



Preliminary Water Quality Management Plan (WQMP)

Project Name:

**Huntington Beach Senior Living
Bolsa Chica Street/Warner Avenue S/W Quad
Huntington Beach, California 92649**

PA 2021-0185, CUP 2021-024, VAR 2021-003, GPA 2021-004, ZMA 2021-003, EA 2021-004

Prepared For:

Hines

**444 South Flower Street - Suite 2100
Los Angeles, CA 90071
(415) 250-4422**

Prepared By:



**Civil Engineer: James H. Kawamura, P.E.
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17530 Von Karman Avenue - Suite 200
Irvine, California 92614
(949) 756-6440**

**Prepared Date: October 15, 2021
Revised Date(s): April 5, 2022**

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ATTESTATION

This Preliminary Water Quality Management Plan has been prepared by, and under the direction of the undersigned, a duly Registered Civil Engineer in the State of California. Except as noted, the undersigned attests to the technical information contained herein, and has judged to be acceptable the qualifications of any technical specialists providing engineering data for this report, upon which findings, conclusions, and recommendations are based.

Preparer (Engineer): James H. Kawamura, P.E.			
Title	President/CEO	PE Registration #	C30560
Company	KHR Associates		
Address	17530 Von Karman Avenue – Suite 200, Irvine, California 92614		
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Telephone No.	(949) 756-6440		
I hereby certify that this Water Quality Management Plan is in compliance with, and meets the requirements set forth in, Order No. R8-2009-0030/NPDES No. CAS618030, of the Santa Ana Regional Water Quality Control Board.			
Preparer Signature		Date	April 5, 2022
Place Stamp Here			

Project Owner's Certification			
Planning/ Application No.	PA 2021-0185, CUP 2021-024, VAR 2021-003, GPA 2021-004, ZMA 2021-003, EA 2021-004	Grading Permit No.	
Tract/Parcel Map No.	A Portion of Lot 2 in Block 20 of Tract No. 86	Building Permit No.	
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract)			APN 163-281-01, 163-281-02

This Preliminary Water Quality Management Plan (WQMP) has been prepared for **Hines**, Los Angeles, by **KHR Associates**, Irvine, California. The Preliminary WQMP is intended to demonstrate the intention to comply with the requirements of the local NPDES Stormwater Program for the subject project.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with the current Orange County Drainage Area Management Plan (DAMP) and the intent of the non-point source NPDES Permit for Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the incorporated Cities of Orange County within the Santa Ana Region. Once the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement and amend the WQMP. An appropriate number of approved and signed copies of this document shall be available on the subject site in perpetuity.

Owner: Ben Morrison			
Title	Development Manager		
Company	Hines		
Address	444 S. Flower Street, Suite 2100		
Email	Ben.Morrison@hines.com		
Telephone No.	(415) 250-4422		
Signature		Date	

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Section I Discretionary Permit(s) and Water Quality Conditions

Project Information			
Planning/ Application No.	PA 2021-0185, CUP 2021-024, VAR 2021-003, GPA 2021-004, ZMA 2021-003, EA 2021-004	Tract/Parcel Map No.	A Portion of Lot 2 in Block 20 of Tract No. 86
Additional Information/ Comments:			
Water Quality Conditions			
Water Quality Conditions (list verbatim)	<p>THE FOLLOWING DEVELOPMENT REQUIREMENTS SHALL BE COMPLETED PRIOR TO ISSUANCE OF A PRECISE GRADING PERMIT:</p> <p>7. A Project Water Quality Management Plan (WQMP) conforming to the current Waste Discharge Requirements Permit for the County of Orange (Order No. R8-2009-0030) [MS4 Permit] prepared by a Licensed Civil Engineer, shall be submitted to the Department of Public Works for review and acceptance. The WQMP shall address Section XII of the MS4 Permit and all current surface water quality issues.</p> <p>8. The project WQMP shall include the following:</p> <ul style="list-style-type: none">a. Low Impact Development.b. Discusses regional or watershed programs (if applicable).c. Addresses Site Design BMPs (as applicable) such as minimizing impervious areas, maximizing permeability, minimizing directly connected impervious areas, creating reduced or “zero discharge” areas, and conserving natural areas.d. Incorporates the applicable Routine Source Control BMPs as defined in the Drainage Area Management Plan (DAMP).e. Incorporates Treatment Control BMPs as defined in the DAMP		

- f. Generally describes the long-term operation and maintenance requirements for the Treatment Control BMPs.
 - g. Identifies the entity that will be responsible for long-term operation and maintenance of the Treatment Control BMPs.
 - h. Describes the mechanism for funding the long-term operation and maintenance of the Treatment Control BMPs.
 - i. Includes an Operations and Maintenance (O&M) Plan for all structural BMPs.
 - j. After incorporating plan check comments of Public Works, three final WQMPs (signed by the owner and the Registered Civil Engineer of record) shall be submitted to the Public Works for acceptance. After acceptance, two copies of the final report shall be returned to applicant for production of a single complete electronic copy of the accepted version of the WQMP on CD media that includes:
 - i. The 11" by 17" Site Plan in .TIFF format (400 by 400 dpi minimum)
 - ii. The remainder of the complete WQMP in .PDF format including the signed and stamped title sheet, owner's certification sheet, Inspection/Maintenance Responsibility sheet, appendices, attachments and all educational material.
 - k. The applicant shall return one CD media to Public Works for the project record file.
9. Indicate the type and location of Water Quality Treatment Control Best Management Practices (BMPs) on the Grading Plan consistent with the Project WQMP. The WQMP shall follow the City of Huntington Beach; Project Water Quality Management Plan Preparation Guidance Manual dated June 2008. The WQMP shall be submitted with the first submittal of the Grading Plan.
10. In complexes larger than 100 dwelling units where car washing is allowed, a designated car wash area that does not drain to a storm drain system shall be provided for community usage. Wash water from this area may be directed to the sanitary sewer (upon approval from Orange County Sanitation District), to an engineered infiltration system, or to an equally effective alternative. Pre-treatment may also be required. (DAMP)
11. A suitable location, as approved by the City, shall be depicted on the grading plan for the necessary trash enclosure(s). The area shall be paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, and screened or

	<p>walled to prevent off-site transport of trash. The trash enclosure area shall be covered or roofed with a solid, impervious material. Connection of trash area drains into the storm drain system is prohibited. If feasible, the trash enclosure area shall be connected into the sanitary sewer. (DAMP)</p> <p>THE FOLLOWING DEVELOPMENT REQUIREMENTS SHALL BE COMPLETED PRIOR TO FINAL INSPECTION OR OCCUPANCY:</p> <p>36. Prior to grading or building permit close-out and/or the issuance of a certificate of use or a certificate of occupancy, the applicant shall:</p> <ol style="list-style-type: none"> Demonstrate that all structural Best Management Practices (BMPs) described in the Project WQMP have been constructed and installed in conformance with approved plans and specifications. Demonstrate all drainage courses, pipes, gutters, basins, etc. are clean and properly constructed. Demonstrate that applicant is prepared to implement all non-structural BMPs described in the Project WQMP. Provide certification from the Engineer of Record or Landscape architect that the LID BMPs were constructed and installed per the approved project plans and specifications. The certifications shall be included in the final WQMP. Demonstrate that an adequate number of copies of the approved Project WQMP are available for the future occupiers. Demonstrate that the preparer of the WQMP has reviewed the BMP maintenance requirements in Section V of the WQMP with the responsible person and that a copy of the WQMP has been provided to the person. A certification letter from the WQMP preparer may be used to satisfy this condition.
Watershed-Based Plan Conditions	
<p>Provide applicable conditions from watershed - based plans including WIHMPs and TMDLS.</p>	<p>As of this dated report, neither a WIHMP nor TMDLS have been developed for Anaheim Bay-Huntington Harbor.</p>

Section II Project Description

II.1 Project Description

Description of Proposed Project		
Development Category (Verbatim from WQMP):	<p>All significant redevelopment projects, where significant redevelopment is defined as the addition or replacement of 5,000 or more square feet of impervious surface on an already developed site. Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of the facility, or emergency redevelopment activity required to protect public health and safety.</p> <p>If the redevelopment results in the addition or replacement of less than 50 percent of the impervious area on-site and the existing development was not subject to WQMP requirement, the numeric sizing criteria discussed in Section 7.II-2.0 only applies to the addition or replacement area. If the addition or replacement accounts for 50 percent or more of the impervious area, the Project WQMP requirements apply to the entire development.</p>	
Project Area Disturbed: 122,392 sf (2.81 ac)	Number of Dwelling Units: 236	SIC Code: 8811 & 8361
Narrative Project Description:	<p>For the overall project, Hines is proposing a 5-story, 236-unit senior living development with 1-level of subterranean parking on 2.81 net acre site located on the southwest corner of Warner Avenue and Bolsa Chica Street. The project will include independent living, assisted living, memory care, common areas, pool/spa, fitness center, and roof decks. Exposed impervious areas include the building, walks, roof decks, and the drive aisle. Landscaped areas are located around the perimeter of the site and within the courtyards. Landscaping consists of drought tolerant or native species grouped with similar irrigation needs. On-site activities will take place within the common areas and open space areas, and include the use of the pool within the courtyard, and the use of the indoor dining area, lounge, fitness center, etc., on the ground floor. Food service will occur within the kitchen and dining area inside the building. A laundry facility is located within a central area on the ground floor. Trash enclosures are enclosed within the ground level of the building. Materials expected to be used/stored will be maintenance materials stored within the building. Waste expected from the site is trash from residential tenants and staff, along with landscape waste. Equipment and vehicle fueling, maintenance</p>	

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	and repair, and washing or cleaning will not be performed onsite.			
Project Area: 122,392 sf (2.81 ac)	Pervious		Impervious	
	Area (acres or sq ft)	Percentage	Area (acres or sq ft)	Percentage
Pre-Project Conditions	9,690 sf	8	112,702 sf	92
Post-Project Conditions	17,796 sf	15	104,596 sf	85
Drainage Patterns/Connections	<p>Drainage from the existing project area sheet flows into ribbon gutters that drain into the adjacent streets from either the driveways, or, in one location, through an inlet that discharges to curb face. Approximately 68,016 square feet of existing area drains into Bolsa Chica Street, where it drains northerly for collection by a municipal catch basin located just prior to Warner Avenue. Approximately 31,693 square feet of existing area drains into Warner Avenue, where it drains easterly for collection by a municipal catch basin located just prior to Bolsa Chica Street, and approximately 22,618 square feet of existing area discharges to curb face on Warner Avenue, where it drains westerly to the municipal catch basin.</p>			
	<p>Both catch basins connect to a northerly flowing 48-inch reinforced concrete pipe (RCP) storm drain in Bolsa Chica Street that increases to a 60-inch concrete pipe, and further increases to a 72-inch concrete pipe prior to discharging to the Sunset Channel. The Sunset Channel discharges into Huntington Harbour and Anaheim Bay.</p>			
	<p>Drainage from the proposed project area will be collected by roof drains and inlets that will be directed to a treatment system prior to discharge into the back of a municipal catch basin. The potential treatment systems currently being considered for the proposed site include biofiltration (flow through) planters; Modular Wetlands Systems; or, a combination of biofiltration planters and Modular Wetlands Systems. Determination of the treatment options will be made once a plumbing engineer is on the design team. From the treatment system, flows will be directed via the on-site storm drain system to the back of an existing catch basin adjacent the site in Bolsa Chica Street and/or Warner Avenue. The storm drain laterals from these catch basins connect to an MS4 within Bolsa Chica Street.</p>			

II.2 Potential Stormwater Pollutants

Pollutants of Concern			
Pollutant	Highlight One: E=Expected to be of concern N=Not Expected to be of concern		Additional Information and Comments
Suspended-Solid/ Sediment	E	N	Residential (Landscaping)
Nutrients	E	N	Residential (Landscaping)
Heavy Metals	E	N	
Pathogens (Bacteria/Virus)	E	N	Residential
Pesticides	E	N	Residential (Landscaping)
Oil and Grease	E	N	Residential
Toxic Organic Compounds	E	N	
Trash and Debris	E	N	Residential

II.3 Hydrologic Conditions of Concern

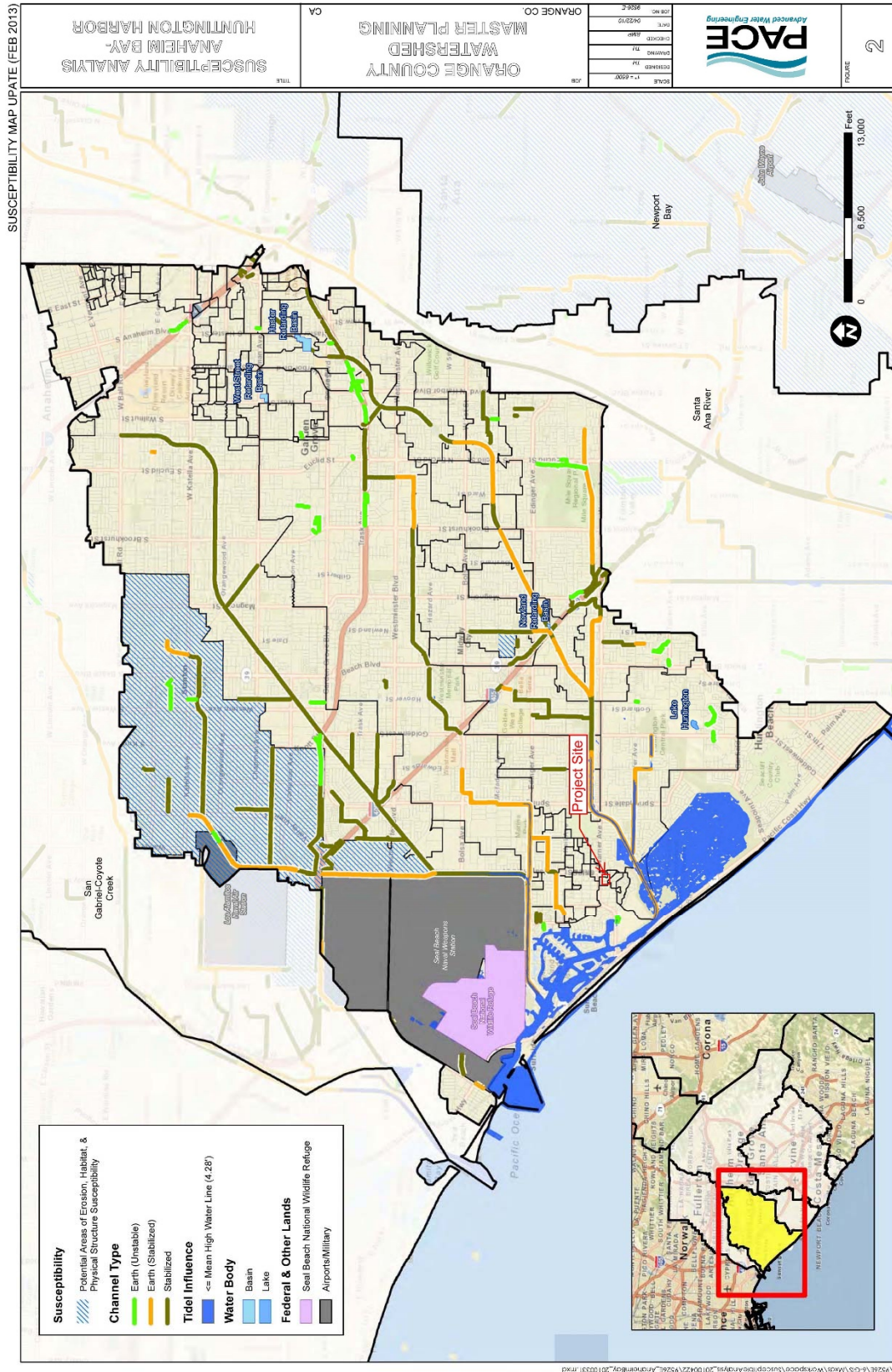
Determine if streams located downstream from the project area are determined to be potentially susceptible to hydromodification impacts. *Refer to Section 2.2.3.1 in the TGD for NOC.*

☒ No – Show map

☐ Yes – Describe applicable hydrologic conditions of concern below. *Refer to Section 2.2.3 in the TGD.*

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II.4 Post Development Drainage Characteristics

Drainage from the proposed project area will be collected by roof drains and inlets that will be directed to a treatment system prior to discharge into the back of a municipal catch basin. The potential treatment systems currently being considered for the proposed site include biofiltration (flow through) planters; Modular Wetlands Systems; or, a combination of biofiltration planters and Modular Wetlands Systems. Determination of the treatment options will be made once a plumbing engineer is on the design team. From the treatment system, flows will be directed via the on-site storm drain system to the back of an existing catch basin adjacent the site in Bolsa Chica Street and/or Warner Avenue. The storm drain laterals from these catch basins connect to an MS4 within Bolsa Chica Street.

Public Storm Drain System

The City-owned catch basins located on the southwest corner of Warner Avenue and Bolsa Chica Street connect to a northerly flowing 48-inch reinforced concrete pipe (RCP) storm drain in Bolsa Chica Street, which increases in size to a 60-inch concrete pipe and then a to 72-inch concrete pipe prior to discharging into the Sunset Channel. The Sunset Channel terminates in Huntington Harbour.

II.5 Property Ownership/Management

Hines is the owner of the subject property and shall be responsible for the long term funding, operation, and maintenance of all specified BMPs. No on-site infrastructures will be transferred to any public agency. If there is a change of ownership, a Notice of Transfer of Responsibility must be submitted to the City of Huntington Beach (Attachment C).

Section III Site Description

III.1 Physical Setting

Planning Area/ Community Name	N/A
Location/ Address	SW Corner of Warner Avenue and Bolsa Chica Street 4952 & 4972 Warner Avenue
Land Use	CG (Commercial General)
Zoning	CG (Commercial General)
Acreage	2.81
Predominant Soil Type	D

III.2 Site Characteristics

Precipitation Zone	0.75
Topography	Site topography is relatively flat with the southwest portion of the site being at a higher elevation and the northeastern portion of the site being a slightly lower elevation.
Drainage Patterns/Connections	<p>Drainage from the existing project area sheet flows into ribbon gutters that drain into the adjacent streets from either the driveways, or, in one location, through an inlet that discharges to curb face. Approximately 68,016 square feet of existing area drains into Bolsa Chica Street, where it drains northerly for collection by a municipal catch basin located just prior to Warner Avenue. Approximately 31,693 square feet of existing area drains into Warner Avenue, where it drains easterly for collection by a municipal catch basin located just prior to Bolsa Chica Street, and approximately 22,618 square feet of existing area discharges to curb face on Warner Avenue, where it drains westerly to the municipal catch basin.</p> <p>Both catch basins connect to a northerly flowing 48-inch reinforced concrete pipe (RCP) storm drain in Bolsa Chica Street that increases to a 60-inch concrete pipe, and further increases to a 72-inch concrete pipe prior to discharging to the Sunset Channel. The Sunset Channel discharges into Huntington Harbour and Anaheim Bay.</p>
Soil Type, Geology, and Infiltration Properties	According to the geotechnical report dated July 26, 2021 by Langan, Irvine, California (Attachment G), the site is underlain by fill underlain by alluvial deposits. The alluvial deposits were encountered in borings LB-1 through LB-3 and consisted of medium dense to dense fine sands with varying amounts of silts and clays extending to about 23 to 25 feet below grade. In LB-1

	and LB-3, these soils were underlain by firm to very stiff clay with trace amounts of fine sands extending to approximately 35 feet below grade, underlain by medium dense to dense fine sand with some clay. In LB-2, medium dense sand layers with varying levels of silt and clay were encountered closer to the surface in the 30 feet and 35 feet samples, underlain by a stiff clay layer with some fine sand.
Site Characteristics (continued)	
Hydrogeologic (Groundwater) Conditions	According to the geotechnical report dated July 26, 2021 by Langan, Irvine, California (Attachment G), groundwater was first encountered at the depth of 46.2 feet and measured 15 minutes later at 44.7 feet below grade in boring LB-2; groundwater was not encountered in borings LB-1 or LB-3.
Geotechnical Conditions (relevant to infiltration)	The site is listed on the State Water Resources Control Board's GeoTracker database as a LUST Cleanup Site due to a Chevron Texaco Station that was historically located on the northeast corner of the site (4972 Warner Avenue), precluding infiltration at the site.
Off-Site Drainage	Current and proposed conditions preclude offsite drainage from entering the site.
Utility and Infrastructure Information	Any existing on-site utilities will be removed, disposed of, and replaced, as required for the proposed building's use.

