.063   .0087                                          .0088     .30     .83     .75     .85   .022      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1051.468    9.416    .847   10.263      3.53    3.43     .18   10.45     .00     .72    1.49   1.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
  20.082   .0087                                          .0086     .17     .85     .73     .85   .022      .00   .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1071.550    9.590    .848   10.438      3.53    3.43     .18   10.62     .00     .72    1.49   1.500    .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
^
^ FILE: 624_EX-F.WSW                     W S P G W - CIVILDESIGN Version 14.06                              PAGE    1
                              Program Package Serial Number: 1841
                                          WATER SURFACE PROFILE LISTING                     Date: 5-31-2019  Time:11:29:55
                        "3111 MANCHESTER" HYDRAULICS                                 0
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                         Prepared By: URBAN RESOURCE CORPORATION
                          Detention Outlet - 18" CMP            Filename: 624_EX-F.wsw
******************************************************************************************************************** ********
          | Invert  | Depth | Water   |    Q    | Vel      Vel  | Energy  | Super  |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station  |  Elev   | (FT)  |  Elev   |  (CFS)  | (FPS)    Head | Grd.El.| Elev   | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-     -|-       -|-       -|-      -|-     -|-      -|-     -|-     -|-     -|-    -|-     -|-    -|
 L/Elem   |Ch Slope |       |         |         |      |SF Ave|   HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |       |       |        |        |        |        |       |       |      |
 1000.000    8.970    .718     9.688      3.54    4.24     .28    9.97     .00     .72     1.50    1.500    .000   .00   1   .0
        -|-       -|-     -|-       -|-       -|-      -|-     -|-      -|-     -|-     -|-     -|-     -|-    -|-     |-
   .325     .0087                                          .0142     .00     .72    1.00     .85    .022      .00   .00  PIPE
         |         |        |         |         |       |       |        |        |        |        |       |       |      |
 1000.325    8.973    .745     9.718      3.54    4.04     .25    9.97     .00     .72     1.50    1.500    .000   .00   1   .0
        -|-       -|-     -|-       -|-       -|-      -|-     -|-      -|-     -|-     -|-     -|-     -|-    -|-     |-
  1.418     .0087                                          .0125     .02     .75     .93     .85    .022      .00   .00  PIPE
         |         |        |         |         |       |       |        |        |        |        |       |       |      |
 1001.742    8.985    .774     9.759      3.54    3.85     .23    9.99     .00     .72     1.50    1.500    .000   .00   1   .0
        -|-       -|-     -|-       -|-       -|-      -|-     -|-      -|-     -|-     -|-     -|-     -|-    -|-     |-
  3.832     .0087                                          .0110     .04     .77     .87     .85    .022      .00   .00  PIPE
         |         |        |         |         |       |       |        |        |        |        |       |       |      |
 1005.574    9.018    .804     9.822      3.54    3.67     .21   10.03     .00     .72     1.50    1.500    .000   .00   1   .0
        -|-       -|-     -|-       -|-       -|-      -|-     -|-      -|-     -|-     -|-     -|-     -|-    -|-     |-
 11.735     .0087                                          .0097     .11     .80     .81     .85    .022      .00   .00  PIPE
         |         |        |         |         |       |       |        |        |        |        |       |       |      |
 1017.309    9.120    .835     9.955      3.54    3.50     .19   10.15     .00     .72     1.49    1.500    .000   .00   1   .0
        -|-       -|-     -|-       -|-       -|-      -|-     -|-      -|-     -|-     -|-     -|-     -|-    -|-     |-
 33.649     .0087                                          .0088     .30     .84     .75     .85    .022      .00   .00  PIPE
         |         |        |         |         |       |       |        |        |        |        |       |       |      |
 1050.958    9.412    .848    10.260      3.54    3.43     .18   10.44     .00     .72     1.49    1.500    .000   .00   1   .0
        -|-       -|-     -|-       -|-       -|-      -|-     -|-      -|-     -|-     -|-     -|-     -|-    -|-     |-
 20.592     .0087                                          .0086     .18     .85     .73     .85    .022      .00   .00  PIPE
WALL  ENTRANCE
         |         |        |         |         |       |       |        |        |        |        |       |       |      |
 1071.550    9.590    .849    10.439      3.54    3.43     .18   10.62     .00     .72     1.49    1.500    .000   .00   0   .0
        -|-       -|-     -|-       -|-       -|-      -|-     -|-      -|-     -|-     -|-     -|-     -|-    -|-     |-
^
^ FILE: 624_EX-F.WSW                        W S P G W - CIVILDESIGN Version 14.06                                PAGE    1
                           Program Package Serial Number: 1841
                                          WATER SURFACE PROFILE LISTING                     Date: 5-31-2019  Time:11:29:55
                        "3111 MANCHESTER" HYDRAULICS                         0
                         Prepared By: URBAN RESOURCE CORPORATION
                          Detention Outlet - 18" CMP            Filename: 624_EX-F.wsw
******************************************************************************************************************** ********
          | Invert  | Depth | Water   |    Q    | Vel      Vel  | Energy  | Super  |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station  |  Elev   | (FT)  |  Elev   |  (CFS)  | (FPS)    Head | Grd.El.| Elev   | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-     -|-       -|-       -|-      -|-     -|-      -|-     -|-     -|-     -|-     -|-    -|-     -|-    -|
 L/Elem   |Ch Slope |       |         |         |      |SF Ave|   HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |       |       |        |        |        |        |       |       |      |
 1000.000    8.970    .719     9.689      3.55    4.24     .28    9.97     .00     .72     1.50    1.500    .000   .00   1   .0
        -|-       -|-     -|-       -|-       -|-      -|-     -|-      -|-     -|-     -|-     -|-     -|-    -|-     |-
   .327     .0087                                          .0142     .00     .72    1.00     .85    .022      .00   .00  PIPE
         |         |        |         |         |       |       |        |        |        |        |       |       |      |
 1000.327    8.973    .746     9.719      3.55    4.04     .25    9.97     .00     .72     1.50    1.500    .000   .00   1   .0
        -|-       -|-     -|-       -|-       -|-      -|-     -|-      -|-     -|-     -|-     -|-     -|-    -|-     |-
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   1.434    .0087                                         .0125       .02      .75      .93      .85   .022     .00    .00 PIPE
        |         |        |         |         |               |         |        |        |        |       |       |      |
1001.760     8.985     .775     9.760      3.55    3.86     .23      9.99      .00      .72     1.50   1.500   .000    .00   1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
   3.815    .0087                                         .0110       .04      .77      .87      .85   .022     .00    .00 PIPE
        |         |        |         |         |               |         |        |        |        |       |       |      |
1005.575     9.018     .805     9.823      3.55    3.68     .21     10.03      .00      .72     1.50   1.500   .000    .00   1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
  11.778    .0087                                         .0097       .11      .80      .81      .85   .022     .00    .00 PIPE
        |         |        |         |         |               |         |        |        |        |       |       |      |
1017.353     9.120     .836     9.957      3.55    3.50     .19     10.15      .00      .72     1.49   1.500   .000    .00   1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
  33.696    .0087                                         .0088       .30      .84      .75      .85   .022     .00    .00 PIPE
        |         |        |         |         |               |         |        |        |        |       |       |      |
1051.048     9.412     .850    10.262      3.55    3.44     .18     10.45      .00      .72     1.49   1.500   .000    .00   1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
  20.502    .0087                                         .0086       .18      .85      .73      .85   .022     .00    .00 PIPE
WALL  ENTRANCE
        |         |        |         |         |               |         |        |        |        |       |       |      |
1071.550     9.590     .851    10.441      3.55    3.43     .18     10.62      .00      .72     1.49   1.500   .000    .00   0   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
↑
↑ FILE: 624_EX-F.WSW                        W S P G W - CIVILDESIGN Version 14.06                                          PAGE    1
                              Program Package Serial Number: 1841
                                                  WATER SURFACE PROFILE LISTING                     Date: 5-31-2019  Time:11:29:55
                        "3111 MANCHESTER" HYDRAULICS                                 0
                          Prepared By: URBAN RESOURCE CORPORATION
                            Detention Outlet - 18" CMP              Filename: 624_EX-F.wsw
************************************************************************************************************************** ********
        | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy |  Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-    -|
L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE Dpth |Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
********|*********|********|*********|*********|*******|*******|*********|********|********|********|*******|*******|***** |*******
        |         |        |         |         |               |         |        |        |        |       |       |      |
1000.000     8.970     .720     9.690      3.56    4.25     .28      9.97      .00      .72     1.50   1.500   .000    .00   1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
    .335    .0087                                         .0142       .00      .72     1.00      .85   .022     .00    .00 PIPE
        |         |        |         |         |               |         |        |        |        |       |       |      |
1000.335     8.973     .747     9.720      3.56    4.05     .25      9.97      .00      .72     1.50   1.500   .000    .00   1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
   1.417    .0087                                         .0125       .02      .75      .93      .85   .022     .00    .00 PIPE
        |         |        |         |         |               |         |        |        |        |       |       |      |
1001.752     8.985     .776     9.761      3.56    3.86     .23      9.99      .00      .72     1.50   1.500   .000    .00   1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
   3.781    .0087                                         .0110       .04      .78      .87      .85   .022     .00    .00 PIPE
        |         |        |         |         |               |         |        |        |        |       |       |      |
1005.533     9.018     .806     9.824      3.56    3.68     .21     10.03      .00      .72     1.50   1.500   .000    .00   1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
  11.739    .0087                                         .0097       .11      .81      .81      .85   .022     .00    .00 PIPE
        |         |        |         |         |               |         |        |        |        |       |       |      |
1017.272     9.120     .838     9.957      3.56    3.51     .19     10.15      .00      .72     1.49   1.500   .000    .00   1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
  33.755    .0087                                         .0089       .30      .84      .75      .85   .022     .00    .00 PIPE
        |         |        |         |         |               |         |        |        |        |       |       |      |
1051.027     9.412     .851    10.264      3.56    3.44     .18     10.45      .00      .72     1.49   1.500   .000    .00   1   .0
```

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       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-      |-
  20.523    .0087                                         .0086      .18      .85     .73     .85    .022       .00   .00  PIPE
WALL  ENTRANCE
        |         |        |         |         |               |         |       |        |        |       |       |       |
1071.550     9.590     .852    10.442      3.56    3.43     .18    10.63     .00     .72     1.49    1.500     .000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-      |-
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                                                                             624_PR-A2.EDT
FILE: 624_PR-A2.WSW                         W S P G W  - EDIT LISTING - Version 14.06          Date: 6- 6-2019  Time:10:22:21
                                        WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING                        PAGE    1
 CARD  SECT  CHN   NO OF  AVE PIER  HEIGHT 1  BASE     ZL     ZR    INV   Y(1)  Y(2)  Y(3)  Y(4)  Y(5)  Y(6)  Y(7)  Y(8)  Y(9)  Y(10)
 CODE   NO   TYPE PIER/PIP WIDTH    DIAMETER  WIDTH                 DROP

 CD      1    3      0     .000     1.500    8.000    .000   .000    .00
 CD      2    4      1              3.500
 CD      3    3      0     .000     4.000    6.000    .000   .000    .00
                                                       W S P G W                                                  PAGE NO   1
                            WATER SURFACE PROFILE - TITLE CARD LISTING
HEADING LINE NO 1 IS -
                              "3111 MANCHESTER" HYDRAULICS                                 0
HEADING LINE NO 2 IS -
                              Prepared By: URBAN RESOURCE CORPORATION
HEADING LINE NO 3 IS -
                              SD LINE 'A'                           Filename: 624_PR-A.wsw
                                                       W S P G W                                                  PAGE NO   2
                            WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO   1 IS A SYSTEM OUTLET     *         *     *
                  U/S DATA   STATION    INVERT  SECT                                              W S ELEV
                             1000.000    8.090    1                                                  8.090
 ELEMENT NO   2 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                                  RADIUS    ANGLE     ANG PT  MAN H
                             1164.490    8.420    1              .013                                 .000     .000      .000     0
 ELEMENT NO   3 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                                  RADIUS    ANGLE     ANG PT  MAN H
                             1195.900    8.580    1              .013                               119.977  -15.000     .000     0
 ELEMENT NO   4 IS A JUNCTION          *         *     *     *                   *                     *              *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2  N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                             1201.200    8.610    2     0     0  .013      .000      .000      .000     .000    .000     .000
                                                                                                 RADIUS    ANGLE
                                                                                                   .000     .000

 ELEMENT NO   5 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                                  RADIUS    ANGLE     ANG PT  MAN H
                             1248.800    8.840    2              .013                                45.005  -60.600     .000     0
 ELEMENT NO   6 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                                  RADIUS    ANGLE     ANG PT  MAN H
                             1285.230    9.030    2              .013                                 .000     .000      .000     0
 ELEMENT NO   7 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                                  RADIUS    ANGLE     ANG PT  MAN H
                             1340.330    9.300    2              .013                                44.997   70.160     .000     0
 ELEMENT NO   8 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                                  RADIUS    ANGLE     ANG PT  MAN H
                             1435.790    9.780    2              .013                               505.963   10.810     .000     0
 ELEMENT NO   9 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                                  RADIUS    ANGLE     ANG PT  MAN H
                             1584.810   10.520    2              .013                               494.110  -17.280     .000     0
 ELEMENT NO  10 IS A  WALL  ENTRANCE                   *
                  U/S DATA   STATION    INVERT  SECT              FP
                             1584.810   10.520    2              .013
 ELEMENT NO  11 IS A SYSTEM HEADWORKS                  *                *
                  U/S DATA   STATION    INVERT  SECT                                              W S ELEV
                             1584.810   10.520    2                                                10.520
```

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                                                                    624_PR-A2.OUT
↑ FILE: 624_PR-A2.WSW                         W S P G W - CIVILDESIGN Version 14.06                               PAGE     1
                                   Program Package Serial Number: 1841
                                                 WATER SURFACE PROFILE LISTING                      Date: 6- 6-2019  Time:10:22:23
                              "3111 MANCHESTER" HYDRAULICS                                 0
                                Prepared By: URBAN RESOURCE CORPORATION
                                  SD LINE 'A'                          Filename: 624_PR-A.wsw
*********************************************************************************************************************** ********
          | Invert  | Depth  | Water   |    Q    | Vel     Vel  | Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
Station   |  Elev   | (FT)   | Elev    |  (CFS)  | (FPS)   Head | Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-      -|-    -|-      -|-     -|-      -|-      -|-     -|-     -|-   -|
L/Elem    |Ch Slope |        |         |         |       SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|***** |*******
         |         |        |         |         |              |        |       |        |        |       |       |      |
1000.000    8.090    1.294     9.384     66.77    6.45      .65    10.03     .00     1.29     8.00    1.500   8.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-      -|-    -|-      -|-     -|-      -|-      -|-     -|-     -|-    |-
  4.126     .0020                                          .0028      .01    1.29    1.00     1.50    .013      .00   .00  BOX
         |         |        |         |         |              |        |       |        |        |       |       |      |
1004.126    8.098    1.357     9.455     66.77    6.15      .59    10.04     .00     1.29     8.00    1.500   8.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-      -|-    -|-      -|-     -|-      -|-      -|-     -|-     -|-    |-
 19.640     .0020                                          .0025      .05    1.36     .93     1.50    .013      .00   .00  BOX
                     -------------------- WARNING - Flow depth near top of box conduit -------------------
         |         |        |         |         |              |        |       |        |        |       |       |      |
1023.765    8.138    1.423     9.561     66.77    5.87      .53    10.09     .00     1.29     8.00    1.500   8.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-      -|-    -|-      -|-     -|-      -|-      -|-     -|-     -|-    |-
 35.610     .0020                                          .0023      .08    1.42     .87     1.50    .013      .00   .00  BOX
                     -------------------- WARNING - Flow depth near top of box conduit -------------------
         |         |        |         |         |              |        |       |        |        |       |       |      |
1059.375    8.209    1.458     9.667     66.77    5.72      .51    10.18     .00     1.29     8.00    1.500   8.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-      -|-    -|-      -|-     -|-      -|-      -|-     -|-     -|-    |-
HYDRAULIC JUMP
                     -------------------- WARNING - Flow depth near top of box conduit -------------------
         |         |        |         |         |              |        |       |        |        |       |       |      |
1059.375    8.209    1.134     9.344     66.77    7.36      .84    10.18     .00     1.29     8.00    1.500   8.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-      -|-    -|-      -|-     -|-      -|-      -|-     -|-     -|-    |-
  3.813     .0020                                          .0050      .02    1.13    1.22     1.50    .013      .00   .00  BOX
         |         |        |         |         |              |        |       |        |        |       |       |      |
1063.188    8.217    1.117     9.334     66.77    7.47      .87    10.20     .00     1.29     8.00    1.500   8.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-      -|-    -|-      -|-     -|-      -|-      -|-     -|-     -|-    |-
  9.871     .0020                                          .0055      .05    1.12    1.25     1.50    .013      .00   .00  BOX
↑ FILE: 624_PR-A2.WSW                         W S P G W - CIVILDESIGN Version 14.06                               PAGE     2
                                   Program Package Serial Number: 1841
                                                 WATER SURFACE PROFILE LISTING                      Date: 6- 6-2019  Time:10:22:23
                              "3111 MANCHESTER" HYDRAULICS                                 0
                                Prepared By: URBAN RESOURCE CORPORATION
                                  SD LINE 'A'                          Filename: 624_PR-A.wsw
*********************************************************************************************************************** ********
          | Invert  | Depth  | Water   |    Q    | Vel     Vel  | Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
Station   |  Elev   | (FT)   | Elev    |  (CFS)  | (FPS)   Head | Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-      -|-    -|-      -|-     -|-      -|-      -|-     -|-     -|-   -|
L/Elem    |Ch Slope |        |         |         |       SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|***** |*******
         |         |        |         |         |              |        |       |        |        |       |       |      |
1073.060    8.237    1.065     9.302     66.77    7.83      .95    10.25     .00     1.29     8.00    1.500   8.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-      -|-    -|-      -|-     -|-      -|-      -|-     -|-     -|-    |-
 10.457     .0020                                          .0064      .07    1.07    1.34     1.50    .013      .00   .00  BOX
         |         |        |         |         |              |        |       |        |        |       |       |      |
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 1083.517    8.258   1.016    9.273    66.77    8.22    1.05    10.32     .00    1.29    8.00   1.500    8.000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-     |-
   10.709   .0020                                            .0074      .08    1.02    1.44    1.50    .013      .00   .00  BOX
         |         |        |         |         |                 |        |       |       |       |       |        |      |
 1094.226    8.279    .969    9.248    66.77    8.62    1.15    10.40     .00    1.29    8.00   1.500    8.000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-     |-
   10.742   .0020                                            .0085      .09     .97    1.54    1.50    .013      .00   .00  BOX
         |         |        |         |         |                 |        |       |       |       |       |        |      |
 1104.968    8.301    .924    9.224    66.77    9.04    1.27    10.49     .00    1.29    8.00   1.500    8.000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-     |-
   10.628   .0020                                            .0099      .11     .92    1.66    1.50    .013      .00   .00  BOX
         |         |        |         |         |                 |        |       |       |       |       |        |      |
 1115.596    8.322    .881    9.202    66.77    9.48    1.40    10.60     .00    1.29    8.00   1.500    8.000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-     |-
   10.415   .0020                                            .0115      .12     .88    1.78    1.50    .013      .00   .00  BOX
         |         |        |         |         |                 |        |       |       |       |       |        |      |
 1126.011    8.343    .840    9.182    66.77    9.94    1.53    10.72     .00    1.29    8.00   1.500    8.000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-     |-
   10.134   .0020                                            .0133      .13     .84    1.91    1.50    .013      .00   .00  BOX
         |         |        |         |         |                 |        |       |       |       |       |        |      |
 1136.145    8.363    .801    9.164    66.77   10.43    1.69    10.85     .00    1.29    8.00   1.500    8.000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-     |-
    9.808   .0020                                            .0154      .15     .80    2.05    1.50    .013      .00   .00  BOX
         |         |        |         |         |                 |        |       |       |       |       |        |      |
 1145.953    8.383    .763    9.146    66.77   10.94    1.86    11.00     .00    1.29    8.00   1.500    8.000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-     |-
    9.454   .0020                                            .0179      .17     .76    2.21    1.50    .013      .00   .00  BOX
         |         |        |         |         |                 |        |       |       |       |       |        |      |
 1155.407    8.402    .728    9.130    66.77   11.47    2.04    11.17     .00    1.29    8.00   1.500    8.000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-     |-
    9.083   .0020                                            .0208      .19     .73    2.37    1.50    .013      .00   .00  BOX
↑ FILE: 624_PR-A2.WSW                    W S P G W - CIVILDESIGN Version 14.06                                 PAGE     3
                          Program Package Serial Number: 1841
                                           WATER SURFACE PROFILE LISTING                     Date: 6- 6-2019  Time:10:22:23
                      "3111 MANCHESTER" HYDRAULICS                               0
                        Prepared By: URBAN RESOURCE CORPORATION
                         SD LINE 'A'                                 Filename: 624_PR-A.wsw
*************************************************************************************************************** ********
          | Invert  |  Depth | Water   |    Q    |  Vel    Vel  | Energy  | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
 Station  |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)   Head | Grd.El. | Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   -|
 L/Elem   |Ch Slope |        |         |         |       SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
          |         |        |         |         |             |         |       |        |        |       |       |     |
 1164.490    8.420    .694    9.114    66.77   12.03    2.25    11.36     .30    1.29    8.00   1.500    8.000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-     |-
    3.704   .0051                                            .0229      .08     .99    2.54    1.12    .013      .00   .00  BOX
         |         |        |         |         |                 |        |       |       |       |       |        |      |
 1168.194    8.439    .682    9.121    66.77   12.24    2.33    11.45     .31    1.29    8.00   1.500    8.000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-     |-
    9.864   .0051                                            .0254      .25     .99    2.61    1.12    .013      .00   .00  BOX
         |         |        |         |         |                 |        |       |       |       |       |        |      |
 1178.058    8.489    .650    9.139    66.77   12.83    2.56    11.70     .34    1.29    8.00   1.500    8.000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-     |-
    9.215   .0051                                            .0296      .27     .99    2.80    1.12    .013      .00   .00  BOX
         |         |        |         |         |                 |        |       |       |       |       |        |      |
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 1187.273    8.536    .620    9.156    66.77  13.46    2.81    11.97    .38    1.29    8.00   1.500   8.000   .00   0   .0
        -|-       -|-     -|-      -|-       -|-    -|-     -|-       -|-    -|-     -|-     -|-     -|-     -|-    |-
   8.627   .0051                                         .0344     .30   1.00    3.01    1.12    .013     .00   .00  BOX
        |         |       |        |         |                |        |      |       |       |       |       |      |
 1195.900    8.580    .591    9.171    66.77  14.12    3.09    12.27    .00    1.29    8.00   1.500   8.000   .00   0   .0
        -|-       -|-     -|-      -|-       -|-    -|-     -|-       -|-    -|-     -|-     -|-     -|-     -|-    |-
JUNCT STR   .0057                                        .0213     .11   1.50    3.24            .013     .00   .00  BOX
                   -------------------- WARNING - Junction Analysis - Change in Channel Type --------------
        |         |       |        |         |                |        |      |       |       |       |       |      |
 1201.200    8.610   2.561   11.171    66.77   8.85    1.22    12.39    .08    2.56    3.10   3.500    .000   .00   1   .0
        -|-       -|-     -|-      -|-       -|-    -|-     -|-       -|-    -|-     -|-     -|-     -|-     -|-    |-
  21.512   .0048                                         .0053     .11   2.64    1.00    2.74    .013     .00   .00  PIPE
        |         |       |        |         |                |        |      |       |       |       |       |      |
 1222.712    8.714   2.682   11.396    66.77   8.44    1.11    12.50    .07    2.56    2.96   3.500    .000   .00   1   .0
        -|-       -|-     -|-      -|-       -|-    -|-     -|-       -|-    -|-     -|-     -|-     -|-     -|-    |-
  26.088   .0048                                         .0050     .13   2.76     .91    2.74    .013     .00   .00  PIPE
        |         |       |        |         |                |        |      |       |       |       |       |      |
 1248.800    8.840   2.705   11.545    66.77   8.37    1.09    12.63    .00    2.56    2.93   3.500    .000   .00   1   .0
        -|-       -|-     -|-      -|-       -|-    -|-     -|-       -|-    -|-     -|-     -|-     -|-     -|-    |-
  36.430   .0052                                         .0050     .18   2.71     .89    2.64    .013     .00   .00  PIPE
↑ FILE: 624_PR-A2.WSW                        W S P G W - CIVILDESIGN Version 14.06                                   PAGE    4
                            Program Package Serial Number: 1841
                                               WATER SURFACE PROFILE LISTING                   Date: 6- 6-2019  Time:10:22:23
                       "3111 MANCHESTER" HYDRAULICS                                  0
                         Prepared By: URBAN RESOURCE CORPORATION
                           SD LINE 'A'                             Filename: 624_PR-A.wsw
****************************************************************************************************************** ********
          | Invert  | Depth | Water  |    Q    |  Vel    Vel  | Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station  |  Elev   | (FT)  |  Elev  |  (CFS)  | (FPS)   Head | Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-     -|-      -|-       -|-    -|-     -|-       -|-    -|-     -|-     -|-     -|-     -|-    -|
 L/Elem   |Ch Slope |       |        |         |       SF Ave|   HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
        |         |       |        |         |                |        |      |       |       |       |       |      |
 1285.230    9.030   2.667   11.697    66.77   8.49    1.12    12.82    .07    2.56    2.98   3.500    .000   .00   1   .0
        -|-       -|-     -|-      -|-       -|-    -|-     -|-       -|-    -|-     -|-     -|-     -|-     -|-    |-
  55.100   .0049                                         .0050     .28   2.74     .92    2.72    .013     .00   .00  PIPE
        |         |       |        |         |                |        |      |       |       |       |       |      |
 1340.330    9.300   2.707   12.007    66.77   8.36    1.09    13.09    .01    2.56    2.93   3.500    .000   .00   1   .0
        -|-       -|-     -|-      -|-       -|-    -|-     -|-       -|-    -|-     -|-     -|-     -|-     -|-    |-
  75.041   .0050                                         .0050     .37   2.71     .89    2.69    .013     .00   .00  PIPE
        |         |       |        |         |                |        |      |       |       |       |       |      |
 1415.371    9.677   2.686   12.363    66.77   8.43    1.10    13.47    .01    2.56    2.96   3.500    .000   .00   1   .0
        -|-       -|-     -|-      -|-       -|-    -|-     -|-       -|-    -|-     -|-     -|-     -|-     -|-    |-
  20.419   .0050                                         .0050     .10   2.69     .91    2.69    .013     .00   .00  PIPE
        |         |       |        |         |                |        |      |       |       |       |       |      |
 1435.790    9.780   2.686   12.466    66.77   8.43    1.10    13.57    .01    2.56    2.96   3.500    .000   .00   1   .0
        -|-       -|-     -|-      -|-       -|-    -|-     -|-       -|-    -|-     -|-     -|-     -|-     -|-    |-
 137.837   .0050                                         .0050     .69   2.69     .91    2.70    .013     .00   .00  PIPE
        |         |       |        |         |                |        |      |       |       |       |       |      |
 1573.627   10.464   2.701   13.166    66.77   8.38    1.09    14.26    .01    2.56    2.94   3.500    .000   .00   1   .0
        -|-       -|-     -|-      -|-       -|-    -|-     -|-       -|-    -|-     -|-     -|-     -|-     -|-    |-
  11.183   .0050                                         .0049     .06   2.71     .90    2.70    .013     .00   .00  PIPE
WALL  ENTRANCE
        |         |       |        |         |                |        |      |       |       |       |       |      |
 1584.810   10.520   2.702   13.222    66.77   8.38    1.09    14.31    .01    2.56    2.94   3.500    .000   .00   0   .0
        -|-       -|-     -|-      -|-       -|-    -|-     -|-       -|-    -|-     -|-     -|-     -|-     -|-    |-
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                                                        624_PR-A2.OUT
↑
↑ FILE: 624_PR-A2.WSW                         W S P G W - CIVILDESIGN Version 14.06                              PAGE    1
                               Program Package Serial Number: 1841
                                                  WATER SURFACE PROFILE LISTING                  Date: 6- 6-2019  Time:10:22:23
                           "3111 MANCHESTER" HYDRAULICS                             0
                             Prepared By: URBAN RESOURCE CORPORATION
                               SD LINE 'A'                             Filename: 624_PR-A.wsw
******************************************************************************************************************** ********
         | Invert  | Depth  | Water   |    Q    |  Vel   Vel  | Energy  | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS) Head  | Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-   -|-      -|-     -|-      -|-      -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |        |         |         |       SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1000.000   8.090    1.095     9.185     52.00    5.94     .55     9.73     .00     1.09     8.00    1.500   8.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
    3.415   .0020                                              .0029     .01    1.09     1.00     1.29    .013      .00   .00  BOX
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1003.415   8.097    1.148     9.245     52.00    5.66     .50     9.74     .00     1.09     8.00    1.500   8.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
   16.405   .0020                                              .0025     .04    1.15      .93     1.29    .013      .00   .00  BOX
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1019.820   8.130    1.204     9.334     52.00    5.40     .45     9.79     .00     1.09     8.00    1.500   8.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
   58.736   .0020                                              .0021     .13    1.20      .87     1.29    .013      .00   .00  BOX
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1078.555   8.248    1.263     9.511     52.00    5.15     .41     9.92     .00     1.09     8.00    1.500   8.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
    7.015   .0020                                              .0021     .02    1.26      .81     1.29    .013      .00   .00  BOX
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1085.571   8.262    1.263     9.525     52.00    5.15     .41     9.94     .00     1.09     8.00    1.500   8.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
HYDRAULIC JUMP
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1085.571   8.262     .941     9.202     52.00    6.91     .74     9.94     .00     1.09     8.00    1.500   8.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
    2.723   .0020                                              .0054     .01     .94     1.26     1.29    .013      .00   .00  BOX
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1088.293   8.267     .927     9.194     52.00    7.01     .76     9.96     .00     1.09     8.00    1.500   8.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
    8.460   .0020                                              .0059     .05     .93     1.28     1.29    .013      .00   .00  BOX
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1096.754   8.284     .884     9.168     52.00    7.36     .84    10.01     .00     1.09     8.00    1.500   8.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
    8.803   .0020                                              .0069     .06     .88     1.38     1.29    .013      .00   .00  BOX
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1105.557   8.302     .842     9.144     52.00    7.72     .92    10.07     .00     1.09     8.00    1.500   8.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
    8.915   .0020                                              .0080     .07     .84     1.48     1.29    .013      .00   .00  BOX
↑ FILE: 624_PR-A2.WSW                         W S P G W - CIVILDESIGN Version 14.06                              PAGE    2
                               Program Package Serial Number: 1841
                                                  WATER SURFACE PROFILE LISTING                  Date: 6- 6-2019  Time:10:22:23
                           "3111 MANCHESTER" HYDRAULICS                             0
                             Prepared By: URBAN RESOURCE CORPORATION
                               SD LINE 'A'                             Filename: 624_PR-A.wsw
******************************************************************************************************************** ********
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          | Invert  |  Depth | Water   |    Q    |  Vel  |  Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
Station   |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS) |  Head | Grd.El. | Elev  | Depth  | Width  |Dia.-FT|or I.D.| ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-   -|
L/Elem    |Ch Slope |        |         |         |       | SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall| ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
          |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1114.471    8.320     .803     9.123     52.00    8.09    1.02    10.14     .00     1.09     8.00    1.500   8.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   8.874   .0020                                                  .0093      .08      .80     1.59     1.29    .013     .00   .00  BOX
          |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1123.345    8.337     .766     9.103     52.00    8.49    1.12    10.22     .00     1.09     8.00    1.500   8.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   8.731   .0020                                                  .0107      .09      .77     1.71     1.29    .013     .00   .00  BOX
          |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1132.076    8.355     .730     9.085     52.00    8.90    1.23    10.32     .00     1.09     8.00    1.500   8.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   8.519   .0020                                                  .0125      .11      .73     1.84     1.29    .013     .00   .00  BOX
          |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1140.595    8.372     .696     9.068     52.00    9.34    1.35    10.42     .00     1.09     8.00    1.500   8.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   8.260   .0020                                                  .0145      .12      .70     1.97     1.29    .013     .00   .00  BOX
          |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1148.855    8.389     .664     9.052     52.00    9.79    1.49    10.54     .00     1.09     8.00    1.500   8.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   7.971   .0020                                                  .0168      .13      .66     2.12     1.29    .013     .00   .00  BOX
          |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1156.826    8.405     .633     9.038     52.00   10.27    1.64    10.68     .00     1.09     8.00    1.500   8.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   7.664   .0020                                                  .0195      .15      .63     2.27     1.29    .013     .00   .00  BOX
          |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1164.490    8.420     .604     9.024     52.00   10.77    1.80    10.82     .24     1.09     8.00    1.500   8.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
    .266   .0051                                                  .0211      .01      .84     2.44      .95    .013     .00   .00  BOX
          |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1164.756    8.421     .602     9.024     52.00   10.79    1.81    10.83     .24     1.09     8.00    1.500   8.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   8.612   .0051                                                  .0228      .20      .84     2.45      .95    .013     .00   .00  BOX
          |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1173.368    8.465     .574     9.040     52.00   11.32    1.99    11.03     .27     1.09     8.00    1.500   8.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   8.023   .0051                                                  .0265      .21      .84     2.63      .95    .013     .00   .00  BOX
↑ FILE: 624_PR-A2.WSW                          W S P G W - CIVILDESIGN Version 14.06                              PAGE     3
                           Program Package Serial Number: 1841
                                                WATER SURFACE PROFILE LISTING                 Date: 6- 6-2019  Time:10:22:23
                    "3111 MANCHESTER" HYDRAULICS                                  0
                      Prepared By: URBAN RESOURCE CORPORATION
                        SD LINE 'A'                                 Filename: 624_PR-A.wsw
************************************************************************************************************** ********
          | Invert  |  Depth | Water   |    Q    |  Vel  |  Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
Station   |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS) |  Head | Grd.El. | Elev  | Depth  | Width  |Dia.-FT|or I.D.| ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-   -|
L/Elem    |Ch Slope |        |         |         |       | SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall| ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
          |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1181.391    8.506     .548     9.054     52.00   11.87    2.19    11.24     .29     1.09     8.00    1.500   8.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
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    7.494    .0051                                              .0309      .23      .84    2.83      .95    .013       .00   .00  BOX
        |         |         |         |         |               |         |         |         |         |         |         |         |
 1188.886     8.544     .522     9.066     52.00    12.45     2.41     11.47      .32     1.09     8.00    1.500    8.000    .00   0   .0
      -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-       -|-      -|-      -|-       -|-       |-
    7.014    .0051                                              .0359      .25      .84    3.04      .95    .013       .00   .00  BOX
        |         |         |         |         |               |         |         |         |         |         |         |         |
 1195.900     8.580     .498     9.078     52.00    13.05     2.65     11.72      .00     1.09     8.00    1.500    8.000    .00   0   .0
      -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-       -|-      -|-      -|-       -|-       |-
JUNCT STR   .0057                                               .0217      .12     1.44    3.26             .013       .00   .00  BOX
                    ------------------- WARNING - Junction Analysis - Change in Channel Type ---------------
        |         |         |         |         |               |         |         |         |         |         |         |         |
 1201.200     8.610    2.248    10.858     52.00     7.96      .98     11.84      .15     2.26     3.36    3.500     .000    .00   1   .0
      -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-       -|-      -|-      -|-       -|-       |-
   28.088    .0048                                              .0048      .14     2.39    1.01     2.25    .013       .00   .00  PIPE
        |         |         |         |         |               |         |         |         |         |         |         |         |
 1229.288     8.746    2.248    10.994     52.00     7.96      .98     11.98      .15     2.26     3.36    3.500     .000    .00   1   .0
      -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-       -|-      -|-      -|-       -|-       |-
   19.512    .0048                                              .0050      .10     2.39    1.01     2.25    .013       .00   .00  PIPE
        |         |         |         |         |               |         |         |         |         |         |         |         |
 1248.800     8.840    2.190    11.030     52.00     8.21     1.05     12.08      .00     2.26     3.39    3.500     .000    .00   1   .0
      -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-       -|-      -|-      -|-       -|-       |-
   14.178    .0052                                              .0052      .07     2.19    1.06     2.19    .013       .00   .00  PIPE
        |         |         |         |         |               |         |         |         |         |         |         |         |
 1262.978     8.914    2.190    11.104     52.00     8.21     1.05     12.15      .00     2.26     3.39    3.500     .000    .00   1   .0
      -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-       -|-      -|-      -|-       -|-       |-
   22.252    .0052                                              .0051      .11     2.19    1.06     2.19    .013       .00   .00  PIPE
        |         |         |         |         |               |         |         |         |         |         |         |         |
 1285.230     9.030    2.237    11.267     52.00     8.01     1.00     12.26      .15     2.26     3.36    3.500     .000    .00   1   .0
      -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-       -|-      -|-      -|-       -|-       |-
   40.039    .0049                                              .0049      .20     2.39    1.02     2.24    .013       .00   .00  PIPE
 FILE: 624_PR-A2.WSW                                W S P G W - CIVILDESIGN Version 14.06                                  PAGE    4
                          Program Package Serial Number: 1841
                                        WATER SURFACE PROFILE LISTING                    Date: 6- 6-2019  Time:10:22:23
                      "3111 MANCHESTER" HYDRAULICS                         0
                       Prepared By: URBAN RESOURCE CORPORATION
                        SD LINE 'A'                                 Filename: 624_PR-A.wsw
*********************************************************************************************************************** ********
          | Invert  |  Depth  |  Water  |    Q     |   Vel     Vel   |  Energy  | Super  |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station  |  Elev   |  (FT)   |  Elev   |  (CFS)   |  (FPS)   Head  | Grd.El.| Elev   | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
        -|-       -|-       -|-       -|-        -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     -|
 L/Elem   |Ch Slope |         |         |          |         SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
        |         |         |         |         |               |         |         |         |         |         |         |         |
 1325.269     9.226    2.237    11.463     52.00     8.01     1.00     12.46      .15     2.26     3.36    3.500     .000    .00   1   .0
      -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-       -|-      -|-      -|-       -|-       |-
   15.061    .0049                                              .0050      .07     2.39    1.02     2.24    .013       .00   .00  PIPE
        |         |         |         |         |               |         |         |         |         |         |         |         |
 1340.330     9.300    2.217    11.517     52.00     8.09     1.02     12.53      .01     2.26     3.37    3.500     .000    .00   1   .0
      -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-       -|-      -|-      -|-       -|-       |-
   77.730    .0050                                              .0050      .39     2.23    1.03     2.22    .013       .00   .00  PIPE
        |         |         |         |         |               |         |         |         |         |         |         |         |
 1418.060     9.691    2.217    11.908     52.00     8.09     1.02     12.92      .01     2.26     3.37    3.500     .000    .00   1   .0
      -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-      -|-       -|-      -|-      -|-       -|-       |-
   17.730    .0050                                              .0050      .09     2.23    1.03     2.22    .013       .00   .00  PIPE
        |         |         |         |         |               |         |         |         |         |         |         |         |
 1435.790     9.780    2.227    12.007     52.00     8.05     1.01     13.01      .01     2.26     3.37    3.500     .000    .00   1   .0
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       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
 140.985    .0050                                         .0050      .70     2.24    1.02    2.23    .013       .00   .00  PIPE
        |         |        |         |         |               |         |       |        |        |       |       |      |
1576.775    10.480    2.227    12.707     52.00    8.05    1.01    13.71     .01    2.26     3.37    3.500     .000   .00   1   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   8.035    .0050                                         .0049      .04     2.24    1.02    2.23    .013       .00   .00  PIPE
WALL  ENTRANCE
        |         |        |         |         |               |         |       |        |        |       |       |      |
1584.810    10.520    2.256    12.776     52.00    7.93     .98    13.75     .01    2.26     3.35    3.500     .000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
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                                                                             624_PR-18C.EDT
FILE: 624_PR-18C.WSW                        W S P G W  - EDIT LISTING - Version 14.06          Date: 5-31-2019  Time:11: 6:21
                                        WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING                      PAGE     1
 CARD  SECT  CHN   NO OF  AVE PIER  HEIGHT 1  BASE    ZL    ZR   INV   Y(1)  Y(2)  Y(3)  Y(4)  Y(5)  Y(6)  Y(7)  Y(8)  Y(9)  Y(10)
 CODE   NO   TYPE PIER/PIP WIDTH    DIAMETER  WIDTH              DROP

 CD      1    4      1             1.500
 CD      2    4      1             3.500
 CD      3    3      0     .000    4.000    6.000    .000  .000   .00
                                                       W S P G W                                              PAGE NO   1
                            WATER SURFACE PROFILE - TITLE CARD LISTING
HEADING LINE NO 1 IS -
                              "3111 MANCHESTER" HYDRAULICS                           0

HEADING LINE NO 2 IS -
                              Prepared By: URBAN RESOURCE CORPORATION

HEADING LINE NO 3 IS -
                              SD LINE '18C'                          Filename: 624_PR-18C.wsw
                                                       W S P G W                                              PAGE NO   2
                            WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO   1 IS A SYSTEM OUTLET     *         *     *
                     U/S DATA   STATION    INVERT  SECT                                         W S ELEV
                                1000.000    9.010    1                                              9.010
 ELEMENT NO   2 IS A REACH             *         *     *
                     U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                                1090.000    9.100    1              .013                           .000     .000      .000     0
 ELEMENT NO   3 IS A  WALL  ENTRANCE                   *
                     U/S DATA   STATION    INVERT  SECT             FP
                                1090.000    9.100    1              .013
 ELEMENT NO   4 IS A SYSTEM HEADWORKS                  *                     *
                     U/S DATA   STATION    INVERT  SECT                                         W S ELEV
                                1090.000    9.100    1                                            9.100
```

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↑ FILE: 624_PR-18C.WSW                  W S P G W - CIVILDESIGN Version 14.06                               PAGE    1
                              Program Package Serial Number: 1841
                                          WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11: 6:23
                          "3111 MANCHESTER" HYDRAULICS                               0
                           Prepared By: URBAN RESOURCE CORPORATION
                            SD LINE '18C'                         Filename: 624_PR-18C.wsw
************************************************************************************************************** ********
         | Invert  |  Depth  |  Water  |    Q    |  Vel     Vel  |  Energy | Super  |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)   |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-       -|-       -|-       -|-       -|-    -|-       -|-      -|-      -|-      -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |         |         |         |          SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|*********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|******|*******
         |         |         |         |         |               |         |        |        |        |       |       |       |
 1000.000    9.010    .568     9.578      2.26     3.68      .21     9.79      .00      .57     1.46    1.500    .000    .00    1   .0
        -|-       -|-       -|-       -|-       -|-       -|-    -|-       -|-      -|-      -|-      -|-      -|-     -|-     |-
     .352    .0010                                          .0047     .00      .57     1.00      .91     .013     .00    .00   PIPE
         |         |         |         |         |               |         |        |        |        |       |       |       |
 1000.352    9.010    .589     9.599      2.26     3.51      .19     9.79      .00      .57     1.46    1.500    .000    .00    1   .0
        -|-       -|-       -|-       -|-       -|-       -|-    -|-       -|-      -|-      -|-      -|-      -|-     -|-     |-
    1.280    .0010                                          .0041     .01      .59      .93      .91     .013     .00    .00   PIPE
         |         |         |         |         |               |         |        |        |        |       |       |       |
 1001.632    9.012    .610     9.622      2.26     3.35      .17     9.80      .00      .57     1.47    1.500    .000    .00    1   .0
        -|-       -|-       -|-       -|-       -|-       -|-    -|-       -|-      -|-      -|-      -|-      -|-     -|-     |-
    2.480    .0010                                          .0036     .01      .61      .87      .91     .013     .00    .00   PIPE
         |         |         |         |         |               |         |        |        |        |       |       |       |
 1004.112    9.014    .632     9.646      2.26     3.19      .16     9.80      .00      .57     1.48    1.500    .000    .00    1   .0
        -|-       -|-       -|-       -|-       -|-       -|-    -|-       -|-      -|-      -|-      -|-      -|-     -|-     |-
    4.063    .0010                                          .0032     .01      .63      .81      .91     .013     .00    .00   PIPE
         |         |         |         |         |               |         |        |        |        |       |       |       |
 1008.175    9.018    .655     9.674      2.26     3.05      .14     9.82      .00      .57     1.49    1.500    .000    .00    1   .0
        -|-       -|-       -|-       -|-       -|-       -|-    -|-       -|-      -|-      -|-      -|-      -|-     -|-     |-
    6.292    .0010                                          .0028     .02      .66      .76      .91     .013     .00    .00   PIPE
         |         |         |         |         |               |         |        |        |        |       |       |       |
 1014.466    9.024    .680     9.704      2.26     2.90      .13     9.84      .00      .57     1.49    1.500    .000    .00    1   .0
        -|-       -|-       -|-       -|-       -|-       -|-    -|-       -|-      -|-      -|-      -|-      -|-     -|-     |-
    9.340    .0010                                          .0024     .02      .68      .71      .91     .013     .00    .00   PIPE
         |         |         |         |         |               |         |        |        |        |       |       |       |
 1023.806    9.034    .705     9.739      2.26     2.77      .12     9.86      .00      .57     1.50    1.500    .000    .00    1   .0
        -|-       -|-       -|-       -|-       -|-       -|-    -|-       -|-      -|-      -|-      -|-      -|-     -|-     |-
   13.710    .0010                                          .0022     .03      .71      .66      .91     .013     .00    .00   PIPE
         |         |         |         |         |               |         |        |        |        |       |       |       |
 1037.516    9.048    .732     9.779      2.26     2.64      .11     9.89      .00      .57     1.50    1.500    .000    .00    1   .0
        -|-       -|-       -|-       -|-       -|-       -|-    -|-       -|-      -|-      -|-      -|-      -|-     -|-     |-
   20.217    .0010                                          .0019     .04      .73      .62      .91     .013     .00    .00   PIPE
         |         |         |         |         |               |         |        |        |        |       |       |       |
 1057.732    9.068    .760     9.827      2.26     2.52      .10     9.93      .00      .57     1.50    1.500    .000    .00    1   .0
        -|-       -|-       -|-       -|-       -|-       -|-    -|-       -|-      -|-      -|-      -|-      -|-     -|-     |-
   30.328    .0010                                          .0017     .05      .76      .57      .91     .013     .00    .00   PIPE
↑ FILE: 624_PR-18C.WSW                  W S P G W - CIVILDESIGN Version 14.06                               PAGE    2
                              Program Package Serial Number: 1841
                                          WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11: 6:23
                          "3111 MANCHESTER" HYDRAULICS                               0
                           Prepared By: URBAN RESOURCE CORPORATION
                            SD LINE '18C'                         Filename: 624_PR-18C.wsw
************************************************************************************************************** ********
         | Invert  |  Depth  |  Water  |    Q    |  Vel     Vel  |  Energy | Super  |Critical|Flow Top|Height/|Base Wt|      |No Wth
```

PR Line 'D'

```
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)   Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-     -|-     -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |        |         |         |       SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|***** |*******
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1088.060    9.098    .789     9.887      2.26    2.40     .09     9.98     .00      .57     1.50     1.500     .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   1.940   .0010                                         .0016     .00     .79      .53      .91     .013      .00   .00  PIPE
 WALL  ENTRANCE
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1090.000    9.100    .791     9.891      2.26    2.39     .09     9.98     .00      .57     1.50     1.500     .000   .00   0    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-

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↑ FILE: 624_PR-18C.WSW                    W S P G W - CIVILDESIGN Version 14.06                                  PAGE    1
                               Program Package Serial Number: 1841
                                                  WATER SURFACE PROFILE LISTING                    Date: 5-31-2019  Time:11: 6:23
                          "3111 MANCHESTER" HYDRAULICS                                   0
                            Prepared By: URBAN RESOURCE CORPORATION
                              SD LINE '18C'                                Filename: 624_PR-18C.wsw
*********************************************************************************************************************** ********
         | Invert  | Depth  |  Water  |    Q    |  Vel    Vel  | Energy  | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)   Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-     -|-     -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |        |         |         |       SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|***** |*******
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1000.000    9.010    .714     9.724      3.50    4.22     .28    10.00     .00      .71     1.50     1.500     .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
    .440   .0010                                         .0050     .00     .71     1.00     1.32     .013      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1000.440    9.010    .741     9.751      3.50    4.03     .25    10.00     .00      .71     1.50     1.500     .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   1.615   .0010                                         .0044     .01     .74      .93     1.32     .013      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1002.055    9.012    .769     9.781      3.50    3.84     .23    10.01     .00      .71     1.50     1.500     .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   3.135   .0010                                         .0038     .01     .77      .87     1.32     .013      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1005.190    9.015    .799     9.814      3.50    3.66     .21    10.02     .00      .71     1.50     1.500     .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   5.193   .0010                                         .0034     .02     .80      .81     1.32     .013      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1010.383    9.020    .830     9.850      3.50    3.49     .19    10.04     .00      .71     1.49     1.500     .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   7.896   .0010                                         .0030     .02     .83      .75     1.32     .013      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1018.279    9.028    .863     9.891      3.50    3.33     .17    10.06     .00      .71     1.48     1.500     .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  11.674   .0010                                         .0026     .03     .86      .70     1.32     .013      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1029.953    9.040    .898     9.937      3.50    3.17     .16    10.09     .00      .71     1.47     1.500     .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  16.880   .0010                                         .0023     .04     .90      .65     1.32     .013      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 1046.833    9.057    .934     9.991      3.50    3.02     .14    10.13     .00      .71     1.45     1.500     .000   .00   1    .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
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  24.409   .0010                                              .0021      .05      .93      .60    1.32    .013        .00    .00  PIPE
          |         |         |         |         |          |         |       |        |        |        |       |       |
 1071.242    9.081     .973   10.055      3.50     2.88      .13    10.18      .00      .71    1.43    1.500      .000    .00   1    .0
         -|-       -|-       -|-       -|-       -|-     -|-      -|-       -|-      -|-      -|-      -|-     -|-      -|-      |-
  18.758   .0010                                              .0019      .04      .97      .55    1.32    .013        .00    .00  PIPE
 FILE: 624_PR-18C.WSW                       W S P G W - CIVILDESIGN Version 14.06                                      PAGE    2
                          Program Package Serial Number: 1841
                                     WATER SURFACE PROFILE LISTING                          Date: 5-31-2019  Time:11: 6:23
                      "3111 MANCHESTER" HYDRAULICS                                   0
                         Prepared By: URBAN RESOURCE CORPORATION
                          SD LINE '18C'                            Filename: 624_PR-18C.wsw
************************************************************************************************************************** ********
          | Invert  | Depth  |  Water  |    Q    |  Vel    Vel  | Energy  | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station  |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)  Head  | Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|
 L/Elem   |Ch Slope |        |         |         |        SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
 WALL   ENTRANCE
          |         |         |         |         |          |         |       |        |        |        |       |       |
 1090.000    9.100     .998   10.098      3.50     2.80      .12    10.22      .00      .71    1.42    1.500      .000    .00   0    .0
         -|-       -|-       -|-       -|-       -|-     -|-      -|-       -|-      -|-      -|-      -|-     -|-      -|-      |-

 FILE: 624_PR-18C.WSW                       W S P G W - CIVILDESIGN Version 14.06                                      PAGE    1
                          Program Package Serial Number: 1841
                                     WATER SURFACE PROFILE LISTING                          Date: 5-31-2019  Time:11: 6:23
                      "3111 MANCHESTER" HYDRAULICS                                   0
                         Prepared By: URBAN RESOURCE CORPORATION
                          SD LINE '18C'                            Filename: 624_PR-18C.wsw
************************************************************************************************************************** ********
          | Invert  | Depth  |  Water  |    Q    |  Vel    Vel  | Energy  | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station  |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)  Head  | Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|
 L/Elem   |Ch Slope |        |         |         |        SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
          |         |         |         |         |          |         |       |        |        |        |       |       |
 1000.000    9.010     .765     9.775     4.00     4.41      .30    10.08      .00      .77    1.50    1.500      .000    .00   1    .0
         -|-       -|-       -|-       -|-       -|-     -|-      -|-       -|-      -|-      -|-      -|-     -|-      -|-      |-
    .502   .0010                                              .0051      .00      .77     1.00    1.50    .013        .00    .00  PIPE
          |         |         |         |         |          |         |       |        |        |        |       |       |
 1000.502    9.011     .795     9.806     4.00     4.21      .27    10.08      .00      .77    1.50    1.500      .000    .00   1    .0
         -|-       -|-       -|-       -|-       -|-     -|-      -|-       -|-      -|-      -|-      -|-     -|-      -|-      |-
   1.728   .0010                                              .0045      .01      .80      .93    1.50    .013        .00    .00  PIPE
          |         |         |         |         |          |         |       |        |        |        |       |       |
 1002.229    9.012     .826     9.838     4.00     4.01      .25    10.09      .00      .77    1.49    1.500      .000    .00   1    .0
         -|-       -|-       -|-       -|-       -|-     -|-      -|-       -|-      -|-      -|-      -|-     -|-      -|-      |-
   3.375   .0010                                              .0040      .01      .83      .86    1.50    .013        .00    .00  PIPE
          |         |         |         |         |          |         |       |        |        |        |       |       |
 1005.605    9.016     .859     9.874     4.00     3.82      .23    10.10      .00      .77    1.48    1.500      .000    .00   1    .0
         -|-       -|-       -|-       -|-       -|-     -|-      -|-       -|-      -|-      -|-      -|-     -|-      -|-      |-
   5.581   .0010                                              .0035      .02      .86      .80    1.50    .013        .00    .00  PIPE
          |         |         |         |         |          |         |       |        |        |        |       |       |
 1011.186    9.021     .893     9.914     4.00     3.65      .21    10.12      .00      .77    1.47    1.500      .000    .00   1    .0
         -|-       -|-       -|-       -|-       -|-     -|-      -|-       -|-      -|-      -|-      -|-     -|-      -|-      |-
   8.453   .0010                                              .0031      .03      .89      .74    1.50    .013        .00    .00  PIPE
          |         |         |         |         |          |         |       |        |        |        |       |       |
 1019.639    9.030     .930     9.959     4.00     3.48      .19    10.15      .00      .77    1.46    1.500      .000    .00   1    .0
```

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        -|-       -|-       -|-       -|-       -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
   12.512   .0010                                            .0027     .03     .93     .69    1.50    .013      .00    .00  PIPE
         |         |        |         |         |                 |        |       |       |       |       |       |      |     |
 1032.151    9.042    .969   10.011     4.00    3.31      .17   10.18     .00     .77    1.43   1.500    .000    .00   1   .0
        -|-       -|-       -|-       -|-       -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
   18.008   .0010                                            .0024     .04     .97     .64    1.50    .013      .00    .00  PIPE
         |         |        |         |         |                 |        |       |       |       |       |       |      |     |
 1050.159    9.060   1.010   10.070     4.00    3.16      .16   10.23     .00     .77    1.41   1.500    .000    .00   1   .0
        -|-       -|-       -|-       -|-       -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
   25.995   .0010                                            .0022     .06    1.01     .59    1.50    .013      .00    .00  PIPE
         |         |        |         |         |                 |        |       |       |       |       |       |      |     |
 1076.153    9.086   1.055   10.141     4.00    3.01      .14   10.28     .00     .77    1.37   1.500    .000    .00   1   .0
        -|-       -|-       -|-       -|-       -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
   13.847   .0010                                            .0020     .03    1.05     .54    1.50    .013      .00    .00  PIPE
↑ FILE: 624_PR-18C.WSW                          W S P G W - CIVILDESIGN Version 14.06                               PAGE    2
                                    Program Package Serial Number: 1841
                                                   WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11: 6:23
                               "3111 MANCHESTER" HYDRAULICS                                  0
                                 Prepared By: URBAN RESOURCE CORPORATION
                                  SD LINE '18C'                               Filename: 624_PR-18C.wsw
**************************************************************************************************************** ********
         | Invert  |  Depth |  Water  |    Q    |  Vel     Vel   |  Energy  | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head  | Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |        |         |         |               SF Ave|    HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
 WALL  ENTRANCE
         |         |        |         |         |                 |        |       |       |       |       |       |      |     |
 1090.000    9.100   1.075   10.175     4.00    2.95      .14   10.31     .00     .77    1.35   1.500    .000    .00   0   .0
        -|-       -|-       -|-       -|-       -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
↑
↑ FILE: 624_PR-18C.WSW                          W S P G W - CIVILDESIGN Version 14.06                               PAGE    1
                                    Program Package Serial Number: 1841
                                                   WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11: 6:23
                               "3111 MANCHESTER" HYDRAULICS                                  0
                                 Prepared By: URBAN RESOURCE CORPORATION
                                  SD LINE '18C'                               Filename: 624_PR-18C.wsw
**************************************************************************************************************** ********
         | Invert  |  Depth |  Water  |    Q    |  Vel     Vel   |  Energy  | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head  | Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-      -|-      -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |        |         |         |               SF Ave|    HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |                 |        |       |       |       |       |       |      |     |
 1000.000    9.010    .904    9.914     5.50    4.94      .38   10.29     .00     .90    1.47   1.500    .000    .00   1   .0
        -|-       -|-       -|-       -|-       -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
     .586   .0010                                            .0056     .00     .90    1.00    1.50    .013      .00    .00  PIPE
         |         |        |         |         |                 |        |       |       |       |       |       |      |     |
 1000.586    9.011    .941    9.952     5.50    4.71      .34   10.30     .00     .90    1.45   1.500    .000    .00   1   .0
        -|-       -|-       -|-       -|-       -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
    2.060   .0010                                            .0050     .01     .94     .93    1.50    .013      .00    .00  PIPE
         |         |        |         |         |                 |        |       |       |       |       |       |      |     |
 1002.646    9.013    .981    9.993     5.50    4.49      .31   10.31     .00     .90    1.43   1.500    .000    .00   1   .0
        -|-       -|-       -|-       -|-       -|-      -|-      -|-       -|-      -|-      -|-      -|-     -|-     -|-     |-
    4.002   .0010                                            .0045     .02     .98     .85    1.50    .013      .00    .00  PIPE
         |         |        |         |         |                 |        |       |       |       |       |       |      |     |
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 1006.648     9.017   1.023   10.040      5.50   4.28     .28    10.32    .00     .90    1.40   1.500    .000  .00   1   .0
        -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-      -|-   |-
    6.579    .0010                                       .0040     .03    1.02     .79    1.50    .013     .00  .00  PIPE
         |         |       |         |         |               |         |       |       |        |       |       |    |
 1013.227     9.023   1.069   10.092      5.50   4.08     .26    10.35    .00     .90    1.36   1.500    .000  .00   1   .0
        -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-      -|-   |-
   10.132    .0010                                       .0035     .04    1.07     .72    1.50    .013     .00  .00  PIPE
         |         |       |         |         |               |         |       |       |        |       |       |    |
 1023.359     9.033   1.118   10.151      5.50   3.89     .24    10.39    .00     .90    1.31   1.500    .000  .00   1   .0
        -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-      -|-   |-
   15.009    .0010                                       .0032     .05    1.12     .66    1.50    .013     .00  .00  PIPE
         |         |       |         |         |               |         |       |       |        |       |       |    |
 1038.368     9.048   1.172   10.220      5.50   3.71     .21    10.43    .00     .90    1.24   1.500    .000  .00   1   .0
        -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-      -|-   |-
   21.945    .0010                                       .0029     .06    1.17     .60    1.50    .013     .00  .00  PIPE
         |         |       |         |         |               |         |       |       |        |       |       |    |
 1060.314     9.070   1.232   10.303      5.50   3.54     .19    10.50    .00     .90    1.15   1.500    .000  .00   1   .0
        -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-      -|-   |-
   29.686    .0010                                       .0026     .08    1.23     .54    1.50    .013     .00  .00  PIPE
 WALL  ENTRANCE
↑ FILE: 624_PR-18C.WSW                    W S P G W - CIVILDESIGN Version 14.06                            PAGE    2
                             Program Package Serial Number: 1841
                                        WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11: 6:23
                       "3111 MANCHESTER" HYDRAULICS                         0
                         Prepared By: URBAN RESOURCE CORPORATION
                           SD LINE '18C'                        Filename: 624_PR-18C.wsw
****************************************************************************************************** ********
          | Invert  | Depth | Water   |   Q     |  Vel    Vel   | Energy  | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station  |  Elev   | (FT)  |  Elev   | (CFS)   | (FPS)   Head  | Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-      -|-    -|
 L/Elem   |Ch Slope |       |         |         |        SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |              |         |       |        |        |       |       |     |
 1090.000     9.100   1.298   10.398      5.50   3.38     .18    10.58    .00     .90    1.02   1.500    .000  .00   0   .0
        -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-      -|-   |-
↑
↑ FILE: 624_PR-18C.WSW                    W S P G W - CIVILDESIGN Version 14.06                            PAGE    1
                             Program Package Serial Number: 1841
                                        WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11: 6:23
                       "3111 MANCHESTER" HYDRAULICS                         0
                         Prepared By: URBAN RESOURCE CORPORATION
                           SD LINE '18C'                        Filename: 624_PR-18C.wsw
****************************************************************************************************** ********
          | Invert  | Depth | Water   |   Q     |  Vel    Vel   | Energy  | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station  |  Elev   | (FT)  |  Elev   | (CFS)   | (FPS)   Head  | Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-      -|-    -|
 L/Elem   |Ch Slope |       |         |         |        SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |              |         |       |        |        |       |       |     |
 1000.000     9.010    .905    9.915      5.51   4.94     .38    10.29    .00     .91    1.47   1.500    .000  .00   1   .0
        -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-      -|-   |-
     .579    .0010                                       .0057     .00     .91    1.00    1.50    .013     .00  .00  PIPE
         |         |       |         |         |               |         |       |       |        |       |       |    |
 1000.579     9.011    .942    9.953      5.51   4.71     .35    10.30    .00     .91    1.45   1.500    .000  .00   1   .0
        -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-      -|-   |-
    2.076    .0010                                       .0050     .01     .94     .93    1.50    .013     .00  .00  PIPE
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          |         |        |         |         |       |       |         |       |       |        |       |       |      |
 1002.655    9.013     .982     9.995     5.51    4.49     .31    10.31     .00     .91    1.43    1.500    .000   .00  1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-    |-
    4.021   .0010                                        .0045     .02     .98     .85    1.50    .013     .00   .00  PIPE
          |         |        |         |         |       |       |         |       |       |        |       |       |      |
 1006.676    9.017    1.024    10.041     5.51    4.29     .29    10.33     .00     .91    1.40    1.500    .000   .00  1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-    |-
    6.633   .0010                                        .0040     .03    1.02     .79    1.50    .013     .00   .00  PIPE
          |         |        |         |         |       |       |         |       |       |        |       |       |      |
 1013.309    9.023    1.070    10.093     5.51    4.09     .26    10.35     .00     .91    1.36    1.500    .000   .00  1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-    |-
   10.153   .0010                                        .0035     .04    1.07     .72    1.50    .013     .00   .00  PIPE
          |         |        |         |         |       |       |         |       |       |        |       |       |      |
 1023.462    9.033    1.119    10.153     5.51    3.90     .24    10.39     .00     .91    1.31    1.500    .000   .00  1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-    |-
   15.028   .0010                                        .0032     .05    1.12     .66    1.50    .013     .00   .00  PIPE
          |         |        |         |         |       |       |         |       |       |        |       |       |      |
 1038.490    9.048    1.174    10.222     5.51    3.71     .21    10.44     .00     .91    1.24    1.500    .000   .00  1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-    |-
   22.010   .0010                                        .0029     .06    1.17     .60    1.50    .013     .00   .00  PIPE
          |         |        |         |         |       |       |         |       |       |        |       |       |      |
 1060.500    9.070    1.234    10.305     5.51    3.54     .19    10.50     .00     .91    1.15    1.500    .000   .00  1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-    |-
   29.500   .0010                                        .0026     .08    1.23     .54    1.50    .013     .00   .00  PIPE
 WALL  ENTRANCE
↑ FILE: 624_PR-18C.WSW                  W S P G W - CIVILDESIGN Version 14.06                          PAGE    2
                              Program Package Serial Number: 1841
                                         WATER SURFACE PROFILE LISTING                Date: 5-31-2019  Time:11: 6:23
                          "3111 MANCHESTER" HYDRAULICS                          0
                           Prepared By: URBAN RESOURCE CORPORATION
                            SD LINE '18C'                       Filename: 624_PR-18C.wsw
*************************************************************************************************************** ********
          | Invert  | Depth  | Water   |    Q    |  Vel    Vel   |  Energy | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
 Station  |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)   Head  | Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-   -|
 L/Elem   |Ch Slope |        |         |         |               SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
          |         |        |         |         |       |       |         |       |       |        |       |       |      |
 1090.000    9.100    1.300    10.400     5.51    3.39     .18    10.58     .00     .91    1.02    1.500    .000   .00  0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-    |-
↑
↑ FILE: 624_PR-18C.WSW                  W S P G W - CIVILDESIGN Version 14.06                          PAGE    1
                              Program Package Serial Number: 1841
                                         WATER SURFACE PROFILE LISTING                Date: 5-31-2019  Time:11: 6:23
                          "3111 MANCHESTER" HYDRAULICS                          0
                           Prepared By: URBAN RESOURCE CORPORATION
                            SD LINE '18C'                       Filename: 624_PR-18C.wsw
*************************************************************************************************************** ********
          | Invert  | Depth  | Water   |    Q    |  Vel    Vel   |  Energy | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
 Station  |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)   Head  | Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-   -|
 L/Elem   |Ch Slope |        |         |         |               SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
          |         |        |         |         |       |       |         |       |       |        |       |       |      |
 1000.000    9.010    1.026    10.036     7.03    5.46     .46    10.50     .00    1.03    1.39    1.500    .000   .00  1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-     -|-      -|-     -|-     -|-    |-
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PR Line 'C'

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     .680    .0010                                                     .0064      .00    1.03    1.00     1.50    .013      .00   .00  PIPE
         |         |        |         |         |       |       |        |       |       |        |        |        |     |
 1000.680     9.011    1.072    10.083      7.03    5.20     .42    10.50     .00    1.03     1.35    1.500     .000   .00   1   .0
      -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-     -|-      -|-      -|-      -|-   |-
    2.407    .0010                                                     .0057      .01    1.07     .92     1.50    .013      .00   .00  PIPE
         |         |        |         |         |       |       |        |       |       |        |        |        |     |
 1003.087     9.013    1.122    10.135      7.03    4.96     .38    10.52     .00    1.03     1.30    1.500     .000   .00   1   .0
      -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-     -|-      -|-      -|-      -|-   |-
    4.764    .0010                                                     .0052      .02    1.12     .84     1.50    .013      .00   .00  PIPE
         |         |        |         |         |       |       |        |       |       |        |        |        |     |
 1007.850     9.018    1.176    10.194      7.03    4.73     .35    10.54     .00    1.03     1.23    1.500     .000   .00   1   .0
      -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-     -|-      -|-      -|-      -|-   |-
    8.054    .0010                                                     .0047      .04    1.18     .76     1.50    .013      .00   .00  PIPE
         |         |        |         |         |       |       |        |       |       |        |        |        |     |
 1015.904     9.026    1.237    10.263      7.03    4.51     .32    10.58     .00    1.03     1.14    1.500     .000   .00   1   .0
      -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-     -|-      -|-      -|-      -|-   |-
   12.983    .0010                                                     .0043      .06    1.24     .68     1.50    .013      .00   .00  PIPE
         |         |        |         |         |       |       |        |       |       |        |        |        |     |
 1028.887     9.039    1.308    10.347      7.03    4.30     .29    10.63     .00    1.03     1.00    1.500     .000   .00   1   .0
      -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-     -|-      -|-      -|-      -|-   |-
   21.499    .0010                                                     .0040      .09    1.31     .59     1.50    .013      .00   .00  PIPE
         |         |        |         |         |       |       |        |       |       |        |        |        |     |
 1050.386     9.060    1.398    10.458      7.03    4.10     .26    10.72     .00    1.03      .75    1.500     .000   .00   1   .0
      -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-     -|-      -|-      -|-      -|-   |-
   28.710    .0010                                                     .0040      .12    1.40     .48     1.50    .013      .00   .00  PIPE
         |         |        |         |         |       |       |        |       |       |        |        |        |     |
 1079.096     9.089    1.500    10.589      7.03    3.98     .25    10.83     .00    1.03      .00    1.500     .000   .00   1   .0
      -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-     -|-      -|-      -|-      -|-   |-
   10.904    .0010                                                     .0043      .05    1.50     .00     1.50    .013      .00   .00  PIPE
 WALL  ENTRANCE
↑ FILE: 624_PR-18C.WSW                        W S P G W - CIVILDESIGN Version 14.06                               PAGE    2
                             Program Package Serial Number: 1841
                                                 WATER SURFACE PROFILE LISTING                   Date: 5-31-2019  Time:11: 6:23
                       "3111 MANCHESTER" HYDRAULICS                             0
                         Prepared By: URBAN RESOURCE CORPORATION
                           SD LINE '18C'                           Filename: 624_PR-18C.wsw
****************************************************************************************************************** ********
         | Invert  | Depth  | Water   |   Q     | Vel     Vel  | Energy  | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
 Station |  Elev   |  (FT)  | Elev    |  (CFS)  | (FPS)   Head | Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.| ZL  |Prs/Pip
      -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-     -|-      -|-      -|-      -|-   -|
 L/Elem  |Ch Slope |        |         |         |        SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall| ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |       |       |        |       |       |        |        |        |     |
 1090.000     9.100    1.538    10.638      7.03    3.98     .25    10.88     .00    1.03      .00    1.500     .000   .00   0   .0
      -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-     -|-      -|-      -|-      -|-   |-
↑
↑ FILE: 624_PR-18C.WSW                        W S P G W - CIVILDESIGN Version 14.06                               PAGE    1
                             Program Package Serial Number: 1841
                                                 WATER SURFACE PROFILE LISTING                   Date: 5-31-2019  Time:11: 6:23
                       "3111 MANCHESTER" HYDRAULICS                             0
                         Prepared By: URBAN RESOURCE CORPORATION
                           SD LINE '18C'                           Filename: 624_PR-18C.wsw
****************************************************************************************************************** ********
         | Invert  | Depth  | Water   |   Q     | Vel     Vel  | Energy  | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
 Station |  Elev   |  (FT)  | Elev    |  (CFS)  | (FPS)   Head | Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.| ZL  |Prs/Pip
      -|-       -|-      -|-       -|-       -|-     -|-     -|-      -|-     -|-     -|-      -|-      -|-      -|-   -|
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PR Line 'C'

```
 L/Elem   |Ch Slope |         |         |         |       |       SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1000.000    9.010   1.045   10.055      7.28    5.54     .48    10.53     .00    1.04     1.38    1.500     .000   .00   1   .0
       -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
     .698    .0010                                     .0066      .00    1.04    1.00     1.50    .013      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1000.698    9.011   1.092   10.103      7.28    5.28     .43    10.54     .00    1.04     1.33    1.500     .000   .00   1   .0
       -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
    2.484    .0010                                     .0059      .01    1.09     .92     1.50    .013      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1003.181    9.013   1.144   10.157      7.28    5.04     .39    10.55     .00    1.04     1.28    1.500     .000   .00   1   .0
       -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
    4.916    .0010                                     .0053      .03    1.14     .83     1.50    .013      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1008.097    9.018   1.201   10.219      7.28    4.80     .36    10.58     .00    1.04     1.20    1.500     .000   .00   1   .0
       -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
    8.437    .0010                                     .0048      .04    1.20     .75     1.50    .013      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1016.534    9.027   1.265   10.292      7.28    4.58     .33    10.62     .00    1.04     1.09    1.500     .000   .00   1   .0
       -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
   13.832    .0010                                     .0044      .06    1.27     .67     1.50    .013      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1030.366    9.040   1.342   10.382      7.28    4.36     .30    10.68     .00    1.04      .92    1.500     .000   .00   1   .0
       -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
   25.227    .0010                                     .0042      .11    1.34     .57     1.50    .013      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1055.593    9.066   1.450   10.516      7.28    4.16     .27    10.78     .00    1.04      .54    1.500     .000   .00   1   .0
       -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
   13.247    .0010                                     .0043      .06    1.45     .41     1.50    .013      .00   .00  PIPE
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1068.840    9.079   1.500   10.579      7.28    4.12     .26    10.84     .00    1.04      .00    1.500     .000   .00   1   .0
       -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
   21.160    .0010                                     .0046      .10    1.50     .00     1.50    .013      .00   .00  PIPE
 WALL  ENTRANCE
↑ FILE: 624_PR-18C.WSW                    W S P G W - CIVILDESIGN Version 14.06                              PAGE    2
                              Program Package Serial Number: 1841
                                           WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11: 6:23
                         "3111 MANCHESTER" HYDRAULICS                          0
                          Prepared By: URBAN RESOURCE CORPORATION
                            SD LINE '18C'                           Filename: 624_PR-18C.wsw
******************************************************************************************************** ********
         | Invert  | Depth  |  Water  |    Q    |  Vel    Vel    | Energy  | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)   Head   | Grd.El. | Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL |Prs/Pip
       -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-   -|
 L/Elem   |Ch Slope |         |         |         |       |       SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1090.000    9.100   1.580   10.680      7.28    4.12     .26    10.94     .00    1.04      .00    1.500     .000   .00   0   .0
       -|-       -|-     -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
↑
↑ FILE: 624_PR-18C.WSW                    W S P G W - CIVILDESIGN Version 14.06                              PAGE    1
                              Program Package Serial Number: 1841
                                           WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11: 6:23
                         "3111 MANCHESTER" HYDRAULICS                          0
                          Prepared By: URBAN RESOURCE CORPORATION
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PR Line 'B'

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                                                                    624_PR-18C.OUT
                              SD LINE '18C'                      Filename: 624_PR-18C.wsw
*******************************************************************************************************************  ********
          | Invert  |  Depth | Water   |    Q    |  Vel    Vel  | Energy | Super |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station  |  Elev   |  (FT)  | Elev    |  (CFS)  | (FPS)   Head | Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
         -|-       -|-      -|-       -|-       -|-      -|-   -|-      -|-     -|-      -|-      -|-     -|-     -|-     -|
 L/Elem   |Ch Slope |        |         |         |        SF Ave|   HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|***** |*******
          |         |        |         |         |              |        |       |        |        |       |       |       |
 1000.000    9.010   1.290   10.300     11.44     7.07     .78    11.08     .00     1.29     1.04    1.500    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-   -|-      -|-     -|-      -|-      -|-     -|-     -|-     |-
    1.356    .0010                                        .0106     .01    1.29     1.00     1.50    .013     .00   .00  PIPE
          |         |        |         |         |              |        |       |        |        |       |       |       |
 1001.356    9.011   1.374   10.385     11.44     6.74     .71    11.09     .00     1.29      .83    1.500    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-   -|-      -|-     -|-      -|-      -|-     -|-     -|-     |-
    7.254    .0010                                        .0107     .08    1.37      .83     1.50    .013     .00   .00  PIPE
          |         |        |         |         |              |        |       |        |        |       |       |       |
 1008.611    9.019   1.500   10.519     11.44     6.47     .65    11.17     .00     1.29      .00    1.500    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-   -|-      -|-     -|-      -|-      -|-     -|-     -|-     |-
   81.389    .0010                                        .0115     .93    1.50      .00     1.50    .013     .00   .00  PIPE
 WALL  ENTRANCE
          |         |        |         |         |              |        |       |        |        |       |       |       |
 1090.000    9.100   2.384   11.484     11.44     6.47     .65    12.13     .00     1.29      .00    1.500    .000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-      -|-   -|-      -|-     -|-      -|-      -|-     -|-     -|-     |-
↑
↑ FILE: 624_PR-18C.WSW                      W S P G W - CIVILDESIGN Version 14.06                             PAGE    1
                               Program Package Serial Number: 1841
                                               WATER SURFACE PROFILE LISTING                    Date: 5-31-2019  Time:11: 6:23
                          "3111 MANCHESTER" HYDRAULICS                                  0
                            Prepared By: URBAN RESOURCE CORPORATION
                              SD LINE '18C'                      Filename: 624_PR-18C.wsw
*******************************************************************************************************************  ********
          | Invert  |  Depth | Water   |    Q    |  Vel    Vel  | Energy | Super |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station  |  Elev   |  (FT)  | Elev    |  (CFS)  | (FPS)   Head | Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
         -|-       -|-      -|-       -|-       -|-      -|-   -|-      -|-     -|-      -|-      -|-     -|-     -|-     -|
 L/Elem   |Ch Slope |        |         |         |        SF Ave|   HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|***** |*******
          |         |        |         |         |              |        |       |        |        |       |       |       |
 1000.000    9.010   1.349   10.359     12.94     7.73     .93    11.29     .00     1.35      .90    1.500    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-   -|-      -|-     -|-      -|-      -|-     -|-     -|-     |-
    2.453    .0010                                        .0134     .03    1.35     1.00     1.50    .013     .00   .00  PIPE
          |         |        |         |         |              |        |       |        |        |       |       |       |
 1002.453    9.012   1.464   10.476     12.94     7.37     .84    11.32     .00     1.35      .46    1.500    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-   -|-      -|-     -|-      -|-      -|-     -|-     -|-     |-
    1.998    .0010                                        .0138     .03    1.46      .66     1.50    .013     .00   .00  PIPE
          |         |        |         |         |              |        |       |        |        |       |       |       |
 1004.452    9.014   1.500   10.514     12.94     7.32     .83    11.35     .00     1.35      .00    1.500    .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-      -|-   -|-      -|-     -|-      -|-      -|-     -|-     -|-     |-
   85.548    .0010                                        .0147    1.25    1.50      .00     1.50    .013     .00   .00  PIPE
 WALL  ENTRANCE
          |         |        |         |         |              |        |       |        |        |       |       |       |
 1090.000    9.100   2.713   11.813     12.94     7.32     .83    12.65     .00     1.35      .00    1.500    .000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-      -|-   -|-      -|-     -|-      -|-      -|-     -|-     -|-     |-
↑
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                                                                                     624_PR-5X15C.EDT
FILE: 624_PR-5X15C.WSW                        W S P G W  - EDIT LISTING - Version 14.06           Date: 5-31-2019  Time:11:11: 5
                                          WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING                                  PAGE    1
 CARD  SECT  CHN   NO OF  AVE PIER  HEIGHT 1  BASE     ZL     ZR    INV   Y(1)  Y(2)  Y(3)  Y(4)  Y(5)  Y(6)  Y(7)  Y(8)  Y(9)  Y(10)
 CODE   NO   TYPE PIER/PIP WIDTH    DIAMETER  WIDTH                 DROP

 CD      1    3      0     .000    1.500    5.000    .000   .000    .00
 CD      2    4      1             3.500
 CD      3    3      0     .000    4.000    6.000    .000   .000    .00
                                                                        W S P G W                                          PAGE NO   1
                                   WATER SURFACE PROFILE - TITLE CARD LISTING
HEADING LINE NO 1 IS -
                                     "3111 MANCHESTER" HYDRAULICS                                 0

HEADING LINE NO 2 IS -
                                     Prepared By: URBAN RESOURCE CORPORATION

HEADING LINE NO 3 IS -
                                     SD LINE '18C'                         Filename: 624_PR-5X15C.wsw
                                                                        W S P G W                                          PAGE NO   2
                                   WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO    1 IS A SYSTEM OUTLET      *         *     *
                     U/S DATA   STATION    INVERT  SECT                                         W S ELEV
                                1000.000    9.010    1                                              9.010
 ELEMENT NO    2 IS A REACH              *         *     *
                     U/S DATA   STATION    INVERT  SECT              N                                    RADIUS    ANGLE     ANG PT  MAN H
                                1090.000    9.100    1              .013                                    .000     .000      .000     0
 ELEMENT NO    3 IS A  WALL  ENTRANCE                    *
                     U/S DATA   STATION    INVERT  SECT             FP
                                1090.000    9.100    1              .013
 ELEMENT NO    4 IS A SYSTEM HEADWORKS                   *                      *
                     U/S DATA   STATION    INVERT  SECT                                         W S ELEV
                                1090.000    9.100    1                                            9.100
```

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 FILE: 624_PR-5X15C.WSW                    W S P G W - CIVILDESIGN Version 14.06                                    PAGE    1
                                 Program Package Serial Number: 1841
                                              WATER SURFACE PROFILE LISTING                 Date: 5-31-2019  Time:11:11: 7
                             "3111 MANCHESTER" HYDRAULICS                        0
                              Prepared By: URBAN RESOURCE CORPORATION
                               SD LINE '18C'                      Filename: 624_PR-5X15C.wsw
******************************************************************************************************************** ********
         | Invert  | Depth | Water  |    Q    |  Vel    Vel  | Energy | Super |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station |  Elev   |  (FT) |  Elev  |  (CFS)  | (FPS)   Head | Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
        -|-       -|-     -|-      -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|
 L/Elem  |Ch Slope |       |        |         |       SF Ave|   HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |       |       |         |       |        |        |       |       |     |
 1000.000    9.010    .404     9.414      7.28    3.61     .20     9.62     .00      .40     5.00    1.500   5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
    .490    .0010                                        .0038     .00     .40     1.00      .63    .013     .00   .00  BOX
         |         |        |         |         |       |       |         |       |        |        |       |       |
 1000.490    9.010    .424     9.434      7.28    3.44     .18     9.62     .00      .40     5.00    1.500   5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
   1.768    .0010                                        .0033     .01     .42      .93      .63    .013     .00   .00  BOX
         |         |        |         |         |       |       |         |       |        |        |       |       |
 1002.258    9.012    .444     9.457      7.28    3.28     .17     9.62     .00      .40     5.00    1.500   5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
   3.607    .0010                                        .0028     .01     .44      .87      .63    .013     .00   .00  BOX
         |         |        |         |         |       |       |         |       |        |        |       |       |
 1005.865    9.016    .466     9.482      7.28    3.12     .15     9.63     .00      .40     5.00    1.500   5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
   6.311    .0010                                        .0024     .02     .47      .81      .63    .013     .00   .00  BOX
         |         |        |         |         |       |       |         |       |        |        |       |       |
 1012.176    9.022    .489     9.511      7.28    2.98     .14     9.65     .00      .40     5.00    1.500   5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
  10.430    .0010                                        .0021     .02     .49      .75      .63    .013     .00   .00  BOX
         |         |        |         |         |       |       |         |       |        |        |       |       |
 1022.606    9.033    .513     9.545      7.28    2.84     .13     9.67     .00      .40     5.00    1.500   5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
  17.064    .0010                                        .0018     .03     .51      .70      .63    .013     .00   .00  BOX
         |         |        |         |         |       |       |         |       |        |        |       |       |
 1039.671    9.050    .538     9.587      7.28    2.71     .11     9.70     .00      .40     5.00    1.500   5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
  28.792    .0010                                        .0016     .04     .54      .65      .63    .013     .00   .00  BOX
         |         |        |         |         |       |       |         |       |        |        |       |       |
 1068.463    9.078    .564     9.642      7.28    2.58     .10     9.75     .00      .40     5.00    1.500   5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   |-
  21.537    .0010                                        .0014     .03     .56      .61      .63    .013     .00   .00  BOX
 WALL  ENTRANCE
 FILE: 624_PR-5X15C.WSW                    W S P G W - CIVILDESIGN Version 14.06                                    PAGE    2
                                 Program Package Serial Number: 1841
                                              WATER SURFACE PROFILE LISTING                 Date: 5-31-2019  Time:11:11: 7
                             "3111 MANCHESTER" HYDRAULICS                        0
                              Prepared By: URBAN RESOURCE CORPORATION
                               SD LINE '18C'                      Filename: 624_PR-5X15C.wsw
******************************************************************************************************************** ********
         | Invert  | Depth | Water  |    Q    |  Vel    Vel  | Energy | Super |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station |  Elev   |  (FT) |  Elev  |  (CFS)  | (FPS)   Head | Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
        -|-       -|-     -|-      -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|
 L/Elem  |Ch Slope |       |        |         |       SF Ave|   HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
```

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*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****  |*******
         |         |        |         |         |               |         |       |        |        |       |       |       |
 1090.000    9.100    .578     9.678      7.28    2.52     .10      9.78     .00      .40     5.00    1.500    5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-

↑
↑ FILE: 624_PR-5X15C.WSW                W S P G W - CIVILDESIGN Version 14.06                         PAGE    1
                               Program Package Serial Number: 1841
                                           WATER SURFACE PROFILE LISTING                   Date: 5-31-2019  Time:11:11: 7
                           "3111 MANCHESTER" HYDRAULICS                            0
                             Prepared By: URBAN RESOURCE CORPORATION
                               SD LINE '18C'                        Filename: 624_PR-5X15C.wsw
******************************************************************************************************************** ********
         | Invert  | Depth  | Water   |    Q    | Vel     Vel   | Energy  | Super |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station |  Elev   | (FT)   | Elev    |  (CFS)  | (FPS)   Head  | Grd.El.| Elev  | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|
 L/Elem  |Ch Slope |        |         |         |         SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****  |*******
         |         |        |         |         |               |         |       |        |        |       |       |       |
 1000.000    9.010    .452     9.462      8.63    3.82     .23      9.69     .00      .45     5.00    1.500    5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
     .559    .0010                                       .0037       .00     .45     1.00      .71    .013      .00   .00  BOX
         |         |        |         |         |               |         |       |        |        |       |       |       |
 1000.559    9.011    .474     9.485      8.63    3.64     .21      9.69     .00      .45     5.00    1.500    5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
    2.020    .0010                                       .0032       .01     .47      .93      .71    .013      .00   .00  BOX
         |         |        |         |         |               |         |       |        |        |       |       |       |
 1002.579    9.013    .498     9.510      8.63    3.47     .19      9.70     .00      .45     5.00    1.500    5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
    4.123    .0010                                       .0028       .01     .50      .87      .71    .013      .00   .00  BOX
         |         |        |         |         |               |         |       |        |        |       |       |       |
 1006.703    9.017    .522     9.539      8.63    3.31     .17      9.71     .00      .45     5.00    1.500    5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
    7.218    .0010                                       .0024       .02     .52      .81      .71    .013      .00   .00  BOX
         |         |        |         |         |               |         |       |        |        |       |       |       |
 1013.921    9.024    .547     9.571      8.63    3.15     .15      9.73     .00      .45     5.00    1.500    5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   11.937    .0010                                       .0021       .02     .55      .75      .71    .013      .00   .00  BOX
         |         |        |         |         |               |         |       |        |        |       |       |       |
 1025.858    9.036    .574     9.610      8.63    3.01     .14      9.75     .00      .45     5.00    1.500    5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   19.558    .0010                                       .0018       .03     .57      .70      .71    .013      .00   .00  BOX
         |         |        |         |         |               |         |       |        |        |       |       |       |
 1045.416    9.055    .602     9.657      8.63    2.87     .13      9.79     .00      .45     5.00    1.500    5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   33.091    .0010                                       .0015       .05     .60      .65      .71    .013      .00   .00  BOX
         |         |        |         |         |               |         |       |        |        |       |       |       |
 1078.507    9.089    .631     9.720      8.63    2.73     .12      9.84     .00      .45     5.00    1.500    5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   11.493    .0010                                       .0014       .02     .63      .61      .71    .013      .00   .00  BOX
 WALL   ENTRANCE
↑ FILE: 624_PR-5X15C.WSW                W S P G W - CIVILDESIGN Version 14.06                         PAGE    2
                               Program Package Serial Number: 1841
                                           WATER SURFACE PROFILE LISTING                   Date: 5-31-2019  Time:11:11: 7
                           "3111 MANCHESTER" HYDRAULICS                            0
                             Prepared By: URBAN RESOURCE CORPORATION
                               SD LINE '18C'                        Filename: 624_PR-5X15C.wsw
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                                                        624_PR-5X15C.OUT
******************************************************************************************************************** ********
          | Invert  |  Depth | Water   |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station  |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)   Head  | Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|
 L/Elem   |Ch Slope |        |         |         |             SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****  |*******
          |         |        |         |         |               |         |       |        |        |       |       |       |
 1090.000    9.100     .640    9.740      8.63    2.70     .11     9.85     .00      .45     5.00    1.500   5.000    .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-      |-

↑
↑ FILE: 624_PR-5X15C.WSW                    W S P G W - CIVILDESIGN Version 14.06                            PAGE     1
                          Program Package Serial Number: 1841
                                         WATER SURFACE PROFILE LISTING                  Date: 5-31-2019  Time:11:11: 7
                       "3111 MANCHESTER" HYDRAULICS                                0
                         Prepared By: URBAN RESOURCE CORPORATION
                          SD LINE '18C'                            Filename: 624_PR-5X15C.wsw
******************************************************************************************************************** ********
          | Invert  |  Depth | Water   |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|       |No Wth
 Station  |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)   Head  | Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL   |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|
 L/Elem   |Ch Slope |        |         |         |             SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR   |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****  |*******
          |         |        |         |         |               |         |       |        |        |       |       |       |
 1000.000    9.010     .546    9.556     11.44    4.19     .27     9.83     .00      .55     5.00    1.500   5.000    .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-      |-
    .688    .0010                                        .0037      .00     .55     1.00      .85    .013      .00    .00  BOX
          |         |        |         |         |               |         |       |        |        |       |       |       |
 1000.688    9.011     .572    9.583     11.44    4.00     .25     9.83     .00      .55     5.00    1.500   5.000    .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-      |-
   2.497    .0010                                        .0032      .01     .57      .93      .85    .013      .00    .00  BOX
          |         |        |         |         |               |         |       |        |        |       |       |       |
 1003.185    9.013     .600    9.614     11.44    3.81     .23     9.84     .00      .55     5.00    1.500   5.000    .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-      |-
   5.098    .0010                                        .0027      .01     .60      .87      .85    .013      .00    .00  BOX
          |         |        |         |         |               |         |       |        |        |       |       |       |
 1008.284    9.018     .630    9.648     11.44    3.63     .21     9.85     .00      .55     5.00    1.500   5.000    .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-      |-
   8.923    .0010                                        .0024      .02     .63      .81      .85    .013      .00    .00  BOX
          |         |        |         |         |               |         |       |        |        |       |       |       |
 1017.206    9.027     .660    9.688     11.44    3.46     .19     9.87     .00      .55     5.00    1.500   5.000    .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-      |-
  14.754    .0010                                        .0020      .03     .66      .75      .85    .013      .00    .00  BOX
          |         |        |         |         |               |         |       |        |        |       |       |       |
 1031.960    9.042     .693    9.735     11.44    3.30     .17     9.90     .00      .55     5.00    1.500   5.000    .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-      |-
  24.176    .0010                                        .0018      .04     .69      .70      .85    .013      .00    .00  BOX
          |         |        |         |         |               |         |       |        |        |       |       |       |
 1056.136    9.066     .726    9.793     11.44    3.15     .15     9.95     .00      .55     5.00    1.500   5.000    .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-      |-
  33.864    .0010                                        .0015      .05     .73      .65      .85    .013      .00    .00  BOX
 WALL  ENTRANCE
          |         |        |         |         |               |         |       |        |        |       |       |       |
 1090.000    9.100     .758    9.858     11.44    3.02     .14    10.00     .00      .55     5.00    1.500   5.000    .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-      |-
↑
↑ FILE: 624_PR-5X15C.WSW                    W S P G W - CIVILDESIGN Version 14.06                            PAGE     1
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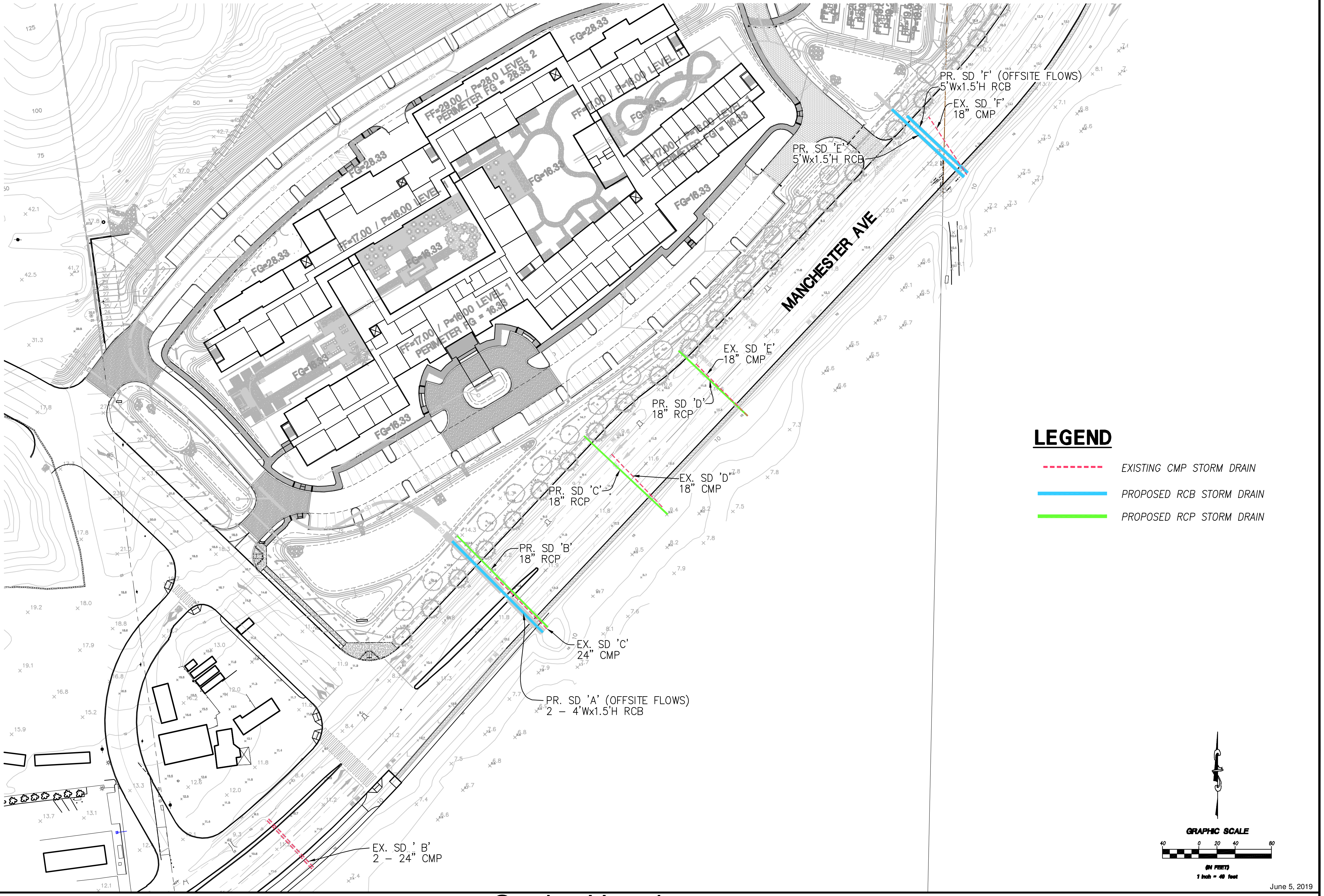
PR Line 'F'
(offsite Flows)

```
                         Program Package Serial Number: 1841
                                    WATER SURFACE PROFILE LISTING              Date: 5-31-2019  Time:11:11: 7
                      "3111 MANCHESTER" HYDRAULICS                                 0
                        Prepared By: URBAN RESOURCE CORPORATION
                          SD LINE '18C'                       Filename: 624_PR-5X15C.wsw
*************************************************************************************************************** ********
         | Invert  | Depth  | Water   |    Q    | Vel    Vel   | Energy  | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
Station  |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)  Head  | Grd.El. | Elev  | Depth  | Width  |Dia.-FT|or I.D.| ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   -|
L/Elem   |Ch Slope |        |         |         |       SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall| ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |             |         |       |        |        |       |       |     |
1000.000    9.010     .592     9.602     12.94    4.37     .30     9.90     .00      .59     5.00    1.500   5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
   .750    .0010                                       .0036     .00      .59    1.00      .93    .013      .00   .00  BOX
         |         |        |         |         |             |         |       |        |        |       |       |     |
1000.750    9.011     .621     9.632     12.94    4.17     .27     9.90     .00      .59     5.00    1.500   5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
  2.729    .0010                                       .0031     .01      .62     .93      .93    .013      .00   .00  BOX
         |         |        |         |         |             |         |       |        |        |       |       |     |
1003.479    9.013     .652     9.665     12.94    3.97     .24     9.91     .00      .59     5.00    1.500   5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
  5.571    .0010                                       .0027     .02      .65     .87      .93    .013      .00   .00  BOX
         |         |        |         |         |             |         |       |        |        |       |       |     |
1009.049    9.019     .683     9.703     12.94    3.79     .22     9.93     .00      .59     5.00    1.500   5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
  9.745    .0010                                       .0023     .02      .68     .81      .93    .013      .00   .00  BOX
         |         |        |         |         |             |         |       |        |        |       |       |     |
1018.794    9.029     .717     9.746     12.94    3.61     .20     9.95     .00      .59     5.00    1.500   5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
 16.103    .0010                                       .0020     .03      .72     .75      .93    .013      .00   .00  BOX
         |         |        |         |         |             |         |       |        |        |       |       |     |
1034.897    9.045     .752     9.797     12.94    3.44     .18     9.98     .00      .59     5.00    1.500   5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
 26.360    .0010                                       .0018     .05      .75     .70      .93    .013      .00   .00  BOX
         |         |        |         |         |             |         |       |        |        |       |       |     |
1061.257    9.071     .788     9.860     12.94    3.28     .17    10.03     .00      .59     5.00    1.500   5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
 28.743    .0010                                       .0016     .04      .79     .65      .93    .013      .00   .00  BOX
WALL  ENTRANCE
         |         |        |         |         |             |         |       |        |        |       |       |     |
1090.000    9.100     .816     9.916     12.94    3.17     .16    10.07     .00      .59     5.00    1.500   5.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
↑
↑ FILE: 624_PR-5X15C.WSW                  W S P G W - CIVILDESIGN Version 14.06                         PAGE    1
                         Program Package Serial Number: 1841
                                    WATER SURFACE PROFILE LISTING              Date: 5-31-2019  Time:11:11: 7
                      "3111 MANCHESTER" HYDRAULICS                                 0
                        Prepared By: URBAN RESOURCE CORPORATION
                          SD LINE '18C'                       Filename: 624_PR-5X15C.wsw
*************************************************************************************************************** ********
         | Invert  | Depth  | Water   |    Q    | Vel    Vel   | Energy  | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
Station  |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)  Head  | Grd.El. | Elev  | Depth  | Width  |Dia.-FT|or I.D.| ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-    -|-       -|-     -|-      -|-      -|-     -|-     -|-   -|
L/Elem   |Ch Slope |        |         |         |       SF Ave|   HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall| ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
```

PR Line 'E'

```
        |         |        |         |         |               |         |       |        |        |       |       |      |
1000.000     9.010     .904     9.914     24.38    5.40     .45    10.37     .00     .90     5.00    1.500    5.000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   1.162     .0010                                        .0036      .00      .90    1.00    1.43    .013       .00   .00  BOX
        |         |        |         |         |               |         |       |        |        |       |       |      |
1001.162     9.011     .948     9.959     24.38    5.14     .41    10.37     .00     .90     5.00    1.500    5.000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   4.200     .0010                                        .0031      .01      .95     .93    1.43    .013       .00   .00  BOX
        |         |        |         |         |               |         |       |        |        |       |       |      |
1005.362     9.015     .994    10.009     24.38    4.91     .37    10.38     .00     .90     5.00    1.500    5.000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   8.512     .0010                                        .0025      .02      .99     .87    1.43    .013       .00   .00  BOX
        |         |        |         |         |               |         |       |        |        |       |       |      |
1013.874     9.024    1.043    10.066     24.38    4.68     .34    10.41     .00     .90     5.00    1.500    5.000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  14.762     .0010                                        .0022      .03     1.04     .81    1.43    .013       .00   .00  BOX
        |         |        |         |         |               |         |       |        |        |       |       |      |
1028.635     9.039    1.093    10.132     24.38    4.46     .31    10.44     .00     .90     5.00    1.500    5.000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  24.124     .0010                                        .0019      .05     1.09     .75    1.43    .013       .00   .00  BOX
        |         |        |         |         |               |         |       |        |        |       |       |      |
1052.759     9.063    1.147    10.210     24.38    4.25     .28    10.49     .00     .90     5.00    1.500    5.000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  37.241     .0010                                        .0017      .06     1.15     .70    1.43    .013       .00   .00  BOX
WALL  ENTRANCE
        |         |        |         |         |               |         |       |        |        |       |       |      |
1090.000     9.100    1.202    10.302     24.38    4.06     .26    10.56     .00     .90     5.00    1.500    5.000   .00   0   .0
       -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
```

APPENDIX D – SUPPORTING DOCUMENTS



June 5, 2019

PREPARED FOR:

Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

PREPARED BY:

URBAN RESOURCE
CONSULTING CIVIL ENGINEERS
23 MAUCHLY, SUITE 110
IRVINE, CA 92618
PHONE: 949-727-9095
FAX: 949-727-9098

TERRY P. AU
C 68466
EXP. 9-30-19

Senior Housing

3111 Manchester Avenue
Cardiff by the Sea, California 92007

DATE: JUNE 5, 2019

PRELIMINARY MANCHESTER AVENUE STORM DRAIN EXHIBIT

ENCINITAS SENIOR APARTMENTS
PRELIMINARY STORMWATER STORAGE ANALYSIS

$V=C*P_6*A$

P_6 (100 yr, in.)	2.5
Total Area (ac.)	9.9

Existing Condition

Land Use	C	A (ac.)	Vex (cf)
Fallow Bare Soil	0.2	9.9	**17,969**
Oak Aspen Mtn	0.2		

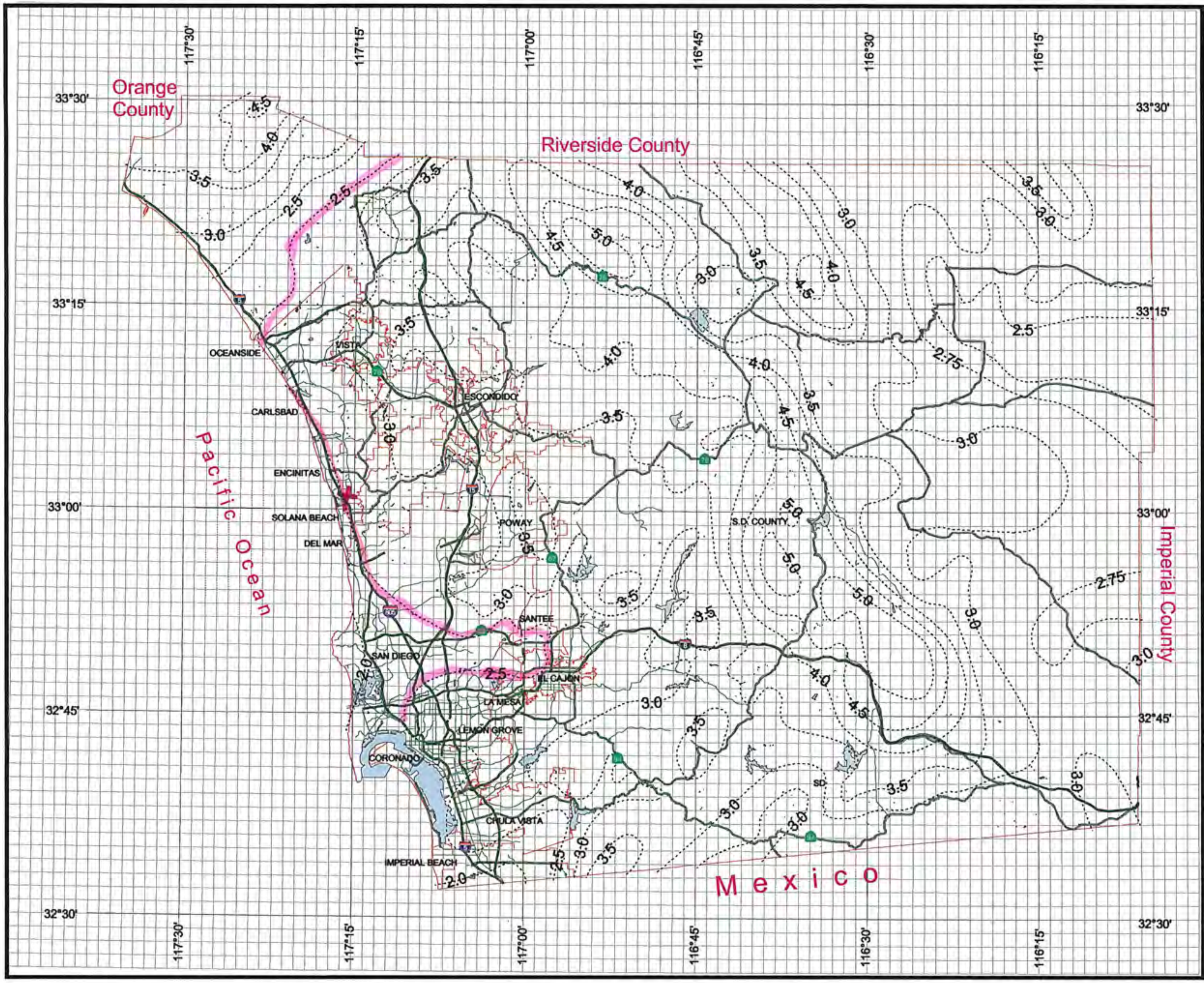
Proposed Condition

Land Use	C	A (ac.)	Subarea	(sf) Basin Bot Area	(sf) Basin at 15" Pond	(cf) Volume at 15" Pond	(cf) 18"Gravel Storage	Vpr (cf)
7.3du/ac	0.48	0.4	Subarea C	2,445	3,933	4,241	2,360	1,742
7.3du/ac	0.48	0.5						2,178
7.3du/ac	0.48	0.93						4,051
street/hard.	0.9	0.37						3,022
Urban Newly Graded	0.2	0.47	Subarea D	4,230	5,406	6,408	3,244	853
street/hard.	0.9	0.11						898
street/hard.	0.9	1.25						10,209
7.3du/ac	0.48	1.56						6,795
7.3du/ac	0.48	0.47						2,047
7.3du/ac	0.48	0.49	Subarea E	11,300	13,572	16,540	8,143	2,134
7.3du/ac	0.48	0.27						1,176
7.3du/ac	0.48	2.06						8,973
street/hard.	0.9	1.02						8,331
	Total:	**9.9**			Total:	**27,189**	**13,747**	**52,412**

Total Storage (cf)= **40,936** **> (Vex-Vpr)** **OK**

Vex-Vpr **34,443**

*See page 3-6 of SD Hydrology Manual for C values



County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

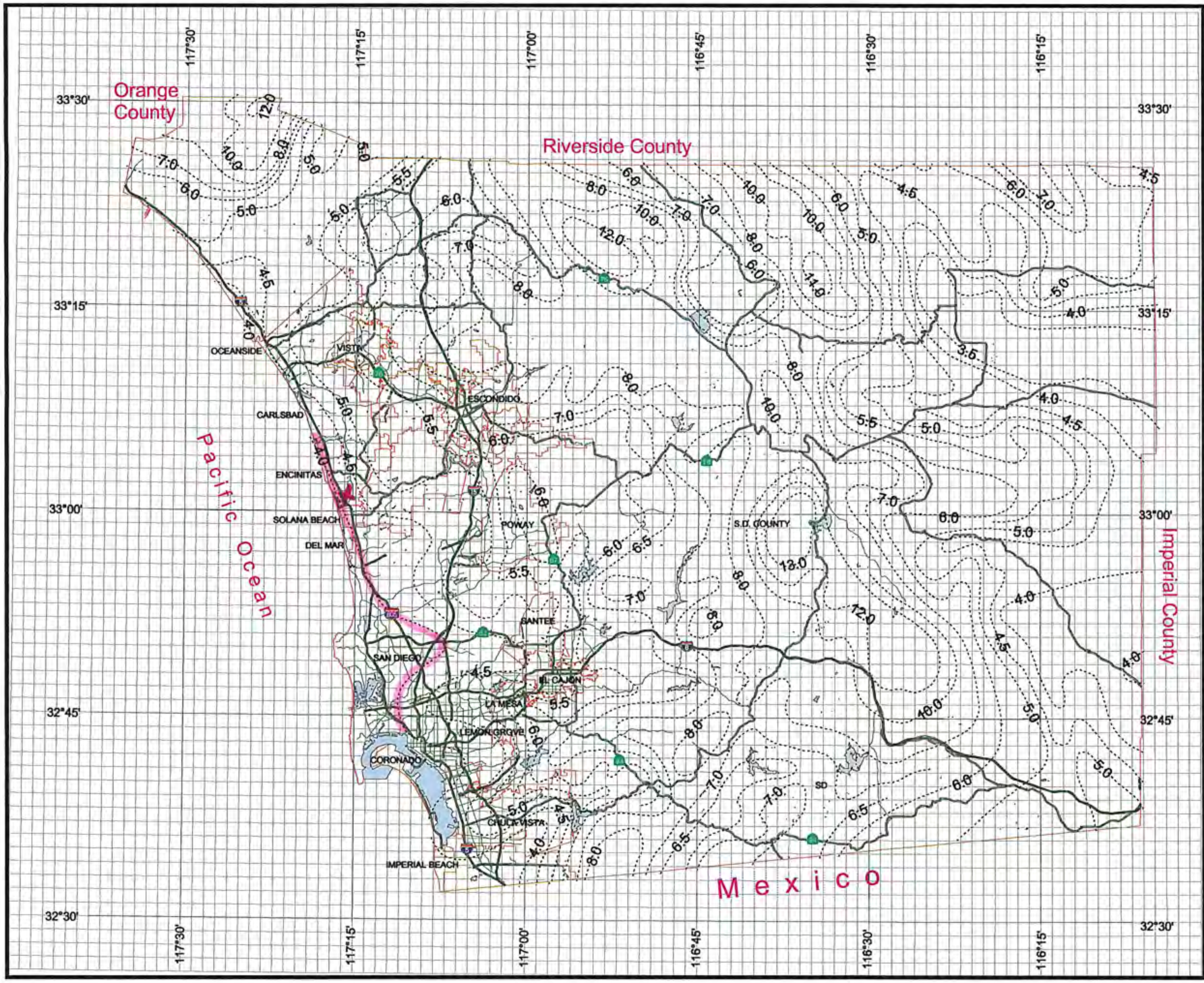
------- Isopluvial (inches)

$P_6 = 2.5''$

$\frac{P_6}{P_{24}} = \frac{2.5''}{4.2''} = 60\% \checkmark$

DPW GIS
Department of Public Works
Geographic Information Services

SanGIS
We Have San Diego Covered!