III.3 Watershed Description

Receiving Waters	Stormwater discharged from the site will be directed to a Municipal Separate Storm Sewer System (MS4) that discharges into the westerly flowing Sunset Channel. The Sunset Channel flows into Huntington Harbor and Anaheim Bay.
303(d) Listed Impairments	<u>Huntington Harbour: Chlordane; Copper; Indicator Bacteria; Lead; PCBs; Toxicity</u> <u>Anaheim Bay: Nickel; PCBs; Toxicity</u>
Applicable TMDLs	N/A
Pollutants of Concern for the Project	Suspended Solids/Sediments, Nutrients, Pathogens, Pesticides, Oil & Grease, Trash & Debris
Environmentally Sensitive and Special Biological Significant Areas	N/A

Section IV Best Management Practices (BMPs)

IV.1 Project Performance Criteria

(NOC Permit Area only) Is there an approved WIHMP or equivalent for the project area that includes more stringent LID feasibility criteria or if there are opportunities identified for implementing LID on regional or sub-regional basis?	YES ☐	NO ☒
If yes, describe WIHMP feasibility criteria or regional/sub-regional LID opportunities.	A WIHMP has not yet been developed for the project area.	

Project Performance Criteria (continued)	
If HCOC exists, list applicable hydromodification control performance criteria (Section 7.II-2.4.2.2 in MWQMP)	According to the TGD's Susceptibility Analysis Anaheim Bay-Huntington Harbor Map, downstream streams are not susceptible to hydromodification impacts. See Map in Section II.3.
List applicable LID performance criteria (Section 7.II-2.4.3 from MWQMP)	<p>The following performance criteria for LID implementation are stated in both permits:</p> <ul style="list-style-type: none"> • Priority Projects must infiltrate, harvest and use, evapotranspire, or biotreat/biofilter, the 85th percentile, 24-hour storm event (Design Capture Volume). • A properly designed biotreatment system may only be considered if infiltration, harvest and use, and evapotranspiration (ET) cannot be feasibly implemented for the full design capture volume. In this case, infiltration, harvest and use, and ET practices must be implemented to the greatest extent feasible and biotreatment may be provided for the remaining design capture volume. <p>The following performance criteria result in capture and retention and/or biotreatment of 80 percent of average annual stormwater runoff volume. The performance criteria for LID are stated as follows:</p> <ul style="list-style-type: none"> • LID BMPs must be designed to retain, on-site, (infiltrate, harvest and use, or evapotranspire) stormwater runoff up to 80 percent average annual capture efficiency • LID BMPs must be designed to:

	<ul style="list-style-type: none"> o Retain, on-site, (infiltrate, harvest and use, or evapotranspire) stormwater runoff as feasible up to the Design Capture Volume, and o Recover (i.e., draw down) the storage volume as soon as possible after a storm event (see criteria for maximizing drawdown rate in the TGD Appendix XI), and, if necessary o Biotreat, on-site, additional runoff, as feasible, up to 80 percent average annual capture efficiency (cumulative, retention plus biotreatment), and, if necessary o NOC Permit Area only – retain or biotreat, in a regional facility, the remaining runoff up to 80 percent average annual capture efficiency (cumulative, retention plus biotreatment, on-site plus off-site), and, if necessary o Fulfill alternative compliance obligations for runoff volume not retained or biotreated up to 80 percent average annual capture efficiency using treatment controls or other alternative approaches as described in Section 7.II-3.
List applicable treatment control BMP performance criteria (Section 7.II-3.2.2 from MWQMP)	<p>If it is not feasible to meet LID performance criteria through retention and/or biotreatment provided on-site or at a sub-regional/regional scale, then treatment control BMPs shall be provided on-site or offsite prior to discharge to waters of the US. Sizing of treatment control BMP(s) shall be based on either the unmet volume after claiming applicable water quality credits, if appropriate (See MWQMP Section 7.II-3.1 Water Quality Credits) and as calculated in TGD Appendix VI. If treatment control BMPs can treat all of the remaining unmet volume and have a medium to high effectiveness for reducing the primary POCs, the project is considered to be in compliance; a waiver application and participation in an alternative program is not required.</p> <p>If the cost of providing treatment control BMPs greatly outweighs the pollution control benefits they would provide, a waiver of treatment control and LID requirements can be requested and alternative compliance approaches must be used to fulfill the remaining unmet volume (See Section 7.II-3.3).</p> <p>The selected Treatment Control BMPs are sized to treat either the Stormwater Quality Design Flow (SQDF) or Stormwater Quality Design Volume (SQDV). The SQDF is the maximum flow rate of runoff produced from a rainfall intensity of 0.2-inch of rainfall per hour, and the SQDV is the volume of runoff produced from a 24-hour 85th percentile storm event, as determined from the local historical rainfall record for the project area.</p>

Calculate LID design storm capture volume for Project (DCV)

This project will utilize BIO-1 Bioretention with underdrains and/or BIO-7 Proprietary Biotreatment device (Modular Wetlands System) as the LID BMP(s). Calculations are provided in Attachment F.

IV.2 Site Design And Drainage Plan

The proposed project scope includes a new building, walkways, courtyards, and landscaping. The walkways and courtyards will drain to adjacent landscaping whenever possible. Stormwater will be collected through roof drains or inlets and directed to either biofiltration planters or Modular Wetlands Systems for treatment. From the treatment system, flows will be directed via the on-site storm drain system to the back of an existing catch basin adjacent the site in Bolsa Chica Street and/or Warner Avenue. The storm drain lateral from these catch basins connect to an MS4 within Bolsa Chica Street.

Modular Wetlands Calculation Summary

DMA # (Subarea)	DMA Area (AC)	SQDF (CFS)	Tributary Area Type	MWS Size & Treatment Capacity
DMA #1	2.81	0.60	Building, Walkways, Courtyards, & Landscaping	MWS-L-8-24 0.693 cfs

Biofiltration w/Underdrain Calculation Summary

DMA # (Subarea)	DMA Area (AC)	DCV (CF)	Tributary Area Type	Minimum Biofiltration Planter Footprint (SF)
DMA #1	2.81	6,311	Building, Walkways, Courtyards, & Landscaping	3,884

IV.3 LID BMP Selection And Project Conformance Analysis

IV.3.1 Hydrologic Source Controls

Name	Included?
Localized on-lot infiltration	☐
Impervious area dispersion (e.g. roof top disconnection)	☐
Street trees (canopy interception)	☐
Residential rain barrels (not actively managed)	☐
Green roofs/ Brown roofs	☐
Blue roofs	☐
Impervious area reduction (e.g. permeable pavers, site design)	☐
Other:	☐

N/A

IV.3.2 Infiltration BMPs

Name	Included?
Bioretention without underdrains	☐
Rain gardens	☐
Porous landscaping	☐
Infiltration planters	☐
Retention swales	☐
Infiltration trenches	☐
Infiltration basins	☐
Drywells	☐
Subsurface infiltration galleries	☐
French drains	☐
Permeable asphalt	☐
Permeable concrete	☐
Permeable concrete pavers	☐
Other:	☐

N/A

IV.3.3 Evapotranspiration, Rainwater Harvesting BMPs

Name	Included?
All HSCs; <i>See Section IV.3.1</i>	☐
Surface-based infiltration BMPs	☐
Biotreatment BMPs	☐
Above-ground cisterns and basins	☐
Underground detention	☐
Other:	☐
Other:	☐

N/A

IV.3.4 Biotreatment BMPs

Name	Included?
Bioretention with underdrains	☒
Stormwater planter boxes with underdrains	☐
Rain gardens with underdrains	☐
Constructed wetlands	☐
Vegetated swales	☐
Vegetated filter strips	☐
Proprietary vegetated biotreatment systems	☒
Wet extended detention basin	☐
Dry extended detention basins	☐
Other:	☐
Other:	☐

Information sheets for the BMPs are included in Attachment B (BIO-7 Proprietary Biotreatment and Modular Wetlands) and the sizing calculations are located in Attachment F.

IV.3.5 Hydromodification Control BMPs

Hydromodification Control BMPs	
BMP Name	BMP Description

IV.3.6 Regional/Sub-Regional LID BMPs

Regional/Sub-Regional LID BMPs

IV.3.7 Treatment Control BMPs

Treatment Control BMPs	
BMP Name	BMP Description

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V.3.8 Non-structural Source Control BMPs

Non-Structural Source Control BMPs				
Identifier	Name	Check One		If not applicable, state brief reason
		Included	Not Applicable	
N1	Education for Property Owners, Tenants and Occupants	☒	☐	
N2	Activity Restrictions	☒	☐	
N3	Common Area Landscape Management	☒	☐	
N4	BMP Maintenance	☒	☐	
N5	Title 22 CCR Compliance (How development will comply)	☐	☒	Project does not contain hazardous substances.
N6	Local Industrial Permit Compliance	☐	☒	Project is not an industrial site.
N7	Spill Contingency Plan	☐	☒	Project does not contain hazardous substances.
N8	Underground Storage Tank Compliance	☐	☒	Project site does not have any UST's.
N9	Hazardous Materials Disclosure Compliance	☐	☒	Project does not contain hazardous substances.
N10	Uniform Fire Code Implementation	☐	☒	Project does not contain hazardous substances.
N11	Common Area Litter Control	☒	☐	
N12	Employee Training	☒	☐	
N13	Housekeeping of Loading Docks	☒	☐	
N14	Common Area Catch Basin Inspection	☒	☐	
N15	Street Sweeping Private Streets and Parking Lots	☒	☐	
N16	Retail Gasoline Outlets	☐	☒	Project site does not include a retail gasoline outlet.

IV.3.9 Structural Source Control BMPs

Structural Source Control BMPs				
Identifier	Name	Check One		If not applicable, state brief reason
		Included	Not Applicable	
S1	Provide storm drain system stenciling and signage	☒	☐	
S2	Design and construct outdoor material storage areas to reduce pollution introduction	☐	☒	No outdoor material storage proposed
S3	Design and construct trash and waste storage areas to reduce pollution introduction	☒	☐	
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	☒	☐	
S5	Protect slopes and channels and provide energy dissipation	☐	☒	Project does not have any slopes or channels.
	Incorporate requirements applicable to individual priority project categories (from SDRWQCB NPDES Permit)	☐	☒	Project is within SARWQCB NPDES Permit area and is not subject to this criterion.
S6	Dock areas	☐	☒	Project does not have dock areas.
S7	Maintenance bays	☐	☒	Project does not have maintenance bays.
S8	Vehicle wash areas	☐	☒	Project does not have wash areas.
S9	Outdoor processing areas	☐	☒	Project does not have outdoor processing areas.
S10	Equipment wash areas	☐	☒	Project does not have equipment wash areas.
S11	Fueling areas	☐	☒	Project does not have fueling areas.
S12	Hillside landscaping	☐	☒	Project does not have hillside landscaping.
S13	Wash water control for food preparation areas	☐	☒	Food preparation and washing will be performed inside building.
S14	Community car wash racks	☐	☒	Project does not have community car wash racks.

IV.4 Alternative Compliance Plan (If Applicable)

IV.4.1 Water Quality Credits

Description of Proposed Project				
Project Types that Qualify for Water Quality Credits (Select all that apply):				
☐ Redevelopment projects that reduce the overall impervious footprint of the project site.	☐ Brownfield redevelopment, meaning redevelopment, expansion, or reuse of real property which may be complicated by the presence or potential presence of hazardous substances, pollutants or contaminants, and which have the potential to contribute to adverse ground or surface WQ if not redeveloped.	☐ Higher density development projects which include two distinct categories (credits can only be taken for one category): those with more than seven units per acre of development (lower credit allowance); vertical density developments, for example, those with a Floor to Area Ratio (FAR) of 2 or those having more than 18 units per acre (greater credit allowance).		
☐ Mixed use development, such as a combination of residential, commercial, industrial, office, institutional, or other land uses which incorporate design principles that can demonstrate environmental benefits that would not be realized through single use projects (e.g. reduced vehicle trip traffic with the potential to reduce sources of water or air pollution).	☐ Transit-oriented developments, such as a mixed use residential or commercial area designed to maximize access to public transportation; similar to above criterion, but where the development center is within one half mile of a mass transit center (e.g. bus, rail, light rail or commuter train station). Such projects would not be able to take credit for both categories, but may have greater credit assigned		☐ Redevelopment projects in an established historic district, historic preservation area, or similar significant city area including core City Center areas (to be defined through mapping).	
☐ Developments with dedication of undeveloped portions to parks, preservation areas and other pervious uses.	☐ Developments in a city center area.	☐ Developments in historic districts or historic preservation areas.	☐ Live-work developments, a variety of developments designed to support residential and vocational needs together – similar to criteria to mixed use development; would not be able to take credit for both categories.	☐ In-fill projects, the conversion of empty lots and other underused spaces into more beneficially used spaces, such as residential or commercial areas.
Calculation of Water Quality Credits(if applicable)				

IV.4.2 Alternative Compliance Plan Information

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Section V Inspection/Maintenance Responsibility for BMPs

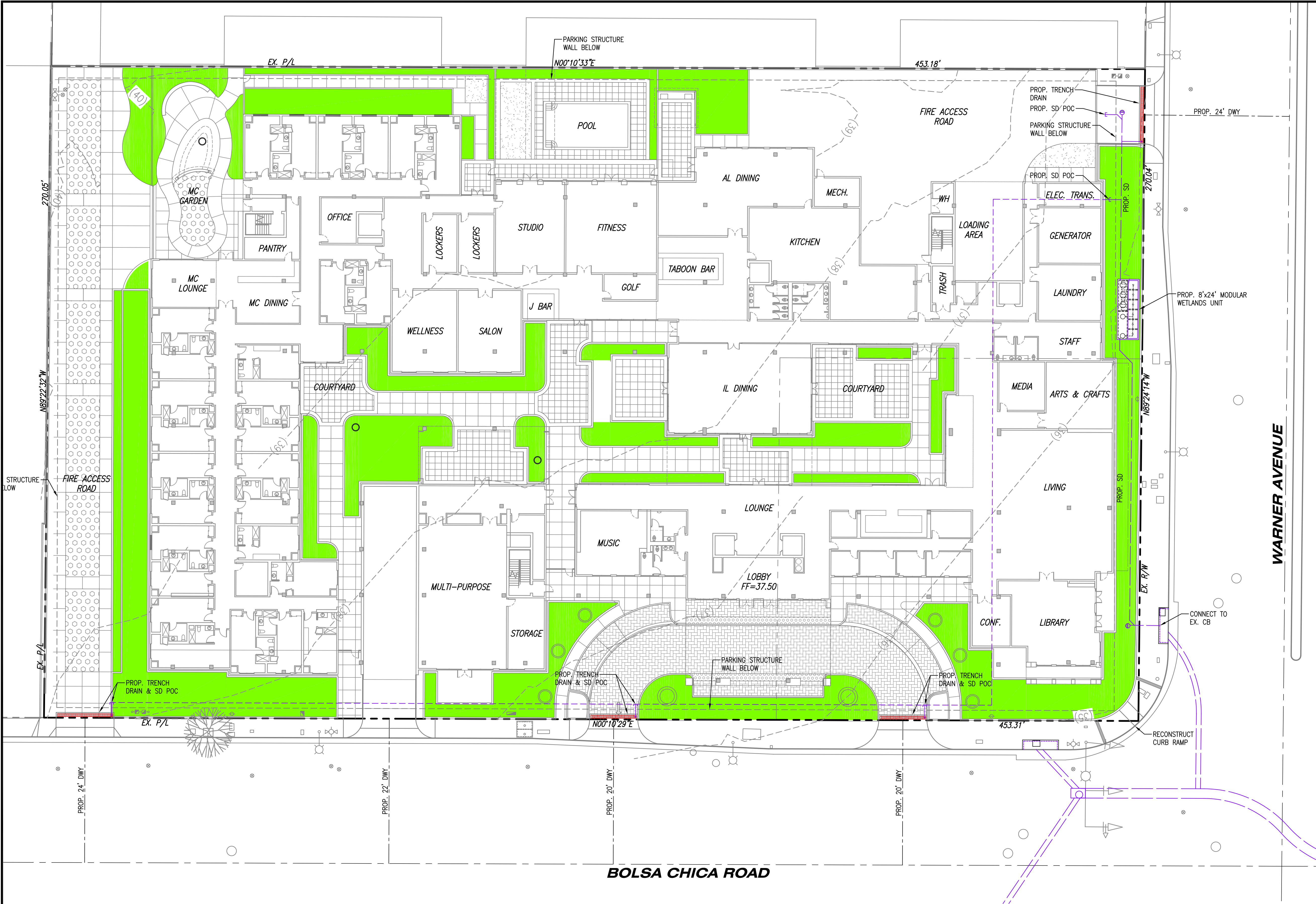
Inspection and maintenance records must be kept for a minimum of five years for inspection by the regulatory agencies. Responsibility and funding for long term inspection and maintenance of all non-structural and structural source control BMPs and all treatment control BMPs is by:

Hines

444 S. Flower Street, Suite 2100
Los Angeles, CA 90071
(415) 250-4422

(See BMP Operation and Maintenance Plan in Attachment D)

Section VI Site Plans



PROJECT INFORMATION

PROJECT AREA:	122,392 SF (2.81 AC)
IMPERVIOUS AREA:	104,596 SF (2.40 AC)
PERVIOUS AREA:	17,796 SF (0.41 AC)
DCV:	6,311 CF
SWQDF:	0.60 CFS

SITE LID OPTION 1

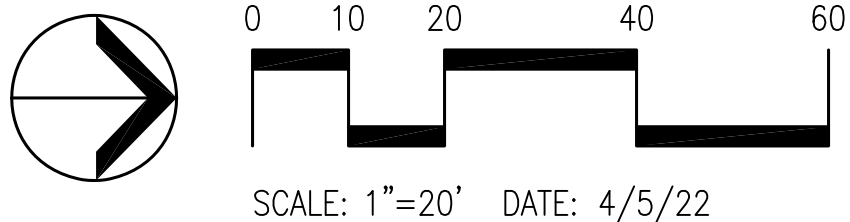
MODULAR WETLANDS SYSTEM: MWS-L-8-24 (0.693 CFS)

SITE LID OPTION 2

BIOFILTRATION PLANTERS W/UNDERDRAIN 3,884 SF

SITE LID OPTION 3

COMBINATION OF OPTION 1 AND OPTION 2



HUNTINGTON BEACH SENIOR LIVING
HINES

PRELIMINARY WQMP SITE PLAN
HUNTINGTON BEACH, CALIFORNIA

KHR ASSOCIATES
CONSULTING ENGINEERS/SURVEYORS/PLANNERS
17530 Von Karman Avenue - Suite 200 Tel (949) 756-6440
Irvine, California 92614

R:\Hines\Huntington Beach\Documents\WQMP\SECTION_V-HRB-15BMP.dwg March 31, 2022 - 2:26pm josh

Section VII Educational Materials

Refer to the Orange County Stormwater Program (ocwatersheds.com) for a library of materials available.