County of San Diego
Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 24 Hours

--------	Isopluvial (inches)

$P_{100} = 4.2''$

DPW GIS
Department of Public Works
Geographic Information Services

SanGIS
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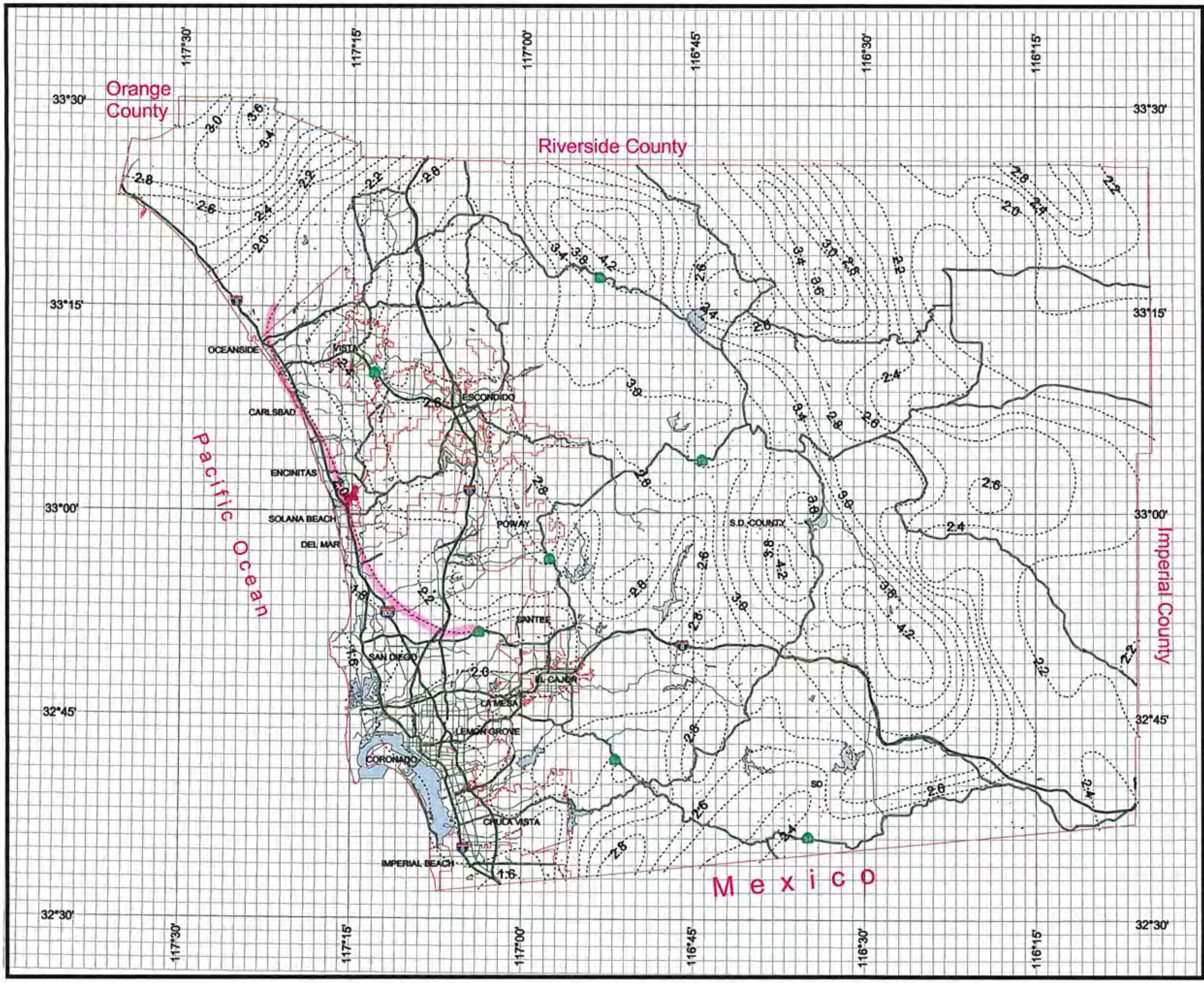
N
W E
S

3 0 3 Miles



County of San Diego
Hydrology Manual

Rainfall Isopluvials

25 Year Rainfall Event - 6 Hours

- - - - - - - Isopluvial (inches)

$P_6 = 2.0"$

$\frac{P_6}{P_{24}} = \frac{2.0"}{3.3"} = 61\%$ ✓

DPW GIS
Department of Public Works
Geographic Information Services

SanGIS
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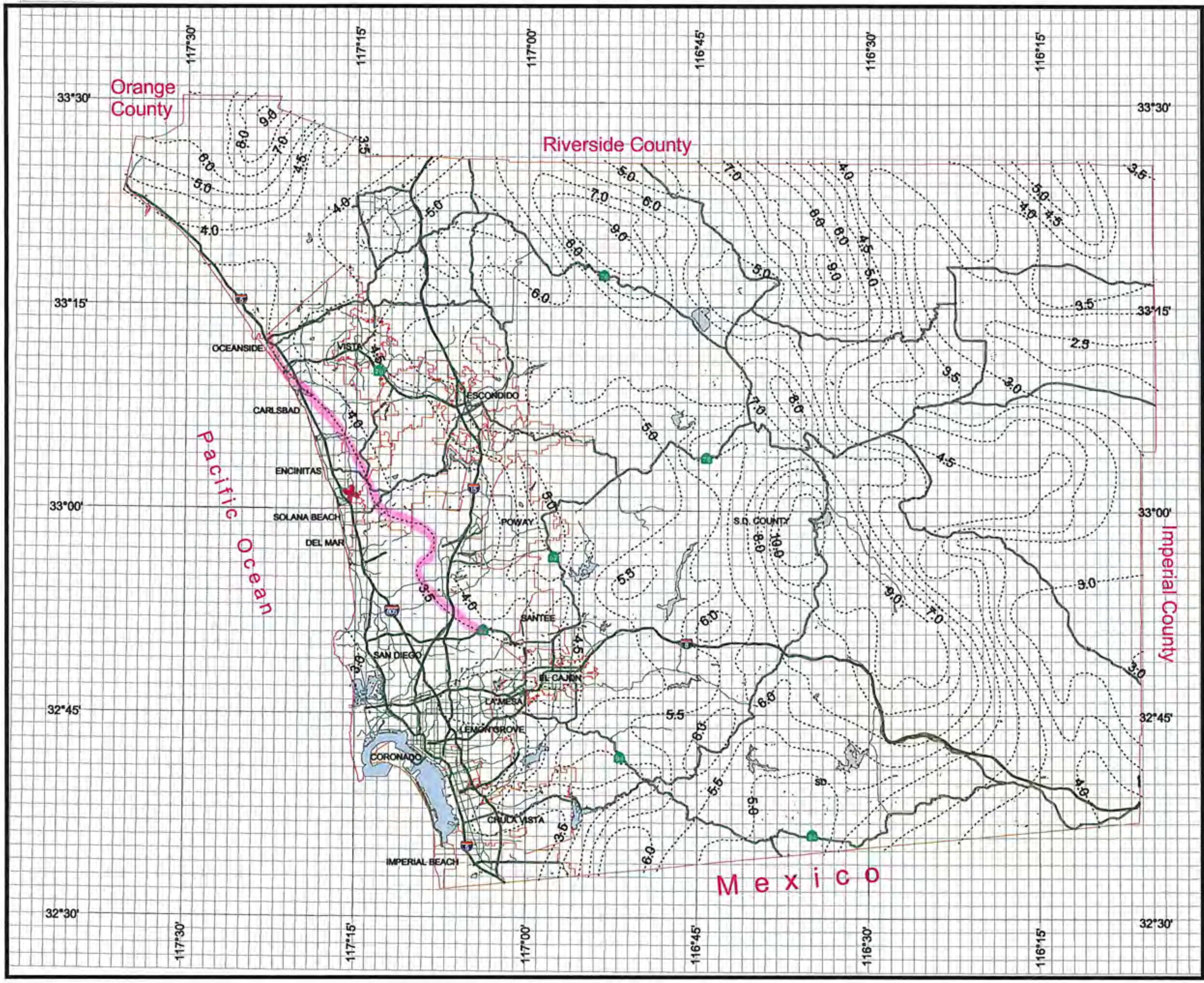
N
W E
S

3 0 3 Miles



County of San Diego
Hydrology Manual

Rainfall Isopluvials

25 Year Rainfall Event - 24 Hours

-------- Isopluvial (inches)

$P_{24} \approx 3.3$"

DPW GIS
Department of Public Works
Geographic Information Services

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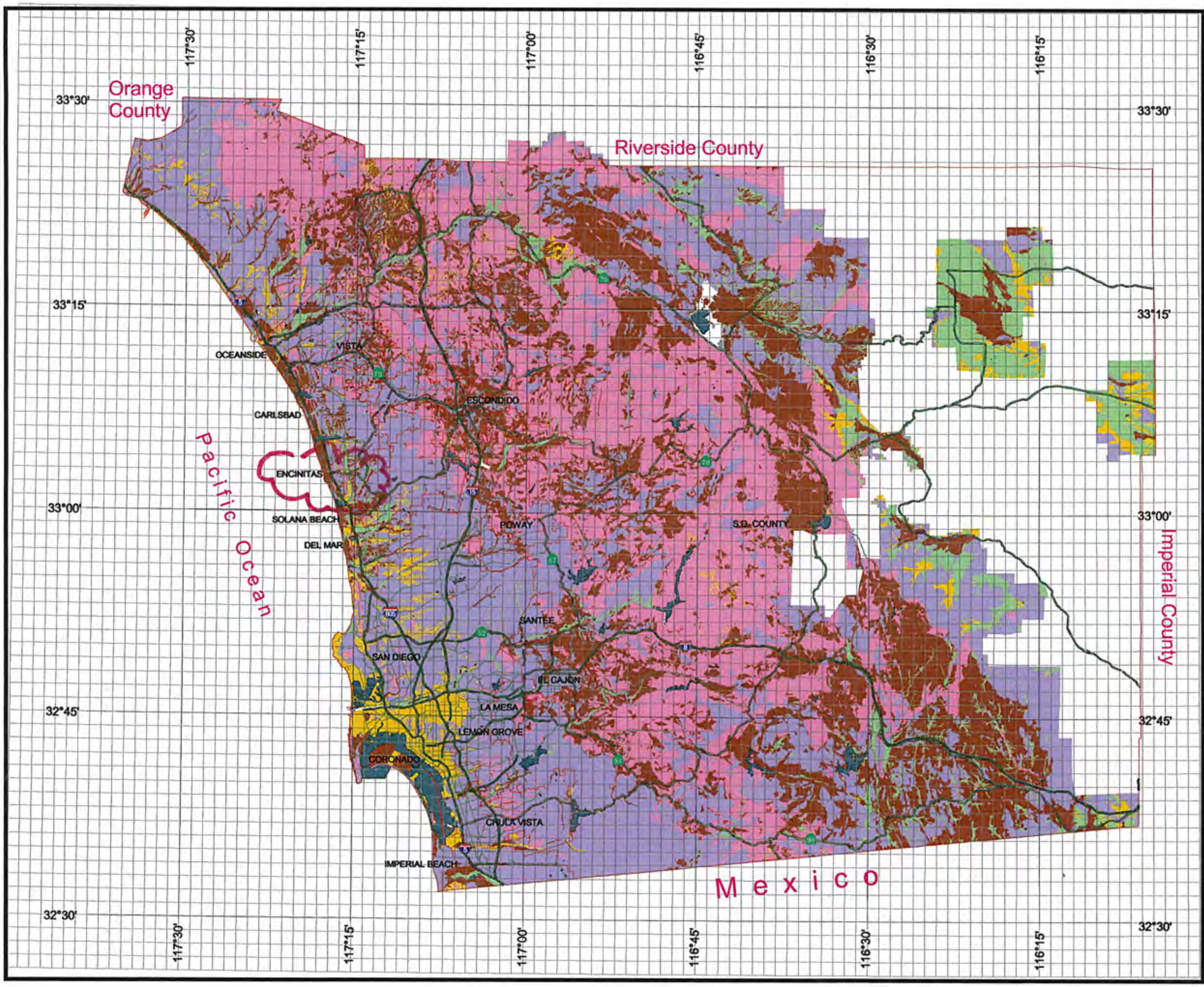
N
W E
S

3 0 3 Miles

County of San Diego Hydrology Manual

Soil Hydrologic Groups



Legend

Soil Groups

🟩	Group A *
🟫	Group B
🟪	Group C
🟦	Group D
🟨	Undetermined
☐	Data Unavailable

DPW GIS
Department of Public Works
Geographic Information Services

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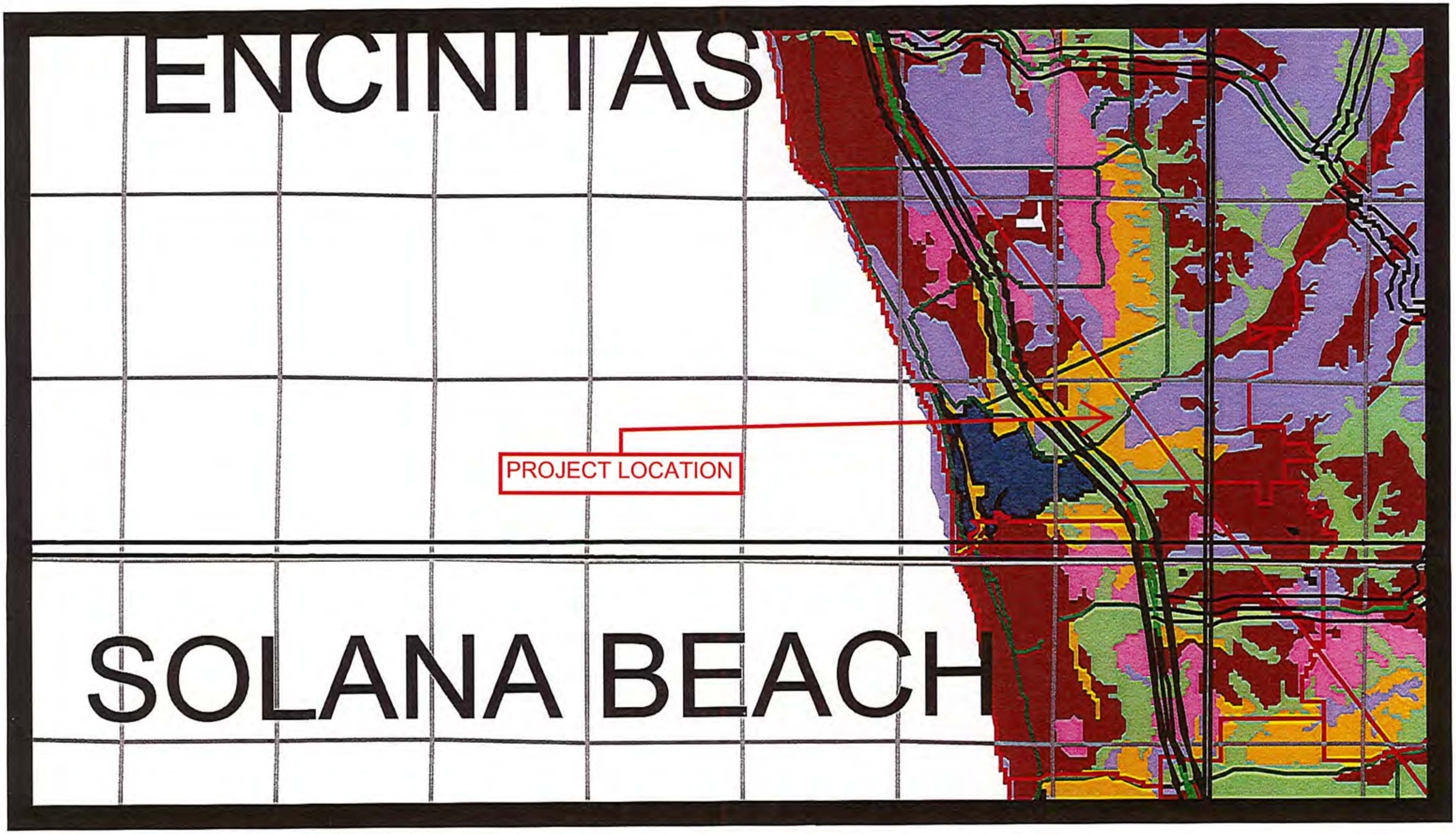
N
W E
S

3 0 3 Miles


ENCINITAS
PROJECT LOCATION
SOLANA BEACH

Hydrologic Soil Group—San Diego County Area, California

Map Scale: 1:2,470 if printed on A portrait (8.5" x 11") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
☐ Area of Interest (AOI)

Soils

Soil Rating Polygons
▨ A
▨ A/D
▨ B
▨ B/D
▨ C
▨ C/D
▨ D
☐ Not rated or not available

Soil Rating Lines
〰 A
〰 A/D
〰 B
〰 B/D
〰 C
〰 C/D
〰 D
〰 Not rated or not available

Soil Rating Points
■ A
■ A/D
■ B
■ B/D
■ C
■ C/D
■ D
□ Not rated or not available

Water Features
〰 Streams and Canals

Transportation
+++ Rails
〰 Interstate Highways
〰 US Routes
〰 Major Roads
〰 Local Roads

Background
■ Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 12, Sep 13, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 3, 2014—Nov 22, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CsC	Corralitos loamy sand, 5 to 9 percent slopes	A ←	13.1	100.0%
Totals for Area of Interest			**13.1**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

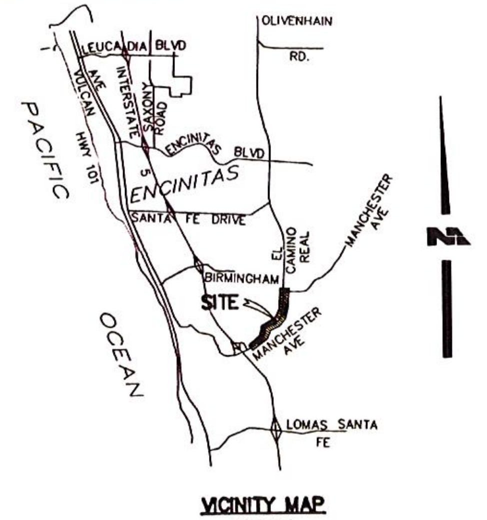
The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

DID: 201

PLANS FOR THE WIDENING OF
MANCHESTER AVENUE
FROM VIA POCO TO
EL CAMINO REAL

GRADING NOTES:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THESE PLANS, THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, THE DESIGN CONSTRUCTION STANDARDS OF THE CITY OF ENCINITAS, THE SPECIAL PROVISIONS FOR THIS PROJECT, AND THE SAN DIEGO AREA REGIONAL STANDARD DRAWINGS. ANY CHANGES OR REVISIONS THEREFROM SHALL BE APPROVED BY THE CITY ENGINEER PRIOR TO ANY REQUEST FOR INSPECTION.
2. CONTRACTOR SHALL TAKE ANY NECESSARY PRECAUTIONS REQUIRED TO PROTECT ADJACENT PROPERTIES DURING GRADING OPERATIONS. ANYTHING DAMAGED OR DESTROYED SHALL BE REPLACED OR REPAIRED TO CONDITION EXISTING PRIOR TO GRADING.
3. THE CONTRACTOR SHALL BE RESPONSIBLE THAT ANY MONUMENT OR BENCH MARK WHICH IS DISTURBED OR DESTROYED SHALL BE REESTABLISHED AND REPLACED BY A REGISTERED CIVIL ENGINEER OR A LICENSED LAND SURVEYOR.
4. THE CONTRACTOR SHALL DESIGN, CONSTRUCT AND MAINTAIN ALL SAFETY DEVICES, INCLUDING SHORING, AND SHALL BE RESPONSIBLE FOR CONFORMING TO ALL LOCAL, STATE AND FEDERAL SAFETY AND HEALTH STANDARDS, LAWS AND REGULATIONS.
5. GRADING AND EQUIPMENT OPERATING WITHIN ONE-HALF (1/2) MILE OF A STRUCTURE FOR HUMAN OCCUPANCY SHALL NOT BE CONDUCTED BETWEEN THE HOURS OF 5:30 P.M. AND 7:30 A.M. NOR ON SATURDAYS, SUNDAYS AND CITY RECOGNIZED HOLIDAYS.
6. PRIOR TO HAULING DIRT OR CONSTRUCTION MATERIALS TO ANY PROPOSED CONSTRUCTION SITE WITHIN THIS PROJECT THE DEVELOPER SHALL SUBMIT TO AND RECEIVE APPROVAL FROM THE CITY ENGINEER FOR THE PROPOSED HAUL ROUTE. THE DEVELOPER SHALL COMPLY WITH ALL CONDITIONS AND REQUIREMENTS THE CITY ENGINEER MAY IMPOSE WITH REGARDS TO THE HAULING OPERATION.
7. ALL GRADING SHALL BE OBSERVED AND TESTED BY A QUALIFIED SOILS ENGINEER OR UNDER THEIR DIRECTION. THEY SHALL OBSERVE AND TEST THE EXCAVATION PLACEMENT AND COMPACTION OF FILLS AND BACKFILLS AND COMPACTION OF TRENCHES. THEY SHALL SUBMIT SOILS REPORTS AS REQUIRED AND WILL DETERMINE THE SUITABILITY OF ANY FILL MATERIAL. UPON COMPLETION OF GRADING OPERATIONS THEY SHALL STATE THAT OBSERVATIONS AND TESTS WERE MADE BY THEM OR UNDER THEIR SUPERVISION AND THAT IN THEIR OPINION, ALL EMBANKMENTS AND EXCAVATIONS WERE CONSTRUCTED IN ACCORDANCE WITH THE APPROVED GRADING PLANS AND THAT ALL EMBANKMENTS AND EXCAVATIONS ARE ACCEPTABLE FOR THEIR INTENDED USE.
8. THE CONTRACTOR SHALL PROPERLY GRADE ALL EXCAVATED SURFACES TO PROVIDE POSITIVE DRAINAGE AND PREVENT PONDING OF WATER. THEY SHALL CONTROL SURFACE WATER AND AVOID DAMAGE TO ADJOINING PROPERTIES OR TO FINISHED WORK ON THE SITE AND SHALL TAKE REMEDIAL MEASURES TO PREVENT EROSION OF FRESHLY GRADED AREAS UNTIL SUCH TIME AS PERMANENT DRAINAGE AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED.
9. ALL AREAS TO BE FILLED SHALL BE PREPARED TO BE FILLED AND FILL SHALL BE PLACED IN ACCORDANCE WITH THE SPECIFICATIONS. ALL VEGETABLE MATTER AND OBJECTIONABLE MATERIAL SHALL BE REMOVED BY THE CONTRACTOR FROM THE SURFACE UPON WHICH THE FILL IS TO BE PLACED. LOOSE FILL AND ALLUVIAL SOILS SHALL BE REMOVED TO SUITABLE FIRM NATURAL GROUND. THE EXPOSED SOILS SHALL BE SCARIFIED TO A DEPTH OF 6" AND THEN COMPACTED TO A MINIMUM OF 90 PERCENT. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PLACE, SPREAD, WATER AND COMPACT THE FILL IN STRICT ACCORDANCE WITH THE APPROVED SOILS REPORT.
10. CUT AND FILL SLOPES SHALL BE CUT AND TRIMMED TO FINISH GRADE TO PRODUCE SMOOTH SURFACES AND UNIFORM CROSS SECTIONS. THE SLOPES OF EXCAVATIONS AND EMBANKMENTS SHALL BE SHAPED, PLANTED, AND TRIMMED AS DIRECTED BY THE ENGINEER OF WORK AND LEFT IN A NEAT AND ORDERLY CONDITION. ALL STONES, ROOTS, AND OTHER WASTE MATTER EXPOSED OR EXCAVATION OR EMBANKMENT SLOPES WHICH ARE LIABLE TO BECOME LOOSENED SHALL BE REMOVED AND DISPOSED OF. THE TOE AND TOP OF ALL SLOPES SHALL BE ROUNDED IN ACCORDANCE WITH THE GRADING ORDINANCE.
11. ALL TREES, BRUSH, GRASS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE COLLECTED, PILED OR OTHERWISE DISPOSED OF OFF THE SITE BY THE CONTRACTOR SO AS TO LEAVE THE AREAS THAT HAVE BEEN CLEARED WITH A NEAT AND FINISHED APPEARANCE FREE FROM UNSIGHTLY DEBRIS. APPROVAL OF LOCATION OF DEBRIS FILL SHALL BE SECURED FROM THE SOILS ENGINEER AND CITY ENGINEER PRIOR PRIOR TO THE DISPOSAL OF ANY SUCH MATERIAL.



VICINITY MAP
NO SCALE

GENERAL NOTES:

1. A PERMIT SHALL BE OBTAINED FROM THE ENCINITAS ENGINEERING SERVICES DEPARTMENT FOR ANY WORK WITHIN THE STREET RIGHT-OF-WAY. NO FEE WILL BE REQUIRED.
2. THE STRUCTURAL SECTIONS OF ALL PAVEMENT SHALL BE IN ACCORDANCE WITH CITY OF ENCINITAS PUBLIC ROAD STANDARDS. R VALUE TESTS SHALL BE REQUIRED PRIOR TO CONSTRUCTION.
3. ALL UNDERGROUND UTILITIES WITHIN THE STREET RIGHT-OF-WAY SHALL BE CONSTRUCTED, CONNECTED AND TESTED PRIOR TO CONSTRUCTION OF BERM, CURB, CROSS GUTTER AND PAVING.
4. THE EXISTENCE AND LOCATION OF EXISTING UNDERGROUND FACILITIES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO OTHER EXISTING FACILITIES EXCEPT AS SHOWN ON THESE PLANS. HOWEVER, THE CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT ANY EXISTING FACILITY SHOWN HEREON AND ANY OTHER WHICH IS NOT OF RECORD OR NOT SHOWN ON THESE PLANS.
5. LOCATION AND ELEVATION OF IMPROVEMENTS TO BE MET BY WORK TO BE DONE SHALL BE CONFIRMED BY FIELD MEASUREMENTS PRIOR TO CONSTRUCTION OF NEW WORK. CONTRACTOR WILL MAKE EXPLORATORY EXCAVATIONS AND LOCATE EXISTING UNDERGROUND FACILITIES SUFFICIENTLY AHEAD OF CONSTRUCTION TO PERMIT REVISIONS TO PLANS IF REVISIONS ARE NECESSARY BECAUSE OF ACTUAL LOCATION OF EXISTING FACILITIES.
6. THE CONTRACTOR SHALL NOTIFY SAN DIEGO GAS AND ELECTRIC COMPANY PRIOR TO STARTING WORK NEAR COMPANY FACILITIES AND SHALL COORDINATE HIS/HER WORK WITH COMPANY REPRESENTATIVES.
7. THE CONTRACTOR SHALL NOTIFY PACIFIC BELL PRIOR TO STARTING WORK NEAR COMPANY FACILITIES AND SHALL COORDINATE HIS/HER WORK WITH COMPANY REPRESENTATIVES.
8. FOR LOCATION OF CABLES AND APPURTENANCES CONTACT (800) 422-4133.
9. NO PAVING SHALL BE DONE UNTIL EXISTING POWER POLES ARE RELOCATED OUTSIDE THE AREAS TO BE PAVED.
10. THE CONTRACTOR SHALL BE RESPONSIBLE THAT ANY MONUMENT OR BENCH MARK WHICH IS DISTURBED OR DESTROYED SHALL BE REESTABLISHED AND REPLACED BY A REGISTERED CIVIL ENGINEER OR A LICENSED LAND SURVEYOR.
11. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (LATEST EDITION), THE SAN DIEGO STANDARD SPECIAL PROVISIONS TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (ADOPTED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE), AND THE SAN DIEGO REGIONAL STANDARD DRAWINGS (LATEST EDITION).
12. ALL GRADING ACTIVITY SHALL BE PROHIBITED BETWEEN OCTOBER 1 AND APRIL 1 OF ANY YEAR.

Construction contractor agrees that in accordance with generally accepted construction practices construction contractor will be required to assume sole and complete responsibility for job site conditions during the course of construction of the project including safety of all persons and property that this requirement shall be made to apply continuously and not be limited to normal working hours and construction contractor further agrees to defend, indemnify and hold design professional harmless from any and all liability, real or alleged, in connection with the performance of work on this project excepting liability arising from the sole negligence of design professional.

California Council
of **Civil Engineers**
& **Land Surveyors**

OLIVENHAIN MWD WATER NOTES:

1. WATER WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DETAILS AND MATERIALS AS SPECIFIED IN THE OLIVENHAIN MUNICIPAL WATER DISTRICT STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS AND FACILITIES, DATED MARCH 1997 WITH REVISIONS. CONTRACTOR SHALL HAVE A CURRENT COPY OF THE STANDARD SPECIFICATIONS ON THE JOB SITE AT ALL TIMES.
2. THE SUBMISSION AND REVIEW OF ALL SUBMITTALS (SHOP DRAWINGS, SIX SETS) AS REQUIRED BY THE STANDARD SPECIFICATIONS ARE TO BE ACCOMPLISHED PRIOR TO THE PRECONSTRUCTION MEETING WITH THE DISTRICT'S INSPECTOR.
3. NO WORK MAY BEGIN OR PROCEED WITHOUT DIRECTION OF DISTRICT'S INSPECTOR. INSPECTOR'S SCHEDULING MUST BE 24-48 HOURS IN ADVANCE OF WORK.
4. WHERE ELEVATIONS AND GRADES ARE NOT SHOWN ON THE WATER MAIN PROFILE, TOP OF PIPE PROFILE IS 48-INCHES BELOW CENTERLINE OF FINISH GRADE OF STREET.
5. INSTALL A MINIMUM 1-INCH WATER SERVICE TO EACH LOT. METER TO BE LOCATED 5-FEET FROM A SIDE LOT LINE. A 3/4-INCH HIGH LETTER "W" SHALL BE CHISELED IN TOP OF EXISTING CURB OR IMPRINTED IN NEW CURB AT ALL WATER SERVICE CROSSINGS. "B"
6. MANUAL AIR RELEASE SHALL BE INSTALLED AT ALL HIGH POINTS AND BLOW-OFFS AT ALL LOW POINTS IN THE WATER MAIN PROFILE. FIRE HYDRANTS MAY BE USED IN LIEU OF A MANUAL AIR RELEASE OR BLOW-OFF WHEN LOCATED AT OR NEAR HIGH OR LOW POINTS AS APPROVED BY THE DISTRICT'S REP.
7. UNLESS OTHERWISE NOTED, CONNECTIONS TO EXISTING MAINS SHALL BE MADE DRY. THE TIME AND DURATION OF ANY SHUTDOWNS OF EXISTING MAINS SHALL BE SUBJECT TO APPROVAL BY THE DISTRICT. DISTRICT SHALL BE NOTIFIED TWO WEEKS MINIMUM IN ADVANCE OF ANY SHUTDOWN.
8. CONTRACTOR SHALL COORDINATE WITH DISTRICT ALL ARRANGEMENTS FOR HIGH-LINING TEMPORARY SERVICES, ETC., PRIOR TO SHUTDOWNS. NO SHUTDOWNS WILL BE SCHEDULED ON A FRIDAY.
9. LINE VALVES, WHERE REQUIRED AT STREET INTERSECTIONS SHALL BE LOCATED ON THE PROLONGATION OF THE STREET RIGHT-OF-WAY WHENEVER POSSIBLE.
10. FIRE HYDRANTS, AS APPROVED BY THE APPROPRIATE FIRE DISTRICT AND MEETING THE DISTRICTS STANDARD SPECIFICATIONS, ARE TO BE INSTALLED AT LOCATIONS SPECIFIED BY THE FIRE DISTRICT.
11. CONTRACTOR SHALL REVIEW ALL PROPOSED TRENCH WORK WITH CAL/OSHA. A COPY OF EXEMPTION LETTER OR TRENCHING PERMIT, IF REQUIRED, SHALL BE SUBMITTED TO THE DISTRICT PRIOR TO CONSTRUCTION.
12. ALL EXISTING FACILITIES WHICH MAY AFFECT FINAL DESIGN, IE, LINE CROSSINGS, LINE PARALLELING, OR PROPOSED CONNECTIONS SHALL BE FIELD VERIFIED. ALL EXISTING OR PROPOSED UTILITY CROSSINGS, OR UTILITIES WITHIN 10-FEET OF PROPOSED WATER MAINS, SHALL BE SHOWN ON IMPROVEMENT PLANS.
13. ALL WATER SERVICES FOR IRRIGATION, MULTIPLE RESIDENTIAL COMPLEXES AND COMMERCIAL OR INDUSTRIAL DEVELOPMENTS SHALL HAVE AN APPROVED BACKFLOW PREVENTION DEVICE ON CUSTOMER'S SIDE OF WATER METER.
14. THE WATER SYSTEM SHALL BE PRESSURE TESTED IN ACCORDANCE WITH THE PROCEDURES IN THE STANDARD SPECIFICATIONS. THE CLASS OF PIPE SHALL BE USED AS THE DESIGNATED WORKING PRESSURE FOR TESTING ALL PIPE, VALVES (CLOSED) AND APPURTENANCES.
15. CONTRACTOR TO TIE OFF ALL VALVE LOCATIONS AND PROVIDE WRITTEN DIMENSIONS TO INSPECTOR IMMEDIATELY UPON INSTALLATION OF VALVES. "B"
16. ALL DEFLECTIONS (HORIZONTAL AND VERTICAL) SHALL BE MADE BY USE OF JOINT COUPLINGS WITH 4° MAXIMUM DEFLECTION PER COUPLING (2° PER JOINT). NO BENDING (CURVING) OF PIPE SHALL BE PERMITTED.
17. PIPELINE AND APPURTENANCES SHALL BE DISINFECTED IN ACCORDANCE WITH SECTION 15041 OF THE STANDARD SPECIFICATIONS PRIOR TO TIE-IN OR CONNECTION TO EXISTING SYSTEM FACILITIES. BACTERIOLOGIC QUALITY TEST RESULTS SHALL CONFORM TO THE CRITERIA SPECIFIED IN PARAGRAPH 3.06 OF THAT SPECIFICATION SECTION.
18. METER BOXES FOR 2-INCH SERVICE OR SMALLER SHALL BE FIBERGLASS REINFORCED POLYMER CONCRETE (RPC) MANUFACTURED BY ARMORCAST PRODUCTS COMPANY, CDR SYSTEMS CORPORATION, OR APPROVED EQUAL. METER BOX SIZE SHALL BE 17"x30".

EROSION CONTROL

1. EQUIPMENT AND WORKERS FOR EMERGENCY WORK SHALL BE MADE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON. ALL NECESSARY MATERIALS SHALL BE STOCKPILED ON SITE AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES WHEN RAIN IS IMMINENT.
2. DEVICES SHOWN ON PLANS SHALL NOT BE MOVED OR MODIFIED WITHOUT THE APPROVAL OF THE ENGINEERING INSPECTOR.
3. THE CONTRACTOR SHALL RESTORE ALL EROSION CONTROL DEVICES TO WORKING ORDER TO THE SATISFACTION OF THE CITY ENGINEER AFTER EACH RUN-OFF PRODUCING RAINFALL.
4. THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL MEASURES AS MAY BE REQUIRED BY THE CITY OF ENCINITAS ENGINEER DUE TO ANY INCOMPLETED GRADING OPERATION OR UNFORSEEN CIRCUMSTANCES WHICH MAY ARISE.
5. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT PUBLIC TRESPASS ONTO AREAS WHEN IMPOUNDED WATERS CREATE A HAZARDOUS CONDITION.
7. GRADED AREAS AROUND THE PROJECT PERIMETER MUST DRAIN AWAY FROM THE FACE OF SLOPE AT THE CONCLUSION OF EACH WORK DAY.
8. ALL REMOVABLE PROTECTIVE DEVICES SHOWN SHALL BE IN PLACE AT THE END OF EACH WORKING DAY WHEN THE FIVE (5) DAY RAIN PROBABILITY FORECAST EXCEEDS FORTY PERCENT (40%). SILT AND OTHER DEBRIS SHALL BE REMOVED AFTER EACH RAINFALL.
9. SHOULD GERMINATION OF HYDROSEEDED SLOPES FAIL TO PROVIDE EFFECTIVE COVERAGE OF GRADED SLOPES (90% COVERAGE) PRIOR TO NOVEMBER 15, THE SLOPES SHALL BE STABILIZED WITH PUNCHED STRAW INSTALLED IN ACCORDANCE WITH SECTION 35.023 OF THE EROSION AND SEDIMENT CONTROL HANDBOOK OF THE STATE OF CALIFORNIA DEPARTMENT OF CONSERVATION.
10. HYDROMULCH ALL GRADED 2:1 SLOPES PER SPECIFICATIONS.

SHEET INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	TYPICAL SECTIONS & INDEX MAPS
3	ROAD WIDENING PLAN & PROFILE STA 3+50± TO 11+00
4	ROAD WIDENING PLAN & PROFILE STA 11+00 TO 19+20.71
5	ROAD WIDENING PLAN & PROFILE STA 19+20.71 TO 25+64.49
6	ROAD WIDENING PLAN & PROFILE STA 40+19.62 TO 46+00
7	ROAD WIDENING PLAN & PROFILE STA 46+00 TO 51+91.40
8	STORM DRAIN PROFILES & ASPHALT SPILLWAY DETAILS
9	STRIPING & SIGNING PLANS STA 3+50± TO 26+00
10	STRIPING & SIGNING PLANS STA 26+00 TO 47+00
11	STRIPING & SIGNING PLANS STA 47+00 TO END
12	SECTIONS STA 5+00 TO 14+75
13	SECTIONS STA 15+00 TO 22+00
14	SECTIONS STA 41+00 TO 50+25
15	TRAFFIC SIGNAL PLANS "B"

WORK TO BE DONE

THE IMPROVEMENTS CONSIST OF THE FOLLOWING WORK TO BE DONE ACCORDING TO THESE PLANS, AND THE FOLLOWING SPECIFICATIONS AND STANDARD DRAWINGS

STANDARD SPECIFICATIONS

1. "GREENBOOK" STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (1997 EDITION).
2. CALIFORNIA DEPARTMENT OF TRANSPORTATION, "MANUAL OF TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE WORK ZONES," (1990 EDITION).
3. SAN DIEGO COUNTY REGIONAL STANDARDS COMMITTEE 1996 EDITION OF THE "WATCH" HANDBOOK.
4. OLIVENHAIN WATER DISTRICT STANDARD SPECIFICATIONS FOR CONSTRUCTION ON WATER MAINS.
5. STATE OF CALIFORNIA STANDARD SPECIFICATIONS-JULY 1992.

STANDARD DRAWINGS

1. COUNTY OF SAN DIEGO REGIONAL STANDARD DRAWINGS-MARCH 1997.
2. STATE OF CALIFORNIA STANDARD PLANS-JULY 1992.

DESCRIPTION	STD DWG	SYMBOL
EXISTING CONTOURS		120
PROPOSED CONTOURS		120
GRADED SLOPES		
PROPOSED SPOT ELEVATIONS		289.7
LOT LINE		
DAYLIGHT LINE		
RIGHT-OF-WAY LINE		R/W
STORM DRAIN (SIZE PER PLAN)	D-60	SD
AC BERM - TYPE B	G-5	
CURB & GUTTER	G-2	
AC PAVEMENT	SEE GEN. NOTE 2	
ASPHALT SPILLWAY	SEE DETAIL, SHEET 8	
AC OVERLAY		▨
CONCRETE DRIVEWAY	G-14B	
TYPE B PEDESTRIAN RAMP	G-27	
8" PVC WATER LINE		W
WATER LINE ELBOW W/ RESTRAINED JOINTS		
WATER LINE END CAP		W
WATER SERVICE LATERAL		W Ⓦ
EXIST RECLAIMED WATER LINE		RW
EXIST CABLE TELEVISION LINE		CTV
EXIST WATER LINE		W
EXIST SEWER LINE		S
EXIST ELECTRICAL		E
EXIST TELEPHONE		TL
EXIST GAS MAIN		G
EXIST STORM DRAIN		SD
ASSESSORS PARCEL NUMBER:		xxx-xxx-xx
ASPHALT SPILLWAY	SEE DETAIL SHEET 8	

TOPOGRAPHY:

TOPOGRAPHY IS BY SAN-LO AERIAL SURVEYS, DATED 5/7/96, SUPPLEMENTED BY A FIELD SURVEY PERFORMED IN APRIL OF 1998 BY NOLTE AND ASSOCIATES.

EARTHWORK:

CUT = 7,465 C.Y.
FILL = 7,465 C.Y.

DECLARATION OF RESPONSIBLE CHARGE

I HEREBY DECLARE THAT I AM THE ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THE PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, AND THAT THE DESIGN IS CONSISTENT WITH CURRENT STANDARDS.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPECIFICATIONS BY THE CITY OF ENCINITAS IS CONFINED TO A REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN.

NOLTE AND ASSOCIATES, INC.
5469 KEARNY VILLA ROAD, SUITE 305
SAN DIEGO, CA 92123
(619) 278-9392

RICHARD E. BERG No. 41782 Exp. 3/31/04

BY: R. E. Berg
RICHARD E. BERG RCE 41782
EXP 3/31/04

6-18-01
DATE

WATER AGENCY
OLIVENHAIN MUNICIPAL WATER DISTRICT
POTABLE WATER SYSTEM APPROVAL

RCE 48853 DATE JOB NO
Note: Signature Expires 2 Years After Date

AS BUILT DRAWINGS
R. E. Berg 6-18-01
RICHARD E. BERG DATE

NOLTE
BEYOND ENGINEERING
15090 AVENUE OF SCIENCE, SUITE 101 SAN DIEGO, CA 92128
858.385.0500 TEL 858.385.0400 FAX WWW.NOLTE.COM

REVISIONS	APPROVED	DATE	REFERENCES	DATE
"A"-REVISE WTR CONNECTION DETAIL		6-9-98		
"B"-CONSTRUCTION CHANGE, REPL SHTS 1,2,5,6,7,8,10,11,14, & ADD SHT 15		4-22-99		
"C"- AS BUILT DRAWINGS- ALL SHEETS		6-15-01		

BENCH MARK
DESCRIPTION: BRASS DISK STAMPED I 131 1933
LOCATION: ROAD S 21 0.55 MILES N OF INT. W/ CHESTERFIELD DR., TOP OF 24" SD HDWL UNDER AT&SF RR. 72.5' S OF MP 80. 8.5' E OF E RAIL
ELEVATION: 73.55 DATUM: USC&GS NAVD 88

SCALE
HORIZONTAL NONE
VERTICAL NONE

ENCINITAS FIRE PROTECTION DISTRICT
APPROVED BY:
DATE:

DESIGNED BY | DRAWN BY | CHECKED BY

PLANS PREPARED UNDER SUPERVISION OF
R. E. Berg
RICHARD E. BERG
DATE: 6-18-01
R.C.E. NO: 41782
EXP: 3-31-04

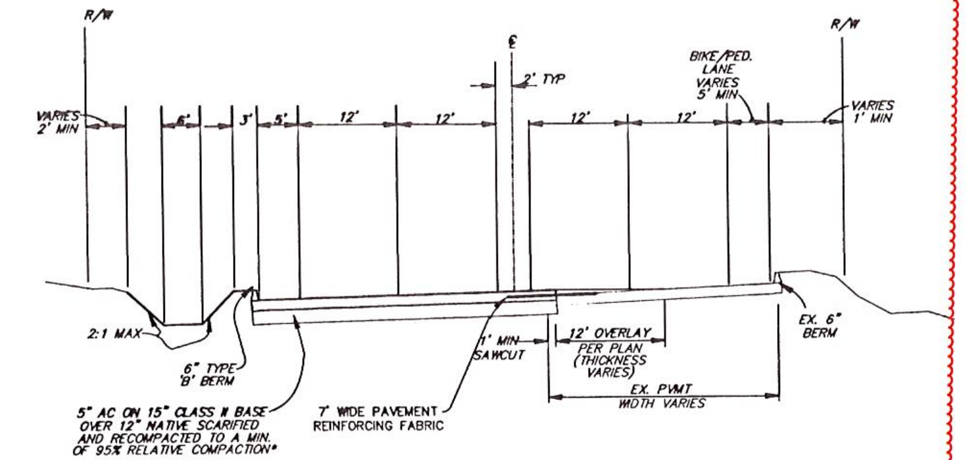
APPROVALS
RECOMMENDED BY: LEROY BODAS DATE: RCE: 22312
APPROVED BY: ALAN D. ARCHIBALD DATE: RCE: 21869

CITY OF ENCINITAS ENGINEERING DEPARTMENT
PLANS FOR THE WIDENING OF
MANCHESTER AVENUE
TITLE SHEET/SHEET INDEX MAP
WORK PROJECT NO. CMS96F

DRAWING NO.
SI-0021 "B"
SHEET 1B OF 15

N:\SD0442\00\CADD\T1.DWG

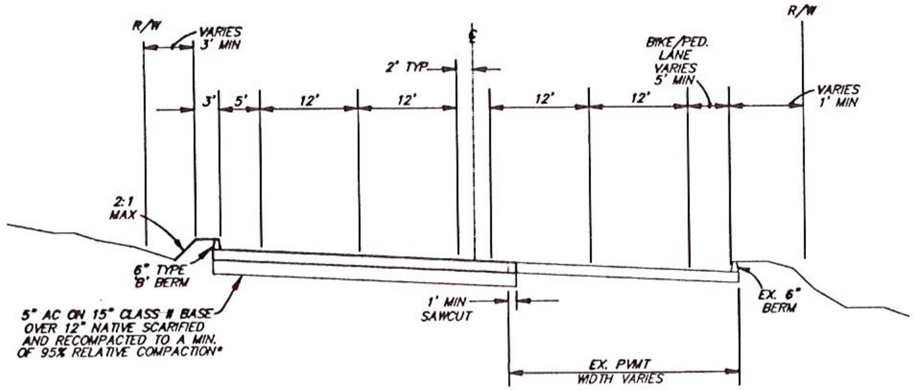
ENGINEER'S NAME: NOLTE & ASSOCIATES, INC.
PHONE NO: (858) 385-0500



* (OR AS DIRECTED BY SOILS ENGR)

MANCHESTER AVE.

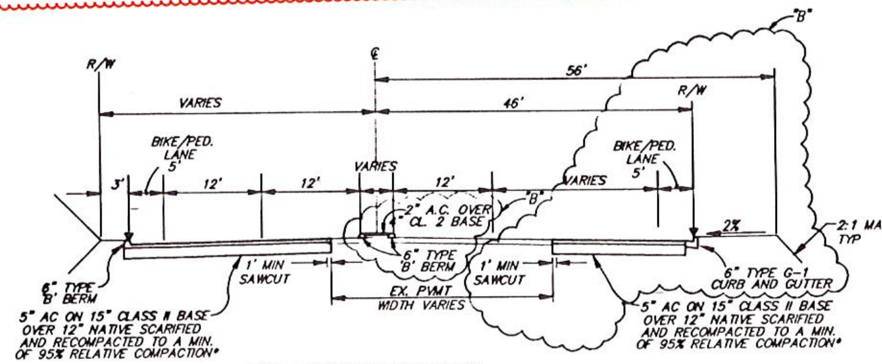
STA. 4+20± to 18+05±
NO SCALE



* (OR AS DIRECTED BY SOILS ENGR)

MANCHESTER AVE.

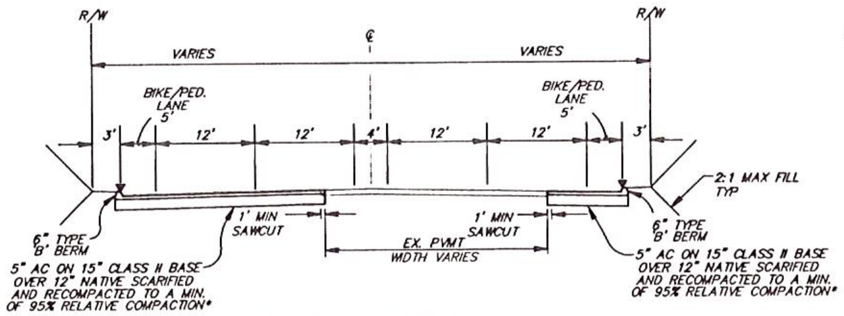
STA. 18+05± TO 22+00±



* (OR AS DIRECTED BY SOILS ENGR)

MANCHESTER AVE.

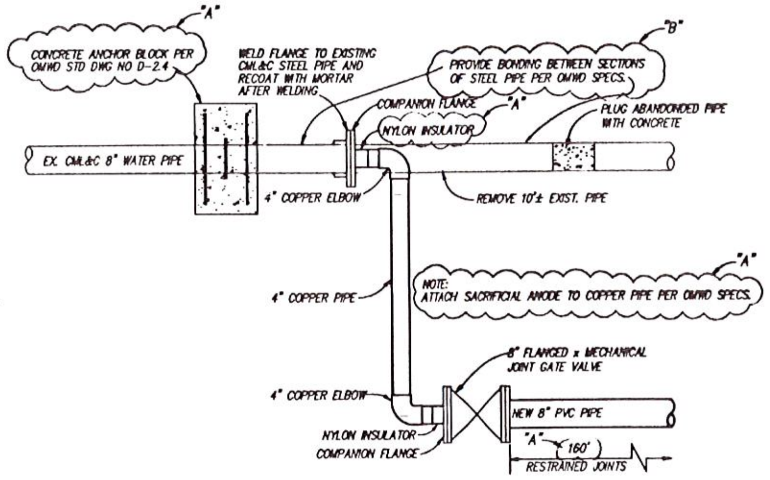
STA. 39+19.24 to 44+89.01
NO SCALE



* (OR AS DIRECTED BY SOILS ENGR)

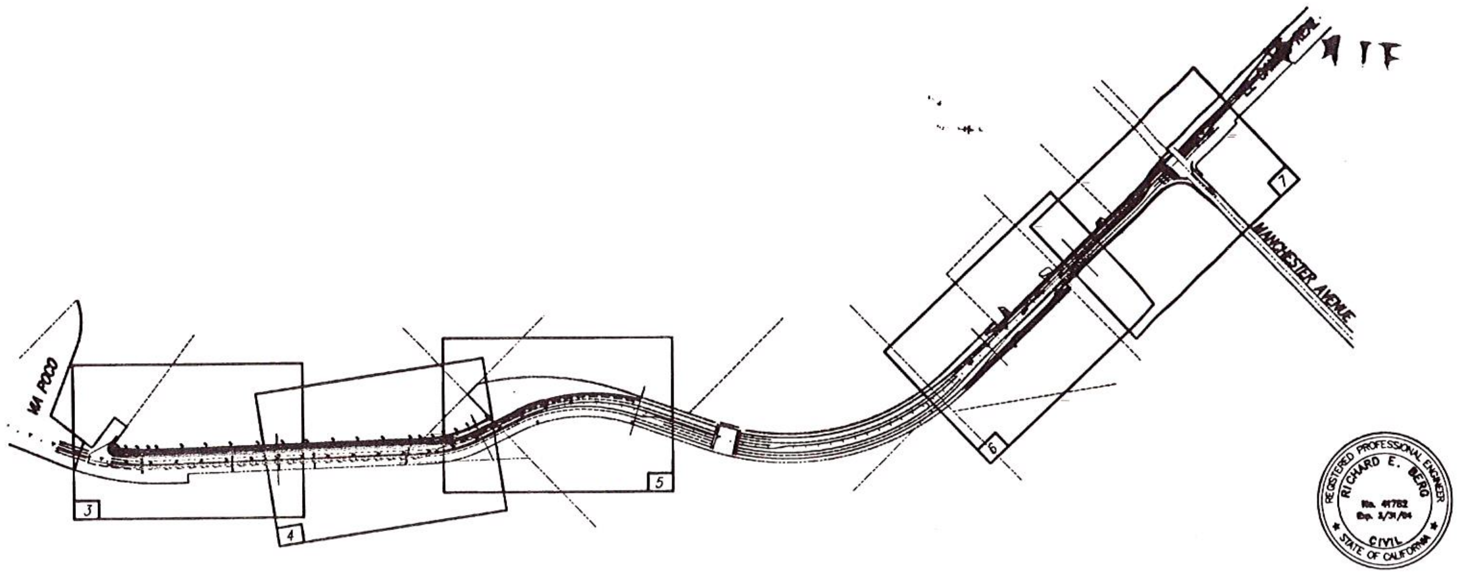
MANCHESTER AVE.

STA. 44+90± to 51+50±
NO SCALE



WATERLINE CONNECTION DETAIL

NO SCALE



KEY MAP

NO SCALE

3 INDICATES PLAN/PROFILE SHEET NUMBER

AS BUILT DRAWINGS
R.E.B. 6-18-01
RICHARD E. BERG DATE

NOLTE
BEYOND ENGINEERING
15090 AVENUE OF SCIENCE, SUITE 101 SAN DIEGO, CA 92128
858 385 0500 TEL 858 385 0400 FAX WWW.NOLTE.COM

No. 41782
Exp. 3/31/04
CIVIL

REVISIONS	APPROVED	DATE	REFERENCES	DATE
"A"-REVISE WTR CONNECTION DETAIL		6-9-98		
"B"-CONSTRUCTION CHANGE, REPL SHTS 1,2,5,6,7,8,10,11,14, & ADD SHT 15		4-22-99		
"C"- AS BUILT DRAWINGS- ALL SHEETS		6-15-01		

BENCH MARK

DESCRIPTION: BRASS DISK STAMPED T 131 1933
LOCATION: ROAD S 21 0.55 MILES N OF INT. W/ CHESTERFIELD DR., TOP OF 24" SD HDWL UNDER AT&SF RR; 72.5' S OF MP 80, 8.5' E OF E RAIL
ELEVATION: 73.55 DATUM: USC&GS NAVD 88

SCALE

HORIZONTAL NONE
VERTICAL NONE

ENCINITAS FIRE PROTECTION DISTRICT

APPROVED BY:
DATE:

DESIGNED BY RST
DRAWN BY RST
CHECKED BY REB

PLANS PREPARED UNDER SUPERVISION OF
R.E.B.
RICHARD E. BERG
DATE: 6-18-01
R.C.E. NO: 41782
EXP: 3-31-04

APPROVALS

RECOMMENDED
BY: LEROY BODAS
DATE:
RCE: 22312

APPROVED
BY: ALAN D. ARCHIBALD
DATE:
RCE: 21869

CITY OF ENCINITAS ENGINEERING DEPARTMENT

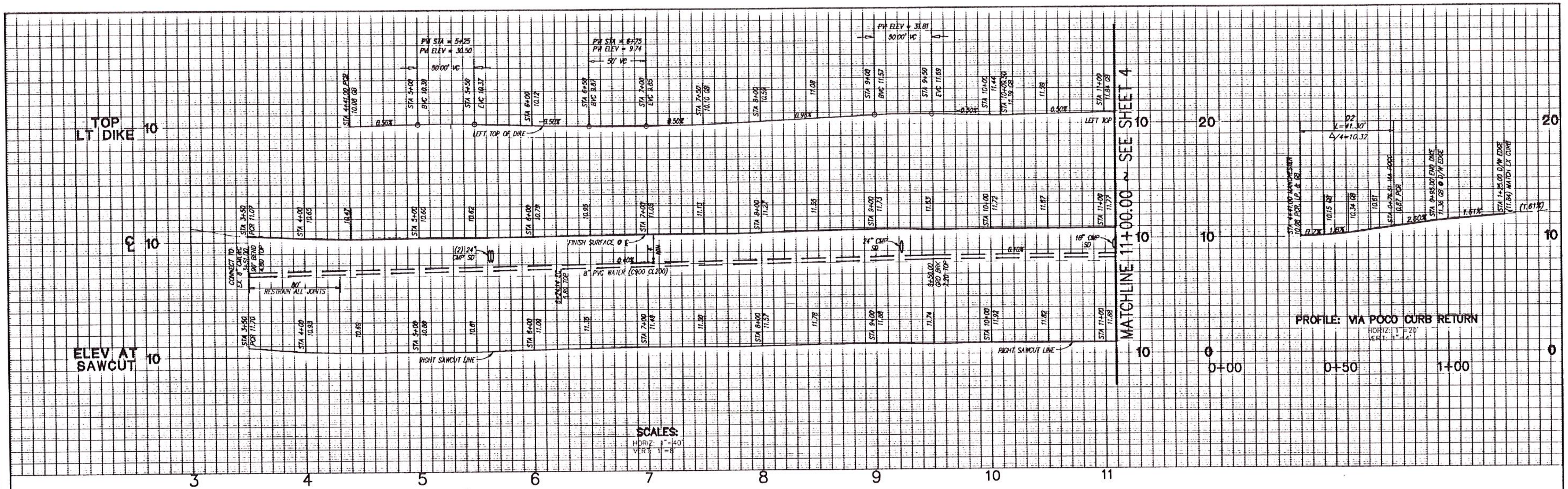
PLANS FOR THE WIDENING OF
MANCHESTER AVENUE
TYPICAL SECTIONS

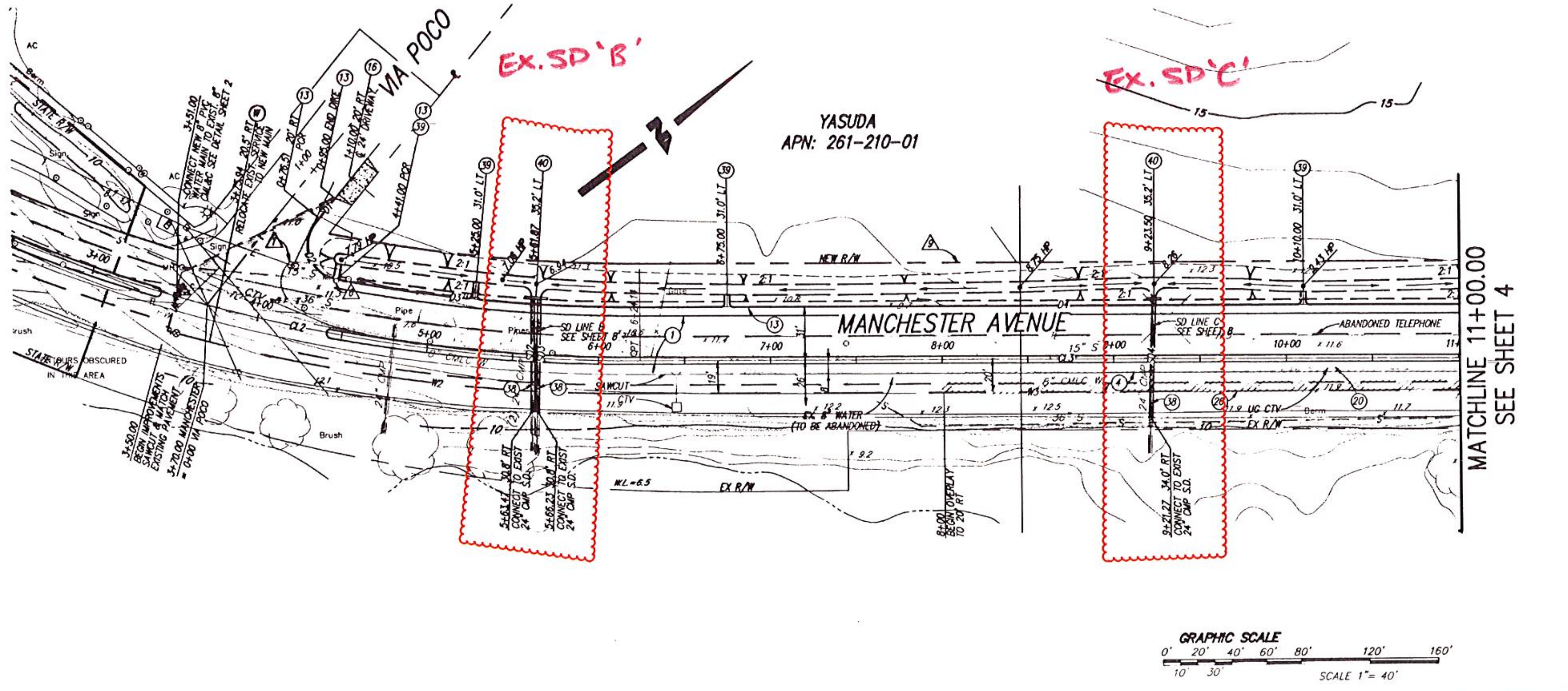
WORK PROJECT NO. CMS96F

DRAWING NO.
SI-0021 "B"
SHEET 2B OF 15

T2.DWG
N:\SD0442\CADD\

ENGINEER'S NAME: NOLTE & ASSOCIATES, INC.
PHONE NO: (858) 385-0500





CONSTRUCTION NOTES

- ① AC PAVEMENT
- ④ AC OVERLAY – THICKNESS VARIES
- ⑦ PAVEMENT REINFORCING FABRIC
- ⑩ PCC CURB AND GUTTER
- ⑬ TYPE 'B' AC DIKE
- ⑯ PCC DRIVEWAY
- ⑳ 8" PVC WATER MAIN
- ㉓ 8" GATE VALVE
- ㉖ THRUST BLOCK "B"
- ㉙ 2" BLOW OFF ASS'Y
- ㉟ 18" CMP STORM DRAIN
- ㊳ 24" CMP STORM DRAIN
- ㊴ ASPHALT SPILLWAY
- ㊵ TYPE 'B' GRAVITY HEADWALL

UTILITY NOTES

- △1 ADJUST EXISTING ELECTRIC PULL BOX TO FINISH GRADE AND REPLACE LID W/ TRAFFIC RATED LID.
- △6 ADJUST EXISTING SEWER MANHOLE TO FINISH GRADE.
- △9 CONSTRUCT 3-STRAND BARBED WIRE FENCE 4' HIGH, W/ STEEL 'T' POST 10' ON CENTER WHERE EXISTING FENCE IS DEMOLISHED BY ROAD WIDENING FROM STATIONS 4+57± TO 9+39±, 11+17± TO 14+03±, AND 15+36± TO 19+23± "B"

ASPHALT DIKE DATA TABLE

SYMBOL	DELTA/BEARING	RADIUS	LENGTH
D1	N07°40'11"E		18.49
D2	117°19'37"	20.00	41.30
D3	10°46'25"	943.00	177.32
D4	N43°13'48"E		475.86
D5	DELETED		
D6	DELETED		

"C"

CENTERLINE DATA TABLE

SYMBOL	DELTA/BEARING	RADIUS	LENGTH
CL1	N66°51'35"E		222.45
CL2	23°37'47"	974.00	401.69
CL3	N43°13'48"E		475.86

STORM DRAIN DATA TABLE

SYMBOL	DELTA/BEARING	RADIUS	LENGTH
SD1	DELETED		
SD2	N46°08'34"W		64.91
SD3	N45°26'12"W		64.80
SD4	N44°53'53"W		68.07

"C"

WATER DATA TABLE

SYMBOL	DELTA/BEARING	RADIUS	LENGTH
W1	S30°59'05"E		20.98
W2	15°47'07"	993.00	273.58
W3	N43°13'48"E		480.85

RICHARD E. BERG
No. 41782
Exp. 3/31/04

AS BUILT DRAWINGS

R.E.B. 6-18-01
RICHARD E. BERG DATE

NOLTE
BEYOND ENGINEERING
15090 AVENUE OF SCIENCE, SUITE 101 SAN DIEGO, CA 92128
858 385 0500 TEL 858 385 0400 FAX WWW.NOLTE.COM

REVISIONS	APPROVED	DATE	REFERENCES	DATE
"A"-REVISE WTR CONNECTION DETAIL		6-9-98		
"B"-CONSTRUCTION CHANGE, REPL SHTS 1,2,5,6,7,8,10,11,14, & ADD SHT 15		4-22-99		
"C"- AS BUILT DRAWINGS- ALL SHEETS		6-15-01		

BENCH MARK

DESCRIPTION: BRASS DISK STAMPED T 131 1933
LOCATION: ROAD S 21 0.55 MILES N OF INT. W/ CHESTERFIELD DR., TOP OF 24" SD HDWL UNDER AT&SF RR. 72.5' S OF MP 80. 8.5' E OF E RAIL
ELEVATION: 73.55 DATUM: USC&GS NAVD 88

SCALE

HORIZONTAL 1"=40'
VERTICAL 1"=8'

DESIGNED BY	DRAWN BY	CHECKED BY
RST	RJC	REB

PLANS PREPARED UNDER SUPERVISION OF
R.E.B.
RICHARD E. BERG
DATE: 6-18-01
R.C.E. NO: 41782
EXP: 3-31-04

APPROVALS

RECOMMENDED
BY: ______
DATE: ______
RCE: ______

APPROVED
BY: ______
ALAN D. ARCHIBALD
DATE: ______
RCE: 21869

CITY OF ENCINITAS ENGINEERING DEPARTMENT

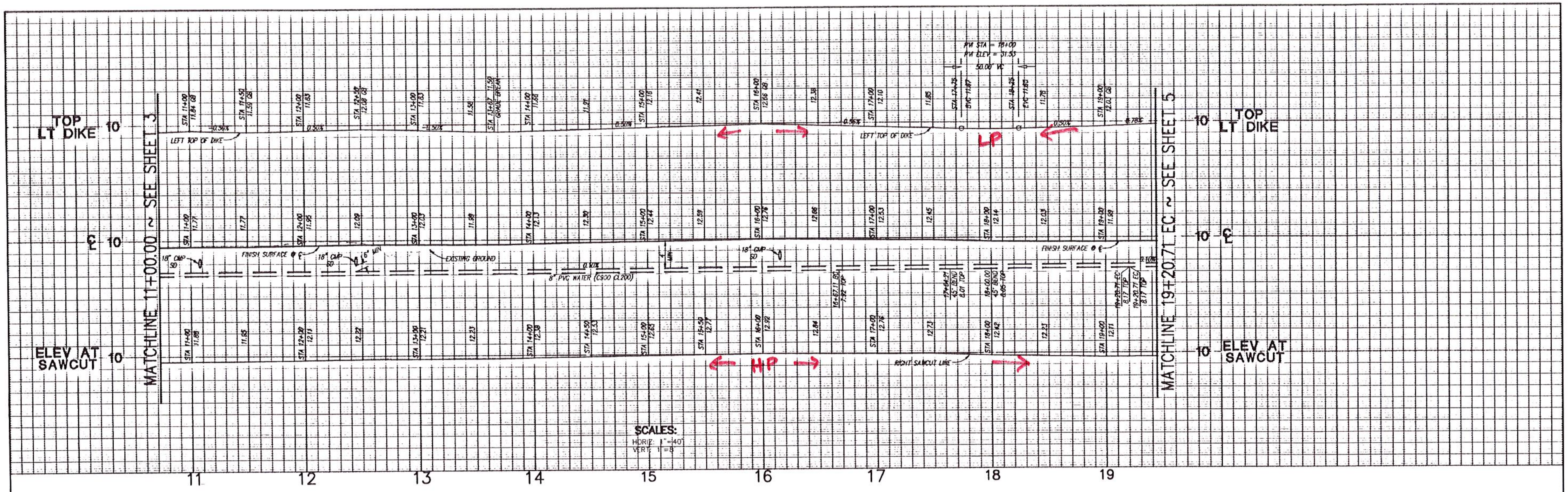
MANCHESTER WIDENING
BEGIN TO STA 11+00
IMPROVEMENTS

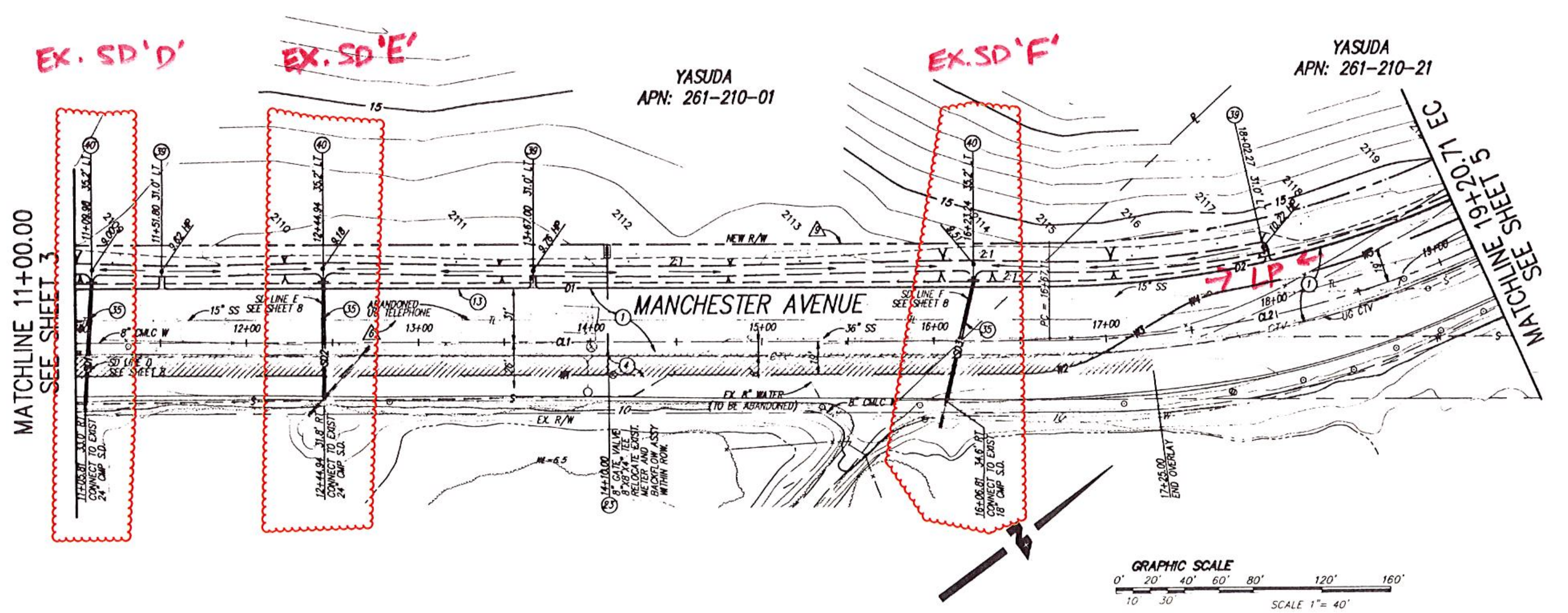
WORK PROJECT NO. CMS96F

DRAWING NO.
SI-0021 "B"
SHEET 3A OF 15

n:\sd0442\00\cadd\pp1.dwg

ENGINEER'S NAME: NOLTE & ASSOCIATES, INC.
PHONE NO: (858) 385-0500





CONSTRUCTION NOTES

- ① AC PAVEMENT
- ④ AC OVERLAY – THICKNESS VARIES
- ⑩ PCC CURB AND GUTTER
- ⑬ TYPE 'B' AC DIKE
- ⑰ PCC DRIVEWAY
- ⑳ 8" PVC WATER MAIN
- ㉓ 8" GATE VALVE
- ㉖ THRUST BLOCK
- ㉙ 2" BLOW OFF ASSEMBLY "B"
- ㉜ WATER SERVICE
- ㉟ 18" CMP STORM DRAIN
- ㊳ 24" CMP STORM DRAIN
- ㊴ ASPHALT SPILLWAY
- ㊵ TYPE 'B' GRAVITY HEADWALL

UTILITY NOTES

- ⚠4 ADJUST EXISTING WATER VALVE COVERS TO FINISH GRADE.
- ⚠6 ADJUST EXISTING SEWER MANHOLE TO FINISH GRADE.
- ⚠9 CONSTRUCT 3-STRAND BARBED WIRE FENCE 4' HIGH, W/ STEEL "T" POST 10' ON CENTER WHERE EXISTING FENCE IS DEMOLISHED BY ROAD WIDENING "B"

CENTERLINE DATA TABLE

SYMBOL	DELTA/BEARING	RADIUS	LENGTH
CL1	N43°13'48"E		567.11'
CL2	24°13'00"	600.00'	253.60'

ASPHALT DIKE DATA TABLE

SYMBOL	DELTA/BEARING	RADIUS	LENGTH
D1	N43°13'48"E		567.11'
~~D2~~	~~24°13'00"~~	~~569.00'~~	~~240.49'~~
D3	DELETED		
D4	DELETED		

"C"

STORM DRAIN DATA TABLE

SYMBOL	DELTA/BEARING	RADIUS	LENGTH
SD1	N43°12'25"W		67.08'
SD2	N46°46'12"W		65.55'
SD3	N33°18'21"W		70.55'

WATER DATA TABLE

SYMBOL	DELTA/BEARING	RADIUS	LENGTH
W1	N43°13'48"E		551.29
W2	30°33'57"	100.00	53.35
W3	N12°39'51"E		41.65
W4	20°16'01"	100.00	35.37
W5	13°55'07"	581.00	141.14

RICHARD E. BERG
No. 41782
Exp. 3/31/04

AS BUILT DRAWINGS
R.E. Berg 6-18-01
RICHARD E. BERG DATE

NOLTE
BEYOND ENGINEERING
15090 AVENUE OF SCIENCE, SUITE 101 SAN DIEGO, CA 92128
858 385 0500 TEL 858 385 0400 FAX WWW.NOLTE.COM

REVISIONS	APPROVED	DATE	REFERENCES	DATE
"A"-REVISE WTR CONNECTION DETAIL		6-9-98		
"B"-CONSTRUCTION CHANGE, REPL SHTS 1,2,5,6,7,8,10,11,14, & ADD SHT 15		4-22-99		
"C"- AS BUILT DRAWINGS- ALL SHEETS		6-15-01		

BENCH MARK

DESCRIPTION: BRASS DISK STAMPED T 131 1933
LOCATION: ROAD S 21 0.55 MILES N OF INT. W/ CHESTERFIELD DR., TOP OF 24" SD HDWL UNDER AT&SF RR. 72.5' S OF MP 80. 8.5' E OF E RAIL
ELEVATION: 73.55 DATUM: USC&GS NAVD 88

SCALE

HORIZONTAL 1"=40'
VERTICAL 1"=8'

DESIGNED BY	DRAWN BY	CHECKED BY
RST	RJC	REB

PLANS PREPARED UNDER SUPERVISION OF
R.E. Berg
RICHARD E. BERG
DATE: 6-18-01
R.C.E. NO: 41782
EXP: 3-31-04

APPROVALS

RECOMMENDED
BY:
DATE:
RCE:

APPROVED
BY:
ALAN D. ARCHIBALD
DATE:
RCE: 21869

CITY OF ENCINITAS ENGINEERING DEPARTMENT

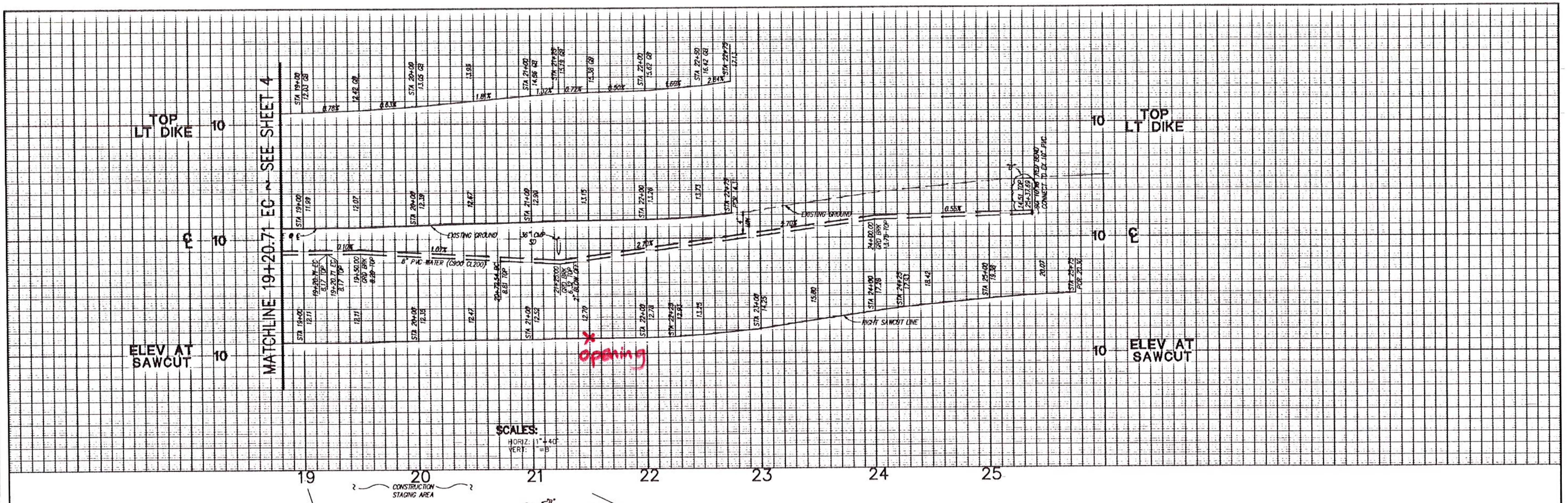
MANCHESTER WIDENING
STA 11+00 TO 19+20.71
IMPROVEMENTS

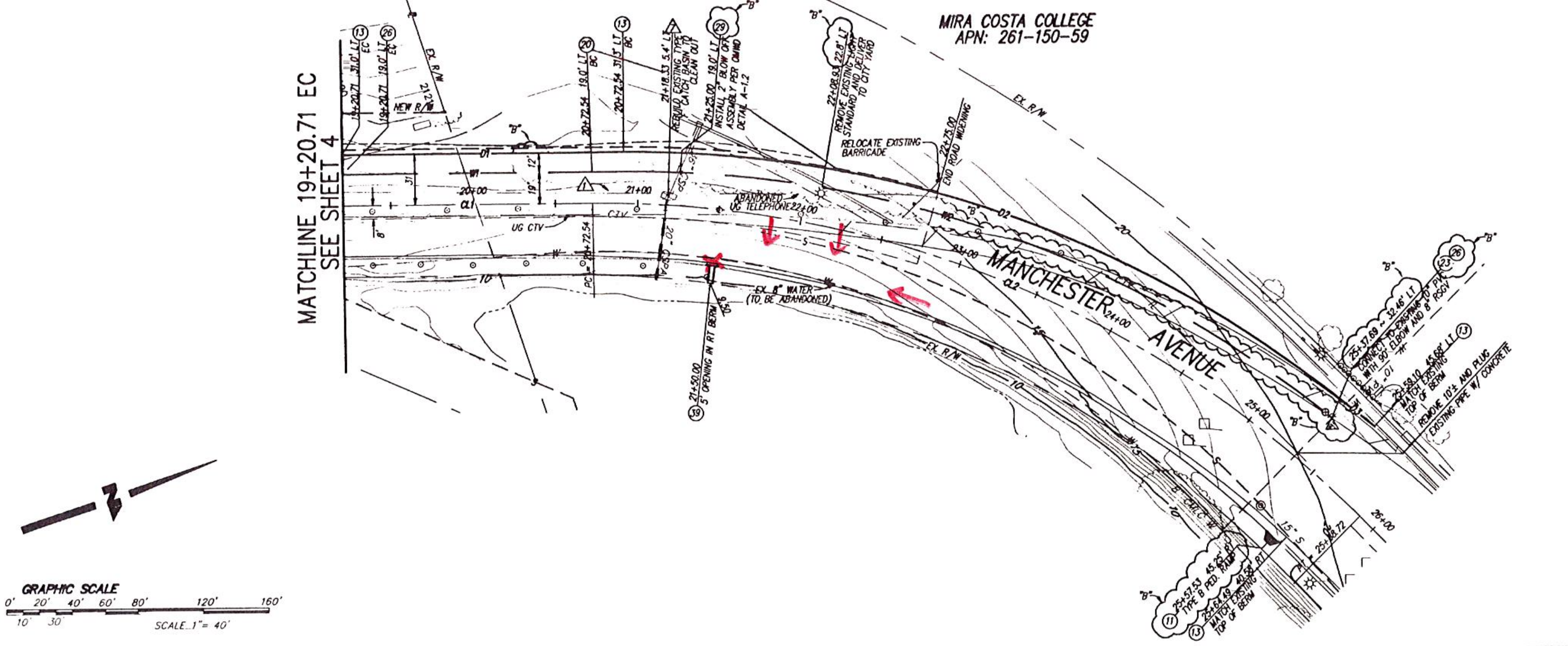
WORK PROJECT NO. CMS96F

DRAWING NO.
SI-0021 "B"
SHEET 4A OF ⑮

n:\ss0442\00\cadd\pp2.dwg

ENGINEER'S NAME: NOLTE & ASSOCIATES, INC.
PHONE NO: (858) 385-0500





CONSTRUCTION NOTES

① AC PAVEMENT
④ AC OVERLAY
⑦ PAVEMENT REINFORCING FABRIC
⑩ PCC CURB AND GUTTER
"B" ⑪ TYPE B PEDESTRIAN RAMP
⑬ TYPE 'B' AC DIKE
⑰ PCC DRIVEWAY
⑳ 8" PVC WATER MAIN
㉓ 8" GATE VALVE
"B" ㉖ THRUST BLOCK
㉙ 2" BLOW OFF ASSEMBLY
㉜ WATER SERVICE
㉟ 18" CMP STORM DRAIN
㊳ 24" CMP STORM DRAIN
㊴ ASPHALT SPILLWAY

UTILITY NOTES

△1 ADJUST EXISTING TELEPHONE MANHOLE TO FINISH GRADE.
△7 RECONSTRUCT TOP OF EXISTING TYPE 'F' CATCH BASIN TOP W/ MANHOLE COVER, SET AT FINISH GRADE.

CENTERLINE DATA TABLE

SYMBOL	DELTA/BEARING	RADIUS	LENGTH
CL1	N19°00'48"E		151.83'
CL2	45°30'00"	650.00'	516.18'
CL3	N64°30'48"E		267.64'

ASPHALT DIKE DATA TABLE

SYMBOL	DELTA/BEARING	RADIUS	LENGTH
D1	N19°00'48"E		171.18'
D2	38°59'20"	685.00'	466.13'
D3	S58°00'08"W		29.76'
D4	DELETE		
D5	DELETE		

"C"

WATER DATA TABLE

SYMBOL	DELTA/BEARING	RADIUS	LENGTH
W1	N19°00'48"E		151.83'
W2	39°32'07"	673.00'	464.38'

"B"

No. 41782
Exp. 3/31/04
CIVIL

AS BUILT DRAWINGS
R.E.B. 6-14-01
RICHARD E. BERG DATE

NOLTE
BEYOND ENGINEERING
15090 AVENUE OF SCIENCE, SUITE 101 SAN DIEGO, CA 92128
858 385 0500 TEL 858 385 0400 FAX WWW.NOLTE.COM

REVISIONS	APPROVED	DATE	REFERENCES	DATE
"A"-REVISE WTR CONNECTION DETAIL		6-9-98		
"B"-CONSTRUCTION CHANGE, REPL SHTS 1,2,5,6,7,8,10,11,14, & ADD SHT 15		4-22-99		
"C"- AS BUILT DRAWINGS- ALL SHEETS		6-15-01		

BENCH MARK

DESCRIPTION: BRASS DISK STAMPED T 131 1933
LOCATION: ROAD S 21 0.55 MILES N OF INT. W/ CHESTERFIELD DR., TOP OF 24" SD HDWL UNDER AT&SF RR. 72.5' S OF MP 80. 8.5' E OF E RAIL
ELEVATION: 73.55 DATUM: USC&GS NAVD 88

SCALE

HORIZONTAL 1"=40'
VERTICAL 1"=8'

DESIGNED BY RST
DRAWN BY RJC
CHECKED BY REB

PLANS PREPARED UNDER SUPERVISION OF
R.E.B.
RICHARD E. BERG
DATE: 6-18-01
R.C.E. NO: 41782
EXP: 3-31-04

APPROVALS

RECOMMENDED
BY: LEROY BODAS
DATE:
RCE: 22312

APPROVED
BY: ALAN D. ARCHIBALD
DATE:
RCE: 21869

CITY OF ENCINITAS ENGINEERING DEPARTMENT

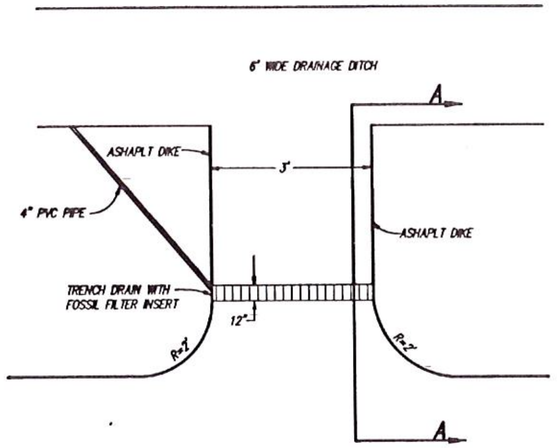
MANCHESTER WIDENING
STA 19+20.71 TO 25+64.49
IMPROVEMENTS

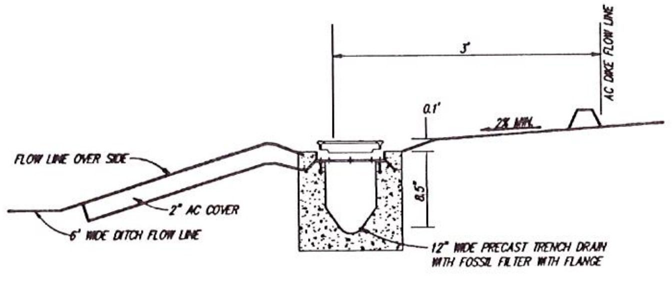
WORK PROJECT NO. CMS96F

DRAWING NO.
SI-0021 "B"
SHEET 5B OF ⑮

n:\sd0442\00\cadd\pp3.dwg

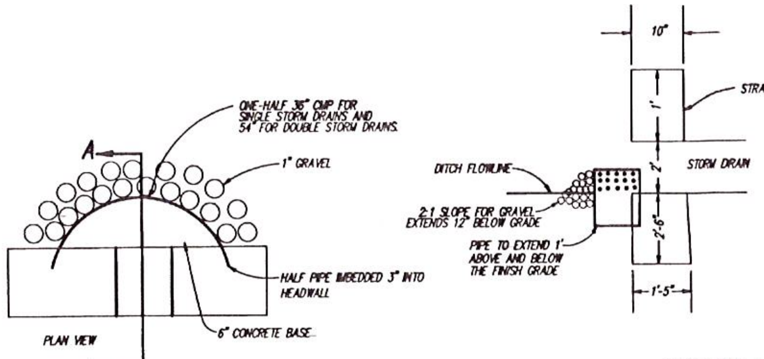
ENGINEER'S NAME: NOLTE & ASSOCIATES, INC.
PHONE NO: (858) 385-0500





SECTION A–A
NO SCALE

ASPHALT SPILLWAY DETAIL
NO SCALE

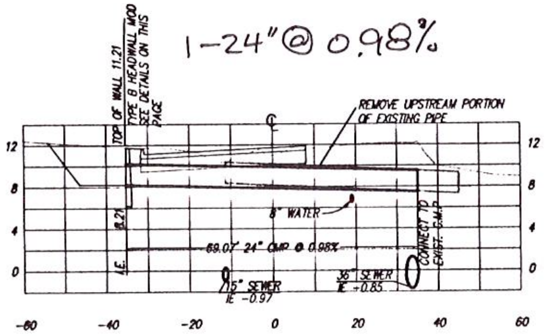


NOTE
THE GRAVEL USED SHALL BE NO SMALLER THAN 1" AND NO LARGER THAN 3". THE 36" PIPE SHALL HAVE 1/2" HOLES DRILLED THROUGHOUT THE PIPE PORTION EXPOSED TO WATER FLOWS. HOLES SHOULD BE DRILLED 2" O.C. TO ALLOW PROPER DISCHARGE.

SECTION A–A
NO SCALE

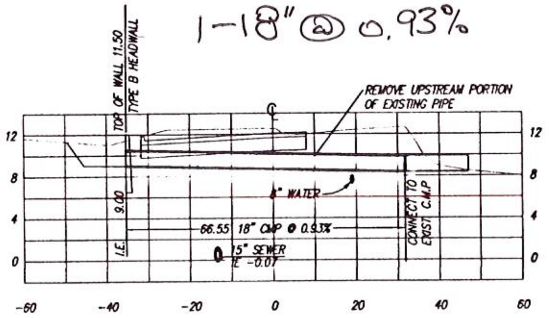
MODIFIED HEADWALL WITH CMP RISER
NO SCALE

1-24"@0.98%

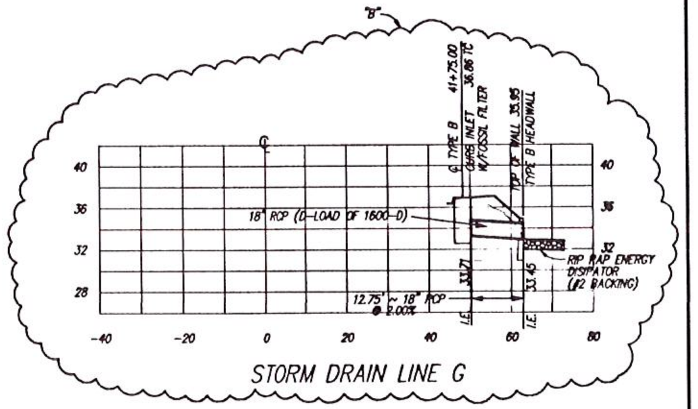


STORM DRAIN LINE C

1-18"@0.93%

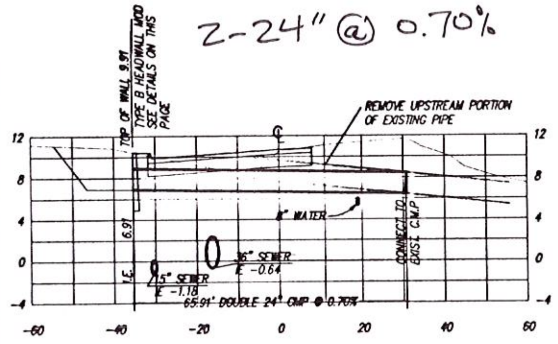


STORM DRAIN LINE E



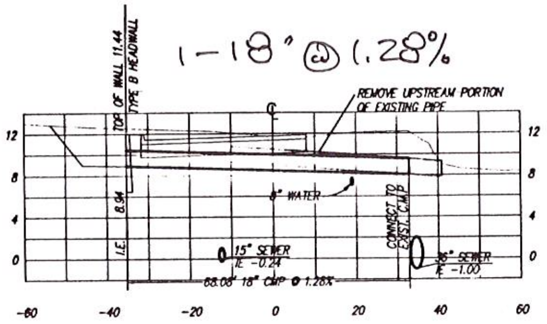
STORM DRAIN LINE G

2-24"@0.70%



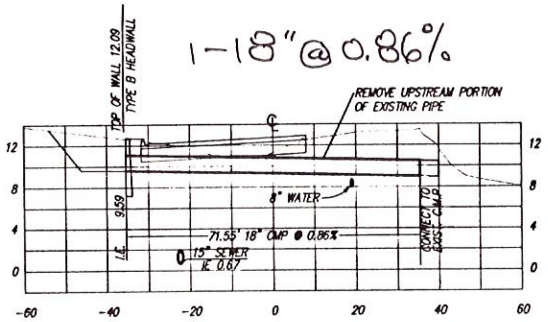
STORM DRAIN LINE B

1-18"@1.28%



STORM DRAIN LINE D

1-18"@0.86%



STORM DRAIN LINE F

RICHARD E. BERG
No. 41782
Exp. 3/31/04
CIVIL

AS BUILT DRAWINGS
R.E. B 6-19-01
RICHARD E. BERG DATE

NOLTE
BEYOND ENGINEERING
15090 AVENUE OF SCIENCE, SUITE 101 SAN DIEGO, CA 92128
858 385 0500 TEL 858 385 0400 FAX WWW.NOLTE.COM

REVISIONS	APPROVED	DATE	REFERENCES	DATE
"A"-REVISE WTR CONNECTION DETAIL		6-9-98		
"B"-CONSTRUCTION CHANGE, REPL & NOTES, ADD FOSSIL FILTER INFO., SHTS 1,2,5,6,7,8,10,11 & ADD SHT 15		4-22-99		
"C"- AS BUILT DRAWINGS- ALL SHEETS		6-15-01		

BENCH MARK
DESCRIPTION: SD CO STD DISC IN S/W STMPD OC 173. 1969
LOCATION: SE CORNER OF I-5/ LEUCADIA BRIDGE
RECORDED FROM: S.D. CO. VERT CONTROL PG 127
ELEVATION: 174.53 DATUM: M.S.L.