Education Materials			
Residential Material (http://www.ocwatersheds.com)	Check If Applicable	Business Material (http://www.ocwatersheds.com)	Check If Applicable
The Ocean Begins at Your Front Door	☒	Tips for the Automotive Industry	☐
Tips for Car Wash Fund-raisers	☐	Tips for Using Concrete and Mortar	☐
Tips for the Home Mechanic	☐	Tips for the Food Service Industry	☐
Homeowners Guide for Sustainable Water Use	☐	Proper Maintenance Practices for Your Business	☐
Household Tips	☐	Other Material	Check If Attached
Proper Disposal of Household Hazardous Waste	☐		
Recycle at Your Local Used Oil Collection Center (North County)	☐	CASQA SC-41 Building & Grounds Maintenance	☒
Recycle at Your Local Used Oil Collection Center (Central County)	☐	CASQA SC-43 Parking/Storage Area Maintenance	☒
Recycle at Your Local Used Oil Collection Center (South County)	☐	CASQA SC-44 Drainage System Maintenance	☒
Tips for Maintaining a Septic Tank System	☐	CASQA SD-12 Efficient Irrigation	☒
Responsible Pest Control	☐	CASQA SD-13 Storm Drain Signage	☒
Sewer Spill	☐	CASQA SD-32 Trash Storage Areas	☒
Tips for the Home Improvement Projects	☐		☐
Tips for Horse Care	☐		☐
Tips for Landscaping and Gardening	☐		☐
Tips for Pet Care	☐		☐
Tips for Pool Maintenance	☐		☐
Tips for Residential Pool, Landscape and Hardscape Drains	☐		☐
Tips for Projects Using Paint	☐		☐

Attachment A: Educational Materials

The Ocean Begins At Your Front Door

SC-41 Building and Grounds Maintenance

SC-43 Parking/Storage Area Maintenance

SC-44 Drainage System Maintenance

SD-12 Efficient Irrigation

SD-13 Storm Drain Signage

SD-32 Trash Storage Areas

Attachment B: BMP Fact Sheet

BIO-7: Proprietary Biotreatment
Modular Wetlands: MWS Linear

XIV.5. Biotreatment BMP Fact Sheets (BIO)

Conceptual criteria for biotreatment BMP selection, design, and maintenance are contained in [Appendix XII](#). These criteria are generally applicable to the design of biotreatment BMPs in Orange County and BMP-specific guidance is provided in the following fact sheets.²⁴

Note: Biotreatment BMPs shall be designed to provide the maximum feasible infiltration and ET based on criteria contained in [Appendix XI.2](#).

BIO-1: Bioretention with Underdrains

Bioretention stormwater treatment facilities are landscaped shallow depressions that capture and filter stormwater runoff. These facilities function as a soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. The facilities normally consist of a ponding area, mulch layer, planting soils, and plants. As stormwater passes down through the planting soil, pollutants are filtered, adsorbed, biodegraded, and sequestered by the soil and plants. Bioretention with an underdrain are utilized for areas with low permeability native soils or steep slopes where the underdrain system that routes the treated runoff to the storm drain system rather than depending entirely on infiltration. [Bioretention must be designed without an underdrain](#) in areas of high soil permeability.

Also known as:

- Rain gardens with underdrains
- Vegetated media filter
- Downspout planter boxes



Bioretention

Source: Geosyntec Consultants

Feasibility Screening Considerations

- If there are no hazards associated with infiltration (such as groundwater concerns, contaminant plumes or geotechnical concerns), [bioinfiltration facilities](#), which achieve partial infiltration, should be used to maximize infiltration.

²⁴ Not all BMPs presented in this section are considered “biofiltration BMPs” under the South Orange County Permit Area. Biofiltration BMPs are vegetated treat-and-release BMPs that filter stormwater through amended soil media that is biologically active, support plant growth, and also promote infiltration and/or evapotranspiration. For projects in South Orange County, the total volume of storage in surface ponding and pores spaces is required to be at least 75% of the remaining DCV that the biofiltration BMP is designed to address. This prevents significant down-sizing of BMPs which otherwise may be possible via routing calculations. Biotreatment BMPs that do not meet this definition are not considered to be LID BMPs, but may be used as treatment control or pre-treatment BMPs. See Section III.7 and Worksheet SOC-1 for guidance.

- Bioretention with underdrain facilities should be lined if contaminant plumes or geotechnical concerns exist. If high groundwater is the reason for infiltration infeasibility, bioretention facilities with underdrains do not need to be lined.

Opportunity Criteria

- Land use may include commercial, residential, mixed use, institutional, and subdivisions. Bioretention may also be applied in parking lot islands, cul-de-sacs, traffic circles, road shoulders, road medians, and next to buildings in planter boxes.
- Drainage area is ≤ 5 acres.
- Area is available for infiltration.
- Site must have adequate relief between land surface and the stormwater conveyance system to permit vertical percolation through the soil media and collection and conveyance in underdrain to stormwater conveyance system.

OC-Specific Design Criteria and Considerations

- ☐ Ponding depth should not exceed 18 inches; fencing may be required if ponding depth is greater than 6 inches to mitigate drowning.
- ☐ The minimum soil depth is 2 feet (3 feet is preferred).
- ☐ The maximum drawdown time of the bioretention ponding area is 48 hours. The maximum drawdown time of the planting media and gravel drainage layer is 96 hours, if applicable.
- ☐ Infiltration pathways may need to be restricted due to the close proximity of roads, foundations, or other infrastructure. A geomembrane liner, or other equivalent water proofing, may be placed along the vertical walls to reduce lateral flows. This liner should have a minimum thickness of 30 mils.
- ☐ If infiltration in bioretention location is hazardous due to groundwater or geotechnical concerns, a geomembrane liner must be installed at the base of the bioretention facility. This liner should have a minimum thickness of 30 mils.
- ☐ The planting media placed in the cell shall be designed per the recommendations contained in MISC-1: Planting/Storage Media
- ☐ Plant materials should be tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 hours; native place species and/or hardy cultivars that are not invasive and do not require chemical inputs should be used to the maximum extent feasible
- ☐ The bioretention area should be covered with 2-4 inches (average 3 inches) or mulch at the start and an additional placement of 1-2 inches of mulch should be added annually.
- ☐ Underdrain should be sized with a 6 inch minimum diameter and have a 0.5% minimum slope.
- ☐ Underdrain should be slotted polyvinyl chloride (PVC) pipe; underdrain pipe should be more than 5 feet from tree locations (if space allows).
- ☐ A gravel blanket or bedding is required for the underdrain pipe(s). At least 0.5 feet of washed aggregate must be placed below, to the top, and to the sides of the underdrain pipe(s).
- ☐ An overflow device is required at the top of the bioretention area ponding depth.
- ☐ Dispersed flow or energy dissipation (i.e. splash rocks) for piped inlets should be provided at basin inlet to prevent erosion.
- ☐ Ponding area side slopes shall be no steeper than 3:1 (H:V) unless designed as a planter box BMP with appropriate consideration for trip and fall hazards.

Simple Sizing Method for Bioretention with Underdrain

If the Simple Design Capture Volume Sizing Method described in **Appendix III.3.1** is used to size a bioretention with underdrain facility, the user selects the basin depth and then determines the appropriate surface area to capture the DCV. The sizing steps are as follows:

Step 1: Determine DCV

Calculate the DCV using the Simple Design Capture Volume Sizing Method described in **Appendix III.3.1**.

Step 2: Verify that the Ponding Depth will Draw Down within 48 Hours

The ponding area drawdown time can be calculated using the following equation:

$$DD_P = (d_P / K_{MEDIA}) \times 12 \text{ in/ft}$$

Where:

DD_P = time to drain ponded water, hours

d_P = depth of ponding above bioretention area, ft (not to exceed 1.5 ft)

K_{MEDIA} = media design infiltration rate, in/hr (equivalent to the media hydraulic conductivity with a factor of safety of 2; K_{MEDIA} of 2.5 in/hr should be used unless other information is available)

If the drawdown time exceeds 48 hours, adjust ponding depth and/or media infiltration rate until 48 hour drawdown time is achieved.

Step 3: Determine the Depth of Water Filtered During Design Capture Storm

The depth of water filtered during the design capture storm can be estimated as the amount routed through the media during the storm, or the ponding depth, whichever is smaller.

$$d_{FILTERED} = \text{Minimum} [((K_{MEDIA} \times T_{ROUTING})/12), d_P]$$

Where:

$d_{FILTERED}$ = depth of water that may be considered to be filtered during the design storm event, ft

K_{MEDIA} = media design infiltration rate, in/hr (equivalent to the media hydraulic conductivity with a factor of safety of 2; K_{MEDIA} of 2.5 in/hr should be used unless other information is available)

$T_{ROUTING}$ = storm duration that may be assumed for routing calculations; this should be assumed to be no greater than 3 hours. If the designer desires to account for further routing effects, the Capture Efficiency Method for Volume-Based, Constant Drawdown BMPs (See **Appendix III.3.2**) should be used.

d_P = depth of ponding above bioretention area, ft (not to exceed 1.5 ft)

Step 4: Determine the Facility Surface Area

$$A = DCV / (d_P + d_{FILTERED})$$

Where:

A = required area of bioretention facility, sq-ft

DCV = design capture volume, cu-ft

$d_{FILTERED}$ = depth of water that may be considered to be filtered during the design storm event, ft

d_P = depth of ponding above bioretention area, ft (not to exceed 1.5 ft)

In South Orange County, the provided ponding plus pore volume must be checked to demonstrate that it is greater than 0.75 of the remaining DCV that this BMP is designed to address. See Section III.7 and Worksheet SOC-1.

Capture Efficiency Method for Bioretention with Underdrains

If the bioretention geometry has already been defined and the user wishes to account more explicitly for routing, the user can determine the required footprint area using the Capture Efficiency Method for Volume-Based, Constant Drawdown BMPs (See [Appendix III.3.2](#)) to determine the fraction of the DCV that must be provided to manage 80 percent of average annual runoff volume. This method accounts for drawdown time different than 48 hours.

Step 1: Determine the drawdown time associated with the selected basin geometry

$$DD = (d_p / K_{DESIGN}) \times 12 \text{ in/ft}$$

Where:

DD = time to completely drain infiltration basin ponding depth, hours

d_p = bioretention ponding depth, ft (should be less than or equal to 1.5 ft)

K_{DESIGN} = design media infiltration rate, in/hr (assume 2.5 inches per hour unless otherwise proposed)

If drawdown is less than 3 hours, the drawdown time should be rounded to 3 hours or the Capture Efficiency Method for Flow-based BMPs (See [Appendix III.3.3](#)) shall be used.

Step 2: Determine the Required Adjusted DCV for this Drawdown Time

Use the Capture Efficiency Method for Volume-Based, Constant Drawdown BMPs (See [Appendix III.3.2](#)) to calculate the fraction of the DCV the basin must hold to achieve 80 percent capture of average annual stormwater runoff volume based on the basin drawdown time calculated above.

Step 3: Determine the Basin Infiltrating Area Needed

The required infiltrating area (i.e. the surface area of the top of the media layer) can be calculated using the following equation:

$$A = \text{Design Volume} / d_p$$

Where:

A = required infiltrating area, sq-ft (measured at the media surface)

Design Volume = fraction of DCV, adjusted for drawdown, cu-ft (see Step 2)

d_p = ponding depth of water stored in bioretention area, ft (from Step 1)

This does not include the side slopes, access roads, etc. which would increase bioretention footprint. If the area required is greater than the selected basin area, adjust surface area or adjust ponding depth and recalculate required area until the required area is achieved.

In South Orange County, the provided ponding plus pore volume must be checked to demonstrate that it is greater than 0.75 of the remaining DCV that this BMP is designed to address. See Section III.7 and Worksheet SOC-1.

Configuration for Use in a Treatment Train

- Bioretention areas may be preceded in a treatment train by HSCs in the drainage area, which would reduce the required design volume of the bioretention cell. For example, bioretention could be used to manage overflow from a cistern.
- Bioretention areas can be used to provide pretreatment for underground infiltration systems.

Additional References for Design Guidance

- CASQA BMP Handbook for New and Redevelopment:
<http://www.cabmphandbooks.com/Documents/Development/TC-32.pdf>

- SMC LID Manual (pp 68):
http://www.lowimpactdevelopment.org/guest75/pub/All_Projects/SoCal_LID_Manual/SoCalLID_Manual_FINAL_040910.pdf
- Los Angeles County Stormwater BMP Design and Maintenance Manual, Chapter 5:
http://dpw.lacounty.gov/DES/design_manuals/StormwaterBMPDesignandMaintenance.pdf
- San Diego County LID Handbook Appendix 4 (Factsheet 7):
<http://www.sdcountry.ca.gov/dplu/docs/LID-Appendices.pdf>

Los Angeles Unified School District (LAUSD) Stormwater Technical Manual, Chapter 4:
http://www.laschools.org/employee/design/fs-studies-and-reports/download/white_paper_report_material/Storm_Water_Technical_Manual_2009-opt-red.pdf?version_id=76975850
- County of Los Angeles Low Impact Development Standards Manual, Chapter 5:
http://dpw.lacounty.gov/wmd/LA_County_LID_Manual.pdf

BIO-7: Proprietary Biotreatment

Proprietary biotreatment devices are devices that are manufactured to mimic natural systems such as bioretention areas by incorporating plants, soil, and microbes engineered to provide treatment at higher flow rates or volumes and with smaller footprints than their natural counterparts. Incoming flows are typically filtered through a planting media (mulch, compost, soil, plants, microbes, etc.) and either infiltrated or collected by an underdrain and delivered to the storm water conveyance system. Tree box filters are an increasingly common type of proprietary biotreatment device that are installed at curb level and filled with a bioretention type soil. For low to moderate flows they operate similarly to bioretention systems and are bypassed during high flows. Tree box filters are highly adaptable solutions that can be used in all types of development and in all types of soils but are especially applicable to dense urban parking lots, street, and roadways.

Also known as:

- Catch basin planter box
- Bioretention vault
- Tree box filter



Proprietary biotreatment

Source:

<http://www.americastusa.com/index.php/filterra/>

Feasibility Screening Considerations

- Proprietary biotreatment devices that are unlined may cause incidental infiltration. Therefore, an evaluation of site conditions should be conducted to evaluate whether the BMP should include an impermeable liner to avoid infiltration into the subsurface.

Opportunity Criteria

- Drainage areas of 0.25 to 1.0 acres.
- Land use may include commercial, residential, mixed use, institutional, and subdivisions. Proprietary biotreatment facilities may also be applied in parking lot islands, traffic circles, road shoulders, and road medians.
- Must not adversely affect the level of flood protection provided by the drainage system.

OC-Specific Design Criteria and Considerations

- ☒ Frequent maintenance and the use of screens and grates to keep trash out may decrease the likelihood of clogging and prevent obstruction and bypass of incoming flows.
- ☒ Consult proprietors for specific criteria concerning the design and performance.
- ☒ Proprietary biotreatment may include specific media to address pollutants of concern. However, for proprietary device to be considered a biotreatment device the media must be capable of supporting rigorous growth of vegetation.
- ☒ Proprietary systems must be acceptable to the reviewing agency. Reviewing agencies shall have the discretion to request performance information. Reviewing agencies shall have the discretion to deny the use of a proprietary BMP on the grounds of performance, maintenance considerations, or other relevant factors.

- X** In right of way areas, plant selection should not impair traffic lines of site. Local jurisdictions may also limit plant selection in keeping with landscaping themes.

Computing Sizing Criteria for Proprietary Biotreatment Device

- Proprietary biotreatment devices can be volume based or flow-based BMPs.
- Volume-based proprietary devices should be sized using the Simple Design Capture Volume Sizing Method described in [Appendix III.3.1](#) or the Capture Efficiency Method for Volume-Based, Constant Drawdown BMPs described in [Appendix III.3.2](#).
- The required design flowrate for flow-based proprietary devices should be computed using the Capture Efficiency Method for Flow-based BMPs described in [Appendix III.3.3](#).

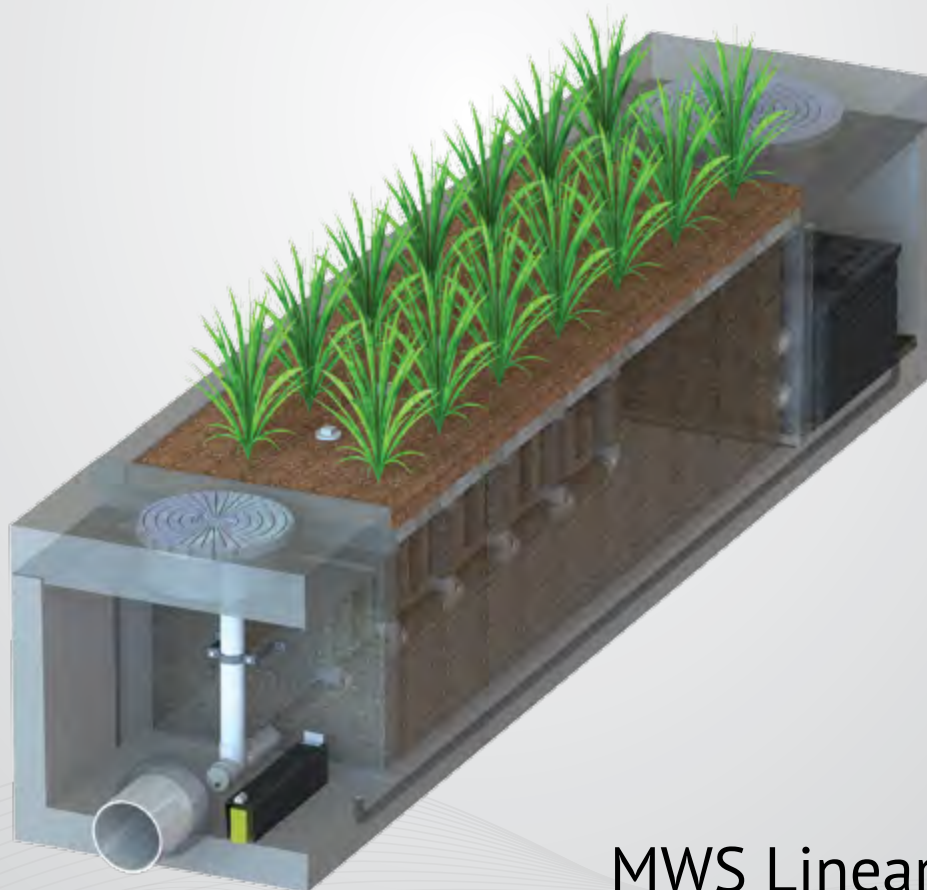
In South Orange County, the provided ponding plus pore volume must be checked to demonstrate that it is greater than 0.75 of the remaining DCV that this BMP is designed to address. Many proprietary biotreatment BMPs will not be able to meet the definition of “biofiltration” that applies in South Orange County. See Section III.7 and Worksheet SOC-1.

Additional References for Design Guidance

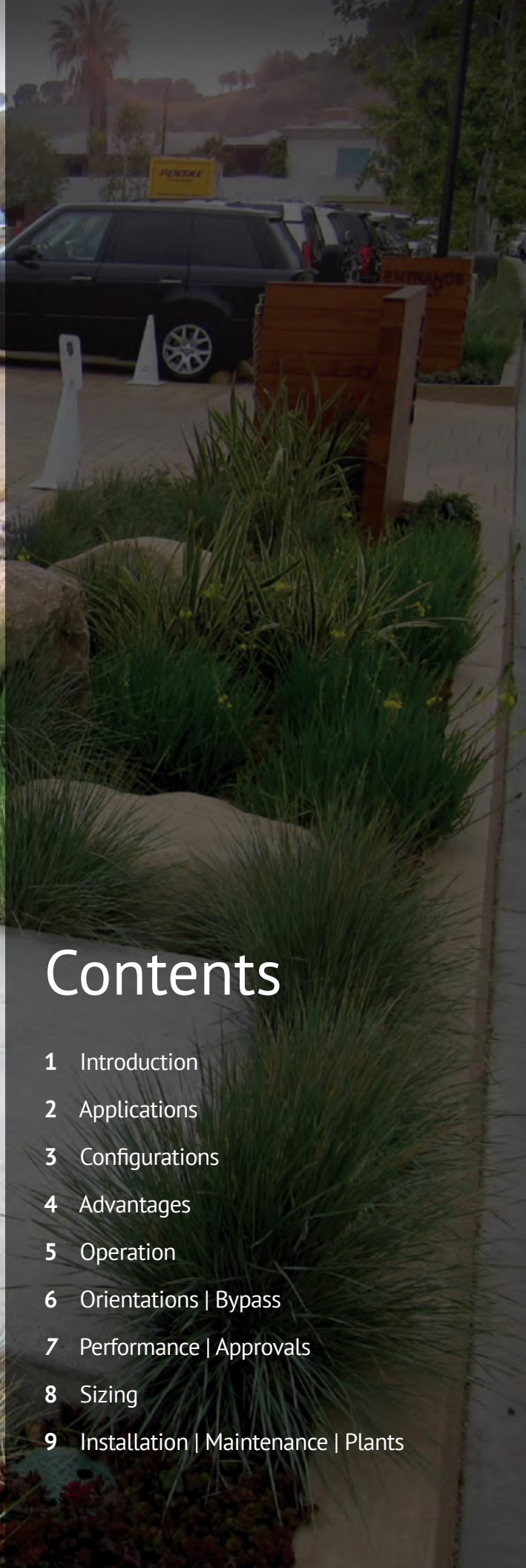
- Los Angeles Unified School District (LAUSD) Stormwater Technical Manual, Chapter 4:
http://www.laschools.org/employee/design/fs-studies-and-reports/download/white_paper_report_material/Storm_Water_Technical_Manual_2009-opt-red.pdf?version_id=76975850
- Los Angeles County Stormwater BMP Design and Maintenance Manual, Chapter 9:
http://dpw.lacounty.gov/DES/design_manuals/StormwaterBMPDesignandMaintenance.pdf
- Santa Barbara BMP Guidance Manual, Chapter 6:
http://www.santabarbaraca.gov/NR/rdonlyres/91D1FA75-C185-491E-A882-49EE17789DF8/0/Manual_071008_Final.pdf



*Advanced **Stormwater** Biofiltration*



MWS Linear



Contents

- 1 Introduction
- 2 Applications
- 3 Configurations
- 4 Advantages
- 5 Operation
- 6 Orientations | Bypass
- 7 Performance | Approvals
- 8 Sizing
- 9 Installation | Maintenance | Plants

The Urban Impact

For hundreds of years natural wetlands surrounding our shores have played an integral role as nature's stormwater treatment system. But as our cities grow and develop, these natural wetlands have perished under countless roads, rooftops, and parking lots.



Plant A Wetland

Without natural wetlands our cities are deprived of water purification, flood control, and land stability. Modular Wetlands and the MWS Linear re-establish nature's presence and rejuvenate water ways in urban areas.



MWS Linear

The Modular Wetland System Linear represents a pioneering breakthrough in stormwater technology as the only biofiltration system to utilize patented horizontal flow, allowing for a smaller footprint and higher treatment capacity. While most biofilters use little or no pre-treatment, the MWS Linear incorporates an advanced pre-treatment chamber that includes separation and pre-filter cartridges. In this chamber sediment and hydrocarbons are removed from runoff before it enters the biofiltration chamber, in turn reducing maintenance costs and improving performance.

Applications

The MWS Linear has been successfully used on numerous new construction and retrofit projects. The system's superior versatility makes it beneficial for a wide range of stormwater and waste water applications - treating rooftops, streetscapes, parking lots, and industrial sites.



Industrial

Many states enforce strict regulations for discharges from industrial sites. The MWS Linear has helped various sites meet difficult EPA mandated effluent limits for dissolved metals and other pollutants.



Residential

Low to high density developments can benefit from the versatile design of the MWS Linear. The system can be used in both decentralized LID design and cost-effective end-of-the-line configurations.



Streets

Street applications can be challenging due to limited space. The MWS Linear is very adaptable, and offers the smallest footprint to work around the constraints of existing utilities on retrofit projects.



Parking Lots

Parking lots are designed to maximize space and the MWS Linear's 4 ft. standard planter width allows for easy integration into parking lot islands and other landscape medians.



Commercial

Compared to bioretention systems, the MWS Linear can treat far more area in less space - meeting treatment and volume control requirements.



Mixed Use

The MWS Linear can be installed as a raised planter to treat runoff from rooftops or patios, making it perfect for sustainable "live-work" spaces.

More applications are available on our website: www.ModularWetlands.com/Applications

- Agriculture
- Low Impact Development
- Reuse
- Waste Water



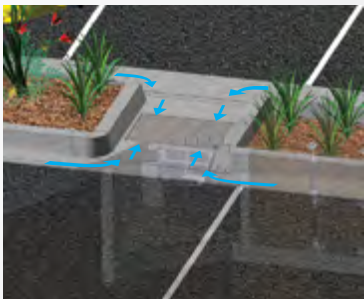
Configurations

The MWS Linear is the preferred biofiltration system of Civil Engineers across the country due to its versatile design. This highly versatile system has available “pipe-in” options on most models, along with built-in curb or grated inlets for simple integration into your stormdrain design.



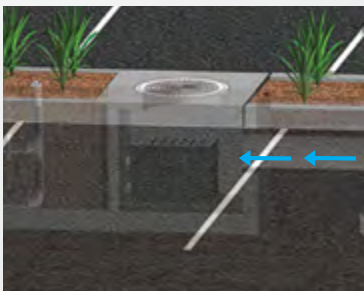
Curb Type

The *Curb Type* configuration accepts sheet flow through a curb opening and is commonly used along road ways and parking lots. It can be used in sump or flow by conditions. Length of curb opening varies based on model and size.



Grate Type

The *Grate Type* configuration offers the same features and benefits as the *Curb Type* but with a grated/drop inlet above the systems pre-treatment chamber. It has the added benefit of allowing for pedestrian access over the inlet. ADA compliant grates are available to assure easy and safe access. The *Grate Type* can also be used in scenarios where runoff needs to be intercepted on both sides of landscape islands.



Vault Type

The system's patented horizontal flow biofilter is able to accept inflow pipes directly into the pre-treatment chamber, meaning the MWS Linear can be used in end-of-the-line installations. This greatly improves feasibility over typical decentralized designs that are required with other biofiltration/bioretention systems. Another benefit of the “pipe in” design is the ability to install the system downstream of underground detention systems to meet water quality volume requirements.



Downspout Type

The *Downspout Type* is a variation of the *Vault Type* and is designed to accept a vertical downspout pipe from roof top and podium areas. Some models have the option of utilizing an internal bypass, simplifying the overall design. The system can be installed as a raised planter and the exterior can be stuccoed or covered with other finishes to match the look of adjacent buildings.

Advantages & Operation

The MWS Linear is the most efficient and versatile biofiltration system on the market, and the only system with horizontal flow which improves performance, reduces footprint, and minimizes maintenance. Figure-1 and Figure-2 illustrate the invaluable benefits of horizontal flow and the multiple treatment stages.

Featured Advantages

- Horizontal Flow Biofiltration
- Greater Filter Surface Area
- Pre-Treatment Chamber
- Patented Perimeter Void Area
- Flow Control
- No Depressed Planter Area

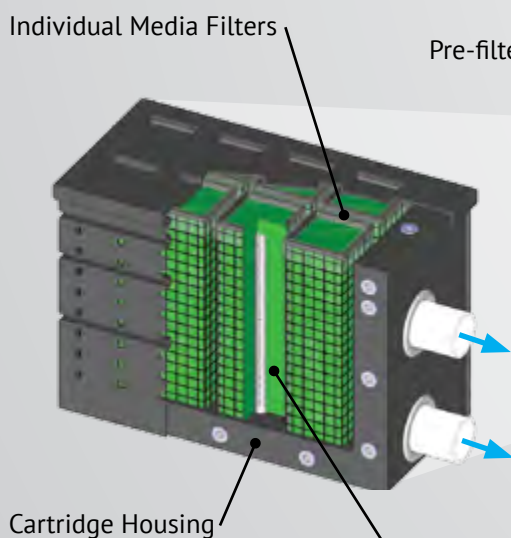
1 Pre-Treatment

Separation

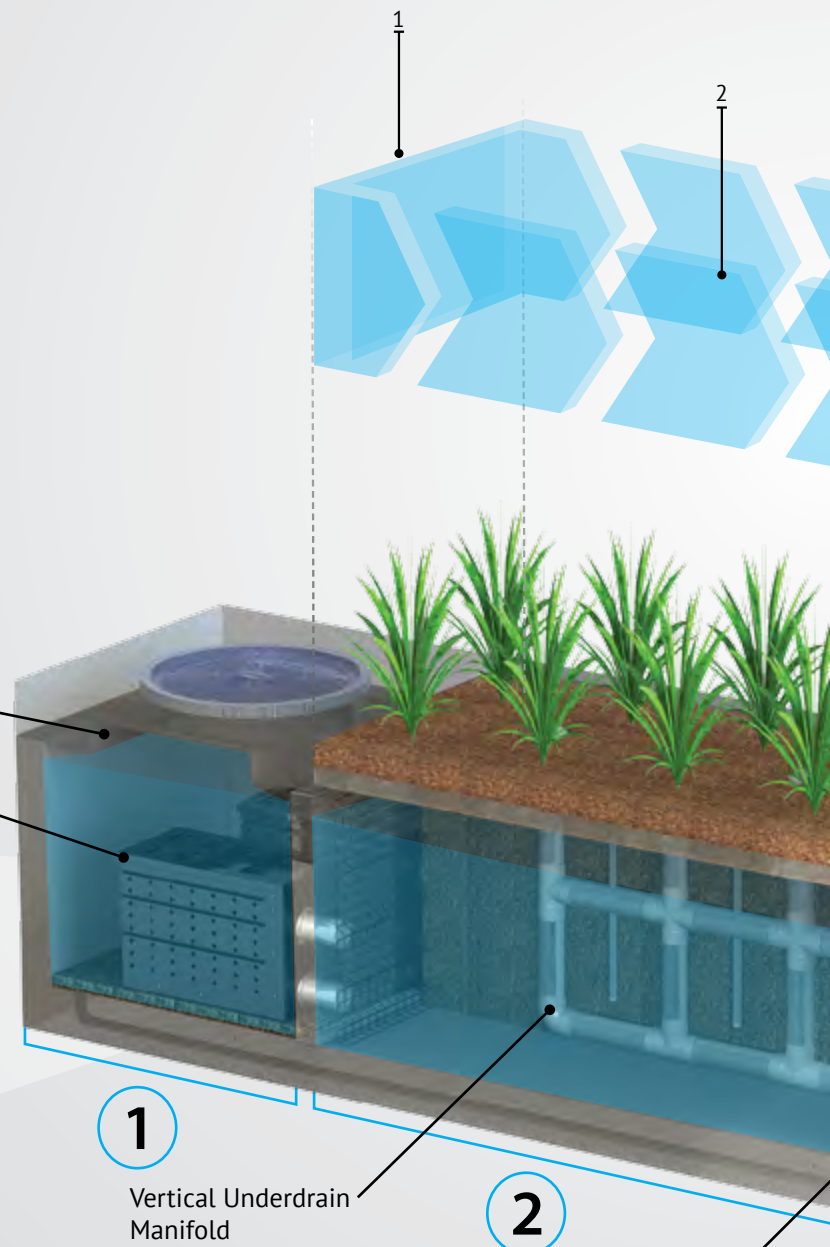
- Trash, sediment, and debris are separated before entering the pre-filter cartridges
- Designed for easy maintenance access

Pre-Filter Cartridges

- Over 25 ft² of surface area per cartridge
- Utilizes BioMediaGREEN filter material
- Removes over 80% of TSS & 90% of hydrocarbons
- Prevents pollutants that cause clogging from migrating to the biofiltration chamber



Curb Inlet
Pre-filter Cartridge



BioMediaGREEN

Wetland
MEDIA™

Drain-

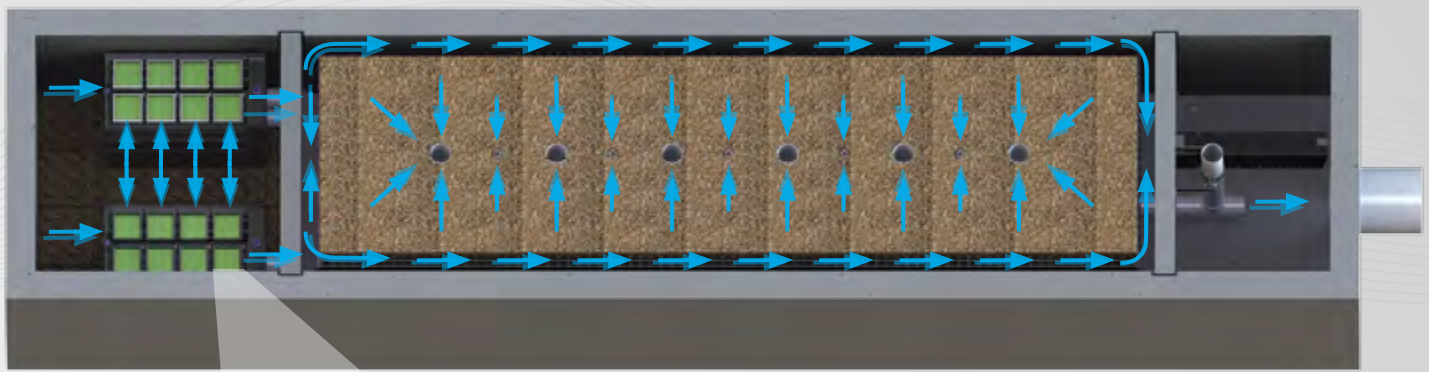
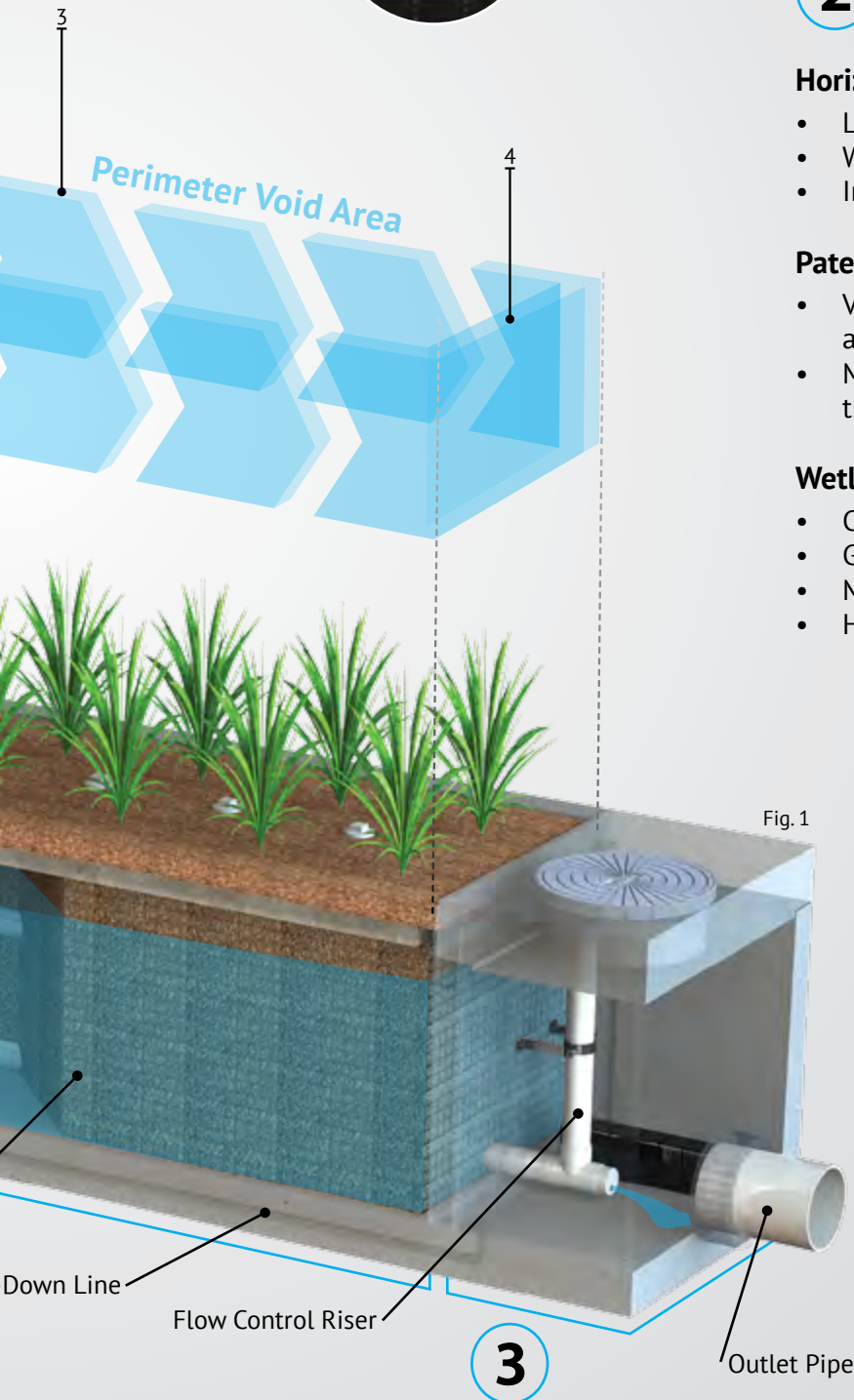


Fig. 2 - Top View

2x to 3x More Surface Area Than Traditional Downward Flow Bioretention Systems.



2 Biofiltration

Horizontal Flow

- Less clogging than downward flow biofilters
- Water flow is subsurface
- Improves biological filtration

Patented Perimeter Void Area

- Vertically extends void area between the walls and the WetlandMEDIA on all four sides.
- Maximizes surface area of the media for higher treatment capacity

WetlandMEDIA

- Contains no organics and removes phosphorus
- Greater surface area and 48% void space
- Maximum evapotranspiration
- High ion exchange capacity and light weight

3 Discharge

Flow Control

- Orifice plate controls flow of water through WetlandMEDIA to a level lower than the media's capacity.
- Extends the life of the media and improves performance

Drain-Down Filter

- The Drain-Down is an optional feature that completely drains the pre-treatment chamber
- Water that drains from the pre-treatment chamber between storm events will be treated

Orientations



Side-By-Side

The *Side-By-Side* orientation places the pre-treatment and discharge chamber adjacent to one another with the biofiltration chamber running parallel on either side. This minimizes the system length, providing a highly compact footprint. It has been proven useful in situations such as streets with directly adjacent sidewalks, as half of the system can be placed under that sidewalk. This orientation also offers internal bypass options as discussed below.



End-To-End

The *End-To-End* orientation places the pre-treatment and discharge chambers on opposite ends of the biofiltration chamber therefore minimizing the width of the system to 5 ft (outside dimension). This orientation is perfect for linear projects and street retrofits where existing utilities and sidewalks limit the amount of space available for installation. One limitation of this orientation is bypass must be external.

Bypass

Internal Bypass Weir (Side-by-Side Only)

The *Side-By-Side* orientation places the pre-treatment and discharge chambers adjacent to one another allowing for integration of internal bypass. The wall between these chambers can act as a bypass weir when flows exceed the system's treatment capacity, thus allowing bypass from the pre-treatment chamber directly to the discharge chamber.

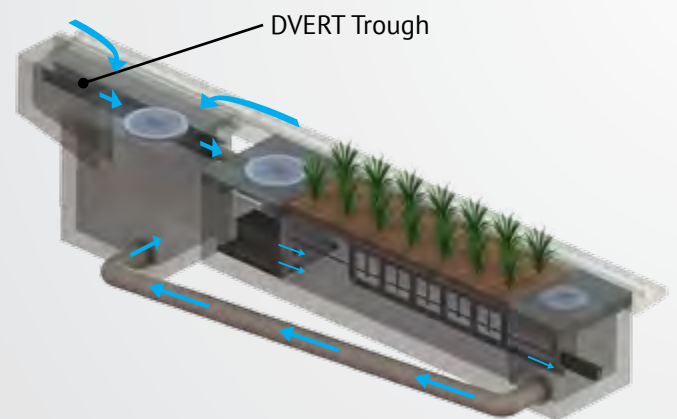
External Diversion Weir Structure

This traditional offline diversion method can be used with the MWS Linear in scenarios where runoff is being piped to the system. These simple and effective structures are generally configured with two outflow pipes. The first is a smaller pipe on the upstream side of the diversion weir - to divert low flows over to the MWS Linear for treatment. The second is the main pipe that receives water once the system has exceeded treatment capacity and water flows over the weir.