SCALE
HORIZONTAL 20'
VERTICAL 8'

DESIGNED BY	DRAWN BY	CHECKED BY
RST	REB	REB

PLANS PREPARED UNDER SUPERVISION OF
R.E. B
RICHARD E. BERG
DATE: 6-18-01
R.C.E. NO: 41782
EXP: 3-31-04

APPROVALS
RECOMMENDED
BY: LEROY BODAS
DATE:
R.C.E. 22312
APPROVED
BY: ALAN D. ARCHIBALD
DATE:
R.C.E. 21869

CITY OF ENCINITAS ENGINEERING DEPARTMENT
MANCHESTER AVE WIDENING
STORM DRAIN PROFILES
WORK PROJECT NO. CMS95D

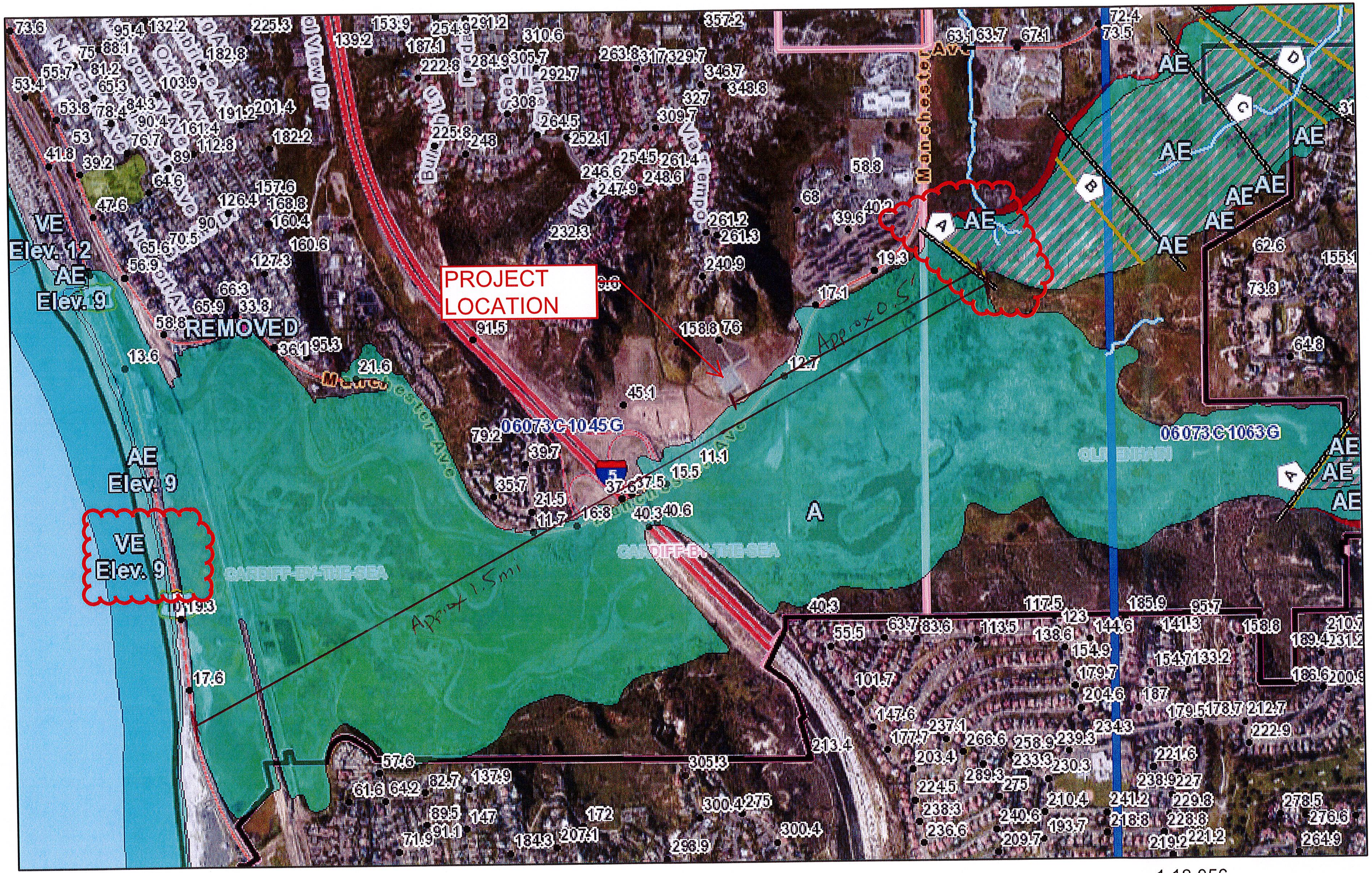
DRAWING NO.
0012-SI "B"
SHEET 8B OF 15

6-15-01
N:\SD0442\CADD\SC4

ENGINEER'S NAME: NOLTE & ASSOCIATES, INC.
PHONE NO: (858) 385-0500

APPENDIX E – FEMA DOCUMENTS

ArcGIS Web Map



September 28, 2018

1:18,056

2ft Topo
— Index
— Intermediate

— 10ft Index Topo
● Spot Elevations
☐ Meta Data from FEMA

DFIRM Panel

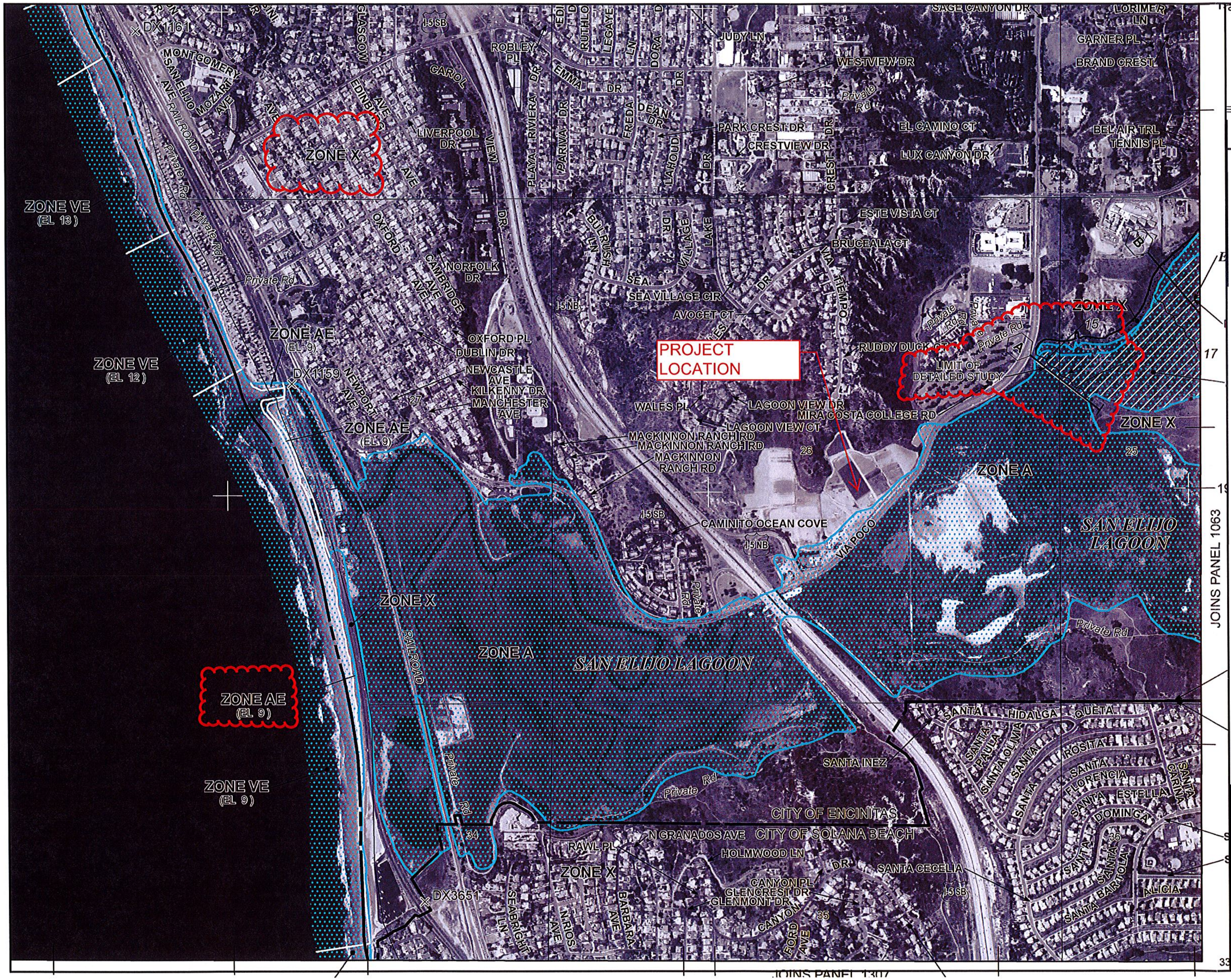
Flood Zone
🟦 100 Year Flood Zone

▨ Floodway
▨ REMOVED
🟥 500 Year Flood Zone

Flood Problem Area
☐ 10
🟦 100

Eagleview

Web AppBuilder for ArcGIS
Eagleview |



rance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

0 500 1,000 1,500 2,000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

NFIP

PANEL 1045G

FIRM

FLOOD INSURANCE RATE MAP

SAN DIEGO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

PANEL 1045 OF 2375

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ENCINITAS, CITY OF	060726	1045	G
SOLANA BEACH, CITY OF	060725	1045	G

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
06073C1045G

MAP REVISED
MAY 16, 2012

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Escondido Creek (At Encinitas)								
*A	11,025	668	3,065	6.9	15.4*	15.4	15.4	0.0
B	12,569	1,290	8,331	2.5	17.3	17.3	17.3	0.0
C	14,054	1,230	6,299	3.3	17.8	17.8	17.8	0.0
D	14,887	1,202	4,902	4.3	18.3	18.3	18.4	0.1
E	16,040	1,265	2,664	7.9	20.8	20.8	20.9	0.1
F	17,729	312	1,750	12.0	30.7	30.7	30.7	0.0
G	18,531	1,211	10,475	2.0	34.1	34.1	34.3	0.2
H	19,456	1,125	8,004	2.6	34.2	34.2	34.4	0.2
I	20,627	400	2,925	7.2	35.4	35.4	35.4	0.0
J	20,672	400	2,942	7.1	35.7	35.7	35.8	0.1
K	21,927	795	4,633	4.5	39.4	39.4	39.6	0.2
L	23,639	548	3,152	6.7	42.6	42.6	42.9	0.3
M	25,313	580	3,569	5.9	47.5	47.5	47.7	0.2
N	25,771	550	2,393	8.8	48.0	48.0	48.3	0.3
O	26,606	977	2,069	10.2	53.7	53.7	53.7	0.0
P	27,378	1,005	5,392	3.9	57.9	57.9	58.0	0.1
Q	28,116	1,163	4,861	4.3	58.7	58.7	58.8	0.1
R	28,780	858	3,536	5.9	59.9	59.9	60.0	0.1
S	29,578	795	3,347	6.3	62.7	62.7	62.8	0.1
T	30,905	254	1,835	11.4	67.5	67.5	67.5	0.0

[1] Feet Above Pacific Ocean

TABLE 13

FEDERAL EMERGENCY MANAGEMENT AGENCY
SAN DIEGO COUNTY, CA
AND INCORPORATED AREAS

FLOODWAY DATA

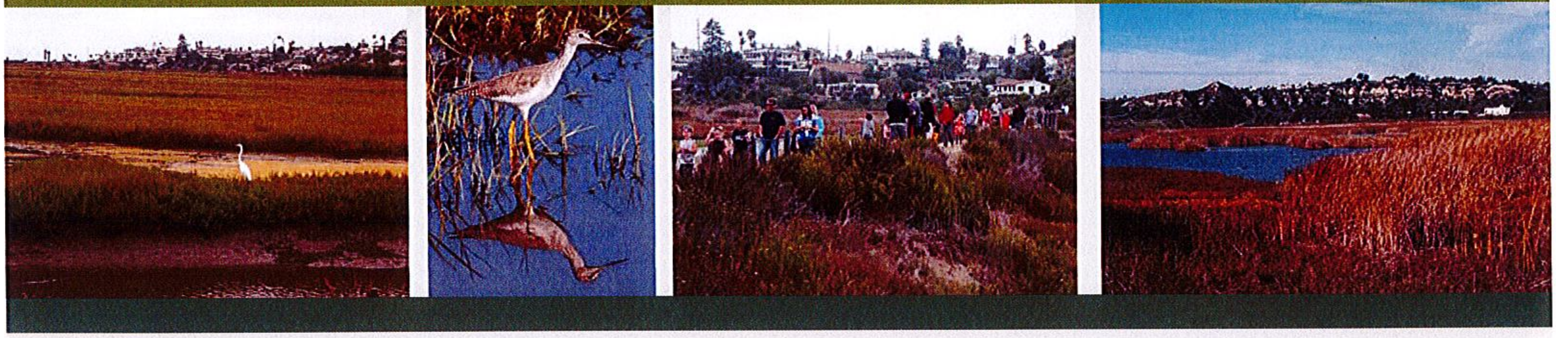
ESCONDIDO CREEK (AT ENCINITAS)

Environmental Impact Report / Environmental Impact Statement for the

San Elijo Lagoon Restoration Project

Final

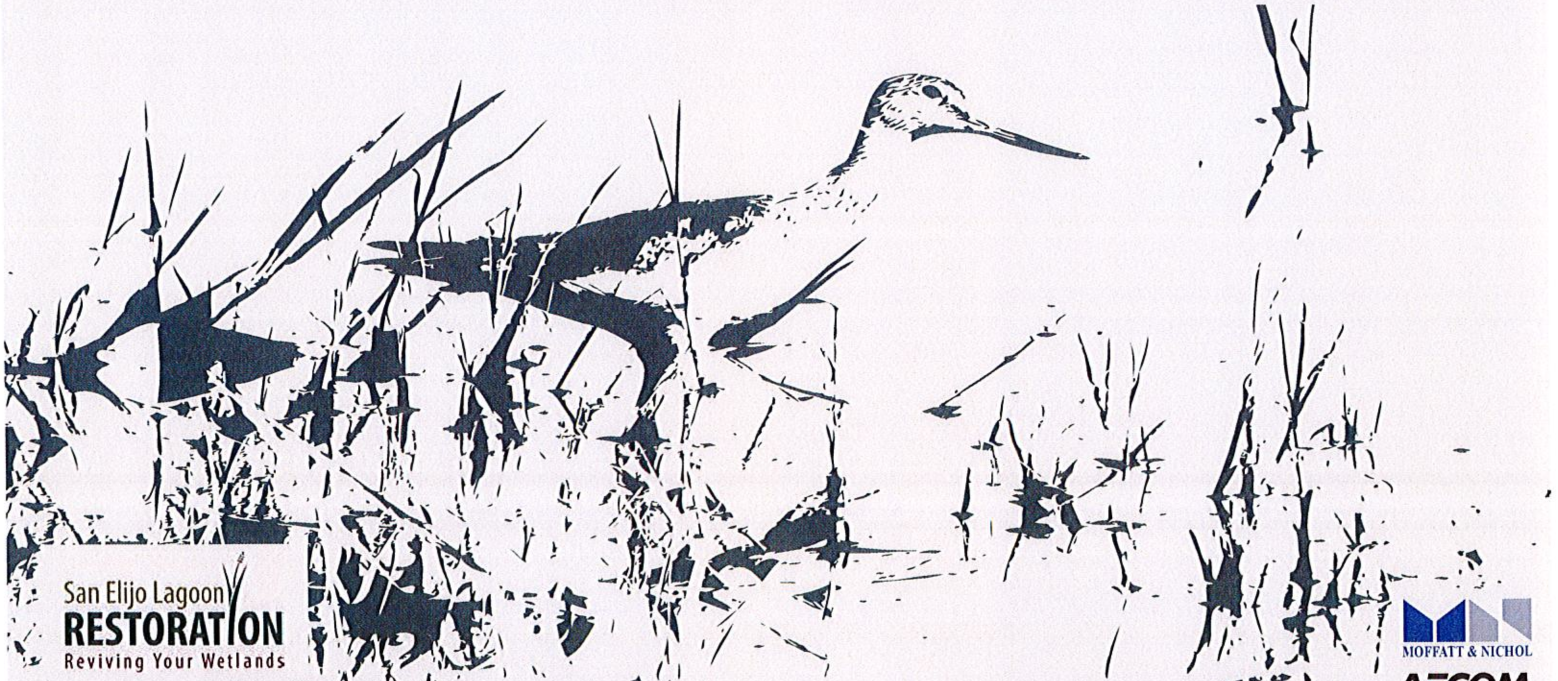
SCH# 2011111013



Prepared for:
U.S. Army Corps of Engineers
5900 La Place Court, Suite 100
Carlsbad, CA 92008

Prepared for:
County of San Diego Department of Parks and Recreation
5500 Overland Avenue, Suite 410
San Diego CA, 92123

Administrated by:
San Elijo Lagoon Conservancy
P.O. Box 230634
Encinitas, CA 92023-0634



San Elijo Lagoon
RESTORATION
Reviving Your Wetlands

MOFFATT & NICHOL
AECOM

Volume 2 of 4
Appendices A-F

February 2016

San Elijo Lagoon Restoration Project
Hydrology/Hydraulic Study

Final Report

June 2012
Revised: March 14, 2014
Amended: July 18, 2014

Prepared for:

The San Elijo Lagoon Conservancy

Prepared by:

moffatt & nichol

3780 Kilroy Airport Way
Suite 600
Long Beach, CA 90806

Environmental Impact Report/Environmental Impact Statement for the San Elijo Lagoon Restoration Project

Volume 2 of 4

TABLE OF CONTENTS

APPENDICES

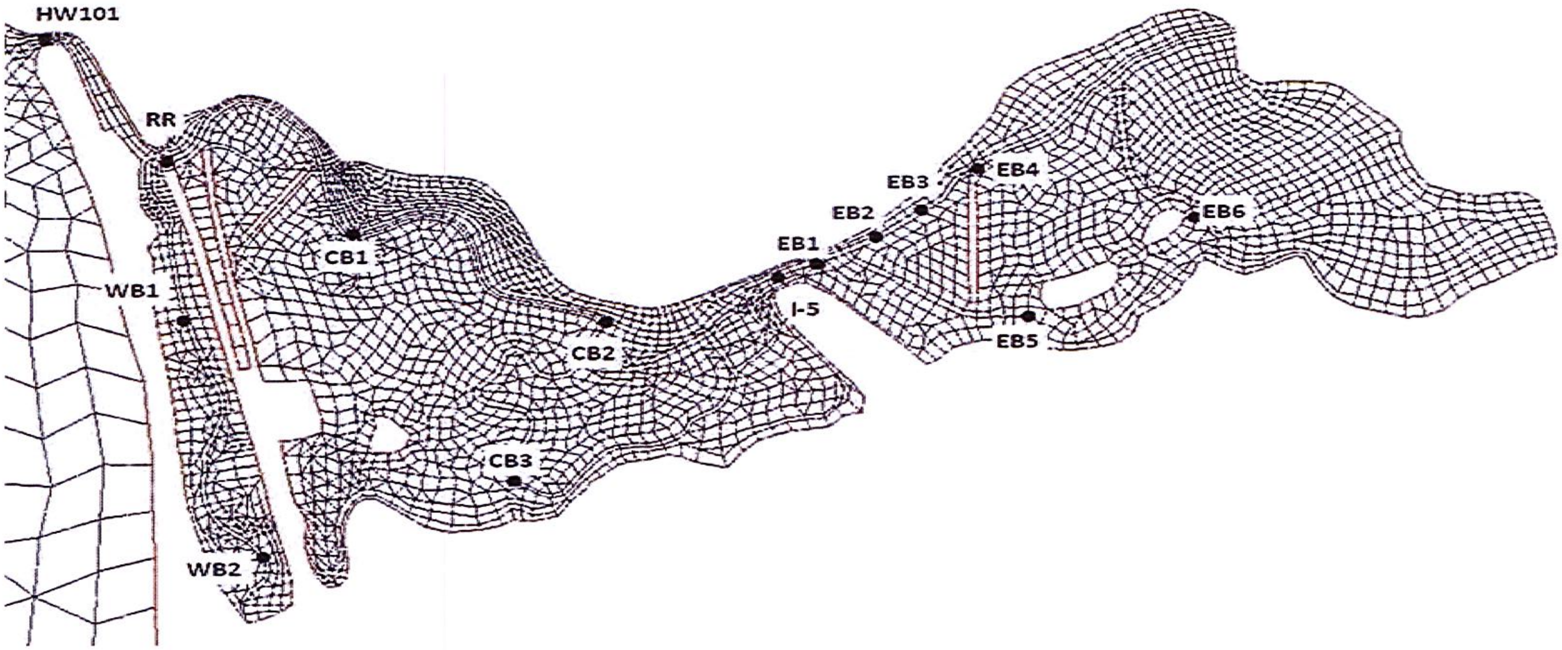


Figure 4-19: Virtual Gage Locations for Existing Conditions and Alternatives 1A and 1B

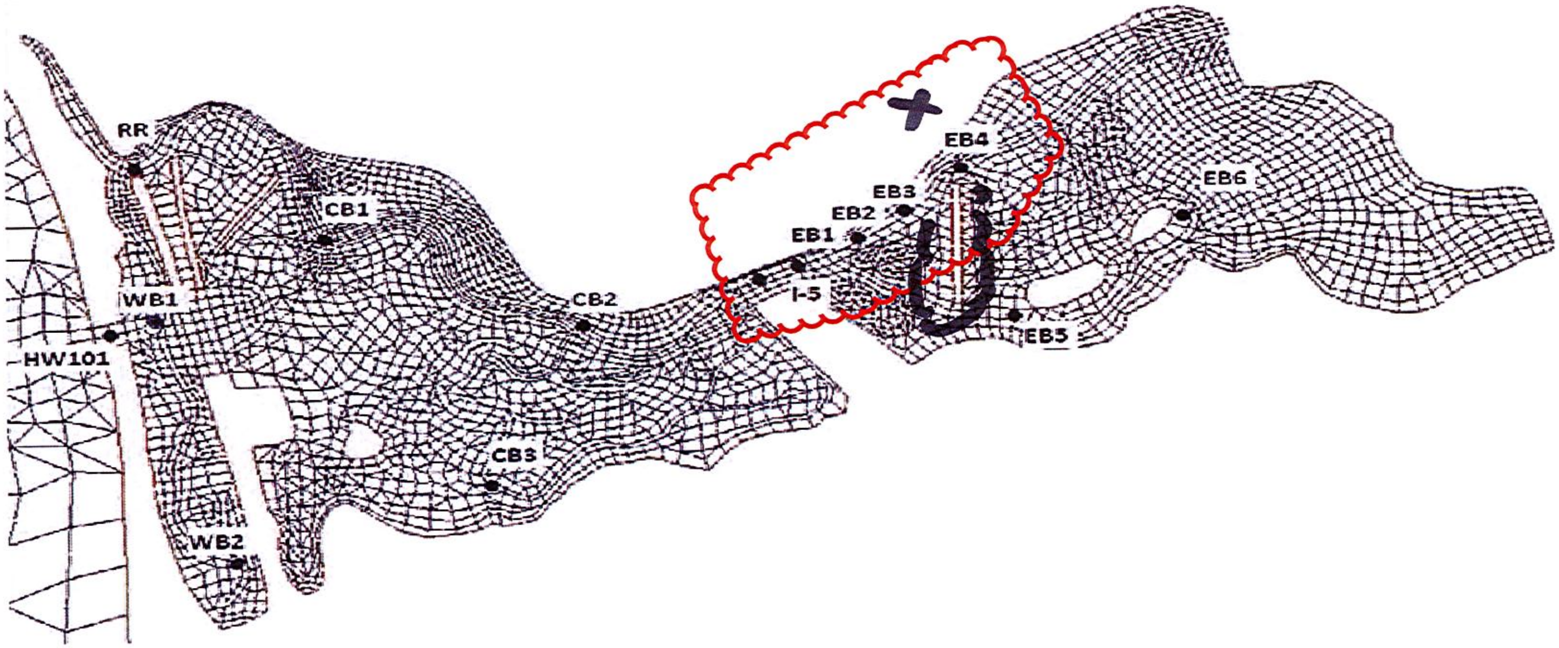


Figure 4-20: Virtual Gage Locations for Alternatives 2A and 2B

Manchester Avenue in the East Basin will be flooded during the combined event. However, the flood water level will be reduced by one half of a foot with proposed Alterative 1A. The table also shows the existing surface elevation of Manchester Avenue for comparison.

In contrast, the results also indicate that the maximum water level will be below Manchester Avenue for Alternatives 1B and 2A. Storm flood water levels are clearly reduced by the project upstream of I-5. Alternative 2B would provide similar flood water level reduction as Alternative 2A although it was not modeled as it was eliminated from consideration by the Lagoon Conservancy from being carried forward in environmental review. Alternatives 2A & 2B may not provide a 3 foot freeboard required by FEMA, but the future condition should be an improvement over existing flood conditions.

Table 4-5: Maximum 100-Year Flood Elevation (ft, NGVD) in the Wetlands in 2015 Based on +5.4-ft NGVD (Recorded Highest) Downstream Tidal Elevation

Virtual Gage Locations	Manchester Avenue Elevation	Existing	Alt 1A	Alt 1B	Alt 2A
HW101	N/A	5.3	5.3	5.3	5.3
RR	N/A	8.5	7.9	8.1	6.3
CB1	29.0	8.9	8.4	8.7	6.5
CB2	9.8	9.0	8.5	8.7	6.7
I-5	12.7	9.4	8.9	8.8	7.3
EB1	12.9	9.8	9.8	8.8	7.5
EB2	9.3	12.3	11.7	9.0	8.1
EB3	10.3	12.4	11.7	9.0	8.3
EB4	10.4	12.3	11.8	9.0	8.4
	Note: Values in red indicate elevations above the roadway and represent flooding.				

4.4.2 *Tidal Hydraulics and Hydrology for 2015*

The purposes of the tidal hydraulic studies are to:

- Predict tidal elevations and flow velocities over time and space within the Lagoon, as compared to the open ocean (to serve as the basis for analyses of water quality and shoaling, and other related studies);
- Determine the tidal inundation frequency in the wetlands to determine probable habitat distribution; and
- Predict the statistics of tidal inlet hydraulics for the inlet design and stability analyses.

Results consist of the following:

1. Storm flows combined with highest measured high tides will result in elevated water levels throughout the Lagoon. Specifically, in 2015:
    a. No Project conditions result in Manchester Avenue being flooded by several feet along the East Basin.
    b. Alternative 1A (with the inlet in the existing location) provides limited flood reduction potential, however Manchester Avenue will still flood along the East Basin although flood water levels will be lowered.
    c. Alternatives 1B, 2A and 2B reduce flood elevations to below Manchester Avenue all along its length due to expanded channel cross-sections under all bridges.
2. In 2065, Manchester Avenue will experience storm flow flooding along both the Central and East Basins for all alternatives due to adverse effects of sea level rise.
3. Tidal flows vary between alternatives as reflected by the following results for 2015:
    a. For No Project, tidal flows are restricted due to the narrow and meandering channel between Highway 101 and the Railroad, and the presence of a sill at the bed. Tidal ranges are significantly muted for both high and low tides, and muting increases progressively from the West Basin through the East Basin.
    b. For Alternatives 1A and 1B (with the inlet in the existing location) tidal muting is significantly reduced and circulation is improved in the wetland basins compared to existing conditions. This is due to expansion of the cross-sections under all bridges. A certain amount of muting still will exist, and is greater in the Central and East Basins than in the West Basin.
    c. For Alternatives 2A and 2B (with the new inlet location) tidal muting is further reduced and circulation is most improved in the wetland basins compared to alternatives using the existing inlet location. This is due to further expansion of the cross-sections under all bridges. Minimal to no muting will exist before sand shoals form within the Lagoon.
4. Tidal inundation frequency resulting from tidal hydrology significantly influences the habitat type and distribution on-site. Results for 2015 include:
    a. For No Project, the vertical zonation of intertidal habitat is relatively narrow at approximately 3 to 4 feet. A progressive decrease in the vertical range of intertidal habitat occurs with distance to the east. A range of salt marsh habitats can occur on-site, but their areas will be constrained by the tidal range, and the habitat distribution on-site may be dominated by fewer species more suited to the muted tidal elevations.
    b. For Alternatives 1A and 1B, the vertical zonation of intertidal habitat increases, ranging from 5.7 feet in the West Basin to 5.2 feet in the Central and East Basins. A

Frequently Asked Questions

1. THE NEEDS AND GOALS OF RESTORATION 2. THE FINAL RESTORATION PLAN 3. CONSTRUCTION

4. INTERSTATE 5. EXPANSION & THE RAILROAD DOUBLE-TRACKING 6. CEQA/NEPA PROCESS

2. The Final Restoration Plan

The plan adopted is officially called the "Modified Alternative Plan 1B Reduced." What are the main modifications, and why?

The significant last minute modification was to maintain suitable habitat for the Ridgway's Rail (Rallus obsoletus levipes), formerly the Light-footed Clapper Rail, (Rallus longirostris levipes). Since restoration planning began, cord grass spread throughout the Central Basin. Cord grass is the preferred habitat for the Ridgway's Rail, and, since the appearance and spread of the grass, our Rail population has expanded rapidly. Ridgway's Rail are an endangered subspecies of an endangered species so protecting both the Rails and the cord grass was a new and important consideration in the Restoration Project. Consequently, the dredging and excavation methods were modified to minimize disruption. We control water elevations and turbidity to allow for sufficient dredging, while minimizing environmental impacts and providing refugia to endangered species like the Ridgeway Rail. Cord grass that must be removed will be maintained in a nursery and replanted later in the project. The amount of restored mudflat has been reduced and the amount of cordgrass habitat expanded from that proposed in the original plans.

What are the positive + negative aspects of the final plan?

Why did you removing the berm and Manchester trail in the east basin?

What will become of the "old settling ponds"?

Will restoration impact Cardiff Reef or water quality along the beach?

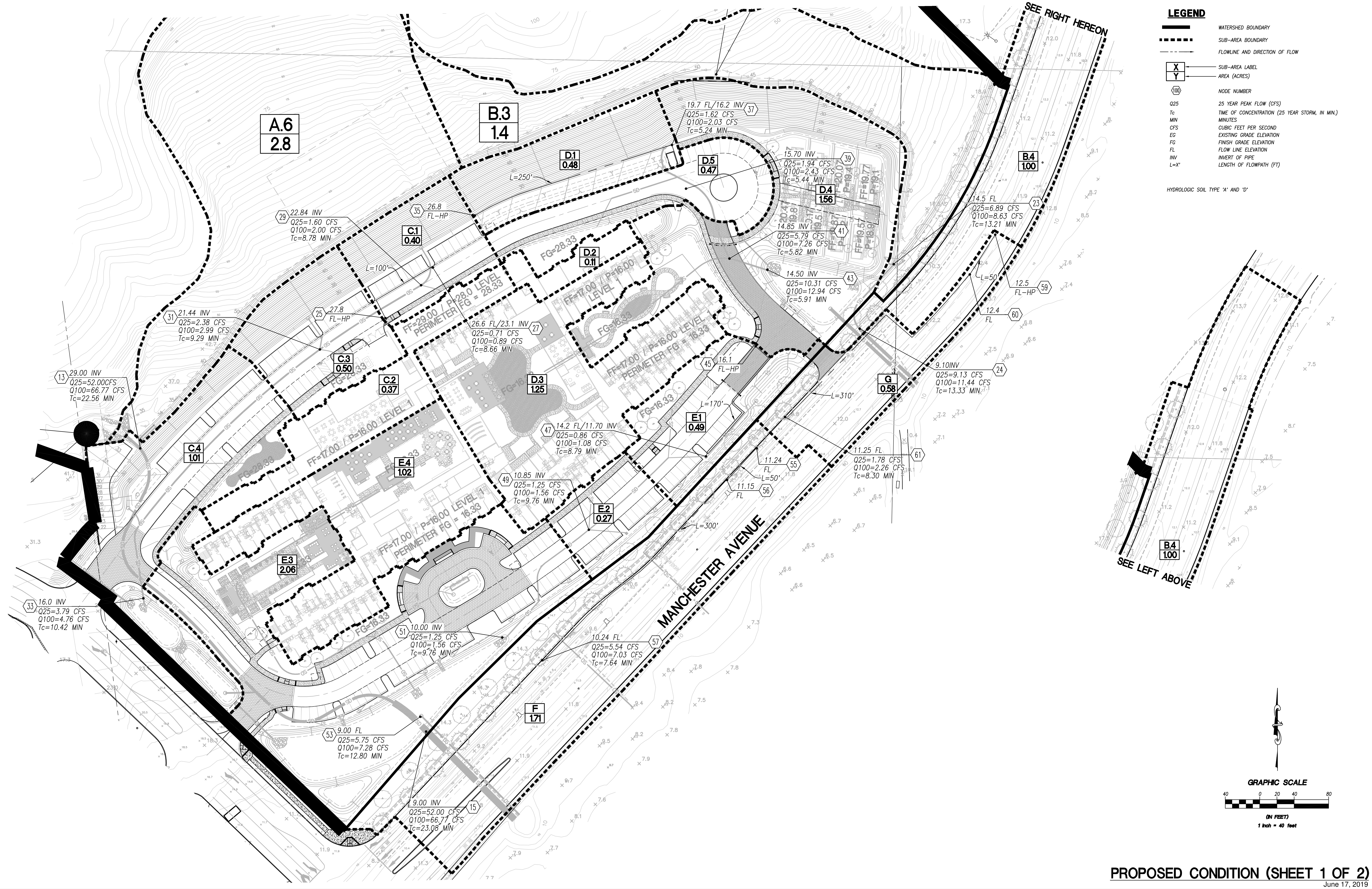
Will the increased exchange of fresh/salt water cause more upstream pollution to be discharged at the beach? Will it destroy the freshwater habitat east of the freeway?

Will the improved circulation eliminate the need for mosquito control?

Will there be new trails? Will I still be able to walk under the freeway? Will there be improved parking around the Reserve? Will we lose any trails?

Will there be any changes to present Reserve regulations?

APPENDIX F – HYDROLOGY MAP(S)



PROPOSED CONDITION (SHEET 1 OF 2)
June 17, 2019

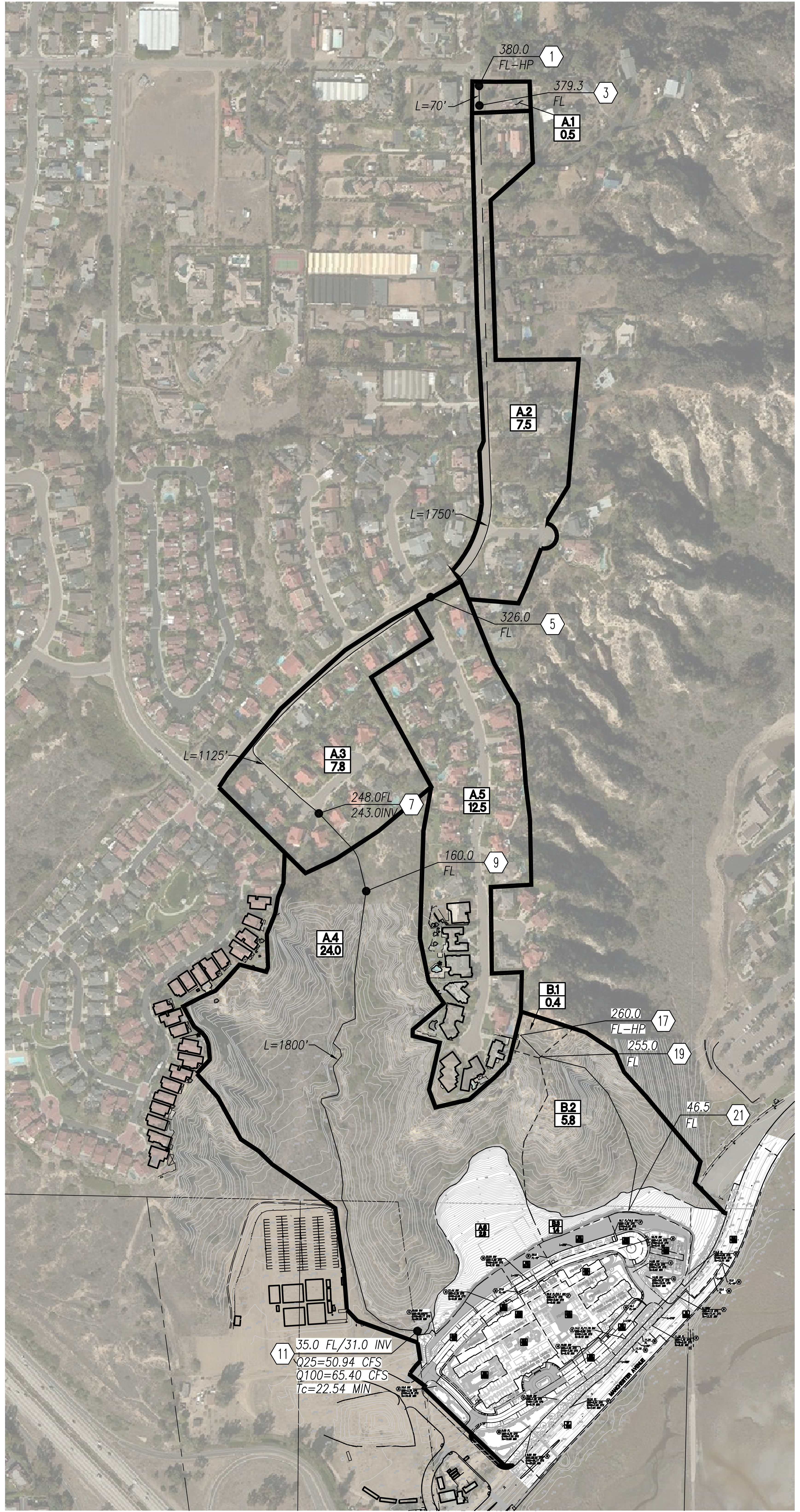
PREPARED FOR:
Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

PREPARED BY:
URBAN RESOURCE
CONSULTING CIVIL ENGINEERS
23 MAUCHLY, SUITE 110
IRVINE, CA 92618
PHONE: 949-727-9095
FAX: 949-727-9098

TERRY P. AU
C 68466
EXP. 9-30-19

Senior Housing
3111 Manchester Avenue
Cardiff by the Sea, California 92007

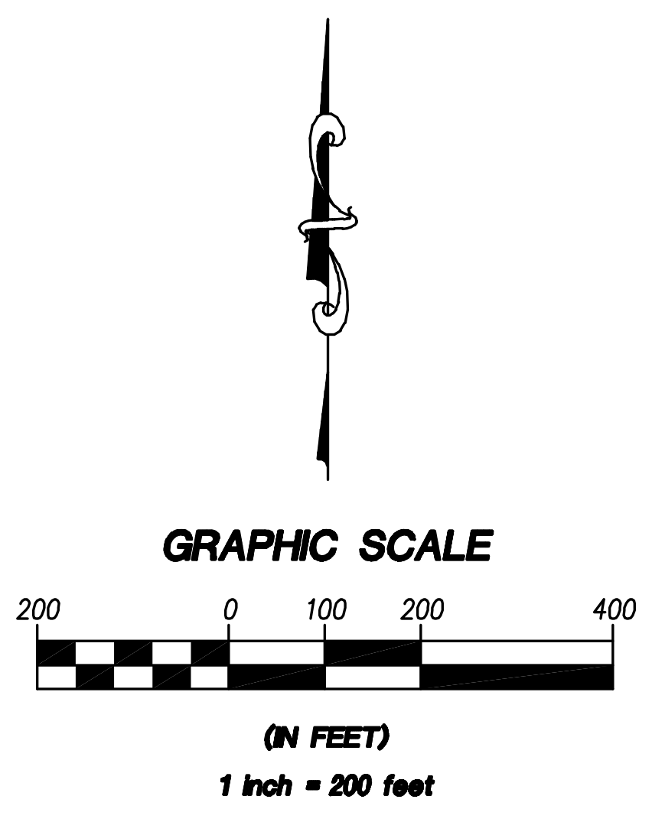
DATE: JUNE 17, 2019
PRELIMINARY HYDROLOGY STUDY
C-12



LEGEND

▬	WATERSHED BOUNDARY
■ ■ ■ ■ ■	SUB-AREA BOUNDARY
— - - —→	FLOWLINE AND DIRECTION OF FLOW
X	SUB-AREA LABEL
Y	AREA (ACRES)
⟨100⟩	NODE NUMBER
Q25	25 YEAR PEAK FLOW (CFS)
Tc	TIME OF CONCENTRATION (25 YEAR STORM, IN MIN.)
MIN	MINUTES
CFS	CUBIC FEET PER SECOND
EG	EXISTING GRADE ELEVATION
FG	FINISH GRADE ELEVATION
FL	FLOW LINE ELEVATION
INV	INVERT OF PIPE
L=X'	LENGTH OF FLOWPATH (FT)

HYDROLOGIC SOIL TYPE 'A' AND 'D'



PROPOSED CONDITION OFFSITE (SHEET 2 OF 2)

June 17, 2019

PREPARED FOR:

Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

PREPARED BY:

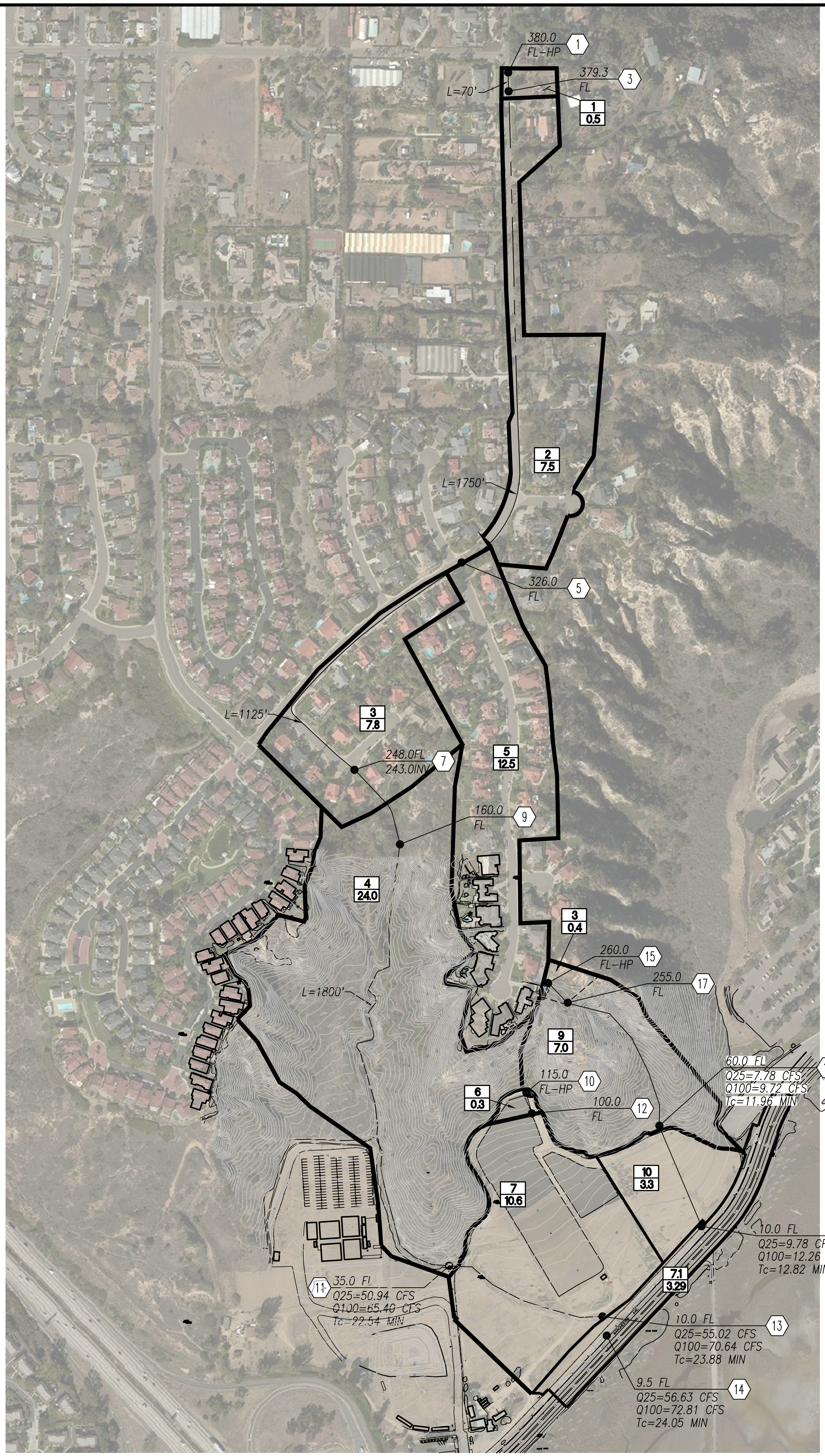
URBAN RESOURCE
CONSULTING CIVIL ENGINEERS
23 MAUCHLY, SUITE 110
IRVINE, CA 92618
PHONE: 949-727-9095
FAX: 949-727-9098

TERRY P. AU
C 68466
EXP. 9-30-19

Senior Housing

3111 Manchester Avenue
Cardiff by the Sea, California 92007

DATE: JUNE 17, 2019
PRELIMINARY HYDROLOGY STUDY
C-13



LEGEND

▬	WATERSHED BOUNDARY
■ ■ ■ ■ ■ ■	SUB-AREA BOUNDARY
— - - →	FLOWLINE AND DIRECTION OF FLOW
X	SUB-AREA LABEL
Y	AREA (ACRES)
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FG	FINISH GRADE ELEVATION
FL	FLOW LINE ELEVATION
INV	INVERT OF PIPE
L=X'	LENGTH OF FLOWPATH (FT)

HYDROLOGIC SOIL TYPE 'A' AND 'D'

GRAPHIC SCALE

200 0 100 200 400

(IN FEET)
1 inch = 200 feet

EXISTING CONDITION

June 17, 2019

PREPARED FOR:

Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

PREPARED BY:

URBAN RESOURCE
CONSULTING CIVIL ENGINEERS
23 MAUCHLY, SUITE 110
IRVINE, CA 92618
PHONE: 949-727-9095
FAX: 949-727-9098

TERRY P. AU
C 68466
EXP. 9-30-19

Senior Housing

3111 Manchester Avenue
Cardiff by the Sea, California 92007

DATE: JUNE 17, 2019
PRELIMINARY HYDROLOGY STUDY
C-14

I-1

Traffic Letter Report

LINSCOTT
LAW &
GREENSPAN
engineers

Engineers & Planners
Traffic
Transportation
Parking

Linscott, Law &
Greenspan, Engineers
4542 Ruffner Street
Suite 100
San Diego , CA 92111
858.300.8800 T
858.300.8810 F
www.llgengineers.com

Pasadena
Irvine
San Diego
Woodland Hills

December 16, 2019

Mr. Beau Brand
Greystar
444 South Cedros Avenue, Suite 172
Solana Beach, CA 92618

LLG Reference: 3-18-2897

Subject: **Belmont Village Encinitas-by-the-Sea Project, Traffic Letter Report**
City of Encinitas

Dear Mr. Brand,

Linscott, Law & Greenspan, Engineers (LLG) has completed the following traffic assessment letter to evaluate the potential traffic-related impacts associated with the proposed Belmont Village Encinitas-by-the-Sea Senior Living Project (the "Project") to be located at 3111 Manchester Avenue in the City of Encinitas. (See **Figure 1, Project Vicinity Map** & **Figure 2, Project Area Map**). *All figures are included at the end of this letter report.*

The Project proposes to construct 77 independent units, 68 assisted living units, 55 memory care units, and 16 workforce affordable units located between Interstate 5 and Mira Costa College Road, along Manchester Avenue. Access to the Project will be provided via the planned Direct Access Ramp (DAR) Access Road. No day-to-day access to Manchester Avenue will be provided. **Figure 3, Conceptual Site Plan** depicts the proposed Project.

LLG has prepared this traffic assessment letter to evaluate the Project's potential transportation impacts. Included in this letter report are the following:

- Study Area / Existing Roadway Conditions
- Trip Generation/ Distribution / Assignment
- Analysis Methodology & Significance Criteria
- Roadway / Intersection Capacity Analysis
- Summary & Conclusions

Philip M. Linscott, PE (1924-2000)
Jack M. Greenspan, PE (Ret.)
William A. Law, PE (Ret.)
Paul W. Wilkinson, PE
John P. Keating, PE
David S. Shender, PE
John A. Boarman, PE
Clare M. Look-Jaeger, PE
Richard E. Barretto, PE
Keil D. Maberry, PE

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STUDY AREA / ROADWAY CONDITIONS

Study Area

The site is located on the north side of Manchester Avenue, east of the proposed DAR Access Road in the City of Encinitas. The following locations were selected for analysis based on the anticipated Project traffic assignment.

Intersections

1. I-5 Southbound Ramps / Manchester Avenue
2. I-5 Northbound Ramps / Manchester Avenue
3. Manchester Avenue / DAR Access Road (Future)

Segments

Manchester Avenue

1. Interstate 5 Southbound Ramps to Interstate 5 Northbound Ramps
2. Interstate 5 Northbound Ramps to DAR Access Road (Future)
3. DAR Access Road (Future) to Mira Costa College Road

Existing Conditions & General Plan Roadway Classifications

The following is a description of the study area roadways:

Manchester Avenue is classified and currently built as a 4-lane major augmented roadway east of I-5, according to the *City of Encinitas General Plan Circulation Element* (last Amended January 2003). Curbside parking is not permitted along the roadway. The posted speed limit is 45 mph. Class II bike lanes are provided along the roadway.

The Manchester DAR Access Roadway is proposed to be constructed by Caltrans. This roadway will provide access to the project site and an adjacent park-and-ride lot and will eventually connect to the I-5 DAR.

Please see **Figure 4, Existing Conditions Diagram**, for an illustration of the study area road segments and intersections.

Existing Traffic Volumes

Existing AM and PM peak hour traffic volumes at the existing study intersection and 24-hour street segment counts were collected in April 2018 while schools were in session. **Table 1** shows the existing street segment Average Daily Traffic (ADT) volumes in the Project area. **Attachment A** contains copies of the existing traffic volumes. The study area was under construction when counts were conducted. Pre-construction ramp volumes were obtained from Caltrans and were utilized to adjust the April 2018 intersection volumes to establish the baseline existing volumes for analysis. See **Figure 5, Existing Traffic Volumes**.

TABLE 1
EXISTING TRAFFIC VOLUMES

Street Segments	ADT [a]	Source	Date
Manchester Street			
1. I-5 Southbound Ramps to I-5 Northbound Ramps	17,649	LLG	Estimated [b]
2. I-5 Northbound Ramps to Mira Costa College	28,565	LLG	Thursday, April 12, 2018

Footnotes:

a. Average Daily Traffic Volumes.

b. The ADT was estimated along this segment based on the ratio of the intersection peak hour volumes and ADT of the adjacent segment.

TRIP GENERATION

The Project proposes to construct 77 independent living units, 68 assisted living units, 55 memory care units, and 16 workforce affordable units. Trip generation for the proposed development was calculated using the SANDAG *(Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*, April 2002. The SANDAG trip rate for "Retirement Community" was used for the independent living units, the trip rate for "Congregate Care" was used for the Assisted Living and Memory Care units, and the trip rate for "Apartment" was used for the workforce affordable units to calculate the trip generation. Using the rates, the Project is expected to generate 712 ADT with 37 AM peak hour trips (16 inbound / 21 outbound) and 57 PM peak hour trips (32 inbound / 25 outbound). **Table 2** shows the Project daily traffic generation.

TABLE 2
PROJECT TRIP GENERATION

Land Use	Size	Daily Trip Ends (ADTs) [a]		Peak Hour	% of ADT [b]	In:Out	Volume		
		Rate [b]	Volume			Split [b]	In	Out	Total
Retirement Community (Independent Living)	77 Units	4 /unit	308	AM	5%	4:6	6	10	16
				PM	7%	6:4	13	9	22
Congregate Care (Assisted Living)	68 Units	2.5 /unit	170	AM	4%	6:4	4	3	7
				PM	8%	5:5	7	7	14
Congregate Care (Memory Care)	55 Units	2.5 /unit	138	AM	4%	6:4	4	2	6
				PM	8%	5:5	6	6	12
Workforce Units	16 Units	6 /unit	96	AM	20%	2:8	2	6	8
				PM	9%	7:3	6	3	9

Footnotes:

a. ADT = Average Daily Traffic.
b. Rates taken from the SANDAG *(Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*, April 2002.

TRIP DISTRIBUTION/ TRIP ASSIGNMENT

Project trip distribution was based on a combination of observed traffic patterns from existing intersection counts, the location of nearby commercial land uses, the potential location of employees, and professional engineering judgment.

Please see **Figure 6, Project Traffic Distribution**.

Using this distribution, Project traffic was assigned to the proposed driveway and nearby street system. **Figure 7, Project Traffic Volumes** depicts the assigned Project volumes. **Figure 8, Near-Term Traffic Volumes** shows the Project traffic added to the existing area traffic.

If the DAR proposed on Manchester Avenue is constructed, 5% of Project traffic is assumed to utilize the DAR. **Figure 9, Project Traffic Volumes (w/ DAR)**, depicts the assigned Project volumes if the DAR is constructed.

The Project access is proposed via the future DAR Access Road, which does not currently exist. The completion of DAR Access Road, including the proposed signalized intersection at Manchester Avenue, is assumed in the Near-Term analyses. Additionally, there is currently ongoing construction at the Manchester Avenue interchange. The completion of these improvements is assumed in the Near-Term analyses. The assumed intersection configurations of the study intersections correspond with the lane configurations shown in Figure 10.

LONG-TERM CONDITIONS

The I-5 North Coast Corridor Project proposes the provision of approximately 26 miles of additional capacity on mainline Interstate 5 and HOV/managed lanes with direct access ramps (DARs). A DAR is proposed on Manchester Avenue. Since the DAR would affect traffic patterns within the study area, this study includes analysis scenarios without and with the Manchester DAR improvements.

Long-Term without the DAR Improvements

Figure 10, **Long-Term Conditions**, depicts the addition of the proposed DAR Access Road. **Figure 11**, **Long-Term (without DAR) Traffic Volumes**, shows the forecasted traffic volumes based on the I-5 North Coast Traffic Report and including traffic volumes generated by the proposed Westmont Residential Care Facility and the potential housing units proposed by the recently approved Encinitas Housing Element Update that are within the vicinity of the study area. **Attachment B** shows the locations of the housing units included in the analysis. **Figure 12**, **Long-Term without DAR + Project Traffic Volumes**, shows the buildout project traffic volumes added to the forecasted traffic volumes without the DAR.

Long-Term with the DAR Improvements

The I-5 North Coast Corridor Project identifies the “8+4 Buffer Alternative” as the preferred alternative, therefore it was used for analysis purposes of this study. Improvement include the conversion of a right turn only lane into a shared thru right at the intersection of Manchester Avenue & I-5 northbound ramps. **Figure 13**, **Long-Term (w/ DAR) Conditions**, depicts the long-term roadway geometry with the addition of the DAR. **Figure 14**, **Long-Term (with DAR) Traffic Volumes**, shows the forecasted traffic volumes with the DAR improvement conditions. **Figure 15**, **Long-Term + Project (with DAR) Traffic Volumes**, shows the buildout project traffic volumes added to the forecasted traffic volumes with the DAR improvement conditions.

ANALYSIS METHODOLOGY & SIGNIFICANCE CRITERIA

The following scenarios are analyzed in this report:

- Existing
- Near-Term
- Long-Term (without DAR) Conditions
- Long-Term (without DAR) + Project Conditions
- Long-Term (with DAR) Conditions
- Long-Term (with DAR) + Project Conditions

Level of Service (LOS) is the term used to denote the different operating conditions which occur on a given roadway segment under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of an intersection. Level of Service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level of Service designation is reported differently for signalized and unsignalized intersections.

Signalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay was determined utilizing the methodology found in Chapter 19 of the *Highway Capacity Manual (HCM 6th Edition),* with the assistance of the *Synchro* (version 10) computer software. The delay values (represented in seconds) were qualified with a corresponding intersection LOS.

Unsignalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay and Levels of Service (LOS) was determined based upon the procedures found in Chapter 20 and Chapter 21 of the *HCM 6* with the assistance of the *Synchro 10* computer software. The delay values (represented in seconds) were qualified with a corresponding intersection LOS.

Street segments were analyzed based upon the comparison of daily traffic volumes (ADT) to the City of Encinitas's published *Roadway Capacity Standards,* March 1989. This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics. **Attachment C** contains a copy of the City's roadway capacity standards.

Because the Project is not expected to add more than 20 peak hour trips to the I-5 on-ramps, ramp meter analysis is not warranted.

The City of Encinitas utilizes the published, regional SANTEC/ITE criteria for determining the significance of a project's traffic impacts. According to these criteria, a project is considered to have a significant impact if the new project traffic has decreased the operations of surrounding roadways by a defined threshold. The defined thresholds for roadway segments and intersections are defined in **Table 3**. If the project exceeds the thresholds in Table 3, then the project may be considered to have a significant project impact. A feasible mitigation measure will need to be identified to return the impact within the thresholds (pre-project + allowable increase) or the impact will be considered significant and unmitigated.

TABLE 3
SANTEC/ITE
TRAFFIC IMPACT SIGNIFICANT THRESHOLDS

Level of Service with Project [b]	Allowable Increase Due to Project Impacts [a]	
	Roadway Segments *V/C*	**Intersections** *Delay (sec.)*
D [c], E, & F	0.02	2.0

Footnotes:

a. If a proposed project's traffic causes the values shown in the table to be exceeded, the impacts are determined to be significant. The project applicant shall then identify feasible improvements (within the Traffic Impact Study) that will restore/and maintain the traffic facility at an acceptable LOS. If the LOS with the proposed project becomes unacceptable (see note b), or if the project adds a significant amount of peak-hour trips to cause any traffic queues to exceed on- or off-ramp storage capacities, the project applicant shall be responsible for mitigating the project's direct significant and/or cumulatively considerable traffic impacts.

b. All LOS measurements are based upon Highway Capacity Manual procedures for peak-hour conditions. However, V/C ratios for roadway segments are estimated on an ADT/24-hour traffic volume basis (using Table 2 of the City's Traffic Impact Study Manual). The acceptable LOS for roadways, and intersections is generally "D" ("C" for undeveloped locations).

c. The City of Encinitas accepts LOS D operations, regardless of project increase in V/C, delay, etc.

ROADWAY / INTERSECTION CAPACITY ANALYSIS

Analysis of Existing and Near-Term Conditions

Intersection Analysis

Peak hour operations at study area intersections are shown to result in LOS C or better with the addition of Project traffic to the existing condition. No intersection impacts were calculated in the Near-Term analysis scenarios.

Table 4, shows the results of the Existing analysis. **Table 6,** shows the results of the Near-Term analysis. **Attachment D** contains the intersection analysis worksheets.

Street Segment Analysis

Based on the results of the street segment capacity analysis, Manchester Avenue is calculated to operate at acceptable better than LOS C for both without and with project scenarios. **Table 5** shows the results of the Existing analysis. **Table 7** shows the results of the Near-Term analysis. No roadway segment impacts were calculated in the existing analysis scenarios.

Analysis of Long-Term Conditions

Intersection Analysis

Peak hour operations at study area intersections are shown to result in LOS D or better for both without and with the addition of Project traffic to the long-term condition without the DAR. Peak hour operations at study area intersections are shown to result in LOS D or better for both without and with the addition of Project traffic to the long-term condition with the DAR. No intersection impacts were calculated in any of the long-term analysis scenarios.

Table 8, shows the results of the analysis. **Attachment D** contains the intersection analysis worksheets.

Street Segment Analysis

Based on the results of the street segment capacity analysis, Manchester Avenue is calculated to operate at LOS D with near-term conditions in both with and without project scenarios with the exception of the segment between the I-5 Southbound Ramps and the I-5 Northbound Ramps, which is calculated to operate at LOS F in both with and without project scenarios. Based on City of Encinitas's significance criteria, no significant impacts are identified on the segment of Manchester Avenue between the I-5 Southbound Ramps and the I-5 Northbound Ramps since the project traffic contribution is below the allowable threshold. In the scenario with the improvements to Manchester Avenue, the roadway is calculated to operate at better than LOS C in both with and without project scenarios. **Table 9**, following Table 8, shows the results of the analysis.

TABLE 4
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing	
			Delay [a]	**LOS [b]**
1. Manchester Ave / I-5 SB Ramps	AWSC[c]	AM	147.0	F
		PM	38.5	E
2. Manchester Ave / I-5 NB Ramps	Signal	AM	23.1	C
		PM	23.5	C
3. Manchester Ave / DAR Access Rd	Signal	AM	DNE	-
		PM	DNE	-

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service. See table at right for delay thresholds.
c. AWSC = all-way stop controlled

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 5
EXISTING STREET SEGMENT OPERATIONS

Street Segment	Existing Capacity (LOS E) [a]	Existing		
		ADT [b]	**LOS [c]**	**V/C [d]**
Manchester Avenue				
1. I-5 Southbound Ramps to I-5 Northbound Ramps	20,000	17,649	D	0.882
2. I-5 Northbound Ramps to DAR Access Road (Future)	45,400	28,565	+C	0.629
3. DAR Access Road (Future) to Mira Costa College	45,400	28,565	+C	0.629

Footnotes:
a. Capacity based on City of Encinitas roadway capacity standards.
b. ADT = Average Daily Traffic Volumes.
c. LOS = Level of Service.
d. V/C = Volume-to-Capacity ratio.

General Notes
1. +C = Better than LOS C operations.

TABLE 6
NEAR-TERM INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Near-Term	
			Delay[a]	LOS[b]
1. Manchester Ave / I-5 SB Ramps	Signal	AM PM	21.8 9.8	C A
2. Manchester Ave / I-5 NB Ramps	Signal	AM PM	23.3 24.0	C C
3. Manchester Ave / DAR Access Rd	Signal	AM PM	17.6 12.8	B B

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service. See table at right for delay thresholds.

SIGNALIZED

DELAY/LOS THRESHOLDS

Delay	LOS
0.0 ≤ 10.0	A
10.1 to 20.0	B
20.1 to 35.0	C
35.1 to 55.0	D
55.1 to 80.0	E
≥ 80.1	F

TABLE 7
NEAR-TERM STREET SEGMENT OPERATIONS

Street Segment	Near-Term Capacity (LOS E) [a]	Near-Term		
		ADT[b]	LOS[c]	V/C[d]
Manchester Avenue				
1. I-5 Southbound Ramps to I-5 Northbound Ramps	20,000	17,969	D	0.898
2. I-5 Northbound Ramps to DAR Access Road (Future)	45,400	29,170	+C	0.643
3. DAR Access Road (Future) to Mira Costa College	45,400	28,672	+C	0.632

Footnotes:

a. Capacity based on City of Encinitas roadway capacity standards.
b. ADT = Average Daily Traffic Volumes.
c. LOS = Level of Service.
d. V/C = Volume-to-Capacity ratio.

General Notes

1. +C = Better than LOS C operations.

TABLE 8
LONG-TERM INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Long-Term (without DAR)		Long-Term (without DAR) + Project		Δ [c] Delay	Sig?	Long-Term (with DAR)		Long-Term (with DAR) + Project		Δ Delay	Sig?
			Delay [a]	LOS [b]	Delay [a]	LOS			Delay	LOS	Delay	LOS		
1. Manchester Ave / I-5 SB Ramps	Signal	AM	31.8	C	31.9	C	0.1	No	46.0	D	46.1	D	0.1	No
		PM	18.3	B	18.4	B	0.1	No	14.0	B	14.1	B	0.1	No
2. Manchester Ave / I-5 NB Ramps	Signal	AM	33.6	C	34.4	C	0.8	No	26.7	C	27.1	C	0.4	No
		PM	49.0	D	51.2	D	2.2	No	36.5	D	37.6	D	1.1	No
3. Manchester Ave / DAR Access Rd	Signal	AM	19.6	B	21.4	C	1.8	No	23.1	C	24.4	C	1.3	No
		PM	19.4	B	22.7	C	3.3	No	17.1	B	17.7	B	0.6	No

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service. See table at right for delay thresholds.
c. Δ = Project-induced change in delay.

General Notes

1. Sig = Significant impact, yes or no.

SIGNALIZED

DELAY/LOS THRESHOLDS

Delay	LOS
0.0 ≤ 10.0	A
10.1 to 20.0	B
20.1 to 35.0	C
35.1 to 55.0	D
55.1 to 80.0	E
≥ 80.1	F

TABLE 9
LONG-TERM STREET SEGMENT OPERATIONS

Street Segment	Long-Term Capacity (LOS E) [a]	Long-Term (without DAR)			Long-Term (without DAR) + Project			Δ [e] V/C	Long-Term (with DAR)			Long-Term (with DAR) + Project			Δ V/C	Sig?
		ADT [b]	LOS [c]	V/C [d]	ADT	LOS	V/C		ADT	LOS	V/C	ADT	LOS	V/C		
Manchester Avenue																
1. I-5 Southbound Ramps to I-5 Northbound Ramps	20,000 / 45,400	22,740	F	1.137	23,060	F	1.153	0.016	20,260	+C	0.446	20,563	+C	0.453	0.007	No
2. I-5 Northbound Ramps to DAR Access Road (Future)	45,400	36,790	D	0.810	37,395	D	0.824	0.013	32,790	+C	0.722	33,395	+C	0.736	0.013	No
3. DAR Access Road (Future) to Mira Costa College	45,400	36,790	D	0.810	36,897	D	0.813	0.002	32,790	+C	0.722	32,897	+C	0.725	0.002	No

Footnotes:

a. Capacity based on City of Encinitas roadway capacity standards.
b. ADT = Average Daily Traffic Volumes.
c. LOS = Level of Service.
d. V/C = Volume-to-Capacity ratio.
e. Δ = Project-induced change in V/C.

General Notes

1. Sig = Significant impact, yes or no.
2. +C = Better than LOS C operations

ACCESS

The Project plans to provide two day-to-day access points, both along the DAR Access Road. The southern driveway should be a right-in/right-out only driveway. For the main driveway, based on the project volumes, it is recommended to provide a one-way stop control with a shared left-turn/right-turn lane on the driveway and one lane in each direction along the DAR Access Road. An emergency-only access driveway is proposed on Manchester Avenue and daily use will be prohibited at this driveway by bollards.

SUMMARY & CONCLUSIONS

Based on the peak hour intersection and daily street segment analyses and the established significance criteria, no significant impacts were determined. Therefore, mitigation measures are not necessary.

Sincerely,

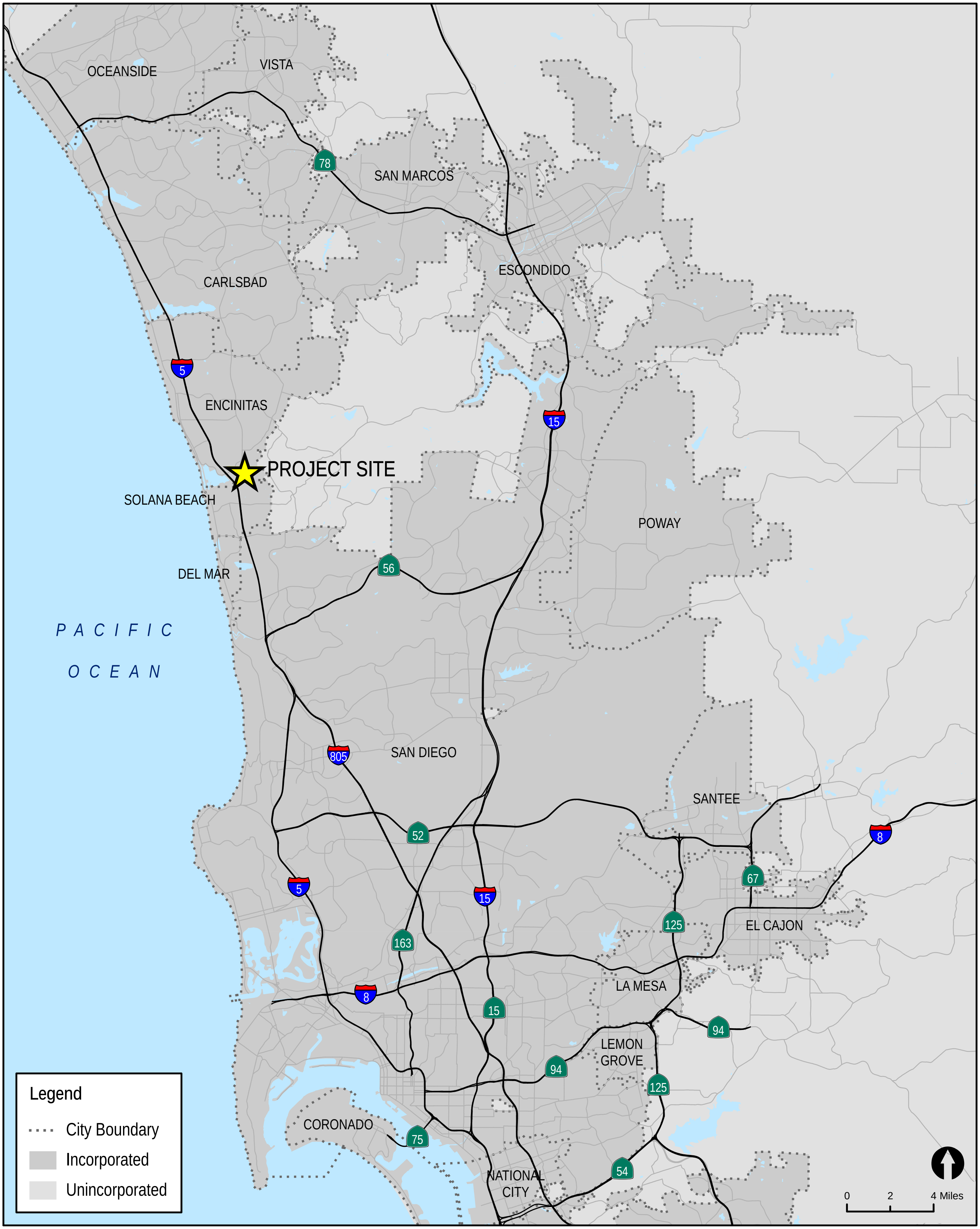
Linscott, Law & Greenspan, Engineers

John Boarman, PE
Principal

Charlene Sadiarin, PE
Transportation Engineer II

Figures:
1: Project Vicinity Map
2: Project Area Map
3. Conceptual Site Plan
4: Existing Conditions Diagram
5: Existing Traffic Volumes
6: Project Traffic Distribution
7: Project Traffic Volumes (w/o DAR)
8: Near-Term Traffic Volumes
9: Project Traffic Volumes (w/ DAR)
10: Long-Term (without DAR) Conditions
11: Long-Term (without DAR) Traffic Volumes
12: Long-Term (without DAR) + Projects Traffic Volumes
13: Long-Term (with DAR) Conditions
14: Long-Term (with DAR) Traffic Volumes
15: Long-Term (with DAR) + Project Traffic Volumes

Attachments:
A: Intersection and Segment Manual Count Sheets
B: City of Encinitas Housing Element Update Potential Rezoning Sites
C: City of Encinitas Roadway Capacity Standards
D: Intersection Analysis Worksheets



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engineers

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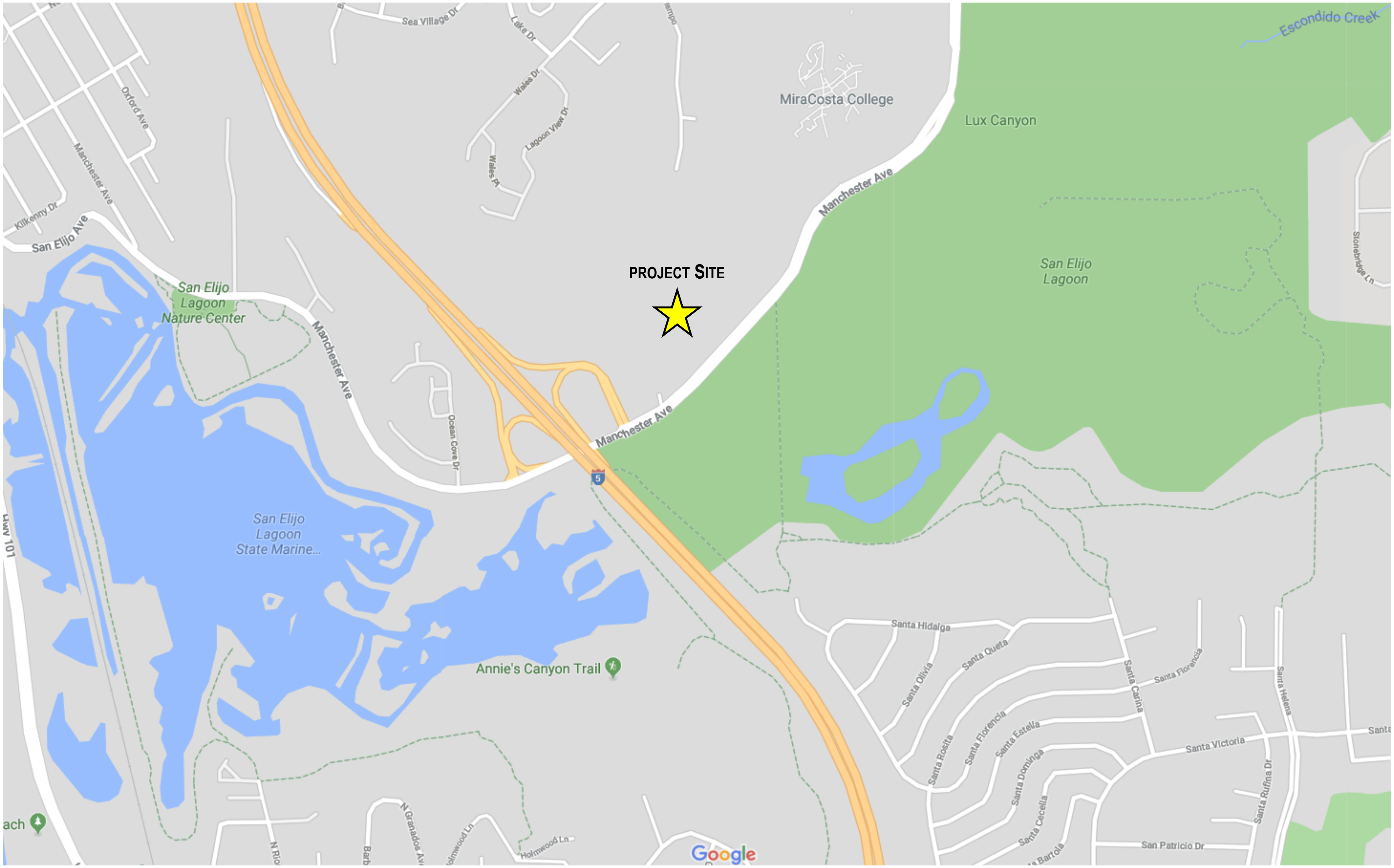
Date: 04/30/18

Figure 1

Vicinity Map

BELMONT VILLAGE ENCINITAS-BY-THE-SEA



Source: Urban Resource

LINSCOTT LAW & GREENSPAN engineers

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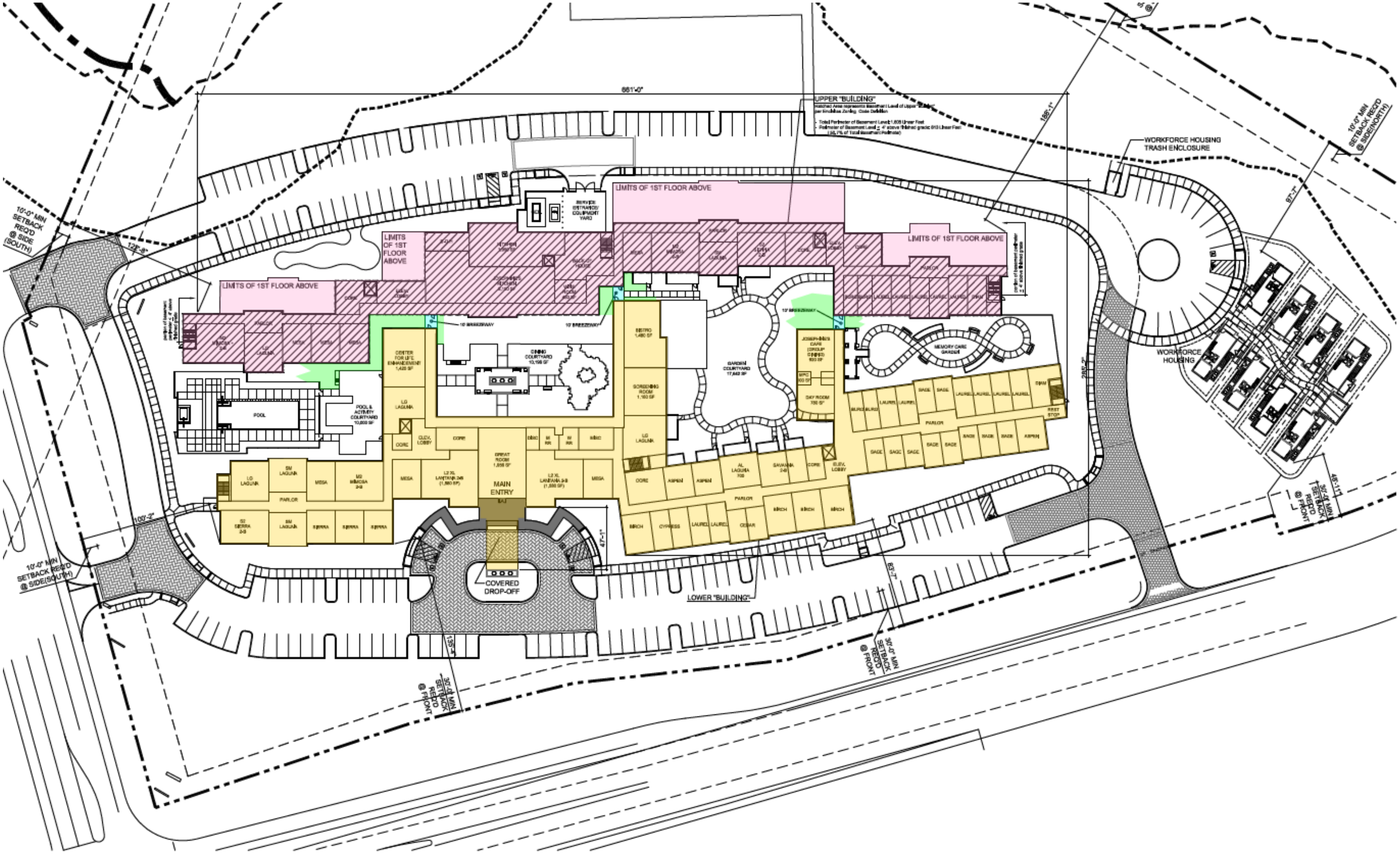
Figure 2

Project Area Map

BELMONT VILLAGE ENCINITAS-BY-THE-SEA



Source: Van Tilburg, Banvard & Soderbergh, AIA

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Figure 3

Site Plan

BELMONT VILLAGE ENCINITAS-BY-THE-SEA

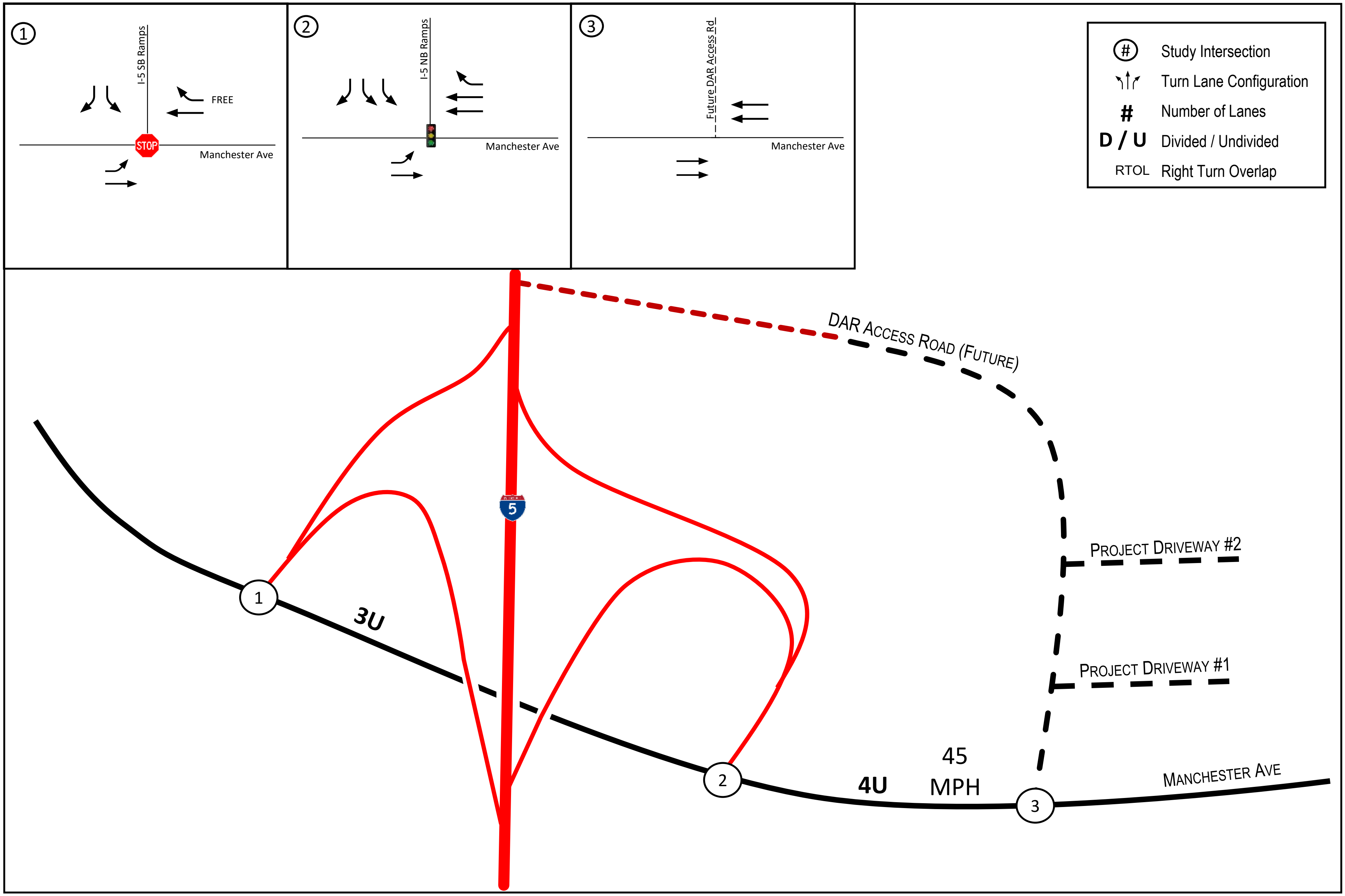

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Figure 4

Existing Conditions

Belmont Village Encinitas-by-the-Sea

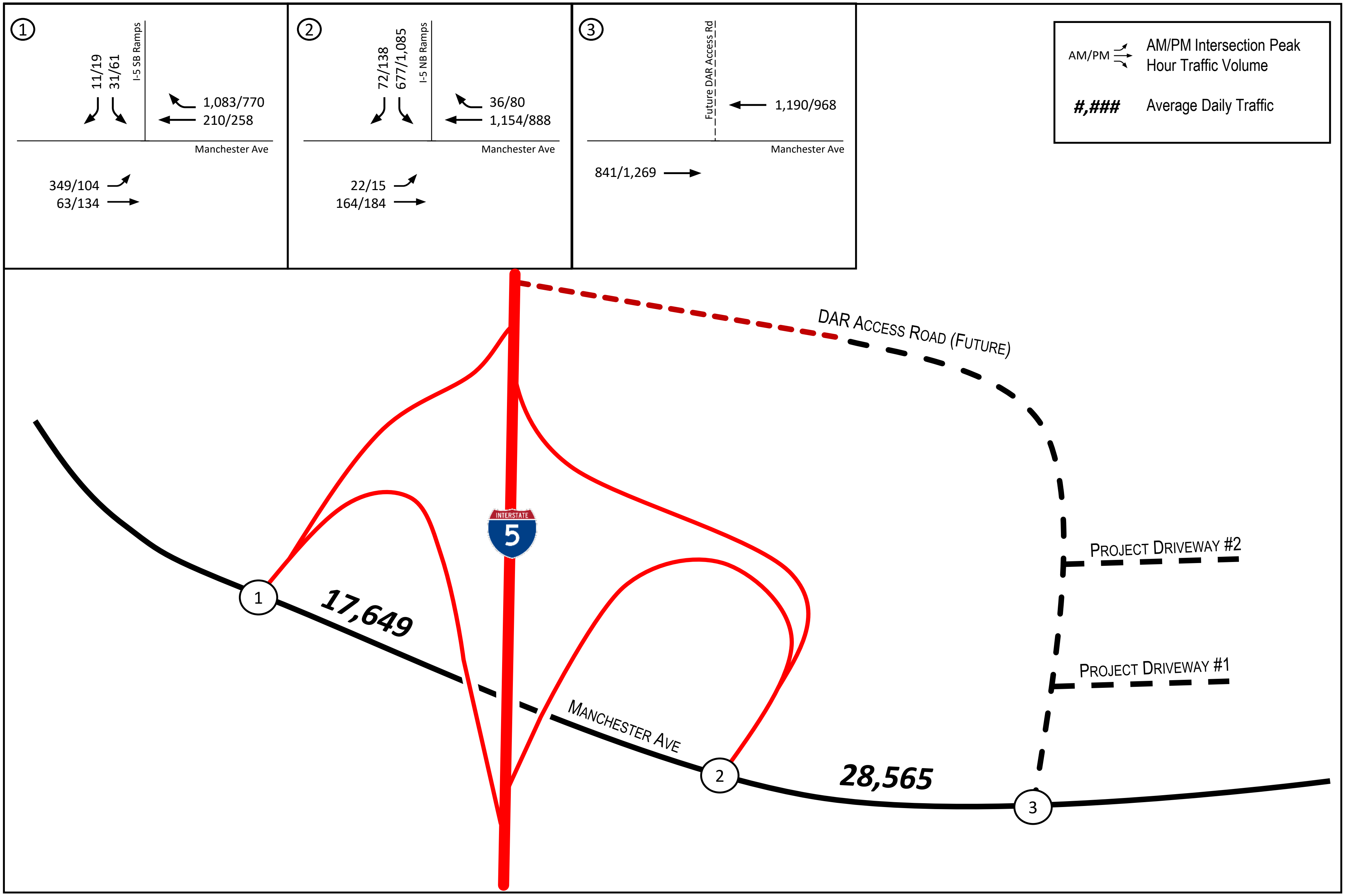

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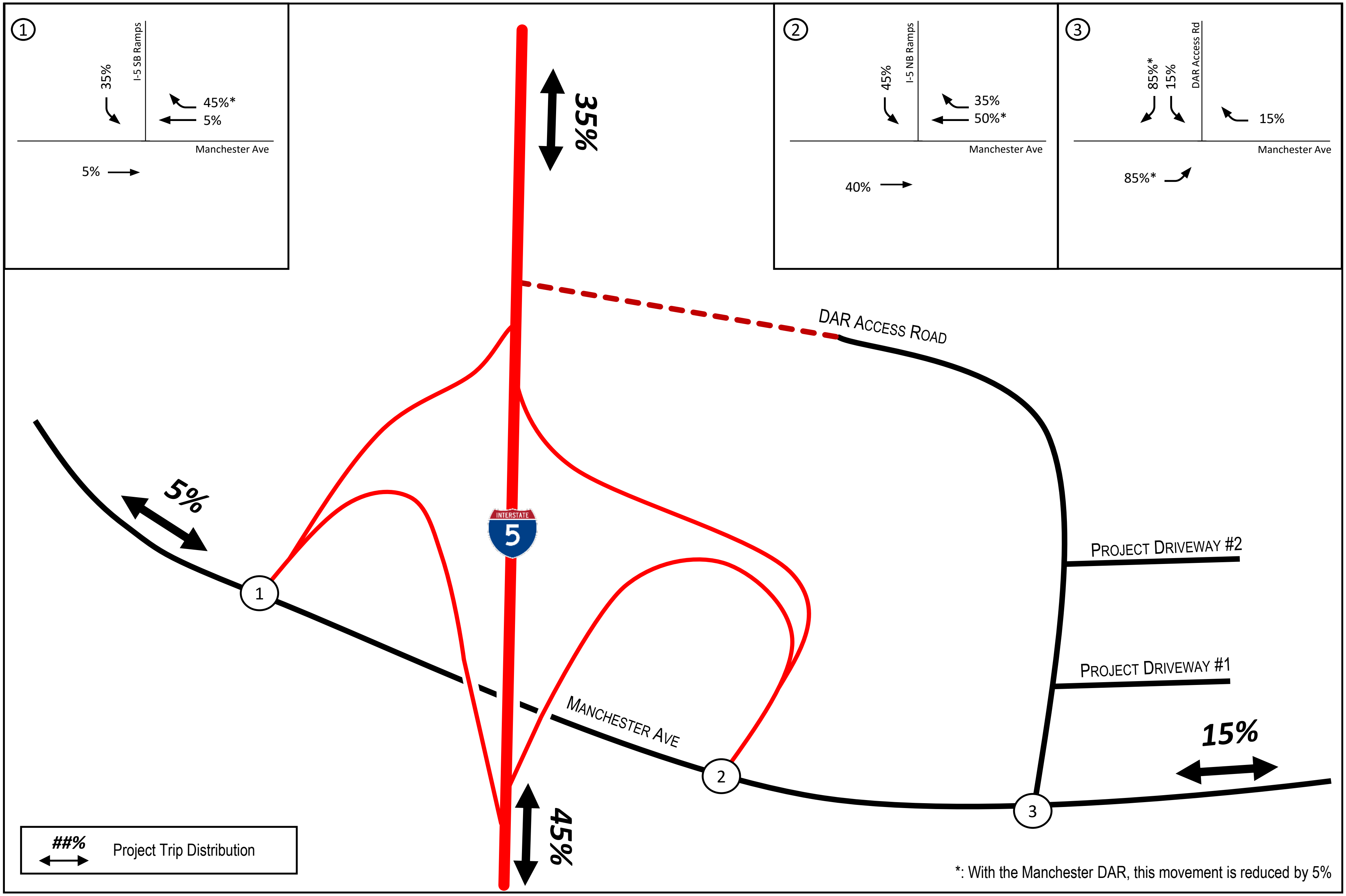
Figure 5

Existing Traffic Volumes

Belmont Village Encinitas-by-the-Sea



*: With the Manchester DAR, this movement is reduced by 5%

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Figure 6

Project Trip Distribution

BELMONT VILLAGE ENCINITAS-BY-THE-SEA

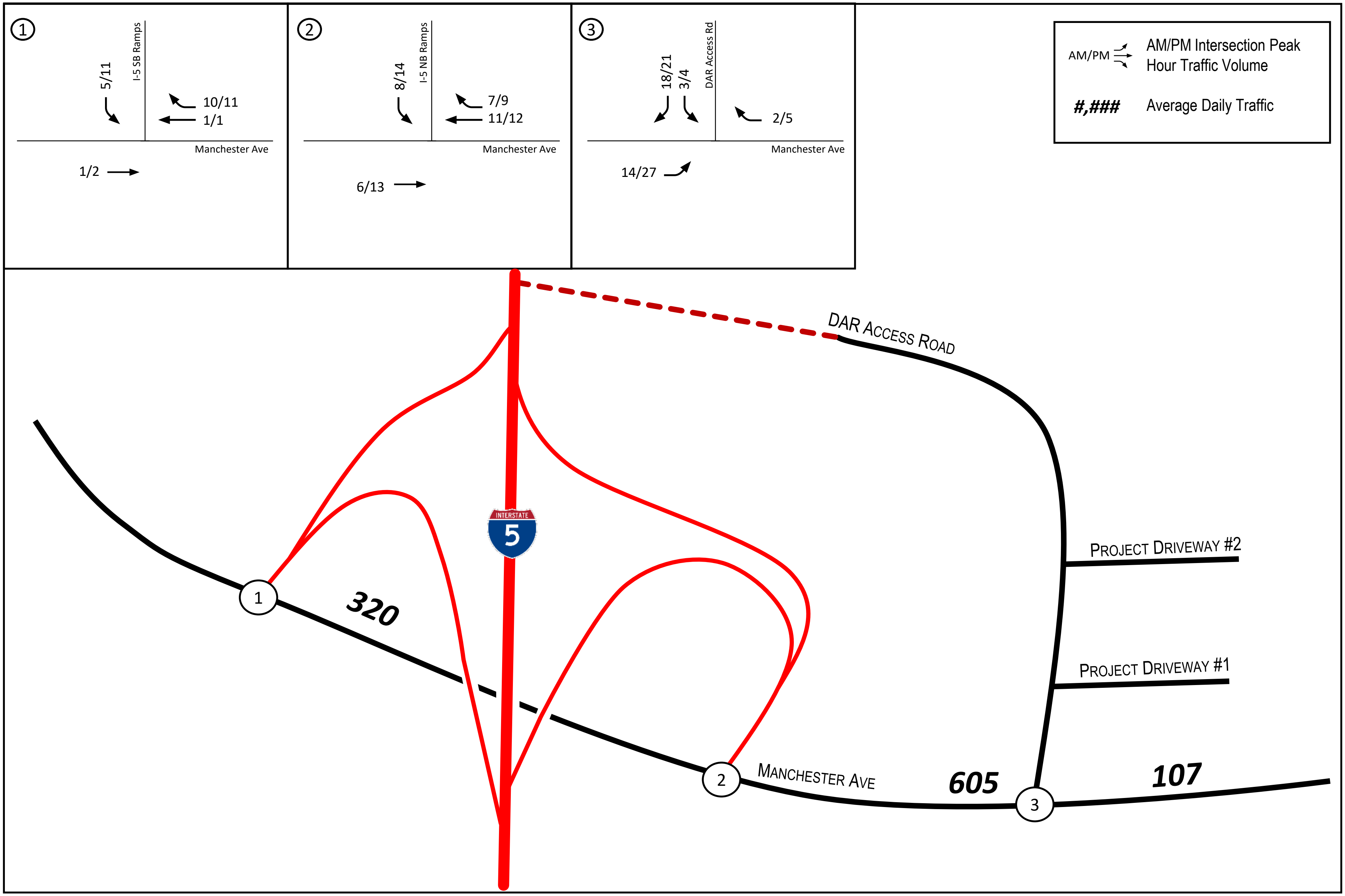

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Figure 7

Project Traffic Volumes (w/out DAR)

BELMONT VILLAGE ENCINITAS-BY-THE-SEA

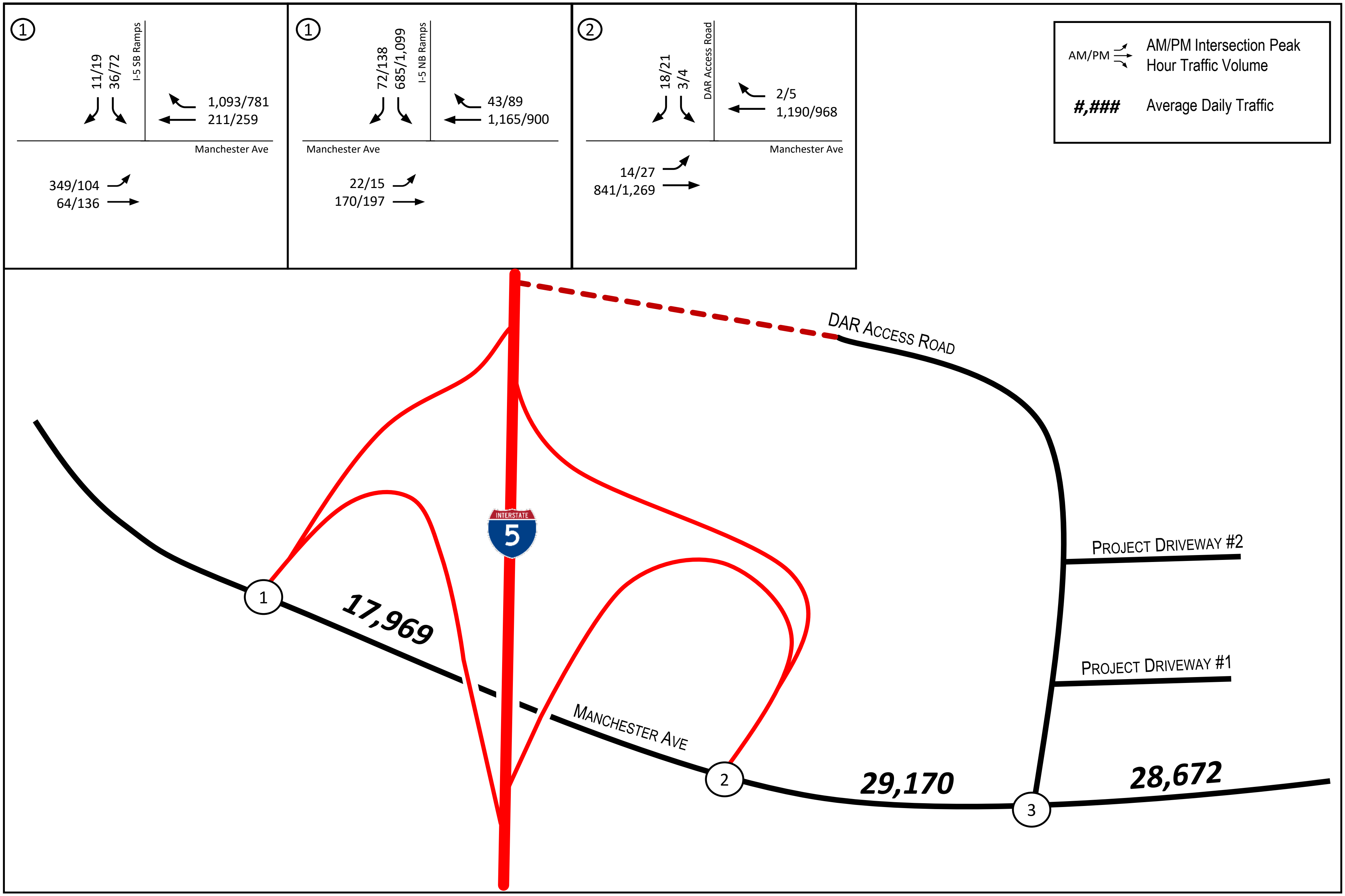

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Figure 8

Near-Term Traffic Volumes

Belmont Village Encinitas-by-the-Sea

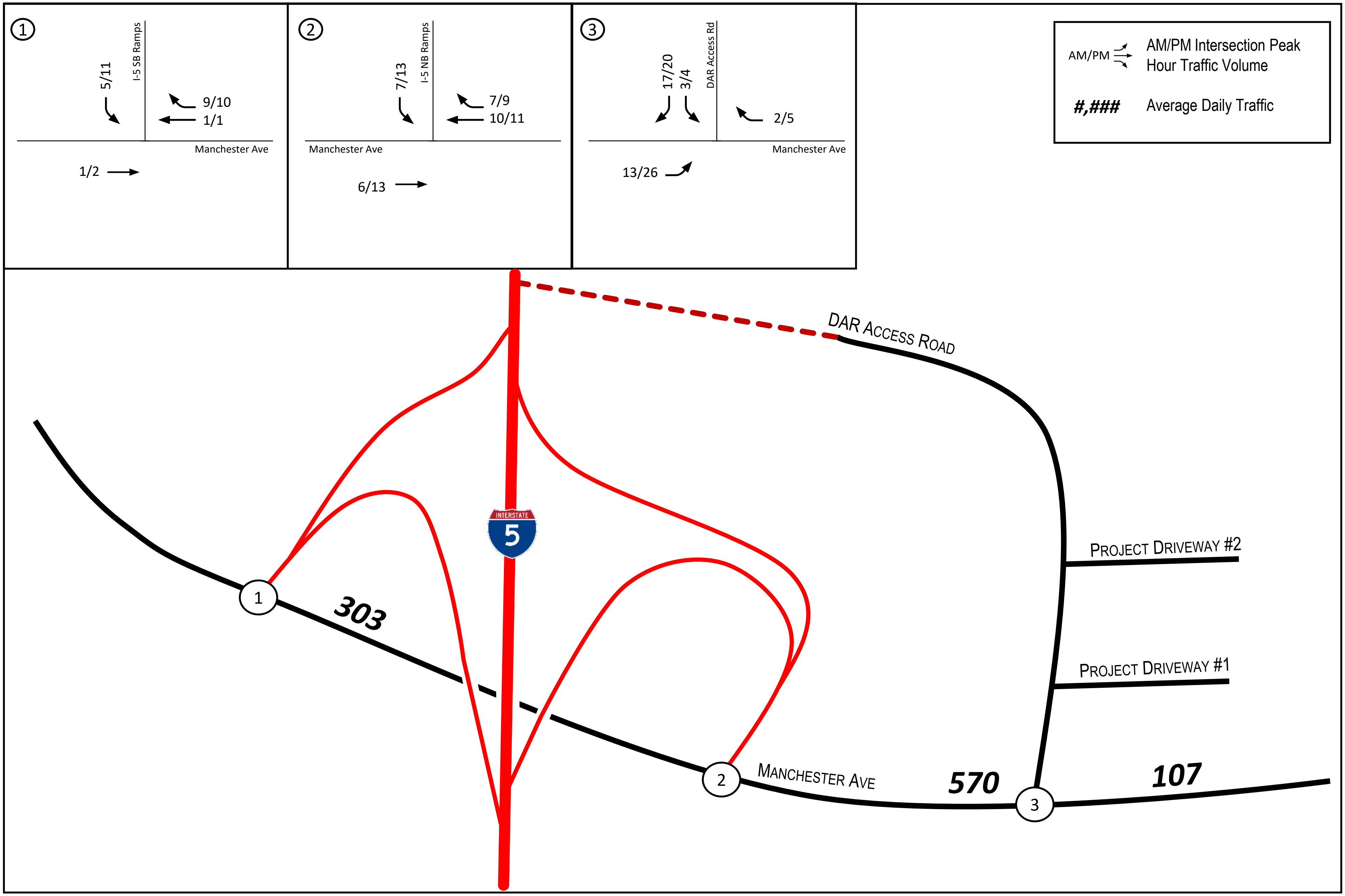

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Figure 9

Project Traffic Volumes (w/ DAR)

BELMONT VILLAGE ENCINITAS-BY-THE-SEA

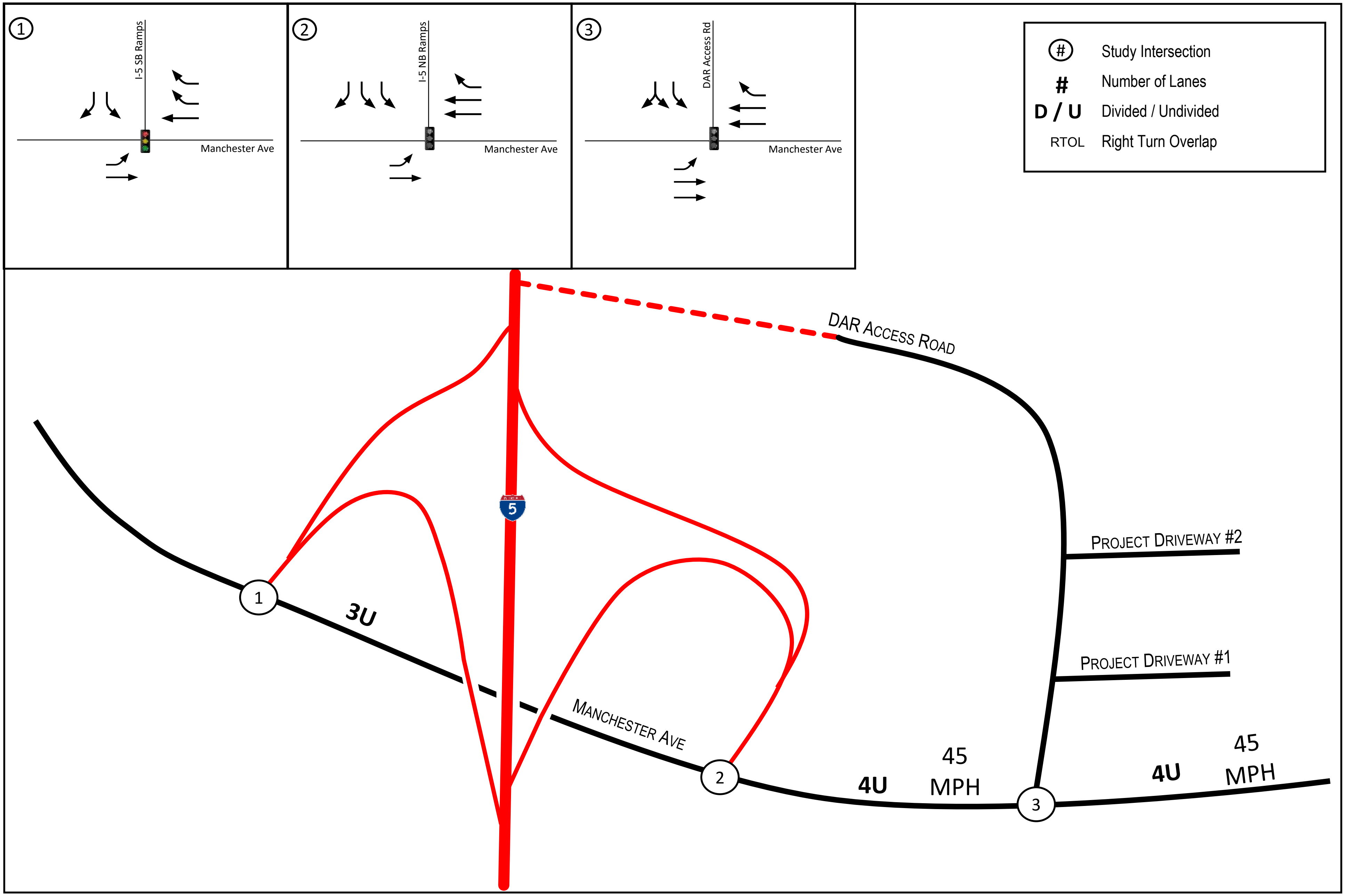

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Figure 10

Long-Term (w/out DAR) Conditions

BELMONT VILLAGE ENCINITAS-BY-THE-SEA

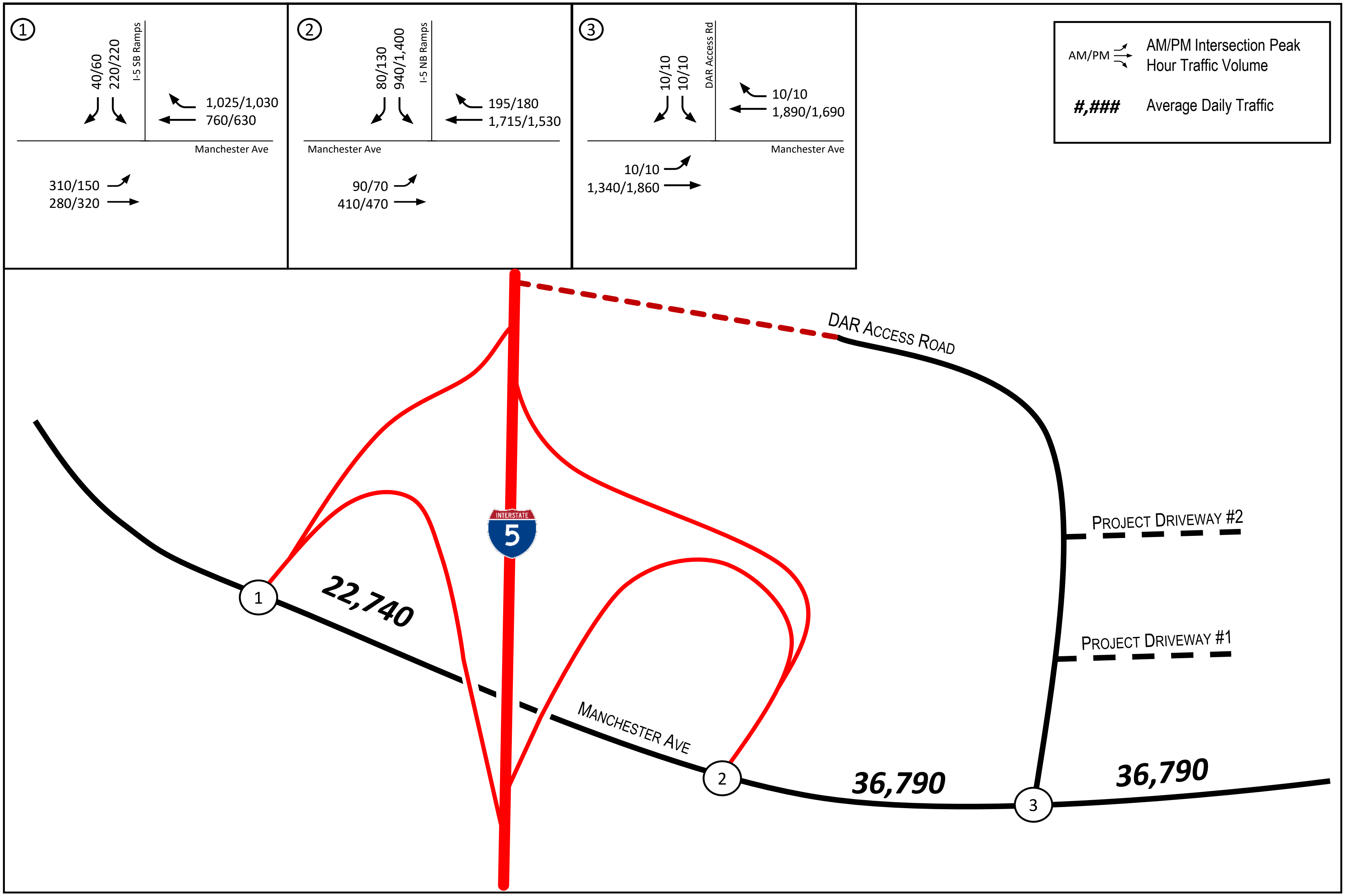

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Figure 11

Long-Term (w/out DAR) Traffic Volumes

BELMONT VILLAGE ENCINITAS-BY-THE-SEA

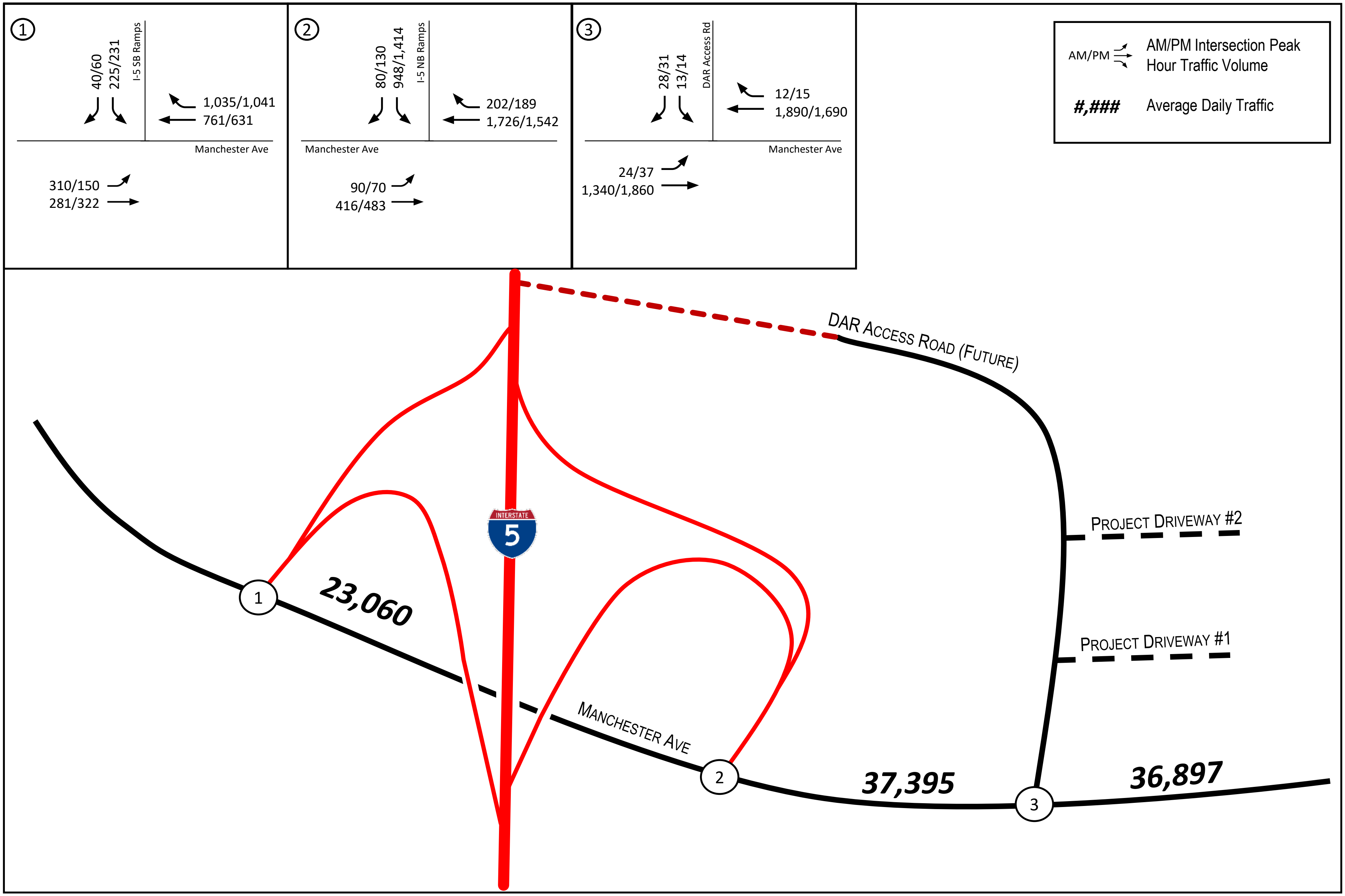

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Figure 12

Long-Term (w/out DAR) + Project Traffic Volumes

BELMONT VILLAGE ENCINITAS-BY-THE-SEA

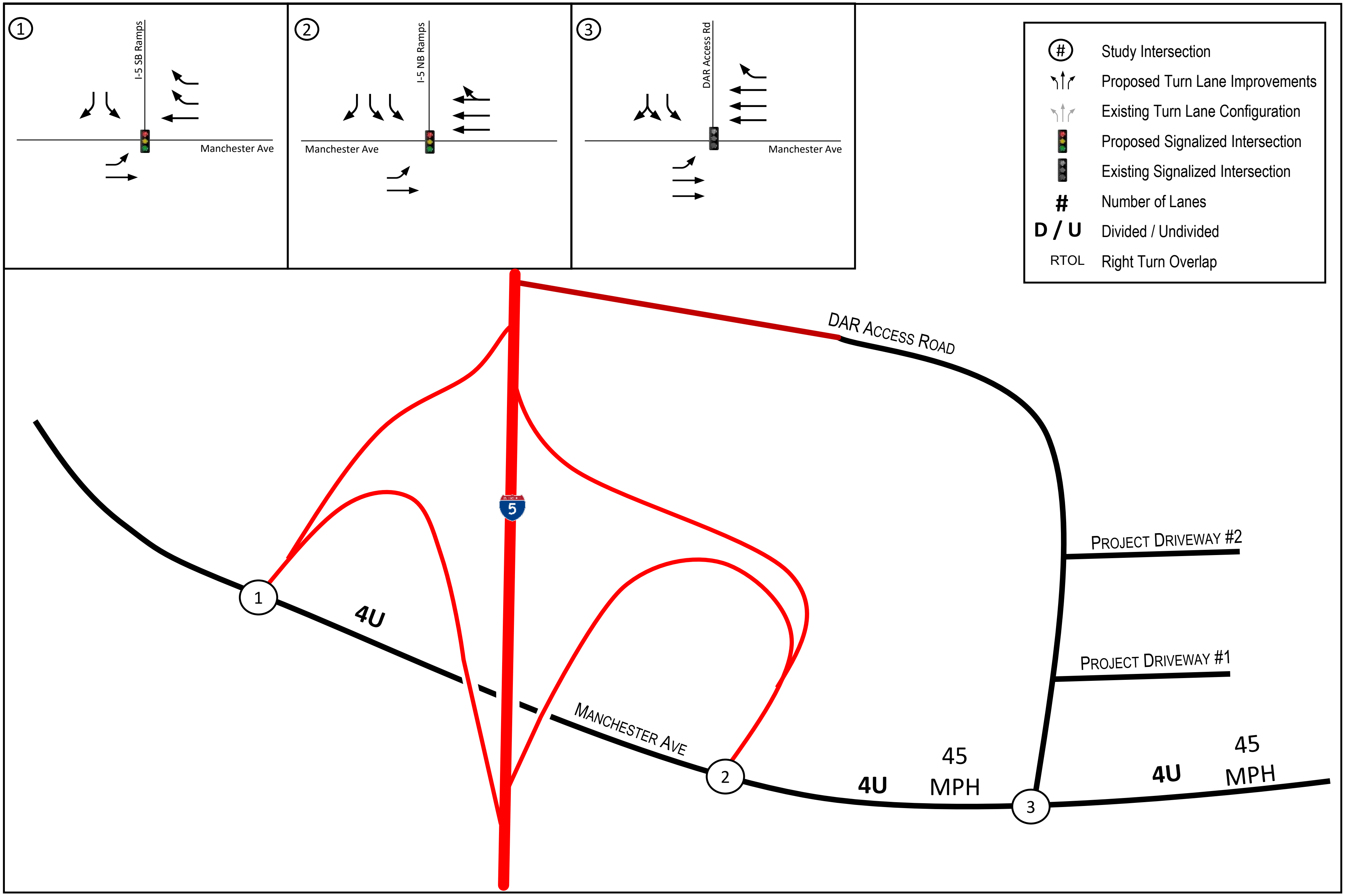

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Figure 13

Long-Term (w/ DAR) Conditions

BELMONT VILLAGE ENCINITAS-BY-THE-SEA

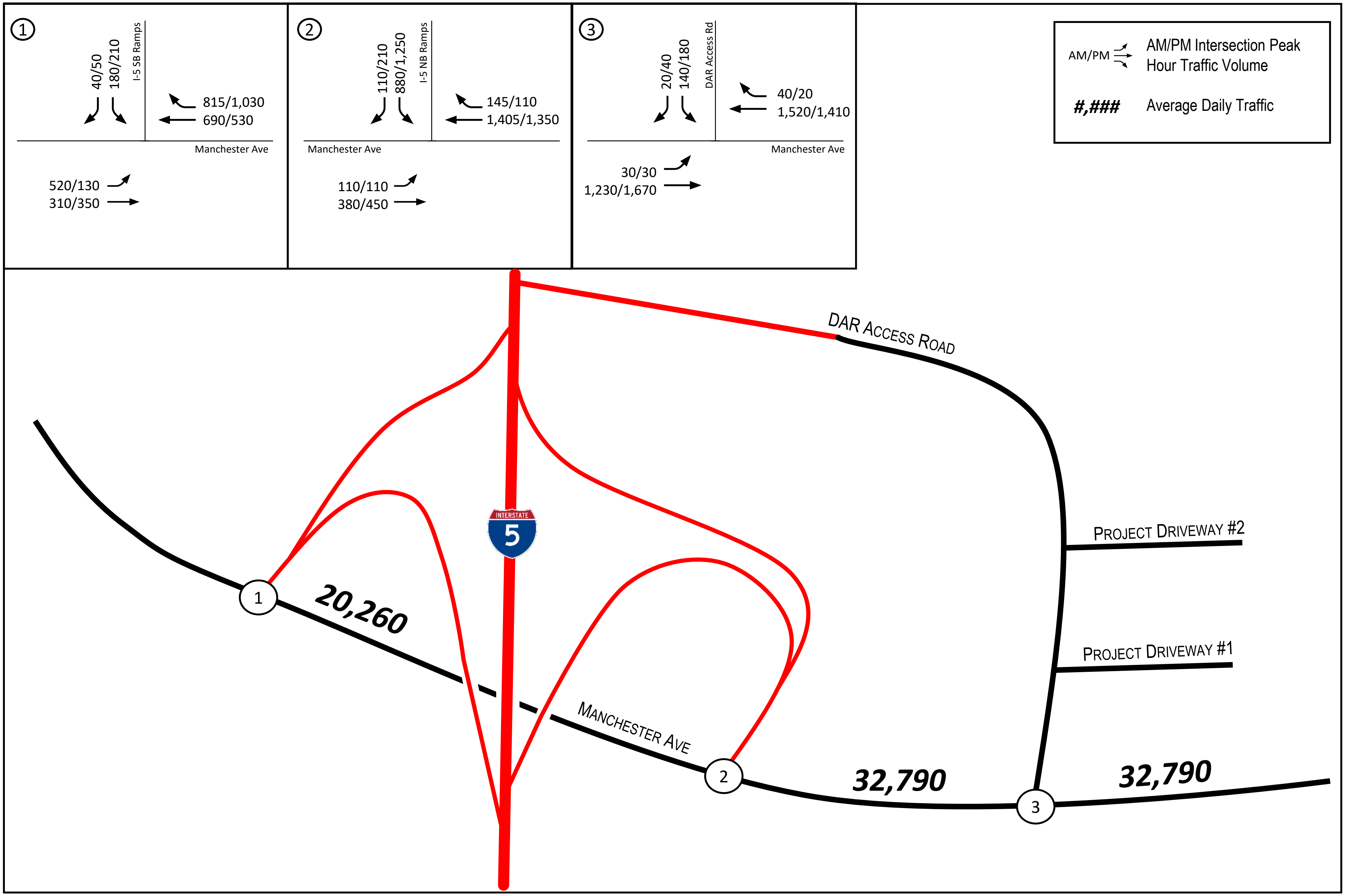

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Figure 14

Long-Term (w/ DAR) Traffic Volumes

BELMONT VILLAGE ENCINITAS-BY-THE-SEA

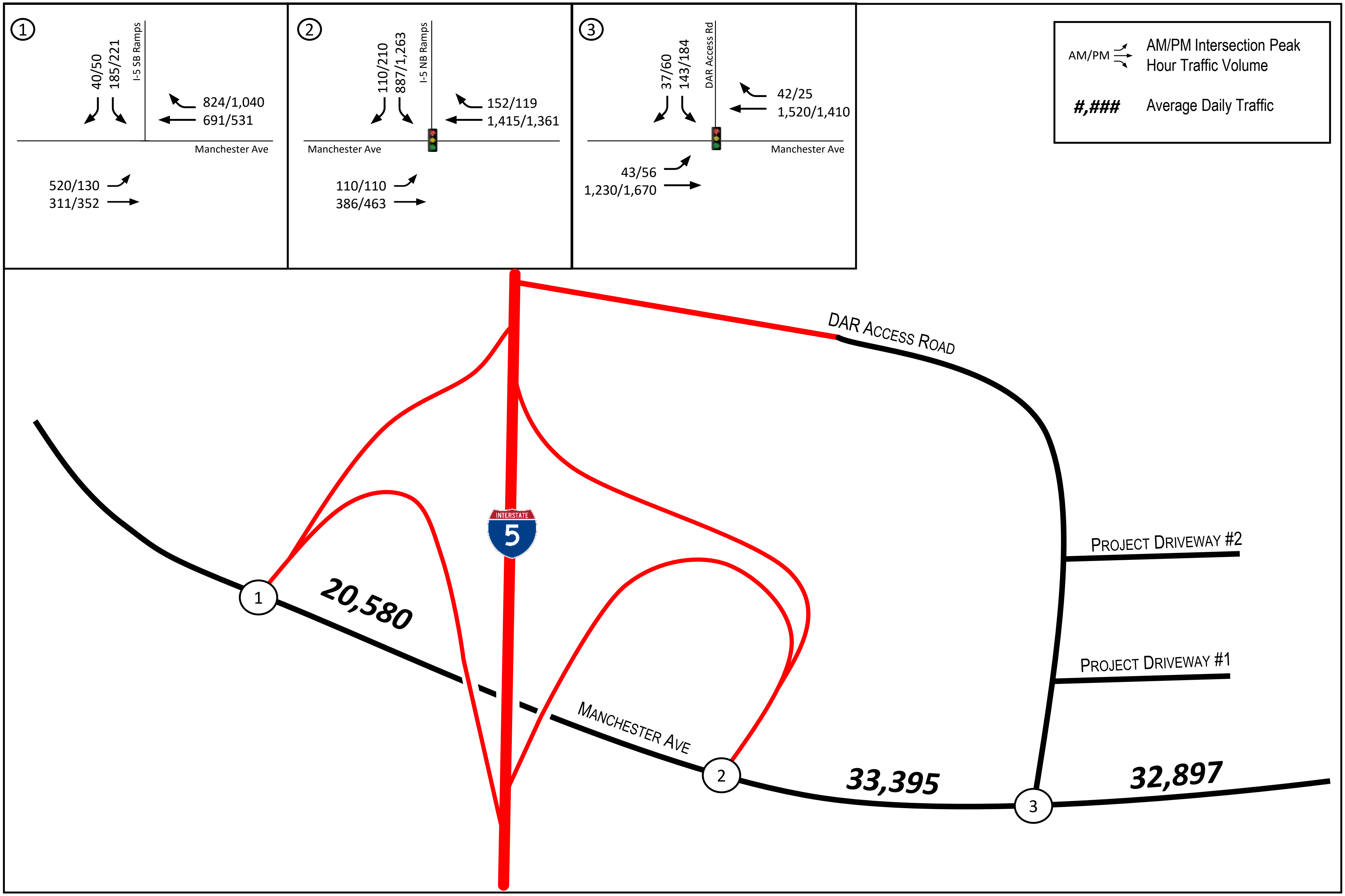

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Figure 15

Long-Term (w/ DAR) + Project Traffic Volumes

Belmont Village Encinitas-by-the-Sea

ATTACHMENT A

INTERSECTION AND SEGMENT MANUAL COUNT SHEETS

Prepared by National Data & Surveying Services

Manchester Ave & I-5 NB Ramps

Peak Hour Turning Movement Count

ID: 18-04130-002
City: Encinitas

Day: Thursday
Date: 04/12/2018

	PEAK HOURS	COUNT PERIODS
AM	08:00 AM - 09:00 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:30 PM - 05:30 PM	04:00 PM - 06:00 PM

Manchester Ave
SOUTHBOUND

	↲	↓	↳	↶	⇧
AM	72	0	677	0	58
NOON	0	0	0	0	0
PM	138	0	1085	0	95
	1	0	2	0	

I-5 NB Ramps
EASTBOUND

		AM	NOON	PM
⇦		1226	0	1026
↶	0	0	0	0
↱	1	22	0	15
→	1	164	0	184
↴	0	0	0	0

I-5 NB Ramps
WESTBOUND

		PM	NOON	AM
↰	1	80	0	36
←	2	888	0	1154
↙	0	0	0	0
↷	0	0	0	0
⇨		1269	0	841

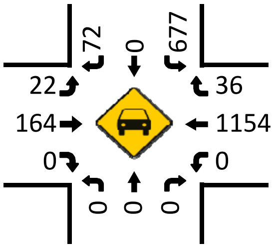
CONTROL
Signalized

	AM	NOON	PM
TEV	2125	0	2390
PHF	0.89		0.89

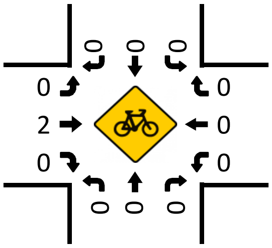
NORTHBOUND
Manchester Ave

	⇩	↶	↰	↑	↱
		0	0	0	0
PM	0	0	0	0	0
NOON	0	0	0	0	0
AM	0	0	0	0	0

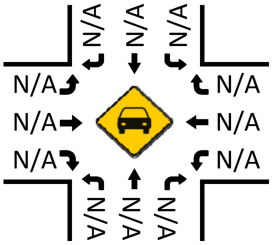
Total Vehicles (AM)



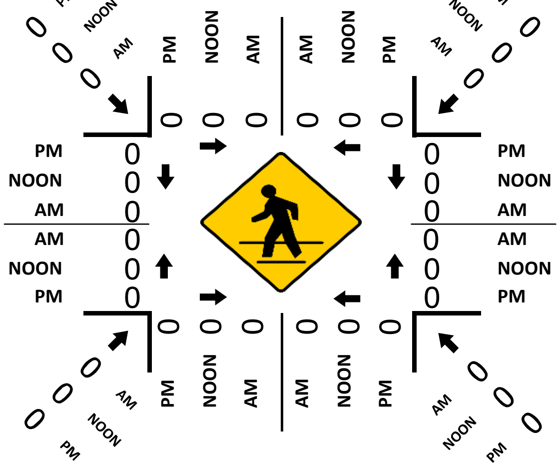
Bikes (AM)



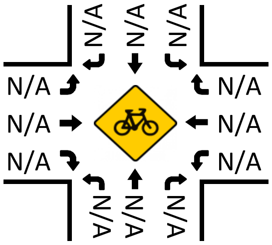
Total Vehicles (Noon)



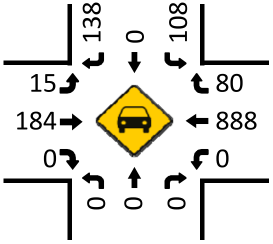
Pedestrians (Crosswalks)



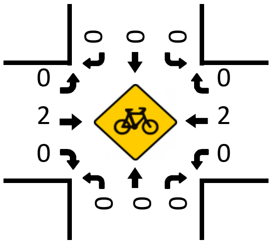
Bikes (NOON)



Total Vehicles (PM)



Bikes (PM)



National Data & Surveying Services Intersection Turning Movement Count

Location: Manchester Ave & I-5 SB Ramps
City: Encinitas
Control: 3-Way Stop (SB/EB/WB)

Project ID: 18-04130-001
Date: 4/12/2018

Total

NS/EW Streets:	Manchester Ave				Manchester Ave				I-5 SB Ramps				I-5 SB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0.5	0.5	0	1	1	0	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	7	0	1	0	42	21	0	0	0	34	276	0	381
7:15 AM	0	0	0	0	5	0	1	0	48	7	0	0	0	32	301	0	394
7:30 AM	0	0	0	0	8	0	3	0	87	18	0	0	0	40	276	0	432
7:45 AM	0	0	0	0	5	0	3	0	125	12	0	0	0	70	237	0	452
8:00 AM	0	0	0	0	13	0	4	0	89	26	0	0	0	68	269	0	469
8:15 AM	0	0	0	0	15	0	1	1	62	24	0	0	0	38	253	0	394
8:30 AM	0	0	0	0	9	0	3	0	66	31	0	0	0	34	244	0	387
8:45 AM	0	0	0	0	24	0	2	0	76	36	0	0	0	48	271	0	457
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	86	0	18	1	595	175	0	0	0	364	2127	0	3366
APPROACH %'s :					81.90%	0.00%	17.14%	0.95%	77.27%	22.73%	0.00%	0.00%	0.00%	14.61%	85.39%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	0	0	0	0	31	0	11	0	349	63	0	0	0	210	1083	0	1747
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.596	0.000	0.688	0.000	0.698	0.606	0.000	0.000	0.000	0.750	0.900	0.000	0.931
					0.618				0.752				0.959				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0.5	0.5	0	1	1	0	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	14	0	2	0	26	23	0	0	0	51	200	0	316
4:15 PM	0	0	0	0	12	0	4	0	26	42	0	0	0	54	158	0	296
4:30 PM	0	0	0	0	9	0	3	1	19	36	0	0	0	53	203	0	324
4:45 PM	0	0	0	0	18	0	3	0	31	33	0	0	0	69	192	0	346
5:00 PM	0	0	0	0	18	0	4	0	25	32	0	0	0	56	152	0	287
5:15 PM	0	0	0	0	15	0	9	0	29	33	0	0	0	80	223	0	389
5:30 PM	0	0	0	0	16	0	6	0	16	22	0	0	0	57	142	0	259
5:45 PM	0	0	0	0	12	0	4	0	28	27	0	0	0	63	165	0	299
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	114	0	35	1	200	248	0	0	0	483	1435	0	2516
APPROACH %'s :					76.00%	0.00%	23.33%	0.67%	44.64%	55.36%	0.00%	0.00%	0.00%	25.18%	74.82%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	60	0	19	1	104	134	0	0	0	258	770	0	1346
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.833	0.000	0.528	0.250	0.839	0.931	0.000	0.000	0.000	0.806	0.863	0.000	0.865
					0.833				0.930				0.848				

Prepared by National Data & Surveying Services

Manchester Ave & I-5 SB Ramps

Peak Hour Turning Movement Count

ID: 18-04130-001
City: Encinitas

Day: Thursday
Date: 04/12/2018

PEAK HOURS		COUNT PERIODS
07:15 AM - 08:15 AM	AM	07:00 AM - 09:00 AM
NONE	NOON	NONE
04:30 PM - 05:30 PM	PM	04:00 PM - 06:00 PM

Manchester Ave

SOUTHBOUND

	↲	↓	↳	↶	⇧
AM	11	0	31	0	1432
NOON	0	0	0	0	0
PM	19	0	60	1	875
	0.5	0.5	0	0	

I-5 SB Ramps

EASTBOUND

	AM	NOON	PM	
⇦	221	0	277	
↶	0	0	0	0
↰	349	0	104	1
→	63	0	134	1
↴	0	0	0	0

I-5 SB Ramps

WESTBOUND

		PM	NOON	AM
1	↰	770	0	1083
1	←	258	0	210
0	↲	0	0	0
0	↷	0	0	0
	⇨	194	0	94

CONTROL

3-Way Stop (SB/EB/WB)

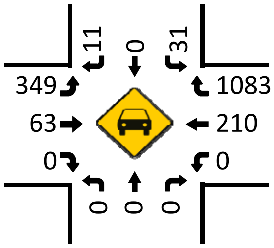
	AM	NOON	PM
TEV	1747	0	1346
PHF	0.93		0.87

NORTHBOUND

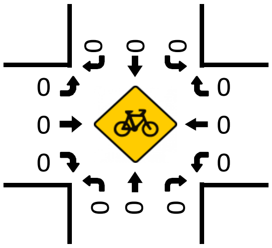
Manchester Ave

	⇩	↶	↰	↑	↱
		0	0	0	0
PM	0	0	0	0	0
NOON	0	0	0	0	0
AM	0	0	0	0	0

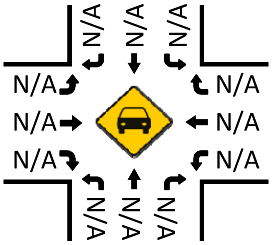
Total Vehicles (AM)



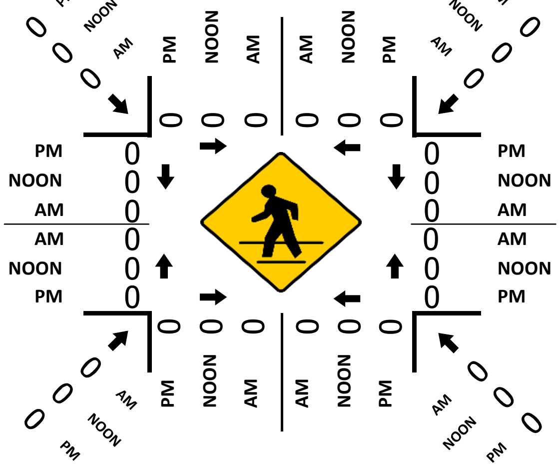
Bikes (AM)



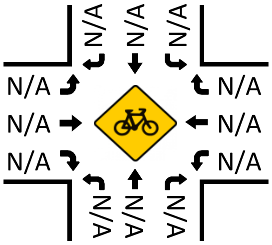
Total Vehicles (Noon)



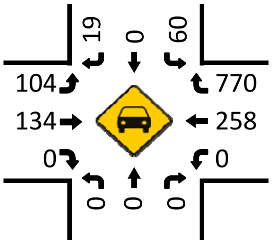
Pedestrians (Crosswalks)



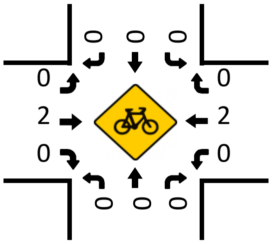
Bikes (NOON)



Total Vehicles (PM)



Bikes (PM)



National Data & Surveying Services Intersection Turning Movement Count

Location: Manchester Ave & I-5 NB Ramps
City: Encinitas
Control: Signalized

Project ID: 18-04130-002
Date: 4/12/2018

Total

NS/EW Streets:	Manchester Ave				Manchester Ave				I-5 NB Ramps				I-5 NB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	2	0	1	0	1	1	0	0	0	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	112	0	12	0	5	24	0	0	0	301	4	0	458
7:15 AM	0	0	0	0	105	0	7	0	2	12	0	0	0	346	3	0	475
7:30 AM	0	0	0	0	122	0	14	0	3	23	0	0	0	312	2	0	476
7:45 AM	0	0	0	0	168	0	17	0	4	15	0	0	0	287	5	0	496
8:00 AM	0	0	0	0	154	0	16	0	5	29	0	0	0	327	9	0	540
8:15 AM	0	0	0	0	155	0	13	0	6	36	0	0	0	269	7	0	486
8:30 AM	0	0	0	0	167	0	20	0	4	38	0	0	0	260	10	0	499
8:45 AM	0	0	0	0	201	0	23	0	7	61	0	0	0	298	10	0	600
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	1184	0	122	0	36	238	0	0	0	2400	50	0	4030
APPROACH %'s :					90.66%	0.00%	9.34%	0.00%	13.14%	86.86%	0.00%	0.00%	0.00%	97.96%	2.04%	0.00%	
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	677	0	72	0	22	164	0	0	0	1154	36	0	2125
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.842	0.000	0.783	0.000	0.786	0.672	0.000	0.000	0.000	0.882	0.900	0.000	0.885
					0.836				0.684				0.885				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	2	0	1	0	1	1	0	0	0	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	244	0	34	0	2	41	0	0	0	208	24	0	553
4:15 PM	0	0	0	0	261	0	27	0	4	43	0	1	0	194	19	0	549
4:30 PM	0	0	0	0	227	0	35	0	6	45	0	0	0	220	22	0	555
4:45 PM	0	0	0	0	265	0	36	0	3	47	0	0	0	229	19	0	599
5:00 PM	0	0	0	0	296	0	32	0	3	46	0	0	0	174	12	0	563
5:15 PM	0	0	0	0	297	0	35	0	3	46	0	0	0	265	27	0	673
5:30 PM	0	0	0	0	296	0	34	0	5	30	0	0	0	170	16	0	551
5:45 PM	0	0	0	0	260	0	39	0	2	41	0	0	0	190	10	0	542
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	2146	0	272	0	28	339	0	1	0	1650	149	0	4585
APPROACH %'s :					88.75%	0.00%	11.25%	0.00%	7.61%	92.12%	0.00%	0.27%	0.00%	91.72%	8.28%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	1085	0	138	0	15	184	0	0	0	888	80	0	2390
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.913	0.000	0.958	0.000	0.625	0.979	0.000	0.000	0.000	0.838	0.741	0.000	0.888
					0.921				0.975				0.829				

Prepared by NDS/ATD

VOLUME

Manchester Ave Bet. I-5 & Mira Costa College Rd

Day: Thursday
Date: 4/12/2018

City: Encinitas
Project #: CA18_4131_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	13,397	15,168	28,565

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			16		11		27		12:00			205		284		489	
00:15			9		4		13		12:15			197		288		485	
00:30			4		6		10		12:30			171		252		423	
00:45			6	35	8	29	14	64	12:45			201	774	265	1089	466	1863
01:00			3		2		5		13:00			199		253		452	
01:15			8		4		12		13:15			259		323		582	
01:30			5		2		7		13:30			236		308		544	
01:45			6	22	3	11	9	33	13:45			233	927	288	1172	521	2099
02:00			4		5		9		14:00			244		261		505	
02:15			2		5		7		14:15			232		256		488	
02:30			4		4		8		14:30			235		304		539	
02:45			4	14	1	15	5	29	14:45			296	1007	359	1180	655	2187
03:00			2		7		9		15:00			266		291		557	
03:15			4		6		10		15:15			275		270		545	
03:30			4		2		6		15:30			268		254		522	
03:45			5	15	6	21	11	36	15:45			255	1064	251	1066	506	2130
04:00			3		10		13		16:00			282		219		501	
04:15			3		10		13		16:15			272		233		505	
04:30			9		16		25		16:30			278		204		482	
04:45			13	28	39	75	52	103	16:45			303	1135	225	881	528	2016
05:00			17		38		55		17:00			315		198		513	
05:15			18		46		64		17:15			351		278		629	
05:30			25		72		97		17:30			300		179		479	
05:45			53	113	109	265	162	378	17:45			290	1256	178	833	468	2089
06:00			57		152		209		18:00			301		210		511	
06:15			68		153		221		18:15			296		191		487	
06:30			86		265		351		18:30			235		179		414	
06:45			128	339	293	863	421	1202	18:45			203	1035	136	716	339	1751
07:00			136		308		444		19:00			201		157		358	
07:15			107		332		439		19:15			176		139		315	
07:30			150		293		443		19:30			155		105		260	
07:45			179	572	249	1182	428	1754	19:45			128	660	104	505	232	1165
08:00			157		286		443		20:00			111		103		214	
08:15			193		254		447		20:15			116		101		217	
08:30			190		283		473		20:30			110		102		212	
08:45			249	789	277	1100	526	1889	20:45			110	447	80	386	190	833
09:00			177		277		454		21:00			111		97		208	
09:15			185		250		435		21:15			92		84		176	
09:30			189		272		461		21:30			94		66		160	
09:45			194	745	276	1075	470	1820	21:45			59	356	49	296	108	652
10:00			217		258		475		22:00			62		29		91	
10:15			267		255		522		22:15			61		26		87	
10:30			227		247		474		22:30			52		32		84	
10:45			209	920	275	1035	484	1955	22:45			46	221	14	101	60	322
11:00			196		238		434		23:00			25		26		51	
11:15			211		295		506		23:15			22		11		33	
11:30			196		320		516		23:30			18		15		33	
11:45			237	840	351	1204	588	2044	23:45			18	83	16	68	34	151
TOTALS				4432		6875		**11307**	**TOTALS**				8965		8293		**17258**
SPLIT %				39.2%		60.8%		**39.6%**	**SPLIT %**				51.9%		48.1%		**60.4%**

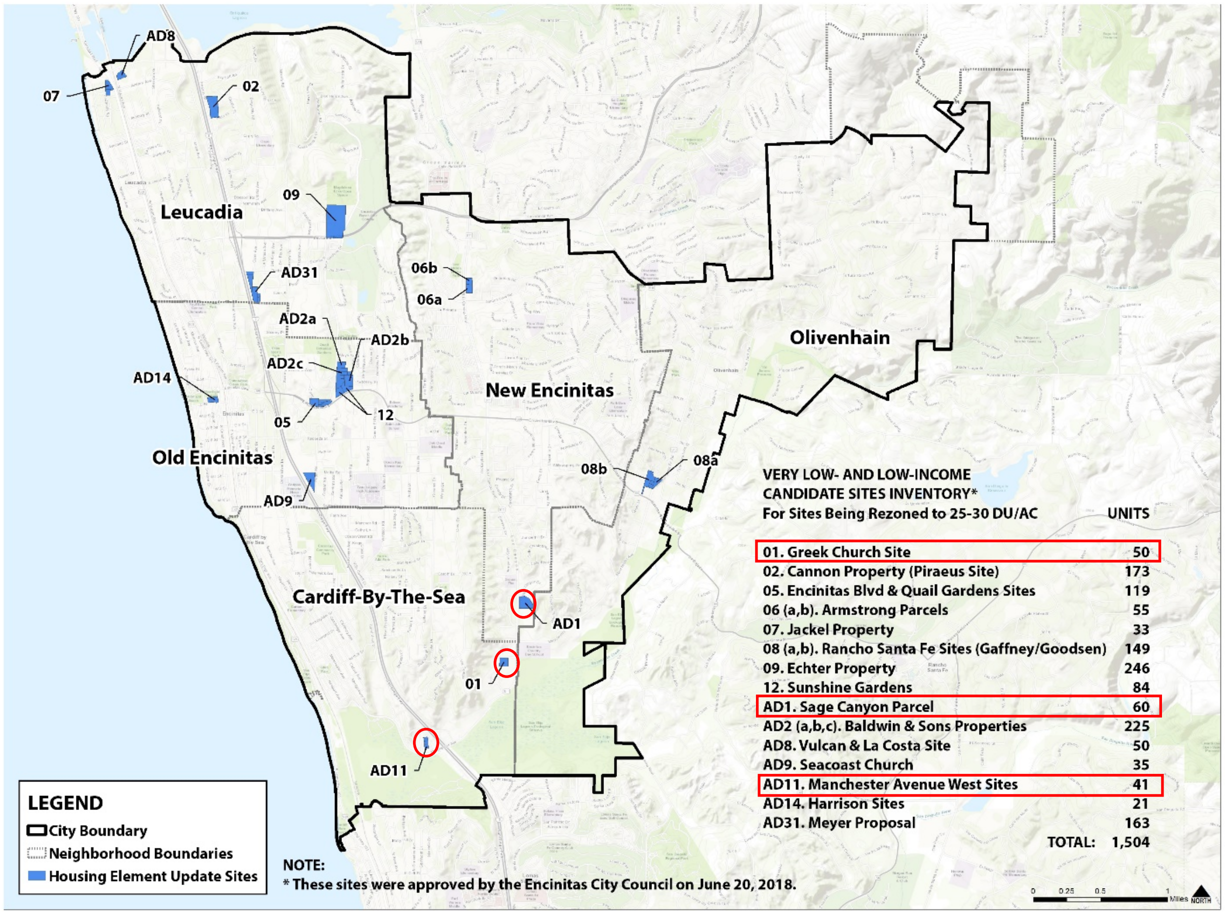
DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	13,397	15,168	28,565

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour			10:00	11:15	**11:15**	**PM Peak Hour**			16:45	14:30	**14:30**
AM Pk Volume			920	1250	**2099**	**PM Pk Volume**			1269	1224	**2296**
Pk Hr Factor			0.861	0.890	**0.892**	**Pk Hr Factor**			0.904	0.852	**0.876**
7 - 9 Volume	0	0	1361	2282	**3643**	**4 - 6 Volume**	0	0	2391	1714	**4105**
7 - 9 Peak Hour			08:00	07:00	**08:00**	**4 - 6 Peak Hour**			16:45	16:30	**16:30**
7 - 9 Pk Volume	0	0	789	1182	**1889**	**4 - 6 Pk Volume**	0	0	1269	905	**2152**
Pk Hr Factor	0.000	0.000	0.792	0.890	**0.898**	**Pk Hr Factor**	0.000	0.000	0.904	0.814	**0.855**

ATTACHMENT B

CITY OF ENCINITAS HOUSING ELEMENT UPDATE
POTENTIAL REZONING SITES

FIGURE 2-1: HOUSING STRATEGY MAP – VERY LOW AND LOW INCOME SITES



VERY LOW- AND LOW-INCOME CANDIDATE SITES INVENTORY*
For Sites Being Rezoned to 25-30 DU/AC

	UNITS
01. Greek Church Site	50
02. Cannon Property (Piraeus Site)	173
05. Encinitas Blvd & Quail Gardens Sites	119
06 (a,b). Armstrong Parcels	55
07. Jackel Property	33
08 (a,b). Rancho Santa Fe Sites (Gaffney/Goodsen)	149
09. Echter Property	246
12. Sunshine Gardens	84
AD1. Sage Canyon Parcel	60
AD2 (a,b,c). Baldwin & Sons Properties	225
AD8. Vulcan & La Costa Site	50
AD9. Seacoast Church	35
AD11. Manchester Avenue West Sites	41
AD14. Harrison Sites	21
AD31. Meyer Proposal	163
TOTAL:	1,504

NOTE:
* These sites were approved by the Encinitas City Council on June 20, 2018.

This rezoning program will create an opportunity for 1,504 units that may be constructed during the planning period pursuant to Section 65583.2. This exceeds the remaining RHNA lower income obligation of 1,141 units by 363 units (31 percent), providing an adequate buffer in consideration of the no net loss requirement under SB 166; requirements of AB 1397 for determining site capacity; and desire to provide some flexibility for future development to property owners. The capacity of vacant sites is 609 units, 53 percent of the City's total lower income RHNA.[1] HCD does not consider sites numbers 06a and 06b adequate sites to meet any portion of the Regional Housing Needs Allocation for lower-income households; excluding these units, the rezoning program still exceeds the remaining RHNA lower income obligation by 308 units (27 percent), with 583 units accommodated on vacant sites (51 percent of the City's remaining lower income RHNA).

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[1] Including Sites 01, 07, and AD2c, but excluding site 06a, the capacity of vacant sites is 701 units, or approximately 62% of the City's remaining lower income RHNA. See Table 2-6 for additional discussion.

ATTACHMENT C

CITY OF ENCINITAS ROADWAY CAPACITY STANDARDS

ROADWAY CAPACITY STANDARDS

Fac. Type	# of Lanes	ADT Capacity		
		LOS C	LOS D	LOS E
Freeway	6	108,000	120,000	135,000
	8	145,000	160,000	175,000
	10	175,000	195,000	215,000
Prime Arterial	6	46,000	51,200	57,000
Prime Arterial-Augmented	6	53,000	60,000	66,000
Major Roadway	4	28,200	31,600	35,200
Major Roadway-Augmented	4 +	36,300	41,000	45,400
Collector Roadway	4	26,000	29,200	32,400
Local Roadway	2	11,200	12,600	14,000
Local Roadway-Augmented	2 +	16,000	18,000	20,000

* Capacity means the maximum volume for the stated level of service.

Source: CITY OF ENCINITAS
3/29/89

ATTACHMENT D

INTERSECTION ANALYSIS WORKSHEETS

HCM 6th AWSC
1: Manchester Avenue & I-5 SB Ramps

Intersection	
Intersection Delay, s/veh	147
Intersection LOS	F

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑	↱	↰	↱
Traffic Vol, veh/h	349	63	210	1083	31	11
Future Vol, veh/h	349	63	210	1083	31	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	379	68	228	1177	34	12
Number of Lanes	1	1	1	1	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	18.5	192.3	11.5
HCM LOS	C	F	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	349	63	210	1083	31	11
LT Vol	349	0	0	0	31	0
Through Vol	0	63	210	0	0	0
RT Vol	0	0	0	1083	0	11
Lane Flow Rate	379	68	228	1177	34	12
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.642	0.106	0.328	1.46	0.074	0.022
Departure Headway (Hd)	6.535	6.029	5.169	4.465	8.548	7.313
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	558	598	696	824	422	492
Service Time	4.235	3.729	2.901	2.196	6.248	5.013
HCM Lane V/C Ratio	0.679	0.114	0.328	1.428	0.081	0.024
HCM Control Delay	20.2	9.4	10.4	227.6	11.9	10.2
HCM Lane LOS	C	A	B	F	B	B
HCM 95th-tile Q	4.5	0.4	1.4	54.1	0.2	0.1

HCM 6th Signalized Intersection Summary
2: Manchester Avenue & I-5 NB Ramps

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑↑	↱	↰↰	↱
Traffic Volume (veh/h)	22	164	1154	36	677	72
Future Volume (veh/h)	22	164	1154	36	677	72
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	24	178	1254	39	736	78
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	49	1126	1778	793	770	353
Arrive On Green	0.03	0.60	0.50	0.50	0.22	0.22
Sat Flow, veh/h	1781	1870	3647	1585	3456	1585
Grp Volume(v), veh/h	24	178	1254	39	736	78
Grp Sat Flow(s),veh/h/ln	1781	1870	1777	1585	1728	1585
Q Serve(g_s), s	0.8	2.4	15.4	0.7	11.9	2.3
Cycle Q Clear(g_c), s	0.8	2.4	15.4	0.7	11.9	2.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	49	1126	1778	793	770	353
V/C Ratio(X)	0.49	0.16	0.71	0.05	0.96	0.22
Avail Cap(c_a), veh/h	157	1240	1778	793	770	353
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.1	4.9	10.9	7.2	21.7	18.0