Flow By Design

This method is one in which the system is placed just upstream of a standard curb or grate inlet to intercept the first flush. Higher flows simply pass by the MWS Linear and into the standard inlet downstream.

DVERT Low Flow Diversion



This simple yet innovative diversion trough can be installed in existing or new curb and grate inlets to divert the first flush to the MWS Linear via pipe. It works similar to a rain gutter and is installed just below the opening into the inlet. It captures the low flows and channels them over to a connecting pipe exiting out the wall of the inlet and leading to the MWS Linear. The DVERT is perfect for retrofit and green street applications that allows the MWS Linear to be installed anywhere space is available.



Performance

The MWS Linear continues to outperform other treatment methods with superior pollutant removal for TSS, heavy metals, nutrients, hydrocarbons and bacteria. Since 2007 the MWS Linear has been field tested on numerous sites across the country. With it's advanced pre-treatment chamber and innovative horizontal flow biofilter, the system is able to effectively remove pollutants through a combination of physical, chemical, and biological filtration processes. With the same biological processes found in natural wetlands, the MWS Linear harnesses nature's ability to process, transform, and remove even the most harmful pollutants.

Approvals

The MWS Linear has successfully met years of challenging technical reviews and testing from some of the most prestigious and demanding agencies in the nation, and perhaps the world.



Washington State DOE Approved

The MWS Linear is approved for General Use Level Designation (GULD) for Basic, Enhanced, and Phosphorus treatment at 1 gpm/ft² loading rate. The highest performing BMP on the market for all main pollutant categories.

TSS	Total Phosphorus	Ortho Phosphorus	Nitrogen	Dissolved Zinc	Dissolved Copper	Total Zinc	Total Copper	Motor Oil
85%	64%	67%	45%	66%	38%	69%	50%	95%



DEQ Assignment

The Virginia Department of Environmental Quality assigned the MWS Linear, the highest phosphorus removal rating for manufactured treatment devices to meet the new Virginia Stormwater Management Program (VSMP) Technical Criteria.



MASTEP Evaluation

The University of Massachusetts at Amherst – Water Resources Research Center, issued a technical evaluation report noting removal rates up to 84% TSS, 70% Total Phosphorus, 68.5% Total Zinc, and more.



Rhode Island DEM Approved

Approved as an authorized BMP and noted to achieve the following minimum removal efficiencies: 85% TSS, 60% Pathogens, 30% Total Phosphorus for discharges to freshwater systems, and 30% Total Nitrogen for discharges to saltwater or tidal systems.

Flow Based Sizing

The MWS Linear can be used in stand alone applications to meet treatment flow requirements. Since the MWS Linear is the only biofiltration system that can accept inflow pipes several feet below the surface it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.



Treatment Flow Sizing Table

Model #	Dimensions	WetlandMedia Surface Area	Treatment Flow Rate (cfs)
MWS-L-4-4	4' x 4'	23 ft ²	0.052
MWS-L-4-6	4' x 6'	32 ft ²	0.073
MWS-L-4-8	4' x 8'	50 ft ²	0.115
MWS-L-4-13	4' x 13'	63 ft ²	0.144
MWS-L-4-15	4' x 15'	76 ft ²	0.175
MWS-L-4-17	4' x 17'	90 ft ²	0.206
MWS-L-4-19	4' x 19'	103 ft ²	0.237
MWS-L-4-21	4' x 21'	117 ft ²	0.268
MWS-L-8-8	8' x 8'	100 ft ²	0.230
MWS-L-8-12	8' x 12'	151 ft ²	0.346
MWS-L-8-16	8' x 16'	201 ft ²	0.462

Volume Based Sizing

Many states require treatment of a water quality volume and do not offer the option of flow based design. The MWS Linear and its unique horizontal flow makes it the only biofilter that can be used in volume based design installed downstream of ponds, detention basins, and underground storage systems.



Treatment Volume Sizing Table

Model #	Treatment Capacity (cu. ft.) @ 24-Hour Drain Down	Treatment Capacity (cu. ft.) @ 48-Hour Drain Down
MWS-L-4-4	1140	2280
MWS-L-4-6	1600	3200
MWS-L-4-8	2518	5036
MWS-L-4-13	3131	6261
MWS-L-4-15	3811	7623
MWS-L-4-17	4492	8984
MWS-L-4-19	5172	10345
MWS-L-4-21	5853	11706
MWS-L-8-8	5036	10072
MWS-L-8-12	7554	15109
MWS-L-8-16	10073	20145

Installation

The MWS Linear is simple, easy to install, and has a space efficient design that offers lower excavation and installation costs compared to traditional tree-box type systems. The structure of the system resembles pre-cast catch basin or utility vaults and is installed in a similar fashion.

The system is delivered fully assembled for quick installation. Generally, the structure can be unloaded and set in place in 15 minutes. Our experienced team of field technicians are available to supervise installations and provide technical support.



Maintenance

Reduce your maintenance costs, man hours, and materials with the MWS Linear. Unlike other biofiltration systems that provide no pre-treatment, the MWS Linear is a self-contained treatment train which incorporates simple and effective pre-treatment.

Maintenance requirements for the biofilter itself are almost completely eliminated, as the pre-treatment chamber removes and isolates trash, sediments, and hydrocarbons. What's left is the simple maintenance of an easily accessible pre-treatment chamber that can be cleaned by hand or with a standard vac truck. Only periodic replacement of low-cost media in the pre-filter cartridges is required for long term operation and there is absolutely no need to replace expensive biofiltration media.



Plant Selection

Abundant plants, trees, and grasses bring value and an aesthetic benefit to any urban setting, but those in the MWS Linear do even more - they increase pollutant removal. What's not seen, but very important, is that below grade the stormwater runoff/flow is being subjected to nature's secret weapon: a dynamic physical, chemical, and biological process working to break down and remove non-point source pollutants. The flow rate is controlled in the MWS Linear, giving the plants more "contact time" so that pollutants are more successfully decomposed, volatilized and incorporated into the biomass of The MWS Linear's micro/macro flora and fauna.

A wide range of plants are suitable for use in the MWS Linear, but selections vary by location and climate. View suitable plants by selecting the list relative to your project location's hardy zone.

Please visit www.ModularWetlands.com/Plants for more information and various plant lists.



Attachment C: Notice of Transfer of Responsibility Form

To be included with Final WQMP.

Attachment D: BMP Operation and Maintenance Plan

To be included with Final WQMP.

Attachment E: Project Code Requirements



CITY OF HUNTINGTON BEACH

DEPARTMENT OF COMMUNITY DEVELOPMENT

PLANNING ♦ BUILDING ♦ PERMIT CENTER ♦ ECONOMIC DEVELOPMENT ♦ HOUSING ♦ CODE ENFORCEMENT

NOTICE OF FILING STATUS

December 21, 2021

Application: General Plan Amendment No. 2021-004, Zoning Text Amendment No. 2021-003, Conditional Use Permit No. 2021-024, Variance No. 2021-003, Environmental Assessment No. 2021-004 (Huntington Beach Senior Living)

Applicant: Tom Lawless, 4000 MacArthur Boulevard, Suite 280, Newport Beach CA 92660

Property Owner: James Filipan, 16531 Cotuit Circle, Huntington Beach CA 92649

Request: **GPA:** To amend the General Plan Land Use Element to modify the definition of General Commercial (CG) to 1) allow new development FAR above the current maximum of 1.5 (Maximum TBD); and 2) permit development in the General Commercial Land Use designation to exceed maximum 2 stories (TBD). **ZTA:** [None requested]. **CUP:** To establish a new convalescent facility land use in the CG zone and construct a new 5-story 290,850 sq. ft. assisted living senior facility consisting of 233 total senior living units, 268 on-site parking spaces within a subterranean parking garage, and associated hardscape, landscaping, and other related improvements. **VAR:** 1) To permit a maximum overall building height of 64 ft. in lieu of maximum 50 ft. within the CG zoning district; 2) To permit a maximum overall height of 64 ft. in lieu of 18 ft. at a 19 ft. 10 in. setback in lieu of the 45 ft. setback requirement when adjacent to a residential use. **EA:** To review the potential environmental impacts associated with the proposed project.

Project Location: 4952 & 4972 Warner Avenue, 92647 (Southwest corner of Bolsa Chica Street at Warner Avenue)

Dear Mr. Lawless:

NOTICE IS HEREBY GIVEN that the Community Development Department has reviewed your entitlement application, received and dated November 22, 2021, and has deemed the application to be incomplete. The following information and/or corrections are requested in order for the Planning Division to deem your application complete and continue the review process of your application:

MINIMUM APPLICATION REQUIREMENTS:

The following items are necessary to deem your application complete:

1. To amend the Huntington Beach Zoning and Subdivision Ordinance (HBZSO), the Zoning Text Amendment (ZTA) request shall be accompanied by a legislative draft copy of the section or sections to be modified, with redline changes throughout as applicable. This legislative draft should include the proposed changes in a page-by-page format, including any exhibits. The project as submitted includes a ZTA request,

but proposes no such changes to the code or associated description within the narrative.

2. The submitted floor plans indicate at least two bar areas, indicating the potential sales and service of alcoholic beverages. Please indicate in the project narrative if a license from the Alcoholic Beverage Control (ABC) is required for the proposed facility and, if so, which type of ABC license is necessary. Staff strongly encourages that the CUP request be inclusive of a specific type of ABC license so that review and approval of this element of future service is processed concurrently.
3. The submitted plans indicate that the subject site currently has a grade differential above three feet (34.46' min – 38.06' max) prior to rough grading, which requires review and approval of a CUP. Please include this request in the narrative description for the CUP. Approval shall be based upon a building and grading plan which terraces the building with the grade and is compatible with adjacent development. **(HBZSO 230.70 (C))**
4. The submitted plans also indicate a conceptual excavation estimate of approximately 55,000 cubic yards of soil. Grading or stockpiling which involves 25,000 cubic yards or more shall be referred to the Planning Commission for review and approval prior to the issuance of the grading or stockpiling permit. (HBZSO 240.02) Please include this request in the narrative description for the CUP.
5. The proposed project would occur over existing property lines between two separate legal parcels. Please identify the intended instrument to consolidate these parcels into one to accommodate the proposed project. An application for a Lot Line Adjustment may be required.
6. A preliminary Lighting Plan for the proposed project.
7. It is anticipated that the proposed project will require compliance with the California Environmental Quality Act (CEQA) through either a Supplemental or Addendum Environmental Impact Report (EIR), Mitigated Negative Declaration (MND), or Negative Declaration (ND). The precise documentation will be determined through the Request for Proposals (RFP) process to engage a CEQA consultant. Ultimately, the applicant will be responsible for submitting a Reimbursement Agreement and funds to cover the cost of the CEQA analysis.

DESIGN RECOMMENDATIONS:

The following items are staff recommendations to improve the design of the project consistent with the City's adopted Design Guidelines and/or design principles:

1. In past projects, staff has found that a developer-led community workshop has been very beneficial to the entitlement process. Please identify any plans for a project-related public workshop.
2. Large scale residential and quasi-residential projects receive numerous Amazon-type deliveries each day and experience constant move-in/move-out activity. Submit a

detailed plan demonstrating how this activity will be accommodated, including the location(s) of a mail and delivery room and describe the moving truck loading areas with access for future residents. Additionally, please demonstrate adequate capacity, maneuverability, and storage for refuse at proposed units and compliance with current recycling and composting regulations.

3. Please identify the number and location of any mature trees that will be removed as a result of the project.

OTHER DEPARTMENTS COMMENTS:

The comments from the other City departments are attached for your review. Please contact the respective department to discuss their comments.

The department encourages you to schedule an appointment with your assigned project planner when you are ready to re-submit plans/drawings. This service is provided to help you understand the minimum requirements of your application and to work toward deeming the application complete. This meeting is to ensure you address all the issues contained within this letter and to help streamline the process so that your application is scheduled in a timely matter. Please contact the assigned project planner to schedule an appointment.

Please submit the above-noted information and/or corrections as soon as possible in order for the Planning Division to continue the review process of your request. Please note, additional comments and concerns may be generated upon receipt of the requested information. Also, completion of the corrections and/or the submittal of the additional information does not presume approval of the application requested.

If you should have any questions or concerns regarding the processing of your application, please feel free to contact me at (714) 536-5561 or hayden.beckman@surfcity-hb.org.

Sincerely,



Hayden Beckman
Senior Planner

Attachments: Public Works Department Comments
Fire Department Comments
Police Department Comments
Building Division Comments

C:	Jane James, Planning Manager	Steve Bogart, Public Works
	Steve Eros, Fire Department	Jan Thomas, CPTED
	Bill Ford, Building Division	James Filipan, Property Owner
	Project File	

Crime Prevention Through Environmental Design



CITY OF HUNTINGTON BEACH POLICE DEPARTMENT

CPTED DEVELOPMENT REVIEW

DATE: DEC. 20, 2021
PROJECT NAME: HUNTINGTON BEACH SENIOR LIVING
PROJECT LOCATION: 4952 & 4972 WARNER AVE.
ASSIGNED PLANNER: HAYDEN BECKMAN
PLAN REVIEWER: JAN THOMAS, CPTED CONSULTANT - HBPD
TELEPHONE/E-MAIL: (949) 290-1604/iae@cox.net

PROJECT DESCRIPTION: THREE VARIANCES REQUESTED: 1) TO DECREASE THE MINIMUM SETBACK ON WESTERN SIDE TO 16', 2) TO INCREASE THE MAXIMUM HEIGHT TO INCLUDE FIVE STORIES, 3) TO DECREASE THE NUMBER OF LOADING SPACES FROM 3 TO 2.

The following is a list of code requirements deemed applicable to the proposed project based on plans stated above. The list is intended to assist the applicant by identifying requirements, which must be satisfied during the various stages of project permitting and implementation. A list of conditions of approval adopted by the Planning Commission in conjunction with the requested entitlement(s), if any, will also be provided upon final project approval. If you have any questions regarding these requirements, please contact the Plan Reviewer.

No concerns regarding any of the requested variances.

However, please continue to apply previous police comments from July 13, 2021, listed below.

SUBTERRANEAN PARKING

Subterranean parking is a potentially unsafe and/or burdensome situation for senior citizens. There is limited visibility in subterranean parking garages, which may impose further risk on a senior who is unable to move quickly to exit the structure and get to his/her apartment. The same is true for a resident entering the garage to get to his/her vehicle.

Lighting and design to optimize visibility is of utmost importance in this structure. Specifically, the parking structure shall throw light between the vehicles, since most crime in parking structures occurs between the vehicles.

24/7 security throughout the property, including this parking structure, is encouraged and strongly recommended, as well as surveillance cameras in, and throughout the facility.

Security

Post the phone number for security in the garage. 24/7 security throughout the property, including this parking structure, is encouraged and strongly recommended.

Surveillance Cameras

Install surveillance cameras throughout the parking structure and access points. Cameras shall also cover all areas in and surrounding the immediate property. Post signs stating that recording is in progress.

Radio Transmission in Parking Structure

Public Safety radios might not transmit well in the parking structure. It is imperative that an effective antenna be installed so that emergency personnel can receive/transmit in the parking structure. Install a system conducive to public safety radio transmission.

Police Access

Install a “dual” Knox-Box to ensure police officers, as well as firefighters have access to the property.

EXTERIOR PERIMETER

Fencing

Is the exterior enclosed? Recommend surrounding the exterior with fencing to enable residents to safely walk the perimeter.

Lighting and Visibility

Light the pedestrian pathways with low path lighting. Keep landscaping to a minimum. Landscaping height should be no more than 2' and trees should allow a window of visibility from the ground up from 2' to at least 6'. This will also enable police to see easily onto the property while on patrol.



CITY OF HUNTINGTON BEACH

PROJECT IMPLEMENTATION CODE REQUIREMENTS

DATE: 12/02/2021
PROJECT NAME: Huntington Beach Senior Living
PLANNING APPLICATION NO.: PA-2021-0185
ENTITLEMENTS:
PROJECT LOCATION: 4952 Warner
PLAN REVIEWER: Kevin Kirby
TELEPHONE/E-MAIL: (714) 374-5324 / kkirby@surfcity-hb.org

The following is a list of code requirements deemed applicable to the proposed project based on plans stated above. The list is intended to assist the applicant by identifying requirements which must be satisfied during the various stages of project permitting and implementation. A list of conditions of approval adopted by the Planning Commission in conjunction with the requested entitlement(s), if any, will also be provided upon final project approval. If you have any questions regarding these requirements, please contact the Plan Reviewer.

➤ **REQUIREMENT:**

1. Development Impact Fees will be required for new construction and commercial/industrial additions.
2. Landscape plan is a separate submittal for irrigation and plants only. No accessory structures or flat work will be reviewed on the landscape plans.
3. **All site work for accessibility will be reviewed and inspected based on the approved architectural plans.**
4. All accessory and minor accessory structures including site MEP will be on separate permits.

➤ **CODE REQUIREMENTS BASED ON PLANS & DRAWINGS SUBMITTED:**

1. Project shall comply with the current State building codes adopted by the City at the time of permit application submittal. Currently they are the 2019 California Building Code (CBC), 2019 California Residential Code (CRC), 2019 California Mechanical Code, 2019 California Plumbing Code, 2019 California Electrical Code, 2019 California Energy Code, 2019 California Green Building Standards Code, and the Huntington Beach Municipal Code (HBMC). Compliance to all applicable state and local codes is required prior to issuance of building permit.

2. Provide building code analysis including type of construction, allowable area and height, occupancy group requirements, exterior wall ratings (per chapter 5 and 7), and means of egress per the 2019 CBC.
3. Provide compliance to disabled accessibility requirements of Chapter 11A and/or 11B of the 2019 CBC. Including an accessible path of travel to the public way.
4. For projects that will include multiple licensed professions in multiple disciplines, i.e. Architect and professional engineers for specific disciplines, a Design Professional in Responsible Charge will be requested per the 2019 CBC, Section 107.3.4.
5. In addition to all of the code requirements of the 2019 California Green Building Standards Code, specifically address Construction Waste Management per Sections 4.408.2, 4.408.3, 4.408.4, 5.408.1.1, 5.408.1.2, 5.408.1.3 and Building Maintenance and Operation, Section 5.410. Prior to the issuance of a building permit, the permittee will be required to describe how they will comply with the sections described above. Prior to Building Final Approval, the City will require a Waste Diversion Report per Sections 4.408.5 and 5.408.1.4.
6. The City of Huntington Beach has adopted the 2019 California Green Building Standards Code, including Sections 4.106.4.1 for Electric Vehicle (EV) Charging for New Construction, and 5.106.5.3 Electric Vehicle (EV) Charging.
7. The City of Huntington Beach has adopted the 2019 California Green Building Standards Code including section 301.1.1 where all non-compliant fixtures shall be replaced with water conserving fixtures as described in section 403.3.1. Non-compliant fixtures are defined in section 1101.3(c) of the California Civil Code.

➤ **COMMENTS:**

1. Project "*Condition of Approval*" shall appear on the submitted drawings.
2. Plans shall show justifications for allowable floor areas and the number of stories.
3. **Exiting Plan & Analysis:** Plans should include an occupant load analysis on the plans and provide an "Exit Plan" to show a clear and dimensioned Means of Egress system that provides a continuous, unobstructed exit from any occupied point in the building to a public way.
4. **Fire-rated Construction:** Plans should clearly identify the locations of the Fire Areas, Fire Walls, Fire Barriers, Fire Partitions, and all Occupancy separations. Provide complete legends and details on the plans.
5. Third party inspection by an independent certified deputy inspector for fire-stopping, fire-resistant penetrations and joints are required. (CBC Sections 1704, 1705, 1705.16)
6. Plans should clearly show compliance with CBC Chapters 11A (Housing Accessibility for Newly-Constructed Covered Multifamily Dwellings) and 11B Accessibility to Public Buildings, Public Accommodations, Commercial Buildings and Public Housing). A Certified Access Specialist (CAsp) report is recommended and shall be incorporated onto the plans.
7. Please provide analysis & a summary matrix of the accessible and/or adaptable units on the Title Sheet.
8. Building shall conform to State amendments for disabled accessibility, CBC Chapter 11A for the residential and common areas and 11B for the public areas.