Incr Delay (d2), s/veh	2.7	0.0	2.4	0.1	23.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.7	5.4	0.2	6.9	2.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	29.8	5.0	13.3	7.4	45.1	19.4
LnGrp LOS	C	A	B	A	D	B
Approach Vol, veh/h		202	1293		814	
Approach Delay, s/veh		7.9	13.1		42.6	
Approach LOS		A	B		D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		39.4		17.2	5.8	33.6
Change Period (Y+Rc), s		5.3		4.6	* 4.2	5.3
Max Green Setting (Gmax), s		37.5		12.6	* 5	28.3
Max Q Clear Time (g_c+I1), s		4.4		13.9	2.8	17.4
Green Ext Time (p_c), s		0.7		0.0	0.0	5.0

Intersection Summary	
HCM 6th Ctrl Delay	23.1
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th AWSC
1: Manchester Avenue & I-5 SB Ramps

Existing PM
12/13/2019

Intersection	
Intersection Delay, s/veh	38.5
Intersection LOS	E

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑	↱	↰	↱
Traffic Vol, veh/h	104	134	258	770	61	19
Future Vol, veh/h	104	134	258	770	61	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	113	146	280	837	66	21
Number of Lanes	1	1	1	1	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	10.6	47.1	11.2
HCM LOS	B	E	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	104	134	258	770	61	19
LT Vol	104	0	0	0	61	0
Through Vol	0	134	258	0	0	0
RT Vol	0	0	0	770	0	19
Lane Flow Rate	113	146	280	837	66	21
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.2	0.237	0.399	1.027	0.14	0.037
Departure Headway (Hd)	6.469	5.963	5.122	4.418	7.753	6.533
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	558	606	698	820	465	551
Service Time	4.169	3.663	2.88	2.175	5.453	4.233
HCM Lane V/C Ratio	0.203	0.241	0.401	1.021	0.142	0.038
HCM Control Delay	10.8	10.5	11.3	59.1	11.7	9.5
HCM Lane LOS	B	B	B	F	B	A
HCM 95th-tile Q	0.7	0.9	1.9	19	0.5	0.1

HCM 6th Signalized Intersection Summary
2: Manchester Avenue & I-5 NB Ramps

Existing PM
12/13/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑↑	↱	↰↰	↱
Traffic Volume (veh/h)	15	184	888	80	1085	138
Future Volume (veh/h)	15	184	888	80	1085	138
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	16	200	965	87	1179	150
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	34	893	1419	633	1327	609
Arrive On Green	0.02	0.48	0.40	0.40	0.38	0.38
Sat Flow, veh/h	1781	1870	3647	1585	3456	1585
Grp Volume(v), veh/h	16	200	965	87	1179	150
Grp Sat Flow(s),veh/h/ln	1781	1870	1777	1585	1728	1585
Q Serve(g_s), s	0.6	4.5	16.0	2.5	22.8	4.6
Cycle Q Clear(g_c), s	0.6	4.5	16.0	2.5	22.8	4.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	34	893	1419	633	1327	609
V/C Ratio(X)	0.47	0.22	0.68	0.14	0.89	0.25
Avail Cap(c_a), veh/h	125	988	1419	633	1327	609
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.6	10.9	17.7	13.6	20.6	15.0
Incr Delay (d2), s/veh	3.7	0.0	2.6	0.5	9.1	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.7	6.5	0.9	10.0	5.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	38.4	11.0	20.3	14.1	29.7	15.9
LnGrp LOS	D	B	C	B	C	B
Approach Vol, veh/h		216	1052		1329	
Approach Delay, s/veh		13.0	19.8		28.1	
Approach LOS		B	B		C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		39.4		32.0	5.6	33.8
Change Period (Y+Rc), s		5.3		4.6	* 4.2	5.3
Max Green Setting (Gmax), s		37.7		27.4	* 5	28.5
Max Q Clear Time (g_c+I1), s		6.5		24.8	2.6	18.0
Green Ext Time (p_c), s		0.7		1.1	0.0	3.7

Intersection Summary	
HCM 6th Ctrl Delay	23.5
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

1: Manchester Avenue & I-5 SB Ramps

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑	↱↱	↰	↱
Traffic Volume (veh/h)	349	64	211	1092	37	11
Future Volume (veh/h)	349	64	211	1092	37	11
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	379	70	229	1187	40	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	416	1184	648	1641	431	383
Arrive On Green	0.23	0.63	0.35	0.35	0.24	0.24
Sat Flow, veh/h	1781	1870	1870	2790	1781	1585
Grp Volume(v), veh/h	379	70	229	1187	40	12
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1395	1781	1585
Q Serve(g_s), s	16.4	1.1	7.2	24.1	1.4	0.5
Cycle Q Clear(g_c), s	16.4	1.1	7.2	24.1	1.4	0.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	416	1184	648	1641	431	383
V/C Ratio(X)	0.91	0.06	0.35	0.72	0.09	0.03
Avail Cap(c_a), veh/h	424	1207	663	1663	431	383
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.5	5.5	19.2	11.7	23.2	22.9
Incr Delay (d2), s/veh	23.5	0.0	0.3	1.6	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.4	0.4	3.0	11.7	0.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	53.0	5.5	19.6	13.2	23.7	23.0
LnGrp LOS	D	A	B	B	C	C
Approach Vol, veh/h		449	1416		52	
Approach Delay, s/veh		45.6	14.2		23.5	
Approach LOS		D	B		C	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				55.3		23.7	22.6	32.7
Change Period (Y+Rc), s				5.3		4.6	* 4.2	5.3
Max Green Setting (Gmax), s				51.0		19.1	* 19	28.0
Max Q Clear Time (g_c+I1), s				3.1		3.4	18.4	26.1
Green Ext Time (p_c), s				0.4		0.1	0.1	1.3

Intersection Summary		
HCM 6th Ctrl Delay		21.8
HCM 6th LOS		C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

2: Manchester Avenue & I-5 NB Ramps

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑↑	↱	↰↰	↱
Traffic Volume (veh/h)	22	170	1165	43	685	72
Future Volume (veh/h)	22	170	1165	43	685	72
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	24	185	1266	47	745	78
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	49	1123	1771	790	776	356
Arrive On Green	0.03	0.60	0.50	0.50	0.22	0.22
Sat Flow, veh/h	1781	1870	3647	1585	3456	1585
Grp Volume(v), veh/h	24	185	1266	47	745	78
Grp Sat Flow(s),veh/h/ln	1781	1870	1777	1585	1728	1585
Q Serve(g_s), s	0.8	2.5	15.7	0.9	12.1	2.3
Cycle Q Clear(g_c), s	0.8	2.5	15.7	0.9	12.1	2.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	49	1123	1771	790	776	356
V/C Ratio(X)	0.49	0.16	0.71	0.06	0.96	0.22
Avail Cap(c_a), veh/h	157	1237	1771	790	776	356
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.1	5.0	11.1	7.3	21.7	17.9
Incr Delay (d2), s/veh	2.7	0.0	2.5	0.1	24.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.7	5.5	0.3	7.0	2.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	29.8	5.0	13.5	7.5	45.7	19.3
LnGrp LOS	C	A	B	A	D	B
Approach Vol, veh/h		209	1313		823	
Approach Delay, s/veh		7.9	13.3		43.2	
Approach LOS		A	B		D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		39.3		17.3	5.8	33.5
Change Period (Y+Rc), s		5.3		4.6	* 4.2	5.3
Max Green Setting (Gmax), s		37.4		12.7	* 5	28.2
Max Q Clear Time (g_c+I1), s		4.5		14.1	2.8	17.7
Green Ext Time (p_c), s		0.7		0.0	0.0	4.9

Intersection Summary		
HCM 6th Ctrl Delay		23.3
HCM 6th LOS		C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: Manchester Avenue & Manchester DAR

Ex + P AM
12/13/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰Y	
Traffic Volume (veh/h)	14	841	1190	2	3	18
Future Volume (veh/h)	14	841	1190	2	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1900
Adj Flow Rate, veh/h	15	914	1293	2	3	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	184	1421	1421	634	713	644
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	426	3647	3647	1585	1781	1610
Grp Volume(v), veh/h	15	914	1293	2	3	20
Grp Sat Flow(s),veh/h/ln	426	1777	1777	1585	1781	1610
Q Serve(g_s), s	1.5	9.3	15.4	0.0	0.0	0.3
Cycle Q Clear(g_c), s	17.0	9.3	15.4	0.0	0.0	0.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	184	1421	1421	634	713	644
V/C Ratio(X)	0.08	0.64	0.91	0.00	0.00	0.03
Avail Cap(c_a), veh/h	184	1421	1421	634	713	644
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.7	10.9	12.7	8.1	8.1	8.2
Incr Delay (d2), s/veh	0.2	1.0	9.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.0	6.4	0.0	0.0	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.9	11.9	21.7	8.1	8.1	8.3
LnGrp LOS	C	B	C	A	A	A
Approach Vol, veh/h		929	1295		23	
Approach Delay, s/veh		12.0	21.7		8.3	
Approach LOS		B	C		A	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	22.5	22.5	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	19.0	2.3	17.4
Green Ext Time (p_c), s	0.0	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	17.6
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary
1: Manchester Avenue & I-5 SB Ramps

Ex + P PM
12/13/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑	↱↱	↰	↱
Traffic Volume (veh/h)	104	136	259	781	72	19
Future Volume (veh/h)	104	136	259	781	72	19
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	113	148	282	849	78	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	147	862	556	1802	621	553
Arrive On Green	0.08	0.46	0.30	0.30	0.35	0.35
Sat Flow, veh/h	1781	1870	1870	2790	1781	1585
Grp Volume(v), veh/h	113	148	282	849	78	21
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1395	1781	1585
Q Serve(g_s), s	3.2	2.4	6.5	8.0	1.5	0.5
Cycle Q Clear(g_c), s	3.2	2.4	6.5	8.0	1.5	0.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	147	862	556	1802	621	553
V/C Ratio(X)	0.77	0.17	0.51	0.47	0.13	0.04
Avail Cap(c_a), veh/h	336	1513	1009	2477	621	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.3	8.2	15.1	4.7	11.5	11.2
Incr Delay (d2), s/veh	8.2	0.1	0.7	0.2	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.8	2.5	4.5	0.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.5	8.3	15.8	4.9	11.9	11.3
LnGrp LOS	C	A	B	A	B	B
Approach Vol, veh/h		261	1131		99	
Approach Delay, s/veh		18.4	7.6		11.8	
Approach LOS		B	A		B	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	29.2	22.7	8.5	20.7
Change Period (Y+Rc), s	5.3	4.6	* 4.2	5.3
Max Green Setting (Gmax), s	42.0	18.1	* 9.8	28.0
Max Q Clear Time (g_c+I1), s	4.4	3.5	5.2	10.0
Green Ext Time (p_c), s	0.9	0.2	0.1	5.4

Intersection Summary	
HCM 6th Ctrl Delay	9.8
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Manchester Avenue & I-5 NB Ramps

Ex + P PM
12/13/2019

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑↑	↱	↰↰	↱
Traffic Volume (veh/h)	15	197	900	89	1099	138
Future Volume (veh/h)	15	197	900	89	1099	138
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	16	214	978	97	1195	150
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	34	893	1419	633	1327	609
Arrive On Green	0.02	0.48	0.40	0.40	0.38	0.38
Sat Flow, veh/h	1781	1870	3647	1585	3456	1585
Grp Volume(v), veh/h	16	214	978	97	1195	150
Grp Sat Flow(s),veh/h/ln	1781	1870	1777	1585	1728	1585
Q Serve(g_s), s	0.6	4.8	16.3	2.8	23.2	4.6
Cycle Q Clear(g_c), s	0.6	4.8	16.3	2.8	23.2	4.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	34	893	1419	633	1327	609
V/C Ratio(X)	0.47	0.24	0.69	0.15	0.90	0.25
Avail Cap(c_a), veh/h	125	988	1419	633	1327	609
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.6	11.0	17.8	13.7	20.7	15.0
Incr Delay (d2), s/veh	3.7	0.1	2.8	0.5	10.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.8	6.6	1.0	10.4	5.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	38.4	11.1	20.5	14.2	30.7	15.9
LnGrp LOS	D	B	C	B	C	B
Approach Vol, veh/h		230	1075		1345	
Approach Delay, s/veh		13.0	19.9		29.1	
Approach LOS		B	B		C	

Timer - Assigned Phs	2	4	5	6
Phs Duration (G+Y+Rc), s	39.4	32.0	5.6	33.8
Change Period (Y+Rc), s	5.3	4.6	* 4.2	5.3
Max Green Setting (Gmax), s	37.7	27.4	* 5	28.5
Max Q Clear Time (g_c+I1), s	6.8	25.2	2.6	18.3
Green Ext Time (p_c), s	0.8	0.9	0.0	3.8

Intersection Summary	
HCM 6th Ctrl Delay	24.0
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: Manchester Avenue & Manchester DAR

Ex + P PM
12/13/2019

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰↰↱	
Traffic Volume (veh/h)	27	1269	968	5	4	21
Future Volume (veh/h)	27	1269	968	5	4	21
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1900
Adj Flow Rate, veh/h	29	1379	1052	5	4	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	274	1695	1695	756	627	567
Arrive On Green	0.48	0.48	0.48	0.48	0.35	0.35
Sat Flow, veh/h	534	3647	3647	1585	1781	1610
Grp Volume(v), veh/h	29	1379	1052	5	4	23
Grp Sat Flow(s),veh/h/ln	534	1777	1777	1585	1781	1610
Q Serve(g_s), s	2.2	17.4	11.6	0.1	0.1	0.5
Cycle Q Clear(g_c), s	13.8	17.4	11.6	0.1	0.1	0.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	274	1695	1695	756	627	567
V/C Ratio(X)	0.11	0.81	0.62	0.01	0.01	0.04
Avail Cap(c_a), veh/h	299	1859	1859	829	627	567
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.3	11.8	10.2	7.2	11.1	11.2
Incr Delay (d2), s/veh	0.2	2.7	0.6	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	6.0	3.7	0.0	0.0	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.5	14.4	10.8	7.2	11.1	11.3
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h		1408	1057		27	
Approach Delay, s/veh		14.4	10.8		11.3	
Approach LOS		B	B		B	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	29.6	23.0	29.6
Change Period (Y+Rc), s	4.5	4.5	4.5
Max Green Setting (Gmax), s	27.5	18.5	27.5
Max Q Clear Time (g_c+I1), s	19.4	2.5	13.6
Green Ext Time (p_c), s	5.6	0.0	6.4

Intersection Summary	
HCM 6th Ctrl Delay	12.8
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary
1: Manchester Avenue & I-5 SB Ramps

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑	↱↱	↰	↱
Traffic Volume (veh/h)	310	280	760	1025	220	40
Future Volume (veh/h)	310	280	760	1025	220	40
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	337	304	826	1114	239	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	357	1307	854	1837	360	320
Arrive On Green	0.20	0.70	0.46	0.46	0.20	0.20
Sat Flow, veh/h	1781	1870	1870	2790	1781	1585
Grp Volume(v), veh/h	337	304	826	1114	239	43
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1395	1781	1585
Q Serve(g_s), s	18.6	5.8	42.9	22.7	12.4	2.2
Cycle Q Clear(g_c), s	18.6	5.8	42.9	22.7	12.4	2.2
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	357	1307	854	1837	360	320
V/C Ratio(X)	0.95	0.23	0.97	0.61	0.66	0.13
Avail Cap(c_a), veh/h	357	1309	856	1840	360	320
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.4	5.4	26.4	9.7	36.7	32.7
Incr Delay (d2), s/veh	33.6	0.1	23.0	0.6	9.3	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.4	2.0	23.5	11.4	6.2	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	73.0	5.5	49.5	10.3	46.0	33.5
LnGrp LOS	E	A	D	B	D	C
Approach Vol, veh/h		641	1940		282	
Approach Delay, s/veh		41.0	27.0		44.1	
Approach LOS		D	C		D	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	75.1	24.8	24.2	50.9
Change Period (Y+Rc), s	5.3	4.6	* 4.2	5.3
Max Green Setting (Gmax), s	69.9	20.2	* 20	45.7
Max Q Clear Time (g_c+I1), s	7.8	14.4	20.6	44.9
Green Ext Time (p_c), s	2.0	0.4	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	31.8
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Manchester Avenue & I-5 NB Ramps

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑↑↱		↰↰	↱
Traffic Volume (veh/h)	90	410	1715	195	940	80
Future Volume (veh/h)	90	410	1715	195	940	80
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	446	1864	212	1022	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	120	1045	2042	231	1097	503
Arrive On Green	0.07	0.56	0.44	0.44	0.32	0.32
Sat Flow, veh/h	1781	1870	4822	526	3456	1585
Grp Volume(v), veh/h	98	446	1360	716	1022	87
Grp Sat Flow(s),veh/h/ln	1781	1870	1702	1776	1728	1585
Q Serve(g_s), s	4.3	11.1	29.9	30.3	22.9	3.2
Cycle Q Clear(g_c), s	4.3	11.1	29.9	30.3	22.9	3.2
Prop In Lane	1.00			0.30	1.00	1.00
Lane Grp Cap(c), veh/h	120	1045	1494	779	1097	503
V/C Ratio(X)	0.82	0.43	0.91	0.92	0.93	0.17
Avail Cap(c_a), veh/h	120	1045	1494	779	1097	503
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.8	10.2	21.0	21.1	26.5	19.7
Incr Delay (d2), s/veh	31.6	0.1	9.9	17.7	15.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	4.1	12.9	15.3	11.2	3.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	68.4	10.3	30.8	38.8	41.5	20.5
LnGrp LOS	E	B	C	D	D	C
Approach Vol, veh/h		544	2076		1109	
Approach Delay, s/veh		20.8	33.6		39.8	
Approach LOS		C	C		D	

Timer - Assigned Phs	2	4	5	6
Phs Duration (G+Y+Rc), s	50.0	30.0	9.6	40.4
Change Period (Y+Rc), s	5.3	4.6	* 4.2	5.3
Max Green Setting (Gmax), s	44.7	25.4	* 5.4	35.1
Max Q Clear Time (g_c+I1), s	13.1	24.9	6.3	32.3
Green Ext Time (p_c), s	1.9	0.2	0.0	2.3

Intersection Summary	
HCM 6th Ctrl Delay	33.6
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰↰↱	
Traffic Volume (veh/h)	10	1340	1890	10	10	10
Future Volume (veh/h)	10	1340	1890	10	10	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1900
Adj Flow Rate, veh/h	11	1457	2054	11	11	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	24	2395	2141	955	373	337
Arrive On Green	0.01	0.67	0.60	0.60	0.21	0.21
Sat Flow, veh/h	1781	3647	3647	1585	1781	1610
Grp Volume(v), veh/h	11	1457	2054	11	11	11
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1585	1781	1610
Q Serve(g_s), s	0.5	19.5	46.8	0.2	0.4	0.5
Cycle Q Clear(g_c), s	0.5	19.5	46.8	0.2	0.4	0.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	24	2395	2141	955	373	337
V/C Ratio(X)	0.46	0.61	0.96	0.01	0.03	0.03
Avail Cap(c_a), veh/h	104	2565	2151	959	373	337
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.1	7.7	16.1	6.8	27.0	27.0
Incr Delay (d2), s/veh	13.1	0.4	11.4	0.0	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	6.2	19.4	0.1	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	55.2	8.1	27.5	6.8	27.2	27.2
LnGrp LOS	E	A	C	A	C	C
Approach Vol, veh/h		1468	2065		22	
Approach Delay, s/veh		8.5	27.4		27.2	
Approach LOS		A	C		C	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				62.9		23.0	6.2	56.8
Change Period (Y+Rc), s				5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s				62.0		18.0	5.0	52.0
Max Q Clear Time (g_c+I1), s				21.5		2.5	2.5	48.8
Green Ext Time (p_c), s				16.1		0.0	0.0	3.0

Intersection Summary	
HCM 6th Ctrl Delay	19.6
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑	↱↱	↰	↱
Traffic Volume (veh/h)	150	320	630	1030	220	60
Future Volume (veh/h)	150	320	630	1030	220	60
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	163	348	685	1120	239	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	200	1081	757	1910	498	443
Arrive On Green	0.11	0.58	0.40	0.40	0.28	0.28
Sat Flow, veh/h	1781	1870	1870	2790	1781	1585
Grp Volume(v), veh/h	163	348	685	1120	239	65
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1395	1781	1585
Q Serve(g_s), s	6.2	6.7	23.9	14.7	7.7	2.1
Cycle Q Clear(g_c), s	6.2	6.7	23.9	14.7	7.7	2.1
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	200	1081	757	1910	498	443
V/C Ratio(X)	0.81	0.32	0.90	0.59	0.48	0.15
Avail Cap(c_a), veh/h	200	1097	773	1933	498	443
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.1	7.6	19.4	5.8	20.8	18.8
Incr Delay (d2), s/veh	22.1	0.2	13.9	0.5	3.3	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	2.3	12.2	8.1	3.5	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	52.2	7.8	33.3	6.2	24.1	19.5
LnGrp LOS	D	A	C	A	C	B
Approach Vol, veh/h		511	1805		304	
Approach Delay, s/veh		21.9	16.5		23.1	
Approach LOS		C	B		C	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				45.4		24.0	12.0	33.4
Change Period (Y+Rc), s				5.3		4.6	* 4.2	5.3
Max Green Setting (Gmax), s				40.7		19.4	* 7.8	28.7
Max Q Clear Time (g_c+I1), s				8.7		9.7	8.2	25.9
Green Ext Time (p_c), s				2.3		0.6	0.0	2.2

Intersection Summary	
HCM 6th Ctrl Delay	18.3
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

2: Manchester Avenue & I-5 NB Ramps

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑↑↱		↰↰	↱
Traffic Volume (veh/h)	70	470	1530	180	1400	130
Future Volume (veh/h)	70	470	1530	180	1400	130
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	76	511	1663	196	1522	141
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	91	855	1686	198	1534	704
Arrive On Green	0.05	0.46	0.36	0.36	0.44	0.44
Sat Flow, veh/h	1781	1870	4800	544	3456	1585
Grp Volume(v), veh/h	76	511	1221	638	1522	141
Grp Sat Flow(s),veh/h/ln	1781	1870	1702	1772	1728	1585
Q Serve(g_s), s	4.2	20.4	35.6	35.8	43.8	5.4
Cycle Q Clear(g_c), s	4.2	20.4	35.6	35.8	43.8	5.4
Prop In Lane	1.00			0.31	1.00	1.00
Lane Grp Cap(c), veh/h	91	855	1239	645	1534	704
V/C Ratio(X)	0.84	0.60	0.99	0.99	0.99	0.20
Avail Cap(c_a), veh/h	91	855	1239	645	1534	704
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.0	20.3	31.5	31.6	27.6	17.0
Incr Delay (d2), s/veh	44.3	0.8	22.3	32.9	21.1	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	8.8	17.9	20.6	21.6	6.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	91.3	21.1	53.8	64.5	48.8	17.6
LnGrp LOS	F	C	D	E	D	B
Approach Vol, veh/h		587	1859		1663	
Approach Delay, s/veh		30.2	57.5		46.1	
Approach LOS		C	E		D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		51.0		49.0	9.3	41.7
Change Period (Y+Rc), s		5.3		4.6	* 4.2	5.3
Max Green Setting (Gmax), s		45.7		44.4	* 5.1	36.4
Max Q Clear Time (g_c+I1), s		22.4		45.8	6.2	37.8
Green Ext Time (p_c), s		2.1		0.0	0.0	0.0

Intersection Summary			
HCM 6th Ctrl Delay			49.0
HCM 6th LOS			D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

3: Manchester Avenue & DAR Access Road

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰Y	
Traffic Volume (veh/h)	10	1860	1690	10	10	10
Future Volume (veh/h)	10	1860	1690	10	10	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1900
Adj Flow Rate, veh/h	11	2022	1837	11	11	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	24	2276	1999	892	412	372
Arrive On Green	0.01	0.64	0.56	0.56	0.23	0.23
Sat Flow, veh/h	1781	3647	3647	1585	1781	1610
Grp Volume(v), veh/h	11	2022	1837	11	11	11
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1585	1781	1610
Q Serve(g_s), s	0.5	37.0	36.4	0.2	0.4	0.4
Cycle Q Clear(g_c), s	0.5	37.0	36.4	0.2	0.4	0.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	24	2276	1999	892	412	372
V/C Ratio(X)	0.45	0.89	0.92	0.01	0.03	0.03
Avail Cap(c_a), veh/h	114	2374	1999	892	412	372
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.1	11.7	15.4	7.5	23.1	23.2
Incr Delay (d2), s/veh	12.7	4.4	7.4	0.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	12.9	14.6	0.1	0.2	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	50.8	16.1	22.8	7.5	23.3	23.3
LnGrp LOS	D	B	C	A	C	C
Approach Vol, veh/h		2033	1848		22	
Approach Delay, s/veh		16.3	22.7		23.3	
Approach LOS		B	C		C	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				54.9		23.0	6.1	48.8
Change Period (Y+Rc), s				5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s				52.0		18.0	5.0	42.0
Max Q Clear Time (g_c+I1), s				39.0		2.4	2.5	38.4
Green Ext Time (p_c), s				10.9		0.0	0.0	3.1

Intersection Summary			
HCM 6th Ctrl Delay			19.4
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

1: Manchester Avenue & I-5 SB Ramps

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑	↱↱	↰	↱
Traffic Volume (veh/h)	310	281	761	1035	225	40
Future Volume (veh/h)	310	281	761	1035	225	40
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	337	305	827	1125	245	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	357	1307	854	1838	360	320
Arrive On Green	0.20	0.70	0.46	0.46	0.20	0.20
Sat Flow, veh/h	1781	1870	1870	2790	1781	1585
Grp Volume(v), veh/h	337	305	827	1125	245	43
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1395	1781	1585
Q Serve(g_s), s	18.6	5.9	43.0	23.0	12.7	2.2
Cycle Q Clear(g_c), s	18.6	5.9	43.0	23.0	12.7	2.2
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	357	1307	854	1838	360	320
V/C Ratio(X)	0.95	0.23	0.97	0.61	0.68	0.13
Avail Cap(c_a), veh/h	357	1308	855	1840	360	320
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.4	5.4	26.4	9.8	36.9	32.7
Incr Delay (d2), s/veh	33.6	0.1	23.3	0.6	9.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.4	2.0	23.6	11.6	6.5	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	73.1	5.5	49.7	10.4	46.8	33.6
LnGrp LOS	E	A	D	B	D	C
Approach Vol, veh/h		642	1952		288	
Approach Delay, s/veh		41.0	27.0		44.8	
Approach LOS		D	C		D	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	75.1	24.8	24.2	50.9
Change Period (Y+Rc), s	5.3	4.6	* 4.2	5.3
Max Green Setting (Gmax), s	69.9	20.2	* 20	45.7
Max Q Clear Time (g_c+I1), s	7.9	14.7	20.6	45.0
Green Ext Time (p_c), s	2.0	0.4	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	31.9
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

2: Manchester Avenue & I-5 NB Ramps

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑↑↱		↰↰	↱
Traffic Volume (veh/h)	90	416	1726	202	948	80
Future Volume (veh/h)	90	416	1726	202	948	80
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	452	1876	220	1030	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	120	1045	2035	237	1097	503
Arrive On Green	0.07	0.56	0.44	0.44	0.32	0.32
Sat Flow, veh/h	1781	1870	4806	540	3456	1585
Grp Volume(v), veh/h	98	452	1373	723	1030	87
Grp Sat Flow(s),veh/h/ln	1781	1870	1702	1773	1728	1585
Q Serve(g_s), s	4.3	11.2	30.4	30.9	23.2	3.2
Cycle Q Clear(g_c), s	4.3	11.2	30.4	30.9	23.2	3.2
Prop In Lane	1.00			0.30	1.00	1.00
Lane Grp Cap(c), veh/h	120	1045	1494	778	1097	503
V/C Ratio(X)	0.82	0.43	0.92	0.93	0.94	0.17
Avail Cap(c_a), veh/h	120	1045	1494	778	1097	503
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.8	10.3	21.1	21.3	26.5	19.7
Incr Delay (d2), s/veh	31.6	0.1	10.6	19.0	15.9	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	4.1	13.2	15.8	11.4	3.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	68.4	10.4	31.8	40.2	42.5	20.5
LnGrp LOS	E	B	C	D	D	C
Approach Vol, veh/h		550	2096		1117	
Approach Delay, s/veh		20.7	34.7		40.8	
Approach LOS		C	C		D	

Timer - Assigned Phs	2	4	5	6
Phs Duration (G+Y+Rc), s	50.0	30.0	9.6	40.4
Change Period (Y+Rc), s	5.3	4.6	* 4.2	5.3
Max Green Setting (Gmax), s	44.7	25.4	* 5.4	35.1
Max Q Clear Time (g_c+I1), s	13.2	25.2	6.3	32.9
Green Ext Time (p_c), s	1.9	0.1	0.0	1.9

Intersection Summary	
HCM 6th Ctrl Delay	34.4
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

3: Manchester Avenue & DAR Access Road

Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations	↰	↑↑	↑↑	↱	↰Y			
Traffic Volume (veh/h)	24	1340	1890	12	13	28		
Future Volume (veh/h)	24	1340	1890	12	13	28		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach		No	No		No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1900		
Adj Flow Rate, veh/h	26	1457	2054	13	14	30		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	0		
Cap, veh/h	48	2413	2114	943	368	332		
Arrive On Green	0.03	0.68	0.59	0.59	0.21	0.21		
Sat Flow, veh/h	1781	3647	3647	1585	1781	1610		
Grp Volume(v), veh/h	26	1457	2054	13	14	30		
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1585	1781	1610		
Q Serve(g_s), s	1.3	19.5	48.4	0.3	0.5	1.3		
Cycle Q Clear(g_c), s	1.3	19.5	48.4	0.3	0.5	1.3		
Prop In Lane	1.00			1.00	1.00	1.00		
Lane Grp Cap(c), veh/h	48	2413	2114	943	368	332		
V/C Ratio(X)	0.54	0.60	0.97	0.01	0.04	0.09		
Avail Cap(c_a), veh/h	102	2526	2118	945	368	332		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	41.9	7.6	17.0	7.2	27.7	28.0		
Incr Delay (d2), s/veh	9.3	0.4	13.5	0.0	0.2	0.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.7	6.2	20.8	0.1	0.3	0.0		
Unsig. Movement Delay, s/veh								
LnGrp Delay(d),s/veh	51.3	8.0	30.4	7.2	27.9	28.5		
LnGrp LOS	D	A	C	A	C	C		
Approach Vol, veh/h		1483	2067		44			
Approach Delay, s/veh		8.8	30.3		28.3			
Approach LOS		A	C		C			
Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				64.2		23.0	7.3	56.9
Change Period (Y+Rc), s				5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s				62.0		18.0	5.0	52.0
Max Q Clear Time (g_c+I1), s				21.5		3.3	3.3	50.4
Green Ext Time (p_c), s				16.1		0.1	0.0	1.5
Intersection Summary								
HCM 6th Ctrl Delay			21.4					
HCM 6th LOS			C					

Notes

User approved volume balancing among the lanes for turning movement.

1: Manchester Avenue & I-5 SB Ramps

Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations	↰	↑	↑	↱↱	↰	↱		
Traffic Volume (veh/h)	150	322	631	1041	231	60		
Future Volume (veh/h)	150	322	631	1041	231	60		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach		No	No		No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870		
Adj Flow Rate, veh/h	163	350	686	1132	251	65		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	200	1081	758	1910	498	443		
Arrive On Green	0.11	0.58	0.41	0.41	0.28	0.28		
Sat Flow, veh/h	1781	1870	1870	2790	1781	1585		
Grp Volume(v), veh/h	163	350	686	1132	251	65		
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1395	1781	1585		
Q Serve(g_s), s	6.2	6.7	23.9	15.0	8.2	2.1		
Cycle Q Clear(g_c), s	6.2	6.7	23.9	15.0	8.2	2.1		
Prop In Lane	1.00			1.00	1.00	1.00		
Lane Grp Cap(c), veh/h	200	1081	758	1910	498	443		
V/C Ratio(X)	0.81	0.32	0.91	0.59	0.50	0.15		
Avail Cap(c_a), veh/h	200	1096	773	1933	498	443		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	30.1	7.6	19.4	5.8	21.0	18.8		
Incr Delay (d2), s/veh	22.1	0.2	14.0	0.5	3.6	0.7		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	3.8	2.3	12.2	8.3	3.7	0.1		
Unsig. Movement Delay, s/veh								
LnGrp Delay(d),s/veh	52.3	7.8	33.4	6.3	24.6	19.5		
LnGrp LOS	D	A	C	A	C	B		
Approach Vol, veh/h		513	1818		316			
Approach Delay, s/veh		21.9	16.5		23.6			
Approach LOS		C	B		C			
Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				45.4		24.0	12.0	33.4
Change Period (Y+Rc), s				5.3		4.6	* 4.2	5.3
Max Green Setting (Gmax), s				40.7		19.4	* 7.8	28.7
Max Q Clear Time (g_c+I1), s				8.7		10.2	8.2	25.9
Green Ext Time (p_c), s				2.3		0.7	0.0	2.2
Intersection Summary								
HCM 6th Ctrl Delay			18.4					
HCM 6th LOS			B					

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

Yr 2030 no DAR + P PM

2: Manchester Avenue & I-5 NB Ramps

12/13/2019

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑↑↱		↰↰	↱
Traffic Volume (veh/h)	70	483	1542	189	1414	130
Future Volume (veh/h)	70	483	1542	189	1414	130
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	76	525	1676	205	1537	141
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	91	855	1678	205	1534	704
Arrive On Green	0.05	0.46	0.36	0.36	0.44	0.44
Sat Flow, veh/h	1781	1870	4779	562	3456	1585
Grp Volume(v), veh/h	76	525	1236	645	1537	141
Grp Sat Flow(s),veh/h/ln	1781	1870	1702	1769	1728	1585
Q Serve(g_s), s	4.2	21.2	36.2	36.4	44.4	5.4
Cycle Q Clear(g_c), s	4.2	21.2	36.2	36.4	44.4	5.4
Prop In Lane	1.00			0.32	1.00	1.00
Lane Grp Cap(c), veh/h	91	855	1239	644	1534	704
V/C Ratio(X)	0.84	0.61	1.00	1.00	1.00	0.20
Avail Cap(c_a), veh/h	91	855	1239	644	1534	704
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.0	20.5	31.8	31.8	27.8	17.0
Incr Delay (d2), s/veh	44.3	1.0	24.9	35.9	23.4	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	9.1	18.6	21.4	22.3	6.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	91.3	21.5	56.7	67.7	51.2	17.6
LnGrp LOS	F	C	E	F	F	B
Approach Vol, veh/h		601	1881		1678	
Approach Delay, s/veh		30.3	60.5		48.4	
Approach LOS		C	E		D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		51.0		49.0	9.3	41.7
Change Period (Y+Rc), s		5.3		4.6	* 4.2	5.3
Max Green Setting (Gmax), s		45.7		44.4	* 5.1	36.4
Max Q Clear Time (g_c+I1), s		23.2		46.4	6.2	38.4
Green Ext Time (p_c), s		2.2		0.0	0.0	0.0

Intersection Summary			
HCM 6th Ctrl Delay			51.2
HCM 6th LOS			D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

Yr 2030 no DAR + P PM

3: Manchester Avenue & DAR Access Road

12/13/2019

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰Y	
Traffic Volume (veh/h)	37	1860	1690	15	14	31
Future Volume (veh/h)	37	1860	1690	15	14	31
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1900
Adj Flow Rate, veh/h	40	2022	1837	16	15	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	66	2276	1915	854	412	372
Arrive On Green	0.04	0.64	0.54	0.54	0.23	0.23
Sat Flow, veh/h	1781	3647	3647	1585	1781	1610
Grp Volume(v), veh/h	40	2022	1837	16	15	34
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1585	1781	1610
Q Serve(g_s), s	1.7	37.0	38.4	0.4	0.5	1.3
Cycle Q Clear(g_c), s	1.7	37.0	38.4	0.4	0.5	1.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	66	2276	1915	854	412	372
V/C Ratio(X)	0.60	0.89	0.96	0.02	0.04	0.09
Avail Cap(c_a), veh/h	114	2374	1917	855	412	372
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.9	11.7	17.1	8.4	23.2	23.5
Incr Delay (d2), s/veh	8.5	4.4	12.3	0.0	0.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	12.9	16.7	0.1	0.2	1.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	45.5	16.1	29.5	8.4	23.4	24.0
LnGrp LOS	D	B	C	A	C	C
Approach Vol, veh/h		2062	1853		49	
Approach Delay, s/veh		16.7	29.3		23.8	
Approach LOS		B	C		C	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				54.9		23.0	7.9	47.0
Change Period (Y+Rc), s				5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s				52.0		18.0	5.0	42.0
Max Q Clear Time (g_c+I1), s				39.0		3.3	3.7	40.4
Green Ext Time (p_c), s				10.9		0.1	0.0	1.4

Intersection Summary			
HCM 6th Ctrl Delay			22.7
HCM 6th LOS			C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary
1: Manchester Avenue & I-5 SB Ramps

Yr 2030 w/ DAR AM
12/13/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑	↱↱	↰	↱
Traffic Volume (veh/h)	520	310	690	815	180	40
Future Volume (veh/h)	520	310	690	815	180	40
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	565	337	750	886	196	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	557	1389	733	1560	298	265
Arrive On Green	0.31	0.74	0.39	0.39	0.17	0.17
Sat Flow, veh/h	1781	1870	1870	2790	1781	1585
Grp Volume(v), veh/h	565	337	750	886	196	43
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1395	1781	1585
Q Serve(g_s), s	34.4	6.2	43.1	22.6	11.3	2.6
Cycle Q Clear(g_c), s	34.4	6.2	43.1	22.6	11.3	2.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	557	1389	733	1560	298	265
V/C Ratio(X)	1.01	0.24	1.02	0.57	0.66	0.16
Avail Cap(c_a), veh/h	557	1389	733	1560	298	265
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.8	4.4	33.5	15.7	42.9	39.2
Incr Delay (d2), s/veh	41.7	0.1	39.3	0.5	10.8	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.1	2.1	26.9	10.3	5.9	2.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	79.5	4.5	72.8	16.2	53.7	40.5
LnGrp LOS	F	A	F	B	D	D
Approach Vol, veh/h		902	1636		239	
Approach Delay, s/veh		51.5	42.1		51.3	
Approach LOS		D	D		D	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				87.0		23.0	38.6	48.4
Change Period (Y+Rc), s				5.3		4.6	* 4.2	5.3
Max Green Setting (Gmax), s				81.7		18.4	* 34	43.1
Max Q Clear Time (g_c+I1), s				8.2		13.3	36.4	45.1
Green Ext Time (p_c), s				2.3		0.3	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	46.0
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Manchester Avenue & I-5 NB Ramps

Yr 2030 w/ DAR AM
12/13/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑↑↱		↰↰	↱
Traffic Volume (veh/h)	110	380	1405	145	880	110
Future Volume (veh/h)	110	380	1405	145	880	110
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	120	413	1527	158	957	120
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	148	1034	1927	199	1056	485
Arrive On Green	0.08	0.55	0.41	0.41	0.31	0.31
Sat Flow, veh/h	1781	1870	4869	486	3456	1585
Grp Volume(v), veh/h	120	413	1105	580	957	120
Grp Sat Flow(s),veh/h/ln	1781	1870	1702	1783	1728	1585
Q Serve(g_s), s	4.6	8.9	19.9	19.9	18.6	4.0
Cycle Q Clear(g_c), s	4.6	8.9	19.9	19.9	18.6	4.0
Prop In Lane	1.00			0.27	1.00	1.00
Lane Grp Cap(c), veh/h	148	1034	1396	731	1056	485
V/C Ratio(X)	0.81	0.40	0.79	0.79	0.91	0.25
Avail Cap(c_a), veh/h	148	1034	1396	731	1056	485
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.6	9.0	18.0	18.1	23.3	18.3
Incr Delay (d2), s/veh	26.5	0.1	4.7	8.6	12.6	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	3.1	7.9	9.1	8.9	4.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	58.0	9.1	22.7	26.7	36.0	19.5
LnGrp LOS	E	A	C	C	D	B
Approach Vol, veh/h		533	1685		1077	
Approach Delay, s/veh		20.1	24.1		34.1	
Approach LOS		C	C		C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		44.0		26.0	10.0	34.0
Change Period (Y+Rc), s		5.3		4.6	* 4.2	5.3
Max Green Setting (Gmax), s		38.7		21.4	* 5.8	28.7
Max Q Clear Time (g_c+I1), s		10.9		20.6	6.6	21.9
Green Ext Time (p_c), s		1.7		0.3	0.0	4.4

Intersection Summary	
HCM 6th Ctrl Delay	26.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: Manchester Avenue & DAR Access Road

Yr 2030 w/ DAR AM
12/13/2019

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰Y	
Traffic Volume (veh/h)	30	1230	1520	40	140	20
Future Volume (veh/h)	30	1230	1520	40	140	20
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1900
Adj Flow Rate, veh/h	33	1337	1652	43	173	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	61	2075	1690	754	953	431
Arrive On Green	0.03	0.58	0.48	0.48	0.27	0.00
Sat Flow, veh/h	1781	3647	3647	1585	3563	1610
Grp Volume(v), veh/h	33	1337	1652	43	173	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1585	1781	1610
Q Serve(g_s), s	1.2	16.9	30.7	1.0	2.5	0.0
Cycle Q Clear(g_c), s	1.2	16.9	30.7	1.0	2.5	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	61	2075	1690	754	953	431
V/C Ratio(X)	0.54	0.64	0.98	0.06	0.18	0.00
Avail Cap(c_a), veh/h	132	2218	1690	754	953	431
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.0	9.3	17.3	9.5	19.0	0.0
Incr Delay (d2), s/veh	7.3	0.6	16.8	0.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	5.4	14.7	0.3	1.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	39.3	9.9	34.1	9.5	19.4	0.0
LnGrp LOS	D	A	C	A	B	A
Approach Vol, veh/h		1370	1695		173	
Approach Delay, s/veh		10.6	33.5		19.4	
Approach LOS		B	C		B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				44.3		23.0	7.3	37.0
Change Period (Y+Rc), s				5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s				42.0		18.0	5.0	32.0
Max Q Clear Time (g_c+I1), s				18.9		4.5	3.2	32.7
Green Ext Time (p_c), s				11.1		0.4	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	23.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary
1: Manchester Avenue & I-5 SB Ramps

Yr 2030 w/ DAR PM
12/13/2019

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑	↱↱	↰	↱
Traffic Volume (veh/h)	130	350	530	1030	210	50
Future Volume (veh/h)	130	350	530	1030	210	50
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	141	380	576	1120	228	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	178	1026	719	1911	535	476
Arrive On Green	0.10	0.55	0.38	0.38	0.30	0.30
Sat Flow, veh/h	1781	1870	1870	2790	1781	1585
Grp Volume(v), veh/h	141	380	576	1120	228	54
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1395	1781	1585
Q Serve(g_s), s	5.1	7.5	18.0	13.9	6.7	1.6
Cycle Q Clear(g_c), s	5.1	7.5	18.0	13.9	6.7	1.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	178	1026	719	1911	535	476
V/C Ratio(X)	0.79	0.37	0.80	0.59	0.43	0.11
Avail Cap(c_a), veh/h	223	1152	799	2029	535	476
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.8	8.4	18.0	5.4	18.4	16.6
Incr Delay (d2), s/veh	14.1	0.2	5.4	0.4	2.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	2.6	8.0	7.9	2.9	1.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	42.9	8.6	23.3	5.8	20.9	17.1
LnGrp LOS	D	A	C	A	C	B
Approach Vol, veh/h		521	1696		282	
Approach Delay, s/veh		17.9	11.8		20.1	
Approach LOS		B	B		C	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				41.3		24.3	10.8	30.5
Change Period (Y+Rc), s				5.3		4.6	* 4.2	5.3
Max Green Setting (Gmax), s				40.4		19.7	* 8.2	28.0
Max Q Clear Time (g_c+I1), s				9.5		8.7	7.1	20.0
Green Ext Time (p_c), s				2.5		0.6	0.0	5.2

Intersection Summary	
HCM 6th Ctrl Delay	14.0
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Manchester Avenue & I-5 NB Ramps

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑↑↱		↰↰	↱
Traffic Volume (veh/h)	110	450	1350	110	1250	210
Future Volume (veh/h)	110	450	1350	110	1250	210
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	120	489	1467	120	1359	228
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	150	885	1646	135	1440	661
Arrive On Green	0.08	0.47	0.34	0.34	0.42	0.42
Sat Flow, veh/h	1781	1870	4979	393	3456	1585
Grp Volume(v), veh/h	120	489	1038	549	1359	228
Grp Sat Flow(s),veh/h/ln	1781	1870	1702	1800	1728	1585
Q Serve(g_s), s	5.9	16.7	25.9	25.9	33.9	8.8
Cycle Q Clear(g_c), s	5.9	16.7	25.9	25.9	33.9	8.8
Prop In Lane	1.00			0.22	1.00	1.00
Lane Grp Cap(c), veh/h	150	885	1165	616	1440	661
V/C Ratio(X)	0.80	0.55	0.89	0.89	0.94	0.35
Avail Cap(c_a), veh/h	155	890	1165	616	1440	661
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.4	16.9	27.9	27.9	25.2	17.8
Incr Delay (d2), s/veh	22.7	0.4	10.5	17.7	13.6	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	6.9	11.8	13.7	15.8	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	63.1	17.3	38.4	45.6	38.8	19.3
LnGrp LOS	E	B	D	D	D	B
Approach Vol, veh/h		609	1587		1587	
Approach Delay, s/veh		26.3	40.9		36.0	
Approach LOS		C	D		D	

Timer - Assigned Phs	2	4	5	6
Phs Duration (G+Y+Rc), s	47.7	42.0	11.7	36.0
Change Period (Y+Rc), s	5.3	4.6	* 4.2	5.3
Max Green Setting (Gmax), s	42.7	37.4	* 7.8	30.7
Max Q Clear Time (g_c+I1), s	18.7	35.9	7.9	27.9
Green Ext Time (p_c), s	2.0	0.8	0.0	2.0

Intersection Summary	
HCM 6th Ctrl Delay	36.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: Manchester Avenue & DAR Access Road

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑↑	↱	↰Y	
Traffic Volume (veh/h)	30	1670	1410	20	180	40
Future Volume (veh/h)	30	1670	1410	20	180	40
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1900
Adj Flow Rate, veh/h	33	1815	1533	22	236	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	62	2003	2303	715	1000	452
Arrive On Green	0.03	0.56	0.45	0.45	0.28	0.00
Sat Flow, veh/h	1781	3647	5274	1585	3563	1610
Grp Volume(v), veh/h	33	1815	1533	22	236	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1702	1585	1781	1610
Q Serve(g_s), s	1.2	29.2	15.1	0.5	3.3	0.0
Cycle Q Clear(g_c), s	1.2	29.2	15.1	0.5	3.3	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	62	2003	2303	715	1000	452
V/C Ratio(X)	0.53	0.91	0.67	0.03	0.24	0.00
Avail Cap(c_a), veh/h	139	2050	2303	715	1000	452
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.5	12.5	13.8	9.8	17.8	0.0
Incr Delay (d2), s/veh	7.0	6.2	0.7	0.0	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	10.8	5.2	0.2	1.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	37.5	18.7	14.6	9.8	18.3	0.0
LnGrp LOS	D	B	B	A	B	A
Approach Vol, veh/h		1848	1555		236	
Approach Delay, s/veh		19.0	14.5		18.3	
Approach LOS		B	B		B	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	41.2	23.0	7.2	33.9
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	37.0	18.0	5.0	27.0
Max Q Clear Time (g_c+I1), s	31.2	5.3	3.2	17.1
Green Ext Time (p_c), s	4.9	0.6	0.0	6.9

Intersection Summary	
HCM 6th Ctrl Delay	17.1
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

1: Manchester Avenue & I-5 SB Ramps

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑	↱↱	↰	↱
Traffic Volume (veh/h)	520	311	691	824	185	40
Future Volume (veh/h)	520	311	691	824	185	40
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	565	338	751	896	201	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	557	1389	733	1560	298	265
Arrive On Green	0.31	0.74	0.39	0.39	0.17	0.17
Sat Flow, veh/h	1781	1870	1870	2790	1781	1585
Grp Volume(v), veh/h	565	338	751	896	201	43
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1395	1781	1585
Q Serve(g_s), s	34.4	6.2	43.1	22.9	11.7	2.6
Cycle Q Clear(g_c), s	34.4	6.2	43.1	22.9	11.7	2.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	557	1389	733	1560	298	265
V/C Ratio(X)	1.01	0.24	1.02	0.57	0.67	0.16
Avail Cap(c_a), veh/h	557	1389	733	1560	298	265
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.8	4.4	33.5	15.8	43.0	39.2
Incr Delay (d2), s/veh	41.7	0.1	39.7	0.5	11.6	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.1	2.1	27.0	10.5	6.1	2.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	79.5	4.5	73.1	16.3	54.6	40.5
LnGrp LOS	F	A	F	B	D	D
Approach Vol, veh/h		903	1647		244	
Approach Delay, s/veh		51.5	42.2		52.1	
Approach LOS		D	D		D	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				87.0		23.0	38.6	48.4
Change Period (Y+Rc), s				5.3		4.6	* 4.2	5.3
Max Green Setting (Gmax), s				81.7		18.4	* 34	43.1
Max Q Clear Time (g_c+I1), s				8.2		13.7	36.4	45.1
Green Ext Time (p_c), s				2.3		0.3	0.0	0.0

Intersection Summary			
HCM 6th Ctrl Delay			46.1
HCM 6th LOS			D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

2: Manchester Avenue & I-5 NB Ramps

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑↑↱		↰↰	↱
Traffic Volume (veh/h)	110	386	1415	152	887	110
Future Volume (veh/h)	110	386	1415	152	887	110
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	120	420	1538	165	964	120
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	148	1034	1920	206	1056	485
Arrive On Green	0.08	0.55	0.41	0.41	0.31	0.31
Sat Flow, veh/h	1781	1870	4851	502	3456	1585
Grp Volume(v), veh/h	120	420	1118	585	964	120
Grp Sat Flow(s),veh/h/ln	1781	1870	1702	1780	1728	1585
Q Serve(g_s), s	4.6	9.1	20.2	20.2	18.8	4.0
Cycle Q Clear(g_c), s	4.6	9.1	20.2	20.2	18.8	4.0
Prop In Lane	1.00			0.28	1.00	1.00
Lane Grp Cap(c), veh/h	148	1034	1396	730	1056	485
V/C Ratio(X)	0.81	0.41	0.80	0.80	0.91	0.25
Avail Cap(c_a), veh/h	148	1034	1396	730	1056	485
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.6	9.0	18.1	18.2	23.4	18.3
Incr Delay (d2), s/veh	26.5	0.1	4.9	9.1	13.3	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	3.2	8.1	9.3	9.0	4.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	58.0	9.1	23.1	27.2	36.7	19.5
LnGrp LOS	E	A	C	C	D	B
Approach Vol, veh/h		540	1703		1084	
Approach Delay, s/veh		20.0	24.5		34.8	
Approach LOS		B	C		C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		44.0		26.0	10.0	34.0
Change Period (Y+Rc), s		5.3		4.6	* 4.2	5.3
Max Green Setting (Gmax), s		38.7		21.4	* 5.8	28.7
Max Q Clear Time (g_c+I1), s		11.1		20.8	6.6	22.2
Green Ext Time (p_c), s		1.7		0.2	0.0	4.2

Intersection Summary			
HCM 6th Ctrl Delay			27.1
HCM 6th LOS			C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: Manchester Avenue & DAR Access Road

Yr 2030 w/ DAR + P AM
12/13/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑	↱	↰↰↱	
Traffic Volume (veh/h)	43	1230	1520	42	143	37
Future Volume (veh/h)	43	1230	1520	42	143	37
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1900
Adj Flow Rate, veh/h	47	1337	1652	46	98	102
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	77	2089	1674	747	472	427
Arrive On Green	0.04	0.59	0.47	0.47	0.26	0.26
Sat Flow, veh/h	1781	3647	3647	1585	1781	1610
Grp Volume(v), veh/h	47	1337	1652	46	98	102
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1585	1781	1610
Q Serve(g_s), s	1.8	16.9	31.2	1.1	2.9	3.4
Cycle Q Clear(g_c), s	1.8	16.9	31.2	1.1	2.9	3.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	77	2089	1674	747	472	427
V/C Ratio(X)	0.61	0.64	0.99	0.06	0.21	0.24
Avail Cap(c_a), veh/h	131	2197	1674	747	472	427
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.9	9.2	17.8	9.8	19.4	19.6
Incr Delay (d2), s/veh	7.6	0.6	18.9	0.0	1.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	5.4	15.4	0.3	1.3	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	39.5	9.8	36.7	9.8	20.4	20.9
LnGrp LOS	D	A	D	A	C	C
Approach Vol, veh/h		1384	1698		200	
Approach Delay, s/veh		10.8	35.9		20.7	
Approach LOS		B	D		C	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	44.9	23.0	7.9	37.0
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	42.0	18.0	5.0	32.0
Max Q Clear Time (g_c+I1), s	18.9	5.4	3.8	33.2
Green Ext Time (p_c), s	11.1	0.5	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	24.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary
1: Manchester Avenue & I-5 SB Ramps

Yr 2030 w/ DAR + P PM
12/13/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑	↱↱	↰	↱
Traffic Volume (veh/h)	130	352	531	1040	221	50
Future Volume (veh/h)	130	352	531	1040	221	50
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	141	383	577	1130	240	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	178	1027	720	1911	535	476
Arrive On Green	0.10	0.55	0.38	0.38	0.30	0.30
Sat Flow, veh/h	1781	1870	1870	2790	1781	1585
Grp Volume(v), veh/h	141	383	577	1130	240	54
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1395	1781	1585
Q Serve(g_s), s	5.1	7.6	18.0	14.1	7.2	1.6
Cycle Q Clear(g_c), s	5.1	7.6	18.0	14.1	7.2	1.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	178	1027	720	1911	535	476
V/C Ratio(X)	0.79	0.37	0.80	0.59	0.45	0.11
Avail Cap(c_a), veh/h	223	1151	798	2028	535	476
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.9	8.4	18.0	5.5	18.6	16.6
Incr Delay (d2), s/veh	14.1	0.2	5.4	0.4	2.7	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	2.6	8.0	8.0	3.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	43.0	8.6	23.3	5.9	21.3	17.1
LnGrp LOS	D	A	C	A	C	B
Approach Vol, veh/h		524	1707		294	
Approach Delay, s/veh		17.9	11.8		20.5	
Approach LOS		B	B		C	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	41.3	24.3	10.8	30.6
Change Period (Y+Rc), s	5.3	4.6	* 4.2	5.3
Max Green Setting (Gmax), s	40.4	19.7	* 8.2	28.0
Max Q Clear Time (g_c+I1), s	9.6	9.2	7.1	20.0
Green Ext Time (p_c), s	2.5	0.7	0.0	5.2

Intersection Summary	
HCM 6th Ctrl Delay	14.1
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Manchester Avenue & I-5 NB Ramps

Yr 2030 w/ DAR + P PM
12/13/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑↑↑↱		↰↰	↱
Traffic Volume (veh/h)	110	463	1361	119	1263	210
Future Volume (veh/h)	110	463	1361	119	1263	210
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	120	503	1479	129	1373	228
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	150	885	1636	143	1440	661
Arrive On Green	0.08	0.47	0.34	0.34	0.42	0.42
Sat Flow, veh/h	1781	1870	4951	417	3456	1585
Grp Volume(v), veh/h	120	503	1053	555	1373	228
Grp Sat Flow(s),veh/h/ln	1781	1870	1702	1795	1728	1585
Q Serve(g_s), s	5.9	17.4	26.4	26.4	34.5	8.8
Cycle Q Clear(g_c), s	5.9	17.4	26.4	26.4	34.5	8.8
Prop In Lane	1.00			0.23	1.00	1.00
Lane Grp Cap(c), veh/h	150	885	1165	614	1440	661
V/C Ratio(X)	0.80	0.57	0.90	0.90	0.95	0.35
Avail Cap(c_a), veh/h	155	890	1165	614	1440	661
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.4	17.1	28.1	28.1	25.3	17.8
Incr Delay (d2), s/veh	22.7	0.5	11.5	19.2	14.9	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	7.2	12.2	14.1	16.3	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	63.1	17.6	39.6	47.3	40.2	19.3
LnGrp LOS	E	B	D	D	D	B
Approach Vol, veh/h		623	1608		1601	
Approach Delay, s/veh		26.4	42.3		37.3	
Approach LOS		C	D		D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		47.7		42.0	11.7	36.0
Change Period (Y+Rc), s		5.3		4.6	* 4.2	5.3
Max Green Setting (Gmax), s		42.7		37.4	* 7.8	30.7
Max Q Clear Time (g_c+I1), s		19.4		36.5	7.9	28.4
Green Ext Time (p_c), s		2.1		0.5	0.0	1.6

Intersection Summary	
HCM 6th Ctrl Delay	37.6
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: Manchester Avenue & DAR Access Road

Yr 2030 w/ DAR + P PM
12/13/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↑↑	↱	↰Y	
Traffic Volume (veh/h)	56	1670	1410	25	184	60
Future Volume (veh/h)	56	1670	1410	25	184	60
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1900
Adj Flow Rate, veh/h	61	1815	1533	27	132	137
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	92	2003	2216	688	500	452
Arrive On Green	0.05	0.56	0.43	0.43	0.28	0.28
Sat Flow, veh/h	1781	3647	5274	1585	1781	1610
Grp Volume(v), veh/h	61	1815	1533	27	132	137
Grp Sat Flow(s),veh/h/ln	1781	1777	1702	1585	1781	1610
Q Serve(g_s), s	2.2	29.2	15.6	0.6	3.7	4.3
Cycle Q Clear(g_c), s	2.2	29.2	15.6	0.6	3.7	4.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	92	2003	2216	688	500	452
V/C Ratio(X)	0.66	0.91	0.69	0.04	0.26	0.30
Avail Cap(c_a), veh/h	139	2050	2216	688	500	452
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.9	12.5	14.7	10.5	17.9	18.1
Incr Delay (d2), s/veh	7.9	6.2	0.9	0.0	1.3	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	10.8	5.5	0.2	1.6	4.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	37.8	18.7	15.6	10.5	19.2	19.9
LnGrp LOS	D	B	B	B	B	B
Approach Vol, veh/h		1876	1560		269	
Approach Delay, s/veh		19.3	15.5		19.5	
Approach LOS		B	B		B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				41.2		23.0	8.3	32.8
Change Period (Y+Rc), s				5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s				37.0		18.0	5.0	27.0
Max Q Clear Time (g_c+I1), s				31.2		6.3	4.2	17.6
Green Ext Time (p_c), s				4.9		0.6	0.0	6.7

Intersection Summary	
HCM 6th Ctrl Delay	17.7
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

I-2

Parking Assessment Memorandum

LINSCOTT
LAW &
GREENSPAN
engineers

Engineers & Planners
Traffic
Transportation
Parking

Linscott, Law & Greenspan, Engineers
4542 Ruffner Street
Suite 100
San Diego , CA 92111
858.300.8800 T
858.300.8810 F
www.llgengineers.com

Pasadena
Irvine
San Diego
Woodland Hills

MEMORANDUM

To:	Beau Brand Greystar	Date:	March 26, 2020
From:	John Boarman, PE Charlene Sadiarin, PE LLG, Engineers	LLG Ref:	3-18-2897
Subject:	Belmont Village Encinitas-by-the-Sea Project – Parking Assessment		

Linscott, Law & Greenspan, Engineers (LLG) has prepared this technical memorandum to summarize the results of a parking assessment for the Belmont Village Encinitas-by-the-Sea Senior Living Project (herein referred to as the "Project"). The Project is located at 3111 Manchester Avenue in the City of Encinitas. The Project proposes the construction of the following land uses:

- 77 independent units (46 one-bedroom units; 31 two-bedroom units),
- 68 assisted living units (16 studio units; 46 one-bedroom units; 6 two-bedroom units),
- 55 memory care units (49 studio units; 6 one-bedroom units), and
- 16 single-family residential units (15 single-family affordable housing units; one single-family market rate unit).

Figure 1 contains the Project site plan.

Section 30.54.030 of the City of Encinitas Municipal Code contains the required off-street parking for developments in the City of Encinitas. The Municipal Code does not contain parking rates for senior independent, assisted living, or memory care units. Therefore, the ITE Parking Generation Manual (5th edition) was consulted. The ITE parking rates are determined based on data collected from various site surveys. These site surveys counted all vehicles parked at the study site, which for senior independent, assisted living, and memory care units include the associated parking for residents, visitors, and employees (See Attachment A for an excerpt ITE's definition of terms). Therefore, the parking requirements calculated using these parking rates account for the combined parking demand of the residents, visitors, and employees associated with each land use type.

ITE's Parking Generation Manual (5th edition) also contains parking rates for senior independent, assisted living, and memory care units. ***Table 1*** shows the Project's parking requirements based on these rates. As shown in *Table 1*, the senior independent living, assisted living, and memory care units require 97 parking spaces. The Project proposes to provide 166 parking spaces for these three unit types, which meets the minimum parking requirements. It should be noted that the unit mix may change to meet the varying needs of acuity care in the market. Based on operational experience of similar developments, it is highly unlikely that all non-memory care units would be leased as independent living units. Rather, most developments tend towards providing more assisted living and memory care units. The 166-space parking supply proposed by the Project would result in a surplus of 69 spaces based on the current unit mix, and thus could handle some variation in the unit mix.

If all of the units were converted to independent living units, the Project would require 122 parking spaces (= 200 units x 0.61 parking spaces per unit). The Project's proposed parking supply of 166 parking spaces would still meet the minimum parking requirement.

Per the California Building Code Table 11B-208.2, the Project is required to provide a minimum of six (6) accessible parking spaces.

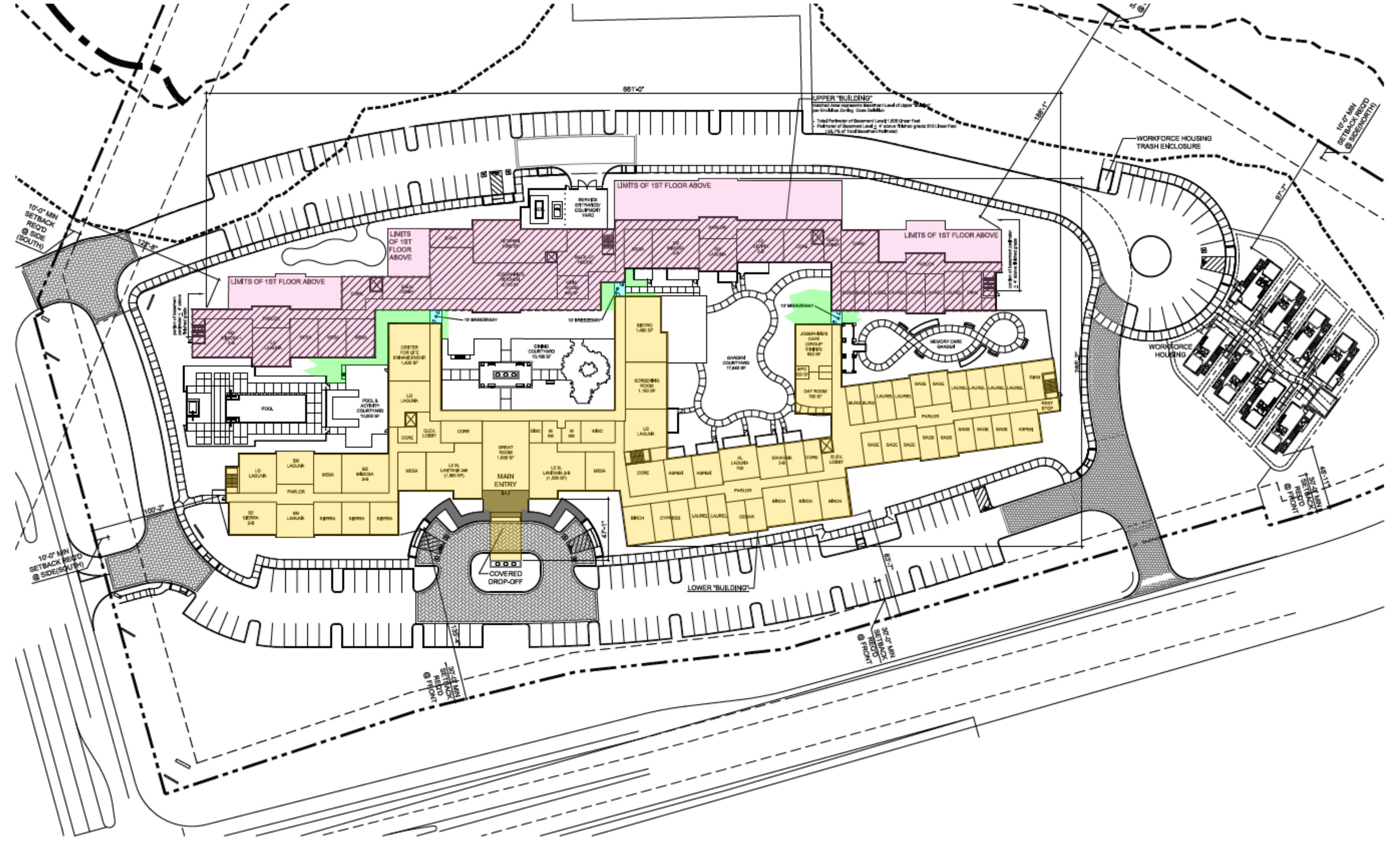
The 16 single-family residential units (8 single-family units + 8 accessory units) will comply with state density bonus parking standards. Per state law (AB 68), parking is not required for the accessory units.

Table 1
Belmont Village Minimum Required Parking – ITE Rates

Land Use	No. of Units / Beds	Parking Ratio [a]	Parking Spaces	
			Required Minimum	Provided
Senior Living Facility				
Independent Living				
1 Bedroom Units	46 Dwelling Units	0.61 / Dwelling Unit	28	
2 Bedroom Units	31 Dwelling Units	0.61 / Dwelling Unit	19	
Subtotal Independent Living	*77 Dwelling Units*		*47*	
Assisted Living				
Studio Units (16 Units)	16 Beds			
1 Bedroom Units (46 Units)	46 Beds			
2 Bedroom Units (6 Units)	12 Beds			
Subtotal Assisted Living	*74 Beds*	0.39 / Bed	*29*	
Memory Care				
Studio Units (49 Units)	49 Beds			
1 Bedroom Units (6 Units)	6 Beds			
Subtotal Memory Care	*55 Beds*	0.39 / Bed	*21*	
Total Senior Living Facility Parking Spaces			**97**	**166**

Footnote:
a. Parking rates from ITE's Parking Generation 5th Edition (Land uses 252 and 254) (See Attachment A for excerpts)

cc: File



Source: Van Tilburg, Banvard & Soderbergh, AIA

LINSCOTT LAW & GREENSPAN engineers

N:\2897\Figures

Figure 1

Site Plan

BELMONT VILLAGE ENCINITAS-BY-THE-SEA

ATTACHMENT A
EXCERPTS FROM ITE'S PARKING GENERATION MANUAL
(5TH EDITION)

Land Use Description Page Terms

Parking Supply (or Parking Spaces)—the total number of parking spaces that are provided or available at the study site, regardless of whether or not they are occupied. Parking supply should include only marked spaces and should not include areas designated for standing vehicles. Parking supply is different from parking demand.

Parking Supply Ratio—expressed in terms of spaces per an independent variable (i.e., spaces per 1,000 sq. ft. GFA or spaces per dwelling unit). The ratio denominator is based on total units, rather than occupied units.

Time-of-Day Distribution [of Parking Demand]—the variation of the parking demand rates for various hours of the day divided by the peak period parking demand rate. The time-of-day distribution is expressed as a percentage (100 percent represents the hour(s) of peak parking demand). This information is generally only provided for the study sites with at least five consecutive hours of parking demand data.

Total Parking Demand—the accumulation of vehicles parked at a given site at any associated point in time. This value should be the highest observed number of vehicles within the period of observation. Total parking demand includes all parking associated with that land use whether in an off-street parking facility, parked illegally, parked on-street, or in a remote parking lot. Total parking demand does not include standing vehicles, awaiting the pick-up or drop-off of a passenger, or in a drive-through lane.

Senior Adult Housing - Attached
(252)

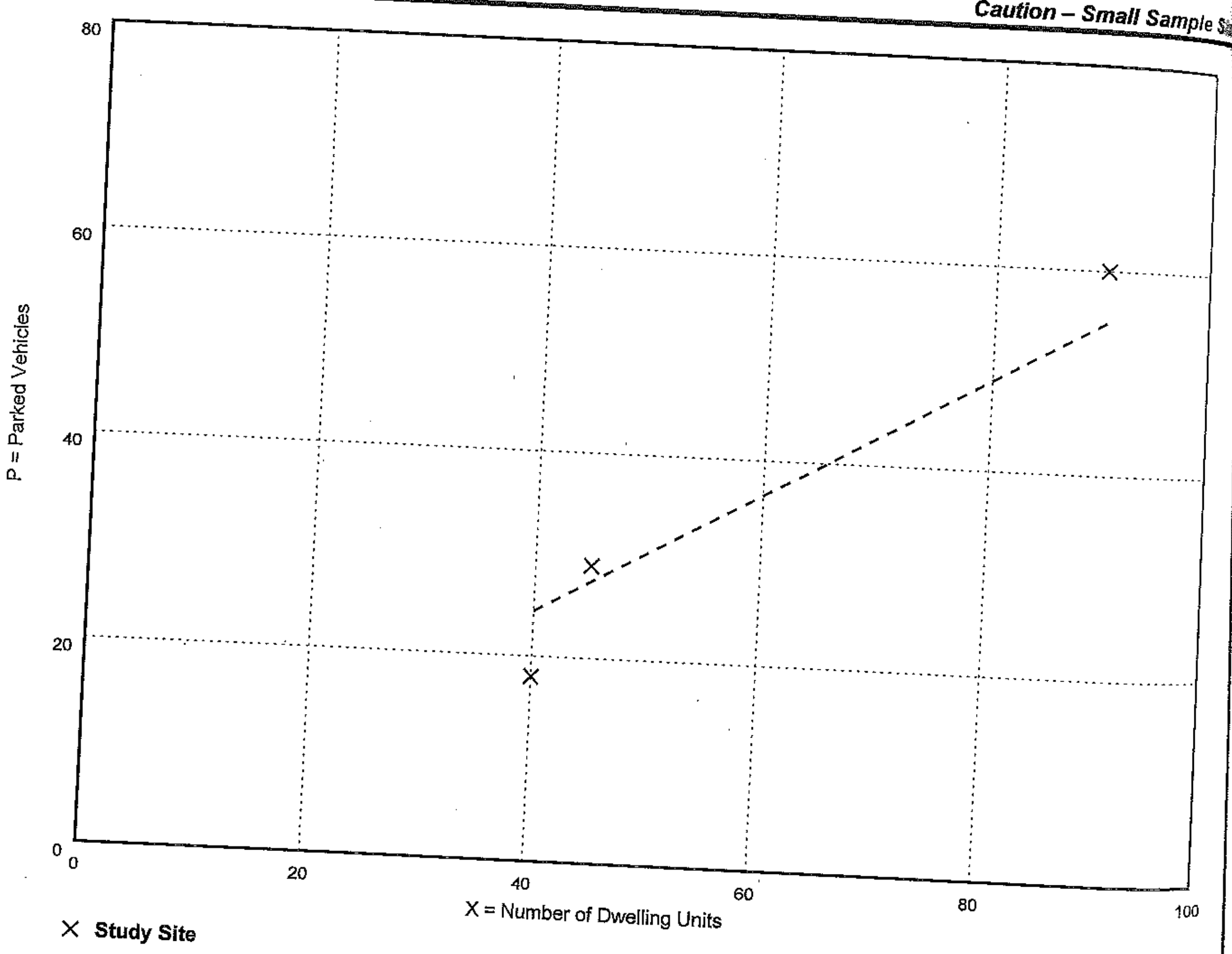
Peak Period Parking Demand vs: Dwelling Units
On a: Weekday (Monday - Friday)
Setting/Location: General Urban/Suburban
Peak Period of Parking Demand: 10:00 p.m. - 8:00 a.m.
Number of Studies: 3
Avg. Num. of Dwelling Units: 58

Peak Period Parking Demand per Dwelling Unit

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviatio (Coeff. of Variatio
0.61	0.45 - 0.67	0.51 / 0.67	***	0.11 (18%)

Data Plot and Equation

Caution – Small Sample S



Fitted Curve Equation: ***

R²= ***

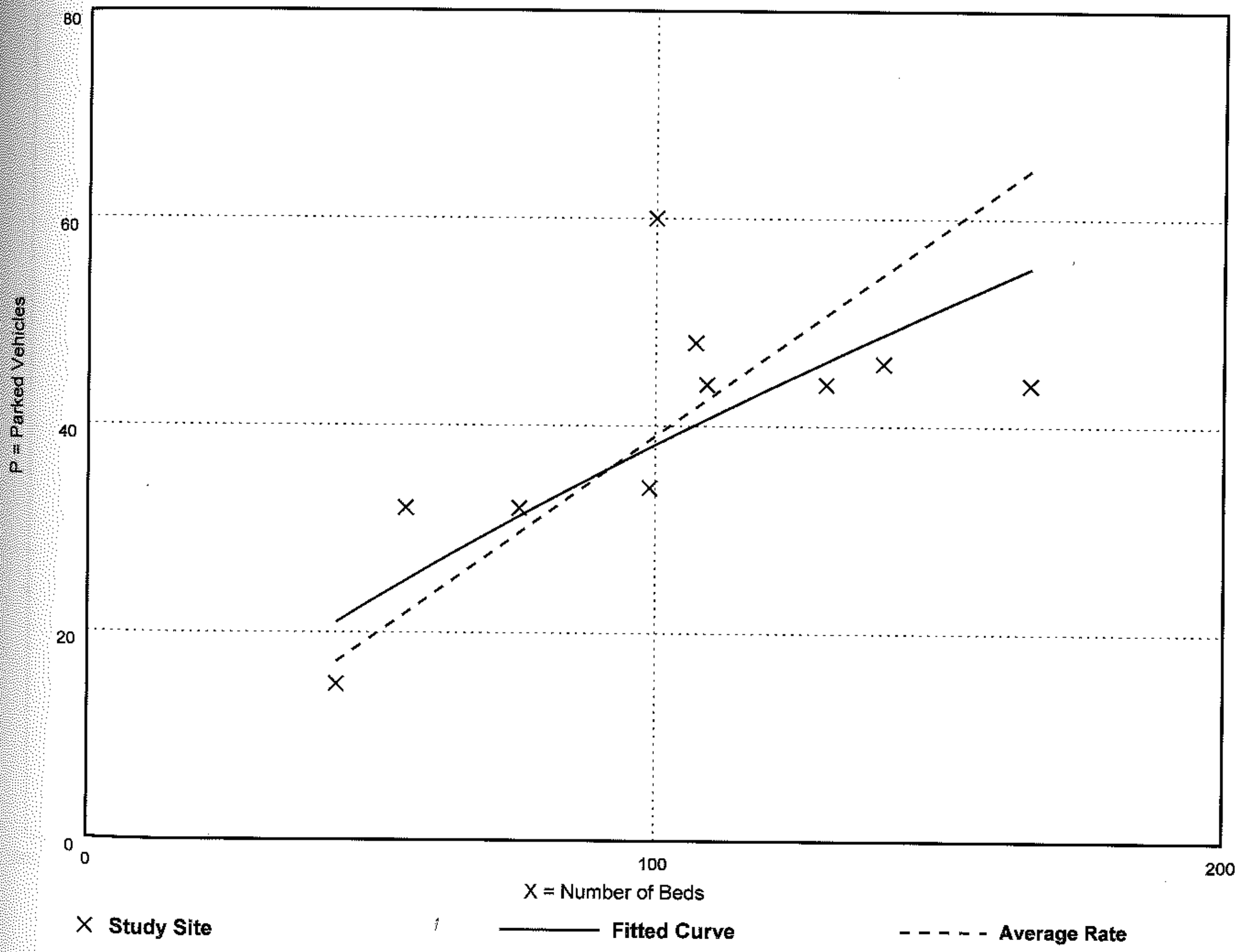
Assisted Living
(254)

Peak Period Parking Demand vs: Beds
On a: Weekday (Monday - Friday)
Setting/Location: General Urban/Suburban
Peak Period of Parking Demand: 11:00 a.m. - 3:00 p.m.
Number of Studies: 10
Avg. Num. of Beds: 103

Peak Period Parking Demand per Bed

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
0.39	0.27 - 0.60	0.34 / 0.58	***	0.11 (28%)

Data Plot and Equation



Fitted Curve Equation: $\ln(P) = 0.73 \ln(X) + 0.28$

$R^2 = 0.63$

J

Phase I Environmental Site Assessment

PHASE I ENVIRONMENTAL SITE ASSESSMENT

3111 Manchester Avenue
Encinitas, California

AEC Project No. 17-325SD
November 9, 2017

Prepared for:

Greystar
444 South Cedros Avenue, Suite 172
Solana Beach, CA 92075

Prepared by:

Advantage Environmental Consultants, LLC
145 Vallecitos De Oro, Suite 201
San Marcos, California 92069
Phone (760) 744-3363 • FAX (760) 744-3383

ADVANTAGE
ENVIRONMENTAL
CONSULTANTS, LLC.

November 9, 2017

Mark Faulkner
Greystar
444 South Cedros Avenue, Suite 172
Solana Beach, CA 92075

Subject: **Phase I Environmental Site Assessment**
3111 Manchester Avenue
Encinitas, California 92007
AEC Project No. 17-325SD

Dear Mr. Faulkner:

Advantage Environmental Consultants, LLC (AEC) has performed a Phase I Environmental Site Assessment (ESA) in conformance with the scope and limitations of American Society for Testing and Materials Practice E 1527-13 and 40 Code of Federal Regulations Part 312, of the above-referenced property. This ESA included public environmental agency and historical record reviews, interviews, site observations, and report preparation. This report includes AEC's findings, conclusions, recommendations, and supporting documentation.

We appreciate the opportunity to be of service on this project. If you should have any questions regarding this report, or if we can be of further assistance, please contact us at (760) 744-3363.

Sincerely,

ADVANTAGE ENVIRONMENTAL CONSULTANTS, LLC

Dan Weis

Daniel Weis, R.E.H.S.
Branch Manager
Western Regional Office

Samantha Hopper
Project Manager

TABLE OF CONTENTS

12.0 APPENDICES

1.0 Introduction

1.1 Purpose

The purpose of this Phase I Environmental Site Assessment (ESA) prepared by Advantage Environmental Consultants, LLC (AEC) is to provide a professional opinion on the presence of recognized environmental conditions and other suspect environmental conditions in connection with the Site, as they existed on the date of the site inspection, and to recommend whether further investigation is required. American Society for Testing and Materials (ASTM) Standard Practice E 1527-13, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, defines good commercial and customary practice for conducting an environmental site assessment of a parcel of commercial real estate with respect to the range of contaminants pertinent to the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as well as petroleum products. As such, this ESA is intended to satisfy one of the threshold criteria for satisfying the landowner liability protections to CERCLA liability assuming compliance with other elements of the defense. In other words, this ESA represents one of the practices that constitute “all appropriate inquiry” into the previous ownership and uses of the property consistent with good commercial or customary practice, as defined in 42 USC Section 9601(35)(B) and 40 CFR Part 312.

The goal of the process is to identify RECs, which are defined by the Practice as “the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: 1) due to any release to the environment; 2) under conditions indicative of a release to the environment; or 3) under conditions that pose a material threat of a future release to the environment. The term recognized environmental condition includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include de minimis conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

The term "environment" is defined in CERCLA 42 USC 9601(8) as "(A) the navigable waters, the water of the contiguous zone, and the ocean waters of which the natural resources are under the exclusive management authority of the United States under the Magnuson-Stevens Fishery conservation and Management Act, and (B) any other surface water, ground water, drinking water supply, land surface or subsurface strata, or ambient air within the United States or under the jurisdiction of the United States.

The term “release” means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing any hazardous substance or pollutant or contaminant), but excludes (A) any release which results in exposure to persons solely within a workplace, with respect to a claim which such persons may assert against the employer of such persons, (B) emissions from the engine exhaust of a motor vehicle, rolling stock, aircraft, vessel, or pipeline pumping station engine, (C) release of source, byproduct, or special nuclear material from a nuclear incident, as those terms are defined in the Atomic Energy Act of 1954 [42 U.S.C. 2011 et seq.], if such release is subject to requirements with respect to financial protection established by the Nuclear Regulatory Commission under section 170 of such Act [42 U.S.C. 2210], or, for the purposes of 42 USC 9604 or any other response action, any release of source byproduct, or special nuclear material from any processing site designated under section 7912(a)(1) or 7942(a) of this title, and (D) the normal application of fertilizer.

1.2 Detailed Scope of Services

The Phase I ESA was conducted in accordance with generally accepted Phase I industry standards using ASTM Standard Practice E 1527-13, 40 Code of Federal Regulations (CFR) Part 312 and the scope of work for the project proposed by AEC. The following services were provided for this assessment:

- A search for environmental liens and other potential environmental related encumbrances to title of the Site.
- An evaluation of standard environmental record sources contained within Federal, State and local environmental databases within specific search distances.
- An evaluation of additional environmental record sources obtained from regulatory departments/agencies.
- A qualitative evaluation of the physical characteristics of the Site through a review of published topographic, geologic, and hydrogeologic maps; published groundwater data; and area observations to characterize surface water flow in the Site area.
- An evaluation of past Site and adjacent/nearby property uses through a review of historical resources including topographic maps and aerial photographs.
- A physical inspection of the Site conducted to search for conditions indicative of potential environmental concerns including underground storage tanks (USTs), aboveground storage tanks (ASTs), associated tank piping; stained soil or pavement; equipment that may contain or have historically contained polychlorinated biphenyls (PCBs); and other potential environmental concerns as defined in the ASTM E 1527-13 standard.
- A physical assessment of indications of past uses and visual observations of adjacent and surrounding properties (from curbside or public spaces) to assess potential impacts to the Site.
- Interviews completed with the client, the Site owner and a local regulatory agency representative.
- Collection of four soil samples from the Site and analysis of said samples for agricultural chemical residues.
- The preparation of this Phase I ESA report, which includes the findings of the study and our opinion regarding their level of significance. Conclusions have been drawn based on the significance levels of the findings with subsequent recommendations provided.

1.3 Significant Assumptions

This Phase I ESA was conducted in accordance with ASTM guidelines, 40 CFR Part 312 and the scope of work for the project proposed by AEC. No other warranties either express or implied, are made by AEC. AEC's evaluations, analyses, and opinions should not be taken as representations regarding subsurface conditions or the actual value of the Site. Subsurface conditions may differ from the conditions implied by the surficial observations, and can only be reliably evaluated through intrusive techniques.

Documentation and data provided by the client, designated representatives, other interested third parties, or from the public domain, and referred to in the preparation of this assessment, are assumed to be complete and correct and have been used and referenced with the understanding that AEC assumes no responsibility or liability for their accuracy. AEC's conclusions are based upon such information and documentation and on our observations of Site conditions, as they existed on the date of the site inspection. Because Site conditions may change significantly over a short period of time and additional data may become available, data reported and conclusions drawn in this report are limited to current conditions and may not be relied upon on a significantly later date.

1.4 Limitations and Exceptions

Reasonable efforts have been made during this assessment to uncover evidence of USTs, ASTs and ancillary equipment associated with such features. "Reasonable efforts" are limited to information gained from visual observation of unobstructed areas, recorded database information held in public record, and available information gathered from interviews. Such methods may not identify subsurface equipment that may have been hidden from view due to paving, construction or debris pile storage, or incorrect information from sources.

This investigation was not an environmental compliance audit. While some observations and discussion in this report may address conditions and/or operations that may be regulated, the regulatory compliance of those conditions and/or operations is outside the scope of this investigation. Nothing in this report constitutes a legal opinion or legal advice. For information regarding specific individual or organizational liability, AEC recommends consultation with independent legal counsel.

According to 40 CFR Part 312, Standards and Practices for All Appropriate Inquiry: Final Rule, CERCLA liability rests with the owner or operator of a property and not with an environmental professional hired by the prospective landowner and who is not involved with the ownership or operation of the property. This report meets the requirements set forth in 40 CFR Part 312 Standards and Practices for All Appropriate Inquiries; Final Rule. However, in order to qualify for certain landowner liability protections under CERCLA. Bona Fide Prospective Purchasers, Contiguous Property Owners, and/or Innocent Landowners must meet additional requirements of CERCLA (42 U.S.C. 9601 (35)(B)).

This ESA does not address non-scope ASTM considerations including asbestos containing materials, radon, lead-based paint, lead in drinking water, wetlands, protected environments and habitat, industrial hygiene concerns, indoor air quality (not resulting from vapor intrusion concerns relative to hazardous substances and petroleum products) and high voltage power lines.

1.5 Special Terms and Conditions

No special terms and conditions between AEC and the client pertinent to the findings of this ESA or methodology used to complete this assessment are noted. In addition, AEC does not have a financial interest in the Site.

1.6 User Reliance

This report was prepared for use solely and exclusively by the client and is not for the use or benefit of, nor may it be relied upon by, any other person or entity for any purpose without the advance written consent of AEC. AEC makes no representation to any third party except that it has used the degree of care and skill ordinarily exercised by a reasonable prudent environmental professional in the same community and in the same time frame given the same or similar facts and circumstances. No other use or disclosure is intended or authorized by AEC. In the preparation of this ESA, AEC has used the degree of care and skill ordinarily exercised by a reasonably prudent environmental professional in the same community and in the same time frame given the same or similar facts and circumstances. No other warranties are made to any third party, either express or implied.

2.0 Site Description

2.1 Location and Legal Description

The Site is located at 3111 Manchester Avenue in the City of Encinitas, San Diego County, California. The Site consists of 16.9 acres (736,164 square feet) of land situated to the north and northwest of Manchester Avenue and to the east of Via Poco. The Site is further identified by San Diego County Assessor's Parcel Number (APN) 261-210-01-00. A Vicinity Map depicting the general location of the Site is included in Section 12.1.

2.2 Site and Vicinity General Characteristics--

The Site and its adjacent/nearby properties are situated within an area of the City of Encinitas comprised primarily of agricultural land and commercial properties, San Elijo Lagoon and vacant and undeveloped land. Additional details pertaining to the Site and its adjoining properties are provided in the sections below.

2.3 Current Use of the Site

The Site consists of a reported 16.9 acres of agricultural land.

2.4 Description of Structures, Roads, Other Improvements on the Site

The majority of the Site is comprised of agricultural land. Several structures are located in the southwestern corner of the Site that are utilized for flower storage and sales purposes. Two additional shed structures used for shading purposes are present in the center and northern portions of the Site. Several shipping containers and trailers used for general storage purposes were also observed at the Site. Site access is provided from the west off of Via Poco. Potable water and sanitary sewer services are provided by the San Dieguito Water District. Electrical and natural gas services in the area are provided by San Diego Gas and Electric. A Site Plan is included in Section 12.2. Photographs taken of the Site during the Site visit are included in Section 12.3.

2.5 Current Uses of the Adjoining Properties

The area surrounding the Site consists primarily of agricultural land, residential and commercial properties, San Elijo Lagoon and vacant and undeveloped land. AEC performed a visual inspection of adjoining properties from adjacent sidewalks and public right-of-ways. The following table identifies the adjacent property uses:

Direction	Adjoining Property Use
North	Vacant land then residences
South	Manchester Avenue, then the San Elijo Lagoon
East	Manchester Avenue, then the San Elijo Lagoon
West	Via Poco and construction site, then a gasoline station

No adjoining properties were observed to be of significant environmental concern to the Site based on AEC's visual inspection from public right-of-ways. This includes the western adjacent gasoline station.

3.0 User Provided Information

3.1 Title Records

No environmentally related liens, deed restrictions or activity and use limitations pertaining to the Site were noted during research completed with the County of San Diego Tax Assessor. In addition, the client is unaware of such encumbrances recorded against the Site.

3.2 Environmental Liens or Activity and Use Limitations

The client has no knowledge of any environmental related liens, deed restrictions or activity and use limitations that are related to potential environmental issues at the Site.

3.3 Specialized Knowledge

The client is unaware of specialized knowledge pertinent to potential recognized environmental conditions at the Site.

3.4 Commonly Known or Reasonably Ascertainable Information

The client has no knowledge of commonly known or reasonably ascertainable information pertinent to potential recognized environmental conditions at the Site.

3.5 Valuation Reduction for Environmental Issues

The client is unaware of information pertaining to the relationship of the purchase price or appraised value of the Site to the estimated fair market value of the property that might indicate that significant contamination exists.

3.6 Owner, Property Manager, and Occupant Information

The Site is currently owned, managed and occupied by Yasuda Family LLC.

3.7 Reason for Performing Phase I ESA

AEC has been retained to conduct this Phase I ESA to identify environmental issues, which may be present and in connection with the possible acquisition of the Site and to comply with 40 CFR Part 312.

4.0 Records Review

4.1 Standard Environmental Record Sources

AEC reviewed Federal, State and local environmental databases provided by Environmental Risk Information Services (ERIS), for information pertaining to documented and/or suspected releases of regulated hazardous substances and/or petroleum products within specified search distances. A copy of the ERIS Report is included in Section 12.4.

AEC also reviewed unmappable sites listed in the environmental database report by cross-referencing addresses and site names. Unmappable ("orphan") sites are sites that cannot be plotted with confidence but can be located by zip code or city name. In general, a site cannot be mapped because of inaccurate or missing location information in the record provided by the regulatory agency. Any unmappable sites that AEC identifies within the specified search radii were evaluated as part of the preparation of this report. None of the orphan listings are considered to be an environmental concern to the Site.

The following Federal databases related to potential on-site and off-site sources of contamination were reviewed and interpreted by AEC:

Federal Databases	Search Distance From Site
National Priorities List (NPL)	One mile
National Priority List – Proposed (Proposed NPL)	One mile
Deleted National Priorities List (Deleted NPL)	One-half mile
Superfund Enterprise Management System (SEMS)	One-half mile
SEMS Archive Sites (SEMS Archive)	One-half mile
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)	One-half mile
CERCLIS No Further Remedial Action Planned (CERCLIS NFRAP)	One-half mile
CERCLIS Liens (CERCLIS LIENS)	Property only
Resource Conservation and Recovery Act (RCRA) CORRACTS Corrective Action	One mile
RCRA non-CORRACTS Treatment, Storage, and Disposal (TSD) Facilities	One-half mile
RCRA Large-Quantity Generator (LQG)	One-quarter mile
RCRA Small-Quantity Generator (SQG)	One-quarter mile
RCRA Conditionally Exempt Small Quantity Generator (CESQG)	One-quarter mile
RCRA Non-Generators (RCRA NON GEN)	One-quarter mile
Federal Engineering Controls (FED ENG)	One-half mile
Federal Institutional Controls (FED INST)	One-half mile
Emergency Response Notification System (ERNS)	Property only
Federal Brownfields (FED BROWNFIELDS)	One-half mile
Material Licensing Tracking System (MLTS)	Property only

The following State/local databases related to potential on-site and off-site sources of contamination were also searched and reviewed:

State/Local Databases	Search Distance From Site
State Response Sites (RESPONSE)	One mile

State/Local Databases	Search Distance From Site
EnviroStor Database (ENVIROSTOR)	One mile
Delisted EnviroStor Database(DELISTED ENVS)	One mile
Solid Waste Information System (SWF/LF)	One-half mile
EnviroStor Hazardous Waste Facilities (HWP)	One mile
Land Disposal Sites (LDS)	One-half mile
Leaking Underground Fuel Tank Reports (LUST)	One-half mile
Delisted Leaking Storage Tanks (DLST)	One-half mile
Permitted Underground Storage Tanks (UST) in Geotracker	One-eighth mile
Proposed Closure of Underground Storage Tank Cases (UST Closure)	One-half mile
Historical Hazardous Substance Storage Information Database (HHSS)	One-eighth mile
Aboveground Storage Tanks (AST)	One-eighth mile
Delisted Storage Tanks (DELISTED TNK)	One-eighth mile
California Environmental Reporting System Tanks (CERS TANK)	One-quarter mile
Site Mitigation and Brownfields Reuse Program Facility Sites with Land Use Restrictions (LUR)	One-half mile
Hazardous Waste Management Program Facility Sites with Deed/Land Use Restrictions (HLUR)	One-half mile
Deed Restriction and Land Use Restriction (DEED)	One-half mile
Voluntary Cleanup Program (VCP)	One-half mile
GeoTracker Cleanup Sites Data (CLEANUP SITES)	One-half mile
California Environmental Reporting System Hazardous Waste Sites (CERS HAZ)	One-half mile
Delisted California Environmental Reporting System Tanks (DELISTED CTNK)	One-quarter mile
Delisted County Records (DELISTED COUNTY)	One-eighth mile
San Diego County Site Assessment and Mitigation Investigation Sites (SAN DIEGO SAM)	One-half mile
San Diego County Solid Waste Facility List (SAN DIEGO SWF)	One-half mile
San Diego County UST List (SAN DIEGO UST)	One-quarter mile
San Diego County Local Oversight Program List (SAN DIEGO LOP)	One-half mile

Descriptions/sources of each of the above referenced regulatory databases and the dates these databases were last updated by the applicable regulatory agencies are included in the ERIS report.

Site

The Site is not listed on any of the standard regulatory databases searched by ERIS.

Adjoining and Nearby Properties

Three listings pertaining to two nearby properties are identified in the standard regulatory databases within their respective search distances from the Site. The table below presents a summary of the listed properties and an opinion regarding their potential impact to the Site.

Listed Property and Address	Database(s)	Mapped Distance and Direction From Site	Details	Significant Concern To Site?
Gim Tom Farm	HHSS	0.00-mile	Referenced with a 2,000-gallon fuel	No

Listed Property and Address	Database(s)	Mapped Distance and Direction From Site	Details	Significant Concern To Site?
3107 Manchester Ave		SSW	tank installed in 1960. There are no reported releases or violations.	
Cardiff Chevron Cardiff 76 #5946 Union Oil Company Cali 3085 Manchester Ave	UST CLEANUP SITES RCRA GEN SAM LUST	0.04-mile SSW	Referenced on the CLEANUP SITES with case closure on 8/13/2009. Referenced on the LOP database with case closure on 10/7/1998. Referenced as a small quantity generator of hazardous waste, with no reported violations. Referenced with two SAM listings. Both cases were closed on 6/10/2003 and 8/12/2009 respectively. Referenced with a release of gasoline to the groundwater. The case was closed on 6/10/2003.	No

As shown in the table above, none of the listings mapped within their respective search distances of the Site are considered to be of significant environmental concern to the Site. This opinion is based on several factors including the nature of the regulatory database listings, distance of the off-Site listed properties from the Site, the orientation of the listed properties relative to the Site, interpreted direction of groundwater flow, and/or regulatory case status information for the various properties as described in the databases.

Non-ASTM Database Reviews

Below is a list of non-ASTM databases searched by ERIS and reviewed by AEC during the preparation of this assessment. The descriptions of each database and their data release frequency are included in the ERIS report, included in Section 12.4.

Federal
FINDS/FRS – Facility Registry Service/Facility Index
TRIS – Toxic Chemical Release Inventory System
HMIRS – Hazardous Materials Information Reporting System
NCDL – National Clandestine Drug Labs
ODI – Open Dump Inventory
IODI – EPA Report on the Status of Open Dumps on Indian Lands
TSCA – Toxic Substances Control Act
HIST TSCA – Toxic Substances Control Act
FTTS ADMIN – Federal Insecticide, Fungicide, & Rodenticide (FIFRA) and Toxic Substances Control Act (TSCA), together known as FTTS, Administrative Case Listing
FTTS INSP – FTTS Inspection Case Listing
PRP – Potentially Responsible Parties List
SCRD DRYCLEANER – State Coalition for Remediation of Drycleaners Listing
ICIS – Integrated Compliance Information System
FED DRYCLEANERS – Drycleaner Facilities

State
DRYCLEANERS – Cleaner Facilities
INSP COMP ENF – EnviroStor Inspection, Compliance, and Enforcement

CDL – Clandestine Drug Labs
SCH – School Property Evaluation Program Sites
CHMIRS – California Hazardous Material Incident Report System
SWAT – Sites Listed in the Solid Waste Assessment Test Program Report
HAZNET – Facility and Manifest Data
CDO/CAO – Cease and Desist Orders and Cleanup and Abatement Orders
HIST CHMIRS – Historical California Hazardous Material Incident Report System
HIST MANIFEST – Historical Hazardous Waste Manifest Data

County
SAN DIEGO HAZ - San Diego County Hazardous Materials Management Division Database

The Site is listed as Williamson Produce on the San Diego Haz and FINDS non-ASTM databases searched by ERIS. The Site is referenced as an agricultural property using dry nitrogen fertilizer. The Site received a violation in 2014 for not having a Hazardous Materials Business Plan when storing hazardous materials at or above the threshold quantities. The non-ASTM databases listings for the Site are not associated with an unauthorized release and are not expected to have adversely impacted the Site. Multiple non-ASTM databases listings for nearby off-Site properties are also mapped within specified search distances of the Site. These listings are not considered to be significant environmental concerns to the Site. This opinion is based on several factors including the type and nature of the facility listings, regulatory case status, distance of the off-Site listed properties from the Site, the orientation of the listed properties relative to the Site, and interpreted direction of groundwater flow.

4.2 Additional Environmental Record Sources

San Diego County Department of Environmental Health (DEH)

The DEH regulatory file for the Site contains documents ranging in date from 2002 to 2016. The business name referenced is Williamson Produce. The documents include compliance inspection reports, hazardous materials inventories, and other typical content. The business received one notice of violation due to the spillage of diesel fuel resulting from a former aboveground storage tank. Impacted soil was reportedly cleaned up and removed from the Site. No records of significant releases of hazardous substances or petroleum products pertaining to the Site were noted in DEH files.

City of Encinitas Building and Fire Department

No records of hazardous substances or petroleum products pertaining to the Site are on file with the City of Encinitas.

State Water Resources Control Board (SWRCB)

The Site is not identified in the online SWRCB Geotracker database. Information included in the SWRCB Geotracker database regarding the adjacent/nearby properties is consistent with the information found in the ERIS database report.

4.3 Physical Setting Sources

The following physical setting sources were reviewed to provide information regarding the topographic, hydrologic, geologic and/or hydrogeologic characteristics of the Site.

4.3.1 Topography and Hydrology

USGS Topographic Quadrangle

Based on the review of United States Geological Survey (USGS) 7.5-minute topographic map of the Encinitas Quadrangle (2015), Site elevation is depicted ranging between approximately five to 180 feet above mean sea level. Regional topography is shown as sloping to the south toward the San Elijo Lagoon. Streets/roadways bordering the Site are shown in their current configurations.

Hydrology/Storm Water Management

Surface runoff at the Site and along adjacent roadways occurs as sheet flow and is facilitated by municipal storm drains along public roadways maintained by the City of Encinitas. The Site likely receives runoff from the northern adjacent hillside.

4.3.2 Geology

The Site lies within the Peninsular Ranges Geologic Province of California. This geomorphic province is traversed by a group of northwest trending sub-parallel fault zones and encompasses an area that extends 125 miles from the Transverse Ranges and the Los Angeles Basin south to the Mexican Border and beyond another 775 miles to the tip of Baja California. Rocks within the Peninsular Range Province were emplaced during Cretaceous age orogenic events and uplifted into the present mountain ranges during the late Tertiary and Quaternary. Igneous, metamorphic and sedimentary rocks marine and marine terrace deposits. The area is seismically active, with several known active faults crossing the Province (CGS, 2002). The Site is underlain by middle Eocene aged, Torrey Sandstone, which is described as white to light-brown, medium- to coarse-grained, moderately well indurated, massive and broadly crossbedded, arkosic sandstone. The Site is also underlain by middle Eocene aged Delmar Formation, which is described as dusky yellowish-green, sandy claystone interbedded with medium-gray, coarse-grained sandstone.

4.3.3 Hydrogeology

The Site is situated within the San Elijo Hydrologic Subarea of the Escondido Creek Hydrologic Area of the Carlsbad Hydrologic Unit (RWQCB, 1994). Groundwater in the San Elijo Hydrologic Subarea is designated as beneficial for municipal, agricultural and industrial supply uses. No recent Site specific groundwater information is available; however, according to information obtained from the California State Water Resources Control Board (SWRCB) GeoTracker database, groundwater in the vicinity of the Site has historically been shallow and present at depths of less than 10 feet below the ground surface along Manchester Avenue. The groundwater flow direction is reportedly to the south towards the San Elijo Lagoon.

4.4 Historical Use Information

Historical sources (as described in the following sections) were reviewed to develop a history of the previous uses of the Site and adjacent/nearby properties to help identify the likelihood of past uses having led to recognized environmental conditions in connection with the Site.

4.4.1 Aerial Photographs

AEC reviewed historical aerial photographs from the years 1947, 1953, 1964, 1966, 1967, 1980, 1990, 1994, 1997, 2002, 2003, 2005, 2009, 2010 and 2012 via online resources. The results of the aerial photograph review are summarized in the following table:

Aerial Photograph Review	
Year	**Observations**
1947 and 1953	**Site:** The Site appears to be used for agricultural purposes. **Adjacent Properties:** The adjacent properties to the west and northeast appear to be agricultural land. The properties to the north appear to be vacant and undeveloped. Manchester Avenue and the San Elijo Lagoon are present to the south and east of the Site.
1964, 1966, 1967 and 1980	**Site:** The Site appears to be vacant and undeveloped. **Adjacent Properties:** The adjacent properties appear similar to the previous photographs. In the 1980 aerial photograph, the northeastern adjacent property appears to be vacant and undeveloped, the northern adjacent properties appear to be graded for construction and the property adjacent to the southwest appears to be developed with a commercial structure (gasoline station).
1990, 1994, 1997, 2002, 2003, 2005, 2009, 2010 and 2012	**Site:** The Site appears to be agricultural land, with a few structures in the southwest corner. **Adjacent Properties:** Adjacent properties appear similar to their current configurations. The northern adjacent properties appear to be vacant and undeveloped followed by residential structures. The northeastern adjacent property appears to be vacant and undeveloped followed by a parking lot and commercial buildings. The western adjacent property appears to be developed with a commercial structure (gasoline station) and agricultural land and the southern adjacent properties appear to be the San Elijo Lagoon.

As stated above, the Site has been previously used for agricultural purposes. During historical agricultural activities throughout the State of California, various pesticides and more specifically organochlorine pesticides (OCPs) were commonly applied during the normal course of agricultural operations. Such compounds have since been banned from production and use in the United States. Section 105215 of the California Health and Safety Code discusses the regulatory reporting of incidents that pertain to pesticide spills and accidental releases of pesticide products. Based on the regulatory and historical research completed during the preparation of this assessment, no information has been revealed that would lead AEC to believe that an accidental spill or release of pesticide products has occurred at the Site. In addition, neither stressed vegetation nor evidence of the storage of pesticides was observed on the Site during the Site reconnaissance or based on regulatory and historical research reviews. As such, the potential presence of residual agricultural chemical in Site soils is not considered to be a recognized environmental condition in connection with the Site. Regardless, soil sampling and analysis was completed at the Site (refer to Section 9.0) concurrent with this Phase I ESA.

4.4.2 Topographic Maps

AEC reviewed historical topographic maps from the years 1893, 1897, 1901, 1907, 1911, 1920, 1925, 1931, 1939, 1947, 1949, 1955, 1963, 1969, 1971, 1978 and 2001 via online resources. The Site is depicted as vacant and undeveloped on the topographic maps from 1893 to 1971. The Site is depicted as agricultural land on the topographic maps from 1978 and 2001. The adjacent properties are depicted as a mixture of vacant and undeveloped land and agricultural land.

4.4.3 State of California Division of Oil and Gas Records

According to online resources provided by the California Department of Conservation, Division of Oil, Gas and Geothermal Resources, there are no oil, gas or geothermal wells located on the Site or its adjacent properties.

5.0 Site Reconnaissance

The objective of the Site reconnaissance was to obtain information indicating the likelihood of recognized environmental conditions in connection with the Site. The reconnaissance was conducted on October 17, 2017, by Ms. Samantha Hopper of AEC's Western Regional office. Ms. Hopper was unaccompanied during the Site reconnaissance.

5.1 Methodology and Limiting Conditions

The Site reconnaissance consisted of walking accessible interior and exterior portions of the Site, inspection of the Site buildings, and walking accessible roadways and pedestrian walkways surrounding the Site. As stated previously, a Site Plan is included in Section 12.2. Photographs of the Site were taken to document existing Site conditions, and are included and described in Section 12.3.

5.2 General Site Setting

The Site consists of a reported 16.9 acres of agricultural land. The Site and its adjacent/nearby properties are situated within an area of the City of Encinitas comprised primarily of agricultural land and commercial properties, San Elijo Lagoon and vacant and undeveloped land. The current use of the Site and its adjoining properties are not ones that are indicative of the use, treatment, storage, disposal or generation of significant quantities of hazardous substances that have adversely impacted the Site.

5.3 Site Observations

AEC examined the Site for evidence of the following potential environmental concerns:

Conditions	Not Observed or Noted	Observed or Noted	Significant Concern?
Hazardous Substances/Petroleum Products		X	No
Waste Generation/Storage/Disposal	X		--
ASTs		X	No
USTs	X		--
PCB Containing Equipment		X	No
Chemical/Petroleum Odors	X		--
Pools of Liquid	X		--
Floor Drains/Sumps/Wells	X		--
Drums	X		--
Stains or Corrosion	X		--
Unidentified Substance Containers	X		--
Stained Soil or Pavement	X		--
Stressed Vegetation	X		--
Pits, Ponds or Lagoons		X	--
Wastewater Discharges/Disposal Systems	X		--
Septic Systems/Cesspools	X		--
Non-Hazardous Solid Waste Disposal Areas		X	No
Drinking Water Systems/Water Wells	X		--
Other Wells	X		--
Hydraulic Lifts/Hoists	X		--

The noted items in the table above are discussed below:

Hazardous Substances/Petroleum Products

AEC observed several paint cans and a gasoline can in a covered area at the Site. No staining or other suspect conditions were observed in the vicinity of these items and no evidence of unauthorized releases were observed on-Site.

ASTs

Two portable water tanks were observed in the southwestern portion of the Site. No suspect conditions were noted in the vicinity of the tanks.

PCB Containing Equipment

AEC observed a pad-mounted electrical transformer at the Site. The transformer is owned by SDG&E and was not labeled with respect to potential PCB content. The transformer appeared to be in good condition with no evidence of damage, leaks or staining on or around the unit.

Pits, Ponds or Lagoons

A desilting basin is present in the southern portion of the Site. Standing water was observed in the basin at the time of the Site reconnaissance. No suspect conditions were noted in the vicinity of the tanks.

Non-Hazardous Solid Waste Disposal Areas

Miscellaneous solid waste was observed in a dumpster located in the southwestern portion of the Site. No staining was observed in the vicinity of the dumpster and no evidence of unauthorized waste disposal was observed on-Site. In addition to the dumpster, a trailer containing tractor tires was observed in the southern portion of the Site. No suspect conditions were noted in the vicinity of such materials.

6.0 Interview Information

6.1. Interview With Owner

As stated previously, the Site is currently owned by Yasuda Family LLC. The Site owner is unaware of environmental concerns or environmental related liens, deed restrictions or activity and use limitations that are related to potential environmental issues at the Site.

6.2 Interview With Site Manager

The Site owner is also considered to be the Site manager. The interview completed with the designated owner representative is referenced in Section 6.1.

6.3 Interviews With Occupants

The Site owner is also considered to be the Site occupant. The interview completed with the designated owner representative is referenced in Section 6.1.

6.4 Interview With Local Government Official

During the preparation of this assessment, multiple governmental agency representatives were interviewed regarding the availability of public records pertaining to the Site.

6.5 Interview With Others

No interviews with other persons knowledgeable of the historical use of the Site were conducted during the preparation of this ESA.

7.0 Additional Services

During the preparation of this ESA, AEC personnel conducted limited soil sampling at the Site. AEC personnel collected shallow soil samples from four locations at the Site using a 3-inch outer diameter stainless steel hand auger and pre-cleaned laboratory supplied jars. Upon completion of sampling, the soil borings were backfilled to match existing surface conditions. Soil sampling equipment was decontaminated between uses by cleansing with a non-phosphate detergent solution followed by successive rinses in drinking and de-ionized water. The four hand auger sampling locations (001–004) are depicted on the Site Plan included in Section 12.2 of this report.

A total of four soil samples were collected from the borings at a depth of approximately one-half to one foot below the ground surface. The samples were analyzed at a State of California certified analytical laboratory for OCPs by United States Environmental Protection Agency (EPA) test Method 8081A and total arsenic by United States EPA test Method 6010B.

No OCP concentrations were detected above the laboratory detection limits in any of the soil samples analyzed. Total arsenic was detected in two of the four soil samples at concentrations of 2.80 milligrams per kilogram (mg/kg) (001) and 8.94 mg/kg (002). Such concentrations are below the ambient screening level of 12 milligrams per kilogram recognized by the State of California Department of Toxic Substances Control. The analytical laboratory report is included in Section 12.5 of this report.

8.0 Findings, Opinion, Conclusions and Recommendations

Advantage Environmental Consultants, LLC has performed a Phase I Environmental Site Assessment, in conformance with the scope and limitations of ASTM Practice E 1527-13 of the property located at 3111 Manchester Avenue in Encinitas, California (San Diego County APN 261-210-01-00).

This assessment has revealed no evidence of recognized environmental conditions in connection with the Site. Additional environmental investigation at the Site is not considered to be warranted at this time.

9.0 Deviations and Data Gaps

No data gaps of significance or deviations as defined in the ASTM E 1527-13 standard were noted during the completion of this assessment.

10.0 References

"All Appropriate Inquiry" as necessary to satisfy the defenses available under 42 U.S.C. §§ 9607(b)(3), 9607(r)(1), and 9607(q), relying on definitions provided at 42 U.S.C. §§ 9601(35)(B); and as further explained in 40 CFR §§ 312.1 – 312.31.

ASTM International, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process," ASTM Designation E 1527-13, Published November 2013.

California Department of Conservation (CDC), 2010, Geologic Map California, compiled by Charles W. Jennings (1977).

California Geological Survey (CGS), 2002, California Geomorphic Provinces Note 36, Electronic Copy, Revised December.

California Regional Water Quality Control Board - San Diego Region 9, 1994, Water Quality Control Plan - San Diego Region: California State Water Resources Control Board Publication.

California State Water Resources Control Board, GeoTracker online database: http://www.geotracker.swrcb.ca.gov.

ERIS Radius Map report dated October 13, 2017.

USGS topographic map, Encinitas, California 7.5' Quadrangle (2015).

11.0 Signatures and Qualifications of Environmental Professionals

We declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental Professional as defined in 40 CFR 312.10. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject Site. We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Dal Weis

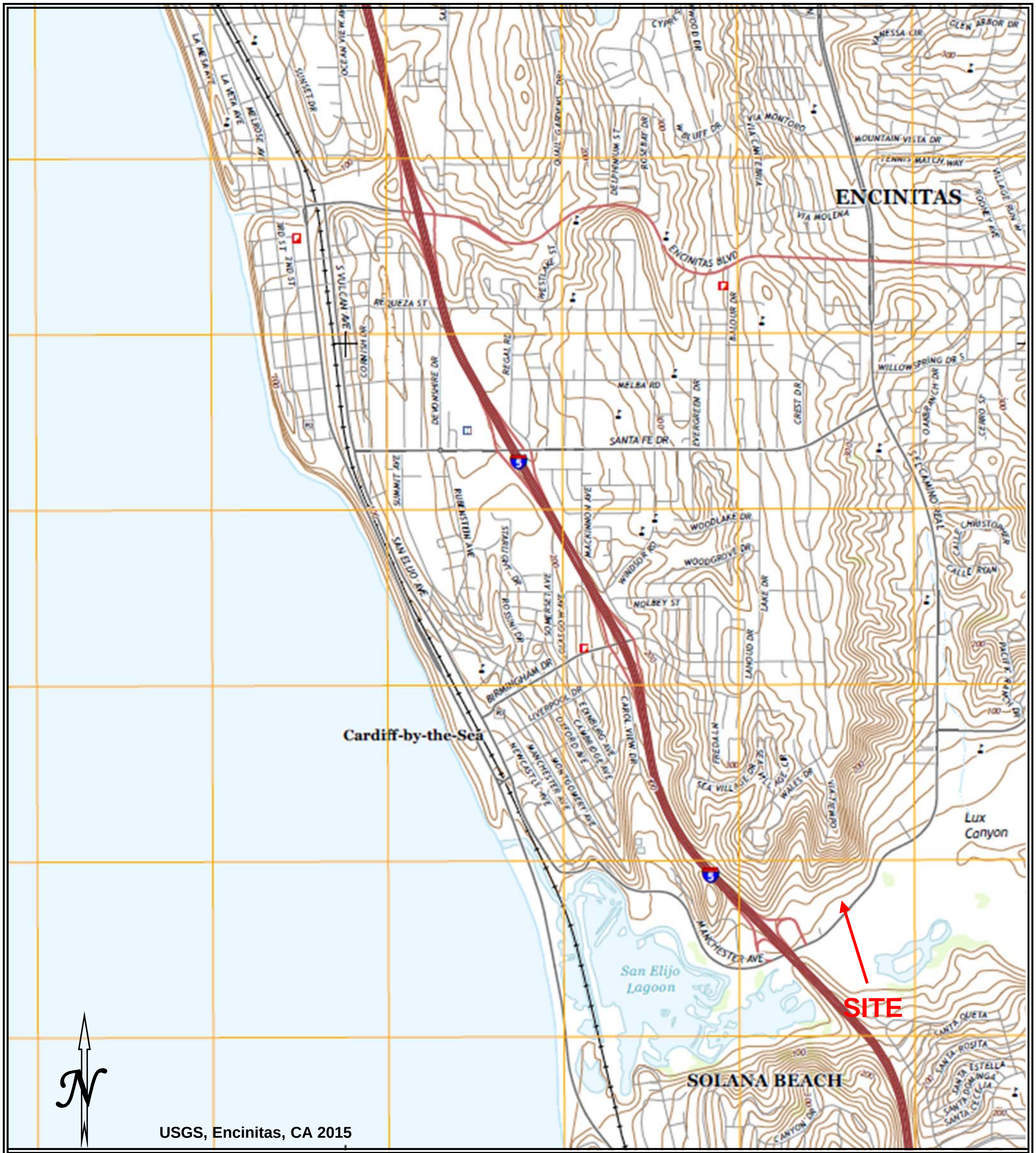
Daniel Weis, R.E.H.S.
Branch Manager

Samantha Hopper
Project Manager

Qualifications for the environmental professionals involved in the performance of the Phase I ESA are included in Section 12.6.

12.0 Appendices

12.1 Vicinity Map



USGS, Encinitas, CA 2015

Advantage Environmental Consultants, LLC

145 Vallecitos de Oro, Suite 201
San Marcos, California 92069
Phone: 760-744-3363 • Fax: 760-744-3383

VICINITY MAP

3111 Manchester Avenue
Encinitas, California

Work Order No.:	Report Date:	Drawn By:
17-325SD	November 2017	SH

12.2 Site Plan

AEC Advantage Environmental Consultants, LLC

145 Vallecitos De Oro, Suite 201
San Marcos, CA 92069
Phone: 760-744-3363 Fax: 760-744-3383

Site Plan
3111 Manchester Avenue
Encinitas, California

Work Order No.:	Report Date:	Drawn By:
17-325SD	November 2017	SH

12.3 Site Photographs

1. View of Site looking east across Via Poco.

2. View of storage trailers at the Site.

3. View of shipping containers at the Site.

4. View of the interior of the produce stand at the Site.

5. View across the Site.

6. View across the Site.

7. View across the Site.

8. View across the Site.

9. View of tractor tires and portable water tank at the Site.

10. View of the dumpster at the Site.

11. View of paint cans at the Site.

12. View of a gasoline can at the Site.

13. View of a portable water tank at the Site.

14. View the pad-mounted transformer at the Site.

15. View of a covered "shade" shed.

16. View of the desilting basin.

17. View along the southern Site boundary looking east along Manchester Avenue.

18. View across the Site, with San Elijo Lagoon in the background.

19. View along the northern Site boundary looking west.

20. View along the northern Site boundary looking east.

21. View of the northern adjacent vacant land and residential properties.

22. View along the western Site boundary along Via Poco.

23. View of the western adjacent construction property.

24. View of the western adjacent construction project.

25. View along the eastern Site boundary looking north.

26. View of the eastern adjacent vacant property.

12.4 Regulatory Database Report

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

DATABASE REPORT

Project Property:	*17-325SD - 3111 Manchester* *3111 Manchester Avenue* *Cardiff CA*
Project No:	*17-325SD*
Report Type:	*Database Report*
Order No:	*20171012123*
Requested by:	*Advantage Environmental Consultants Llc*
Date Completed:	*October 13, 2017*

Environmental Risk
Information Services
A division of Glacier Media Inc.
P: 1.866.517.5204
E: info@erisinfo.com

www.erisinfo.com

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Executive Summary

Property Information:

Project Property:	*17-325SD - 3111 Manchester* *3111 Manchester Avenue Cardiff CA*
Project No:	*17-325SD*

Coordinates:

Latitude:	*33.013769*
Longitude:	*-117.261523*
UTM Northing:	*3,652,843.76*
UTM Easting:	*475,573.33*
UTM Zone:	*UTM Zone 11S*

Elevation:	*36 FT*

Order Information:

Order No:	*20171012123*
Date Requested:	*October 12, 2017*
Requested by:	*Advantage Environmental Consultants Llc*
Report Type:	*Database Report*

Historicals/Products:

Executive Summary: Report Summary

Database	*Searched*	*Search Radius*	*Project Property*	*Within 0.12mi*	*.125mi to 0.25mi*	*0.25mi to 0.50mi*	*0.50mi to 1.00mi*	*Total*
Standard Environmental Records								
Federal								
NPL	*Y*	*1*	*0*	*0*	*0*	*0*	*0*	*0*
PROPOSED NPL	*Y*	*1*	*0*	*0*	*0*	*0*	*0*	*0*
DELETED NPL	*Y*	*.5*	*0*	*0*	*0*	*0*	*-*	*0*
SEMS	*Y*	*.5*	*0*	*0*	*0*	*0*	*-*	*0*
SEMS ARCHIVE	*Y*	*.5*	*0*	*0*	*0*	*0*	*-*	*0*
CERCLIS	*Y*	*.5*	*0*	*0*	*0*	*0*	*-*	*0*
CERCLIS NFRAP	*Y*	*.5*	*0*	*0*	*0*	*0*	*-*	*0*
CERCLIS LIENS	*Y*	*.125*	*0*	*0*	*-*	*-*	*-*	*0*
RCRA CORRACTS	*Y*	*1*	*0*	*0*	*0*	*0*	*0*	*0*
RCRA TSD	*Y*	*.5*	*0*	*0*	*0*	*0*	*-*	*0*
RCRA LQG	*Y*	*.125*	*0*	*0*	*-*	*-*	*-*	*0*
RCRA SQG	*Y*	*.125*	*0*	*1*	*-*	*-*	*-*	*1*
RCRA CESQG	*Y*	*.125*	*0*	*0*	*-*	*-*	*-*	*0*
RCRA NON GEN	*Y*	*.125*	*0*	*0*	*-*	*-*	*-*	*0*
FED ENG	*Y*	*.5*	*0*	*0*	*0*	*0*	*-*	*0*
FED INST	*Y*	*.5*	*0*	*0*	*0*	*0*	*-*	*0*
ERNS 1982 TO 1986	*Y*	*.125*	*0*	*0*	*-*	*-*	*-*	*0*
ERNS 1987 TO 1989	*Y*	*.125*	*0*	*0*	*-*	*-*	*-*	*0*
ERNS	*Y*	*.125*	*0*	*0*	*-*	*-*	*-*	*0*
FED BROWNFIELDS	*Y*	*.5*	*0*	*0*	*0*	*0*	*-*	*0*
FEMA UST	*Y*	*.25*	*0*	*0*	*0*	*-*	*-*	*0*
SEMS LIEN	*Y*	*PO*	*0*	*-*	*-*	*-*	*-*	*0*
State								
RESPONSE	*Y*	*1*	*0*	*0*	*0*	*0*	*0*	*0*
ENVIROSTOR	*Y*	*1*	*0*	*0*	*0*	*0*	*0*	*0*
DELISTED ENVS	*Y*	*1*	*0*	*0*	*0*	*0*	*0*	*0*
SWF/LF	*Y*	*.5*	*0*	*0*	*0*	*0*	*-*	*0*
HWP	*Y*	*1*	*0*	*0*	*0*	*0*	*0*	*0*

Database	Searched	Search Radius	Project Property	Within 0.12mi	.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
LDS	Y	.5	0	0	0	0	-	0
LUST	Y	.5	0	1	0	0	-	1
DLST	Y	.5	0	0	0	0	-	0
UST	Y	.125	0	1	-	-	-	1
UST CLOSURE	Y	.5	0	0	0	0	-	0
HHSS	Y	.125	0	1	-	-	-	1
AST	Y	.125	0	0	-	-	-	0
DELISTED TNK	Y	.125	0	0	-	-	-	0
CERS TANK	Y	.25	0	0	0	-	-	0
DELISTED HAZ	Y	.5	0	0	0	0	-	0
LUR	Y	.5	0	0	0	0	-	0
HLUR	Y	.5	0	0	0	0	-	0
DEED	Y	.5	0	0	0	0	-	0
VCP	Y	.5	0	0	0	0	-	0
CLEANUP SITES	Y	.5	0	1	0	0	-	1
CERS HAZ	Y	.5	0	0	0	0	-	0
DELISTED CTNK	Y	.25	0	0	0	-	-	0

Tribal

Database	Searched	Search Radius	Project Property	Within 0.12mi	.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
INDIAN LUST	Y	.5	0	0	0	0	-	0
INDIAN UST	Y	.125	0	0	-	-	-	0
DELISTED ILST	Y	.5	0	0	0	0	-	0
DELISTED IUST	Y	.125	0	0	-	-	-	0

County

Database	Searched	Search Radius	Project Property	Within 0.12mi	.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
DELISTED COUNTY	Y	.125	0	0	-	-	-	0
SANDIEGO HAZ	Y	.125	1	5	-	-	-	6
SANDIEGO SAM	Y	.5	0	2	0	0	-	2
SANDIEGO SWF	Y	.5	0	0	0	0	-	0
SANDIEGO UST	Y	.25	0	1	0	-	-	1
SAN DIEGO LOP	Y	.5	0	1	0	0	-	1

Additional Environmental Records

Federal

Database	Searched	Search Radius	Project Property	Within 0.12mi	.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
FINDS/FRS	Y	.125	1	6	-	-	-	7
TRIS	Y	.125	0	0	-	-	-	0
HMIRS	Y	.125	0	0	-	-	-	0
NCDL	Y	.125	0	0	-	-	-	0
ODI	Y	.5	0	0	0	0	-	0
IODI	Y	.5	0	0	0	0	-	0
TSCA	Y	.125	0	0	-	-	-	0
HIST TSCA	Y	.125	0	0	-	-	-	0

Database	Searched	Search Radius	Project Property	Within 0.12mi	.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
FTTS ADMIN	Y	.125	0	0	-	-	-	0
FTTS INSP	Y	.125	0	0	-	-	-	0
PRP	Y	.125	0	0	-	-	-	0
SCRD DRYCLEANER	Y	.125	0	0	-	-	-	0
ICIS	Y	.125	0	0	-	-	-	0
FED DRYCLEANERS	Y	.125	0	0	-	-	-	0
DELISTED FED DRY	Y	.25	0	0	0	-	-	0
FUDS	Y	1	0	0	0	0	0	0
MLTS	Y	.125	0	0	-	-	-	0
HIST MLTS	Y	PO	0	-	-	-	-	0
MINES	Y	.25	0	0	0	-	-	0
ALT FUELS	Y	.25	0	0	0	-	-	0
SUPERFUND ROD	Y	1	0	0	0	0	0	0
SSTS	Y	.25	0	0	0	-	-	0
PCB	Y	.5	0	0	0	0	-	0
State								
INSP COMP ENF	Y	1	0	0	0	0	0	0
CDL	Y	.125	0	0	-	-	-	0
SCH	Y	.125	0	0	-	-	-	0
CHMIRS	Y	.125	0	2	-	-	-	2
SWAT	Y	.5	0	0	0	0	-	0
HAZNET	Y	.125	0	7	-	-	-	7
SWRCB SWF	Y	.5	0	0	0	0	-	0
HWSS CLEANUP	Y	.125	0	0	-	-	-	0
DTSC HWF	Y	.5	0	0	0	0	-	0
HIST MANIFEST	Y	.125	0	0	-	-	-	0
HIST CHMIRS	Y	.125	0	0	-	-	-	0
HIST CORTESE	Y	.125	0	0	-	-	-	0
CDO/CAO	Y	.125	0	0	-	-	-	0
DRYCLEANERS	Y	.125	0	0	-	-	-	0
DELISTED DRYC	Y	.25	0	0	0	-	-	0
WASTE DISCHG	Y	.25	0	0	0	-	-	0
Tribal	*No Tribal additional environmental record sources available for this State.*							
County	*No County additional environmental databases were selected to be included in the search.*							
	Total:		2	29	0	0	0	31

**** PO – Property Only***
**** 'Property and adjoining properties' database search radii are set at 0.25 miles.***

Executive Summary: Site Report Summary - Project Property

Map Key	*DB*	*Company/Site Name*	*Address*	*Direction*	*Distance (mi/ft)*	*Elev Diff (ft)*	*Page Number*
2	FINDS/FRS	WILLIAMSON PRODUCE-AWM	3111 MANCHESTER AVE CARDIFF CA 92007	ESE	0.01 / 35.11	-25	21
2	SANDIEGO HAZ	WILLIAMSON PRODUCE-AWM	3111 MANCHESTER AVE 3111 MANCHESTER AVE CARDIFF CA 92007	ESE	0.01 / 35.11	-25	21

Executive Summary: Site Report Summary - Surrounding Properties

Map Key	*DB*	*Company/Site Name*	*Address*	*Direction*	*Distance (mi/ft)*	*Elev Diff (ft)*	*Page Number*
1	HHSS	GIM TOM FARM	3107 MANCHESTER AVE. CARDIFF BY THE SEA CA 92007	SSW	0.00 / 24.31	-25	22
1	SANDIEGO HAZ	GIM TOM FARMS	3107 MANCHESTER AV, CARDIFF, 92007- CA	SSW	0.00 / 24.31	-25	23
3	FINDS/FRS	CITY OF ENCINITAS-OLIVENHAIN PUMP STN	3050 MANCHESTER AV CARDIFF BY THE SEA CA 92007	SE	0.01 / 62.22	-25	24
3	SANDIEGO HAZ	CITY OF ENCINITAS-OLIVENHAIN PUMP STN	3050 MANCHESTER AVE 3050 MANCHESTER AVE CARDIFF BY THE SEA CA 92007	SE	0.01 / 62.22	-25	24
4	UST	CARDIFF CHEVRON	3085 MANCHESTER AVE CARDIFF BY THE SEA CA 92007 ***Facility ID:*** 37-000-211657	SSW	0.01 / 63.91	-22	25
5	CHMIRS	County San Diego Hazmat	3100 Manchester Ave Encinitas CA 92007	ENE	0.02 / 99.19	-27	25
6	CLEANUP SITES	CARDIFF 76 #5946	3085 MANCHESTER AV CARDIFF CA 920072205	SSW	0.03 / 169.20	-18	26
7	CHMIRS	unocal	#5946 3085 manchester ave cardiff CA 92007	NE	0.04 / 186.73	-25	27
7	FINDS/FRS	UNOCAL / CARDIFF	3085 MANCHESTER AVENUE CARDIFF CA 92007-2205	NE	0.04 / 186.73	-25	27
7	FINDS/FRS	CARDIFF 76	3085 MANCHESTER AVE CARDIFF BY THE SEA CA 92007	NE	0.04 / 186.73	-25	28
7	FINDS/FRS	CARDIFF 76 #5946	3085 MANCHESTER AV CARDIFF CA 920072205	NE	0.04 / 186.73	-25	28
7	SANDIEGO HAZ	CARDIFF CHEVRON	3085 MANCHESTER AVE 3085 MANCHESTER AVE CARDIFF BY THE SEA CA	NE	0.04 / 186.73	-25	29

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			92007				
7	SANDIEGO HAZ	CARDIFF 76 #255946	3085 MANCHESTER AV, CARDIFF, 92007-2205 CA	NE	0.04 / 186.73	-25	32
7	SAN DIEGO LOP	CARDIFF 76 #5946	3085 MANCHESTER AVE, CARDIFF BY THE SEA, CA 92007-2205 CARDIFF BY THE SEA CA	NE	0.04 / 186.73	-25	32
7	HAZNET	CONOCO PHILLIPS # 255946	3085 MANCHESTER AVE CARDIFF CA 920072205	NE	0.04 / 186.73	-25	33
7	HAZNET	UNOCAL SERVICE STATION #5946	3085 MANCHESTER CARDIFF BY THE SEA CA 920070000	NE	0.04 / 186.73	-25	35
7	HAZNET	CARDIFF UNION 76	3085 MANCHESTER CARDIFF BY THE SEA CA 920070000	NE	0.04 / 186.73	-25	37
7	HAZNET	CARDIFF 76	3085 MANCHESTER AVE CARDIFF CA 920070000	NE	0.04 / 186.73	-25	37
7	HAZNET	TOSCO CORPORATION STATION #31033	3085 MANCHESTER CARDIFF BY THE SEA CA 922070000	NE	0.04 / 186.73	-25	39
7	HAZNET	UNION OIL COMPANY OF CALI	3085 MANCHESTER CARDIFF CA 920070000	NE	0.04 / 186.73	-25	41
7	RCRA SQG	UNION OIL COMPANY OF CALI	3085 MANCHESTER CARDIFF CA 92007	NE	0.04 / 186.73	-25	42
7	SANDIEGO SAM	CARDIFF 76 #5946	3085 MANCHESTER AVE Cardiff by the Sea CA	NE	0.04 / 186.73	-25	44
7	SANDIEGO SAM	CARDIFF 76 #5946	3085 MANCHESTER AVE Cardiff by the Sea CA	NE	0.04 / 186.73	-25	44
7	SANDIEGO UST	CARDIFF CHEVRON	3085 MANCHESTER AVE CARDIFF BY THE SEA CA 92007	NE	0.04 / 186.73	-25	45

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
8	FINDS/FRS	CITY OF ENCINITAS-OLIVENHAIN SEWER PUMP STATION CONSTRUCTION DEWATERING PRJT	3101 MANCHESTER ENCINITAS CA 92007	NE	0.05 / 257.46	-24	46
8	FINDS/FRS	OLIVENHAIN PUMP STATION	3101 MANCHESTER AVENUE CARDIFF BY THE SEA CA 92007	NE	0.05 / 257.46	-24	46
8	SANDIEGO HAZ	OLIVENHAIN PUMP STATION	3101 MANCHESTER AVE 3101 MANCHESTER AVE CARDIFF BY THE SEA CA 92007	NE	0.05 / 257.46	-24	47
9	LUST	CARDIFF 76 #5946	3085 MANCHESTER AV CARDIFF CA 920072205	SSW	0.07 / 350.60	-22	48
			Global ID | Status | Status Date: T0607302519 | Completed - Case Closed | 2003-06-10 00:00:00				
10	HAZNET	CITY OF ENCINITAS OLIVENHAIN PUMP STATION	3150 MANCHESTER AVE ENCINITAS CA 92024	ENE	0.10 / 506.53	-23	49

Executive Summary: Summary by Data Source

Standard

Federal

RCRA SQG - RCRA Small Quantity Generators List

A search of the RCRA SQG database, dated Aug 10, 2017 has found that there are 1 RCRA SQG site(s) within approximately 0.12 miles of the project property.

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
UNION OIL COMPANY OF CALI	3085 MANCHESTER CARDIFF CA 92007	NE	0.04 / 186.73	7

State

LUST - Leaking Underground Fuel Tank Reports

A search of the LUST database, dated Aug 14, 2017 has found that there are 1 LUST site(s) within approximately 0.50 miles of the project property.

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
CARDIFF 76 #5946	3085 MANCHESTER AV CARDIFF CA 920072205	SSW	0.07 / 350.60	9

Global ID | Status | Status Date*: T0607302519 | Completed - Case Closed | 2003-06-10 00:00:00*

UST - Permitted Underground Storage Tank (UST) in GeoTracker

A search of the UST database, dated Sep 25, 2017 has found that there are 1 UST site(s) within approximately 0.12 miles of the project property.

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
CARDIFF CHEVRON	3085 MANCHESTER AVE CARDIFF BY THE SEA CA 92007	SSW	0.01 / 63.91	4

Facility ID*: 37-000-211657*

HHSS - Historical Hazardous Substance Storage Information Database

A search of the HHSS database, dated Aug 27, 2015 has found that there are 1 HHSS site(s) within approximately 0.12 miles of the project property.

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
GIM TOM FARM	3107 MANCHESTER AVE. CARDIFF BY THE SEA CA 92007	SSW	0.00 / 24.31	1

CLEANUP SITES - GeoTracker Cleanup Sites Data

A search of the CLEANUP SITES database, dated Aug 14, 2017 has found that there are 1 CLEANUP SITES site(s) within approximately 0.50 miles of the project property.

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
CARDIFF 76 #5946	3085 MANCHESTER AV CARDIFF CA 920072205	SSW	0.03 / 169.20	6

County

SANDIEGO HAZ - San Diego County Hazardous Materials Management Division Database

A search of the SANDIEGO HAZ database, dated May 19, 2017 has found that there are 6 SANDIEGO HAZ site(s) within approximately 0.12 miles of the project property.

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
GIM TOM FARMS	3107 MANCHESTER AV, CARDIFF, 92007- CA	SSW	0.00 / 24.31	1
WILLIAMSON PRODUCE-AWM	3111 MANCHESTER AVE 3111 MANCHESTER AVE CARDIFF CA 92007	ESE	0.01 / 35.11	2
CITY OF ENCINITAS-OLIVENHAIN PUMP STN	3050 MANCHESTER AVE 3050 MANCHESTER AVE CARDIFF BY THE SEA CA 92007	SE	0.01 / 62.22	3
CARDIFF 76 #255946	3085 MANCHESTER AV, CARDIFF, 92007-2205 CA	NE	0.04 / 186.73	7
CARDIFF CHEVRON	3085 MANCHESTER AVE 3085 MANCHESTER AVE CARDIFF BY THE SEA CA 92007	NE	0.04 / 186.73	7
OLIVENHAIN PUMP STATION	3101 MANCHESTER AVE 3101 MANCHESTER AVE CARDIFF BY THE SEA CA 92007	NE	0.05 / 257.46	8

SANDIEGO SAM - San Diego County Site Assessment and Mitigation Investigation Sites

A search of the SANDIEGO SAM database, dated Sep 7, 2017 has found that there are 2 SANDIEGO SAM site(s) within approximately 0.50 miles of the project property.

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
CARDIFF 76 #5946	3085 MANCHESTER AVE Cardiff by the Sea CA	NE	0.04 / 186.73	7
CARDIFF 76 #5946	3085 MANCHESTER AVE Cardiff by the Sea CA	NE	0.04 / 186.73	7

SANDIEGO UST - San Diego County UST List

A search of the SANDIEGO UST database, dated May 26, 2017 has found that there are 1 SANDIEGO UST site(s) within approximately 0.25 miles of the project property.

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
CARDIFF CHEVRON	3085 MANCHESTER AVE CARDIFF BY THE SEA CA 92007	NE	0.04 / 186.73	7

SAN DIEGO LOP - San Diego County Local Oversight Program List

A search of the SAN DIEGO LOP database, dated Aug 3, 2017 has found that there are 1 SAN DIEGO LOP site(s) within approximately 0.50 miles of the project property.

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
CARDIFF 76 #5946	3085 MANCHESTER AVE, CARDIFF BY THE SEA, CA 92007-2205 CARDIFF BY THE SEA CA	NE	0.04 / 186.73	7

Non Standard

Federal

FINDS/FRS - Facility Registry Service/Facility Index

A search of the FINDS/FRS database, dated Jun 1, 2017 has found that there are 7 FINDS/FRS site(s) within approximately 0.12 miles of the project property.

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
WILLIAMSON PRODUCE-AWM	3111 MANCHESTER AVE CARDIFF CA 92007	ESE	0.01 / 35.11	2
CITY OF ENCINITAS-OLIVENHAIN PUMP STN	3050 MANCHESTER AV CARDIFF BY THE SEA CA 92007	SE	0.01 / 62.22	3
CARDIFF 76	3085 MANCHESTER AVE CARDIFF BY THE SEA CA 92007	NE	0.04 / 186.73	7
CARDIFF 76 #5946	3085 MANCHESTER AV CARDIFF CA 920072205	NE	0.04 / 186.73	7
UNOCAL / CARDIFF	3085 MANCHESTER AVENUE CARDIFF CA 92007-2205	NE	0.04 / 186.73	7
OLIVENHAIN PUMP STATION	3101 MANCHESTER AVENUE CARDIFF BY THE SEA CA 92007	NE	0.05 / 257.46	8

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
CITY OF ENCINITAS-OLIVENHAIN SEWER PUMP STATION CONSTRUCTION DEWATERING PRJT	3101 MANCHESTER ENCINITAS CA 92007	NE	0.05 / 257.46	8

State

CHMIRS - California Hazardous Material Incident Report System (CHMIRS)

A search of the CHMIRS database, dated May 09, 2017 has found that there are 2 CHMIRS site(s) within approximately 0.12 miles of the project property.

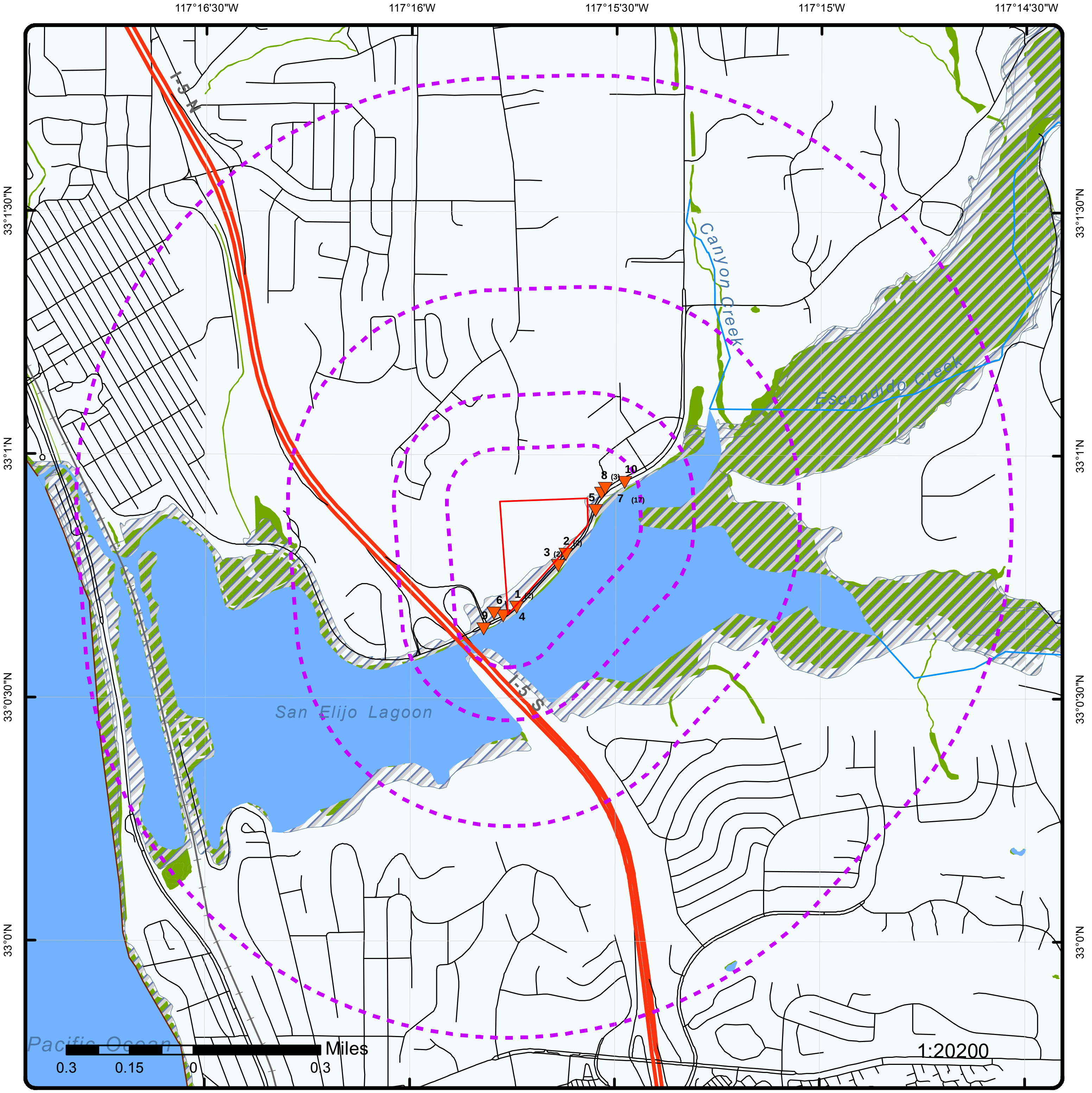
Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
County San Diego Hazmat	3100 Manchester Ave Encinitas CA 92007	ENE	0.02 / 99.19	5
unocal	#5946 3085 manchester ave cardiff CA 92007	NE	0.04 / 186.73	7

HAZNET - Hazardous Waste Manifest Data

A search of the HAZNET database, dated Oct 24, 2016 has found that there are 7 HAZNET site(s) within approximately 0.12 miles of the project property.