9. **Accessible route:** All buildings of covered multifamily dwellings and related facilities such as parking spaces, laundry, storage, and other facilities for the use of the residents; passenger drop off points; the public way; and any adjacent public transportation stops, shall be connected by an accessible route of travel.
10. Dwelling Units constructed as senior citizens housing may also be subject to the Unruh Civil Rights Act. Refer to Division I, Part 2 of the California Civil Code Section 51. In particular section 51.2(d) subsections(1-7)
11. Covered multifamily dwellings may be subject to the requirements of more than one jurisdiction or law, which would require compliance with each law. Where federal, state or local laws differ, the more stringent requirements apply.
12. Your building is a covered multifamily dwelling with possibly a small public component in the first floor lobby area for business and sales. You should use Section 1109A 2019 CBC to calculate the required accessible parking. The ratios used in Huntington Beach Municipal Code 231.04 were developed considering all auto trips associated with your proposed development and as a result include trips by tenants, guests and employees. If both unassigned tenant parking, employees and visitors will be using the subterranean parking then use 1109A.5 to calculate the number of required accessible parking spaces. Also note the van spaces as shown on the level B1 floor plan cannot share a common access aisle.
13. You will need to be compliant with the applicable provisions of Section 435 2019 CBC. Special Provisions for licensed 24-Hour Care Facilities in a R-2.1, R-3.1 R-4. In particular Section 435.5 Fire-resistance-rated construction provisions



CITY OF HUNTINGTON BEACH

PUBLIC WORKS INTERDEPARTMENTAL COMMUNICATION

PROJECT IMPLEMENTATION CODE REQUIREMENTS

DATE: DECEMBER 7, 2021

PROJECT NAME: HUNTINGTON BEACH SENIOR LIVING

ENTITLEMENTS: CUP 2021-024, VAR 2021-003 GPA 2021-004, ZMA 2021-003 EA 2021-004

PLNG APPLICATION NO. PA 2021-0185

DATE OF PLANS: OCTOBER 15, 2021

PROJECT LOCATION: 4952 AND 4972 WARNER AVE., 92649 (SOUTHWEST CORNER OF WARNER AVENUE AT BOLSA CHICA STREET)

PROJECT PLANNER: HAYDEN BECKMAN, SENIOR PLANNER

PLAN REVIEWER: STEVE BOGART, SENIOR CIVIL ENGINEER 

TELEPHONE/E-MAIL: 714-374-1692 / SBOGART@SURFCITY-HB.ORG

PROJECT DESCRIPTION: TO REVIEW CONCEPTUAL PLANS TO AMEND THE GENERAL PLAN AND ZONING TO CONSTRUCT A NEW 5-STORY 290.850 SQ. FT. ASSISTED LIVING/RESIDENTIAL CARE FACILITY AT AN OVERALL HEIGHT OF 64 FT. THAT INCLUDES:

- 233 TOTAL RESIDENTIAL CARE UNITS
 - 145 INDEPENDENT LIVING
 - 60 ASSISTED LIVING
 - 28 MEMORY CARE
- SUBTERRANEAN PARKING GARAGE WITH 207 PARKING SPACES
- TWO INTERIOR COURTYARDS
- POOL AND GARDEN AMENITIES

The following is a list of code requirements deemed applicable to the proposed project based on plans as stated above. The items below are to meet the City of Huntington Beach's Municipal Code (HBMC), Zoning and Subdivision Ordinance (ZSO), Department of Public Works Standard Plans (Civil, Water and Landscaping) and the American Public Works Association (APWA) Standards Specifications for Public Works Construction (Green Book), the Orange County Drainage Area management Plan (DAMP), and the City Arboricultural and Landscape Standards and Specifications. The list is intended to assist the applicant by identifying requirements which shall be satisfied during the various stages of project permitting, implementation and construction. If you have any questions regarding these requirements, please contact the Plan Reviewer or Project Planner.

SITE PLAN DEVELOPMENT REQUIREMENTS:

1. Consolidate the project driveway locations to be consistent with General Plan Policy CIRC-1G which states to limit development driveway access points. The number of access driveways on Bolsa Chica Street shall be limited to a maximum of two (2) driveways.

2. A Project Trip Generation Analysis shall be provided to Public Works for review. Based on the results of the trip generation analysis a Traffic Impact Analysis (TIA) may be required. If said Traffic Impact Analysis is required, the applicant shall prepare the project (TIA) for review and approval by Public Works. (CIRC-1F)

**THE FOLLOWING DEVELOPMENT REQUIREMENTS SHALL BE COMPLETED PRIOR TO
ISSUANCE OF A GRADING PERMIT:**

1. A Precise Grading Plan, prepared by a Licensed Civil Engineer, shall be submitted to the Public Works Department for review and approval. (MC 17.05/ZSO 230.84) The plans shall comply with Public Works plan preparation guidelines and include the following improvements on the plan:
 - a. Damaged curb, gutter and sidewalk along the site's Bolsa Chica Street and Warner Avenue frontages shall be removed and replaced per Public Works Standard Plan Nos. 202 and 207. (ZSO 230.84)
 - b. The proposed driveway approaches on Bolsa Chica Street shall be constructed per Public Works Standard Plan No. 209 or 211. (ZSO 230.84)
 - c. The existing driveway approaches on Bolsa Chica Street and Warner Avenue shall be removed and replaced with curb, gutter, and sidewalk per Public Works Standard Plan Nos. 202 and 207. (ZSO 230.84)
 - d. The full depth of the existing AC pavement, for half-width (from existing curb line to the existing street centerline) of the project's Bolsa Chica Street frontage, shall be removed and replaced. The new roadway section shall be designed pursuant to the recommendations provided by the developer's licensed Geotechnical Engineer and as approved by the City Department of Public Works. (ZSO 230.84)
 - e. An ADA compliant access ramp at the southwest corner of Bolsa Chica Street and Warner Avenue per Caltrans Standard Plan A88A. (ZSO 230.84, ADA)
 - f. A new sewer lateral shall be installed connecting to the existing City sewer main in Warner Avenue. If the new sewer lateral is not constructed at the same location as the existing lateral, then the existing lateral shall be severed and capped at the main or chimney. (ZSO 230.84)
 - g. Any existing on-site public water pipeline (including removal of water appurtenances) impacted by the proposed structures, curbs, planters, parking facilities, trees, walls, etc. shall be abandoned per Water Division Standards. (State of California Administrative Code, Title 17)
 - h. The developer shall construct approximately 350 linear feet (LF) of minimum 8-inch water diameter pipeline along Warner Avenue starting from the most northwesterly corner of the property, head east, and connect to an existing 12-inch water main at the intersection of Bolsa Chica Street and Warner Avenue.
 - i. New domestic water service(s) and meter(s) shall be installed per Water Division Standards, and sized to meet the minimum requirements set by the California Plumbing Code (CPC). The quantity of public water meters shall be minimized and master-metered to the fullest extent possible. Sub-metering with private water meters constructed within private property is allowed. (ZSO 230.84) (MC 14.08.020)
 - j. The existing domestic water services currently serving the existing development may potentially be utilized if they are of adequate size, conform to current standards, and are in working condition as determined by the Water Inspector. If the property owner elects to utilize the existing water service(s), any non-conforming water service(s), meter(s), and backflow

protection device(s) shall be upgraded to conform to the current Water Division Standards. (ZSO 230.84)

- k. A separate irrigation water service and meter shall be installed per Water Division Standards. (ZSO 232) (MC 14.52)
 - l. Separate backflow protection devices shall be installed per Water Division Standards for domestic, irrigation and fire water services, and shall be screened from view. (Resolution 5921 and State of California Administrative Code, Title 17)
 - m. All backflow devices for domestic, irrigation and fire water services shall be constructed the outside building, parking structure, and as close as practical to the meter or point of connection to the City's water main per the current Water Division Standards. (Resolution 5921 and State of California Administrative Code, Title 17 and Downtown Specific Plan)
 - n. The existing domestic water services and meters, if not being used, shall be abandoned per Water Division Standards. (ZSO 230.84)
 - o. The fire sprinkler system that is required by the Fire Department for the proposed development shall have a separate dedicated fire service line installed per Water Division Standards. (ZSO 230.84)
 - p. Any on-site fire hydrant(s) that are/is required by the Fire Department to serve the proposed development shall become a private fire hydrant(s) that are served by private fire water service(s). These private fire water services shall be separated from the public water main(s) in Bolsa Chica Street and Warner Avenue by construction of a double check detector assembly. The double check detector assembly shall be constructed per the City of Huntington Beach Standard Plan No. 618, and shall be sized to provide adequate fire flow protection for the private on-site fire hydrant(s). The double check detector assembly shall be located within landscape planter area or other area and screened from view by landscaping or other method as approved by the Department of Public Works. The on-going maintenance of this private fire water service and private fire hydrants shall be the responsibility of the development owner(s). (Resolution 5921, State of California Administrative Code, Title 17)
2. The developer shall submit for approval by the Fire Department and Water Division, a hydraulic water analysis to ensure that fire service connection from the point of connection to City water main to the backflow protection device satisfies Water Division standard requirements.
 3. The Property Owner shall request of the Public Works Department in writing to vacate any existing water line easements, previously dedicated to the City of Huntington Beach that will no longer be needed. The Property Owner shall provide to the Public Works Department all necessary legal descriptions and exhibits to describe the water line easements to be abandoned. (ZSO 230.84)
 4. A Hydrology and Hydraulics Report shall be submitted for Public Works review and approval (10, 25, and 100-year storms shall be analyzed). The drainage improvements shall be designed and constructed as required by the Department of Public Works to mitigate impact of increased runoff due to development, or deficient, downstream systems. Design of all necessary drainage improvements shall provide mitigation for all rainfall event frequencies up to a 100-year frequency. The Hydrology and Hydraulic Report shall include, but not be limited to facilities sizing, limits of attenuation, downstream impacts and other related design features. Runoff shall be limited to existing 25-year flows, which must be established in the hydrology study. If the analyses shows that the City's current drainage system cannot meet the volume needs of the project runoff, the developer shall be required to attenuate site runoff to an amount not to exceed the existing 25-year storm as determined by the hydrology study. As an option, the developer may choose to explore low-flow design alternatives,

onsite attenuation or detention, or upgrade the City's storm water system to accommodate the impacts of the new development, at no cost to the City. (ZSO 230.84)

5. A sewer study shall be prepared and submitted to the Public Works Dept. for review and approval. A fourteen (14)-day or longer flow test data shall be included in the study. The location and number of monitoring test sites shall be determined by the Public Works Department. The sanitary sewer system shall be designed and constructed to serve the development, including any offsite improvements necessary to accommodate any increased flow associated with the project. (ZSO 230.84/MC 14.36.010)
6. Prior to the issuance of any grading or building permits for projects that will result in soil disturbance of one or more acres of land, the applicant shall demonstrate that coverage has been obtained under the Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ) [General Construction Permit] by providing a copy of the Notice of Intent (NOI) submitted to the State of California Water Resources Control Board and a copy of the subsequent notification of the issuance of a Waste Discharge Identification (WDID) Number. Projects subject to this requirement shall prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) conforming to the current National Pollution Discharge Elimination System (NPDES) requirements shall be submitted to the Department of Public Works for review and acceptance. A copy of the current SWPPP shall be kept at the project site and another copy to be submitted to the City. (DAMP)
7. A Project Water Quality Management Plan (WQMP) conforming to the current Waste Discharge Requirements Permit for the County of Orange (Order No. R8-2009-0030) [MS4 Permit] prepared by a Licensed Civil Engineer, shall be submitted to the Department of Public Works for review and acceptance. The WQMP shall address Section XII of the MS4 Permit and all current surface water quality issues.
8. The project WQMP shall include the following:
 - a. Low Impact Development.
 - b. Discusses regional or watershed programs (if applicable).
 - c. Addresses Site Design BMPs (as applicable) such as minimizing impervious areas, maximizing permeability, minimizing directly connected impervious areas, creating reduced or "zero discharge" areas, and conserving natural areas.
 - d. Incorporates the applicable Routine Source Control BMPs as defined in the Drainage Area Management Plan. (DAMP)
 - e. Incorporates Treatment Control BMPs as defined in the DAMP.
 - f. Generally describes the long-term operation and maintenance requirements for the Treatment Control BMPs.
 - g. Identifies the entity that will be responsible for long-term operation and maintenance of the Treatment Control BMPs.
 - h. Describes the mechanism for funding the long-term operation and maintenance of the Treatment Control BMPs.
 - i. Includes an Operations and Maintenance (O&M) Plan for all structural BMPs.
 - j. After incorporating plan check comments of Public Works, three final WQMPs (signed by the owner and the Registered Civil Engineer of record) shall be submitted to Public Works for acceptance. After acceptance, two copies of the final report shall be returned to applicant for

the production of a single complete electronic copy of the accepted version of the WQMP on CD media that includes:

- i. The 11" by 17" Site Plan in .TIFF format (400 by 400 dpi minimum).
 - ii. The remainder of the complete WQMP in .PDF format including the signed and stamped title sheet, owner's certification sheet, Inspection/Maintenance Responsibility sheet, appendices, attachments and all educational material.
 - k. The applicant shall return one CD media to Public Works for the project record file.
9. Indicate the type and location of Water Quality Treatment Control Best Management Practices (BMPs) on the Grading Plan consistent with the Project WQMP. The WQMP shall follow the City of Huntington Beach; Project Water Quality Management Plan Preparation Guidance Manual dated June 2008. The WQMP shall be submitted with the first submittal of the Grading Plan.
 10. In complexes larger than 100 dwelling units where car washing is allowed, a designated car wash area that does not drain to a storm drain system shall be provided for common usage. Wash water from this area may be directed to the sanitary sewer (upon approval by the Orange County Sanitation District), to an engineered infiltration system, or to an equally effective alternative. Pre-treatment may also be required. (DAMP)
 11. A suitable location, as approved by the City, shall be depicted on the grading plan for the necessary trash enclosure(s). The area shall be paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, and screened or walled to prevent off-site transport of trash. The trash enclosure area shall be covered or roofed with a solid, impervious material. Connection of trash area drains into the storm drain system is prohibited. If feasible, the trash enclosure area shall be connected into the sanitary sewer. (DAMP)
 12. A detailed soils and geological/seismic analysis shall be prepared by a registered engineer. This analysis shall include on-site soil sampling and laboratory testing of materials to provide detailed recommendations for grading, over excavation, engineered fill, dewatering, settlement, protection of adjacent structures, chemical and fill properties, liquefaction, retaining walls, streets, and utilities. (MC 17.05.150)
 13. The applicant's grading/erosion control plan shall abide by the provisions of AQMD's Rule 403 as related to fugitive dust control. (AQMD Rule 403)
 14. The name and phone number of an on-site field supervisor hired by the developer shall be submitted to the Planning and Public Works Departments. In addition, clearly visible signs shall be posted on the perimeter of the site every 250 feet indicating who shall be contacted for information regarding this development and any construction/grading-related concerns. This contact person shall be available immediately to address any concerns or issues raised by adjacent property owners during the construction activity. He/She will be responsible for ensuring compliance with the conditions herein, specifically, grading activities, truck routes, construction hours, noise, etc. Signs shall include the applicant's contact number, regarding grading and construction activities, and "1-800-CUTSMOG" in the event there are concerns regarding fugitive dust and compliance with AQMD Rule No. 403.
 15. The applicant shall notify all property owners and tenants within 300 feet of the perimeter of the property of a tentative grading schedule at least 30 days prior to such grading.

THE FOLLOWING DEVELOPMENT REQUIREMENTS SHALL BE COMPLIED WITH DURING GRADING OPERATIONS:

16. An Encroachment Permit is required for all work within the City's right-of-way. (MC 12.38.010/MC 14.36.030)
17. The developer shall coordinate the development of a truck haul route with the Department of Public Works if the import or export of material in excess of 5000 cubic yards is required. This plan shall include the approximate number of truck trips and the proposed truck haul routes. It shall specify the hours in which transport activities can occur and methods to mitigate construction-related impacts to adjacent residents. These plans must be submitted for approval to the Department of Public Works. (MC 17.05.210)
18. Water trucks will be utilized on the site and shall be available to be used throughout the day during site grading to keep the soil damp enough to prevent dust being raised by the operations. (California Stormwater BMP Handbook, Construction Wind Erosion WE-1)
19. All haul trucks shall arrive at the site no earlier than 8:00 a.m. or leave the site no later than 5:00 p.m., and shall be limited to Monday through Friday only. (MC 17.05)
20. Wet down the areas that are to be graded or that is being graded, in the late morning and after work is completed for the day. (WE-1/MC 17.05)
21. The construction disturbance area shall be kept as small as possible. (California Stormwater BMP Handbook, Construction Erosion Control EC-1) (DAMP)
22. All haul trucks shall be covered or have water applied to the exposed surface prior to leaving the site to prevent dust from impacting the surrounding areas. (DAMP)
23. Prior to leaving the site, all haul trucks shall be washed off on-site on a gravel surface to prevent dirt and dust from leaving the site and impacting public streets. (DAMP)
24. Comply with appropriate sections of AQMD Rule 403, particularly to minimize fugitive dust and noise to surrounding areas. (AQMD Rule 403)
25. Wind barriers shall be installed along the perimeter of the site. (DAMP)
26. All construction materials, wastes, grading or demolition debris and stockpiles of soils, aggregates, soil amendments, etc. shall be properly covered, stored and secured to prevent transport into surface or ground waters by wind, rain, tracking, tidal erosion or dispersion. (DAMP)
27. Existing street tree(s) to be inspected by the City Inspector during removal of concrete and prior to replacement thereof. Tree replacement or root/tree protection, will be specified upon the inspection of the root system. (Resolution 4545)

THE FOLLOWING DEVELOPMENT REQUIREMENTS SHALL BE COMPLETED PRIOR TO ISSUANCE OF A BUILDING PERMIT:

28. A Precise Grading Permit shall be issued. (MC 17.05)
29. A drainage fee for the subject development shall be paid at the rate applicable at the time of Building Permit issuance. The current rate of \$14,888 per gross acre is subject to periodic adjustments. This project consists of 3.89 gross acres (including its tributary area portions along the half street frontages) for a total required drainage fee of \$57,914. City records indicate the previous use on this property never paid this required fee. Per provisions of the City Municipal Code, this one-time fee shall be paid for all subdivisions or development of land. (MC 14.48)

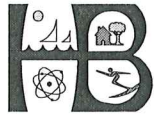
30. The applicable Orange County Sanitation District Capital Facility Capacity Charge shall be paid to the City Department of Public Works. (Ordinance OCSD-40)

**THE FOLLOWING DEVELOPMENT REQUIREMENTS SHALL BE COMPLETED PRIOR TO
ISSUANCE OF AN ENCROACHMENT PERMIT:**

31. Traffic Control Plans, prepared by a Licensed Civil or Traffic Engineer, shall be prepared in accordance with the latest edition of the City of Huntington Beach Construction Traffic Control Plan Preparation Guidelines and submitted for review and approval by the Public Works Department. (Construction Traffic Control Plan Preparation Guidelines)

**THE FOLLOWING DEVELOPMENT REQUIREMENTS SHALL BE COMPLETED PRIOR TO FINAL
INSPECTION OR OCCUPANCY:**

32. Complete all improvements as shown on the approved grading and improvement plans. (MC 17.05)
33. All existing and new utilities shall be undergrounded. This requirement applies to all existing overhead utilities along the project's Bolsa Chica Street frontage, including but not limited to all telephone, electric, and Cable TV lines. If required, easements shall be quitclaimed and/or new easements granted to the corresponding utility companies. (MC 17.64)
34. All applicable Public Works fees shall be paid at the current rate unless otherwise stated, per the Public Works Fee Schedule adopted by the City Council and available on the city web site at http://www.surfcity-hb.org/files/users/public_works/fee_schedule.pdf. (ZSO 240.06/ZSO 250.16)
35. Traffic Impact Fees (TIF) for the project shall be paid prior to final occupancy. The current rate for the project is \$1,843.08/unit. Credit is applied based on the prior use(s) of the site. The rate is subject to an annual adjustment. (MC 17.65)
36. Prior to grading or building permit close-out and/or the issuance of a certificate of use or a certificate of occupancy, the applicant shall:
- Demonstrate that all structural Best Management Practices (BMPs) described in the Project WQMP have been constructed and installed in conformance with approved plans and specifications.
 - Demonstrate all drainage courses, pipes, gutters, basins, etc. are clean and properly constructed.
 - Demonstrate that applicant is prepared to implement all non-structural BMPs described in the Project WQMP.
 - Provide certifications from the Engineer of Record or Landscape Architect that the LID BMPs were constructed and installed per the approved project plans and specifications. The certifications shall be included in the final WQMP.
 - Demonstrate that an adequate number of copies of the approved Project WQMP are available for the future occupiers.
 - Demonstrate that the preparer of the WQMP has reviewed the BMP maintenance requirements in Section V of the WQMP with the responsible person and that a copy of the WQMP has been provided to that person. A certification letter from the WQMP preparer may be used to satisfy this condition.