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
UNOCAL SERVICE STATION #5946	3085 MANCHESTER CARDIFF BY THE SEA CA 920070000	NE	0.04 / 186.73	7
TOSCO CORPORATION STATION #31033	3085 MANCHESTER CARDIFF BY THE SEA CA 922070000	NE	0.04 / 186.73	7
CARDIFF 76	3085 MANCHESTER AVE CARDIFF CA 920070000	NE	0.04 / 186.73	7
CARDIFF UNION 76	3085 MANCHESTER CARDIFF BY THE SEA CA 920070000	NE	0.04 / 186.73	7
CONOCO PHILLIPS # 255946	3085 MANCHESTER AVE CARDIFF CA 920072205	NE	0.04 / 186.73	7
UNION OIL COMPANY OF CALI	3085 MANCHESTER CARDIFF CA 920070000	NE	0.04 / 186.73	7

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
CITY OF ENCINITAS OLIVENHAIN PUMP STATION	3150 MANCHESTER AVE ENCINITAS CA 92024	ENE	0.10 / 506.53	10



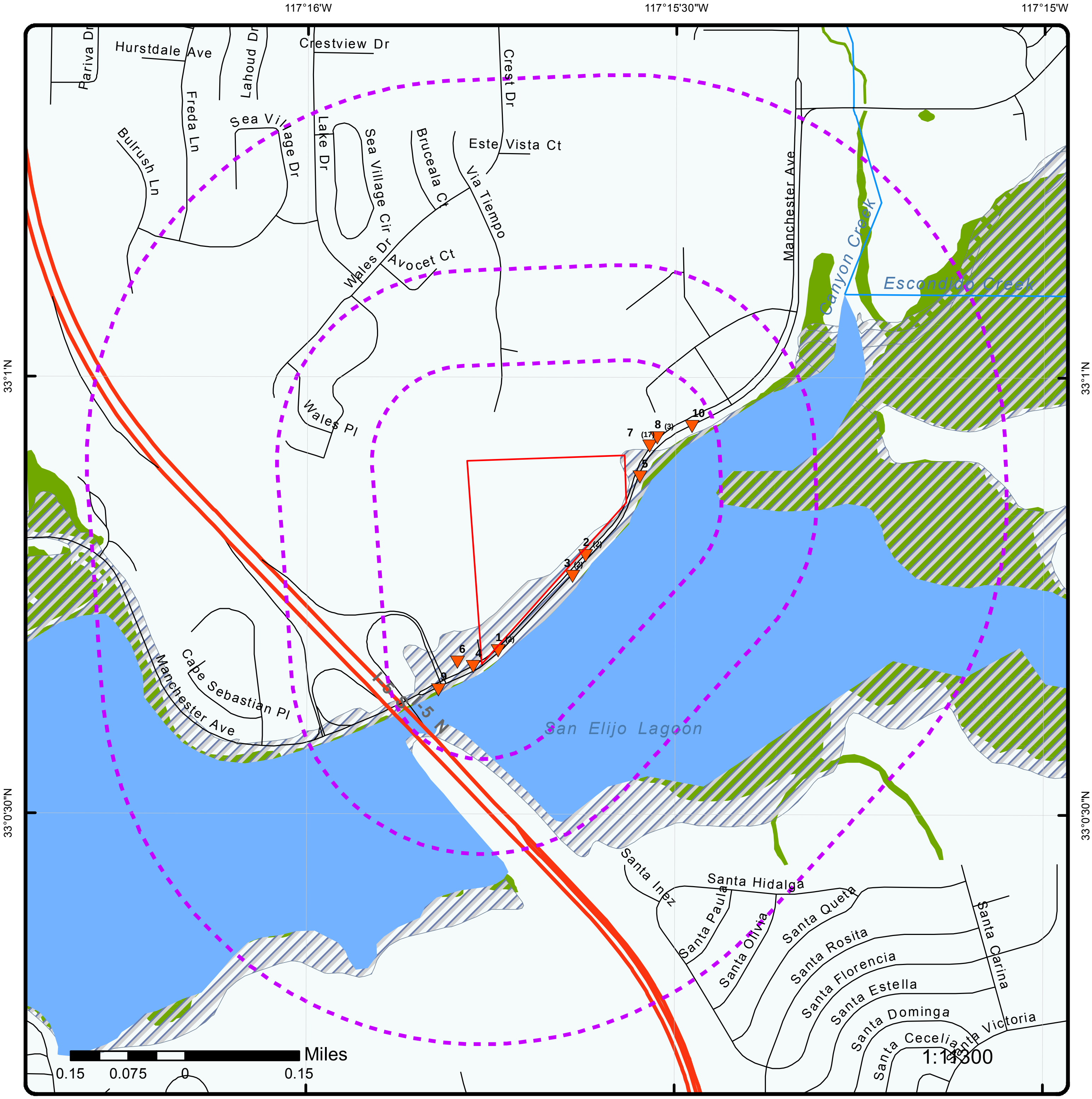
Map : 1 Mile Radius

Order No: 20171012123

Address: 3111 Manchester Avenue, Cardiff, CA

- ▭ Project Property
- ▭ **Buffer Outline**
- △ Eris Sites with Higher Elevation
- ■ Eris Sites with Same Elevation
- ▼ Eris Sites with Lower Elevation
- ○ Eris Sites with Unknown Elevation
- ▭ County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
- Local Roads and Ramps
- ▭ State Boundary
- ▨ National Priority List Sites
- 🟩 National Wetland
- ▨ Indian Reserve Land
- ▥ Historic Fill
- ▨ 100 Year Flood Zone
- ▨ 500 Year Flood Zone
- ▦ FWS Special Designation Areas
- ▤ State Brownfield Sites
- ▤ State Brownfield Areas
- ▨ State Superfund Areas:Dept. of Defense
- ▥ State Superfund Areas:NPL
- ▤ WQARF Areas
- ▨ Federal Lands: Dept. of Defense (owned/administered areas)

Source: © 2016 ESRI



Map : 0.5 Mile Radius

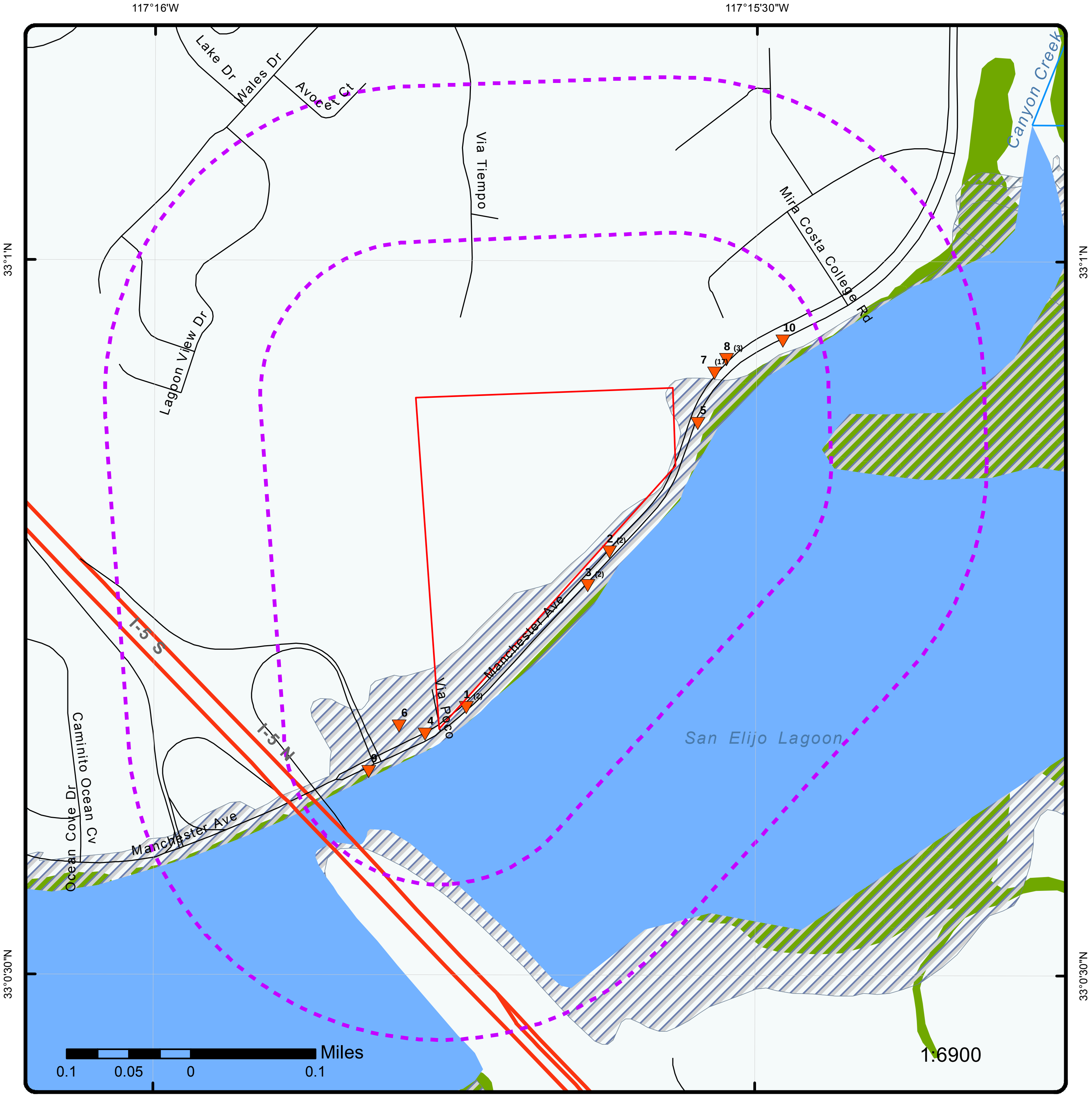
Order No: 20171012123

Address: 3111 Manchester Avenue, Cardiff, CA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- ▭ Project Property
- ▭ **Buffer Outline**
- △ Eris Sites with Higher Elevation
- ■ Eris Sites with Same Elevation
- ▼ Eris Sites with Lower Elevation
- ○ Eris Sites with Unknown Elevation
- ▭ County Boundary
- ─ Rails
- ─ Major Highways
- ─ Major Highways Ramps
- ─ Major Roads
- ─ Major Roads Ramps
- ─ Secondary Roads
- ─ Secondary Roads Ramps
- ─ Local Roads and Ramps
- ▭ State Boundary
- ▨ National Priority List Sites
- ■ National Wetland
- ▨ Indian Reserve Land
- ▥ Historic Fill
- ▨ 100 Year Flood Zone
- ▨ 500 Year Flood Zone
- ▩ FWS Special Designation Areas
- ▤ State Brownfield Sites
- ▭ State Brownfield Areas
- ▨ State Superfund Areas:Dept. of Defense
- ▥ State Superfund Areas:NPL
- ▤ WQARF Areas
- ▨ Federal Lands: Dept. of Defense (owned/administered areas)

Source: © 2016 ESRI



Map : 0.25 Mile Radius

Order No: 20171012123
Address: 3111 Manchester Avenue, Cardiff, CA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- 🟥 Project Property
- **Buffer Outline**
- △ Eris Sites with Higher Elevation
- ■ Eris Sites with Same Elevation
- ▼ Eris Sites with Lower Elevation
- ○ Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
- Local Roads and Ramps
- State Boundary
- ▨ National Priority List Sites
- 🟩 National Wetland
- ▨ Indian Reserve Land
- Historic Fill
- ▨ 100 Year Flood Zone
- ▨ 500 Year Flood Zone
- ▨ FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- ▨ State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)

Source: © 2016 ESRI

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

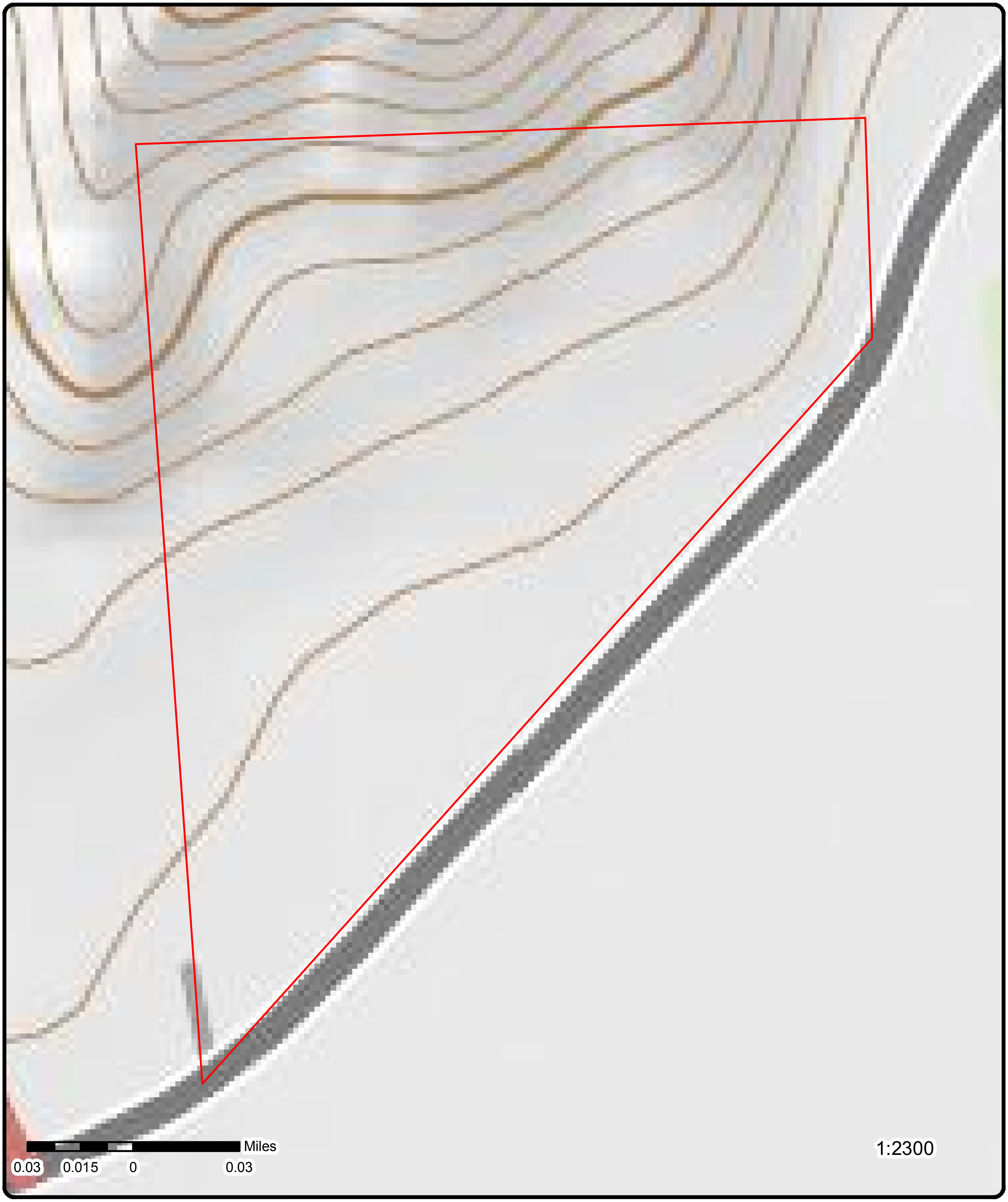
Aerial

Order No: 20171012123

Address: 3111 Manchester Avenue, Cardiff, CA

Source: ESRI World Imagery

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES



Topographic Map

Order No: 20171012123

Address: 3111 Manchester Avenue, Cardiff, CA

Source: USGS Topographic Map

Detail Report

Map Key	***Number of Records***	***Direction***	***Distance (mi/ft)***	***Elev (ft)***	***Site***	***DB***
2	***1 of 2***	***ESE***	***0.01 / 35.11***	***11.57***	***WILLIAMSON PRODUCE-AWM 3111 MANCHESTER AVE CARDIFF CA 92007***	***FINDS/FRS***

Registry ID:	110065293113
FIPS Code:	
Program Acronyms:	CA-ENVIROVIEW
HUC Code:	18070303
Site Type Name:	STATIONARY
EPA Region Code:	09
Conveyor:	FRS-GEOCODE
Source:	
County Name:	SAN DIEGO
SIC Codes:	
SIC Code Descriptions:	
NAICS Codes:	
Federal Facility Code:	
NAICS Code Descriptions:	
Federal Agency Name:	
US/Mexico Border Ind:	Yes
Congressional Dist No.:	50
Create Date:	10-OCT-2015 10:36:04
Census Block Code:	060730174043018
Update Date:	
Location Description:	
Supplemental Location:	
Tribal Land Code:	
Tribal Land Name:	
Latitude:	33.01345
Longitude:	-117.26176
Coord Collection Method:	ADDRESS MATCHING-HOUSE NUMBER
Accuracy Value:	30
Datum:	NAD83
Reference Point:	CENTER OF A FACILITY OR STATION
Interest Types:	STATE MASTER
Facility Detail Rprt URL:	http://ofmpub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110065293113

2	***2 of 2***	***ESE***	***0.01 / 35.11***	***11.57***	***WILLIAMSON PRODUCE-AWM 3111 MANCHESTER AVE 3111 MANCHESTER AVE CARDIFF CA 92007***	***SANDIEGO HAZ***

Record ID:	DEH2002-HUPFP-199148	***GIS Record Type:***	LUEG-DEH/HMD/UPFP/Facility
Facility ID No:	37-000-199148	***GIS Facility ID:***	37-000-199148
EPA ID No:		***GIS EPA ID No:***	
ID:	5085	***GIS CERS ID:***	10363693
CERS ID:	10363693	***Record Status:***	Issued
Permit Status:	Permit Renewed	***SIC Code:***	0000
Active Permit:	Yes	***NAICS Code:***	
Project Name:	WILLIAMSON PRODUCE-AWM	***Record Name:***	WILLIAMSON PRODUCE-AWM
Business Phone:	760-420-6626	***Site Address:***	3111 MANCHESTER AVE
Business Fax:	0	***City:***	CARDIFF
Latitude:	33.011346598419571	***Zip Code:***	92007
Longitude:	-117.26260378901783	***Census Tra:***	174.04
Haz Materials on Site:	Yes	***Watrshed Ba:***	904.61
Own/Oper Under:	No	***Thomas Bros:***	1167 F 4

Own/Oper Above:	No	***Insp Dist:***	HN099
Haz Waste Generator:	No	***KivaPerTyp:***	HK07 199148
Recycle:	No	***Point X:***	6251517.26193
Onsite Haz Waste Tr.:	No	***Point Y:***	1950025.43688
RCRA Large Qty Gen.:	No	***Hazmat EHS:***	No
HHW Collection:	No	***Hazmat Rad:***	No
Last Updated:	2017-03-23T17:18:07.000	***Tank Owner:***	
Expiration:	1015545600000	***Indian or Tr:***	
Open Date:	1020470400000	***UST Facili:***	
Parcel No:	261-210-01-00	***Total No USTS:***	
HW Tier:	Not Applicable	***Community Z:***	Cardiff by the Sea
LRG QTY MW:		***Jurisd:***	ENCINITAS
RMP CALARP:	Not Applicable	***Water Purv:***	OLIVENHAIN MUNICIPAL WATER DISTRICT
Disclose QT:	Yes	***Fire Agenc:***	OLIVENHAIN MUNICIPAL WATER DISTRICT
Own Oper APS:	No	***BOS Dist:***	3
Haz Waste G:	No	***Zip Code:***	92007
Recycle100:	No	***GIS Latitude:***	33.01345
Onsite Haz W:	No	***GIS Longitude:***	-117.261762
RCRA LRG Q:	No	***X Mapcoord:***	6251517.262
HHW Colle Si:	No	***Y Mapcoord:***	1950025.437
Accept Offs:	No	***Permit Owner:***	
Universal W:	No	***Phone 1:***	
Toxic Gas G:		***ER Contact N:***	
Haz Waste EH:		***ER Contact:***	
Haz Waste1:		***ER Contact T:***	
Tot APSA Cap:		***ER Contac 1:***	
Farm Nurser:		***Own/Operate:***	
Nummin10KT:		***Email Perm:***	
Capacity LR:			

Record Type:	Unified Program Facility Permit
Bill Code1:	Not Applicable
Bill Code2:	EXEMPT Agriculture Sites
Bill Code3:	EXEMPT Agriculture Sites
Address:	3111 MANCHESTER AVE, CARDIFF, CA 92007
Business T:	Agriculture Site Inspect By Dept AWM
Mailing Address:	308 FOUSSAT RD, OCEANSIDE, CA 92054
Geo SRC:	Mapped to parcel/APN center X,Y
Source File:	DEH Hazardous Material Facility Data; Permits - REST GIS Data - San Diego County

DEH HMD Hazardous Waste and Materials Data

ID:	30644	***Case No:***	7727-37-9
Permit Status:	Permit Renewed	***Trade Secret:***	N
Active Permit:	YES	***Haz Material Type:***	Pure
Child Record ID:	DEH2016-HCHEM-0090572	***Last Updated:***	2017-03-01T05:45:59.000
Chemical Name:	DRY NITROGEN FERTILIZER		
Common Name Inventory:	DRY NITROGEN FERTILIZER		

DEH HMD Inspection and Violation Data

Facility ID:	37-000-199148	***Inspection Date:***	10/03/2014
UST ID:		***Inspection No:***	4088789
Container Tank ID:		***Inspection Type:***	Routine
ID:	11413	***NOV:***	No
Permit Status:	Permit Renewed	***Compliance Date:***	10/17/2014
Active Permit:	YES	***Last Updated:***	2017-03-01T05:45:59.000
Violation Class.:	Minor		
Program Element:	Hazardous Materials Release Response Plans		
Violation Code:	1010002 Owner/Operator failed to complete and/or submit a Hazardous Materials Business Plan when storing hazardous materials at or above the thresholds quantities of 55 gallons/500 lbs/200 cubic feet; HSC 6.95 25508(a)1A		

1	***1 of 2***	***SSW***	***0.00 / 24.31***	***11.64***	***GIM TOM FARM*** ***3107 MANCHESTER AVE.***	***HHSS***

CARDIFF BY THE SEA CA 92007

County:	
Pdf File Url:	http://geotracker.waterboards.ca.gov/ustpdfs/pdf/0002b3b4.pdf

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev (ft)	Site	DB
1	2 of 2	SSW	0.00 / 24.31	11.64	GIM TOM FARMS 3107 MANCHESTER AV, CARDIFF, 92007- CA	SANDIEGO HAZ

Record ID:	DEH2002-HUPFP-199147	**GIS Record Type:**	
Facility ID No:		**GIS Facility ID:**	
EPA ID No:		**GIS EPA ID No:**	
ID:		**GIS CERS ID:**	
CERS ID:		**Record Status:**	
Permit Status:	Completed	**SIC Code:**	
Active Permit:		**NAICS Code:**	
Project Name:	GIM TOM FARMS	**Record Name:**	
Business Phone:		**Site Address:**	
Business Fax:		**City:**	
Latitude:		**Zip Code:**	
Longitude:		**Census Tra:**	
Haz Materials on Site:		**Watrshed Ba:**	
Own/Oper Under:		**Thomas Bros:**	
Own/Oper Above:		**Insp Dist:**	
Haz Waste Generator:		**KivaPerTyp:**	
Recycle:		**Point X:**	
Onsite Haz Waste Tr.:		**Point Y:**	
RCRA Large Qty Gen.:		**Hazmat EHS:**	
HHW Collection:		**Hazmat Rad:**	
Last Updated:	05/04/2002	**Tank Owner:**	
Expiration:		**Indian or Tr:**	
Open Date:		**UST Facili:**	
Parcel No:		**Total No USTS:**	
HW Tier:		**Community Z:**	
LRG QTY MW:		**Jurisd:**	
RMP CALARP:		**Water Purv:**	
Disclose QT:		**Fire Agenc:**	
Own Oper APS:		**BOS Dist:**	
Haz Waste G:		**Zip Code:**	
Recycle100:		**GIS Latitude:**	
Onsite Haz W:		**GIS Longitude:**	
RCRA LRG Q:		**X Mapcoord:**	
HHW Colle Si:		**Y Mapcoord:**	
Accept Offs:		**Permit Owner:**	
Universal W:		**Phone 1:**	
Toxic Gas G:		**ER Contact N:**	
Haz Waste EH:		**ER Contact:**	
Haz Waste1:		**ER Contact T:**	
Tot APSA Cap:		**ER Contac 1:**	
Farm Nurser:		**Own/Operate:**	
Nummin10KT:		**Email Perm:**	
Capacity LR:			
Record Type:	Unified Program Facility Permit		
Bill Code1:			
Bill Code2:			
Bill Code3:			
Address:			
Business T:			
Mailing Address:			
Geo SRC:			
Source File:			

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev (ft)	Site	DB
3	1 of 2	SE	0.01 / 62.22	11.38	CITY OF ENCINITAS-OLIVENHAIN PUMP STN 3050 MANCHESTER AV CARDIFF BY THE SEA CA 92007	FINDS/FRS

Registry ID:	110065067803
FIPS Code:	
Program Acronyms:	CA-ENVIROVIEW
HUC Code:	18070303
Site Type Name:	STATIONARY
EPA Region Code:	09
Conveyor:	FRS-GEOCODE
Source:	
County Name:	SAN DIEGO
SIC Codes:	
SIC Code Descriptions:	
NAICS Codes:	
Federal Facility Code:	
NAICS Code Descriptions:	
Federal Agency Name:	
US/Mexico Border Ind:	Yes
Congressional Dist No.:	50
Create Date:	10-OCT-2015 08:52:03
Census Block Code:	060730174043025
Update Date:	
Location Description:	
Supplemental Location:	
Tribal Land Code:	
Tribal Land Name:	
Latitude:	33.011008
Longitude:	-117.263101
Coord Collection Method:	ADDRESS MATCHING-HOUSE NUMBER
Accuracy Value:	50
Datum:	NAD83
Reference Point:	ENTRANCE POINT OF A FACILITY OR STATION
Interest Types:	STATE MASTER
Facility Detail Rprt URL:	http://ofmpub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110065067803

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev (ft)	Site	DB
3	2 of 2	SE	0.01 / 62.22	11.38	CITY OF ENCINITAS-OLIVENHAIN PUMP STN 3050 MANCHESTER AVE 3050 MANCHESTER AVE CARDIFF BY THE SEA CA 92007	SANDIEGO HAZ

Record ID:	DEH2011-HUPFP-213701	**GIS Record Type:**	LUEG-DEH/HMD/UPFP/Facility
Facility ID No:	37-000-213701	**GIS Facility ID:**	37-000-213701
EPA ID No:		**GIS EPA ID No:**	
ID:	11729	**GIS CERS ID:**	10363741
CERS ID:	10363741	**Record Status:**	Permit Renewed
Permit Status:	Permit Renewed	**SIC Code:**	0000
Active Permit:	Yes	**NAICS Code:**	
Project Name:	CITY OF ENCINITAS-OLIVENHAIN PUMP STN	**Record Name:**	CITY OF ENCINITAS-OLIVENHAIN PUMP STN
Business Phone:	760-753-6203	**Site Address:**	3050 MANCHESTER AV
Business Fax:	7607535935	**City:**	CARDIFF BY THE SEA
Latitude:	33.010617485338784	**Zip Code:**	92007
Longitude:	-117.26404302483375	**Census Tra:**	174.04
Haz Materials on Site:	Yes	**Watrshed Ba:**	904.61
Own/Oper Under:	No	**Thomas Bros:**	1167 F 4
Own/Oper Above:	No	**Insp Dist:**	HC006
Haz Waste Generator:	No	**KivaPerTyp:**	HK07 213701
Recycle:	No	**Point X:**	6250791.99993
Onsite Haz Waste Tr.:	No	**Point Y:**	1949174.99993
RCRA Large Qty Gen.:	No	**Hazmat EHS:**	No
HHW Collection:	No	**Hazmat Rad:**	No

Last Updated:	2017-04-28T02:31:46.000	**Tank Owner:**	
Expiration:	1464652800000	**Indian or Tr:**	
Open Date:	1297036800000	**UST Facili:**	
Parcel No:		**Total No USTS:**	
HW Tier:	Not Applicable	**Community Z:**	Cardiff by the Sea
LRG QTY MW:	No	**Jurisd:**	ENCINITAS
RMP CALARP:	Not Applicable	**Water Purv:**	CWA OLIVENHAIN MUNI WATER DIST
Disclose QT:	Yes	**Fire Agenc:**	ENCINITAS
Own Oper APS:	No	**BOS Dist:**	3
Haz Waste G:	No	**Zip Code:**	92007
Recycle100:	No	**GIS Latitude:**	33.0111
Onsite Haz W:	No	**GIS Longitude:**	-117.2641
RCRA LRG Q:	No	**X Mapcoord:**	6250792
HHW Colle Si:	No	**Y Mapcoord:**	1949175
Accept Offs:	No	**Permit Owner:**	
Universal W:	No	**Phone 1:**	
Toxic Gas G:		**ER Contact N:**	
Haz Waste EH:		**ER Contact:**	
Haz Waste1:		**ER Contact T:**	
Tot APSA Cap:		**ER Contac 1:**	
Farm Nurser:		**Own/Operate:**	
Nummin10KT:		**Email Perm:**	
Capacity LR:			

Record Type:	Unified Program Facility Permit
Bill Code1:	One (Billable) Waste Item or One Reportable Material Per Business
Bill Code2:	Not Applicable
Bill Code3:	Not Applicable
Address:	3050 MANCHESTER AVE, CARDIFF BY THE SEA, CA 92007
Business T:	One (1) Waste Item or One (1) Inventory
Mailing Address:	2695 Manchester Avenue, Encinitas, CA 92024
Geo SRC:	Mapped to parcel/APN center X,Y
Source File:	DEH Hazardous Material Facility Data; Permits - REST GIS Data - San Diego County

<u>DEH HMD Hazardous Waste and Materials Data</u>

ID:	56107	**Case No:**	68334-30-5
Permit Status:	Permit Renewed	**Trade Secret:**	N
Active Permit:	YES	**Haz Material Type:**	Pure
Child Record ID:	DEH2014-HCHEM-0023496	**Last Updated:**	2016-04-28T02:30:35.000
Chemical Name:	Diesel Fuel		
Common Name Inventory:	Diesel Fuel		

4	**1 of 1**	**SSW**	**0.01 / 63.91**	**14.73**	**CARDIFF CHEVRON** **3085 MANCHESTER AVE** **CARDIFF BY THE SEA CA 92007**	**UST**

Facility ID:	37-000-211657	**Latitude:**	33.01114
County:	San Diego	**Longitude:**	-117.2629
Permitting Agency:	San Diego County Department of Environmental Health		

5	**1 of 1**	**ENE**	**0.02 / 99.19**	**9.63**	**County San Diego Hazmat** **3100 Manchester Ave** **Encinitas CA 92007**	**CHMIRS**

ID:	12-2982	**Notified Date:**	5/20/2012 14:36
Year:	2012	**Notified Date Time:**	
County:	San Diego County		

<u>California Hazardous Material Incident Report System</u>

Contained:	Yes	**3 Vessel 300 Tons:**	No
1 Substance:	Engine Oil	**Incident Date:**	5/20/2012
1 Measure:	Qt.(s)	**Incident Time:**	1100

1 Other:		***Spill Site:***	Waterways
1 Quantity:	1	***Injuries?:***	No
1 Type:	PETROLEUM	***No of Injuries:***	
1 Pipeline:	No	***Fatals?:***	No
1 Vessel >= 300 Tons:	No	***No of Fatals:***	
2 Substance:	Gasoline	***Evacs?:***	No
2 Quantity:	1	***No of Evacs:***	
2 Measure:	Gal(s)	***Cleanup:***	Reporting Party
2 Type:	PETROLEUM	***Site:***	San Elijo Lagoon
2 Other:		***Cause:***	Unknown
2 Pipeline:	No	***Cause Other:***	
2 Vessel 300 Tons:	No	***Dog No:***	
3 Substance:		***Water:***	Yes
3 Quantity:		***Water Way:***	San Elijo Lagoon
3 Measure:		***City:***	Encinitas
3 Type:		***County:***	San Diego County
3 Other:		***Zip:***	92007
3 Pipeline:	No		

Admin Agency: San Diego County Health Services Department
Notification Area: AA/CUPA,DFG-OSPR,DTSC,RWQCB,US EPA,USFWS
Location: 3100 Manchester Ave
Description: Caller states substance was released from a vehicle due to it crashing into a waterway. Caller states the vehicle has been removed and there is a residual sheen that will be allowed to dissipate.

Main Page Information

On Scene:
Other on Scene:
Other Notified:
Admin Agency: San Diego County Health Services Department
Admin Agency 2:
Additional County:
Document Title: SPILL Report
Creation Date: 05/20/2012 02:36 PM
Received By:
Person Notifying Cal OES:
Phone No:
Ext:
Pag Cell:
Type: PETROLEUM
Cause Description for Other:
Amount 1: 1
Amount 2: 1
Amount 3:
Doc URL: https://w3.calema.ca.gov/operational/malhaz.nsf/f1841a103c102734882563e200760c4a/955bcd7d8e8aa9b588257a040076ae34?OpenDocument

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Map Key	***Number of Records***	***Direction***	***Distance (mi/ft)***	***Elev (ft)***	***Site***	***DB***
6	***1 of 1***	***SSW***	***0.03 / 169.20***	***18.16***	***CARDIFF 76 #5946 3085 MANCHESTER AV CARDIFF CA 920072205***	***CLEANUP SITES***

Global ID:	T10000001082	***CUF Case:***	NO
Case Type:	Cleanup Program Site	***Begin Date:***	2009-05-06 00:00:00
Status:	Completed - Case Closed	***How Discovered:***	
Status Date:	2009-08-13 00:00:00	***Stop Method:***	
RB Case No:		***County:***	San Diego
LOC Case No:	H05833 -002	***Latitude:***	33.0112323
Lead Agency:	SAN DIEGO COUNTY LOP	***Longitude:***	-117.2632604
Case Worker:	JC	***File Location:***	
Local Agency:	SAN DIEGO COUNTY LOP		

Potential Cntm of Concrn:
Potential Media Affected:
How Discovered Description:
Stop Description:
Cal Water Watershed Name: Carlsbad - Escondido Creek - San Elijo (904.61)
DWR Groundwater Subbasin

Name:
Site History:

Status History

Status:	Completed - Case Closed	***Status Date:***	2009-08-13 00:00:00
Status:	Open - Site Assessment	***Status Date:***	2009-05-06 00:00:00
Status:	Open - Case Begin Date	***Status Date:***	2009-05-06 00:00:00

Activities

Action Type:	ENFORCEMENT
Action:	Closure/No Further Action Letter
Date:	2009-07-22 00:00:00

Contacts

Contact Type:	Local Agency Caseworker	***City:***	San Diego
Contact Name:	JAMES CLAY	***Email:***	james.clay@sdcounty.ca.gov
Organization Name:	SAN DIEGO COUNTY LOP	***Phone No:***	
Address:	P.O. Box 129261		

7	***1 of 17***	***NE***	***0.04 / 186.73***	***11.38***	***unocal #5946 3085 manchester ave cardiff CA 92007***	***CHMIRS***

ID:	006451	***Notified Date:***	1/26/1995
Year:	1995	***Notified Date Time:***	01:33:15 PM
County:	SAN DIEGO		

California Hazardous Material Incident Report System

Contained:	NO	***Incident Date:***	1300/23jan95
Substance:	waste oil	***Injuries?:***	NO
Type:	PETROLEUM	***Fatals?:***	NO
Qty:		***Evacs?:***	NO
Other:		***Cleanup:***	unocal
Measure:		***Site:***	S/S
Amount:	unknown	***City:***	cardiff
Water:	YES	***County:***	SAN DIEGO
Water Way:		***Zip:***	92007

Location:	#5946 3085 manchester ave
Description:	soil contamination found during construction project

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7	***2 of 17***	***NE***	***0.04 / 186.73***	***11.38***	***UNOCAL / CARDIFF 3085 MANCHESTER AVENUE CARDIFF CA 92007-2205***	***FINDS/FRS***

Registry ID:	110013854597
FIPS Code:	06073
Program Acronyms:	EIS, RCRAINFO
HUC Code:	18070303
Site Type Name:	STATIONARY
EPA Region Code:	09
Conveyor:	FRS-GEOCODE
Source:	
County Name:	SAN DIEGO
SIC Codes:	
SIC Code Descriptions:	
NAICS Codes:	447110

Federal Facility Code:
NAICS Code Descriptions: GASOLINE STATIONS WITH CONVENIENCE STORES.
Federal Agency Name:
US/Mexico Border Ind: Yes
Congressional Dist No.: 50
Create Date: 03-APR-2003 12:04:45
Census Block Code: 060730174043018
Update Date: 14-APR-2015 22:12:37
Location Description:
Supplemental Location:
Tribal Land Code:
Tribal Land Name:
Latitude: 33.011149
Longitude: -117.262784
Coord Collection Method: ADDRESS MATCHING-HOUSE NUMBER
Accuracy Value: 50
Datum: NAD83
Reference Point: ENTRANCE POINT OF A FACILITY OR STATION
Interest Types: HAZARDOUS AIR POLLUTANT MAJOR, SQG
Facility Detail Rprt URL: http://ofmpub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110013854597

7	3 of 17	NE	0.04 / 186.73	11.38	CARDIFF 76 3085 MANCHESTER AVE CARDIFF BY THE SEA CA 92007	FINDS/FRS

Registry ID: 110055763641
FIPS Code: 37
Program Acronyms: CA-CERS, CA-ENVIROVIEW
HUC Code: 18070303
Site Type Name: STATIONARY
EPA Region Code: 09
Conveyor: FRS-GEOCODE
Source:
County Name: SAN DIEGO
SIC Codes: 5541
SIC Code Descriptions: GASOLINE SERVICE STATIONS
NAICS Codes:
Federal Facility Code:
NAICS Code Descriptions:
Federal Agency Name:
US/Mexico Border Ind: Yes
Congressional Dist No.: 50
Create Date: 15-SEP-2013 12:25:16
Census Block Code: 060730174043018
Update Date: 14-OCT-2015 10:13:30
Location Description:
Supplemental Location:
Tribal Land Code:
Tribal Land Name:
Latitude: 33.011149
Longitude: -117.262784
Coord Collection Method: ADDRESS MATCHING-HOUSE NUMBER
Accuracy Value: 50
Datum: NAD83
Reference Point: ENTRANCE POINT OF A FACILITY OR STATION
Interest Types: STATE MASTER
Facility Detail Rprt URL: http://ofmpub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110055763641

7	4 of 17	NE	0.04 / 186.73	11.38	CARDIFF 76 #5946 3085 MANCHESTER AV CARDIFF CA 920072205	FINDS/FRS

Registry ID: 110065946007
FIPS Code:

Program Acronyms:	CA-ENVIROVIEW
HUC Code:	
Site Type Name:	STATIONARY
EPA Region Code:	09
Conveyor:	
Source:	
County Name:	SAN DIEGO
SIC Codes:	
SIC Code Descriptions:	
NAICS Codes:	
Federal Facility Code:	
NAICS Code Descriptions:	
Federal Agency Name:	
US/Mexico Border Ind:	
Congressional Dist No.:	
Create Date:	14-OCT-2015 09:07:06
Census Block Code:	
Update Date:	
Location Description:	
Supplemental Location:	
Tribal Land Code:	
Tribal Land Name:	
Latitude:	
Longitude:	
Coord Collection Method:	
Accuracy Value:	
Datum:	NAD83
Reference Point:	
Interest Types:	STATE MASTER
Facility Detail Rprt URL:	http://ofmpub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110065946007

7	***5 of 17***	***NE***	***0.04 / 186.73***	***11.38***	***CARDIFF CHEVRON 3085 MANCHESTER AVE 3085 MANCHESTER AVE CARDIFF BY THE SEA CA 92007***	***SANDIEGO HAZ***

Record ID:	DEH2010-HUPFP-211657	***GIS Record Type:***	LUEG-DEH/HMD/UPFP/Facility
Facility ID No:	37-000-211657	***GIS Facility ID:***	37-000-211657
EPA ID No:	CAL000018938	***GIS EPA ID No:***	CAL000018938
ID:	10811	***GIS CERS ID:***	10363729
CERS ID:	10363729	***Record Status:***	Expired
Permit Status:	Permit Renewed	***SIC Code:***	5541
Active Permit:	Yes	***NAICS Code:***	
Project Name:	CARDIFF CHEVRON	***Record Name:***	CARDIFF 76
Business Phone:	760-436-4782	***Site Address:***	3085 MANCHESTER AVE
Business Fax:	0	***City:***	CARDIFF BY THE SEA
Latitude:	33.010995043988821	***Zip Code:***	92007
Longitude:	-117.26340494191476	***Census Tra:***	174.04
Haz Materials on Site:	Yes	***Watrshed Ba:***	904.61
Own/Oper Under:	Yes	***Thomas Bros:***	1167 F 4
Own/Oper Above:	No	***Insp Dist:***	HT202
Haz Waste Generator:	Yes	***KivaPerTyp:***	HK07 211657
Recycle:	No	***Point X:***	6251052.796
Onsite Haz Waste Tr.:	No	***Point Y:***	1949288.49806
RCRA Large Qty Gen.:	No	***Hazmat EHS:***	No
HHW Collection:	No	***Hazmat Rad:***	No
Last Updated:	2017-04-19T12:54:32.000	***Tank Owner:***	8
Expiration:	1451520000000	***Indian or Tr:***	No
Open Date:	1262649600000	***UST Facili:***	Motor Vehicle Fueling
Parcel No:	261-210-14-00	***Total No USTS:***	2
HW Tier:	Not Applicable	***Community Z:***	Cardiff by the Sea
LRG QTY MW:	No	***Jurisd:***	ENCINITAS
RMP CALARP:	Not Applicable	***Water Purv:***	SAN DIEGUITO WATER DISTRICT LAND
Disclose QT:	Yes	***Fire Agenc:***	SAN DIEGUITO WATER DISTRICT LAND
Own Oper APS:	No	***BOS Dist:***	3

Haz Waste G:	Yes	**Zip Code:**	92007
Recycle100:	No	**GIS Latitude:**	33.011412
Onsite Haz W:	No	**GIS Longitude:**	-117.263254
RCRA LRG Q:	No	**X Mapcoord:**	6251052.796
HHW Colle Si:	No	**Y Mapcoord:**	1949288.498
Accept Offs:	No	**Permit Owner:**	
Universal W:	No	**Phone 1:**	
Toxic Gas G:		**ER Contact N:**	
Haz Waste EH:	No	**ER Contact:**	
Haz Waste1:	No	**ER Contact T:**	
Tot APSA Cap:		**ER Contac 1:**	
Farm Nurser:		**Own/Operate:**	
Nummin10KT:		**Email Perm:**	
Capacity LR:			

Record Type:	Unified Program Facility Permit
Bill Code1:	Not Applicable
Bill Code2:	Not Applicable
Bill Code3:	Not Applicable
Address:	3085 MANCHESTER AVE, CARDIFF BY THE SEA, CA 92007
Business T:	UST - Retail Site - No Repair Service
Mailing Address:	3085 MANCHESTER AV, CARDIFF, CA 92007
Geo SRC:	Mapped to parcel/APN center X,Y
Source File:	DEH Hazardous Material Facility Data; Permits - REST GIS Data - San Diego County

<u>DEH HMD Hazardous Waste and Materials Data</u>

ID:	52640	**Case No:**	8006-61-9
Permit Status:	Permit Renewed	**Trade Secret:**	N
Active Permit:	YES	**Haz Material Type:**	Pure
Child Record ID:	DEH2017-HCHEM-0132399	**Last Updated:**	2017-03-03T00:33:48.000
Chemical Name:	REGULAR UNLEADED		
Common Name Inventory:	UNDERGROUND TANK 105833 T001		

ID:	52641	**Case No:**	
Permit Status:	Permit Renewed	**Trade Secret:**	N
Active Permit:	YES	**Haz Material Type:**	
Child Record ID:	DEH2017-HWAST-0110791	**Last Updated:**	2017-03-03T00:33:49.000
Chemical Name:	WASTE 134 AQUEOUS SOL'N W/LESS 10% ORG		
Common Name Inventory:	GASOLINE/WATER MIX		

ID:	52639	**Case No:**	8006-61-9
Permit Status:	Permit Renewed	**Trade Secret:**	N
Active Permit:	YES	**Haz Material Type:**	Pure
Child Record ID:	DEH2017-HCHEM-0132398	**Last Updated:**	2017-03-03T00:33:48.000
Chemical Name:	PREMIUM UNLEADED		
Common Name Inventory:	UNDERGROUND TANK 105833 T002		

<u>DEH HMD Inspection and Violation Data</u>

Facility ID:	37-000-211657	**Inspection Date:**	03/19/2015
UST ID:		**Inspection No:**	5126982
Container Tank ID:		**Inspection Type:**	Routine
ID:	22841	**NOV:**	No
Permit Status:	Permit Renewed	**Compliance Date:**	03/27/2015
Active Permit:	YES	**Last Updated:**	2017-03-03T00:33:47.000
Violation Class.:	Class I		
Program Element:	Hazardous Waste Generator		
Violation Code:	3030010 Failure to dispose of hazardous waste within 180 days (or 270 if waste is transported over 200 miles) for the generator who generates less than 1000 kilogram per month, but more than 100 kilograms per month.; 22 CCR 12 66262.34(d).		

Facility ID:	37-000-211657	**Inspection Date:**	03/08/2016
UST ID:	20058	**Inspection No:**	5239294
Container Tank ID:		**Inspection Type:**	Routine
ID:	22842	**NOV:**	No
Permit Status:	Permit Renewed	**Compliance Date:**	07/25/2016

Active Permit: YES **Last Updated:** 2017-03-03T00:33:47.000
Violation Class.: Class I
Program Element: Underground Storage Tank
Violation Code: 2030005 (RD) Option 1: Failure to conduct the 0.2 gallon per hour continuous in tank leak detection test. 23 CCR 2643(b)(5)

Facility ID: 37-000-211657 **Inspection Date:** 03/08/2016
UST ID: 20058 **Inspection No:** 5239294
Container Tank ID: **Inspection Type:** Routine
ID: 22844 **NOV:** No
Permit Status: Permit Renewed **Compliance Date:** 03/23/2016
Active Permit: YES **Last Updated:** 2017-03-03T00:33:47.000
Violation Class.: Class I
Program Element: Underground Storage Tank
Violation Code: 2030036 (RP) Failure of the overfill prevention system to meet one of the following requirements: 1. Alert the transfer operator when the tank is 90% full by restricting the flow into the tank or triggering an audible and visual alarm; or 2. Restrict delivery of flow to the tank at least 30m before the tank overfills, provided the restriction occurs when the tank is filled to no more than 95% of capacity; and activate an audible alarm at least 5m before the tank overfills; or 3. Provide positive shut-off of flow to the tank when the tank is filled to no more than 95% of capacity; or 4. Provide positive shut-off of flow to the tank so that none of the fittings located on the top of the tank are exposed to product due to overfilling. 23 CCR 2635(b)(2), 2665

Facility ID: 37-000-211657 **Inspection Date:** 03/19/2015
UST ID: 0 **Inspection No:** 5126982
Container Tank ID: **Inspection Type:** Routine
ID: 22839 **NOV:** No
Permit Status: Permit Renewed **Compliance Date:** 03/27/2015
Active Permit: YES **Last Updated:** 2017-03-03T00:33:47.000
Violation Class.: Class I
Program Element: Underground Storage Tank
Violation Code: 2030021 Failure to obtain and maintain a valid operation permit from the CUPA. 23 CCR 16 2712(i); HSC 6.7 25284

Facility ID: 37-000-211657 **Inspection Date:** 03/08/2016
UST ID: 20059 **Inspection No:** 5239294
Container Tank ID: **Inspection Type:** Routine
ID: 22843 **NOV:** No
Permit Status: Permit Renewed **Compliance Date:** 07/25/2016
Active Permit: YES **Last Updated:** 2017-03-03T00:33:47.000
Violation Class.: Class I
Program Element: Underground Storage Tank
Violation Code: 2030005 (RD) Option 1: Failure to conduct the 0.2 gallon per hour continuous in tank leak detection test. 23 CCR 2643(b)(5)

Facility ID: 37-000-211657 **Inspection Date:** 03/19/2015
UST ID: 20059 **Inspection No:** 5126982
Container Tank ID: **Inspection Type:** Routine
ID: 22840 **NOV:** No
Permit Status: Permit Renewed **Compliance Date:** 03/27/2015
Active Permit: YES **Last Updated:** 2017-03-03T00:33:47.000
Violation Class.: Class I
Program Element: Underground Storage Tank
Violation Code: 2030026 Failure of line leak detector to detect a leak and/or failure of audible and visual alarm. 23 CCR 16 2636(f)(2), 2666.

Facility ID: 37-000-211657 **Inspection Date:** 03/08/2016
UST ID: 20059 **Inspection No:** 5239294
Container Tank ID: **Inspection Type:** Routine
ID: 22845 **NOV:** No
Permit Status: Permit Renewed **Compliance Date:** 03/23/2016
Active Permit: YES **Last Updated:** 2017-03-03T00:33:47.000
Violation Class.: Class I
Program Element: Underground Storage Tank
Violation Code: 2030036 (RP) Failure of the overfill prevention system to meet one of the following requirements: 1. Alert the transfer operator when the tank is 90% full by restricting the flow into the tank or triggering an audible and visual alarm; or 2. Restrict delivery of flow to the tank at least 30m before the tank overfills, provided the restriction occurs when the tank is filled to no more than 95% of capacity; and activate an audible alarm at least 5m before the tank overfills; or 3. Provide positive shut-off of flow to the tank when the tank is filled to no more than 95% of capacity; or 4. Provide positive shut-off of flow to the tank so that none of the fittings located on the top of the tank are exposed

to product due to overfilling. 23 CCR 2635(b)(2), 2665

7	***6 of 17***	***NE***	***0.04 / 186.73***	***11.38***	***CARDIFF 76 #255946*** ***3085 MANCHESTER AV, CARDIFF, 92007-2205*** ***CA***	**SANDIEGO HAZ**

Record ID:	DEH2002-HUPFP-105833	***GIS Record Type:***	
Facility ID No:		***GIS Facility ID:***	
EPA ID No:		***GIS EPA ID No:***	
ID:		***GIS CERS ID:***	
CERS ID:		***Record Status:***	
Permit Status:	Completed	***SIC Code:***	
Active Permit:		***NAICS Code:***	
Project Name:	CARDIFF 76 #255946	***Record Name:***	
Business Phone:		***Site Address:***	
Business Fax:		***City:***	
Latitude:		***Zip Code:***	
Longitude:		***Census Tra:***	
Haz Materials on Site:		***Watrshed Ba:***	
Own/Oper Under:		***Thomas Bros:***	
Own/Oper Above:		***Insp Dist:***	
Haz Waste Generator:		***KivaPerTyp:***	
Recycle:		***Point X:***	
Onsite Haz Waste Tr.:		***Point Y:***	
RCRA Large Qty Gen.:		***Hazmat EHS:***	
HHW Collection:		***Hazmat Rad:***	
Last Updated:	05/04/2002	***Tank Owner:***	
Expiration:		***Indian or Tr:***	
Open Date:		***UST Facili:***	
Parcel No:		***Total No USTS:***	
HW Tier:		***Community Z:***	
LRG QTY MW:		***Jurisd:***	
RMP CALARP:		***Water Purv:***	
Disclose QT:		***Fire Agenc:***	
Own Oper APS:		***BOS Dist:***	
Haz Waste G:		***Zip Code:***	
Recycle100:		***GIS Latitude:***	
Onsite Haz W:		***GIS Longitude:***	
RCRA LRG Q:		***X Mapcoord:***	
HHW Colle Si:		***Y Mapcoord:***	
Accept Offs:		***Permit Owner:***	
Universal W:		***Phone 1:***	
Toxic Gas G:		***ER Contact N:***	
Haz Waste EH:		***ER Contact:***	
Haz Waste1:		***ER Contact T:***	
Tot APSA Cap:		***ER Contac 1:***	
Farm Nurser:		***Own/Operate:***	
Nummin10KT:		***Email Perm:***	
Capacity LR:			
Record Type:	Unified Program Facility Permit		
Bill Code1:			
Bill Code2:			
Bill Code3:			
Address:			
Business T:			
Mailing Address:			
Geo SRC:			
Source File:			

7	***7 of 17***	***NE***	***0.04 / 186.73***	***11.38***	***CARDIFF 76 #5946*** ***3085 MANCHESTER AVE, CARDIFF BY THE SEA, CA 92007-2205*** ***CARDIFF BY THE SEA CA***	**SAN DIEGO LOP**

Latitude GS 84:	33.0114122
Thomasbros Mappage Grid:	1167 F 4
X Map Coord:	6251052.796
Y Map Coord:	1949288.498
Opened Date:	7/29/1998
Parcel No:	261-210-14-00
Case Type:	LOP - Local Oversight Program
Record ID:	DEH1998-LSAM-H05833-001
Historical Name:	TOSCO 76 #5946
Swrcb Global ID:	T0607302519
Funding:	F - LOP Federal Fund
Lead Agency:	DEH/SAM
Lead Agency Date:	10/7/1998
Census Tract:	174.04
Zip Code 2:	92007
Community:	Cardiff by the Sea
Jurisdiction:	ENCINITAS
Watershed basin No:	904.61
Record Status:	Completed
Water Purveyor:	SAN DIEGUITO WATER DISTRICT LAND
Fire Agency:	SAN DIEGUITO WATER DISTRICT LAND
Longitude GS 84:	-117.2632539

7	***8 of 17***	***NE***	***0.04 / 186.73***	***11.38***	***CONOCO PHILLIPS # 255946 3085 MANCHESTER AVE CARDIFF CA 920072205***	***HAZNET***

SIC Code:	5541	**Mailing City:**	HOUSTON
NAICS Code:	44719	**Mailing State:**	TX
EPA ID:	CAL000276757	**Mailing Zip:**	770790000
Create Date:	12/5/2003 11:36:43 AM	**Region Code:**	4
Fac Act Ind:	No	**Owner Name:**	CONOCO PHILLIPS INC
Inact Date:	4/28/2010	**Owner Addr 1:**	600 N DAIRY ASHFORD
County Code:	37	**Owner Addr 2:**	
County Name:	San Diego	**Owner City:**	HOUSTON
Mail Name:		**Owner State:**	TX
Mailing Addr 1:	600 N DAIRY ASHFORD - US MARKETING	**Owner Zip:**	770790000
Mailing Addr 2:		**Owner Phone:**	8324863344
Owner Fax:	0000000000		

Contact Information	
--	--
Contact Name:	Tom G. Martin
Street Address 1:	600 N DAIRY ASHFORD US MARKETING -
Street Address 2:	
City:	HOUSTON
State:	TX
Zip:	770790000
Phone:	8324863344
--	--
--	--
Tanner Information	
--	--
Generator EPA ID:	CAL000276757
Generator County Code:	37
Generator County:	San Diego
TSD EPA ID:	CAD982444481
TSD County Code:	36
TSD County:	San Bernardino
State Waste Code:	134
State Waste Code Desc.:	Aqueous solution with total organic residues less than 10 percent
Method Code:	H01
Method Description:	Transfer station
Tons:	0.0252
Year:	2004

-- --
Generator EPA ID: CAL000276757
Generator County Code: 37
Generator County: San Diego
TSD EPA ID: CAD982444481
TSD County Code: 36
TSD County: San Bernardino
State Waste Code: 134
State Waste Code Desc.: Aqueous solution with total organic residues less than 10 percent
Method Code: T01
Method Description: Treatment, tank
Tons: 0.063
Year: 2004
-- --
Generator EPA ID: CAL000276757
Generator County Code: 37
Generator County: San Diego
TSD EPA ID: CAD982444481
TSD County Code: 36
TSD County: San Bernardino
State Waste Code: 134
State Waste Code Desc.: Aqueous solution with total organic residues less than 10 percent
Method Code: T01
Method Description: Treatment, tank
Tons: 0.8904
Year: 2005
-- --
Generator EPA ID: CAL000276757
Generator County Code: 37
Generator County: San Diego
TSD EPA ID: CAD982444481
TSD County Code: 36
TSD County: San Bernardino
State Waste Code: 352
State Waste Code Desc.: Other organic solids
Method Code: R01
Method Description: Recycler
Tons: 0.015
Year: 2005
-- --
Generator EPA ID: CAL000276757
Generator County Code: 37
Generator County: San Diego
TSD EPA ID: CAD982444481
TSD County Code: 36
TSD County: San Bernardino
State Waste Code: 352
State Waste Code Desc.: Other organic solids
Method Code: R01
Method Description: Recycler
Tons: 0.0025
Year: 2006
-- --
Generator EPA ID: CAL000276757
Generator County Code: 37
Generator County: San Diego
TSD EPA ID: CAD982444481
TSD County Code: 36
TSD County: San Bernardino
State Waste Code: 352
State Waste Code Desc.: Other organic solids
Method Code: H010
Method Description: METALS RECOVERY INCLUDING RETORING,SMELTING,CHEMICALS,ECT
Tons: 0.05
Year: 2007
-- --
Generator EPA ID: CAL000276757
Generator County Code: 37

Generator County:	San Diego
TSD EPA ID:	CAD982444481
TSD County Code:	36
TSD County:	San Bernardino
State Waste Code:	352
State Waste Code Desc.:	Other organic solids
Method Code:	H141
Method Description:	STORAGE, BULKING, AND/OR TRANSFER OFF SITE--NO TREATMENT/REOVERY (H010-H129) OR (H131-H135)
Tons:	0.0495
Year:	2007
--	--
Generator EPA ID:	CAL000276757
Generator County Code:	37
Generator County:	San Diego
TSD EPA ID:	CAD982444481
TSD County Code:	36
TSD County:	San Bernardino
State Waste Code:	134
State Waste Code Desc.:	Aqueous solution with total organic residues less than 10 percent
Method Code:	H141
Method Description:	STORAGE, BULKING, AND/OR TRANSFER OFF SITE--NO TREATMENT/REOVERY (H010-H129) OR (H131-H135)
Tons:	0.063
Year:	2008
--	--
Generator EPA ID:	CAL000276757
Generator County Code:	37
Generator County:	San Diego
TSD EPA ID:	CAD982444481
TSD County Code:	36
TSD County:	San Bernardino
State Waste Code:	352
State Waste Code Desc.:	Other organic solids
Method Code:	H141
Method Description:	STORAGE, BULKING, AND/OR TRANSFER OFF SITE--NO TREATMENT/REOVERY (H010-H129) OR (H131-H135)
Tons:	8
Year:	2009
--	--

7	**9 of 17**	**NE**	**0.04 / 186.73**	**11.38**	**UNOCAL SERVICE STATION #5946** **3085 MANCHESTER** **CARDIFF BY THE SEA CA 920070000**	**HAZNET**

SIC Code:		**Mailing City:**	SANTA ANA
NAICS Code:		**Mailing State:**	CA
EPA ID:	CAL000046604	**Mailing Zip:**	927995376
Create Date:	2/15/1991	**Region Code:**	4
Fac Act Ind:	No	**Owner Name:**	UNION OIL COMPANY OF CALIFORNI
Inact Date:	6/30/1997	**Owner Addr 1:**	DBA UNOCAL
County Code:	37	**Owner Addr 2:**	
County Name:	San Diego	**Owner City:**	EL SEGUNDO
Mail Name:	HAZMAT COMPL COORD, RM 9001	**Owner State:**	CA
Mailing Addr 1:	PO BOX 25376	**Owner Zip:**	902450000
Mailing Addr 2:		**Owner Phone:**	7144286560
Owner Fax:			

Contact Information

--	--
Contact Name:	CHRISTOPHER Z HILL
Street Address 1:	PO BOX 25376 CANX VQ97 CC
Street Address 2:	
City:	SANTA ANA
State:	CA

Zip:	927995376
Phone:	7144286802
--	--
--	--
Tanner Information	
--	--
Generator EPA ID:	CAL000046604
Generator County Code:	37
Generator County:	San Diego
TSD EPA ID:	CAD099452708
TSD County Code:	19
TSD County:	Los Angeles
State Waste Code:	134
State Waste Code Desc.:	Aqueous solution with total organic residues less than 10 percent
Method Code:	R01
Method Description:	Recycler
Tons:	0.168
Year:	1993
--	--
Generator EPA ID:	CAL000046604
Generator County Code:	37
Generator County:	San Diego
TSD EPA ID:	CAD028409019
TSD County Code:	19
TSD County:	Los Angeles
State Waste Code:	213
State Waste Code Desc.:	Hydrocarbon solvents (benzene, hexane, Stoddard, Etc.)
Method Code:	T01
Method Description:	Treatment, tank
Tons:	0.9174
Year:	1995
--	--
Generator EPA ID:	CAL000046604
Generator County Code:	37
Generator County:	San Diego
TSD EPA ID:	CAT080013352
TSD County Code:	19
TSD County:	Los Angeles
State Waste Code:	134
State Waste Code Desc.:	Aqueous solution with total organic residues less than 10 percent
Method Code:	T01
Method Description:	Treatment, tank
Tons:	0.252
Year:	1995
--	--
Generator EPA ID:	CAL000046604
Generator County Code:	37
Generator County:	San Diego
TSD EPA ID:	
TSD County Code:	
TSD County:	
State Waste Code:	331
State Waste Code Desc.:	Off-specification, aged or surplus organics
Method Code:	T01
Method Description:	Treatment, tank
Tons:	12.54
Year:	1998
--	--
Generator EPA ID:	CAL000046604
Generator County Code:	37
Generator County:	San Diego
TSD EPA ID:	CAD028409019
TSD County Code:	19
TSD County:	Los Angeles
State Waste Code:	331
State Waste Code Desc.:	Off-specification, aged or surplus organics
Method Code:	H01
Method Description:	Transfer station

Tons:	0.1
Year:	1998
--	--
Generator EPA ID:	CAL000046604
Generator County Code:	37
Generator County:	San Diego
TSD EPA ID:	CAD028409019
TSD County Code:	19
TSD County:	Los Angeles
State Waste Code:	331
State Waste Code Desc.:	Off-specification, aged or surplus organics
Method Code:	T01
Method Description:	Treatment, tank
Tons:	137.61
Year:	1998
--	--

7	**10 of 17**	**NE**	**0.04 / 186.73**	**11.38**	**CARDIFF UNION 76** **3085 MANCHESTER** **CARDIFF BY THE SEA CA** **920070000**	**HAZNET**

SIC Code:		**Mailing City:**	CARDIFF BY THE SEA
NAICS Code:		**Mailing State:**	CA
EPA ID:	CAL000018760	**Mailing Zip:**	920070000
Create Date:	11/14/1989	**Region Code:**	4
Fac Act Ind:	No	**Owner Name:**	STRAM INC
Inact Date:	6/30/1995	**Owner Addr 1:**	--
County Code:	37	**Owner Addr 2:**	
County Name:	San Diego	**Owner City:**	--
Mail Name:		**Owner State:**	99
Mailing Addr 1:	3085 MANCHESTER	**Owner Zip:**	--
Mailing Addr 2:		**Owner Phone:**	0000000000
Owner Fax:			

Contact Information

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Contact Name:	DEACT PER 95 FEE FORM -P.H.
Street Address 1:	--
Street Address 2:	
City:	--
State:	99
Zip:	--
Phone:	--
--	--

7	**11 of 17**	**NE**	**0.04 / 186.73**	**11.38**	**CARDIFF 76** **3085 MANCHESTER AVE** **CARDIFF CA 920070000**	**HAZNET**

SIC Code:	5541	**Mailing City:**	CARDIFF
NAICS Code:	44719	**Mailing State:**	CA
EPA ID:	CAL000018938	**Mailing Zip:**	920070000
Create Date:	11/14/1989	**Region Code:**	4
Fac Act Ind:	Yes	**Owner Name:**	R. ROSANO, INC. DBA CARDIFF 76
Inact Date:		**Owner Addr 1:**	236 N EL CAMINO REAL
County Code:	37	**Owner Addr 2:**	
County Name:	San Diego	**Owner City:**	ENCINITAS
Mail Name:		**Owner State:**	CA
Mailing Addr 1:	3085 MANCHESTER AVE	**Owner Zip:**	920242847
Mailing Addr 2:		**Owner Phone:**	7609426451
Owner Fax:	7609426453		

Contact Information

--	--
Contact Name:	ROBERT ROSANO

Street Address 1: 236 N EL CAMINO REAL
Street Address 2:
City: ENCINITAS
State: CA
Zip: 92024
Phone: 7609426451
-- --
-- --
Tanner Information
-- --
Generator EPA ID: CAL000018938
Generator County Code: 37
Generator County: San Diego
TSD EPA ID: CAT080013352
TSD County Code: 19
TSD County: Los Angeles
State Waste Code: 221
State Waste Code Desc.: Waste oil and mixed oil
Method Code:
Method Description:
Tons: 0.57
Year: 1993
-- --
Generator EPA ID: CAL000018938
Generator County Code: 37
Generator County: San Diego
TSD EPA ID: CAD028409019
TSD County Code: 19
TSD County: Los Angeles
State Waste Code: 181
State Waste Code Desc.: Other inorganic solid waste
Method Code: H01
Method Description: Transfer station
Tons: 0.0375
Year: 2003
-- --
Generator EPA ID: CAL000018938
Generator County Code: 37
Generator County: San Diego
TSD EPA ID: CAD028409019
TSD County Code: 19
TSD County: Los Angeles
State Waste Code: 352
State Waste Code Desc.: Other organic solids
Method Code: H01
Method Description: Transfer station
Tons: 0.015
Year: 2004
-- --
Generator EPA ID: CAL000018938
Generator County Code: 37
Generator County: San Diego
TSD EPA ID: CAD028409019
TSD County Code: 19
TSD County: Los Angeles
State Waste Code: 352
State Waste Code Desc.: Other organic solids
Method Code: H141
Method Description: STORAGE, BULKING, AND/OR TRANSFER OFF SITE--NO TREATMENT/REOVERY (H010-H129) OR (H131-H135)
Tons: 0.01
Year: 2008
-- --
Generator EPA ID: CAL000018938
Generator County Code: 37
Generator County: San Diego
TSD EPA ID: CAD981696420
TSD County Code: 19

TSD County: Los Angeles
State Waste Code: 223
State Waste Code Desc.: Unspecified oil-containing waste
Method Code: H141
Method Description: STORAGE, BULKING, AND/OR TRANSFER OFF SITE--NO TREATMENT/REOVERY (H010-H129) OR (H131-H135)
Tons: 0.86319
Year: 2010
-- --
Generator EPA ID: CAL000018938
Generator County Code: 37
Generator County: San Diego
TSD EPA ID: CAD981696420
TSD County Code: 19
TSD County: Los Angeles
State Waste Code: 135
State Waste Code Desc.: Unspecified aqueous solution
Method Code: H141
Method Description: STORAGE, BULKING, AND/OR TRANSFER OFF SITE--NO TREATMENT/REOVERY (H010-H129) OR (H131-H135)
Tons: 0.294
Year: 2012
-- --
Generator EPA ID: CAL000018938
Generator County Code: 37
Generator County: San Diego
TSD EPA ID: CAT080013352
TSD County Code: 19
TSD County: Los Angeles
State Waste Code: 223
State Waste Code Desc.: Unspecified oil-containing waste
Method Code: H039
Method Description: OTHER RECOVERY OF RECLAMATION FOR REUSE INCLUDING ACID REGENERATION, ORGANICS RECOVERY ECT
Tons: 1.0425
Year: 2015
-- --

7	***12 of 17***	***NE***	***0.04 / 186.73***	***11.38***	***TOSCO CORPORATION STATION #31033 3085 MANCHESTER CARDIFF BY THE SEA CA 922070000***	***HAZNET***

SIC Code:
NAICS Code:
EPA ID: CAL000135612
Create Date: 4/24/1997
Fac Act Ind: No
Inact Date: 6/30/2002
County Code: 37
County Name: San Diego
Mail Name:
Mailing Addr 1: PO BOX 52085
Mailing Addr 2:
Owner Fax:

Mailing City: PHOENIX
Mailing State: AZ
Mailing Zip: 850722085
Region Code: 4
Owner Name: TOSCO MARKETING
Owner Addr 1: PO BOX 52085
Owner Addr 2:
Owner City: PHOENIX
Owner State: AZ
Owner Zip: 850722085
Owner Phone: 6027284180

Contact Information
-- --
Contact Name: HAZMAT SPECIALIST
Street Address 1: PO BOX 52085
Street Address 2:
City: PHOENIX
State: AZ
Zip: 850722085
Phone: 6027284180
-- --

-- --
Tanner Information
-- --
Generator EPA ID: CAL000135612
Generator County Code: 37
Generator County: San Diego
TSD EPA ID: CAD028409019
TSD County Code: 19
TSD County: Los Angeles
State Waste Code: 134
State Waste Code Desc.: Aqueous solution with total organic residues less than 10 percent
Method Code: T01
Method Description: Treatment, tank
Tons: 0.357
Year: 1999
-- --
Generator EPA ID: CAL000135612
Generator County Code: 37
Generator County: San Diego
TSD EPA ID: CAT080013352
TSD County Code: 19
TSD County: Los Angeles
State Waste Code: 134
State Waste Code Desc.: Aqueous solution with total organic residues less than 10 percent
Method Code: R01
Method Description: Recycler
Tons: 0.0588
Year: 2000
-- --
Generator EPA ID: CAL000135612
Generator County Code: 37
Generator County: San Diego
TSD EPA ID: CAD028409019
TSD County Code: 19
TSD County: Los Angeles
State Waste Code: 352
State Waste Code Desc.: Other organic solids
Method Code: H01
Method Description: Transfer station
Tons: 0.0025
Year: 2001
-- --
Generator EPA ID: CAL000135612
Generator County Code: 37
Generator County: San Diego
TSD EPA ID: CAD982444481
TSD County Code: 36
TSD County: San Bernardino
State Waste Code: 223
State Waste Code Desc.: Unspecified oil-containing waste
Method Code: H01
Method Description: Transfer station
Tons: 0.22935
Year: 2001
-- --
Generator EPA ID: CAL000135612
Generator County Code: 37
Generator County: San Diego
TSD EPA ID: CAD028409019
TSD County Code: 19
TSD County: Los Angeles
State Waste Code: 352
State Waste Code Desc.: Other organic solids
Method Code: H01
Method Description: Transfer station
Tons: 0.118
Year: 2002
-- --

Generator EPA ID:	CAL000135612
Generator County Code:	37
Generator County:	San Diego
TSD EPA ID:	CAD028409019
TSD County Code:	19
TSD County:	Los Angeles
State Waste Code:	134
State Waste Code Desc.:	Aqueous solution with total organic residues less than 10 percent
Method Code:	T01
Method Description:	Treatment, tank
Tons:	0.588
Year:	2003
--	--
Generator EPA ID:	CAL000135612
Generator County Code:	37
Generator County:	San Diego
TSD EPA ID:	CAD982444481
TSD County Code:	36
TSD County:	San Bernardino
State Waste Code:	134
State Waste Code Desc.:	Aqueous solution with total organic residues less than 10 percent
Method Code:	
Method Description:	
Tons:	0.021
Year:	2003
--	--
Generator EPA ID:	CAL000135612
Generator County Code:	37
Generator County:	San Diego
TSD EPA ID:	CAD982444481
TSD County Code:	36
TSD County:	San Bernardino
State Waste Code:	134
State Waste Code Desc.:	Aqueous solution with total organic residues less than 10 percent
Method Code:	H01
Method Description:	Transfer station
Tons:	0.021
Year:	2004
--	--

Map Key	*Number of Records*	*Direction*	*Distance (mi/ft)*	*Elev (ft)*	*Site*	*DB*
7	*13 of 17*	*NE*	*0.04 / 186.73*	*11.38*	***UNION OIL COMPANY OF CALI 3085 MANCHESTER CARDIFF CA 920070000***	***HAZNET***

SIC Code:		***Mailing City:***	SANTA ANA
NAICS Code:		***Mailing State:***	CA
EPA ID:	CAT080014947	***Mailing Zip:***	927995376
Create Date:	7/23/1982	***Region Code:***	4
Fac Act Ind:	No	***Owner Name:***	UNION OIL COMPANY OF CALIFORNI
Inact Date:	6/30/1998	***Owner Addr 1:***	--
County Code:	37	***Owner Addr 2:***	
County Name:	San Diego	***Owner City:***	--
Mail Name:	DAVID CORDER RM 9001	***Owner State:***	99
Mailing Addr 1:	PO BOX 25376	***Owner Zip:***	--
Mailing Addr 2:		***Owner Phone:***	0000000000
Owner Fax:			

Contact Information

--	--
Contact Name:	--
Street Address 1:	INACT PER 98VQ FINAL NOTICE
Street Address 2:	- BATCH 4/27
City:	--
State:	99
Zip:	--
Phone:	--
--	--

Map Key	**Number of Records**	**Direction**	**Distance (mi/ft)**	**Elev (ft)**	**Site**	**DB**
7	*14 of 17*	*NE*	*0.04 / 186.73*	*11.38*	*UNION OIL COMPANY OF CALI* *3085 MANCHESTER* *CARDIFF CA 92007*	*RCRA SQG*

EPA Handler ID:	CAT080014947
Land Type Code:	
Land Type Desc:	
Federal Waste Generator Code:	2
Gen Status Univ:	SQG
Gen Status Univ Desc:	Small Quantity Generator
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility:	No
Recycler Activity:	No
Onsite Burner Exemption:	No
Furnace Exemption:	No
Underground Inject Activity:	No
Receives Waste from Offsite:	No
TSD Type:	-----
TSD Activity:	No
Corrective Action Univ:	No
Action has been Imposed:	No
Action under 3004 (U)/(V):	No
Institutional Control Indicator:	N
Used Oil Transporter:	
Used Oil Transfer Facility:	
Used Oil Processor:	
Used Oil Refiner:	
Used Oil Burner:	
Used Oil Market Burner:	
Used Oil Spec Marketer:	
Activity Location:	CA
County Code:	CA073
County Name:	SAN DIEGO
Contact Name:	
Contact Phone No and Exten:	
Contact Email:	
Contact Address:	US
Mailing Address:	P O BOX 7600, SAN DIEGO, CA, 92138, US

Owner/Operator Details

Owner/Operator Ind:	CO	***Country:***	
Name:	UNION OIL COMPANY OF CALIFORNIA	***Zip Code:***	99999
Street No:		***Phone:***	415-555-1212
Street 1:	NOT REQUIRED	***Type:***	P
Street 2:		***Date Became Current:***	
City:	NOT REQUIRED	***Date Ended Current:***	
State:	ME		
Source Type:	N		

Owner/Operator Ind:	CP	***Country:***	
Name:	NOT REQUIRED	***Zip Code:***	99999
Street No:		***Phone:***	415-555-1212
Street 1:	NOT REQUIRED	***Type:***	P
Street 2:		***Date Became Current:***	
City:	NOT REQUIRED	***Date Ended Current:***	
State:	ME		
Source Type:	I		

Handler Details

Source Type:	N	***Used Oil Transporter:***	No

Receive Date:	19810306	***UO Transfer Fac:***	No
Non Notifier:		***Used Oil Processor:***	No
Acknowledge Flag:		***Used Oil Refiner:***	No
Acknowledge Date:	19910331	***Used Oil Burner:***	No
Accessibility:		***UO Market Burner:***	No
Land Type:	O	***UO Spec Marketer:***	No
Fed Waste Gen Own:	HQ	***Current Site Name:***	UNION OIL COMPANY OF CALI
Fed Waste Gen Cd:	1	***Location Street No:***	
Fed Waste Gen Desc:	Large Quantity Generator	***Location Street 1:***	3085 MANCHESTER
ST Waste Gen Own:		***Location Street 2:***	
State Waste Gen Cd:		***Location City:***	CARDIFF
Short Term Gen:	No	***Location State:***	CA
Importer Activity:	No	***Location Zip Code:***	92007
Mixed Waste Gen:	No	***County Code:***	CA073
Transporter:	No	***State District:***	4
Transfer Facility:	No	***Mailing Street No:***	
TSD Activity:	No	***Mailing Street 1:***	P O BOX 7600
Recycler Activity:	No	***Mailing Street 2:***	
Onsite Burn Exempt:	No	***Mailing City:***	SAN DIEGO
Furnace Exemption:	No	***Mailing State:***	CA
Underground Inject:	No	***Mailing Zip Code:***	92138
Off Site Receipt:	No	***Mailing Country:***	US
Waste Dest Fac:	No	***Contact First Name:***	ENVIRONMENTAL
Subpart K College:		***Contact Middle Initial:***	
Subpart K Hospital:		***Contact Last Name:***	MANAGER
Subpart K Non Profit:		***Contact Street No:***	
Subpart K Withdraw:		***Contact Street 1:***	3085 MANCHESTER
Include Ntnl Rprt:		***Contact Street 2:***	
Reporting Cycle:		***Contact City:***	CARDIFF
LQHUW:	N	***Contact State:***	CA
Trader Importer:		***Contact Zip:***	92007
Trader Exporter:		***Contact Country:***	US
Slab Importer:		***Contact Phone:***	714-291-7600
Slab Exporter:		***Contact Phone Ext:***	
Current Record:	No	***Contact Fax:***	
Location Country:	US	***Contact Email Addr:***	
State District Owner:	CA	***Contact Title:***	

Handler Details

Source Type:	I	***Used Oil Transporter:***	No
Receive Date:	19960901	***UO Transfer Fac:***	No
Non Notifier:		***Used Oil Processor:***	No
Acknowledge Flag:		***Used Oil Refiner:***	No
Acknowledge Date:	19910331	***Used Oil Burner:***	No
Accessibility:		***UO Market Burner:***	No
Land Type:		***UO Spec Marketer:***	No
Fed Waste Gen Own:	HQ	***Current Site Name:***	UNION OIL COMPANY OF CALI
Fed Waste Gen Cd:	2	***Location Street No:***	
Fed Waste Gen Desc:	Small Quantity Generator	***Location Street 1:***	3085 MANCHESTER
ST Waste Gen Own:		***Location Street 2:***	
State Waste Gen Cd:		***Location City:***	CARDIFF
Short Term Gen:	No	***Location State:***	CA
Importer Activity:	No	***Location Zip Code:***	92007
Mixed Waste Gen:	No	***County Code:***	CA073
Transporter:	No	***State District:***	4
Transfer Facility:	No	***Mailing Street No:***	
TSD Activity:	No	***Mailing Street 1:***	P O BOX 7600
Recycler Activity:	No	***Mailing Street 2:***	
Onsite Burn Exempt:	No	***Mailing City:***	SAN DIEGO
Furnace Exemption:	No	***Mailing State:***	CA
Underground Inject:	No	***Mailing Zip Code:***	92138
Off Site Receipt:	No	***Mailing Country:***	US
Waste Dest Fac:	No	***Contact First Name:***	
Subpart K College:		***Contact Middle Initial:***	
Subpart K Hospital:		***Contact Last Name:***	
Subpart K Non Profit:		***Contact Street No:***	

Subpart K Withdraw:		**Contact Street 1:**	
Include Ntnl Rprt:		**Contact Street 2:**	
Reporting Cycle:		**Contact City:**	
LQHUW:	N	**Contact State:**	
Trader Importer:		**Contact Zip:**	
Trader Exporter:		**Contact Country:**	US
Slab Importer:		**Contact Phone:**	
Slab Exporter:		**Contact Phone Ext:**	
Current Record:	Yes	**Contact Fax:**	
Location Country:	US	**Contact Email Addr:**	
State District Owner:	CA	**Contact Title:**	

7	15 of 17	NE	0.04 / 186.73	11.38	CARDIFF 76 #5946 3085 MANCHESTER AVE Cardiff by the Sea CA	SANDIEGO SAM

Record ID:	DEH2009-LSAM-H05833-002	**Object ID:**	6035
Record Type:	SAM Investigation	**ID:**	6039
Status:	Completed	**Feature ID:**	2612101400
REST Record ID:	DEH2009-LSAM-H05833-002	**Parcel No:**	261-210-14-00
Record Name:	CARDIFF 76 #5946	**SWRCB Global ID:**	T10000001082
Record Status:	Completed	**H No:**	
Record Alias:	SAM Investigation	**Historical Name:**	CONOCO-PILLIPS
Date:	02/24/2009	**Agency Name:**	COSD
Primary Parcel:	YES	**Fire Agency:**	SAN DIEGUITO WATER DISTRICT LAND
Primary Address:	YES	**Funding:**	V - Private - VAP
Address:	3085 MANCHESTER AVE, CARDIFF BY THE SEA CA 920072205	**GT Global ID:**	T10000001082
Address Type:	ALIAS	**GT RB Case No:**	
Street String:	3085 MANCHESTER AVE	**GT Cuf Case:**	NO
Zip Code:	92007-2205	**GT Case Type:**	Cleanup Program Site
Zip Community:	92007	**GT Lead Agency:**	SAN DIEGO COUNTY LOP
Jurisdiction:	ENCINITAS	**GT County:**	San Diego
Census Tract:	174.04	**GT Latitude:**	33.0112323
BOS District:	3	**GT Longitude:**	-117.2632604
Watershed Basin:	904.61	**Latitude GS84:**	33.0114122
Water Purveyor:	SAN DIEGUITO WATER DISTRICT LAND	**Longitude GS84:**	-117.2632539
KIVA per Tp per No:	6SAM H05833	**Point X:**	6251052.79599914
X:	6251052.796	**Point Y:**	1949288.49806064
Y:	1949288.498		

Case No:	
Case Type:	VAP - Voluntary Assistance Program
REST Record Type:	LUEG-DEH/LWQD/SAM Investigation/NA
Opened Date:	1235433600000
Opened Date Converted:	02/23/2009 08:00PM
Full Name DEH Permit Owner:	
Lead Agency:	DEH/SAM
Lead Agency Date:	1235433600000
Lead Agency Date Converted:	02/23/2009 08:00PM
Geo SRC:	Mapped to parcel centroid using AA XY
GT Status:	Completed - Case Closed
GT Status Date:	1250121600000
GT Status Date Converted:	08/12/2009 08:00PM
Thomasbros Mappage Grid:	1167 F 4

7	16 of 17	NE	0.04 / 186.73	11.38	CARDIFF 76 #5946 3085 MANCHESTER AVE Cardiff by the Sea CA	SANDIEGO SAM

Record ID:	DEH1998-LSAM-H05833-001	**Object ID:**	4443
Record Type:	SAM Investigation	**ID:**	4447
Status:	Completed	**Feature ID:**	2612101400
REST Record ID:	DEH1998-LSAM-H05833-001	**Parcel No:**	261-210-14-00
Record Name:	CARDIFF 76 #5946	**SWRCB Global ID:**	T0607302519
Record Status:	Completed	**H No:**	H05833

Record Alias:	SAM Investigation	**Historical Name:**	TOSCO 76 #5946
Date:	07/29/1998	**Agency Name:**	COSD
Primary Parcel:	YES	**Fire Agency:**	SAN DIEGUITO WATER DISTRICT LAND
Primary Address:	YES	**Funding:**	F - LOP Federal Fund
Address:	3085 MANCHESTER AVE, CARDIFF BY THE SEA CA 920072205	**GT Global ID:**	T0607302519
Address Type:	ALIAS	**GT RB Case No:**	9UT3750
Street String:	3085 MANCHESTER AVE	**GT Cuf Case:**	YES
Zip Code:	92007-2205	**GT Case Type:**	LUST Cleanup Site
Zip Community:	92007	**GT Lead Agency:**	SAN DIEGO COUNTY LOP
Jurisdiction:	ENCINITAS	**GT County:**	San Diego
Census Tract:	174.04	**GT Latitude:**	33.0106984
BOS District:	3	**GT Longitude:**	-117.263681
Watershed Basin:	904.61	**Latitude GS84:**	33.0114122
Water Purveyor:	SAN DIEGUITO WATER DISTRICT LAND	**Longitude GS84:**	-117.2632539
KIVA per Tp per No:	6SAM H05833	**Point X:**	6251079.02035613
X:	6251052.796	**Point Y:**	1949227.37810415
Y:	1949288.498		

Case No:	H05833-001
Case Type:	LOP - Local Oversight Program
REST Record Type:	LUEG-DEH/LWQD/SAM Investigation/NA
Opened Date:	901670400000
Opened Date Converted:	07/28/1998 08:00PM
Full Name DEH Permit Owner:	
Lead Agency:	DEH/SAM
Lead Agency Date:	907718400000
Lead Agency Date Converted:	10/06/1998 08:00PM
Geo SRC:	Mapped to XY from previous SAM Layer
GT Status:	Completed - Case Closed
GT Status Date:	1055203200000
GT Status Date Converted:	06/09/2003 08:00PM
Thomasbros Mappage Grid:	1167 F 4

7	*17 of 17*	*NE*	*0.04 / 186.73*	*11.38*	***CARDIFF CHEVRON*** ***3085 MANCHESTER AVE*** ***CARDIFF BY THE SEA CA 92007***	***SANDIEGO UST***

Record ID:	DEH2010-HUPFP-211657	**Haz. Mat. on Site:**	Y
CERS ID:	10363729	**Own or Operate UG:**	Y
Facility ID:	37-000-211657	**Own or Operate AG:**	N
EPA ID Number:	CAL000018938	**Haz. Waste Generator:**	Y
Permit Status:	Permit Renewed	**Recycle:**	N
Active Permit:	YES	**Onsite Haz. Waste Treatment:**	N
Facility Type UST:	Motor Vehicle Fueling	**RCRA Large Qty. Generator:**	N
Tank Owner Name:	R ROSANO INC	**HHW Collection:**	N
Business Phone:	760-436-4782	**Latitude:**	33.010995043988821
Business Fax:	0	**Longitude:**	-117.26340494191476
Mailing Address:	3085 MANCHESTER AV, CARDIFF, CA 92007		

--Details--

Tank ID:	20059
Tank Status:	Active
Type of Tank:	Single Wall
Piping System Type:	Pressure
ID:	4945
Tank Contents:	Premium Unleaded
Other Content Info:	
UST Perm Close Date:	
Tank Use:	Motor Vehicle Fueling
Last Updated:	2017-04-19T12:54:32.000
Tank Capacity (Gal):	10000
Tank ID:	20058

Tank Status: Active
Type of Tank: Single Wall
Piping System Type: Pressure
ID: 4944
Tank Contents: Regular Unleaded
Other Content Info:
UST Perm Close Date:
Tank Use: Motor Vehicle Fueling
Last Updated: 2017-04-19T12:54:32.000
Tank Capacity (Gal): 10000

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[8]()	***1 of 3***	***NE***	***0.05 / 257.46***	***11.88***	***CITY OF ENCINITAS- OLIVENHAIN SEWER PUMP STATION CONSTRUCTION DEWATERING PRJT*** ***3101 MANCHESTER*** ***ENCINITAS CA 92007***	***FINDS/FRS***

Registry ID: 110065826967
FIPS Code:
Program Acronyms: CA-ENVIROVIEW
HUC Code: 18070303
Site Type Name: STATIONARY
EPA Region Code: 09
Conveyor: FRS-GEOCODE
Source:
County Name: SAN DIEGO COUNTY
SIC Codes:
SIC Code Descriptions:
NAICS Codes:
Federal Facility Code:
NAICS Code Descriptions:
Federal Agency Name:
US/Mexico Border Ind: Yes
Congressional Dist No.: 50
Create Date: 13-OCT-2015 15:17:20
Census Block Code: 060730174043018
Update Date:
Location Description:
Supplemental Location:
Tribal Land Code:
Tribal Land Name:
Latitude: 33.01122
Longitude: -117.26266
Coord Collection Method: ADDRESS MATCHING-HOUSE NUMBER
Accuracy Value: 50
Datum: NAD83
Reference Point: ENTRANCE POINT OF A FACILITY OR STATION
Interest Types: STATE MASTER
Facility Detail Rprt URL: http://ofmpub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110065826967

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[8]()	***2 of 3***	***NE***	***0.05 / 257.46***	***11.88***	***OLIVENHAIN PUMP STATION*** ***3101 MANCHESTER AVENUE*** ***CARDIFF BY THE SEA CA 92007***	***FINDS/FRS***

Registry ID: 110063186092
FIPS Code: 6073
Program Acronyms: CA-ENVIROVIEW
HUC Code: 18070303
Site Type Name: STATIONARY
EPA Region Code: 09
Conveyor: FRS-GEOCODE
Source:
County Name: SAN DIEGO

SIC Codes:	
SIC Code Descriptions:	
NAICS Codes:	
Federal Facility Code:	
NAICS Code Descriptions:	
Federal Agency Name:	
US/Mexico Border Ind:	Yes
Congressional Dist No.:	50
Create Date:	29-DEC-2014 14:40:23
Census Block Code:	060730174043018
Update Date:	13-OCT-2015 13:10:57
Location Description:	
Supplemental Location:	
Tribal Land Code:	
Tribal Land Name:	
Latitude:	33.01122
Longitude:	-117.26266
Coord Collection Method:	ADDRESS MATCHING-HOUSE NUMBER
Accuracy Value:	50
Datum:	NAD83
Reference Point:	ENTRANCE POINT OF A FACILITY OR STATION
Interest Types:	STATE MASTER
Facility Detail Rprt URL:	http://ofmpub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110063186092

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev (ft)	Site	DB
8	3 of 3	NE	0.05 / 257.46	11.88	**OLIVENHAIN PUMP STATION** **3101 MANCHESTER AVE 3101 MANCHESTER AVE** **CARDIFF BY THE SEA CA 92007**	SANDIEGO HAZ

Record ID:	DEH2005-HUPFP-204808	**GIS Record Type:**	LUEG-DEH/HMD/UPFP/Facility
Facility ID No:		**GIS Facility ID:**	
EPA ID No:		**GIS EPA ID No:**	
ID:		**GIS CERS ID:**	
CERS ID:		**Record Status:**	Permit Suspended
Permit Status:		**SIC Code:**	
Active Permit:		**NAICS Code:**	
Project Name:		**Record Name:**	OLIVENHAIN PUMP STATION
Business Phone:		**Site Address:**	
Business Fax:		**City:**	CARDIFF BY THE SEA
Latitude:		**Zip Code:**	92007
Longitude:		**Census Tra:**	
Haz Materials on Site:		**Watrshed Ba:**	
Own/Oper Under:		**Thomas Bros:**	
Own/Oper Above:		**Insp Dist:**	HC006
Haz Waste Generator:		**KivaPerTyp:**	HK18 204808
Recycle:		**Point X:**	6251128.6177
Onsite Haz Waste Tr.:		**Point Y:**	1949189.32798
RCRA Large Qty Gen.:		**Hazmat EHS:**	
HHW Collection:		**Hazmat Rad:**	
Last Updated:		**Tank Owner:**	
Expiration:	1438300800000	**Indian or Tr:**	
Open Date:	1107993600000	**UST Facili:**	
Parcel No:		**Total No USTS:**	
HW Tier:		**Community Z:**	
LRG QTY MW:		**Jurisd:**	
RMP CALARP:		**Water Purv:**	
Disclose QT:		**Fire Agenc:**	
Own Oper APS:	No	**BOS Dist:**	
Haz Waste G:		**Zip Code:**	
Recycle100:		**GIS Latitude:**	
Onsite Haz W:		**GIS Longitude:**	
RCRA LRG Q:		**X Mapcoord:**	
HHW Colle Si:		**Y Mapcoord:**	
Accept Offs:		**Permit Owner:**	SAN ELIJO JOINT POWERS AUTHORITY
Universal W:		**Phone 1:**	760-753-6203

Toxic Gas G:		**ER Contact N:**	JOHN CLARK
Haz Waste EH:		**ER Contact:**	800-303-8877
Haz Waste1:		**ER Contact T:**	CHIEF OPERATOR X 23
Tot APSA Cap:		**ER Contac 1:**	760-753-6203X23
Farm Nurser:		**Own/Operate:**	
Nummin10KT:		**Email Perm:**	
Capacity LR:			

Record Type: Unified Program Facility Permit
Bill Code1: One (Billable) Waste Item or One Reportable Material Per Business
Bill Code2: Not Applicable
Bill Code3: Not Applicable
Address: 3101 MANCHESTER AVE, CARDIFF BY THE SEA, CA 92007
Business T: One (1) Waste Item or One (1) Inventory
Mailing Address:
Geo SRC: Mapped to record pirmary address
Source File: Hazardous Material Division- Permits - REST GIS Data - San Diego County

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9	**1 of 1**	**SSW**	**0.07 / 350.60**	**14.11**	**CARDIFF 76 #5946** **3085 MANCHESTER AV** **CARDIFF CA 920072205**	**LUST**

Global ID:	T0607302519	**CUF Case:**	YES
Case Type:	LUST Cleanup Site	**Begin Date:**	1998-07-29 00:00:00
Status:	Completed - Case Closed	**How Discovered:**	
Status Date:	2003-06-10 00:00:00	**Stop Method:**	
RB Case No:	9UT3750	**County:**	San Diego
LOC Case No:	H05833-001	**Latitude:**	33.0106984
Lead Agency:	SAN DIEGO COUNTY LOP	**Longitude:**	-117.263681
Case Worker:	EM	**File Location:**	Local Agency
Local Agency:	SAN DIEGO COUNTY LOP		

Potential Cntm of Concrn: Gasoline
Potential Media Affected: Aquifer used for drinking water supply
How Discovered Description:
Stop Description:
Cal Water Watershed Name: Carlsbad - Escondido Creek - San Elijo (904.61)
DWR Groundwater Subbasin Name:
Site History:

Status History

Status:	Completed - Case Closed	**Status Date:**	2003-06-10 00:00:00
Status:	Open - Case Begin Date	**Status Date:**	1998-07-29 00:00:00

Activities

Action Type: Other
Action: Leak Reported
Date: 1998-07-29 00:00:00

Action Type: Other
Action: Leak Began
Date: 1998-07-29 00:00:00

Action Type: Other
Action: Leak Discovery
Date: 1998-07-29 00:00:00

Contacts

Contact Type:	Local Agency Caseworker	**City:**	San Diego
Contact Name:	EWAN MOFFAT	**Email:**	ewan.moffat@sdcounty.ca.gov
Organization Name:	SAN DIEGO COUNTY LOP	**Phone No:**	

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev (ft)	Site	DB

Address: P.O. Box 129261

10	***1 of 1***	***ENE***	***0.10 / 506.53***	***13.31***	***CITY OF ENCINITAS OLIVENHAIN PUMP STATION*** ***3150 MANCHESTER AVE*** ***ENCINITAS CA 92024***	***HAZNET***

SIC Code:	4959	***Mailing City:***	ENCINITAS
NAICS Code:	56291	***Mailing State:***	CA
EPA ID:	CAC002708735	***Mailing Zip:***	920243633
Create Date:	10/18/2012	***Region Code:***	4
Fac Act Ind:	No	***Owner Name:***	CITY OF ENCINITAS
Inact Date:	6/30/2013	***Owner Addr 1:***	505 S VULCAN AVE
County Code:	37	***Owner Addr 2:***	
County Name:	San Diego	***Owner City:***	ENCINITAS
Mail Name:		***Owner State:***	CA
Mailing Addr 1:	505 S VULCAN AVE	***Owner Zip:***	920243633
Mailing Addr 2:		***Owner Phone:***	7606332600
Owner Fax:	7604363592		

Contact Information

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Contact Name:	DONNA TROTTER
Street Address 1:	160 CALLE MAGDALENA
Street Address 2:	
City:	ENCINITAS
State:	CA
Zip:	92024
Phone:	7606332852
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Tanner Information

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Generator EPA ID:	CAC002708735
Generator County Code:	37
Generator County:	San Diego
TSD EPA ID:	CAD028409019
TSD County Code:	19
TSD County:	Los Angeles
State Waste Code:	181
State Waste Code Desc.:	Other inorganic solid waste
Method Code:	H141
Method Description:	STORAGE, BULKING, AND/OR TRANSFER OFF SITE--NO TREATMENT/REOVERY (H010-H129) OR (H131-H135)
Tons:	0.1
Year:	2012
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Unplottable Summary

Total: 12 Unplottable sites

DB	Company Name/Site Name	Address	City	Zip	ERIS ID
CHMIRS	Rancho Santa Fe Fire Protection District	Intersection of Manchester Avenue and MacKinnon Ranch Road	Encinitas CA	92024	821852903
CHMIRS	CHP - San Diego	Southbound I-5 at Manchester Avenue	Encinitas CA		836811329
CHMIRS	City of Escondido	Cross streets of I5 at Manchester Ave.	Encinitas CA	92026	821883589
CHMIRS	City Encinitas	3000 block of Manchester Ave	Encinitas CA	92024	821893253
CHMIRS	San Diego CHP	NB 5 @ Manchester at the top of the off ramp	San Diego CA		821847355
CHMIRS	City of Solana Beach	San Elijo Lagoon access road east of I-5 between Manchester & Santa Inez	Encinitas CA	92075	821800445
CHMIRS	CHP San Diego	SB I-5 south of Manchester	Encinitas CA		821816817
CHMIRS	City of Solano Beach	East of I 5 and S Manchester Ave	Encinitas CA	92075	821821527
ERNS		MANCHESTER AVE MACKINNON RANCH RD	ENCINITAS CA	92024	806895126
HAZNET	Fuji Photo Film U S A Inc	1 Marketplace Hyatt Regency 2nd Floor Manchester Foyer E	San Diego CA	92101	826679212
HAZNET	STEVE MADSEN	4909 MANCHESTER AVE	CARDIFF CA	920070000	826763185
SANDIEGO SAM	BROWNS PLANTS INCORPORATED	1264 LAKE	Cardiff by the Sea CA		820131457

Unplottable Report

Site: ***Rancho Santa Fe Fire Protection District***
Intersection of Manchester Avenue and MacKinnon Ranch Road Encinitas CA 92024

CHMIRS

ID:	11-2708	***Notified Date:***	5/1/2011 21:47
Year:	2011	***Notified Date Time:***	
County:	San Diego County		

California Hazardous Material Incident Report System

Contained:	Yes	***3 Vessel 300 Tons:***	No
1 Substance:	Gasoline	***Incident Date:***	5/1/2011
1 Measure:	Gal(s)	***Incident Time:***	2002
1 Other:		***Spill Site:***	Road,Residence
1 Quantity:	15-20	***Injuries?:***	Yes
1 Type:	PETROLEUM	***No of Injuries:***	3
1 Pipeline:		***Fatals?:***	Yes
1 Vessel >= 300 Tons:	No	***No of Fatals:***	2
2 Substance:	Water	***Evacs?:***	No
2 Quantity:	200	***No of Evacs:***	
2 Measure:	Gal(s)	***Cleanup:***	City of Encinitas Public Works
2 Type:	OTHER	***Site:***	Elijo Lagoon
2 Other:	Water	***Cause:***	Other
2 Pipeline:		***Cause Other:***	Vehicle Fire
2 Vessel 300 Tons:	No	***Dog No:***	
3 Substance:		***Water:***	Yes
3 Quantity:		***Water Way:***	Elijo Lagoon
3 Measure:		***City:***	Encinitas
3 Type:		***County:***	San Diego County
3 Other:		***Zip:***	92024
3 Pipeline:			

Admin Agency:	San Diego County Health Services Department
Notification Area:	AA/CUPA,DFG-OSPR,DTSC,RWQCB,US EPA,USFWS,COASTAL COM,LANDS,PARKS & REC,USCG
Location:	Intersection of Manchester Avenue and MacKinnon Ranch Road
Description:	Callers states 15-20 gallons of gasoline mixed with 200 gallons of water released into Elijo Lagoon due to the fire department putting out a vehicle fire. Caller states as a result of the vehicle fire, 2 people within the vehicle were killed and 3 others were transported with injuries (1 with a burn injury, 2 others with unknown injuries).

Main Page Information

On Scene:	
Other on Scene:	
Other Notified:	
Admin Agency:	San Diego County Health Services Department
Admin Agency 2:	
Additional County:	
Document Title:	SPILL Report
Creation Date:	05/01/2011 09:47 PM
Received By:	
Person Notifying Cal OES:	
Phone No:	
Ext:	
Pag Cell:	
Type:	PETROLEUM
Cause Description for Other:	Vehicle Fire
Amount 1:	15-20
Amount 2:	200
Amount 3:	
Doc URL:	https://w3.calema.ca.gov/operational/malhaz.nsf/f1841a103c102734882563e200760c4a/dc8fb16970146d8088257884001a4795?OpenDocument

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Site: ***CHP - San Diego***
Southbound I-5 at Manchester Avenue Encinitas CA

CHMIRS

ID:	15-7442	***Notified Date:***	12/20/2015 3:47
Year:	2015	***Notified Date Time:***	
County:	San Diego County		

California Hazardous Material Incident Report System

Contained:	No	***3 Vessel 300 Tons:***	No
1 Substance:	Petroleum	***Incident Date:***	12/20/2015
1 Measure:	Gal(s)	***Incident Time:***	324
1 Other:		***Spill Site:***	Road
1 Quantity:	50	***Injuries?:***	No
1 Type:	PETROLEUM	***No of Injuries:***	
1 Pipeline:	No	***Fatals?:***	Yes
1 Vessel >= 300 Tons:	No	***No of Fatals:***	1
2 Substance:		***Evacs?:***	No
2 Quantity:		***No of Evacs:***	
2 Measure:		***Cleanup:***	CalTrans
2 Type:		***Site:***	Storm Drain
2 Other:		***Cause:***	Collision
2 Pipeline:	No	***Cause Other:***	
2 Vessel 300 Tons:	No	***Dog No:***	
3 Substance:		***Water:***	Yes
3 Quantity:		***Water Way:***	Storm Drain
3 Measure:		***City:***	Encinitas
3 Type:		***County:***	San Diego County
3 Other:		***Zip:***	
3 Pipeline:	No		

Admin Agency:	San Diego County Health Services Department
Notification Area:	AA/CUPA,DFG-OSPR,DTSC,RWQCB,US EPA,USFWS,COASTAL COM,LANDS,PARKS & REC,Co/WP,Co/Hlth,Co/E-Hlth
Location:	Southbound I-5 at Manchester Avenue
Description:	A sedan illegally entered the San Ysidro Port of Entry. The vehicle traveled the I-5 southbound lane(s) and collided head on with another sedan. Both vehicles caught on fire and released an estimated amount of 50 gallons of petroleum. The release entered a nearby storm drain. It is unknown where the storm drain leads to. The nearest waterway is the San Elijo Lagoon to the west of the incident. Rain has been intermittent throughout the area. CalTrans is on-scene and will be conducting a clean-up. All southbound lanes have been temporarily closed pending an investigation.

Main Page Information

On Scene:	
Other on Scene:	
Other Notified:	
Admin Agency:	San Diego County Health Services Department
Admin Agency 2:	
Additional County:	
Document Title:	SPILL Report
Creation Date:	12/20/2015 03:47 AM
Received By:	
Person Notifying Cal OES:	
Phone No:	
Ext:	
Pag Cell:	
Type:	PETROLEUM
Cause Description for Other:	
Amount 1:	50
Amount 2:	
Amount 3:	
Doc URL:	https://w3.calema.ca.gov/operational/malhaz.nsf/f1841a103c102734882563e200760c4a/bc1588cc5717474088257f210040cb38?OpenDocument

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Site: ***City of Escondido***
Cross streets of I5 at Manchester Ave. Encinitas CA 92026

CHMIRS

ID:	04-1555	***Notified Date:***	3/21/200410:54:50 AM

Year:	2004	***Notified Date Time:***	
County:	San Diego County		

California Hazardous Material Incident Report System

Contained:	Yes	***Bbls:***	0
Substance:	Sewage	***Cups:***	0
Incident Date:	3/21/200412:00:00 AM	***Cuft:***	0
No of Injuries:	0	***Gals:***	5,000
No of Fatals:	0	***Grams:***	0
No of Evacs:	0	***Lbs:***	0
Cleanup:	Reporting Party	***Liters:***	0
Water:		***Oz:***	0
Water Way:	San Elijo Lagoon	***Pts:***	0
City:	Encinitas	***Qts:***	0
County:	San Diego County	***Sheen:***	0
Zip:	92026	***Tons:***	0
Site:	Road	***Unknown:***	0
Admin Agency:	San Diego County Health Services Dept.		
Location:	Cross streets of I5 at Manchester Ave.		
Description:	Valve malfunction on a sewer pipe caused this release.		

Site: ***City Encinitas***
3000 block of Manchester Ave   Encinitas CA 92024

CHMIRS

ID:	11-7632	***Notified Date:***	12/28/2011 14:17
Year:	2011	***Notified Date Time:***	
County:	San Diego County		

California Hazardous Material Incident Report System

Contained:	Yes	***3 Vessel 300 Tons:***	No
1 Substance:	Sewage	***Incident Date:***	12/28/2011
1 Measure:	Gal(s)	***Incident Time:***	1145
1 Other:		***Spill Site:***	Treatment/Sewage Facility
1 Quantity:	Unknown	***Injuries?:***	No
1 Type:	SEWAGE	***No of Injuries:***	
1 Pipeline:	No	***Fatals?:***	No
1 Vessel >= 300 Tons:	No	***No of Fatals:***	
2 Substance:		***Evacs?:***	No
2 Quantity:		***No of Evacs:***	
2 Measure:		***Cleanup:***	Contractor
2 Type:		***Site:***	San Vallejo Lagoon
2 Other:		***Cause:***	Overflow
2 Pipeline:	No	***Cause Other:***	
2 Vessel 300 Tons:	No	***Dog No:***	
3 Substance:		***Water:***	Yes
3 Quantity:		***Water Way:***	San Vallejo Lagoon
3 Measure:		***City:***	Encinitas
3 Type:		***County:***	San Diego County
3 Other:		***Zip:***	92024
3 Pipeline:	No		
Admin Agency:	San Diego County Health Services Department		
Notification Area:	AA/CUPA,DFG-OSPR,DTSC,RWQCB,US EPA,USFWS,COASTAL COM,LANDS,USCG,Co/E-Hlth		
Location:	3000 block of Manchester Ave		
Description:	Force main overlowing small amount spilled into the lagoon prior to being contained		

Main Page Information

On Scene:	
Other on Scene:	
Other Notified:	
Admin Agency:	San Diego County Health Services Department
Admin Agency 2:	
Additional County:	
Document Title:	SPILL Report
Creation Date:	12/28/2011 02:17 PM
Received By:	

Person Notifying Cal OES:	
Phone No:	
Ext:	
Pag Cell:	
Type:	SEWAGE
Cause Description for Other:	
Amount 1:	Unknown
Amount 2:	
Amount 3:	
Doc URL:	https://w3.calema.ca.gov/operational/malhaz.nsf/f1841a103c102734882563e200760c4a/b681833558f1214b88257974007a6bf0?OpenDocument

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Site: ***San Diego CHP***
NB 5 @ Manchester at the top of the off ramp San Diego CA

CHMIRS

ID:	02-6987	**Notified Date:**	12/23/200207:53:51 AM
Year:	2002	**Notified Date Time:**	
County:	San Diego County		

California Hazardous Material Incident Report System

Contained:	Unknown	**Bbls:**	0
Substance:	Diesel	**Cups:**	0
Incident Date:	12/23/200212:00:00 AM	**Cuft:**	0
No of Injuries:	0	**Gals:**	120
No of Fatals:	0	**Grams:**	0
No of Evacs:	0	**Lbs:**	0
Cleanup:	Unknown	**Liters:**	0
Water:	Unknown	**Oz:**	0
Water Way:	Storm drain	**Pts:**	0
City:	San Diego	**Qts:**	0
County:	San Diego County	**Sheen:**	0
Zip:		**Tons:**	0
Site:	Road	**Unknown:**	0

Admin Agency:	San Diego County Health Services Dept.
Location:	NB 5 @ Manchester at the top of the off ramp
Description:	Release occurred during a truck fire, the product is released from the fuel tank . The truck is at the top of the off ramp, there are storm drains at the bottom of this off ramp, unknown where the fuel has flowed.

Site: ***City of Solana Beach***
San Elijo Lagoon access road east of I-5 between Manchester & Santa Inez Encinitas CA 92075

CHMIRS

ID:	99-2694	**Notified Date:**	6/25/199912:04:39 PM
Year:	1999	**Notified Date Time:**	
County:	San Diego County		

California Hazardous Material Incident Report System

Contained:	No	**Bbls:**	0
Substance:	Raw sewage	**Cups:**	0
Incident Date:	6/25/199912:00:00 AM	**Cuft:**	0
No of Injuries:	0	**Gals:**	5
No of Fatals:	0	**Grams:**	0
No of Evacs:	0	**Lbs:**	0
Cleanup:	not possible	**Liters:**	0
Water:	Yes	**Oz:**	0
Water Way:	San Elijo Lagoon	**Pts:**	0
City:	Encinitas	**Qts:**	0
County:	San Diego County	**Sheen:**	0
Zip:	92075	**Tons:**	0
Site:	Other	**Unknown:**	0

Admin Agency:	San Diego County Health Services Dept.
Location:	San Elijo Lagoon access road east of I-5 between Manchester & Santa Inez
Description:	Malfunction in a temporary sewer pump station. Went into San Elijo Lagoon, none was recovered

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Site: ***CHP San Diego***
SB I-5 south of Manchester Encinitas CA

CHMIRS

ID:	04-0592	***Notified Date:***	2/3/200401:01:30 AM
Year:	2004	***Notified Date Time:***	
County:	San Diego County		

California Hazardous Material Incident Report System

Contained:	Yes	***Bbls:***	0
Substance:	Diesel	***Cups:***	0
Incident Date:	2/3/200412:00:00 AM	***Cuft:***	0
No of Injuries:	0	***Gals:***	20-30
No of Fatals:	0	***Grams:***	0
No of Evacs:	0	***Lbs:***	0
Cleanup:	CalTrans	***Liters:***	0
Water:		***Oz:***	0
Water Way:		***Pts:***	0
City:	Encinitas	***Qts:***	0
County:	San Diego County	***Sheen:***	0
Zip:		***Tons:***	0
Site:	Road	***Unknown:***	0

Admin Agency:	San Diego County Health Services Dept.
Location:	SB I-5 south of Manchester
Description:	Released from the saddle tank of a truck involved in a solo vehicle accident.

Site: ***City of Solano Beach***
East of I 5 and S Manchester Ave   Encinitas CA 92075

CHMIRS

ID:	98-4245	***Notified Date:***	9/16/199804:36:00 PM
Year:	1998	***Notified Date Time:***	
County:	San Diego County		

California Hazardous Material Incident Report System

Contained:	Yes	***Bbls:***	0
Substance:	Sewage	***Cups:***	0
Incident Date:	9/14/199812:00:00 AM	***Cuft:***	0
No of Injuries:	0	***Gals:***	625-19,583
No of Fatals:	0	***Grams:***	0
No of Evacs:	0	***Lbs:***	0
Cleanup:	Unknown	***Liters:***	0
Water:	Yes	***Oz:***	0
Water Way:	San Elijo Lagoon	***Pts:***	0
City:	Encinitas	***Qts:***	0
County:	San Diego County	***Sheen:***	0
Zip:	92075	***Tons:***	0
Site:	Other	***Unknown:***	0

Admin Agency:	San Diego County Health Services Dept.
Location:	East of I 5 and S Manchester Ave
Description:	2 inch tear in a 8 inch bypass line discovered by field crew while inspecting lines. Bypass line goes through San Elijo Lagoon, San Elijo Lagoon does not flow any where nor does it provide drinking water.

Site:
MANCHESTER AVE MACKINNON RANCH RD ENCINITAS CA 92024

ERNS

NRC Report No:	974562	***Direction From City:***	
Type of Incident:	MOBILE	***Lat Quad:***	
Incident Cause:	TRANSPORT ACCIDENT	***Long Quad:***	
Incident Date:	5/1/2011 8:02:00 PM	***Location Section:***	
Incident Location:	AT THE INTERSECTION OF	***Location Township:***	
Incident Dtg:	DISCOVERED	***Location Range:***	
Distance From City:		***Potential Flag:***	No
Distance Units:		***Year:***	Calendar Year 2011

Description of Incident:	CALLER IS REPORTING A RELEASE OF GASOLINE AND 200 GALLONS OF FIRE FIGHTER WATER DUE TO A TRAFFIC COLLISION NEAR A LAGOON. UNKNOWN AMOUNT OF INJURIES REPORTED AND CONFIRMED TWO FATALITIES. AIR LIFT WAS USED TO TRANSPORT INDIVIDUALS TO THE HOSPITAL.