CITY OF HUNTINGTON BEACH

PUBLIC WORKS INTERDEPARTMENTAL COMMUNICATION

COMMENTS ON THE PRELIMINARY WQMP AND HYDROLOGY STUDY

DATE: DECEMBER 7, 2021

PROJECT NAME: HUNTINGTON BEACH SENIOR LIVING

ENTITLEMENTS: CUP 2021-024, VAR 2021-003 GPA 2021-004, ZMA 2021-003 EA 2021-004

PLNG APPLICATION NO. PA 2021-0185

DATE OF PLANS: OCTOBER 15, 2021

PROJECT LOCATION: 4952 AND 4972 WARNER AVE., 92649 (SOUTHWEST CORNER OF WARNER AVENUE AT BOLSA CHICA STREET)

PROJECT PLANNER: HAYDEN BECKMAN, SENIOR PLANNER

PLAN REVIEWER: STEVE BOGART, SENIOR CIVIL ENGINEER 

TELEPHONE/E-MAIL: 714-374-1692 / SBOGART@SURFCITY-HB.ORG

PROJECT DESCRIPTION: TO REVIEW CONCEPTUAL PLANS TO AMEND THE GENERAL PLAN AND ZONING TO CONSTRUCT A NEW 5-STORY 290.850 SQ. FT. ASSISTED LIVING/RESIDENTIAL CARE FACILITY AT AN OVERALL HEIGHT OF 64 FT. THAT INCLUDES:

- 233 TOTAL RESIDENTIAL CARE UNITS
 - o 145 INDEPENDENT LIVING
 - o 60 ASSISTED LIVING
 - o 28 MEMORY CARE
- SUBTERRANEAN PARKING GARAGE WITH 207 PARKING SPACES
- TWO INTERIOR COURTYARDS
- POOL AND GARDEN AMENITIES

THE FOLLOWING ARE PUBLIC WORKS COMMENTS SHALL BE ADDRESSED PRIOR TO THIS REPORT BEING SUBMITTED FOR THE FINAL PW PLAN CHECK OF THIS PROJECT:

1. TITLE SHEET: fill in all project entitlement numbers (i.e. CUP 2021-024, VAR 2021-003, etc.).
2. SECTION I, (PROJECT INFORMATION): fill in all project permit/application numbers.
3. SECTION I, WATER QUALITY CONDITIONS: List (verbatim) all water quality related code requirements as stated in the Public Works Project Implementation Code Requirements memo, dated December 7, 2021.

THE FOLLOWING ARE PUBLIC WORKS COMMENTS SHALL BE ADDRESSED PRIOR TO THIS REPORT BEING SUBMITTED FOR THE FINAL PW PLAN CHECK OF THIS PROJECT:

1. The *PRELIMINARY HYDROLOGY AND HYDRAULIC ANALYSIS* shall include further analysis to identify any necessary mitigation requirement and design for any runoff that exceeds the existing 25-year flows.

2. SECTION 4.3 CONCLUSION: Revise to address the required mitigation of the difference in storm flows between the flow from the 25-year storm (for the site's existing condition) and the flow from the 100-year storm (for the site's redeveloped condition).



HUNTINGTON BEACH FIRE DEPARTMENT

PROJECT IMPLEMENTATION CODE REQUIREMENTS

DATE: DECEMBER 8TH, 2021
PROJECT NAME: SENIOR LIVING FACILITY
RECORD NUMBER: DAT-2021-0022
PROJECT LOCATION: 4952 WARNER AVE
PLANNER: HAYDEN BECKMAN, SENIOR PLANNER
PLAN REVIEWER-FIRE: STEVE EROS, DEPUTY FIRE MARSHAL
TELEPHONE/E-MAIL: (714) 536-5531/ steve.eros@surfcity-hb.org

PROJECT DESCRIPTION: 236 unit, five-story, senior living development. Note that this project also includes the adjacent parcel at 4972 Warner Ave.

The following is a list of code requirements deemed applicable to the proposed project based on plans stated above. The list is intended to assist the applicant by identifying requirements which must be satisfied during the various stages of project permitting and implementation. A list of conditions of approval adopted by the Planning Commission in conjunction with the requested entitlement(s), if any, will also be provided upon final project approval. If you have any questions regarding these requirements, please contact the Plan Reviewer.

PRIOR TO DEMOLITION, GRADING, SITE DEVELOPMENT, ISSUANCE OF GRADING PERMITS, BUILDING PERMITS, AND/OR CONSTRUCTION, THE FOLLOWING SHALL BE REQUIRED:

1. Fire Master Plan

The Fire Master Plan shall be completed and approved prior to precise grading plan or building plan approval.

A separate Fire Master Plan is required for submittal to the HBFD. It shall be a site plan reflecting all the following fire department related items:

- Fire hydrant locations, public and private.
- FDC locations.
- Dimensions from FDC's to hydrants.
- DCDA locations.
- Fire sprinkler riser locations and location of system serving.
- FACP locations.
- Knox box and knox switch locations.

- Gate locations, and opticoms if required.
- Fire lane locations, dimensions, lengths, turning radii at corners and circles/cul-de-sacs
- Fire lane signage and striping.
- Property dimensions or accurate scale.
- Building locations and heights.
- Building addresses and suite addresses. **(FD)**

2. Environmental

City Specification # 429 and 431-92 Soil Clean-Up Standards testing is required. Due to the site having a former LUST case on site and a former oil well is located roughly 300 feet from the site, the HBFD will require soil testing conforming to City Specification # 429 and 431-92 Soil Clean-Up Standards is required.

All soils shall conform to City Specification #429 and 431-92 Soil Clean-Up Standards prior to the issuance of a building permit. Building plans shall reference that “All soils shall conform to City Specification # 431-92 Soil Clean-Up Standards” in the plan notes.

Imported Soil Plan. All imported soil shall meet *City Specification #431-92, Soil Cleanup Standards*. An “Imported Soil Work Plan” must be submitted to the Fire Department for review and approval prior to importing any soil from off site. Once approved, the soil source can be sampled per the approved work plan, then results sent to the HBFD for review. No rough grade will be approved prior to the actual soil source approval. Multiple soil sources required separate sampling as per the approved work plan, with no soil being imported until each source has been verified to meet the CS #431-92 requirements. **(FD)**

3. Fire Apparatus Access

The following items shall be completed prior to rough or precise grading plan approval.

Fire Access Roads shall be provided and maintained in compliance with City Specification # 401, *Minimum Standards for Fire Apparatus Access*. Driving area shall be capable of supporting a fire apparatus (75,000 lbs and 12,000 lb point load). Minimum fire access road width is twenty-four feet (24') wide, with thirteen feet six inches (13' 6") vertical clearance. Fire access roads fronting commercial buildings shall be a minimum width of twenty-six feet (26') wide, with thirteen feet six inches (13' 6") vertical clearance. For Fire Department approval, reference and demonstrate compliance with City Specification # 401 *Minimum Standards for Fire Apparatus Access* on the plans. **(FD)**

HBFD Note: The proposed fire department access lane on the south side of the property shows the use of turf block in the fire access lane. The HBFD will need to review and approve the turf block material to verify that this is an acceptable material. Submit the specifications for the turf block for HBFD review.

Maximum Grade for Fire Apparatus Access Roads shall not exceed 10%. **(FD)**

No Parking shall be allowed in the designated 24 foot wide fire apparatus access road or supplemental fire access per City Specification # 415. For Fire Department approval, reference and demonstrate compliance with City Specification # 415 *Minimum Standards for Fire Apparatus Access* on the plans. **(FD)**

Fire Lanes, as determined by the Fire Department, shall be posted, marked, and maintained per City Specification #415, *Fire Lanes Signage and Markings on Private, Residential, Commercial and Industrial Properties*. The site plan shall clearly identify all red fire lane curbs, both in location and length of run. The location of fire lane signs shall be depicted. No parking shall be allowed in the designated 24 foot wide fire apparatus access road or supplemental fire access per City Specification # 415. For Fire Department approval, reference and demonstrate compliance with City Specification # 401 *Minimum Standards for Fire Apparatus Access* on the plans. **(FD)**

Emergency Escape and Rescue openings shall not be required as the plans indicate the construction type to be 1-B. Since this facility is constructed of non-combustible material, emergency escape windows are not required.

4. Fire Suppression Systems

The following items shall be completed prior to issuance of a certificate of occupancy.

Fire Extinguishers shall be installed and located in all areas to comply with Huntington Beach Fire Code standards found in *City Specification #424*. The minimum required dry chemical fire extinguisher size is 2A 10BC and shall be installed within 75 feet travel distance to all portions of the building. Extinguishers are required to be serviced or replaced annually. **(FD)**

Fire Alarm System is required. A building fire alarm system is required. For Fire Department approval, shop drawings shall be submitted to the Fire Department as separate plans for permits and approval. For Fire Department approval, reference and demonstrate compliance with CFC Chapter 9 and NFPA 72 on the plans. A C-10 electrical contractor, certified in fire alarm systems, must certify the system is operational annually. **(FD)**

Automatic Fire Sprinklers are required. NFPA13 Automatic fire sprinkler systems are required per Huntington Beach Fire Code for new buildings with "fire areas" 5000 square feet or more or for buildings 10,000 square feet or more. An addition of square footage to an existing building also triggers this requirement.

Separate plans (two sets) shall be submitted to the Fire Department for permits and approval.

Automatic fire sprinkler systems must be maintained operational at all times, with maintenance inspections performed quarterly and the system serviced every five years by a state licensed C-16 Fire Protection Contractor.

For Fire Department approval, reference that a fire sprinkler system will be installed in compliance with the California Fire Code, NFPA 13, and City Specification # 420 - *Automatic Fire Sprinkler Systems* in the plan notes.

NOTE: When buildings under construction are more than one (1) story in height and required to have automatic fire sprinklers, the fire sprinkler system shall be installed and operational to protect all floors lower than the floor currently under construction. Fire sprinkler systems for the current floor under construction shall be installed, in-service, inspected and approved prior to beginning construction on the next floor above. Exception: Buildings entirely of Type 1 or Type 2 construction. **(FD)**

Fire Department Connections (FDC) to the automatic fire sprinkler systems shall be located to the front of the building, at least 10 feet from and no farther than 100 feet of a properly rated fire hydrant. **(FD)**

Class 1 Standpipes (2 ½" NFH connections) are required at each stairway. The standpipe system in stairwells cannot protrude into, impede, or compromise the CBC "Exit Width" requirements. For Fire Department approval, reference and portray Class 1 standpipes at each stairway in the plan notes. **(FD)**

Commercial Food Preparation Fire Protection System required for commercial cooking. Plans (three sets) shall be submitted to the Fire Department as separate plans for permits and approval. Reference compliance with CFC Chapter 9 and *City Specification # 412 Protection Of Commercial Cooking Operations* in the plan notes. **(FD)**

Smoke alarms and Carbon Monoxide alarms are required per CBC and CFC Sections 907.2.11 and 915, respectively.

Emergency Responder Radio Coverage is required throughout all portions of the structure(s) as per Chapter 5 of the CFC. A separate plan must be submitted to the HBFD for method of addressing this requirement. System must be tested, certified and then inspected once building construction is primarily complete but before the certificate of occupancy will be issued. **(FD)**

5. Fire Hydrants and Water Systems

The following items shall be completed prior to issuance of a certificate of occupancy.

Private Fire Hydrants are required. Hydrants must be portrayed on the site plan. Hydrants shall be installed and in service **before** combustible construction begins. Installation of hydrants and service mains shall meet NFPA 13 and 24, 2013 Edition, Huntington Beach Fire Code Appendix B and C, and City Specification # 407 Fire Hydrant Installation Standards requirements. Private fire hydrants shall not be pressurized by Fire Department Connections to the sprinkler system. The system design shall ensure that recirculation of pressurized water from the hydrant, thru the FDC and back through the sprinkler system supply to the hydrant does not occur. Installation of the private fire service main, including fire department connections, shall meet NFPA 13 and 24, 2013 Edition requirements. Maximum allowed velocity of fire flow in supply piping is 12 fps. The maintenance of private fire hydrants is the responsibility of the owner or facility association. Shop drawings shall be submitted to and approved by the Fire Department. For Fire Department approval, portray the fire hydrants and reference compliance with City Specification #407 Fire Hydrant Installation Standards in the plan notes. **(FD)**

HBFD Note: Private hydrants are required when the fire access lanes exceed 150 feet onto the parcel.

Connection to the Public Water Supply - Separate plans shall be submitted to the Public Works Department detailing the connection, piping, valves and back-flow prevention assembly (DDCA) for approval and permits. Approval by Public Works and the Fire Department must be completed prior to issuance of a grading permit. The dedicated private fire water service off-site improvements shall be shown on a precise grading plan, prepared by a Licensed Civil Engineer. **(FD)**

6. Fire Personnel Access

Main Secured Building Entries shall utilize a KNOX® Fire Department Access Key Box, installed and in compliance with City Specification #403, Fire Access for Pedestrian or Vehicular Security Gates & Buildings. Please contact the Huntington Beach Fire Department Administrative Office at (714) 536-5411 for information. Reference compliance with City Specification #403 - KNOX® Fire Department Access in the building plan notes. **(FD)**

Roof Access is required. At least one stair shall extend to the roof from grade level and have an exterior door available for fire fighter access. **(FD)**

Fire Sprinkler System Controls access shall be provided, utilizing a KNOX® Fire Department Access Key Box, installed and in compliance with City Specification #403, Fire Access for Pedestrian or Vehicular Security Gates & Buildings. The approximate location of the system controls shall be noted on the plans. Reference compliance in the plan notes. **(FD)**

Elevators shall be sized to accommodate an ambulance gurney. Minimum interior dimensions are 7 feet (84") wide by 4 feet 3 inches (51") deep. Minimum door opening dimensions are 3 feet 6 inches (42") wide right or left side opening. Center opening doors

require a 4 feet 6 inches (54") width. For Fire Department approval, reference and demonstrate compliance on the building plans. **(FD)**

7. Addressing and Street Names

The following items shall be completed prior to issuance of a certificate of occupancy.

Structure or Building Address Assignments. The Planning Department shall review and make address assignments. The individual dwelling units shall be identified with numbers per City Specification # 409 Street Naming and Address Assignment Process. For Fire Department approval, reference compliance with City Specification #409 Street Naming and Address Assignment Process in the plan notes. **(FD)**

8. Building Construction

The following items shall be completed prior to issuance of a certificate of occupancy.

Emergency Responder Radio Coverage is required throughout all portions of the structure(s) as per Chapter 5 of the CFC. A separate plan must be submitted to the HBFD for method of addressing this requirement. System must be tested, certified and then inspected once building construction is primarily complete but before the certificate of occupancy will be issued. **(FD)**

Stairwell Required Minimum Widths. Standpipe systems in stairwell areas shall not impede code required minimum widths. **(FD)**

Fire Control Room required. Provide a dedicated room for the Fire Department to observe and monitor all systems operations from an integrated annunciator panel. They shall be located in an exterior location that is at grade level and has clear-to-the sky access. **(FD)**

Exit Signs And Exit Path Markings will be provided in compliance with the Huntington Beach Fire Code and Title 24 of the California Administrative Code. Reference compliance in the plan notes. **(FD)**

Gates and Barriers shall be able to open without the use of a key or any special knowledge or effort. Gates and barriers in a means of egress shall not be locked, chained, bolted, barred, latched or otherwise rendered unable to open at times when the building or area served by the means of egress is occupied, and shall swing in the direction of travel when required by the Building Code for exit doors. **(FD)**

Posting Of Room Occupancy is required. Any room having an occupant load of 50 or more where fixed seats are not installed, and which is used for assembly purposes, shall

have the capacity of the room posted in a conspicuous place near the main exit per CFC Chapter 10. **(FD)**

Egress Illumination/Emergency Exit Lighting with emergency back-up power is required. Provide means of egress illumination per HBFC 604.2.4 and UBC 1003.2.9. **(FD)**

Exit Ways and Aisles Plan is required for this project. HBFC section 408.2.1. Plans shall be submitted indicating the seating arrangement, location and width of exit ways and aisles for approval and an approved copy of the plan shall be kept on display on the premises. **(FD)**

THE FOLLOWING CONDITIONS SHALL BE MAINTAINED DURING CONSTRUCTION:

- a. Fire/Emergency Access And Site Safety shall be maintained during project construction phases in compliance with CFC Chapter 33, Fire Safety During Construction And Demolition. **(FD)**

OTHER:

- a. Discovery of additional soil contamination or underground pipelines, etc., must be reported to the Fire Department immediately and the approved work plan modified accordingly in compliance with City Specification #431-92 Soil Clean-Up Standards. **(FD)**
- b. Outside City Consultants The Fire Department review of this project and subsequent plans may require the use of City consultants. The Huntington Beach City Council approved fee schedule allows the Fire Department to recover consultant fees from the applicant, developer or other responsible party. **(FD)**

Fire Department City Specifications may be obtained at:

Huntington Beach Fire Department Administrative Office

City Hall 2000 Main Street, 5th floor

Huntington Beach, CA 92648

or through the City's website at **www.surfcity-hb.org**

If you have any questions, please contact the Fire Prevention Division at (714) 536-5411.