Material Spill Information

Chris Code:	NCC	***Name of Material:***	FIRE FIGHTER WATER
CAS No:	000000-00-0	***If Reached Water:***	UNKNOWN
UN No:		***Amount in Water:***	0
Amount of Material:	200	***Unit Reach Water:***	UNKNOWN AMOUNT
Unit of Measure:	GALLON(S)		

Chris Code:	GAS	***Name of Material:***	GASOLINE: AUTOMOTIVE (UNLEADED)
CAS No:	000000-00-0	***If Reached Water:***	UNKNOWN
UN No:		***Amount in Water:***	0
Amount of Material:	10	***Unit Reach Water:***	UNKNOWN AMOUNT
Unit of Measure:	GALLON(S)		

Calls Information

Date Time Received:	5/2/2011 12:33:24 AM	***Responsible City:***	
Date Time Complete:	5/2/2011 12:52:29 AM	***Responsible State:***	XX
Call Type:	INC	***Responsible Zip:***	
Responsible Company:		***On Behalf of:***	
Responsible ORG Type:	UNKNOWN	***Source:***	TELEPHONE

Incidents Information

Aircraft Type:	
Aircraft Model:	
Aircraft ID:	
Aircraft Fuel Capacity:	
Aircraft Fuel Capacity Units:	
Aircraft Fuel on Board:	
Aircraft Fuel OB Units:	
Aircraft Spot No:	
Aircraft Hanger:	
Aircraft Runway No:	
Road Mile Marker:	
Building ID:	
Type of Fixed Object:	
Power Generating Facility:	U
Generating Capacity:	
Type of Fuel:	
NPDES:	
NPDES Compliance:	U
Pipeline Type:	
DOT Regulated:	U
Pipeline Above Ground:	ABOVE
Exposed Underwater:	N
Pipeline Covered:	U
Railroad Hotline:	
Grade Crossing:	U
Location Subdivision:	
Railroad Milepost:	
Type Vehicle Involved:	
Crossing Device Type:	
Device Operational:	U
Dot Crossing No:	
Brake Failure:	U
Description of Tank:	
Tank Above Ground:	ABOVE
Transportable Container:	U
Tank Regulated:	U
Tank Regulated By:	
Tank ID:	
Capacity of Tank:	
Capacity of Tank Units:	
Actual Amount:	
Actual Amount Units:	
Platform Rig Name:	
Platform Letter:	

Location Area ID:
Location Block ID:
OCSG No:
OCSG No:
State Lease No:
Pier Dock No:
Berth Slip No:
Continuous Release Type:
Initial Cont Release No:
Continuous Release Permit:
Allision: U
Type of Structure:
Structure Name:
Structure Operational: U
Airbag Deployed: U
Date Time Normal Service:
Service Disruption Time:
Service Disruption Units:
Transit Bus Flag:
CR Begin Date:
CR End Date:
CR Change Date:
FBI Contact:
FBI Contact Date Time:
Sub Part C Testing Req: XXX
Conductor Testing:
Engineer Testing:
Trainman Testing:
Yard Foreman Testing:
RCL Operator Testing:
Brakeman Testing:
Train Dispatcher Testing:
Signalman Testing:
Other Employee Testing:
Unknown Testing:
Passenger Handling:
Passenger Route: XXX
Passenger Delay: XXX

Incident Details Information

Fire Involved: Y
Fire Extinguished: Y
Any Evacuations: N
Number Evacuated:
Who Evacuated:
Radius Of Evacuation:
Any Injuries: U
No. Injured:
No. Hospitalized:
Any Fatalities: Y
No. Fatalities: 2
Any Damages: N
Damage Amount:
Air Corridor Closed: N
Air Corridor Desc:
Air Closure Time:
Waterway Closed: N
Waterway Desc:
Waterway Closure Time:
Road Closed: N
Road Desc:
Road Closure Time:
Closure Direction:
Major Artery: No
Track Closed: N
Track Desc:
Track Closure Time:
Media Interest: NONE
Medium Desc: WATER

Additional Medium Info:	SAN ELIJO LAGOON
Body of Water:	
Tributary of:	
Nearest River Mile Maker:	
Release Secured:	U
Est Duration of Release:	
Release Rate:	
Desc Remedial Action:	FIRE AND LOCAL AUTHORITIES ARE ON SCENE.
State Agency on Scene:	NONE
State Agency Report No:	NONE
Other Agency Notified:	
Weather Conditions:	UNKNOWN
Air Temperature:	
Wind Speed:	
Wind Direction:	
Water Supply Contaminated:	U
Sheen Size:	
Sheen Color:	
Direction of Sheen Travel:	
Sheen Odor Description:	
Wave Condition:	
Current Speed:	
Current Direction:	
Water Temperature:	
Track Close Dir:	
EMPL Fatality:	
Pass Fatality:	
Community Impact:	
Wind Speed Unit:	
Employee Injuries:	
Passenger Injuries:	
Occupant Fatality:	
Current Speed Unit:	
Road Closure Units:	
Track Closure Units:	
Sheen Size Units:	
Additional Info:	NO ADDITIONAL INFORMATION.
State Agency Notified:	NONE
Federal Agency Notified:	NONE
Nearest River Mile Marker:	
Sheen Size Length:	
Sheen Size Length Units:	
Sheen Size Width:	
Sheen Size Width Units:	
Offshore:	N
Duration Unit:	
Release Rate Unit:	
Release Rate Rate:	
Passengers Transferred:	NO

Site: ***Fuji Photo Film U S A Inc***
1 Marketplace Hyatt Regency 2nd Floor Manchester Foyer E San Diego CA 92101

HAZNET

SIC Code:		***Mailing City:***	Edison
NAICS Code:		***Mailing State:***	NJ
EPA ID:	CAP000097725	***Mailing Zip:***	08837
Create Date:	3/4/2003 8:07:30 AM	***Region Code:***	4
Fac Act Ind:	No	***Owner Name:***	Fuji Photo Film U S A Inc
Inact Date:	9/5/2003	***Owner Addr 1:***	555 Taxter Rd
County Code:	37	***Owner Addr 2:***	
County Name:	San Diego	***Owner City:***	Elmsford
Mail Name:		***Owner State:***	NY
Mailing Addr 1:	1100 King George Post Rd	***Owner Zip:***	105232394
Mailing Addr 2:		***Owner Phone:***	7328573175
Owner Fax:			

Contact Information

--	--
Contact Name:	Kevin Jeffries
Street Address 1:	1100 King George Post Rd

Street Address 2:	
City:	Edison
State:	NJ
Zip:	08837
Phone:	7328573175
--	--
--	--
Tanner Information	
--	--
Generator EPA ID:	CAP000097725
Generator County Code:	37
Generator County:	San Diego
TSD EPA ID:	CAD093459485
TSD County Code:	10
TSD County:	Fresno
State Waste Code:	541
State Waste Code Desc.:	Photochemicals/photoprocessing waste
Method Code:	R01
Method Description:	Recycler
Tons:	0.2502
Year:	2001
--	--

Site: ***STEVE MADSEN***
4909 MANCHESTER AVE   CARDIFF CA 920070000

HAZNET

SIC Code:		***Mailing City:***	CARDIFF
NAICS Code:		***Mailing State:***	CA
EPA ID:	CAC002655513	***Mailing Zip:***	920071804
Create Date:	7/7/2010	***Region Code:***	4
Fac Act Ind:	No	***Owner Name:***	STEVE MADSEN
Inact Date:	1/4/2011	***Owner Addr 1:***	2157 EDINBURG AVE
County Code:	37	***Owner Addr 2:***	
County Name:	San Diego	***Owner City:***	CARDIFF
Mail Name:		***Owner State:***	CA
Mailing Addr 1:	2157 EDINBURG AVE	***Owner Zip:***	920071804
Mailing Addr 2:		***Owner Phone:***	7604369763
Owner Fax:			

Contact Information

--	--
Contact Name:	STEVE MADSEN
Street Address 1:	2157 EDINBURG AVE
Street Address 2:	
City:	CARDIFF
State:	CA
Zip:	920071804
Phone:	7604369763
--	--

Site: ***BROWNS PLANTS INCORPORATED***
1264 LAKE   Cardiff by the Sea CA

SANDIEGO SAM

Record ID:	DEH2009-LSAM-H39744-001	***Object ID:***	6064
Record Type:	SAM Investigation	***ID:***	6068
Status:	Completed	***Feature ID:***	2602121800
REST Record ID:	DEH2009-LSAM-H39744-001	***Parcel No:***	260-212-18-00
Record Name:	BROWNS PLANTS INCORPORATED	***SWRCB Global ID:***	T10000001608
Record Status:	Completed	***H No:***	H39744
Record Alias:	SAM Investigation	***Historical Name:***	BROWNS PLANTS INCORPORATED
Date:	10/08/2009	***Agency Name:***	COSD
Primary Parcel:	YES	***Fire Agency:***	ENCINITAS
Primary Address:	YES	***Funding:***	V - Private - VAP
Address:	1264 LAKE, ENCINITAS CA 92024	***GT Global ID:***	T10000001608
Address Type:	ALIAS	***GT RB Case No:***	
Street String:	1264 LAKE	***GT Cuf Case:***	NO
Zip Code:	92024	***GT Case Type:***	Cleanup Program Site
Zip Community:	92007	***GT Lead Agency:***	SAN DIEGO COUNTY LOP
Jurisdictiction:	ENCINITAS	***GT County:***	San Diego

Census Tract:	174.04	***GT Latitude:***	33.03511093
BOS District:	3	***GT Longitude:***	-117.26695061
Watershed Basin:	904.61	***Latitude GS84:***	33.0348417
Water Purveyor:	SAN DIEGUITO WATER DISTRICT LAND	***Longitude GS84:***	-117.2671574
KIVA per Tp per No:	6SAM H39744	***Point X:***	6249858.79477821
X:	6249663.52702731	***Point Y:***	1957910.23081714
Y:	1958067.28521761		

Case No:	H39744-001
Case Type:	VAP - Voluntary Assistance Program
REST Record Type:	LUEG-DEH/LWQD/SAM Investigation/NA
Opened Date:	1254960000000
Opened Date Converted:	10/07/2009 08:00PM
Full Name DEH Permit Owner:	
Lead Agency:	DEH/SAM
Lead Agency Date:	1254960000000
Lead Agency Date Converted:	10/07/2009 08:00PM
Geo SRC:	Mapped to GeoTracker Lat/Lon
GT Status:	Completed - Case Closed
GT Status Date:	1402876800000
GT Status Date Converted:	06/15/2014 08:00PM
Thomasbros Mappage Grid:	1167 F 1

Appendix: Database Descriptions

Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. ERIS updates databases as set out in ASTM Standard E1527-13, Section 8.1.8 Sources of Standard Source Information:

"Government information from nongovernmental sources may be considered current if the source updates the information at least every 90 days, or, for information that is updated less frequently than quarterly by the government agency, within 90 days of the date the government agency makes the information available to the public."

Standard Environmental Record Sources

Federal

National Priority List: NPL

National Priorities List (Superfund)-NPL: EPA's (United States Environmental Protection Agency) list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under the Superfund program. The NPL, which EPA is required to update at least once a year, is based primarily on the score a site receives from EPA's Hazard Ranking System. A site must be on the NPL to receive money from the Superfund Trust Fund for remedial action.

Government Publication Date: Sep 13, 2017

National Priority List - Proposed: PROPOSED NPL

Includes sites proposed (by the EPA, the state, or concerned citizens) for addition to the NPL due to contamination by hazardous waste and identified by the Environmental Protection Agency (EPA) as a candidate for cleanup because it poses a risk to human health and/or the environment.

Government Publication Date: Sep 13, 2017

Deleted NPL: DELETED NPL

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Government Publication Date: Sep 13, 2017

SEMS List 8R Active Site Inventory: SEMS

The Superfund Program has deployed the Superfund Enterprise Management System (SEMS), which integrates multiple legacy systems into a comprehensive tracking and reporting tool. This inventory contains active sites evaluated by the Superfund program that are either proposed to be or are on the National Priorities List (NPL) as well as sites that are in the screening and assessment phase for possible inclusion on the NPL. The Active Site Inventory Report displays site and location information at active SEMS sites. An active site is one at which site assessment, removal, remedial, enforcement, cost recovery, or oversight activities are being planned or conducted.

Government Publication Date: Jul 11, 2017

SEMS List 8R Archive Sites: SEMS ARCHIVE

The Superfund Enterprise Management System (SEMS) Archived Site Inventory displays site and location information at sites archived from SEMS. An archived site is one at which EPA has determined that assessment has been completed and no further remedial action is planned under the Superfund program at this time.

Government Publication Date: Jul 11, 2017

Comprehensive Environmental Response, Compensation and Liability Information System - CERCLIS: CERCLIS

Superfund is a program administered by the United States Environmental Protection Agency (EPA) to locate, investigate, and clean up the worst hazardous waste sites throughout the United States. CERCLIS is a database of potential and confirmed hazardous waste sites at which the EPA Superfund program has some involvement. It contains sites that are either proposed to be or are on the National Priorities List (NPL) as well as sites that are in the screening and assessment phase for possible inclusion on the NPL. The EPA administers the Superfund program in cooperation with individual states and tribal governments; this database is made available by the EPA.

Government Publication Date: Oct 25, 2013

CERCLIS - No Further Remedial Action Planned: CERCLIS NFRAP

An archived site is one at which EPA has determined that assessment has been completed and no further remedial action is planned under the Superfund program at this time. The Archive designation means that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL). This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Government Publication Date: Oct 25, 2013

CERCLIS Liens: CERCLIS LIENS

A Federal Superfund lien exists at any property where EPA has incurred Superfund costs to address contamination ("Superfund site") and has provided notice of liability to the property owner. A Federal CERCLA ("Superfund") lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. This database is made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: Jan 30, 2014

RCRA CORRACTS-Corrective Action: RCRA CORRACTS

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. At these sites, the Corrective Action Program ensures that cleanups occur. EPA and state regulators work with facilities and communities to design remedies based on the contamination, geology, and anticipated use unique to each site.

Government Publication Date: Aug 10, 2017

RCRA non-CORRACTS TSD Facilities: RCRA TSD

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. This database includes Non-Corrective Action sites listed as treatment, storage and/or disposal facilities of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA).

Government Publication Date: Aug 10, 2017

RCRA Generator List: RCRA LQG

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Large Quantity Generators (LQGs) generate 1,000 kilograms per month or more of hazardous waste or more than one kilogram per month of acutely hazardous waste.

Government Publication Date: Aug 10, 2017

RCRA Small Quantity Generators List: RCRA SQG

RCRA Info is the EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Small Quantity Generators (SQGs) generate more than 100 kilograms, but less than 1,000 kilograms, of hazardous waste per month.

Government Publication Date: Aug 10, 2017

RCRA Conditionally Exempt Small Quantity Generators List: RCRA CESQG

RCRA Info is the EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Conditionally Exempt Small Quantity Generators (CESQG) generate 100 kilograms or less per month of hazardous waste or one kilogram or less per month of acutely hazardous waste.

Government Publication Date: Aug 10, 2017

RCRA Non-Generators: RCRA NON GEN

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Non-Generators do not presently generate hazardous waste.

Government Publication Date: Aug 10, 2017

Federal Engineering Controls-ECs: FED ENG

Engineering controls (ECs) encompass a variety of engineered and constructed physical barriers (e.g., soil capping, sub-surface venting systems, mitigation barriers, fences) to contain and/or prevent exposure to contamination on a property. This database is made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: Jan 20, 2016

Federal Institutional Controls- ICs: FED INST

Institutional controls are non-engineered instruments, such as administrative and legal controls, that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy. Although it is EPA's (United States Environmental Protection Agency) expectation that treatment or engineering controls will be used to address principal threat wastes and that groundwater will be returned to its beneficial use whenever practicable, ICs play an important role in site remedies because they reduce exposure to contamination by limiting land or resource use and guide human behavior at a site.

Government Publication Date: Jan 20, 2016

Emergency Response Notification System: ERNS 1982 TO 1986

Database of oil and hazardous substances spill reports controlled by the National Response Center. The primary function of the National Response Center is to serve as the sole national point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories.

Government Publication Date: 1982-1986

Emergency Response Notification System: ERNS 1987 TO 1989

Database of oil and hazardous substances spill reports controlled by the National Response Center. The primary function of the National Response Center is to serve as the sole national point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories.

Government Publication Date: 1987-1989

Emergency Response Notification System: ERNS

Database of oil and hazardous substances spill reports controlled by the National Response Center. The primary function of the National Response Center is to serve as the sole national point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories. This database is made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: Feb 8, 2017

The Assessment, Cleanup and Redevelopment Exchange System (ACRES) Brownfield Database: FED BROWNFIELDS

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties protects the environment, reduces blight, and takes development pressures off greenspaces and working lands. This database is made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: Feb 3, 2017

FEMA Underground Storage Tank Listing: FEMA UST

The Federal Emergency Management Agency (FEMA) of the Department of Homeland Security maintains a list of FEMA owned underground storage tanks.

Government Publication Date: May 31, 2017

LIEN on Property: SEMS LIEN

The EPA Superfund Enterprise Management System (SEMS) provides LIEN information on properties under the EPA Superfund Program.

Government Publication Date: Jul 11, 2017

State

State Response Sites: RESPONSE

A list of identified confirmed release sites where the Department of Toxic Substances Control (DTSC) is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk. This database is state equivalent NPL.

Government Publication Date: Jul 6, 2017

EnviroStor Database: ENVIROSTOR

The EnviroStor Data Management System is made available by the Department of Toxic Substances Control (DTSC). Includes Corrective Action sites, Tiered Permit sites, Historical Sites and Evaluation/Investigation sites. This database is state equivalent CERCLIS.
Government Publication Date: Jun 26, 2017

Delisted EnviroStor Database: DELISTED ENVS

Sites removed from the list of facilities made available by the EnviroStor Data Management System, Department of Toxic Substances Control (DTSC).
Government Publication Date: Jul 6, 2017

Solid Waste Information System (SWIS): SWF/LF

The Solid Waste Information System (SWIS) database made available by the Department of Resources Recycling and Recovery (CalRecycle) contains information on solid waste facilities, operations, and disposal sites throughout the State of California. The types of facilities found in this database include landfills, transfer stations, material recovery facilities, composting sites, transformation facilities, waste tire sites, and closed disposal sites.
Government Publication Date: Aug 30, 2017

EnviroStor Hazardous Waste Facilities: HWP

A list of hazardous waste facilities including permitted, post-closure and historical facilities found in the Department of Toxic Substances Control (DTSC) EnviroStor database.
Government Publication Date: Jun 13, 2017

Land Disposal Sites: LDS

Land Disposal Sites in GeoTracker, the State Water Resources Control Board (SWRCB)'s data management system. The Land Disposal program regulates of waste discharge to land for treatment, storage and disposal in waste management units. Waste management units include waste piles, surface impoundments, and landfills.
Government Publication Date: Jul 18, 2017

Leaking Underground Fuel Tank Reports: LUST

List of Leaking Underground Storage Tanks within the Cleanup Sites data in GeoTracker database. GeoTracker is the State Water Resources Control Board's (SWRCB) data management system for managing sites that impact groundwater, especially those that require groundwater cleanup (Underground Storage Tanks, Department of Defense and Site Cleanup Program) as well as permitted facilities such as operating Underground Storage Tanks. The Leak Prevention Program that overlooks LUST sites is the SWRCB in California's Environmental Protection Agency.
Government Publication Date: Aug 14, 2017

Delisted Leaking Storage Tanks: DLST

List of Leaking Underground Storage Tanks (LUST) cleanup sites removed from GeoTracker, the State Water Resources Control Board (SWRCB)'s database system, as well as sites removed from the SWRCB's list of UST Case closures.
Government Publication Date: Aug 14, 2017

Permitted Underground Storage Tank (UST) in GeoTracker: UST

List of Permitted Underground Storage Tank (UST) sites made available by the State Water Resources Control Board (SWRCB) in California's Environmental Protection Agency (EPA).
Government Publication Date: Sep 25, 2017

Proposed Closure of Underground Storage Tank Cases: UST CLOSURE

List of UST cases that are being considered for closure by either the California Environmental Protection Agency, State Water Resources Control Board or the Executive Director that have been posted for a 60-day public comment period.
Government Publication Date: Aug 31, 2017

Historical Hazardous Substance Storage Information Database: HHSS

The Historical Hazardous Substance Storage database contains information collected in the 1980s from facilities that stored hazardous substances. The information was originally collected on paper forms, was later transferred to microfiche, and recently indexed as a searchable database. When using this database, please be aware that it is based upon self-reported information submitted by facilities which has not been independently verified. It is unlikely that every facility responded to the survey and the database should not be expected to be a complete inventory of all facilities that were operating at that time. This database is maintained by the California State Water Resources Control Board's (SWRCB) Geotracker.
Government Publication Date: Aug 27, 2015

Aboveground Storage Tanks: AST

A statewide list from 2009 of aboveground storage tanks (ASTs) made available by the Cal FIRE Office of the State Fire Marshal (OSFM). This list is no longer maintained or updated by the Cal FIRE OSFM.

Government Publication Date: Aug 31, 2009

Delisted Storage Tanks: DELISTED TNK

This database contains a list of storage tank sites that were removed by the State Water Resources Control Board (SWRCB) in California's Environmental Protection Agency (EPA) and the Cal FIRE Office of State Fire Marshal (OSFM).

Government Publication Date: Sep 25, 2017

California Environmental Reporting System (CERS) Tanks: CERS TANK

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs. The CalEPA oversees the statewide implementation of the Unified Program which applies regulatory standards to protect Californians from hazardous waste and materials.

Government Publication Date: May 30, 2017

Delisted Environmental Reporting System (CERS) Hazardous Waste Sites: DELISTED HAZ

This database contains a list of sites that were removed from the California Environmental Protection Agency (CalEPA) in the following regulatory programs: Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, RCRA LQ HW Generator.

Government Publication Date: May 30, 2017

Site Mitigation and Brownfields Reuse Program Facility Sites with Land Use Restrictions: LUR

The Department of Toxic Substances Control (DTSC) Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents land use restrictions that are active. Some sites have multiple land use restrictions.

Government Publication Date: Sep 12, 2017

Hazardous Waste Management Program Facility Sites with Deed / Land Use Restrictions: HLUR

The Department of Toxic Substances Control (DTSC) Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Government Publication Date: Sep 8, 2017

Deed Restrictions and Land Use Restrictions: DEED

List of Deed Restrictions, Land Use Restrictions and Covenants in GeoTracker made available by the State Water Resources Control Board (SWRCB) in California's Environmental Protection Agency. A deed restriction (land use covenant) may be required to facilitate the remediation of past environmental contamination and to protect human health and the environment by reducing the risk of exposure to residual hazardous materials.

Government Publication Date: Apr 18, 2017

Voluntary Cleanup Program: VCP

List of sites in the Voluntary Cleanup Program made available by the Department of Toxic Substances and Control (DTSC). The Voluntary Cleanup Program was designed to respond to lower priority sites. Under the Voluntary Cleanup Program, DTSC enters site-specific agreements with project proponents for DTSC oversight of site assessment, investigation, and/or removal or remediation activities, and the project proponents agree to pay DTSC's reasonable costs for those services.

Government Publication Date: Jun 20, 2017

GeoTracker Cleanup Sites Data: CLEANUP SITES

A list of cleanup sites in the state of California made available by The State Water Resources Control Board (SWRCB) of the California Environmental Protection Agency (EPA). SWRCB tracks leaking underground storage tank cleanups as well as other water board cleanups.

Government Publication Date: Aug 14, 2017

California Environmental Reporting System (CERS) Hazardous Waste Sites: CERS HAZ

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the following regulatory programs: Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, RCRA LQ HW Generator. The CalEPA oversees the statewide implementation of the Unified Program which applies regulatory standards to protect Californians from hazardous waste and materials.

Government Publication Date: May 30, 2017

Delisted California Environmental Reporting System (CERS) Tanks: DELISTED CTNK

This database contains a list of Aboveground Petroleum Storage and Underground Storage Tank sites that were removed from in the California Environmental Protection Agency (CalEPA) Regulated Site Portal.

Government Publication Date: May 30, 2017

Tribal

Leaking Underground Storage Tanks (LUSTs) on Indian Lands: INDIAN LUST

LUSTs on Tribal/Indian Lands in Region 9, which includes California.

Government Publication Date: Apr 13, 2017

Underground Storage Tanks (USTs) on Indian Lands: INDIAN UST

USTs on Tribal/Indian Lands in Region 9, which includes California.

Government Publication Date: Apr 13, 2017

Delisted Tribal Leaking Storage Tanks: DELISTED ILST

Leaking Underground Storage Tank facilities which have been removed from the Regional Tribal LUST lists made available by the EPA.

Government Publication Date: Aug 3, 2017

Delisted Tribal Underground Storage Tanks: DELISTED IUST

Underground Storage Tank facilities which have been removed from the Regional Tribal UST lists made available by the EPA.

Government Publication Date: Aug 3, 2017

County

Delisted County Records: DELISTED COUNTY

Records removed from county or CUPA databases. Records may be removed from the county lists made available by the respective county departments because they are inactive, or because they have been deemed to be below reportable thresholds.

Government Publication Date: Oct 4, 2017

San Diego County Hazardous Materials Management Division Database: SANDIEGO HAZ

A list of facilities with Unified Program Facility Permit in San Diego County. This list has been made available by County of San Diego Environmental Health.

Government Publication Date: May 19, 2017

San Diego County Site Assessment and Mitigation Investigation Sites: SANDIEGO SAM

List of sites which have undergone a Site Assessment and Mitigation investigation. This list is made available by the County of San Diego Department of Environmental Health.

Government Publication Date: Sep 7, 2017

San Diego County Solid Waste Facility List: SANDIEGO SWF

A list of open and closed Solid Waste Facilities in the County of San Diego. The list is made available by San Diego County Department of Environmental Health.

Government Publication Date: Jul 12, 2017

San Diego County UST List: SANDIEGO UST

A list of registered Underground Storage Tanks in the County of San Diego. The list is made available by the San Diego County Hazardous Materials Division.

Government Publication Date: May 26, 2017

San Diego County Local Oversight Program List: SAN DIEGO LOP

A list of Underground Storage Tank (UST) release sites in the County of San Diego. This list is made available by San Diego County Department of Environmental Health.

Government Publication Date: Aug 3, 2017

Additional Environmental Record Sources

Federal

Facility Registry Service/Facility Index: FINDS/FRS

The US Environmental Protection Agency (EPA)'s Facility Registry System (FRS) is a centrally managed database that identifies facilities, sites or places subject to environmental regulations or of environmental interest. FRS creates high-quality, accurate, and authoritative facility identification records through rigorous verification and management procedures that incorporate information from program national systems, state master facility records, data collected from EPA's Central Data Exchange registrations and data management personnel.

Government Publication Date: Jun 1, 2017

Toxics Release Inventory (TRI) Program: TRIS

The EPA's Toxics Release Inventory (TRI) is a database containing data on disposal or other releases of over 650 toxic chemicals from thousands of U.S. facilities and information about how facilities manage those chemicals through recycling, energy recovery, and treatment. One of TRI's primary purposes is to inform communities about toxic chemical releases to the environment.

Government Publication Date: Dec 31, 2016

Hazardous Materials Information Reporting System: HMIRS

US DOT - Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) Incidents Reports Database taken from Hazmat Intelligence Portal, U.S. Department of Transportation.

Government Publication Date: Feb 28, 2017

National Clandestine Drug Labs: NCDL

The U.S. Department of Justice ("the Department") provides this data as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy.

Government Publication Date: May 4, 2017

Inventory of Open Dumps, June 1985: ODI

The Resource Conservation and Recovery Act (RCRA of the Act) provides for publication of an inventory of open dumps. The Act defines "open dumps" as facilities which do not comply with EPA's "Criteria for Classification of Solid Waste Disposal Facilities and Practices" (40 CFR 257).

Government Publication Date: Jun 1985

EPA Report on the Status of Open Dumps on Indian Lands: IODI

Public Law 103-399, The Indian Lands Open Dump Cleanup Act of 1994, enacted October 22, 1994, identified ongressional concerns that solid waste open dump sites located on American Indian or Alaska Native (AI/AN) lands threaten the health and safety of residents of those lands and contiguous areas. The purpose of the Act is to identify the location of open dumps on Indian lands, assess the relative health and environment hazards posed by those sites, and provide financial and technical assistance to Indian tribal governments to close such dumps in compliance with Federal standards and regulations or standards promulgated by Indian Tribal governments or Alaska Native entities.

Government Publication Date: Dec 31, 1998

Toxic Substances Control Act: TSCA

The Environmental Protection Agency (EPA) is amending the Toxic Substances Control Act (TSCA) section 8(a) Inventory Update Reporting (IUR) rule and changing its name to the Chemical Data Reporting (CDR) rule.

The CDR enables EPA to collect and publish information on the manufacturing, processing, and use of commercial chemical substances and mixtures (referred to hereafter as chemical substances) on the TSCA Chemical Substance Inventory (TSCA Inventory). This includes current information on chemical substance production volumes, manufacturing sites, and how the chemical substances are used. This information helps the Agency determine whether people or the environment are potentially exposed to reported chemical substances. EPA publishes submitted CDR data that is not Confidential Business Information (CBI).

Government Publication Date: Jun 30, 2017

Hist TSCA: HIST TSCA

The Environmental Protection Agency (EPA) is amending the Toxic Substances Control Act (TSCA) section 8(a) Inventory Update Reporting (IUR) rule and changing its name to the Chemical Data Reporting (CDR) rule.
The 2006 IUR data summary report includes information about chemicals manufactured or imported in quantities of 25,000 pounds or more at a single site during calendar year 2005. In addition to the basic manufacturing information collected in previous reporting cycles, the 2006 cycle is the first time EPA collected information to characterize exposure during manufacturing, processing and use of organic chemicals. The 2006 cycle also is the first time manufacturers of inorganic chemicals were required to report basic manufacturing information.

Government Publication Date: Dec 31, 2006

FTTS Administrative Case Listing: FTTS ADMIN

An administrative case listing from the Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA) and Toxic Substances Control Act (TSCA), together known as FTTS. This database was obtained from the Environmental Protection Agency's (EPA) National Compliance Database (NCDB). The FTTS and NCDB was shut down in 2006.

Government Publication Date: Jan 19, 2007

FTTS Inspection Case Listing: FTTS INSP

An inspection case listing from the Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA) and Toxic Substances Control Act (TSCA), together known as FTTS. This database was obtained from the Environmental Protection Agency's (EPA) National Compliance Database (NCDB). The FTTS and NCDB was shut down in 2006.

Government Publication Date: Jan 19, 2007

Potentially Responsible Parties List: PRP

Early in the cleanup process, the Environmental Protection Agency (EPA) conducts a search to find the potentially responsible parties (PRPs). EPA looks for evidence to determine liability by matching wastes found at the site with parties that may have contributed wastes to the site.

Government Publication Date: Nov 12, 2013

State Coalition for Remediation of Drycleaners Listing: SCRD DRYCLEANER

The State Coalition for Remediation of Drycleaners (SCRD) was established in 1998, with support from the U.S. Environmental Protection Agency (EPA) Office of Superfund Remediation and Technology Innovation. Coalition members are states with mandated programs and funding for drycleaner site remediation. Current members are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Government Publication Date: Jan 1, 2017

Integrated Compliance Information System (ICIS): ICIS

The Integrated Compliance Information System (ICIS) is a system that provides information for the Federal Enforcement and Compliance (FE&C) and the National Pollutant Discharge Elimination System (NPDES) programs. The FE&C component supports the Environmental Protection Agency's (EPA) Civil Enforcement and Compliance program activities. These activities include Compliance Assistance, Compliance Monitoring and Enforcement. The NPDES program supports tracking of NPDES permits, limits, discharge monitoring data and other program reports.

Government Publication Date: Nov 18, 2016

Drycleaner Facilities: FED DRYCLEANERS

A list of drycleaner facilities from the Integrated Compliance Information System (ICIS). The Environmental Protection Agency (EPA) tracks facilities that possess NAIC and SIC codes that classify businesses as drycleaner establishments.

Government Publication Date: Sep 14, 2016

Delisted Drycleaner Facilities: DELISTED FED DRY

List of sites removed from the list of Drycleaner Facilities (sites in the EPA's Integrated Compliance Information System (ICIS) with NAIC or SIC codes identifying the business as a drycleaner establishment).

Government Publication Date: Sep 14, 2016

Formerly Used Defense Sites: FUDS

Formerly Used Defense Sites (FUDS) are properties that were formerly owned by, leased to, or otherwise possessed by and under the jurisdiction of the Secretary of Defense prior to October 1986, where the Department of Defense (DoD) is responsible for an environmental restoration. This list is published by the U.S. Army Corps of Engineers.

Government Publication Date: Nov 22, 2016

Material Licensing Tracking System (MLTS): MLTS

A list of sites that store radioactive material subject to the Nuclear Regulatory Commission (NRC) licensing requirements. This list is maintained by the NRC. As of September 2016, the NRC no longer releases location information for sites. Site locations were last received in July 2016.

Government Publication Date: Sep 13, 2016

Historic Material Licensing Tracking System (MLTS) sites: HIST MLTS

A historic list of sites that have inactive licenses and/or removed from the Material Licensing Tracking System (MLTS). In some cases, a site is removed from the MLTS when the state becomes an "Agreement State". An Agreement State is a State that has signed an agreement with the Nuclear Regulatory Commission (NRC) authorizing the State to regulate certain uses of radioactive materials within the State.

Government Publication Date: Jan 31, 2010

Mines Master Index File: MINES

The Master Index File (MIF) contains mine identification numbers issued by the Department of Labor Mine Safety and Health Administration (MSHA) for mines active or opened since 1971. Note that addresses may or may not correspond with the physical location of the mine itself.

Government Publication Date: Feb 8, 2017

Alternative Fueling Stations: ALT FUELS

List of alternative fueling stations made available by the US Department of Energy's Office of Energy Efficiency & Renewable Energy. Includes Biodiesel stations, Ethanol (E85) stations, Liquefied Petroleum Gas (Propane) stations, Ethanol (E85) stations, Natural Gas stations, Hydrogen stations, and Electric Vehicle Supply Equipment (EVSE). The National Renewable Energy Laboratory (NREL) obtains information about new stations from trade media, Clean Cities coordinators, a Submit New Station form on the Station Locator website, and through collaborating with infrastructure equipment and fuel providers, original equipment manufacturers (OEMs), and industry groups.

Government Publication Date: Aug 16, 2017

Superfund Decision Documents: SUPERFUND ROD

This database contains a listing of decision documents for Superfund sites. Decision documents serve to provide the reasoning for the choice of (or) changes to a Superfund Site cleanup plan. The decision documents include Records of Decision (ROD), ROD Amendments, Explanations of Significant Differences (ESD), along with other associated memos and files. This information is maintained and made available by the US EPA (Environmental Protection Agency).

Government Publication Date: Jul 12, 2017

Registered Pesticide Establishments: SSTS

List of active EPA-registered foreign and domestic pesticide-producing and device-producing establishments based on data from the Section Seven Tracking System (SSTS). The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Section 7 requires that facilities producing pesticides, active ingredients, or devices be registered. The list of establishments is made available by the EPA.

Government Publication Date: Feb 28, 2017

Polychlorinated Biphenyl (PCB) Notifiers: PCB

Facilities included in the national list of facilities that have notified the United States Environmental Protection Agency (EPA) of Polychlorinated Biphenyl (PCB) activities. Any company or person storing, transporting or disposing of PCBs or conducting PCB research and development must notify the EPA and receive an identification number.

Government Publication Date: Jul 18, 2017

State

EnviroStor Inspection, Compliance, and Enforcement: INSP COMP ENF

A list of permitted facilities with inspections and enforcements tracked in the Department of Toxic Substance Control (DTSC) EnviroStor.

Government Publication Date: Apr 17, 2017

Clandestine Drug Lab Sites: CDL

The Department of Toxic Substances Control (DTSC) maintains a listing of drug lab sites. DTSC is responsible for removal and disposal of hazardous substances discovered by law enforcement officials while investigating illegal/clandestine drug laboratories.

Government Publication Date: Jun 30, 2017

School Property Evaluation Program Sites: SCH

A list of sites registered with The Department of Toxic Substances Control (DTSC) School Property Evaluation and Cleanup (SPEC) Division. SPEC is responsible for assessing, investigating and cleaning up proposed school sites. The Division ensures that selected properties are free of contamination or, if the properties were previously contaminated, that they have been cleaned up to a level that protects the students and staff who will occupy the new school.

Government Publication Date: Jul 5, 2017

California Hazardous Material Incident Report System (CHMIRS): CHMIRS

A list of reported hazardous material incidents, spills, and releases from the California Hazardous Material Incident Report System (CHMIRS). This list has been made available by the California Office of Emergency Services (OES).

Government Publication Date: May 09, 2017

Sites Listed in the Solid Waste Assessment Test (SWAT) Program Report: SWAT

In a 1993 Memorandum of Understanding, the State Water Resources Control Board (SWRCB) agreed to submit a comprehensive report on the Solid Waste Assessment Test (SWAT) Program to the California Integrated Waste Management Board (CIWMB). This report summarizes the work completed to date on the SWAT Program, and addresses both the impacts that leakage from solid waste disposal sites (SWDS) may have upon waters of the State and the actions taken to address such leakage.

Government Publication Date: Dec 31, 1995

Hazardous Waste Manifest Data: HAZNET

A list of hazardous waste manifests received each year by Department of Toxic Substances Control (DTSC). The volume of manifests is typically 900,000 - 1,000,000 annually, representing approximately 450,000 - 500,000 shipments.

Government Publication Date: Oct 24, 2016

Solid Waste Disposal Sites with Waste Constituents Above Hazardous Waste Levels: SWRCB SWF

This is a list of solid waste disposal sites identified by California State Water Resources Control Board with waste constituents above hazardous waste levels outside the waste management unit.

Government Publication Date: Sep 20, 2006

Hazardous Waste and Substances Site List - Site Cleanup: HWSS CLEANUP

The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies and developers to comply with the California Environmental Quality Act requirements in providing information about the location of hazardous materials release sites. This list is published by California Department of Toxic Substance Control.

Government Publication Date: Sep 6, 2017

List of Hazardous Waste Facilities Subject to Corrective Action: DTSC HWF

This is a list of hazardous waste facilities identified in Health and Safety Code (HSC) § 25187.5. These facilities are those where Department of Toxic Substances Control (DTSC) has taken or contracted for corrective action because a facility owner/operator has failed to comply with a date for taking corrective action in an order issued under HSC § 25187, or because DTSC determined that immediate corrective action was necessary to abate an imminent or substantial endangerment.

Government Publication Date: Jul 18, 2016

Historical Hazardous Waste Manifest Data: HIST MANIFEST

A list of historic hazardous waste manifests received by the Department of Toxic Substances Control (DTSC) from year the 1980 to 1992. The volume of manifests is typically 900,000 - 1,000,000 annually, representing approximately 450,000 - 500,000 shipments.

Government Publication Date: Dec 31, 1992

Historical California Hazardous Material Incident Report System (CHMIRS): HIST CHMIRS

A list of reported hazardous material incidents, spills, and releases from the California Hazardous Material Incident Report System (CHMIRS) prior to 1993. This list has been made available by the California Office of Emergency Services (OES).

Government Publication Date: Jan 1, 1993

Historical Cortese List: HIST CORTESE

List of sites which were once included on the Cortese list. The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies and developers to comply with the California Environmental Quality Act requirements for providing information about the location of hazardous sites.

Government Publication Date: Nov 13, 2008

Cease and Desist Orders and Cleanup and Abatement Orders: CDO/CAO

The California Environment Protection Agency "Cortese List" of active Cease and Desist Orders (CDO) and Cleanup and Abatement Orders (CAO). This list contains many CDOs and CAOs that do NOT concern the discharge of wastes that are hazardous materials. Many of the listed orders concern, as examples, discharges of domestic sewage, food processing wastes, or sediment that do not contain hazardous materials, but the Water Boards' database does not distinguish between these types of orders.

Government Publication Date: Feb 16, 2012

Drycleaner Facilities: DRYCLEANERS

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial, linen supply, commercial laundry, dry cleaning and pressing machines - Coin Operated Laundry and Dry Cleaning. This is provided by the Department of Toxic Substance Control.

Government Publication Date: Jul 17, 2017

Delisted Drycleaners: DELISTED DRYC

Sites removed from the list of drycleaner related facilities that have EPA ID numbers, made available by the California Department of Toxic Substance Control.

Government Publication Date: Jul 17, 2017

Waste Discharge Requirements: WASTE DISCHG

List of sites in California State Water Resources Control Board (SWRCB) Waste Discharge Requirements (WDRs) Program in California, made available by the SWRCB via GeoTracker. The WDR program regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act. The scope of the WDRs Program also includes the discharge of wastes classified as inert, pursuant to section 20230 of Title 27.

Government Publication Date: Mar 7, 2017

Tribal

No Tribal additional environmental record sources available for this State.

County

No County additional environmental databases were selected to be included in the search.

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.

12.5 Analytical Laboratory Report

American Environmental Testing Laboratory Inc.
2834 & 2908 North Naomi Street Burbank, CA 91504 • DOHS NO: 1541, LACSD NO: 10181
Tel: (888) 288-AETL • (818) 845-8200 • Fax: (818) 845-8840 • www.aetlab.com

Ordered By

Advantage Environmental Consultants
145 Vallecitos De Oro Suite 201
San Marcos, CA 92069-

Number of Pages 6
Date Received 10/18/2017
Date Reported 10/31/2017

Telephone: (760)744-3363
Attention: Dan Weis

Job Number	Order Date	Client
89989	10/18/2017	AEC

Project ID: 17-325
Site: 3111 Manchester Ave.
Cardiff by the Sea, CA

Enclosed please find results of analyses of 4 soil samples which were analyzed as specified on the attached chain of custody. If there are any questions, please do not hesitate to call.

Checked By: ____________________

Approved By: C. Razmara

Cyrus Razmara, Ph.D.
Laboratory Director

American Environmental Testing Laboratory Inc.
2834 & 2908 North Naomi Street, Burbank, CA 91504 • DOHS NO: 1541, LACSD NO: 10181
Tel: (888) 288-AETL • (818) 845-8200 • Fax: (818) 845-8840 • www.aetlab.com

CHAIN OF CUSTODY RECORD

101548

AETL JOB No. 89989

Page 1 of 1

COMPANY AEC

PROJECT MANAGER Dan Weis

COMPANY ADDRESS 145 Vallecitos De Oro Ste 201 San Marcos CA

PHONE 760 744-3363

FAX 760 744 3383

PROJECT NAME

PROJECT # 17-325

SITE NAME AND ADDRESS 3111 Manchester Ave Cardiff By the Sea, CA

PO #

	SAMPLE ID	LAB ID	DATE	TIME	MATRIX	CONTAINER NUMBER/SIZE	PRES.	OCPs 8081A	As 6010B
1	001	89989.01	10/17/17		Soil	4oz Jar	ICE	X	X
2	002	89989.02	⊥		⊥	⊥	⊥	X	X
3	003	89989.03	⊥		⊥	⊥	⊥	X	X
4	004	89989.04	⊥		⊥	⊥	⊥	X	X
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									

ANALYSIS REQUESTED

TEST INSTRUCTIONS & COMMENTS

X(4) - Added 10/25 Normal
WATCH HOLD TIME

Archive

SAMPLE RECEIPT - TO BE FILLED BY LABORATORY

TOTAL NUMBER OF CONTAINERS	4	PROPERLY COOLED [✓ Y] / N / NA	
CUSTODY SEALS Y / [✓ N] / NA		SAMPLES INTACT [✓ Y] / N / NA	
RECEIVED IN GOOD COND. [✓ Y] / N		SAMPLES ACCEPTED [✓ Y] / N	

TURN AROUND TIME

☐ NORMAL ☐ RUSH ☐ SAME DAY ☐ NEXT DAY ☐ 2 DAYS ☐ 3 DAYS

DATA DELIVERABLE REQUIRED

☐ HARD COPY
☐ PDF
☐ GEOTRACKER (GLOBAL ID) ____________
☐ OTHER (PLEASE SPECIFY) ____________

RELINQUISHED BY SAMPLER: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature:	Signature:	Signature:
Printed Name: Samantha Hopper	Printed Name:	Printed Name: Sargis P
Date: 10/18/17 Time: 1230	Date: Time:	Date: 10/18/17 Time: 1850
RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY LABORATORY: AETL 3.
Signature:	Signature:	Signature:
Printed Name: Sargis P	Printed Name:	Printed Name: Jean Claude
Date: 10/18/17 Time: 1230	Date: Time:	Date: 10/18/17 Time: 1850

DISTRIBUTION: WHITE - Laboratory, CANARY - Laboratory, PINK - Project/Account Manager, YELLOW - Sampler/Originator

American Environmental Testing Laboratory Inc.
2834 North Naomi Street Burbank, CA 91504 • DOHS NO: 1541, LACSD NO: 10181
Tel: (888) 288-AETL • (818) 845-8200 • Fax: (818) 845-8840 • www.aetlab.com

COOLER RECEIPT FORM

Client Name: AEC
Project Name:
AETL Job Number: 89989
Date Received: 10/18/17 Received by: Jean Claude
Carrier: ☒ AETL Courier ☐ Client ☐ GSO ☐ FedEx ☐ UPS
☐ Others:

Samples were received in: ☒ Cooler (1) ☐ Other (Specify):
Inside temperature of shipping container No 1: 3.4°C, No 2: ____, No 3: ____
Type of sample containers: ☐ VOA, ☐ Glass bottles, ☒ Wide mouth jars, ☐ HDPE bottles, ☐ Metal sleeves, ☐ Others (Specify):
How are samples preserved: ☐ None, ☐ Ice , ☒ Blue Ice, ☐ Dry Ice
X None, _ HNO_3, _ NaOH, _ ZnOAc, _ HCl, _ $Na_2S_2O_3$, _ MeOH
_ Other (Specify):

	Yes	No, explain below	Name, if client was notified.
1. Are the COCs Correct?	X		
2. Are the Sample labels legible?	X		
3. Do samples match the COC?	X		
4. Are the required analyses clear?	X		
5. Is there enough samples for required analysis?	X		
6. Are samples sealed with evidence tape?	NA		
7. Are sample containers in good condition?	X		
8. Are samples preserved?	X		
9. Are samples preserved properly for the intended analysis?	X		
10. Are the VOAs free of headspace?	NA		
11. Are the jars free of headspace?	+		

Explain all "No" answers for above questions:

Samples covered by COC# 101548 Received on
* 10/18/17. No Analysis was mentioned in COC *
* the Analysis Released on 10/25/17 by client ⓧ

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Ordered By

Advantage Environmental Consultants
145 Vallecitos De Oro Suite 201
San Marcos, CA 92069-

Project ID: 17-325
Date Received 10/18/2017
Date Reported 10/31/2017

Telephone: (760)744-3363
Attention: Dan Weis

Job Number	Order Date	Client
89989	10/18/2017	AEC

CERTIFICATE OF ANALYSIS
CASE NARRATIVE

AETL received 4 samples with the following specification on 10/18/2017.

Lab ID	Sample ID	Sample Date	Matrix	Quantity Of Containers
89989.01	001	10/17/2017	Soil	1
89989.02	002	10/17/2017	Soil	1
89989.03	003	10/17/2017	Soil	1
89989.04	004	10/17/2017	Soil	1

Method ^ Submethod	*Req Date*	*Priority*	*TAT*	*Units*
(6010BSCAN) ^ AS	10/25/2017	2	Normal	mg/Kg
(8081A)	10/25/2017	2	Normal	ug/Kg

The samples were analyzed as specified on the enclosed chain of custody.
No analytical non-conformances were encountered.

Unless otherwise noted, all results of soil and solid samples are based on wet weight.

Checked By: ____________________ Approved By: C. Razmara

Cyrus Razmara, Ph.D.
Laboratory Director

ANALYTICAL RESULTS

Ordered By

Advantage Environmental Consultants
145 Vallecitos De Oro
Suite 201
San Marcos, CA 92069-

Site

3111 Manchester Ave.
Cardiff by the Sea, CA

Telephone: (760)744-3363
Attn: Dan Weis
Page: **2**
Project ID: 17-325

AETL Job Number	Submitted	Client
89989	10/18/2017	AEC

Method: (8081A), Organochlorine Pesticides by GC

QC Batch No: 103117EB1

Our Lab I.D.			Method Blank	**89989.01**	**89989.02**	**89989.03**	**89989.04**
Client Sample I.D.				001	002	003	004
Date Sampled				10/17/2017	10/17/2017	10/17/2017	10/17/2017
Date Prepared			10/31/2017	10/31/2017	10/31/2017	10/31/2017	10/31/2017
Preparation Method			3550B	3550B	3550B	3550B	3550B
Date Analyzed			10/31/2017	10/31/2017	10/31/2017	10/31/2017	10/31/2017
Matrix			Soil	Soil	Soil	Soil	Soil
Units			ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Aldrin	1.0	2.0	ND	ND	ND	ND	ND
Chlordane (Total)	1.0	2.0	ND	ND	ND	ND	ND
Chlordane (alpha)	1.0	2.0	ND	ND	ND	ND	ND
4,4'-DDD (DDD)	1.0	2.0	ND	ND	ND	ND	ND
4,4'-DDE (DDE)	1.0	2.0	ND	ND	ND	ND	ND
4,4'-DDT (DDT)	1.0	2.0	ND	ND	ND	ND	ND
Dieldrin	1.0	2.0	ND	ND	ND	ND	ND
Endosulfan 1	1.0	2.0	ND	ND	ND	ND	ND
Endosulfan 11	1.0	2.0	ND	ND	ND	ND	ND
Endosulfan sulfate	1.0	2.0	ND	ND	ND	ND	ND
Endrin	1.0	2.0	ND	ND	ND	ND	ND
Endrin aldehyde	1.0	2.0	ND	ND	ND	ND	ND
Endrin ketone	1.0	2.0	ND	ND	ND	ND	ND
Chlordane (gamma)	1.0	2.0	ND	ND	ND	ND	ND
Heptachlor	1.0	2.0	ND	ND	ND	ND	ND
Heptachlor epoxide	1.0	2.0	ND	ND	ND	ND	ND
alpha-Hexachlorocyclohexane (Alpha-BHC)	1.0	2.0	ND	ND	ND	ND	ND
beta-Hexachlorocyclohexane (Betta-BHC)	1.0	2.0	ND	ND	ND	ND	ND
delta-Hexachlorocyclohexane (Delta-BHC)	1.0	2.0	ND	ND	ND	ND	ND
gamma-Hexachlorocyclohexane (Gamma-BHC, Lindane)	1.0	2.0	ND	ND	ND	ND	ND
Methoxychlor	5.0	10.0	ND	ND	ND	ND	ND
Toxaphene	85.0	170.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project ID: 17-325

AETL Job Number	Submitted	Client
89989	10/18/2017	AEC

Method: (8081A), Organochlorine Pesticides by GC

Our Lab I.D.			Method Blank	89989.01	89989.02	89989.03	89989.04
Surrogates	%Rec.Limit		% Rec.	% Rec.	% Rec.	% Rec.	% Rec.
Decachlorobiphenyl	30-150		87.0	111	116	83.2	98.2
Tetrachloro-m-xylene	30-150		81.4	105	102	83.8	90.6

ANALYTICAL RESULTS

Ordered By

Advantage Environmental Consultants
145 Vallecitos De Oro
Suite 201
San Marcos, CA 92069-

Telephone: (760)744-3363
Attn: Dan Weis

Page: **4**

Project ID: 17-325

Site

3111 Manchester Ave.
Cardiff by the Sea, CA

AETL Job Number	Submitted	Client
89989	10/18/2017	AEC

Method: (6010BSCAN), Arsenic by ICP

QC Batch No: 1027172C6

Our Lab I.D.			Method Blank	**89989.01**	**89989.02**	**89989.03**	**89989.04**
Client Sample I.D.				001	002	003	004
Date Sampled				10/17/2017	10/17/2017	10/17/2017	10/17/2017
Date Prepared			10/27/2017	10/27/2017	10/27/2017	10/27/2017	10/27/2017
Preparation Method			3050B	3050B	3050B	3050B	3050B
Date Analyzed			10/30/2017	10/30/2017	10/30/2017	10/30/2017	10/30/2017
Matrix			Soil	Soil	Soil	Soil	Soil
Units			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor			1	1	1	1	1
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Arsenic	2.5	5.0	ND	2.80J	8.94	ND	ND

QUALITY CONTROL RESULTS

Ordered By

Advantage Environmental Consultants
145 Vallecitos De Oro
Suite 201
San Marcos, CA 92069-

Site

3111 Manchester Ave.
Cardiff by the Sea, CA

Telephone: (760)744-3363
Attn: Dan Weis
Page: **5**
Project ID: 17-325

AETL Job Number	Submitted	Client
89989	10/18/2017	AEC

Method: (6010BSCAN), Arsenic by ICP

QC Batch No: 1027172C6; Dup or Spiked Sample: 89989.01; LCS: Clean Sand; QC Prepared: 10/27/2017; QC Analyzed: 10/30/2017; Units: mg/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Arsenic	2.80	50.0	52.6	99.6	50.0	53.3	101	1.4	75-125	<15

QC Batch No: 1027172C6; Dup or Spiked Sample: 89989.01; LCS: Clean Sand; QC Prepared: 10/27/2017; QC Analyzed: 10/30/2017; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS DUP Concen	LCS DUP Recov	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit	
Arsenic	50.0	54.0	108	50.0	53.5	107	<1	75-125	<15	

QUALITY CONTROL RESULTS

Ordered By

Advantage Environmental Consultants
145 Vallecitos De Oro
Suite 201
San Marcos, CA 92069-

Site

3111 Manchester Ave.
Cardiff by the Sea, CA

Telephone: (760)744-3363
Attn: Dan Weis
Page: 6
Project ID: 17-325

AETL Job Number	Submitted	Client
89989	10/18/2017	AEC

Method: (8081A), Organochlorine Pesticides by GC

QC Batch No: 103117EB1; Dup or Spiked Sample: 89989.02; LCS: Clean Sand; QC Prepared: 10/31/2017; QC Analyzed: 10/31/2017; Units: ug/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Aldrin	0.00	20.0	25.8	129	20.0	24.0	120	7.2	40-150	<40
4,4'-DDT (DDT)	0.00	50.0	68.0	136	50.0	61.5	123	10.0	40-150	<40
Dieldrin	0.00	50.0	62.0	124	50.0	57.5	115	7.5	40-150	<40
Endrin	0.00	50.0	71.5	143	50.0	67.5	135	5.8	40-150	<40
Heptachlor	0.00	20.0	17.1	85.5	20.0	16.0	80.0	6.6	40-150	<40
gamma-Hexachlorocyclohexane (Gamma-BHC, Lindane)	0.00	20.0	25.4	127	20.0	23.6	118	7.3	40-150	<40
Surrogates										
Decachlorobiphenyl	0.00	50.0	54.0	108	50.0	49.9	99.8	7.9	30-150	<40
Tetrachloro-m-xylene	0.00	50.0	51.0	102	50.0	47.5	95.0	7.1	30-150	<40

QC Batch No: 103117EB1; Dup or Spiked Sample: 89989.02; LCS: Clean Sand; QC Prepared: 10/31/2017; QC Analyzed: 10/31/2017; Units: ug/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS DUP Concen	LCS DUP Recov	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit	
Aldrin	20.0	21.4	107	20.0	20.4	102	4.8	50-150	<40	
4,4'-DDT (DDT)	50.0	52.0	104	50.0	60.5	121	15.1	50-150	<40	
Dieldrin	50.0	52.5	105	50.0	54.5	109	3.7	50-150	<40	
Endrin	50.0	54.0	108	50.0	57.5	115	6.3	50-150	<40	
Heptachlor	20.0	13.4	67.0	20.0	13.2	66.0	1.5	50-150	<40	
gamma-Hexachlorocyclohexane (Gamma-BHC, Lindane)	20.0	22.4	112	20.0	22.0	110	1.8	50-150	<40	
Surrogates										
Decachlorobiphenyl	50.0	46.7	93.4	50.0	68.5	137	37.8	30-150	<40	
Tetrachloro-m-xylene	50.0	44.0	88.0	50.0	68.5	137	43.6	30-150	<40	

American Environmental Testing Laboratory Inc.
2834 & 2908 North Naomi Street, Burbank, CA 91504 • DOHS NO: 1541, LACSD NO: 10181
Tel: (888) 288-AETL • (818) 845-8200 • Fax: (818) 845-8840 • www.aetlab.com

Data Qualifiers and Descriptors

Data Qualifier:

#: Recovery is not within acceptable control limits.

*: In the QC section, sample results have been taken directly from the ICP reading. No preparation factor has been applied.

B: Analyte was present in the Method Blank.

D: Result is from a diluted analysis.

E: Result is beyond calibration limits and is estimated.

H: Analysis was performed over the allowed holding time due to circumstances which were beyond laboratory control.

J: Analyte was detected . However, the analyte concentration is an estimated value, which is between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL).

M: Matrix spike recovery is outside control limits due to matrix interference. Laboratory Control Sample recovery was acceptable.

MCL: Maximum Contaminant Level

NS: No Standard Available

S6: Surrogate recovery is outside control limits due to matrix interference.

S8: The analysis of the sample required a dilution such that the surrogate concentration was diluted below the method acceptance criteria.

X: Results represent LCS and LCSD data.

Definition:

%Limi: Percent acceptable limits.

%REC: Percent recovery.

Con.L: Acceptable Control Limits

Conce: Added concentration to the sample.

LCS: Laboratory Control Sample

MDL: Method Detection Limit is a statistically derived number which is specific for each instrument, each method, and each compound. It indicates a distinctively detectable quantity with 99% probability.

Data Qualifiers and Descriptors

MS:	Matrix Spike
MS DU:	Matrix Spike Duplicate
ND:	Analyte was not detected in the sample at or above MDL.
PQL:	Practical Quantitation Limit or ML (Minimum Level as per RWQCB) is the minimum concentration that can be quantified with more than 99% confidence. Taking into account all aspects of the entire analytical instrumentation and practice.
Recov:	Recovered concentration in the sample.
RPD:	Relative Percent Difference

12.6 Qualifications of the Environmental Professionals

SAMANTHA HOPPER
Environmental Scientist

EDUCATION

Hawaii Pacific University, Honolulu, HI (2010)
Bachelor of Science- Environmental Science

PROFESSIONAL REGISTRATIONS, LICENSES, AND CERTIFICATIONS

- 40-Hour OSHA HAZWOPER (29 CFR 1910.120)

PROFESSIONAL SUMMARY AND EXPERIENCE

During her educational experience, Ms. Hopper completed numerous environmental research projects pertaining to environmental cost-benefit analysis, sustainability and Hawaiian water quality. She has assisted with the completion of numerous Phase I Environmental Site Assessments on vacant, agricultural, multi-family, commercial, and industrial properties and has a strong working knowledge of ASTM standards for the completion of such assessments. Ms. Hopper is also experienced in the completion ground water monitoring/sampling. She is very proficient in researching and interpreting historical and regulatory information (i.e. aerial photographs; fire insurance, topographic, soil, and geologic maps; and regulatory database reports) pertaining to properties of varying land uses.

SPECIFIC PROJECT EXPERIENCE

1112 North Magnolia Avenue and 2571 West La Palma Avenue Anaheim, California -- Phase I Environmental Site Assessment

Nelson Canyon Donation 79 Hwy Descanso, California -- Phase I Environmental Site Assessment

Forever 21 901 State Street Santa Barbara, California -- Phase I Environmental Site Assessment, PCA and Seismic

Lemon Grove Mossy 3611 and 6000 Lemon Grove Avenue Lemon Grove, California -- Phase I Environmental Site Assessment

7501 Sepulveda Boulevard Culver City, California -- Phase I Environmental Site Assessment

Integral Norman Property 316 East Mission Road San Marcos, California -- Phase I Environmental Site Assessment

DANIEL A. WEIS, R.E.H.S.
Branch Manager – Western Regional Office

EDUCATION

- Bachelor of Arts - University of Delaware, Newark, DE (1995)
- Master of Science – Public Health, San Diego State University, San Diego, CA (1998)

PROFESSIONAL REGISTRATIONS, LICENSES, AND CERTIFICATIONS

- Registered Environmental Health Specialist #8172 in the State of California
- OSHA 40-hour Hazardous Waste Operations Worker and Supervisor Certifications and Annual Refreshers

PROFESSIONAL SUMMARY

Mr. Weis is the branch manager of AEC's western regional office based in the City of San Marcos, San Diego County, California. He has 17 years of experience in the environmental sciences and consulting fields and is supported by Professional Geologists, Engineers and other technical team members of AEC staff. His responsibilities at AEC include client development and management, project management, technical oversight and quality control for assessment, remediation and construction oversight services, project staffing, and office financial management. Mr. Weis also completes technical services (including field activities) required of select projects completed by AEC. He has a proven ability to manage multiple personnel and technical projects, negotiate with regulatory agencies and maintain strong and trusting client relationships. Such clientele include but are not limited to local government entities, developers (affordable housing and market rate), Federal government entities, law firms, architectural and engineering firms, commercial lending institutions, conservancies, commercial/industrial real estate owners/managers, insurance companies, wireless telecommunication carriers and other real estate developers. He is also very experienced in the completion of assessment, construction and remediation quality assurance during the completion of urban redevelopment/brownfields projects, many of which have been located in downtown areas of San Diego, Los Angeles, Oakland, San Francisco, and other urban communities throughout the State of California.

PROFESSIONAL EXPERIENCE SUMMARY

Mr. Weis has completed or managed over 1,000 due diligence related environmental assessments and has completed or managed over 300 subsurface environmental investigations of soil gas, soil, groundwater and other media. Such investigations have also included human health and ecological risk assessments, evaluations of indoor air conditions based on interpretations of subsurface conditions, underground storage tank (UST) evaluation/closure and hazardous waste characterization/management. Subsurface activities performed include the completion of soil borings using various drilling technologies, soil and groundwater sampling, installation and sampling of groundwater monitoring wells, free product evaluations, exploratory trenching and real-time delineation using mobile analytical laboratories and other soil screening technology. Assets evaluated include industrial, commercial, residential, agricultural and vacant land sites throughout the State of California and numerous additional states of the Nation, with many of the assessments completed under the regulatory oversight of local environmental regulatory agencies, the California

Regional Water Quality Control Boards (RWQCBs) and the California Environmental Protection Agency Department of Toxic Substances Control (DTSC). Mr. Weis has also conducted and/or managed hundreds of public/environmental health related assessments including electromagnetic field surveys, radionuclide surveys, indoor air quality investigations, radon surveys, drinking water assessments, asbestos containing materials (ACM) and lead-based paint (LBP) surveys and mold/microbial evaluations.

Mr. Weis has managed over 50 remediation or construction management related projects primarily related to source removal of subsurface contaminants including but not limited to petroleum hydrocarbons, chlorinated solvents, heavy metals, organochlorine pesticides and other agricultural related chemicals, dioxins and furans and polychlorinated biphenyls (PCBs). Cost effective solutions and various remedial action options are provided prior to remedial action implementation. He is very proficient in developing remediation cost estimates and evaluating multiple remedial strategies on specific projects and conducting budget tracking to ensure the accuracy of such estimates during remedial implementation. Mr. Weis also assists clients with the preparation of contractor bid specifications, contractor bid and change order reviews for such projects, contractor agreements and project status reports/updates and has conducted presentations to client personnel, regulatory agencies and/or the public pertaining to such remediation related projects. He has also assisted numerous clients in cost recovery efforts from private parties and State/Federal funding programs for environmental assessment and remediation work and has served as an expert witness during legal proceedings (including mediation and jury trial settings) pertaining to environmental related claims. Site specific project descriptions and information is available upon request. Client references are also available upon request.

SPECIFIC PROJECT EXPERIENCE

- 14th and Island, San Diego, California – Development of Site Mitigation Plan, contaminated soil management and disposal concurrent with site construction activities at the superblock construction site in downtown San Diego and achievement of regulatory closure with the County of San Diego Department of Environmental Health.

- 2198 Market Street, San Francisco, California – Phase I and II Environmental Site Assessments, supplemental subsurface investigation, Site Mitigation Plan development, contaminated soil management and disposal concurrent with site construction activities and negotiation/achievement of regulatory closure with the City of San Francisco Department of Public Health.

- Former EZ Serve, 9305 Mission Gorge Road, Santee, California – Closure report preparation and San Diego Regional Water Quality Control Board interface and negotiation/achievement of regulatory closure under State of California low-threat policy.

- French Field – Former Vista Burn Dump, Oceanside, California – Oversight of the capping of a former burn dump/landfill facility and restoration for public use as a sports facility. Negotiation and achievement of regulatory closure with the California Department of Toxic Substances Control with concurrence from the San Diego Regional Water Quality Control Board and the County of San Diego Local Enforcement Agency.

- Indoor Skydiving Facility, 1401 Imperial Avenue, San Diego, California – Development of Soil Management Plan and contaminated soil management and disposal concurrent with site construction activities in downtown San Diego.

- Lemon Grove Avenue Realignment Project, Lemon Grove, California – Development of Impacted Soil Management Plan, Community Health and Safety Plan and Worker Health and Safety Plan and oversight of the implementation of such plans during construction activities.

- North Side Interior Road and Utilities Project at San Diego International Airport, San Diego, California - Subsurface assessment, development of Soil Management Plan and Work Health and Safety Plan and implementation and monitoring of soil management strategies.

- Olympic and Hill, Los Angeles, California – Removal of multiple underground storage tanks and underlying contaminated soil and achievement of regulatory closure with the City of Los Angeles Fire Department.

- San Ysidro - U.S. Land Port of Entry, San Diego, California – Subsurface assessment and development and implementation of soil management strategies.

- Tabata Ranch Site, Carlsbad, California – Development of Soil Management Plan and Community Health and Safety Plan, completion of soil removal action of petroleum hydrocarbon impacted soil, oversight and management of selective reuse and replacement of pesticide impacted soil and subsequent export of inert soils and achievement of regulatory closure with the County of San Diego Department of Environmental Health. Consent to discharge inert soils at an off-site receiving location was granted by the San Diego Regional Water Quality Control Board.

- VA Medical Center Long Beach, 5901 East 7th Street, Long Beach, California - VA Long Beach: Seismic Corrections – Mental Health, Community Living Center and Chiller Replacements Project – Asbestos containing materials and lead-based paint surveys and preparation of abatement contractor bid specifications.

PUBLICATIONS

- Gersberg, R.M., Brown, C., Zambrano, V., Worthington, K., and Weis, D. (2000) Quality of urban runoff in the Tijuana River watershed. In Westerhoff, P. (editors), SCERP Monograph Series (no.2) on Water Issues Along the United States and Mexico Border. : Southwest Center for Environmental Research and Policy, 31-45.
- Weis, D.A., Callaway, J.C., and R.M. Gersberg (2001). Vertical Accretion Rates and Heavy Metal Chronologies in Wetland Sediments of the Tijuana Estuary. Estuaries 24(6A).
- Gersberg, R.M., Pitt, J.L., Weis, D.A., and D.D. Yorkey. Characterizing In-Stream Metal Loading in the Tijuana River Watershed. (2002). National TMDL Science and Policy Conference, Specialty Conference Proceeding on CD Rom, November 13-16, Phoenix, Arizona

AFFILIATIONS

Building Industry Association
San Diego Environmental Professionals
San Diego Housing Federation

PROFESSIONAL REFERENCES

Available On Request

K-1

Service Availability Letter: Fire Department

PROJECT FACILITY AVAILABILITY FORM

FIRE

F

Please type or use pen

Yasuda Family Applicant: Greystar
Owner's name Phone 858-735-756

444 S Cedros Ave, Suite 172
Owner's mailing address Street

Solana Beach, CA 92075
City State Zip

ORG____
ACCT____
ACT____
TASK____
AMT $____ DATE____

DISTRICT CASHIER'S USE ONLY

SECTION 1. PROJECT DESCRIPTION TO BE COMPLETED BY APPLICANT

A.
☒ Major Subdivision (TM)
☐ Minor Subdivision (TPM)
☐ Certificate of Compliance, purpose: ____
☒ Major Use Permit (MUP), purpose: Residential Care
☐ Rezone (Reclassification) from ____ to ____ zone
☐ Time Extension... Case No. ____
☐ Expired Map....... Case No. ____
☐ Other ____
☐ Specific Plan or Specific Plan Amendment
☐ Boundary Adjustment

Assessor's Parcel Number(s)
(Add extra if necessary)

2	6	1	2	1	0	0	1
2	6	1	2	1	0	1	7

B.
☒ Residential.........Total number of dwelling units 16 Unit
☒ Commercial.......Gross floor area 215,830 (200 senior units)
☐ Industrial...........Gross floor area ____
☐ Other.................Gross floor area ____

Thomas Bros. Page ____ Grid ____

Project address 2111 Manchester Ave
Street

Cardiff 92007
Community Planning Area/Subregion Zip

C. Total Project acreage 1432 Total lots 12 Smallest proposed lot .040

OWNER/APPLICANT AGREES TO COMPLETE ALL CONDITIONS REQUIRED BY THE DISTRICT.

Applicant's signature: ____ Date: 06/27/19

Address: 444 S Cedros Avenue, Solana Beach Phone: 858-735-7568

(On completion of above, present to the district that provides fire protection to complete Section 2 and 3 below)

SECTION 2. FACILITY AVAILABILITY TO BE COMPLETED BY DISTRICT

District Name: Encinitas Fire Department

Indicate the location and distance of the primary fire station that will serve the proposed project: ____

A.
☒ Project is in the District and eligible for service.
☐ Project is not in District but it is within its Sphere of Influence boundary, owner must apply for annexation.
☐ Project is not in the District and not within the District's Sphere of Influence.
☐ Project is not located entirely within the District and a potential boundary issue exists with the ____ District.

B.
☐ Based on the capacity and capability of the District's existing and planned facilities, fire protection facilities are currently adequate or will be adequate to serve the proposed project. The expected emergency travel time to the proposed project is ____ minutes.
☐ Fire protection facilities are not expected to be adequate to serve the proposed development within the next five years.

C.
☐ District conditions are attached. The number of sheets attached: ____.
☒ District will submit conditions at a later date.

SECTION 3. FUELBREAK REQUIREMENTS

> ***Note:** The fuelbreak requirements prescribed by the fire district for the proposed project do not authorize any clearing prior to project approval by the Department of Planning and Land Use.*

☒ Within the proposed project 100 feet of clearing will be required around all structures.
☐ The proposed project is located in a hazardous wildland fire area, and additional fuelbreak requirements may apply. Environmental mitigation requirements should be coordinated with the fire district to ensure that these requirements will not pose fire hazards.

Date: 6/27/2019 Expiration date: 6/27/2020 *(One year from date of issuance unless district indicates otherwise)*

____ Jordan Villazomez Deputy Fire Marshal 760 633 2820
Authorized signature Print name and title Phone

On completion of Section 2 and 3 by the District, applicant is to submit this form with application to: Zoning Counter at the Planning and Community Development Department, 505 S. Vulcan Ave., Encinitas, CA 92024

DPU/ZC #399F(Rev.4/91)

K-2

Service Availability Letter: City of Cardiff Sanitation District

PROJECT FACILITY AVAILABILITY FORM- City of Encinitas **SEWER**

S

Please type or use pen

Yasuda Family Applicant: Greystar
Owner's Name Phone

444 S Cedros Ave, Suite 172 858-735-7569
Owner's Mailing Address Street

Solana Beach, CA 92075
City State Zip

ORG
ACCT
ACT
TASK
DATE AMT $
DISTRICT CASHIER'S USE ONLY

SECTION 1. PROJECT DESCRIPTION TO BE COMPLETED BY APPLICANT

A. ☒ Major Subdivision (TM) ☐ Certificate of Compliance:
☐ Minor Subdivision (TPM) ☐ Boundary Adjustment
☐ Specific Plan or Specific Plan Amendment
☐ Rezone (Reclassification) from ______ to ______ zone
☒ Major Use Permit (MUP), purpose: Residential Care
☐ Time Extension... Case No.
☐ Expired Map... Case No.
☐ Other

B. ☒ Residential . . . Total number of dwelling units 16 affordable
☒ Commercial. . .Gross floor area 215,870 (200 senior units)
☐ Industrial. . . . .Gross floor area
☐ Other. . . . . . . .Gross floor area

C. Total Project acreage 14.32 Total number of lots 12

D. Is the project proposing its own wastewater treatment plant? Yes ☐ No ☒
Is the project proposing the use of reclaimed water? Yes ☐ No ☒

Assessor's Parcel Number(s)
(Add extra if necessary)

261	210	01
261	210	15

Thomas Bros. Page ______ Grid ______

Project address 2111 Manchester Ave
Street

Cardiff
Comm.Advisory Board Area

Owner/Applicant agrees to pay all necessary construction costs and dedicate all district required easements to extend service to the project. OWNER/APPLICANT MUST COMPLETE ALL CONDITIONS REQUIRED BY THE DISTRICT.

Applicant's Signature: Date: 06/27/19

Address: 444 S Cedros Ave, Solana Beach Phone: 858-735-7569

(On completion of above, present to the sewer district to establish facility availability. Section 2 below)

SECTION 2. FACILITY AVAILABILITY TO BE COMPLETED BY DISTRICT

District name Cardiff Service area

A. ☒ Project is in the district.
☐ Project is not in the district but is within its Sphere of Influence boundary, owner must apply for annexation.
☐ Project is not in the district and is not within its Sphere of Influence boundary.
☐ The project is not located entirely within the district and a potential boundary issue exists with the ______ District.

B. ☐ Facilities to serve the project ☒ ARE ☐ ARE NOT reasonably expected to be available within the next 5 years based on the capital facility plans of the district. Explain in space below or on attached. Number of sheets attached:
☐ Project will not be served for the following reason(s):

C. ☐ **District conditions are attached. Number of sheets attached:**
☐ **District has specific water reclamation conditions which are attached. Number of sheets attached:**
☒ **District will submit conditions at a later date.**

D. ☐ **How far will the pipeline(s) have to be extended to serve the project?**

Date: 6/27/19 Expiration date: 6/27/20 *(One year from date of issuance unless district indicates otherwise)*

Authorized signature: Print name: Jose Rodriguez

Print title: Engineering Tech Phone:

NOTE: THIS DOCUMENT IS NOT A COMMITMENT OF FACILITIES OR SERVICE BY THE DISTRICT. On completion of Section 2 by the district, applicant is to submit this form with application to the Zoning Counter at the Planning & Community Development, 505 S. Vulcan Ave., Encinitas, CA 92024

DPL/ZC #399S(Rev.4/91)

K-3

Service Availability Letter: Olivenhain Water District

PROJECT FACILITY AVAILABILITY FORM - City of Encinitas WATER

W

Please type or use pen

YASUDA FAMILY APPLICANT: GREYSTAR
Owner's Name

858-735-7569
Phone

444 CEDROS AVE #172
Owner's Mailing Address Street

SOLANA BEACH CA 92075
City State Zip

ORG ____
ACCT ____
ACT ____
TASK ____
DATE ____ AMT $ ____
DISTRICT CASHIER'S USE ONLY

SECTION 1: PROJECT DESCRIPTION — TO BE COMPLETED BY APPLICANT

A. ☒ Major Subdivision (TM) ☐ Specific Plan or Specific Plan Amendment
☐ Minor Subdivision (TPM) ☐ Certificate of Compliance: ____
☐ Boundary Adjustment
☐ Rezone (Reclassification) from ____ to ____ zone.
☒ Major Use Permit (MUP), purpose: RESIDENTIAL CARE
☐ Time Extension... Case No. ____
☐ Expired Map... Case No. ____
☐ Other ____

Assessor's Parcel Number(s)
(Add extra if necessary)

261	210	01
261	210	12

B. ☒ Residential....... Total number of dwelling units 16
☒ Commercial...... Gross floor area 215,870 sf (200 units)
☐ Industrial........ Gross floor area ____
☐ Other........... Gross floor area ____

Thomas Bros. Page ____ Grid ____

3111 MANCHESTER AVE
Project address Street

CARDIFF BY THE SEA
Community Planning Area/Subregion Zip

C. Total Project acreage 14.32 Total number of lots 12

D. Is the project proposing the use of groundwater? ☐ Yes ☒ No
Is the project proposing the use of reclaimed water? ☐ Yes ☒ No

Owner/Applicant agrees to pay all necessary construction costs, dedicate all district required easements to extend service to the project and COMPLETE ALL CONDITIONS REQUIRED BY THE DISTRICT.

Applicant's Signature: ____ Date: ____

Address: 444 S. CEDROS AVE #172 SOLANA BEACH Phone: 858-735-7569

(On completion of above, present to the water district to establish facility availability, Section 2 below)

SECTION 2. FACILITY AVAILABILITY — TO BE COMPLETED BY DISTRICT

District name Olivenhain MWD Service area Zone A-3

A. ☑ Project is in the district.
☐ Project is not in the district but is within its Sphere of Influence boundary, owner must apply for annexation.
☐ Project is not in the district and is not within its Sphere of Influence boundary.
☐ The project is not located entirely within the district and a potential boundary issue exists with the ____ District.

B. ☑ Facilities to serve the project ☑ ARE ☐ ARE NOT reasonably expected to be available within the next 5 years based on the capital facility plans of the district. Explain in space below or on attached ____ (Number of sheets)
☐ Project will not be served for the following reason(s): ____

C. ☑ **District conditions are attached. Number of sheets attached:** 4 Sheets
☐ **District has specific water reclamation conditions which are attached. Number of sheets attached:** ____
☐ **District will submit conditions at a later date.**

D. ☑ **How far will the pipeline(s) have to be extended to serve the project?** Hydraulic analysis required

Date: 5 July 2019 Expiration date: 5 July 2020 *(One year from date of issuance unless district indicates otherwise.)*

Authorized signature: Karen Ogawa Print name: Karen Ogawa

Print title: Engineering Project Administrator Phone: 760-753-6466

NOTE: THIS DOCUMENT IS NOT A COMMITMENT OF SERVICE OR FACILITIES BY THE DISTRICT. On completion of Section 2 by the district, applicant is to submit this form with application to the Zoning Counter at the Planning & Community Development Dept., 505 S. Vulcan Ave., Encinitas, CA 92024

DPL#399W(Rev.4/12/91)

Board of Directors
Edmund K. Sprague, President
Robert F. Topolovac, Vice President
Lawrence A. Watt, Treasurer
Robert M. Kephart, Secretary
Christy Guerin, Director

OLIVENHAIN
Municipal Water District

General Manager
Kimberly A. Thorner, Esq.
General Counsel
Alfred Smith, Esq.

July 5, 2019

City of Encinitas
Planning and Community Development Department
505 S. Vulcan Avenue
Encinitas, CA 92024

Re: Tax Assessors Parcel # 261-210-01 and -12

Subject: Water Availability Letter / Yasuda Family Applicant: Greystar
Supplement to County Form 399W

The fee owner, Yasuda Family Applicant: Greystar (Applicant), has requested the District to provide a Water Availability Letter for the property identified above for a proposed project Applicant described as: Major subdivision and Major Use Permit of a 200 unit commercial and 16 unit residential development.This property is in the District and eligible to receive domestic service at this time.

The District has or will have adequate facilities in this area to serve the project. There is or will be capacity in these facilities to serve the proposed project at a minimum of 25 psi pressure at the District's main during normal operating conditions and upon completion of all necessary facilities, including any onsite and offsite water lines, facilities and appurtenances that are required, at the sole discretion of the District. While there is adequate water to serve the project at this time, all water received by the District is imported from other agencies. Accordingly, there is no guarantee that water will be available to serve the project when water is requested. The availability of water depends upon a number of complex factors including annual rainfall, drought periods, the amount of water remaining in storage and environmental and other constraints to the delivery of water. No final decision will be made by the District on the ability to serve water to the project until an application for water service is made by the applicant and approved by the District. At that time, the District will determine whether adequate water is available to serve the project in the District's sole discretion.

Both Water Code §350 and Water Code §71640 grant the District the right to restrict the use of water during any emergency caused by a drought or any other threatened or existing water shortage and to prohibit the use of District water during such periods as the District determines to be necessary. The District may also prohibit the use of District water during any periods for specific uses which it finds to be nonessential. Nothing contained in this water availability letter shall be construed as limiting in any way the legislative discretion of the District to declare an emergency or water shortage and to curtail or prohibit the use of water as determined necessary or appropriate by the District to conserve water during droughts or other threatened or existing water shortages. Certain stages of water shortages may result in a prohibition on new water meters.

The District has been requested to furnish a staff estimate, based on current water service conditions, of the availability of water service in this area. This letter is issued for planning purposes and is not a representation, express or implied, that the District will provide any water service at a future date. Commitments to provide water service are made only when an application for water service is made by the applicant and approved by the District and are subject to the applicants compliance with the Districts' fees, charges, rules and regulations, the Environmental Quality Act of 1970, as amended, and the applicants' agreement to construct any required onsite and off site facilities together with the Applicant's providing security as required by the District for construction of those facilities.

The issuance of this Water Availability Letter does not grant the Applicant any water rights. The Applicant does not secure a right to water until application for service is made and approved by the District in its sole discretion, and the Applicant has complied with all requirements of the District.

The failure of the Applicant to pay any fee or charge of the District's when due, or to comply with other requirements of the District, shall entitle the District to unilaterally terminate this Water Availability Letter, and all further rights of the Applicant to water service.

Improvement fees, when applicable, are paid to the District to reserve future water service for the project contingent upon the Applicant paying all fees and charges and complying with all requirements of the District. The payment of all improvement fees by the date they are due is an express condition precedent to any right of the Applicant to receive future water service. The failure of Applicant to make any improvement fee payment by the date it is due shall automatically terminate the right of Applicant to receive future water service and no previous improvement fee payments paid by the Applicant shall be refunded. Reinstatement of the water commitment requires Applicant to remedy any defects or deficiencies and payment of fees and charges applicable, as determined by the District, in its sole discretion.

This commitment to water service availability is conditioned on the following requirements and/or limitations:

1. The District's determination that adequate water is available to serve the project at the time the applicant submits a request for water service to the District.

2. Payment of all improvements fees, as appropriate, when due in accordance with District Ordinance 301, or successor Ordinance, not attached hereto, but incorporated herein by reference.
3. Applicant is required to have a hydraulic analysis done by the District's consulting engineer to ascertain the impact of the project on the District's water system and to determine fire flow availability as required by the Fire Department.
4. Applicant is aware the site is currently served via an 8-inch pipeline. The hydraulic analysis will determine the facilities that will be required to serve the project.
5. Applicant is required to provide all fee and easements as required for construction of onsite and offsite facilities as required by the District, in its sole discretion.
6. Applicant is required to construct all onsite and offsite facilities as required by the District, in its sole discretion.
7. Applicant is required to execute District Agreement for pipeline construction and furnish all necessary documents for insurance, bonding, and pay all District's charges as they are invoiced.
8. In accordance with District Assessment District 96-01, not attached hereto, but incorporated herein by reference, residential lots of ½ acre or less may have a ¾ inch meter installed unless owner chooses to upgrade the meter and pay the additional fees and charges. Lots greater than ½ acre but less than 3 acres require one-inch meters to be installed. Lots in excess of 3 acres require a minimum 1½ inch meter to be installed. Larger meters may be required by the District, in its sole discretion.

   If it can be demonstrated that lots of a given area are not useable in gross, a deviation in meter size may be made with the concurrence of the District Engineering Manager.
9. The District may require larger meters than the Assessment District 96-01 lot size criteria would dictate if the individual residence requires water service greater than can be accommodated by the standard ¾ inch meter irrespective of the lot size, in its sole discretion.
10. Applicant is required to comply with District Ordinance 280 for the mitigation of impacts to the District's Assessment District 96-1R. Ordinance 280 requires an executed agreement to request increased EDU's that this project requires. The Applicant is responsible for payment of all fees and charges as outlined in the executed agreement.
11. In accordance with Olivenhain Municipal Water District Administrative and Ethics Code Article 13 Policy for District Facilities, each commercial unit base capacity feewill be based on a per dwelling unit equivalent for the 5/8 inch meter.
12. The District has not declared a water shortage that restricts water usage or prohibits new water meters. The District's Board of Directors on July 20, 2016

adopted Resolution 2016-13 returning the District to a Level 1 Water Supply Shortage per Ordinance 427 rules, rates and regulations.

This letter of water availability pertains solely to the proposed project as described by Applicant, is not transferable to any other project, and is not transferable to any other owner or developer without written permission of the Board of Directors of the District. Any purported transfer, sale, or assignment of this Water Availability Letter without the prior written consent of the District renders this letter null and void.

This letter automatically terminates, and is of no further force or effect, on the occurrence of: (1) July 5, 2020 without an approved tentative map; (2) termination of any tentative map; (3) termination of any final map; or (4) five years from the date of recordation of any final map.

OLIVENHAIN MUNICIPAL WATER DISTRICT

By: Karen Ogawa
Karen Ogawa
Engineering Project Administrator

L

Storm Water Management Narrative

URBAN RESOURCE
CONSULTING CIVIL ENGINEERS

August 23, 2019
276.624

SUBJECT: MANCHESTER SENIOR HOUSING
STORM WATER MANAGEMENT NARRATIVE
3111 MANCHESTER AVENUE, ENCINITAS, CA

The project site is located at 3111 Manchester Avenue in the City of Encinitas, California. The project site is located within a parcel with an original overall area of 19.03 acres, which consists of an existing farm and agricultural field operations as well as some natural vegetated slopes. Per an adjacent Caltrans project and eminent domain action, the net project site area is 14.43 aces of which 9.9 acres will be the developed site. The site is bound by Manchester Avenue to the southeast, and existing mountainous terrain and open space that are located to the north and the west. The proposed future Caltrans improvements will be adjacent to the property on the west side.

The project site is part of a larger drainage tributary area where there is offsite run-on drainage in the existing condition and proposed condition. There is a major tributary drainage area that flows through the existing site including approximately 28 acres of existing residential development that outlets into the mountainous terrain and open space area located to the north of the project, and approximately 39 acres of the existing mountainous terrain and open space to the north currently passes through the existing site towards Manchester Avenue via an existing earthen channel. These flows are collected in an existing drainage ditch that is approximately 1,350 linear feet that runs parallel to the north side of Manchester Avenue. These existing flows are then conveyed across Manchester Avenue in existing 18” and 24” CMP storm drain lines beneath the street, and into San Elijo Lagoon via gravity flow pipe conveyance.

The project onsite stormwater management system will consist of area drain and catch basin inlets, PVC area drain lines, RCP storm drain lines, and biofiltration basins. To meet water quality, hydromodification, and detention requirements that are necessary to develop the existing site, onsite stormwater mitigation measures will, at a minimum, include three biofiltration basins onsite that comprise of mulch, engineered soil media, gravel, and an underdrain system. The proposed development will increase peak storm flows in the develop condition, and onsite stormwater detention is proposed to mitigate the increase in peak storm flows for the 100 year storm frequency. Mitigation of increased peak flows for the 100 year storm frequency will be addressed with the proposed biofiltration basins, and if necessary, underground storage pipes, or approved similar. This project is categorized as a Priority Development Project for storm water subject to the requirements of Hydromodification management. The proposed biofiltration basins will also provide water quality treatment for the developed area and will provide hydromodification mitigation. Biofiltrations BMPs will incorporate underdrains per Geotechnical recommendations. Critical Coarse Sediment Protection for offsite flows will be addressed by proposed RCP storm drains that will convey the offsite storm flows directly to the San Elijo Lagoon, bypassing the onsite biofiltration basins.

In the developed condition, offsite run-on from the north will be collected by proposed concrete channels and/or v-ditches located along the northerly, easterly, and westerly limits of work for the project, and routed to storm drain inlets/outlets, and conveyed through the project via proposed RCP storm drain lines, which will bypass the on-site biofiltrations, and outlet to new RCB and/or RCP pipes that will run beneath Manchester Avenue, and into the San Elijo Lagoon. Onsite stormwater flows within the limits of work will be collected into a separate onsite storm drain system to allow for water quality treatment of the disturbed project areas and to allow for stormwater detention of increased flows due to the development, before connecting to the Manchester Avenue Culverts for discharge to the San Elijo Lagoon.

Historically, the existing site drainage was conveyed by sheet flow surface drainage patterns or concentrated flows within the existing open channel that bisected the site. These drainage flows are all ultimately connected to the existing earthen drainage ditch that runs approximately 1,350 feet along the north side of Manchester Avenue adjacent to the property. This drainage ditch also collects surface drainage from the existing Manchester street flows that are conveyed into the ditch by street gutter/culverts on the north side of the road. All of these combined flows are discharged into the existing ditch which then conveys the storm water to six (6) existing CMP storm drain pipe culverts that extend beneath Manchester Avenue and discharge into the lagoon via open pipe outlets. As noted, the existing road ditch contains six (6) drainage culverts, but with the Caltrans Eminent Domain Action and future Caltrans improvements, approximately 360 linear feet of the existing drainage ditch will be removed with the new street improvements. This includes the removal of two (2) of the existing CMP culvert crossings beneath Manchester Avenue that historically collected and conveyed storm water from our project site and from the off-site drainage tributary area. With the removal of the portion of the ditch and the two culverts, there is approximately 1,000 linear feet of ditch and four (4) CMP culverts that collect and divert the majority of the original drainage tributary area. These flows are now divided among the four (4) remaining outlets to those existing four (4) drainage discharge locations within the Lagoon.

The City of Encinitas is responsible for the maintenance of the existing culverts within the Manchester Avenue right of way and has noted that the existing CMP culverts are in poor condition. With the proposed development, the City of Encinitas is requiring per Conditions of Approval that the existing CMP culverts be replaced as part of this development with either RCP or RCB storm drain infrastructure. In addition, the proposed development is conditioned to widen Manchester Avenue per a City approved street dimensional section that provides for a new DG trail along the south side of Manchester, modified lane and bike lane widths, new curb and gutter, a vegetated swale on the north side for Manchester street flows, and a new parkway with sidewalk on the north side adjacent to the development. With these required improvements, the development will be replacing the existing CMP culverts with new storm drain infrastructure.

The proposed storm drain improvements within the Manchester right of way include the removal of the existing CMP culverts and their replacement with two (2) reinforced concrete box (RCB) culverts and two (2) reinforced concrete pipe (RCP) culverts to replace the existing four (4). These four (4) new culverts are located in the same location as the existing ones, so that the outlet / point of discharge location is at the same general location. This will ensure the least amount of impact to the Lagoon with the removal of the existing pipes and installation of the new system, while maintaining the existing storm flow and discharge location into the lagoon as best feasible. The south side of Manchester consists of a 40' right of way line from the street centreline. As mentioned above, the proposed improvements include the installation of new curb and a DG trail along the south side of the street. The south side of Manchester was surveyed for jurisdictional resources and mapped three zones. The four (4) existing to be removed and the four (4) new proposed storm drain culverts all are located within either disturbed non-resource or CDFW Wetland, RWQCB Wetland (Riparian) zone or a combination of the two and do not have any encroachment into Federal designated areas.

The goal of the new storm drain improvements was to replace the existing poor condition culverts with new storm drain infrastructure that would safely and appropriately convey the existing and developed storm drain flows from the development / tributary area to the same discharge locations within the Lagoon with minimal impact to any existing environmental constraints as these locations; while providing the City of Encinitas the new storm drain infrastructure that could be owned and maintained within their street right of way. The proposed culvert outlet structures will consist of concrete outlet structures with a concrete headwall approximately 1' behind the proposed DG trail, side angled wing walls that transition with the existing topography slope, and a concrete bottom that conveys the culvert flows from the headwall to the point of discharge into the Lagoon that is at the identical location and elevation of the existing CMP culverts that discharged at this location. All of the permanent infrastructure (concrete outlet structure) will be completely constructed within the City's street right of way, so all of the concrete structure will end at the existing 40' right of way line. The portion of the area from the right of way line to the discharge location of the existing pipes will be graded to drain as required to match the existing elevation of the CMP culvert pipe with the removal of that pipe and re-construction of the graded earthen swale/outlet from the new proposed culvert structure. The graded swale area has minimal encroachment into the Lagoon and matches the approximate encroachment by the existing pipe. We are considering this grading as an interim condition as needed to remove the pipe and re-establish the flow line, but ultimately will result in a naturally vegetated area with no permanent impacts. There will be minor temporary impacts approximately 5' outside the limits of grading to accommodate construction activity and this will be considered interim as well just until the completion of construction. Any large equipment needed for this work is planned to be staged within the public right of way on the paved street of Manchester and will work from that above grade elevation in order to remove the existing pipes and to construct the new concrete outlet structures. A guardrail fence will be installed along the headwall and side wing walls of the outlet structure for safety as required by elevational change. We are also proposing to install cleanout manholes or access hatches within the street area of the Manchester improvements so that the City can have minimal impact or need to impact the area for any future maintenance. It was noted that existing and future maintenance by the City would be minimal and would consist of cleaning out the drainage structures as required.

We believe that the proposed storm drain improvements that maintain the existing discharge locations into the Lagoon are the most appropriate engineered solution based on existing and proposed hydrology, infrastructure hydraulics, minimizing any impacts to the existing environmental constraints, elevational control for a gravity storm drain system, depth of cover within Manchester, City requirements based on right of way and maintenance, the proposed new street improvements, and the surveyed existing jurisdictional resources.

Respectfully submitted

Urban Resource Corporation

Jay Ruby, President **Terry Au, Principal Engineer**

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Landscaping Plan Sheets

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BRUSH MANAGEMENT NOTES

BRUSH MANAGEMENT MAINTENANCE:

PROPERTY MANAGEMENT COMPANY WILL BE RESPONSIBLE FOR THE LONG TERM MAINTENANCE OF THE BRUSH MANAGEMENT ZONES.

- <u>BRUSH MANAGEMENT ZONE ONE:</u>
  - BRUSH MANAGEMENT ZONE ONE IS THE AREA ADJACENT TO THE STRUCTURE, SHALL BE LEAST FLAMMABLE, AND SHALL CONSIST OF PERMANENTLY IRRIGATED ORNAMENTAL PLANTING. BRSH MANAGEMENT ZONE ONE SHALL NOT BE ALLOWED ON SLOPES WITH GRADIENT GREATER THAN 4:1.\
- <u>BRUSH MANAGEMENT ZONE TWO:</u>
  - BRUSH MANAGEMENT ZONE TWO IS THE AREA BETWEEN ZONE ONE AND ANY AREA OF NATIVE OR NATURALIZED VEGETATION AND TYPICALLY CONSISTS OF THINNING, NATIVE OR NATURALIZED NON-IRRIGATED VEGETATION.

ILLUSTRATIVE SITE PLAN - L.1

December 5, 2019

PREPARED FOR:
Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

Senior Housing

3111 Manchester Avenue
Cardiff by the Sea, California 92007

0' 15' 30' 60'

MJS
LANDSCAPE
ARCHITECTURE

POOL COURTYARD
- shade cabanas
- firepit with seatwall
- lounge furniture
- chaise lounge
- lap pool (20'x60')
- spa (8'x12') with wall fountain
- umbrellas
- daybeds

ENTERTAINMENT TERRACE
- overhead shade trellis
- tree canopy for shade
- lounge furniture
- dining tables
- umbrellas
- barbecue counter
- views to pool

POOL COURTYARD ENLARGEMENT - L.2

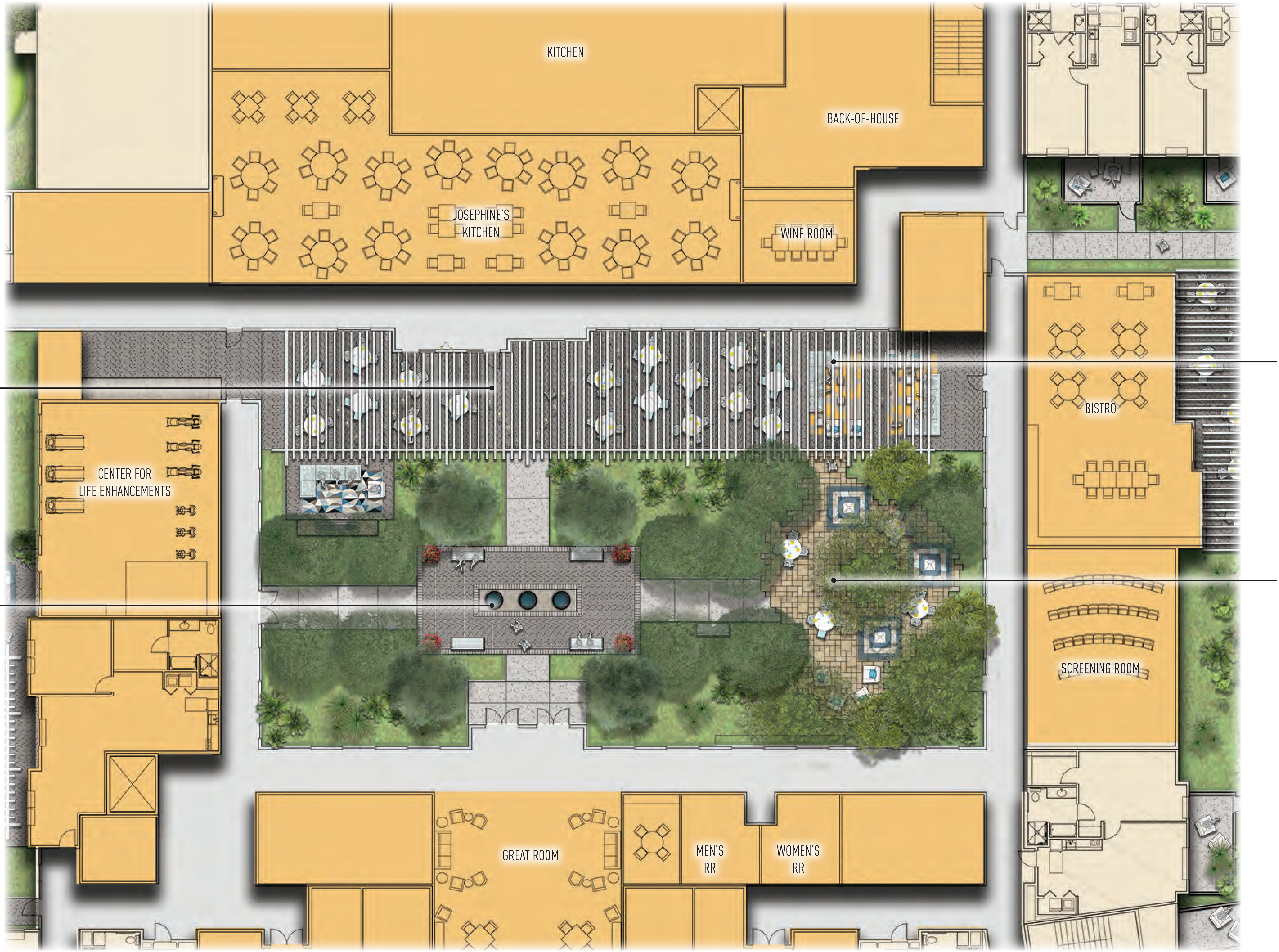
December 5, 2019

PREPARED FOR:
Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

Senior Housing
3111 Manchester Avenue
Cardiff by the Sea, California 92007

0' 4' 8' 16'

MJS
LANDSCAPE
ARCHITECTURE



DINING PAVILION
- shade trellis
- enhanced concrete pavers
- dining tables
- fireplace terrace

FOUNTAIN GARDEN
- water feature at axis of view
- tree allee
- benches
- pottery
- concrete pavers

WINE DOWN LOUNGE
- shade trellis
- lounge furniture

GARDEN PATIO
- tree canopy for shade
- dining tables
- umbrellas

DINING COURTYARD ENLARGEMENT - L.3

December 5, 2019

PREPARED FOR:
Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

Senior Housing
3111 Manchester Avenue
Cardiff by the Sea, California 92007

MJS
LANDSCAPE ARCHITECTURE

ALFRESCO DINING
- shade trellis
- enhanced concrete pavers
- dining tables

meandering walking path

GREAT LAWN
- turf lawn
- lawn games
- shade trees
- movie night

ENLARGED PRIVATE PATIOS - TYP.
- patio walls with gates
- direct access to great lawn

GARDEN COURTYARD ENLARGEMENT - L.4

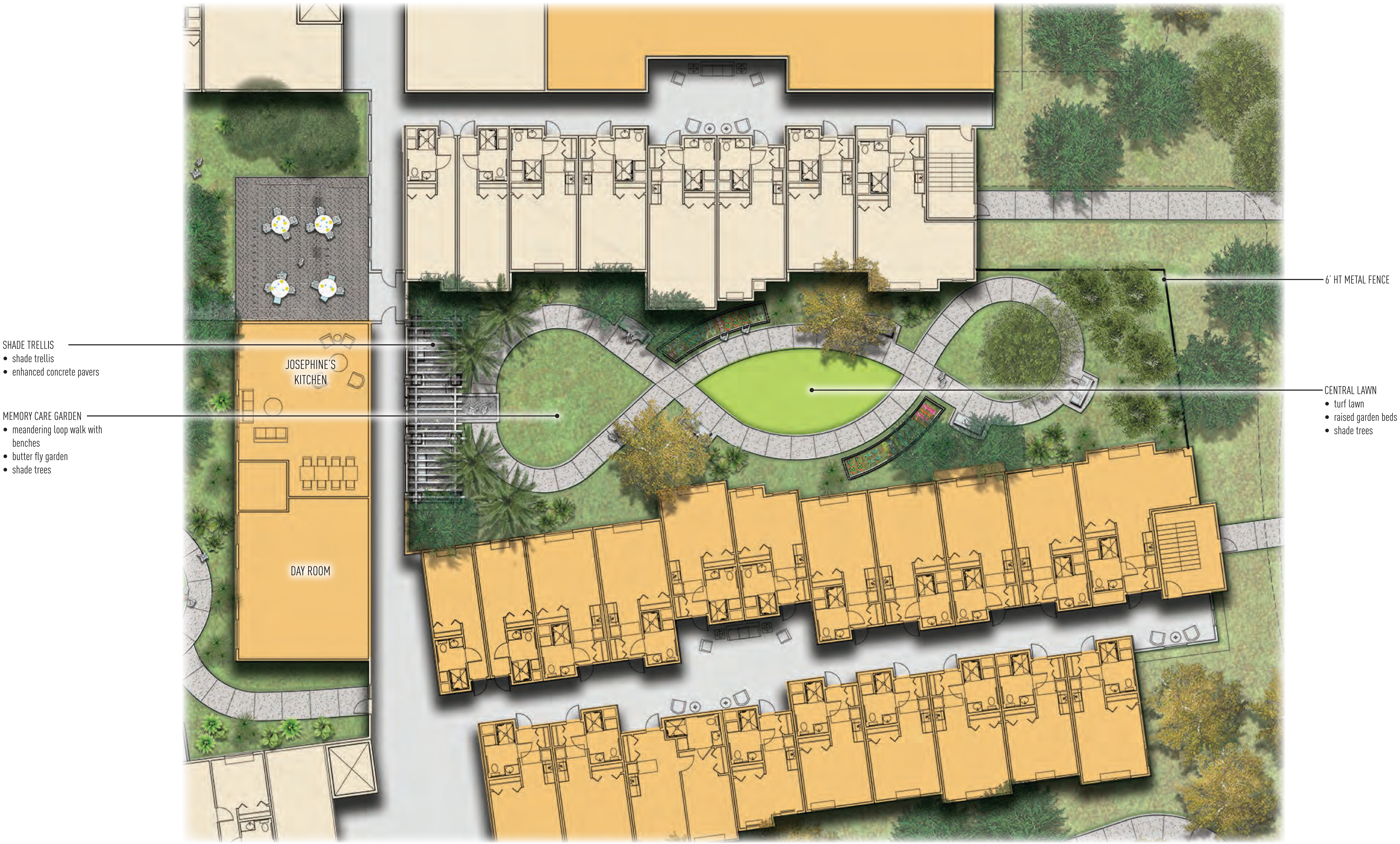
December 5, 2019

PREPARED FOR:
Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

Senior Housing
3111 Manchester Avenue
Cardiff by the Sea, California 92007

0' 4' 8' 16'

MJS
LANDSCAPE ARCHITECTURE



MEMORY CARE COURTYARD ENLARGEMENT - L.5

December 5, 2019

PREPARED FOR:
Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

Senior Housing
3111 Manchester Avenue
Cardiff by the Sea, California 92007

0' 4' 8' 16'

MJS LANDSCAPE ARCHITECTURE

FINAL OFF SITE TREE SELECTION TO BE COORDINATED/APPROVED BY CITY

SODDED TURF:

HYBRID BERMUDA 'TIF GREEN'.
AVAILABLE FROM SOUTHLAND SOD FARMS

ORGANIC MULCHES:

3" THICK SHREDDED BARK MULCH (ALL SHRUB AREAS - ALL HYDROZONES)
INSTALL JUTE MESH ON ALL MANUFACTURED SLOPE 3:1 OR GREATER.

CALIFORNIA COASTAL COMMISSION AND SAN ELIJO LAGOON CONSERVANCY PLANT PALETTE NOTES:

- ALL LANDSCAPING SHALL CONSIST OF NATIVE , SAN ELIJO LAGOON COMPLIANT AND DROUGHT TOLERANT NON-INVASIVE PLANT SPECIES
- NO PLANT SPECIES LISTED AS PROBLEMATIC AND/OR INVASIVE BY THE CALIFORNIA NATIVE PLANT SOCIETY, THE CALIFORNIA INVASIVE PLANT COUNCIL, OR AS MAY BE IDENTIFIED FROM TIME TO TIME BY THE STATE OF CALIFORNIA SHALL BE EMPLOYED OR ALLOWED TO NATURALIZE OR PERSIST ON THE SITE.
- NO PLANT SPECIES LISTED AS A "NOXIOUS WEED" BY THE STATE OF CALIFORNIA OR THE U.S. FEDERAL GOVERNMENT SHALL BE UTILIZED WITHIN THE PROPERTY.
- ANY EXISTING LANDSCAPING THAT DOES NOT MEET THE ABOVE REQUIREMENTS SHALL BE REMOVED.
- ALL PLANTING SHALL PROVIDE 90 PERCENT COVERAGE WITHIN 90 DAYS AND SHALL BE REPEATED IF NECESSARY TO PROVIDE SUCH COVERAGE; AND
- ALL PLANTINGS SHALL BE MAINTAINED IN GOOD GROWING CONDITION THROUGHOUT THE LIFE OF THE PROJECT, AND WHENEVER NECESSARY, SHALL BE REPLACED WITH NEW PLANT MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH THE LANDSCAPE PLAN.
- **ALL PLANT SELECTIONS TO MEET THE CRITERIA SET FORTH IN THE SAN ELIJO CONSERVANCY COASTAL SAGE SCRUB PLANT FIELD GUIDE AND SECTION 7 OF THE CITY OF ENCINITAS DESIGN GUIDELINES**

PLANT SCHEDULE

TREES	BOTANICAL / COMMON NAME	SIZE	FIELD2	QTY
●	ARBUTUS X `MARINA` ARBUTUS MULTI-TRUNK	24"BOX	LOW	4
●	GEIJERA PARVIFLORA AUSTRALIAN WILLOW	24"BOX	LOW	21
●	HETEROMELES ARBUTIFOLIA TOYON	24"BOX	LOW	60
●	MELALEUCA QUINQUENERVIA CAJEPUT TREE MULTI-TRUNK	24"BOX	LOW	1
✱	PHOENIX DACTYLIFERA `MEDJOOL` DATE PALM DIAMOND CUT	20` BTH	LOW	26
●	PINUS TORREYANA TORREY PINE LOW BRANCHING	24"BOX	LOW	73
●	PLATANUS RACEMOSA CALIFORNIA SYCAMORE LOW BRANCHING	36"BOX	LOW	53
●	QUERCUS AGRIFOLIA COAST LIVE OAK MULTI-TRUNK MULTI-TRUNK / 20` MIN. SPACING	36"BOX	VERY LOW	34
●	QUERCUS DUMOSA COASTAL SCRUB OAK STANDARD / 20` MIN. SPACING	15 GAL.	LOW	23
●	RHUS LANCEA AFRICAN SUMAC STANDARD	24"BOX	LOW	21

EXISTING PLANT NOTE:

THE EXISTING USE IS STRICTLY COASTAL AGRICULTURE, NO EXISTING PLANTS ONSITE EXCEED 4" IN TRUNK DBH.

TREE PLAN - LP.1

December 5, 2019

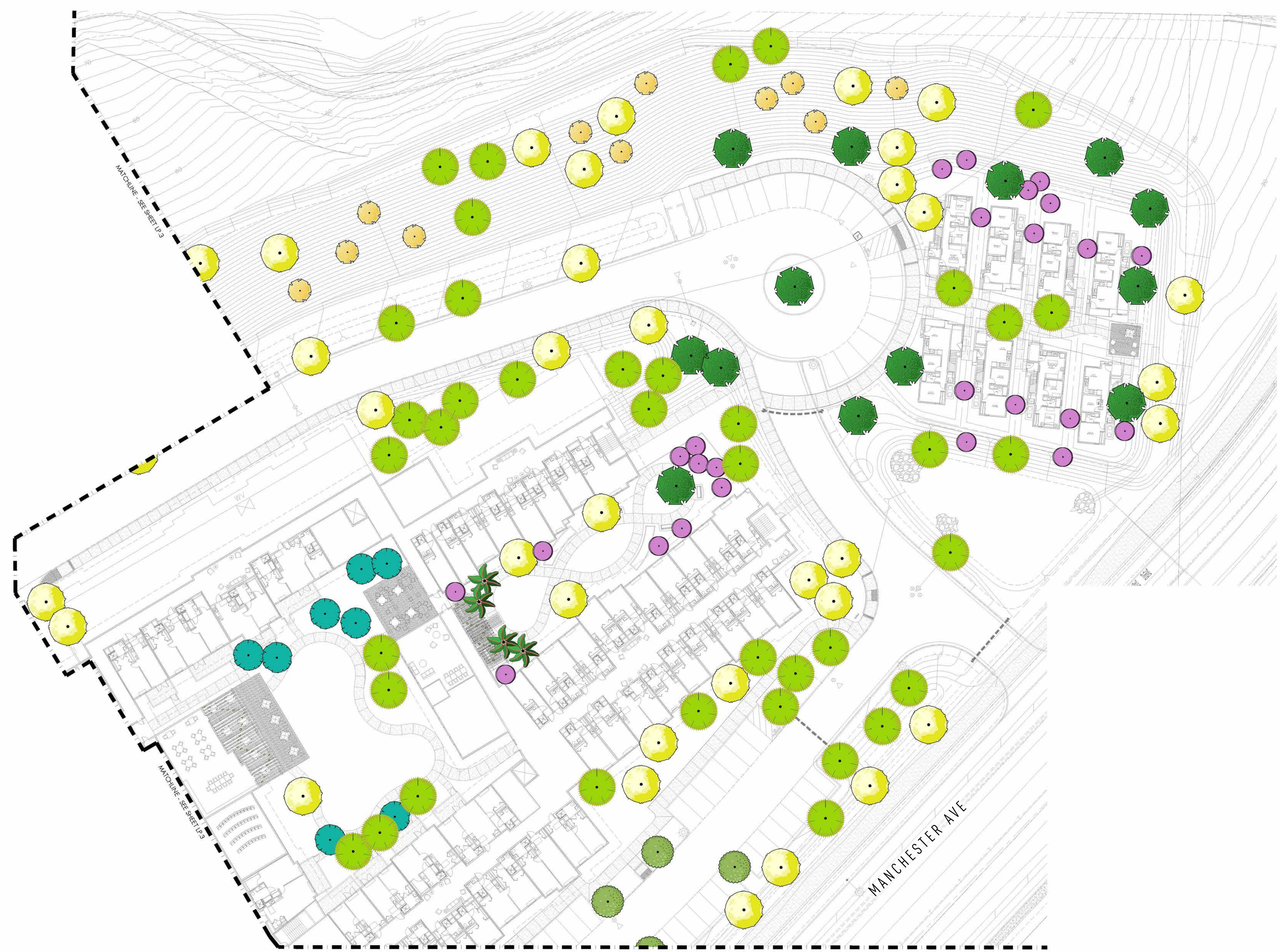
PREPARED FOR:
Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

Senior Housing

3111 Manchester Avenue
Cardiff by the Sea, California 92007

0' 5' 10' 20' 40'

MJS
LANDSCAPE
ARCHITECTURE



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SODDED TURF:

HYBRID BERMUDA 'TIF GREEN'.
AVAILABLE FROM SOUTHLAND SOD FARMS

ORGANIC MULCHES:

3" THICK SHREDDED BARK MULCH (ALL SHRUB AREAS - ALL HYDROZONES)
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TREE PLAN - LP.2

December 5, 2019

PREPARED FOR:
Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

Senior Housing

3111 Manchester Avenue
Cardiff by the Sea, California 92007

0' 5' 10' 20' 40'

MJS
LANDSCAPE
ARCHITECTURE

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CALIFORNIA COASTAL COMMISSION AND SAN ELIJO LAGOON CONSERVANCY PLANT PALETTE NOTES:

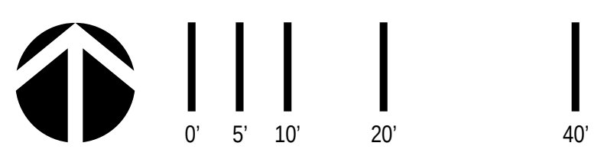
- ALL LANDSCAPING SHALL CONSIST OF NATIVE , SAN ELIJO LAGOON COMPLIANT AND DROUGHT TOLERANT NON-INVASIVE PLANT SPECIES
- NO PLANT SPECIES LISTED AS PROBLEMATIC AND/OR INVASIVE BY THE CALIFORNIA NATIVE PLANT SOCIETY, THE CALIFORNIA INVASIVE PLANT COUNCIL, OR AS MAY BE IDENTIFIED FROM TIME TO TIME BY THE STATE OF CALIFORNIA SHALL BE EMPLOYED OR ALLOWED TO NATURALIZE OR PERSIST ON THE SITE.
- NO PLANT SPECIES LISTED AS A "NOXIOUS WEED" BY THE STATE OF CALIFORNIA OR THE U.S. FEDERAL GOVERNMENT SHALL BE UTILIZED WITHIN THE PROPERTY.
- ANY EXISTING LANDSCAPING THAT DOES NOT MEET THE ABOVE REQUIREMENTS SHALL BE REMOVED.
- ALL PLANTING SHALL PROVIDE 90 PERCENT COVERAGE WITHIN 90 DAYS AND SHALL BE REPEATED IF NECESSARY TO PROVIDE SUCH COVERAGE; AND
- ALL PLANTINGS SHALL BE MAINTAINED IN GOOD GROWING CONDITION THROUGHOUT THE LIFE OF THE PROJECT, AND WHENEVER NECESSARY, SHALL BE REPLACED WITH NEW PLANT MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH THE LANDSCAPE PLAN.
- **ALL PLANT SELECTIONS TO MEET THE CRITERIA SET FORTH IN THE SAN ELIJO CONSERVANCY COASTAL SAGE SCRUB PLANT FIELD GUIDE AND SECTION 7 OF THE CITY OF ENCINITAS DESIGN GUIDELINES**

TREE PLAN - LP.3

December 5, 2019

PREPARED FOR:
Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

Senior Housing
3111 Manchester Avenue
Cardiff by the Sea, California 92007



MJS
LANDSCAPE
ARCHITECTURE

BOTANICAL NAME	COMMON NAME	SIZE	WUCOLS
🟥 MANCHESTER LANDSCAPE SETBACK - LOW - 22,234 S.F. 4' O.C. = 1,390 MIN.			
ACHILLEA MILLEFOLIUM	YARROW	1 GAL	LOW
BACCHARIS PILULARIS	COYOTE BRUSH	1 GAL	LOW
BACCHARIS SALICIFOLIA	MULE FAT	1 GAL	VERY LOW
ELYMUS CONDENSATUS	GIANT WILD RYE	1 GAL	LOW
MIMULUS AURANTIACUS	STICKY MONKEYFLOWER	1 GAL	LOW
RHUS INTEGRIFOLIA	LEMONADE BERRY	1 GAL	VERY LOW
SAMBUCUS MEXICANA	BLUE ELDERBERRY	1 GAL	LOW
▨ ADJACENT OPEN SPACE - LOW - 82,247 S.F. 5' O.C. = 3,329 MIN.			
ACHILLEA MILLEFOLIUM	YARROW	1 GAL	LOW
BACCHARIS PILULARIS	COYOTE BRUSH	1 GAL	LOW
BACCHARIS SALICIFOLIA	MULE FAT	1 GAL	VERY LOW
ELYMUS CONDENSATUS	GIANT WILD RYE	1 GAL	LOW
MIMULUS AURANTIACUS	STICKY MONKEYFLOWER	1 GAL	LOW
RHUS INTEGRIFOLIA	LEMONADE BERRY	1 GAL	VERY LOW
SAMBUCUS MEXICANA	BLUE ELDERBERRY	1 GAL	LOW
▨ BIO - RETENTION BASINS - LOW - 29,389 24" O.C. = 7,327 MIN.			
BOTTOM OF BASIN:			
ACHILLEA MILLEFOLIUM	YARROW	1 GAL.	LOW
BACCHARIS SALICIFOLIA	MULE FAT	1 GAL.	VERY LOW
CHONDROPETALUM TECTORUM	CAPE RUSH	1 GAL	MOD

BOTANICAL NAME	COMMON NAME	SIZE	WUCOLS
🟩 RESIDENT COURTYARDS - MODERATE - 18,496 S.F. 4' O.C. = 1,336 MIN.			
AEONIUM 'URBICUM' 'SALAD BOWL'	AEONIUM	5 GAL	LOW
ALOE BAINSII	TREE ALOE	24" BOX	LOW
ALOE STRIATA	CORAL ALOE	5 GAL	LOW
ARBUTUS 'COMPACTA'	DWARF STRAWBERRY	5 GAL	LOW
BOUGAINVILLEA ROSENKA	SHRUB BOUGAINVILLEA	5 GAL.	LOW
CALLISTEMON 'LITTLE JOHN'	DWARF CALLISTEMON	5 GAL	LOW
CAREX DIVULSA	BERKELEY SEDGE	5 GAL.	LOW
CHONDROPETALUM 'ELEPHANTINUM'	LARGE CAPE RUSH	5 GAL.	LOW
DIANELLA REVOLUTA	LITTLE REV	5 GAL	LOW
DRACAENA DRACO	DRAGON TREE	24" BOX	VERY LOW
FESTUCA MAIREI	ATLAS FESCUE	1 GAL	LOW
FESTUCA OVINA GLAUCA	BLUE FESCUE	5 GAL	LOW
LOMANDRA LONGIFOLIA 'BREEZE'	SPINY-HEADED MAT RUSH	5 GAL.	LOW
ROSMARINUS PROSTRATUS	DWARF ROSEMARY	5 GAL.	LOW
SALVIA CLEVELANDII	CA BLUE SAGE	5 GAL	VERY LOW
TEUCRIUM CHAMAEDRYS	GERMANDER	5 GAL	LOW
🟧 ENHANCED ENTRIES / MOTOR COURT - LOW - 10,661 S.F. 4' O.C. = 692 MIN.			
ECHEVERIA GLAUCA	HENS & CHICKS	1 GAL	LOW
ECHEVERIA PEACOCKII	PEACOCK ECHEVERIA	5 GAL	LOW
AEONIUM ARBOREUM 'SCHWARZKOPF'	AEONIUM	5 GAL	LOW
AGAVE AMERICANA	CENTURY PLANT	15 GAL	VERY LOW
ALOE STRIATA	CORAL ALOE	5 GAL	LOW
DASYLIRION WHEELERI	DESERT SPOON	15 GAL	VERY LOW
HESPERALOE PARVIFLORA	RED YUCCA	5 GAL	VERY LOW
HETEROMELES ARBUTIFOLIA	TOYON	15 GAL	VERY LOW
KALANCHOE BEHARENSIS	FELT PLANT	15 GAL	LOW
MUHLENBURGIA CAPILLARIS	PINK MUHLY	5 GAL	MOD
SENECIO MANDRALISCAE	SENECIO	1 GAL	LOW
WESTRINGIA FLORIBUNDA	COAST ROSEMARY	5 GAL	LOW
🟦 PERIMETER LANDSCAPE - LOW - 31,611 S.F. 4' O.C. = 2,901 MIN.			
ECHEVERIA GLAUCA	HENS & CHICKS	1 GAL	LOW
ECHEVERIA PEACOCKII	PEACOCK ECHEVERIA	5 GAL	LOW
AEONIUM ARBOREUM 'SCHWARZKOPF'	AEONIUM	5 GAL	LOW
AGAVE AMERICANA	CENTURY PLANT	15 GAL	VERY LOW
ALOE STRIATA	CORAL ALOE	5 GAL	LOW
DASYLIRION WHEELERI	DESERT SPOON	15 GAL	VERY LOW
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SENECIO MANDRALISCAE	SENECIO	1 GAL	LOW
WESTRINGIA FLORIBUNDA	COAST ROSEMARY	5 GAL	LOW
▨ WORKFORCE HOUSING COMMON AREA - LOW - 7,994 S.F. 4' O.C. = 485 MIN.			
ECHEVERIA GLAUCA	HENS & CHICKS	1 GAL	LOW
ECHEVERIA PEACOCKII	PEACOCK ECHEVERIA	5 GAL	LOW
AEONIUM ARBOREUM 'SCHWARZKOPF'	AEONIUM	5 GAL	LOW
AGAVE AMERICANA	CENTURY PLANT	15 GAL	VERY LOW

SHRUB PLAN - LP.4

December 5, 2019

PREPARED FOR:
Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

Senior Housing
3111 Manchester Avenue
Cardiff by the Sea, California 92007

0' 5' 10' 20' 40'

MJS
LANDSCAPE
ARCHITECTURE

BOTANICAL NAME	COMMON NAME	SIZE	WUCOLS
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BACCHARIS SALICIFOLIA	MULE FAT	1 GAL	VERY LOW
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MIMULUS AURANTIACUS	STICKY MONKEYFLOWER	1 GAL	LOW
RHUS INTEGRIFOLIA	LEMONADE BERRY	1 GAL	VERY LOW
SAMBUCUS MEXICANA	BLUE ELDERBERRY	1 GAL	LOW
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CHONDROPETALUM TECTORUM	CAPE RUSH	1 GAL.	MOD.
JUNCUS PATENS	CA. GRAY RUSH	1 GAL.	MOD.
SIDES OF BASINS:			
HETEROMELES ARBUTIFOLIA	TOYON	1 GAL.	VERY LOW
MIMULUS AURANTIACUS	STICKY MONKEY-FLOWER	1 GAL.	VERY LOW
MUHLENBERGIA RIGENS	DEERGRASS	1 GAL.	LOW
RHUS INTEGRIFOLIA	LEMONADE BERRY	1 GAL.	VERY LOW
SAMBUCUS NIGRA CAERULEA	BLUE ELDERBERRY	1 GAL.	LOW

BOTANICAL NAME	COMMON NAME	SIZE	WUCOLS
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BOUGAINVILLEA ROSENKA	SHRUB BOUGAINVILLEA	5 GAL.	LOW
CALLISTEMON 'LITTLE JOHN'	DWARF CALLISTEMON	5 GAL	LOW
CAREX DIVULSA	BERKELEY SEDGE	5 GAL.	LOW
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DIANELLA REVOLUTA	LITTLE REV	5 GAL	LOW
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SENECIO MANDRALISCAE	SENECIO	1 GAL	LOW
WESTRINGIA FLORIBUNDA	COAST ROSEMARY	5 GAL	LOW

SHRUB PLAN -LP.5

December 5, 2019

PREPARED FOR:
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Solana Beach, CA 92075

Senior Housing

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0' 5' 10' 20' 40'

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HESPERALOE PARVIFLORA	RED YUCCA	5 GAL	VERY LOW
HETEROMELES ARBUTIFOLIA	TOYON	15 GAL	VERY LOW
KALANCHOE BEHARENSIS	FELT PLANT	15 GAL	LOW
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SENECIO MANDRALISCAE	SENECIO	1 GAL	LOW
WESTRINGIA FLORIBUNDA	COAST ROSEMARY	5 GAL	LOW
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ECHEVERIA PEACOCKII	PEACOCK ECHEVERIA	5 GAL	LOW
AEONIUM ARBOREUM 'SCHWARZKOPF'	AEONIUM	5 GAL	LOW
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MUHLENBURGIA CAPILLARIS	PINK MUHLY	5 GAL	MOD
SENECIO MANDRALISCAE	SENECIO	1 GAL	LOW
WESTRINGIA FLORIBUNDA	COAST ROSEMARY	5 GAL	LOW

SHRUB PLAN - LP.6

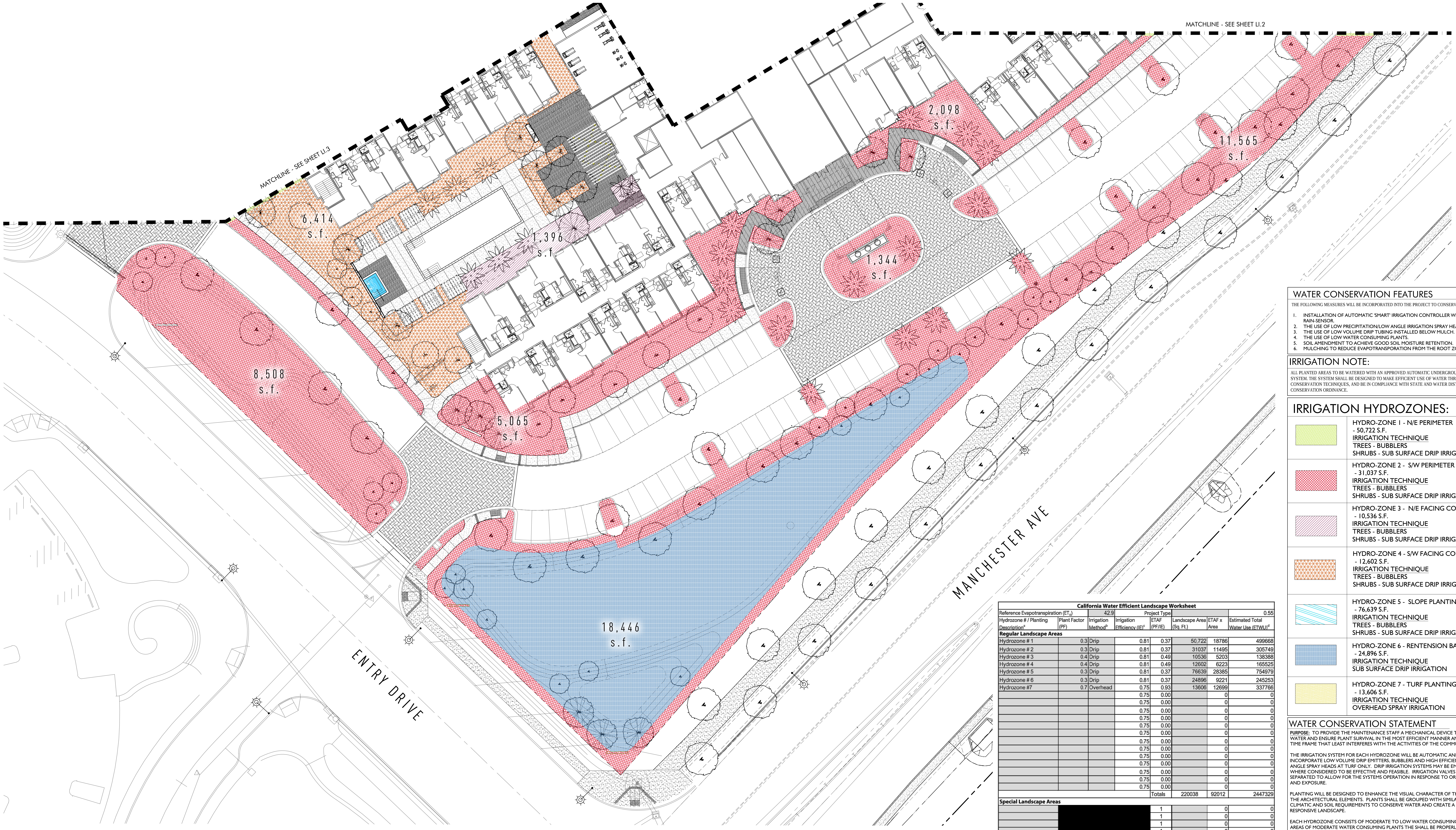
December 5, 2019

PREPARED FOR:
Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

Senior Housing
3111 Manchester Avenue
Cardiff by the Sea, California 92007

0' 5' 10' 20' 40'

MJS
LANDSCAPE
ARCHITECTURE



WATER CONSERVATION FEATURES

THE FOLLOWING MEASURES WILL BE INCORPORATED INTO THE PROJECT TO CONSERVE WATER:

1. INSTALLATION OF AUTOMATIC 'SMART' IRRIGATION CONTROLLER WITH RAIN-SENSOR.
2. THE USE OF LOW PRECIPITATION/LOW ANGLE IRRIGATION SPRAY HEADS.
3. THE USE OF LOW VOLUME DRIP TUBING INSTALLED BELOW MULCH.
4. THE USE OF LOW WATER CONSUMING PLANTS.
5. SOIL AMENDMENT TO ACHIEVE GOOD SOIL MOISTURE RETENTION.
6. MULCHING TO REDUCE EVAPOTRANSPORATION FROM THE ROOT ZONE.

IRRIGATION NOTE:

ALL PLANTED AREAS TO BE WATERED WITH AN APPROVED AUTOMATIC UNDERGROUND IRRIGATION SYSTEM. THE SYSTEM SHALL BE DESIGNED TO MAKE EFFICIENT USE OF WATER THROUGH CONSERVATION TECHNIQUES, AND BE IN COMPLIANCE WITH STATE AND WATER DISTRICT'S WATER CONSERVATION ORDINANCE.

IRRIGATION HYDROZONES:

🟩	HYDRO-ZONE 1 - N/E PERIMETER - 50,722 S.F. IRRIGATION TECHNIQUE TREES - BUBBLERS SHRUBS - SUB SURFACE DRIP IRRIGATION
🟥	HYDRO-ZONE 2 - S/W PERIMETER - 31,037 S.F. IRRIGATION TECHNIQUE TREES - BUBBLERS SHRUBS - SUB SURFACE DRIP IRRIGATION
▨	HYDRO-ZONE 3 - N/E FACING COURTYARD - 10,536 S.F. IRRIGATION TECHNIQUE TREES - BUBBLERS SHRUBS - SUB SURFACE DRIP IRRIGATION
🟧	HYDRO-ZONE 4 - S/W FACING COURTYARD - 12,602 S.F. IRRIGATION TECHNIQUE TREES - BUBBLERS SHRUBS - SUB SURFACE DRIP IRRIGATION
▨	HYDRO-ZONE 5 - SLOPE PLANTING - 76,639 S.F. IRRIGATION TECHNIQUE TREES - BUBBLERS SHRUBS - SUB SURFACE DRIP IRRIGATION
🟦	HYDRO-ZONE 6 - RENTENSION BASIN - 24,896 S.F. IRRIGATION TECHNIQUE SUB SURFACE DRIP IRRIGATION
🟨	HYDRO-ZONE 7 - TURF PLANTING - 13,606 S.F. IRRIGATION TECHNIQUE OVERHEAD SPRAY IRRIGATION

WATER CONSERVATION STATEMENT

PURPOSE: TO PROVIDE THE MAINTENANCE STAFF A MECHANICAL DEVICE TO DISTRIBUTE WATER AND ENSURE PLANT SURVIVAL IN THE MOST EFFICIENT MANNER AND WITHIN A TIME FRAME THAT LEAST INTERFERES WITH THE ACTIVITIES OF THE COMMUNITY.

THE IRRIGATION SYSTEM FOR EACH HYDROZONE WILL BE AUTOMATIC AND INCORPORATE LOW VOLUME DRIP EMITTERS, BUBBLERS AND HIGH EFFICIENCY LOW ANGLE SPRAY HEADS AT TURF ONLY. DRIP IRRIGATION SYSTEMS MAY BE EMPLOYED WHERE CONSIDERED TO BE EFFECTIVE AND FEASIBLE. IRRIGATION VALVES SHALL BE SEPARATED TO ALLOW FOR THE SYSTEMS OPERATION IN RESPONSE TO ORIENTATION AND EXPOSURE.

PLANTING WILL BE DESIGNED TO ENHANCE THE VISUAL CHARACTER OF THE SITE AND THE ARCHITECTURAL ELEMENTS. PLANTS SHALL BE GROUPED WITH SIMILAR WATER, CLIMATIC AND SOIL REQUIREMENTS TO CONSERVE WATER AND CREATE A DROUGHT RESPONSIVE LANDSCAPE.

EACH HYDROZONE CONSISTS OF MODERATE TO LOW WATER CONSUMING PLANTS. IN AREAS OF MODERATE WATER CONSUMING PLANTS THE SHALL BE PROPERLY AMENDED TO RETAIN MOISTURE FOR HEALTHY GROWTH AND TO CONSERVE WATER.

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California Water Efficient Landscape Worksheet

Reference Evapotranspiration (ET_o)		42.9	Project Type				0.55
Hydrozone # / Planting Description^a	Plant Factor (PF)	Irrigation Method^b	Irrigation Efficiency (IE)^c	ETAF (PF/IE)	Landscape Area (Sq. Ft.)	ETAF x Area	Estimated Total Water Use (ETWU)^d
Regular Landscape Areas							
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			0.75	0.00		0	0
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			0.75	0.00		0	0
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			0.75	0.00		0	0
			0.75	0.00		0	0
			0.75	0.00		0	0
				Totals	220038	92012	2447329
Special Landscape Areas							
				1		0	0
				1		0	0
				1		0	0
				1		0	0
				Totals	0	0	0
						ETWU Total	2447329
						Maximum Allowed Water Allowance (MAWA)^e	3218914

ETAF Calculations

Regular Landscape Areas

Total ETAF x Area	92012
Total Area	220038
Average ETAF	0.42

Average ETAF for Regular Landscape Areas must be 0.55 or below for residential areas, and 0.45 or below for non-residential areas.

All Landscape Areas

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IRRIGATION PLAN - LI.1

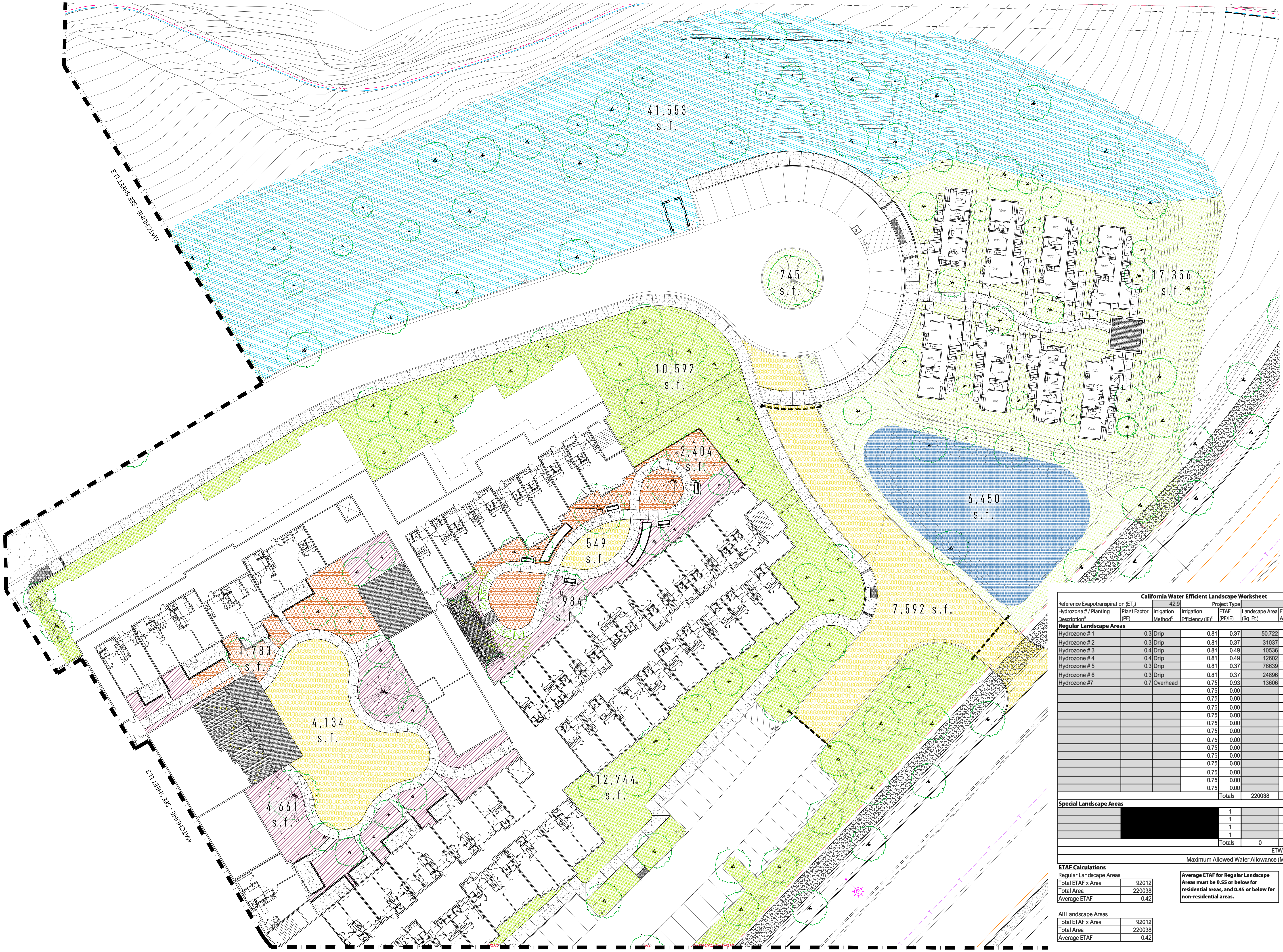
December 5, 2019

PREPARED FOR:
Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

Senior Housing
3111 Manchester Avenue
Cardiff by the Sea, California 92007

0' 5' 10' 20' 40'

LANDSCAPE ARCHITECTURE



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IRRIGATION PLAN - LI.2

December 5, 2019

PREPARED FOR:
Greystar
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Senior Housing

3111 Manchester Avenue
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0' 5' 10' 20' 40'

MJS
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IRRIGATION PLAN - LI.3

December 5, 2019

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Greystar
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Solana Beach, CA 92075

Senior Housing

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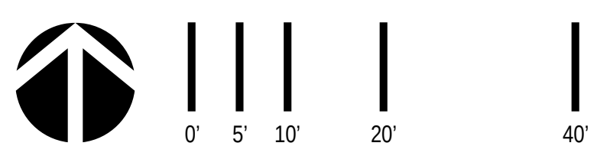

MJS
LANDSCAPE
ARCHITECTURE


STREET LIGHT


ILLUMINATED BOLLARD


SIGN LIGHT


DOWNLIGHT


OVERHEAD FESTIVAL LIGHT

LIGHTING CONCEPT:

THE OUTDOOR LIGHTING CONCEPT IS TO PROVIDE LEVELS OF LIGHTING SUFFICIENT TO MEET SAFETY AND ORIENTATION NEEDS.

WITHIN PUBLIC AREAS LIGHTING WILL BE WARM COLORED AND UNOBTRUSIVE.

LIGHTING SOURCES FOR THE LANDSCAPE AND PAVED AREAS WILL BE CONCEALED AND THE LIGHTING INDIRECT NOT VISIBLE FROM A PUBLIC VIEWPOINT. LIGHT SOURCES SHOULD BE DIRECTED SO THAT IT DOES NOT FALL OUTSIDE THE AREA TO BE LIGHTED.

ALL EXTERIOR SURFACE AND ABOVE-GROUND MOUNTED FIXTURES WILL BE SYMPATHETIC AND COMPLIMENTARY TO THE ARCHITECTURAL THEME.

PHOTOMETRICS PROVIDED BY CANDELA ELECTRICAL CONSULTANT.

EXTERIOR LIGHTING LEGEND

SYMBOL	TYPE/TECHNIQUE:	LOCATION:
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🟦	ILLUMINATED BOLLARD	PEDESTRIAN PATHWAYS
-o--o--o--o-	OVERHEAD FESTIVAL LIGHTING	OVERHEAD STRUCTURES
🟧	DOWNLIGHT	ENTRY COURT
●○●	TREE DOWNLIGHT	COURTYARD TREE
🟩	SIGN LIGHT	ENTRY WAYFINDING SIGNS
🟢	CITY STANDARD STREET LIGHT	CITY STREETS

LANDSCAPE LIGHTING PLAN - LL.1

December 5, 2019

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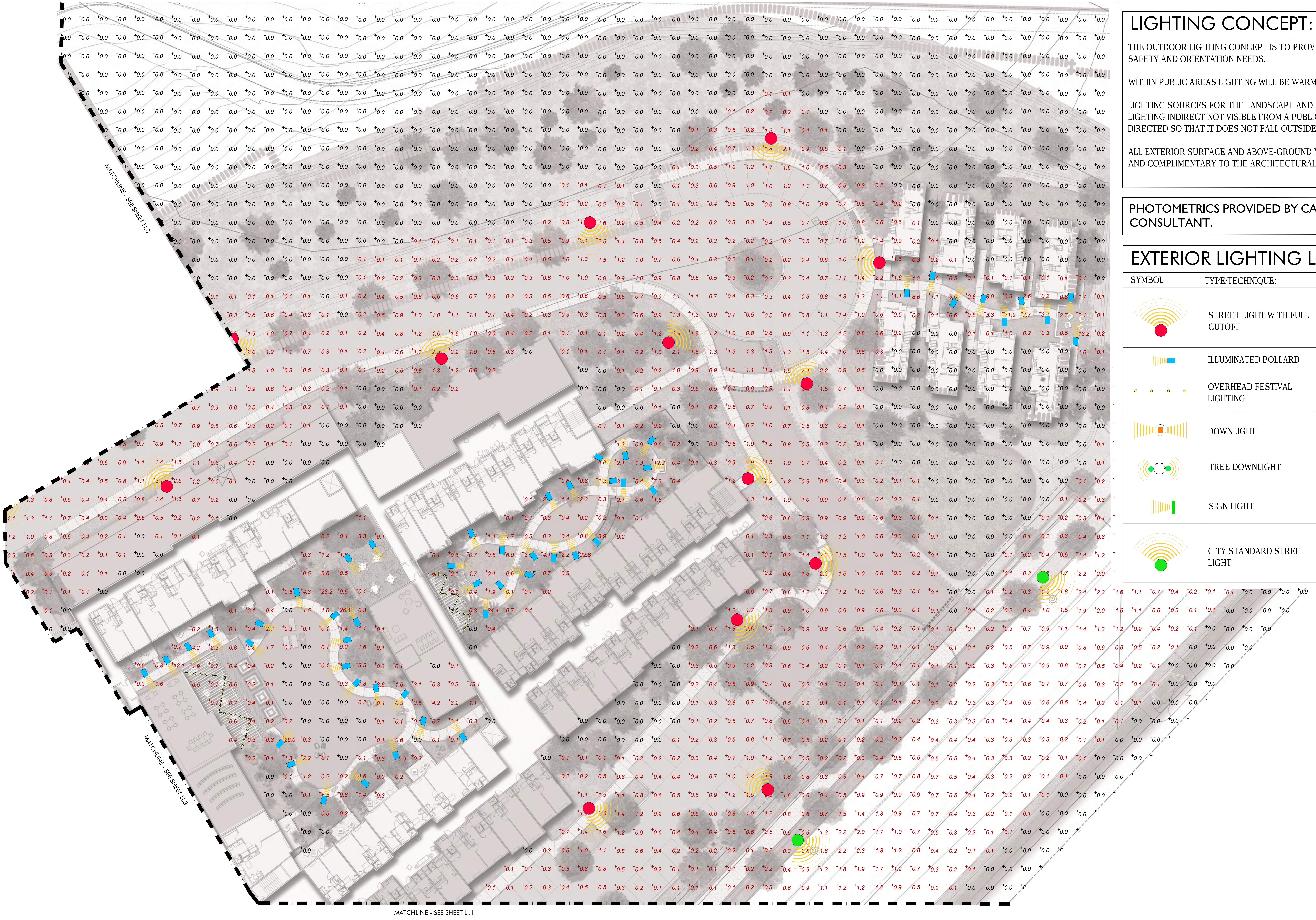

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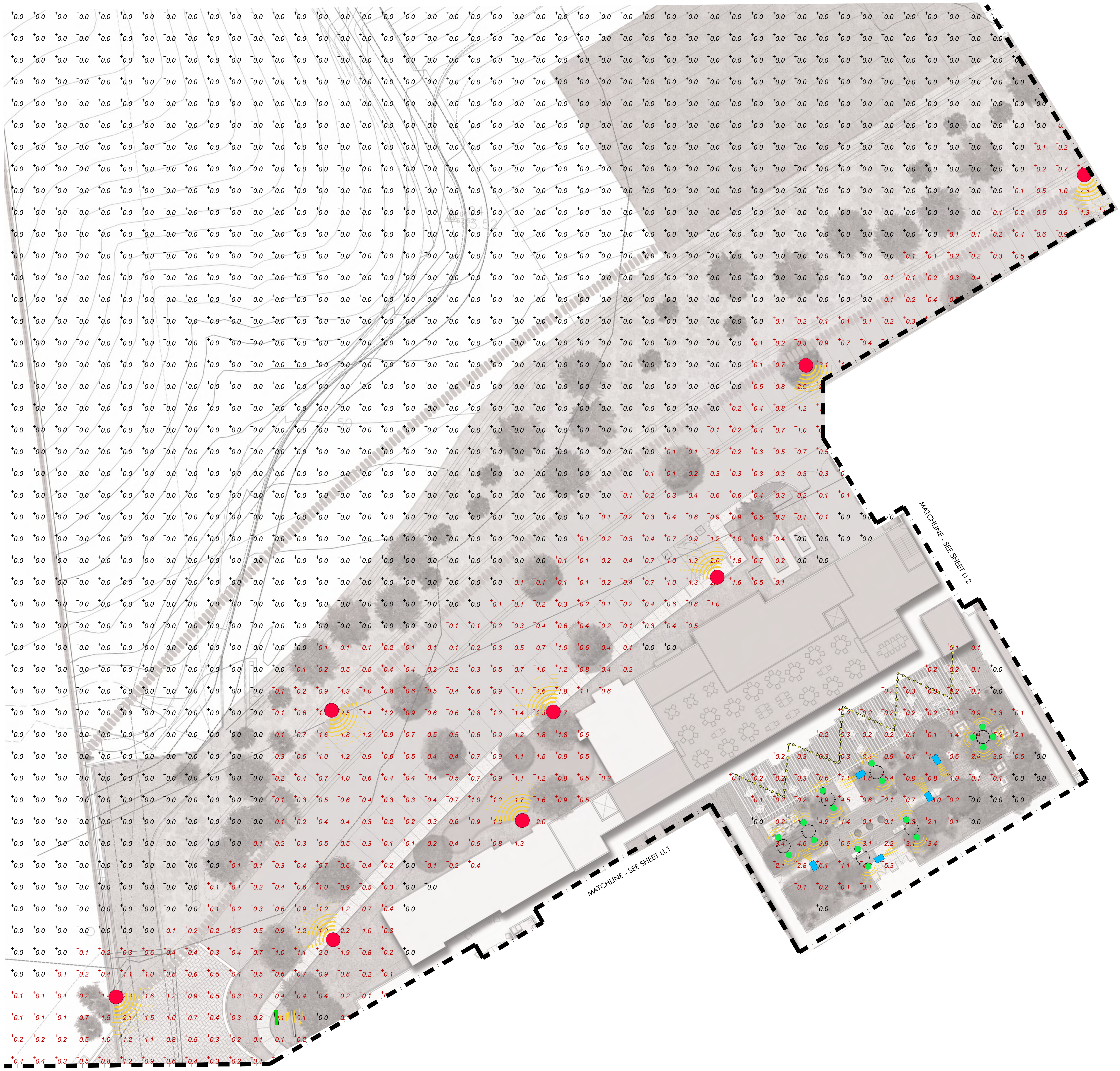

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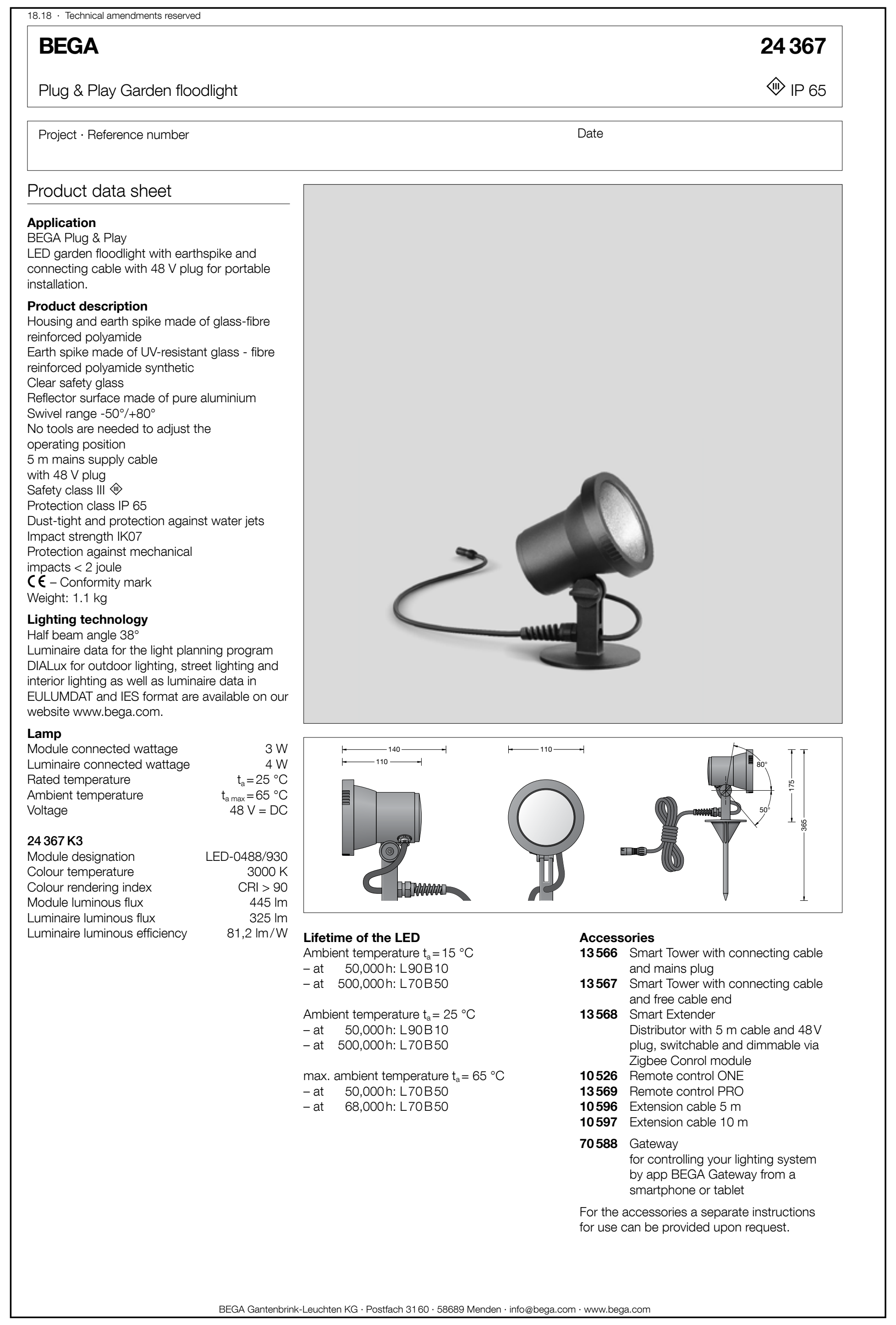
18.18 · Technical amendments reserved

BEGA **24 367**

Plug & Play Garden floodlight IP 65

Project · Reference number Date

Product data sheet

Application
BEGA Plug & Play
LED garden floodlight with earthspike and connecting cable with 48 V plug for portable installation.

Product description
Housing and earth spike made of glass-fibre reinforced polyamide
Earth spike made of UV-resistant glass - fibre reinforced polyamide synthetic
Clear safety glass
Reflector surface made of pure aluminium
Swivel range -50°/+80°
No tools are needed to adjust the operating position
5 m mains supply cable with 48 V plug
Safety class III
Protection class IP 65
Dust-tight and protection against water jets
Impact strength IK07
Protection against mechanical impacts < 2 joule
CE – Conformity mark
Weight: 1.1 kg

Lighting technology
Half beam angle 38°
Luminaire data for the light planning program DIALux for outdoor lighting, street lighting and interior lighting as well as luminaire data in EULUMDAT and IES format are available on our website www.bega.com.

Lamp

Module connected wattage	3 W
Luminaire connected wattage	4 W
Rated temperature	$t_a = 25$ °C
Ambient temperature	$t_{a\,max} = 65$ °C
Voltage	48 V = DC

24 367 K3

Module designation	LED-0488/930
Colour temperature	3000 K
Colour rendering index	CRI > 90
Module luminous flux	445 lm
Luminaire luminous flux	325 lm
Luminaire luminous efficiency	81,2 lm/W

Lifetime of the LED
Ambient temperature $t_a = 15$ °C
– at 50,000 h: L90 B10
– at 500,000 h: L70 B50

Ambient temperature $t_a = 25$ °C
– at 50,000 h: L90 B10
– at 500,000 h: L70 B50

max. ambient temperature $t_a = 65$ °C
– at 50,000 h: L70 B50
– at 68,000 h: L70 B50

Accessories

13 566	Smart Tower with connecting cable and mains plug
13 567	Smart Tower with connecting cable and free cable end
13 568	Smart Extender Distributor with 5 m cable and 48 V plug, switchable and dimmable via Zigbee Conrol module
10 526	Remote control ONE
13 569	Remote control PRO
10 596	Extension cable 5 m
10 597	Extension cable 10 m
70 588	Gateway for controlling your lighting system by app BEGA Gateway from a smartphone or tablet

For the accessories a separate instructions for use can be provided upon request.

BEGA Gantenbrink-Leuchten KG · Postfach 31 60 · 58689 Menden · info@bega.com · www.bega.com

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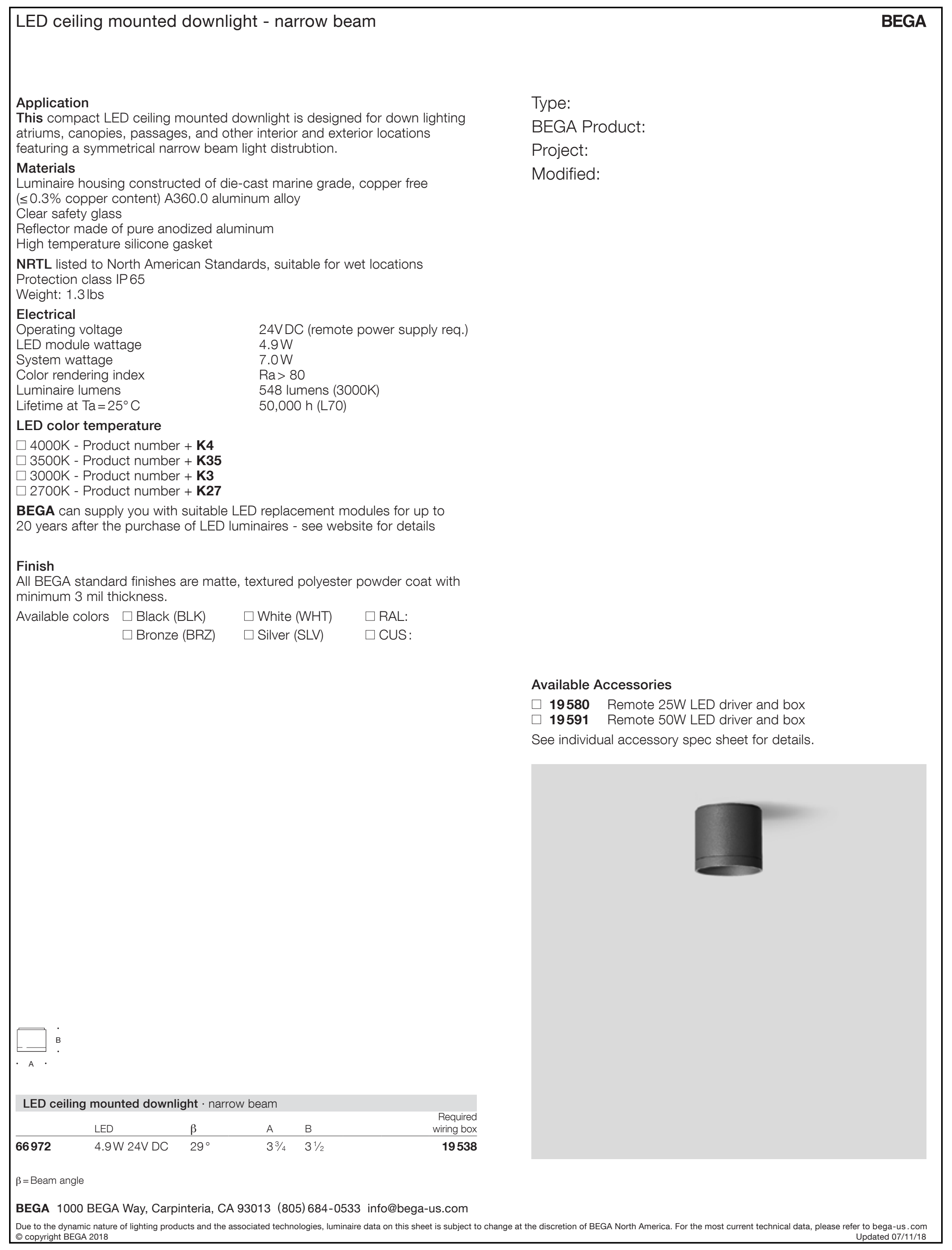

LED ceiling mounted downlight - narrow beam **BEGA**

Application
This compact LED ceiling mounted downlight is designed for down lighting atriums, canopies, passages, and other interior and exterior locations featuring a symmetrical narrow beam light distrubtion.

Materials
Luminaire housing constructed of die-cast marine grade, copper free (≤0.3% copper content) A360.0 aluminum alloy
Clear safety glass
Reflector made of pure anodized aluminum
High temperature silicone gasket

NRTL listed to North American Standards, suitable for wet locations
Protection class IP65
Weight: 1.3 lbs

Electrical

Operating voltage	24V DC (remote power supply req.)
LED module wattage	4.9W
System wattage	7.0W
Color rendering index	Ra > 80
Luminaire lumens	548 lumens (3000K)
Lifetime at Ta = 25° C	50,000 h (L70)

LED color temperature
☐ 4000K - Product number + **K4**
☐ 3500K - Product number + **K35**
☐ 3000K - Product number + **K3**
☐ 2700K - Product number + **K27**

BEGA can supply you with suitable LED replacement modules for up to 20 years after the purchase of LED luminaires - see website for details

Finish
All BEGA standard finishes are matte, textured polyester powder coat with minimum 3 mil thickness.

Available colors ☐ Black (BLK) ☐ White (WHT) ☐ RAL:
☐ Bronze (BRZ) ☐ Silver (SLV) ☐ CUS:

Type:
BEGA Product:
Project:
Modified:

Available Accessories
☐ **19 580** Remote 25W LED driver and box
☐ **19 591** Remote 50W LED driver and box
See individual accessory spec sheet for details.

LED ceiling mounted downlight · narrow beam

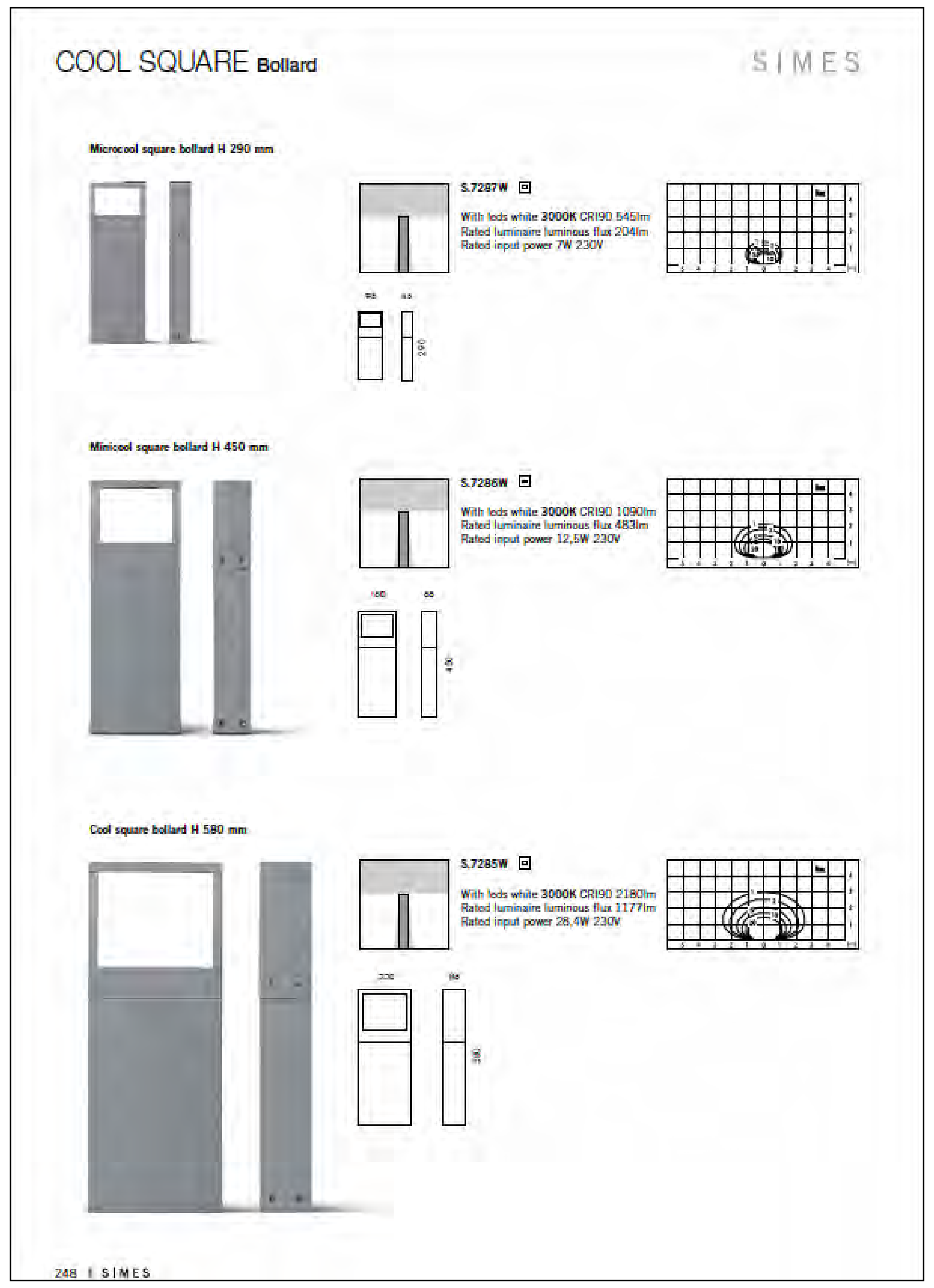
	LED	β	A	B	Required wiring box
66 972	4.9W 24V DC	29°	3¾	3½	**19 538**

β = Beam angle

BEGA 1000 BEGA Way, Carpinteria, CA 93013 (805) 684-0533 info@bega-us.com

Due to the dynamic nature of lighting products and the associated technologies, luminaire data on this sheet is subject to change at the discretion of BEGA North America. For the most current technical data, please refer to bega-us.com

Updated 07/11/18


COOL SQUARE **Bollard** SIMES

Microcool square bollard H 290 mm

S.7287W
With leds white **3000K** CRI90 545lm
Rated luminaire luminous flux 204lm
Rated input power 7W 230V

Minicool square bollard H 450 mm

S.7286W
With leds white **3000K** CRI90 1090lm
Rated luminaire luminous flux 483lm
Rated input power 12,5W 230V

Cool square bollard H 580 mm

S.7285W
With leds white **3000K** CRI90 2180lm
Rated luminaire luminous flux 1177lm
Rated input power 28,4W 230V

248 | SIMES


How to Specify

When specifying an Exhibitor Lighting System, take into consideration:
Socket Spacing, LED Style and Globe Selection.

The Basic System

The Exhibitor Series consists of sockets permanently sealed to flexible cable.
All components are rated for wet location use.

EXBK - 6 - VI - S14 - C

Cable / Socket Color		Socket Spacing		LED			Globe Style		Globe Color	
Code	Color	Code	Inches (mm)	Code	Color	Watts/Volts	Code	Style	Code	Color
BK	Black	6	6" (150 mm)	UBLW	2000K White	1.8 W / 24 VAC	G19	G-19	C	Clear
WH	White	12	12" (300 mm)	UB	2400K White	1.8 W / 24 VAC	G14	G-14	F	Frosted
		18	18" (450 mm)	VILW	2000K White	1.8 W / 24 VAC	S14	S-14	G	Green
		24	24" (600 mm)	VI	2400K White	1.8 W / 24 VAC	G-14 & S-14 in clear and frosted only		A	Amber
		Custom spacing is available.		Virtual Incandescent (VILW & VI) not for use with Frosted Globes					B	Blue
				WW	2500K White	0.48 W / 24 VAC			R	Red
				WH	5500K White	0.48 W / 24 VAC			V	Violet
				BL	Blue	0.48 W / 24 VAC			M	Multi-Color
				GR	Green	0.48 W / 24 VAC				
				OR	Orange	0.48 W / 24 VAC				
				PL	Purple	0.48 W / 24 VAC				
				RD	Red	0.48 W / 24 VAC				
				YG	Yellow-Green	0.48 W / 24 VAC				
				(Any Combination of 0.48 Watt Colors is Possible)						
				Xenon Lamp						
				124	2500K	7.5 W / 24 VAC				
				Xenon lamp not for use with G-14 globes						

EXC Series

EXC Series incorporates Exhibitor Series into a 2" x 2" satin aluminum profile for use in all environments.
Custom finishes are available upon request. Fixtures can be wired for single circuit or chasing effects.

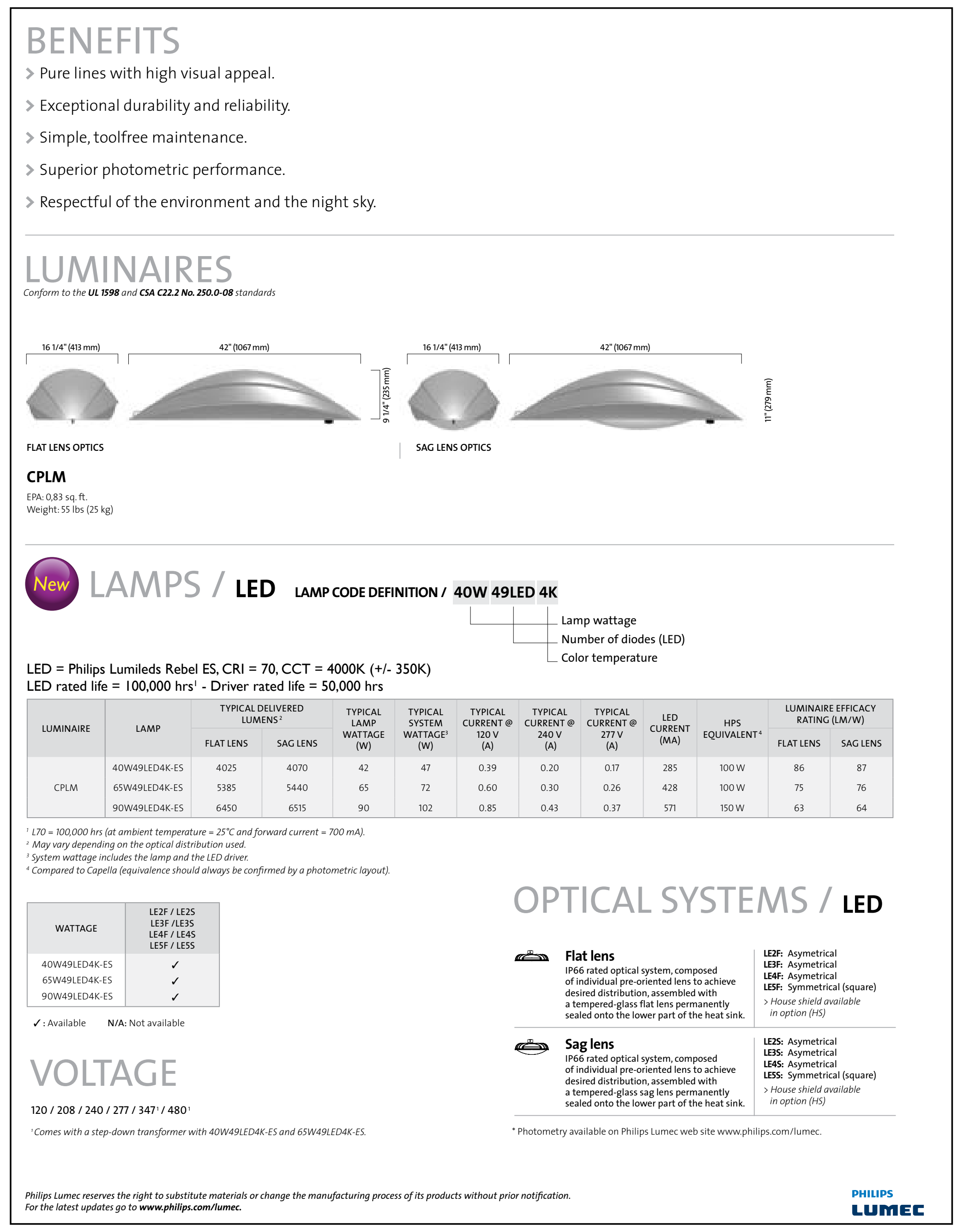
EXC - 6 - UB - G19 - F

Extrusion Finish		Socket Spacing		LED			Globe Style		Globe Color	
Code	Color	Code	Inches (mm)	Code	Color	Watts/Volts	Code	Style	Code	Color
EXC	Satin Aluminum	6	6" (150 mm)	UBLW	2000K White	1.8 W / 24 VAC	G19	G-19	C	Clear
		12	12" (300 mm)	UB	2400K White	1.8 W / 24 VAC	G14	G-14	F	Frosted
		18	18" (450 mm)	VILW	2000K White	1.8 W / 24 VAC	S14	S-14	G	Green
		6C	6" Chase (150 mm)	VI	2400K White	1.8 W / 24 VAC	G-14 & S-14 in clear and frosted only		A	Amber
		12C	12" Chase (300 mm)	Virtual Incandescent (VILW & VI) not for use with Frosted Globes					B	Blue
		Custom spacing is available.		WW	2500K White	0.48 W / 24 VAC			R	Red
				WH	5500K White	0.48 W / 24 VAC			V	Violet
				BL	Blue	0.48 W / 24 VAC			M	Multi-Color
				GR	Green	0.48 W / 24 VAC				
				OR	Orange	0.48 W / 24 VAC				
				PL	Purple	0.48 W / 24 VAC				
				RD	Red	0.48 W / 24 VAC				
				YG	Yellow-Green	0.48 W / 24 VAC				
				(Any Combination of 0.48 Watt Colors is Possible)						
				Xenon Lamp						
				124	2500K	7.5 W / 24 VAC				
				Xenon lamp not for use with G-14 globes						

Custom curving available upon request.

EXC Series
Shown with G-19 Globe

TOKISTAR LIGHTING | 5


BENEFITS

- Pure lines with high visual appeal.
- Exceptional durability and reliability.
- Simple, toolfree maintenance.
- Superior photometric performance.
- Respectful of the environment and the night sky.

LUMINAIRES

*Conform to the **UL 1598** and **CSA C22.2 No. 250.0-08** standards*

FLAT LENS OPTICS

SAG LENS OPTICS

CPLM
EPA: 0,83 sq. ft.
Weight: 55 lbs (25 kg)

New LAMPS / LED

LAMP CODE DEFINITION / 40W 49LED 4K

Lamp wattage
Number of diodes (LED)
Color temperature

LED = Philips Lumileds Rebel ES, CRI = 70, CCT = 4000K (+/- 350K)
LED rated life = 100,000 hrs[1] - Driver rated life = 50,000 hrs

LUMINAIRE	LAMP	TYPICAL DELIVERED LUMENS[2]		TYPICAL LAMP WATTAGE (W)	TYPICAL SYSTEM WATTAGE[3] (W)	TYPICAL CURRENT @ 120 V (A)	TYPICAL CURRENT @ 240 V (A)	TYPICAL CURRENT @ 277 V (A)	LED CURRENT (MA)	HPS EQUIVALENT[4]	LUMINAIRE EFFICACY RATING (LM/W)	
		FLAT LENS	SAG LENS								FLAT LENS	SAG LENS
CPLM	40W49LED4K-ES	4025	4070	42	47	0.39	0.20	0.17	285	100 W	86	87
	65W49LED4K-ES	5385	5440	65	72	0.60	0.30	0.26	428	100 W	75	76
	90W49LED4K-ES	6450	6515	90	102	0.85	0.43	0.37	571	150 W	63	64

[1] *L70 = 100,000 hrs (at ambient temperature = 25°C and forward current = 700 mA).*
[2] *May vary depending on the optical distribution used.*
[3] *System wattage includes the lamp and the LED driver.*
[4] *Compared to Capella (equivalence should always be confirmed by a photometric layout).*

WATTAGE	LE2F / LE2S LE3F / LE3S LE4F / LE4S LE5F / LE5S
40W49LED4K-ES	✓
65W49LED4K-ES	✓
90W49LED4K-ES	✓

✓ : Available **N/A:** Not available

VOLTAGE

120 / 208 / 240 / 277 / 347[1] / 480[1]

[1] *Comes with a step-down transformer with 40W49LED4K-ES and 65W49LED4K-ES.*

OPTICAL SYSTEMS / LED

Flat lens
IP66 rated optical system, composed of individual pre-oriented lens to achieve desired distribution, assembled with a tempered-glass flat lens permanently sealed onto the lower part of the heat sink.

LE2F: Asymetrical
LE3F: Asymetrical
LE4F: Asymetrical
LE5F: Symmetrical (square)
> *House shield available in option (HS)*

Sag lens
IP66 rated optical system, composed of individual pre-oriented lens to achieve desired distribution, assembled with a tempered-glass sag lens permanently sealed onto the lower part of the heat sink.

LE2S: Asymetrical
LE3S: Asymetrical
LE4S: Asymetrical
LE5S: Symmetrical (square)
> *House shield available in option (HS)*

* Photometry available on Philips Lumec web site www.philips.com/lumec.

Philips Lumec reserves the right to substitute materials or change the manufacturing process of its products without prior notification.
*For the latest updates go to **www.philips.com/lumec**.*

PHILIPS LUMEC

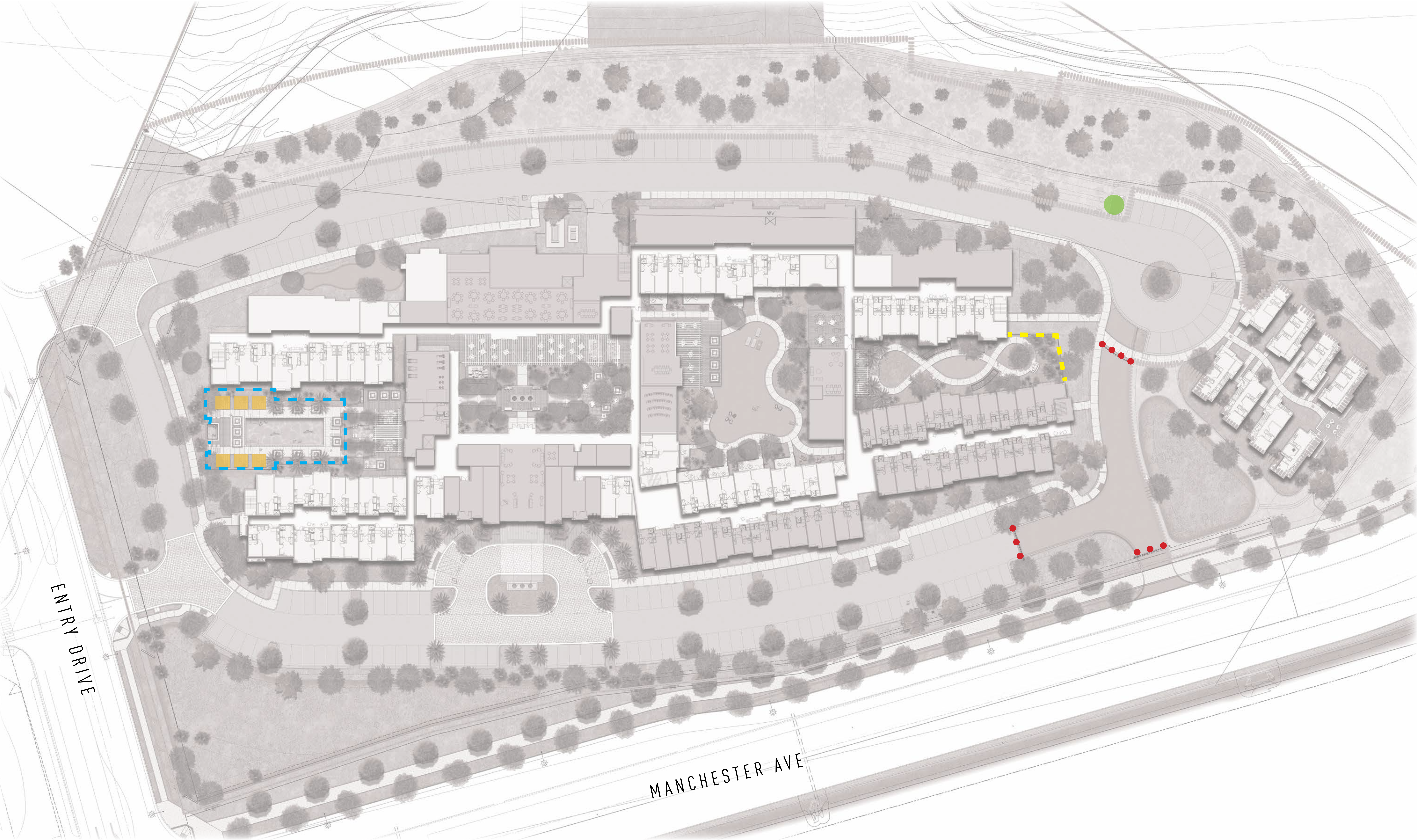
LANDSCAPE LIGHTING FIXTURE CUTSHEETS- LL.4

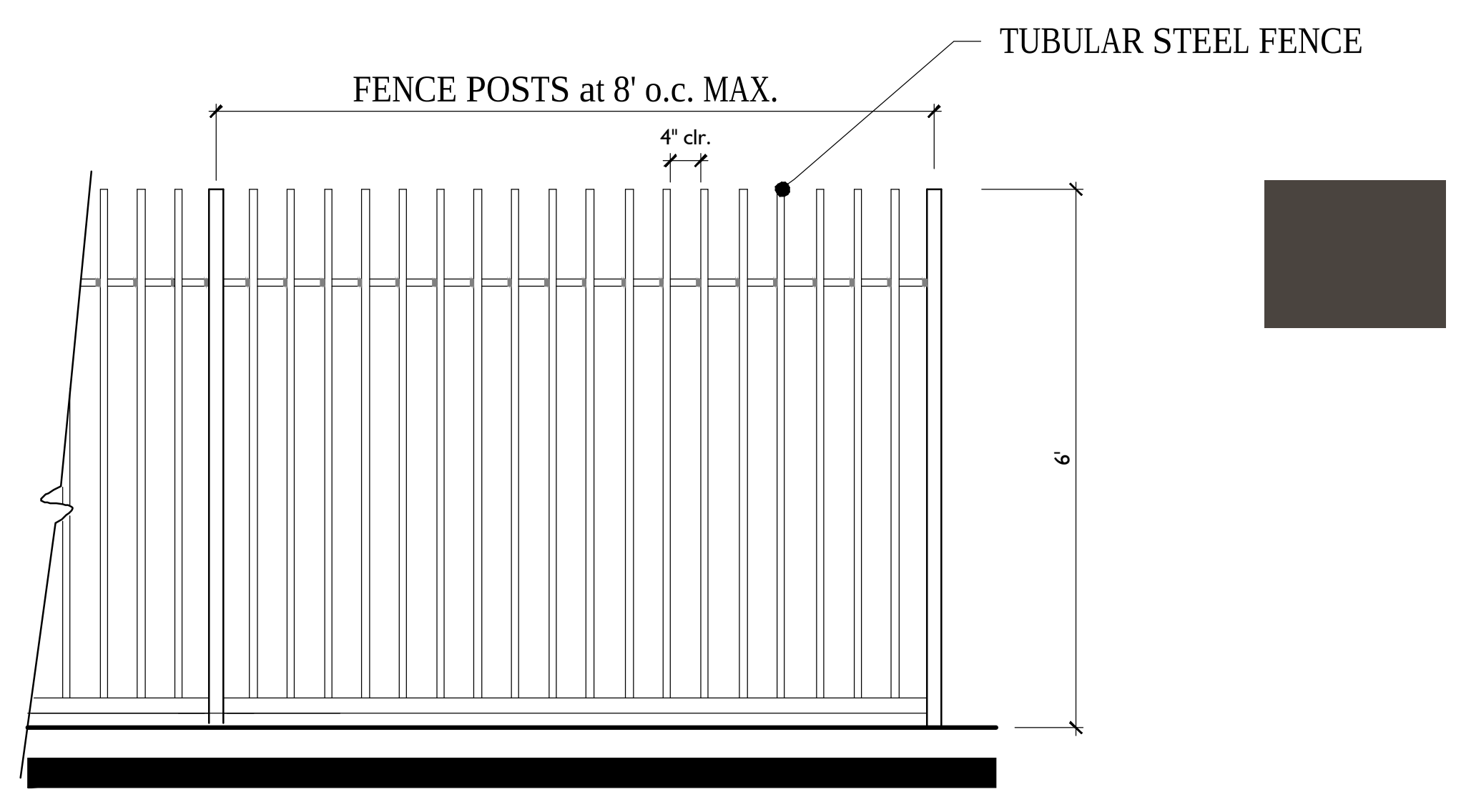
December 5, 2019

PREPARED FOR:
Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

Senior Housing
3111 Manchester Avenue
Cardiff by the Sea, California 92007

MJS
LANDSCAPE
ARCHITECTURE

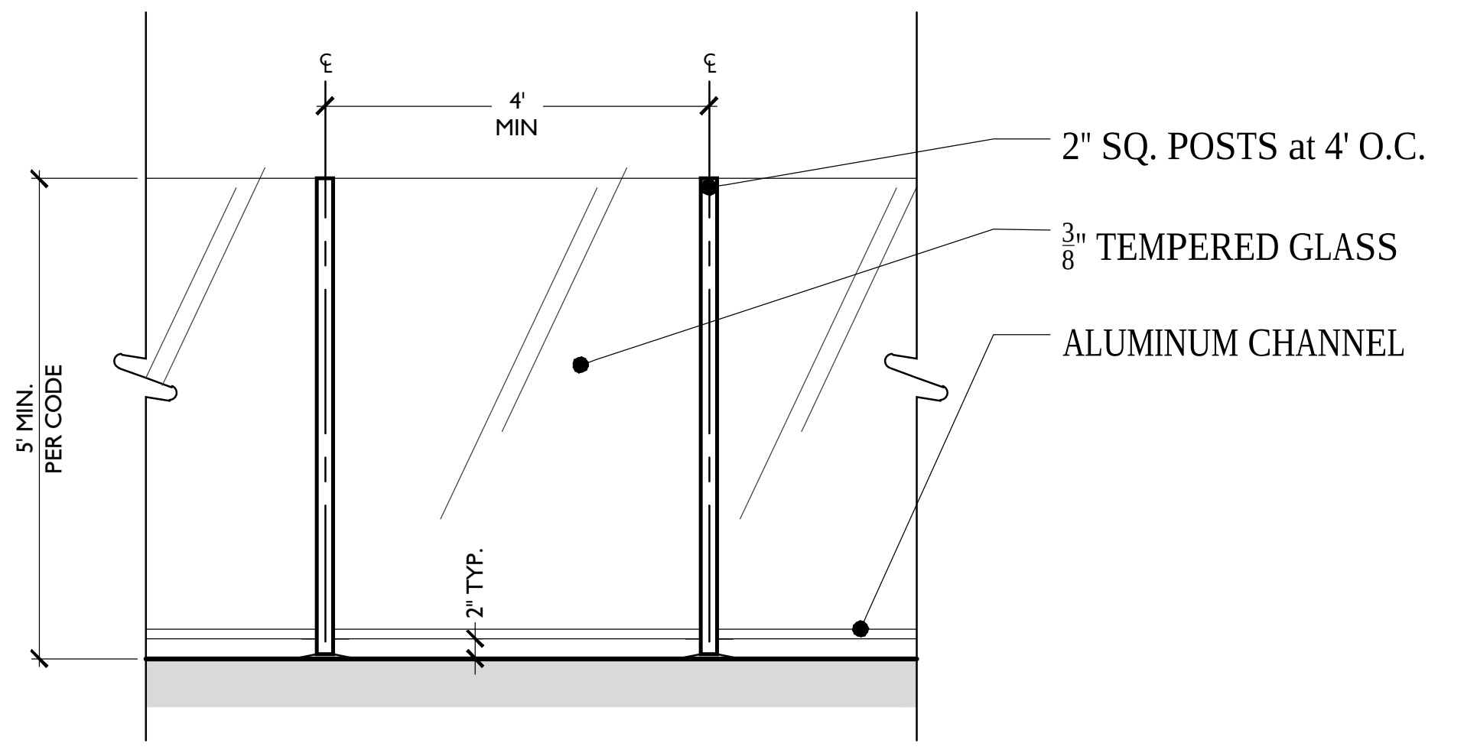




A TUBULAR STEEL FENCE

🟨 🟨 🟨

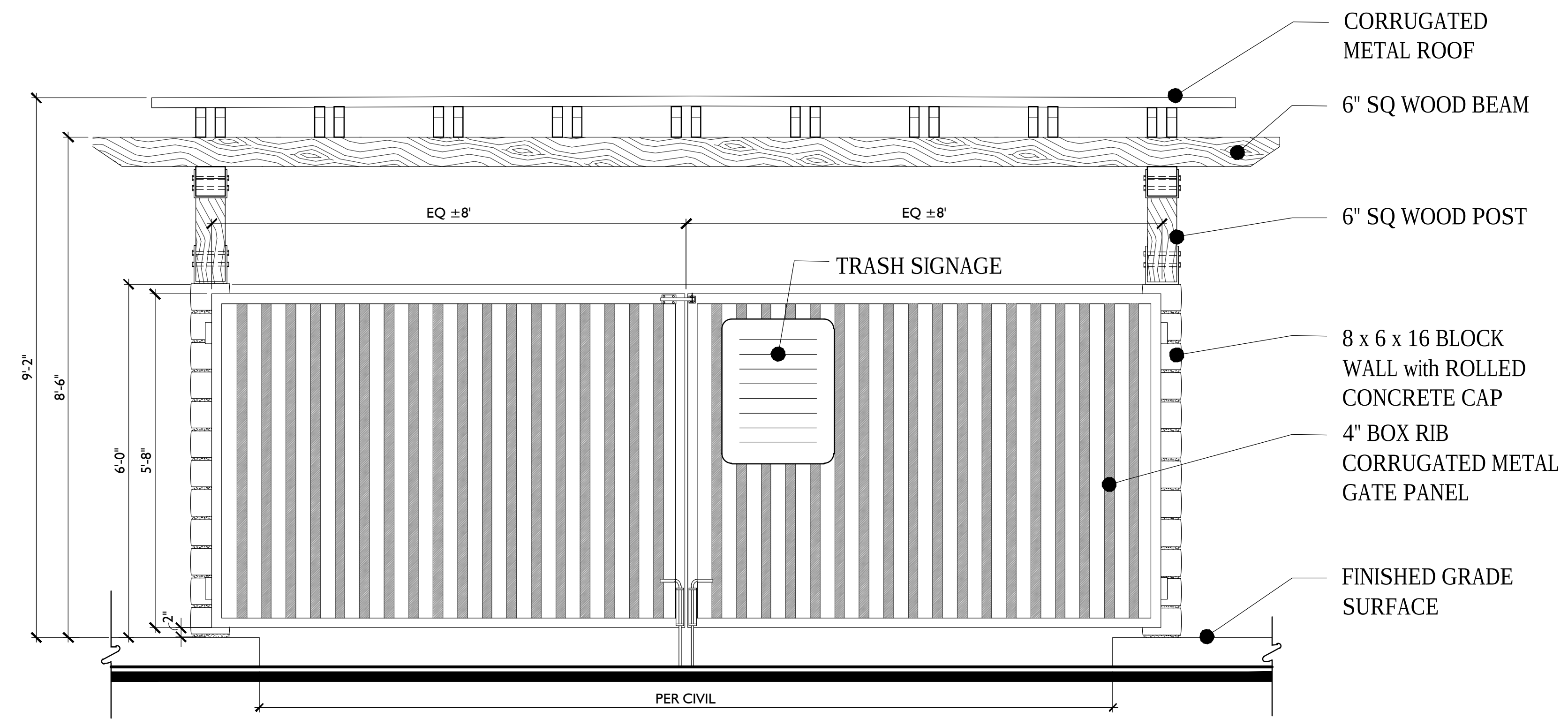
ELEVATION
SCALE: $\frac{1}{2}$" = 1'-0"



B 5' HT GLASS POOL ENCLOSURE

🟦 🟦 🟦

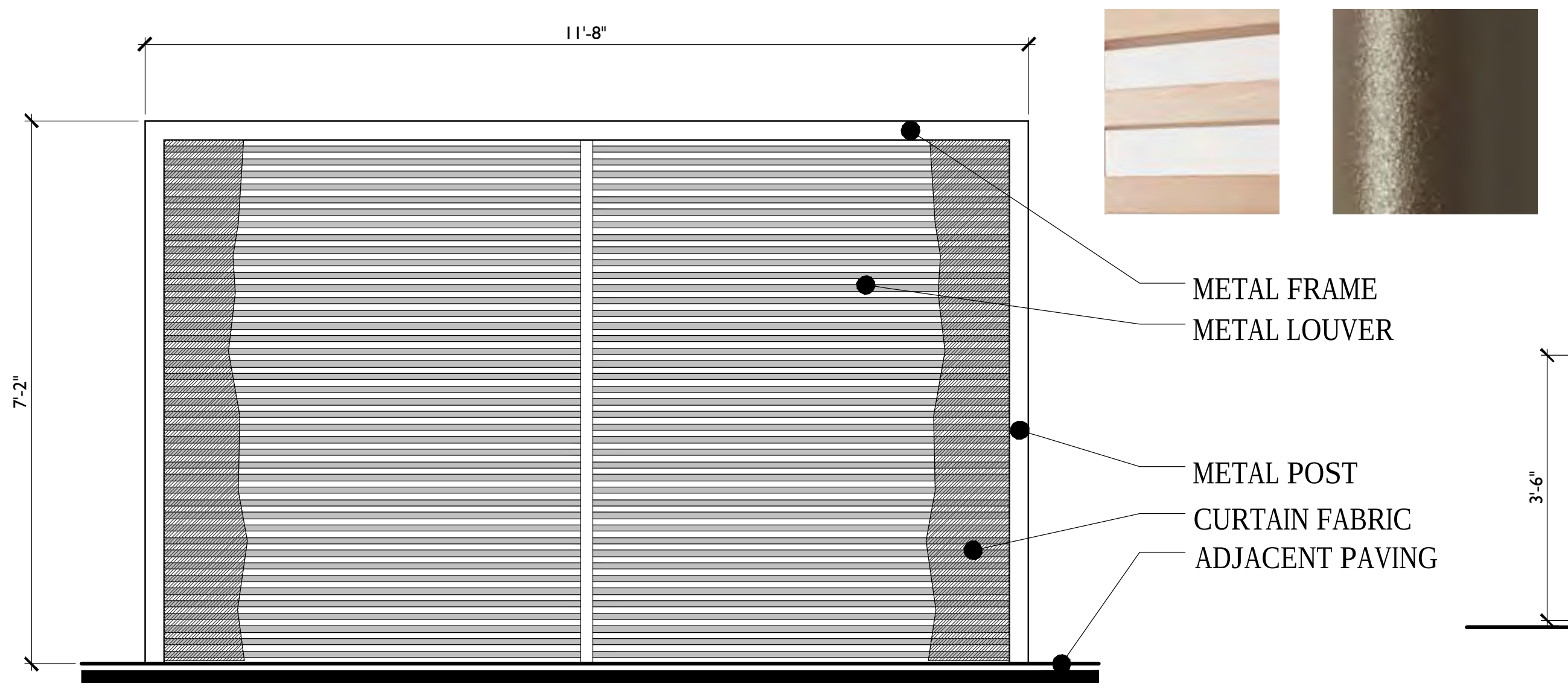
ELEVATION
SCALE: $\frac{1}{2}$" = 1'-0"



E TRASH ENCLOSURE with SOLID ROOF

●

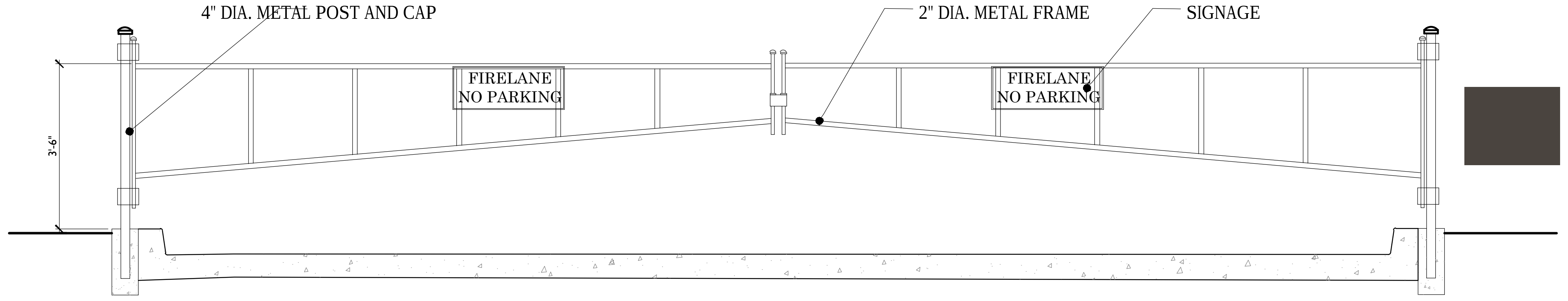
ELEVATION
SCALE: 3/4" = 1'-0"



D CABANA (MANUFACTURER'S DETAIL)

🟨

ELEVATION
SCALE: 1" = 1'-0"



C FIRE GATE

● ● ● ● ●

ELEVATION
SCALE: $\frac{1}{2}$" = 1'-0"

FENCE PLAN AND ELEVATIONS - LF.1

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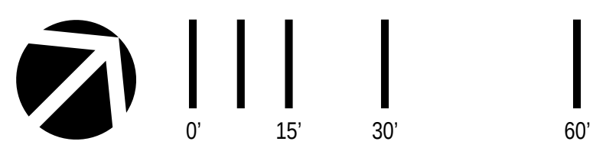

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LANDSCAPE
ARCHITECTURE

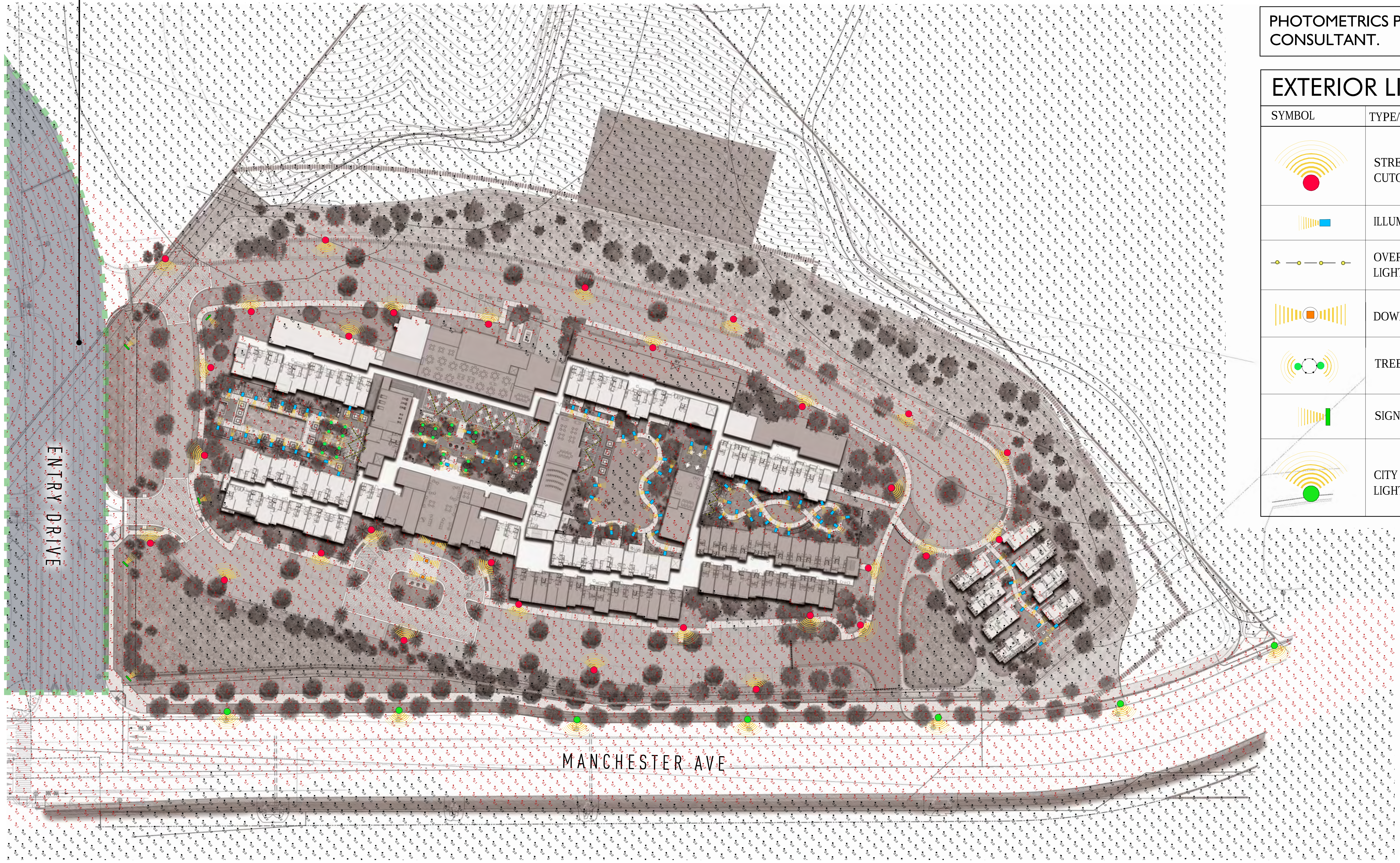

STREET LIGHT


ILLUMINATED BOLLARD


SIGN LIGHT


DOWNLIGHT


OVERHEAD FESTIVAL LIGHT


STREET LIGHTS PER CAL TRANS TO BE REVIEWED UNDER SEPERATE PHOTOMETRIC SUBMITTAL

LIGHTING CONCEPT:

THE OUTDOOR LIGHTING CONCEPT IS TO PROVIDE LEVELS OF LIGHTING SUFFICIENT TO MEET SAFETY AND ORIENTATION NEEDS.

WITHIN PUBLIC AREAS LIGHTING WILL BE WARM COLORED AND UNOBTRUSIVE.

LIGHTING SOURCES FOR THE LANDSCAPE AND PAVED AREAS WILL BE CONCEALED AND THE LIGHTING INDIRECT NOT VISIBLE FROM A PUBLIC VIEWPOINT. LIGHT SOURCES SHOULD BE DIRECTED SO THAT IT DOES NOT FALL OUTSIDE THE AREA TO BE LIGHTED.

ALL EXTERIOR SURFACE AND ABOVE-GROUND MOUNTED FIXTURES WILL BE SYMPATHETIC AND COMPLIMENTARY TO THE ARCHITECTURAL THEME.

PHOTOMETRICS PROVIDED BY CANDELA ELECTRICAL CONSULTANT.

EXTERIOR LIGHTING LEGEND

SYMBOL	TYPE/TECHNIQUE:	LOCATION:
🔴	STREET LIGHT WITH FULL CUTOFF	PARKING LOT & PERIMETER PEDESTRIAN PATHWAYS
🟦	ILLUMINATED BOLLARD	PEDESTRIAN PATHWAYS
·—·—·—·	OVERHEAD FESTIVAL LIGHTING	OVERHEAD STRUCTURES
🟧	DOWNLIGHT	ENTRY COURT
◌	TREE DOWNLIGHT	COURTYARD TREE
🟩	SIGN LIGHT	ENTRY WAYFINDING SIGNS
🟢	CITY STANDARD STREET LIGHT	CITY STREETS

STREETSCAPE LIGHTING PLAN

December 5, 2019

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Greystar
444 South Cedros Ave, Suite 172
Solana Beach, CA 92075

Senior Housing

3111 Manchester Avenue
Cardiff by the Sea, California 92007

0' 25' 50' 100'

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LANDSCAPE ARCHITECTURE