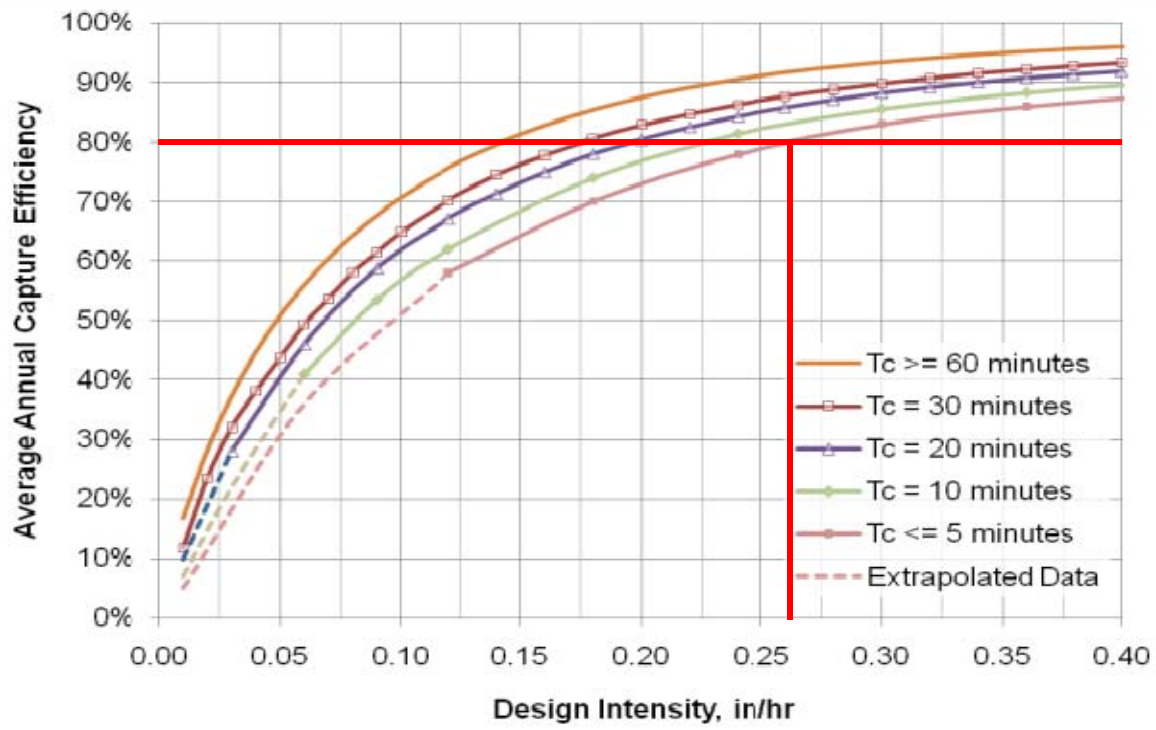
Attachment F: BMP Sizing Calculations and Documentation

Simple Design Capture Volume				
SIMPLE DCV WORKSHEET		Drainage Management Area (DMA):		DMA A
		Area:		122,392 sq. ft.
Calculate Design Storm Volume				
1	Enter design capture storm depth, d (inches)	$d =$	0.750	inches
2a	Enter the combined effect of provided HSCs, d_{HSC} (inches) (based on Worksheet 4)	$d_{HSC} =$	0	inches
2b	Calculate the remainder of the design capture storm depth, $d_{remainder} = d - d_{HSC}$	$d_{remainder} =$	0.750	inches
3a	Enter DMA area tributary to BMP(s), A (acres) excluding any self-retaining areas	$A =$	2.81	acres
3b	Enter DMA Imperviousness, imp (unitless) after removal of self-retaining areas	$imp =$	90	%
3c	Calculate runoff coefficient, $C = (0.75 \times imp) + 0.15$	$C =$	0.825	
3d	Calculate runoff volume, $DCV = (C \times d_{remainder} \times A \times 43560 \times (1/12))$ (See Section E.2.2)	$DCV =$	6,311	cu. ft.

Worksheet D: Capture Efficiency Method for Flow-Based BMPs				
		Drainage Management Area:	DMA A	
		BMP ID:	1	
Step 1: Determine the design storm intensity of the flow-based BMP				
1	Enter the time of concentration, Tc (min) (See Appendix IV.2)	Tc=	5	min
2	Using Figure III.4, determine the design intensity at which the estimated time of concentration (Tc) achieves 80% capture efficiency, I ₁	I ₁ =	0.26	in/hr
3	Enter the effect depth of provided HSCs upstream, d _{HSC} (inches) (Worksheet A)	d _{HSC} =	0.00	inches
4	Enter capture efficiency corresponding to upstream d _{HSC} , Y ₂ (Worksheet A)	Y ₂ =	0.00	%
5	Using Figure III.4, determine the design intensity at which the time of concentration (Tc) achieves the upstream capture efficiency (Y ₂), I ₂	I ₂ =	0.00	in/hr
6	Determine the design intensity that must be provided by BMP to achieve 80 percent capture, I _{design} = I ₁ -I ₂	I _{design} =	0.26	in/hr
Step 2: Calculate the design flowrate				
1	Enter DMA area tributary to BMP(s), A (acres)	A=	2.81	acres
2	Enter DMA Imperviousness, imp (unitless)	imp=	90	%
3	Calculate runoff coefficient, C = (0.75 x imp) + 0.15	C=	0.825	
4	Calculate design flowrate, Q _{design} = (c x I _{design} x A)	Q _{design} =	0.60	cfs
Supporting Calculations				
Describe system:				
Provide time of concentration assumptions: Assumed a Tc of 5 minutes.				

Worksheet D: Capture Efficiency Method for Flow-Based BMPs

Graphical Operations



Provide supporting graphical operations in figure above.

$$C = (0.75 \times \%imp) + 0.15$$

$$DCV = C \cdot d \cdot A \cdot (1/12) \cdot 43,560$$

$$DDp = (dp/K_{media}) \cdot 12 \text{ (in/ft)}$$

$$d(\text{filtered}) = [K(\text{media}) \cdot T(\text{routing})] / 12$$

$$A = DCV / (dp + d(\text{filtered}))$$

BIO-1 Stormwater Planter		
Runoff Volume, V (cf)	V=	6311
K _{media} (in/hr)	K(media)=	2.5
Surface Ponding Depth (ft)	dp=	1.0
Time to Drain (hours)	DDp=	4.8
Storm Routing Duration (hours)	T(routing)=	3
Depth of Filtered Water	d(filtered)=	0.625
Required Bioretention Area (sf)	A(bio)=	3884

Attachment G:

Soils Report

26 July 2021

Mr. Ben Morrison
Hines
444 S. Flower Street, Suite 2100
Los Angeles, California 90071

**Re: Preliminary Geotechnical Investigation Report
Senior Housing Development
Huntington Beach, California
Langan Project No.: 700101401**

Dear Mr. Morrison:

As requested by Hines and in accordance with our 'Proposal for Geotechnical Services Engineering Services,' of 25 May 2021, Langan Engineering and Environmental Services, Inc., (LANGAN) has completed a preliminary geotechnical engineering investigation in support of your due diligence for site acquisition and development of the property at the southwest corner (SWC) of Warner Avenue and Bolsa Chica Street, Huntington Beach, California.

This letter report presents a summary of the items listed below:

- Our understanding of the existing site conditions and the proposed development,
- Geological and geotechnical information publicly available,
- Subsurface investigation,;
- Anticipated geologic conditions and seismic hazards, and
- Our preliminary comments and recommendations regarding the geotechnical feasibility and construction considerations for the proposed development.

Our recommendations were prepared in accordance with the 2019 California Building Code (CBC) and Orange County Geotechnical Guidelines.

PROJECT OVERVIEW

Existing Site Description

The Site is an approximately 3.1 acre site on the SWC of Warner Avenue and Bolsa Chica Street, in Huntington Beach. The site is currently occupied by a two story wood frame commercial buildings and at grade parking. The Site is surrounded by housing developments on the west, a commercial development on the south, Warner Avenue to the north, and Bolsa Chica Street to the east (Figure 1).

Proposed Development

Based on your email dated 19 May, 2021, we understand the proposed development is a five-story apartment building on top of a one level basement parking garage. The site is currently divided into two Parcels based on the provided ALTA/NSPS Land Title Survey document.

AVAILABLE INFORMATION REVIEW

Information that LANGAN reviewed included reports, maps, and other publicly available information from the United States Geological Survey (USGS), California Geological Survey (CGS), City of Huntington Beach, Federal Emergency Management Agency (FEMA), and our files.

A summary of the available information reviewed is provided in the sections below.

Regional and Local Geology

The site is situated along the southwesterly margin of the Orange County Coastal Plain, a relatively broad lowland area that was formed through alluvial aggradations and the formation of coalescing alluvial fans which were deposited along the ancestral Santa Ana River during late Quaternary time. The Coastal Plain is bounded on the northeast by an alignment of highland areas and foothills (including the Puente and Coyote Hills), and on the southwest by a succession of low coastal hills and mesas that are topographic expressions of deformation along the Newport-Inglewood structural zone. Between these coastal topographic highs occur a total of six gaps through which continuations of the central lowland extend to the Pacific Ocean shoreline.

Published regional geologic information indicates that the subject site is underlain by old shallow marine (terrace) deposits (map symbol Qom, Saucedo et al, 2016). These deposits are reportedly late to middle Pleistocene in age. The terrace deposits are in turn underlain by marine and littoral sedimentary bedrock of the Lakewood and San Pedro Formations.

The referenced literature indicates that the old shallow marine deposits beneath the site consist generally of poorly sorted, moderately permeable, reddish-brown, interfingering strandline, beach, estuarine, and colluvial deposits.

Geologic Hazards Review

Our geologic hazard review was performed in general accordance with CGS Special Publication 117A, "Guidelines for Evaluating and Mitigating Seismic Hazards in California" (2008). The following subsections present the results of our hazard review.

Regional Faulting

Recognized and mapped faults that are located within a 100-kilometer (km) radius of the site, according to the "2014 USGS National Seismic Hazards Maps," are shown on Figure 2. The closest known fault to the site is the Newport-Inglewood alt 2 approximately 0.84 miles east of the site. The next closest faults are the Newport-Inglewood alt 1 Fault approximately 1.03 miles north of the site and the Compton Fault approximately 4.1 miles north of the site.

The site is in an active seismic area that has historically been affected by generally moderate to occasionally high levels of ground motion. Therefore, the proposed development will probably experience moderate to occasionally high levels of ground motion from nearby faults and other active seismic areas of the southern California region. A summary of the reported earthquake events are provided in Appendix A.

Regional Seismicity

A search of the Uniform California Earthquake Rupture Forecast (UCERF3), accessed on 07 July 2021, using a web-based Earthquake Archive Search and URL Builder tool, found that 55 earthquakes with magnitudes greater than 5.0 have occurred within a 100-km radius of the site since 1900. A summary of the reported earthquake events are provided in Appendix A.

Surface Rupture

Earthquake Fault Zones are regulatory zones delineated by CGS around active faults with the potential to cause surface rupture. The zones average approximately ¼-mile wide. A review of the Seismic Hazard Zone Map with the Earthquake Zones Map of Required Investigation revised on 1 January 2018 and the 2017 “City of Huntington Beach Geologic Hazards” indicates that the site is not within a mapped, currently established Alquist-Priolo Special Study Zone or a Fault Rupture Study Area (Figure 3).

Liquefaction

Liquefaction is a transformation of soil from a solid to a liquefied state during which saturated soil temporarily loses shear strength resulting from the buildup of excess pore-water pressure, especially during earthquake-induced cyclic loading. Flow failure, lateral spreading, differential settlement, loss of bearing, ground fissures, and sand boils are evidence of excess pore-pressure generation and liquefaction. Soil susceptible to liquefaction includes loose to medium-dense sands and gravels, low-plasticity silts, and some low-plasticity clay deposits below the groundwater table. According to Seismic Hazard Zone Report 020 and the 2017 “City of Huntington Beach Geologic Hazards” map, the site is mapped, in a “low” liquefaction-potential investigation zone (Figure 3).

Landslides

A review of the 2017 “City of Huntington Beach Geologic Hazards” map and Seismic Hazard Zone Report 020 indicates that the site is not within a mapped, currently established zone of landslide occurrences or areas of significant grading (Figure 3).

Historical High Groundwater

As noted above, the presence of groundwater may increase the susceptibility to liquefaction for loose to medium granular soils, low-plasticity silts and some clays when subjected to sufficient ground shaking. The Seismic Hazard Zone Report 020 indicates that the site’s historically highest groundwater is approximately 30 feet below existing grade (Figure 4).

Seismically-Induced Ground Deformations

Seismically induced ground deformations include ground-surface settlement and differential settlement resulting from liquefaction-induced ground deformation and cyclic densification of unsaturated sands and gravels from earthquakes. As discussed above, the site is not within a mapped liquefaction-hazard investigation zone. Therefore, liquefaction-induced settlement of soils below the groundwater table is not an anticipated hazard. Based on subsurface condition, cyclic densification of dry sands above the groundwater is not anticipated seismic hazard at the site.

Lateral Spreading

Lateral spreading is a phenomenon in which surficial soil displaces along a shear zone that has formed within an underlying liquefied layer. The surficial blocks are transported downslope or in the direction of a free face, such as a slope, by earthquake and gravitational forces. Lateral spreading is not anticipated at this site.

Flood Mapping

A review on the FEMA Flood Insurance Rate Map (FIRM) Number 06059C0233K (21 March 2019) indicates that the site is within Zone X, defined as an “area of minimal flood hazard” (Figure 5).

Additionally, the 2017 City of Huntington Beach Local Hazard Mitigation Plan indicates that the site is outside the flood zone.

Tsunami and Seiche

A tsunami is a long, high sea wave based by an earthquake, submarine landslide, or other disturbances. A seiche is an oscillation of surface water in an enclosed or semi-enclosed basin such as a lake, bay, or harbor. According to information and maps available from CGS and the City of Huntington Beach Tsunami Inundation Zone, the site is not within a mapped tsunami-inundation hazard zone or flood-control basin (Figure 6).

Subsidence

Land subsidence may be induced from withdrawal of oil, gas, or water from wells. According to the City of Huntington Beach Local Hazard Mitigation Plan (2017), the site is located in a zone of approximately -0.1 to -0.2 inches of subsidence per year (Figure 7). The 2017 report also details, "subsidence has occurred underneath both the Murdy Fire Station and the City Corporation Yard, resulting in damage to the structures and to outdoor areas (City of Huntington Beach 2012). While subsidence remains an issue of concern in the community, it has slowed from previous levels. According to a 1987 report, some parts of Huntington Beach had sunk by 6 feet over a 60-year period, an average of 1.2 inches each year (Billiter 1990). This is 50 percent more than the fastest subsidence observed recently." Therefore, the site is considered to be subject to land subsidence from oil, gas, or water withdrawal from oil wells and design should take into account the subsidence rates.

Expansive Soils

Expansive soils occur when the moisture content in the soil causes swelling or shrinking as a result of cyclic wet/dry weather cycles, installation of irrigation systems, change in landscape plantings, or changes in grading. Swelling and shrinking soils can result in differential movement of structures including floor slabs and foundations, and site work including hardscape, utilities, and sidewalks. The 2019 CBC defines potentially expansive soils as soils with expansion indices (EI) greater than 20. Additional information and recommendations are included in our Preliminary Geotechnical Evaluations section of this report.

SUBSURFACE INVESTIGATION

Geotechnical Exploration

Our geotechnical subsurface exploration program consisted of three hollow-stem auger (HSA) borings (identified as LB-1, LB-2, and LB-3) where LB-2 was drilled to approximately 51.5 feet and LB-1 to approximately 38 feet, and LB-3 were drilled to approximately 36.5 feet. Prior to drilling, the boring location was marked out by a LANGAN field engineer. Underground Service Alert of Southern California (USA/DigAlert) was contacted to locate and mark known public underground utilities within the public right-of-way. A private utility-locating subcontractor also confirmed that the boring locations were clear of conductive underground utilities. Refer to Figure 8 for approximate boring location.

Borings LB-1, LB-2 and LB-3 were drilled by Martini Drilling, on 25 June 2021 using a truck-mounted drill rig under the full-time observation of a Langan field engineer. The boring was hand-augered to a depth of approximately 5 feet and subsequently advanced with the drill rig using

conventional drilling techniques. Standard Penetration Tests (SPT)¹ and California Modified Ring sampling were generally performed at 5-foot intervals until boring termination depth, following the guidelines of ASTM D1586 and ASTM D3550. California Modified Ring samples were collected at select locations using a 3.0-inch-outer-diameter split-barrel California sampler lined with 2.42-inch-inner-diameter brass rings. SPT N-values were recorded to identify the relative density and stiffness of the cohesionless and cohesive soils, respectively.

Upon completion, the boring was backfilled via tremie method with cement-grout slurry to near ground surface, and the surface was patched with quick-dry set concrete. Excess soil cuttings generated during drilling were temporarily stored on site in Department of Transportation (DOT) approved 55-gallon drums for subsequent characterization and disposal. Excess soil cuttings encountered are pending characterization and disposal.

Retrieved soil samples were visually examined and classified in the field following the Unified Soil Classification System (USCS) and confirmed by re-examination in our office. A copy of the boring logs is provided in Appendix B.

Laboratory Testing

Select representative soil samples retrieved from the borings were delivered to a geotechnical laboratory to determine the sample's physical and engineering index properties. Our laboratory test program included the following analyses:

- Moisture Content (ASTM D2216)
- Unit Weight (ASTM D7623)
- Direct Shear (ASTM D3080)
- Expansion Index (ASTM D4829)
- Percent Fines (ASTM D1140)
- Corrosion Testing (pH, sulfate, chloride, minimum resistivity)

Copies of the laboratory test results are provided in Appendix C.

SUBSURFACE CONDITIONS

Based on our field investigation and interpretation of laboratory tests, the site is generally underlain by fill underlain by alluvial deposits. Details of the subsurface conditions encountered in our boring are summarized below.

- **Fill:** LB-1 was measured to have 3 inches of asphalt and 8 inches of aggregate base, LB-2 was measured to have 1.5-inches of asphalt and 5.5 inches of aggregate base, and LB-3 was measured to have 2.5 inches of asphalt and 4.5 inches of aggregate base. Below the asphalt, we encountered up to 8 feet of undocumented fill, consisting of clay with varying amounts of fine sand and gravel.
- **Terrace Deposits:** Terrace deposits were encountered in LB-1 through LB-3 to the maximum explored depth of 51.5 feet, consisting of medium dense to dense fine sands with varying amounts of silts and clays extending to about 23 to 25 feet below ground surface. Beneath the sand was firm to very stiff clay with trace fine sands extending to

¹ The Standard Penetration Test is a measure of the soil density and consistency. The SPT N-value is defined as the number of blows required to drive a 2-inch outer diameter split-barrel sampler 12-inches, after an initial penetration of 6 inches, using a 140-pound automatic hammer free falling of a height of 30 inches (ASTM D1586).

approximately to 35' on LB-1 and LB-3. Under the LB-1 and LB-3 clay layer, the final samples encountered medium dense to dense fine sand with some clay. LB-2, however, encountered medium dense sand layers with varying levels of silt and clay closer to the surface in the 30' and 35' samples. Beneath these sand layers a stiff clay layer with some fine sand extended to approximately 51 feet below the ground surface. A medium dense sand layer with some clay was encountered at the bottom of the last sample at 51 feet. The upper sandy samples had SPT blow counts between 10 and 29 with a higher value of 74 blows for 11.5 inches in LB-2. The middle clay layer had SPT blowcounts of 9 to 37. The middle sandy layers in LB-2 had blowcounts of 18 to 33. The lower clay layers in LB-2 had blowcounts of 14 to 24.

- **Groundwater:** Groundwater was first encountered at the depth of 46.2 feet and measured 15 minutes later at 44.7 feet below grade on LB-2. Groundwater was not detected on LB-1 and LB-3.

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PRELIMINARY GEOTECHNICAL EVALUATION

Based on our field exploration, limited soil tests, and review of available documents, the soils at the proposed foundation level are suitable for support of the proposed structure. The proximity of neighboring structures and streets will need to be considered during design and construction.

Presented below are preliminary comments and recommendations based on the available geotechnical information reviewed to date. Confirmatory geotechnical subsurface investigation, laboratory tests, analysis, and evaluation should be performed to confirm recommendations provided in this letter report.

Seismic Design Parameters

Preliminary seismic design parameters in accordance with the 2019 California Building Code and ASCE 7-16 are listed below. The seismic design criteria assumes the structure meets the exceptions of ASCE 7-16 Chapter 12.

Type	Value	Description
S_S	1.454	MCE_R mapped spectral response acceleration at short period
S_1	0.528	MCE_R mapped spectral response acceleration at one-second period
F_a	1.2	Site Amplification Factor at 0.2 second
F_v	1.52	Site Amplification Factor at 1.0 second
S_{MS}	1.746	Site-modified spectral acceleration at short period
S_{M1}	0.802	Site-modified spectral acceleration at one-second period
S_{DS}	1.164	Design earthquake spectral response acceleration at short period
S_{D1}	0.535	Design earthquake spectral response acceleration at one-second period
PGA_M	0.634	MCE geometric mean peak ground acceleration adjusted for site class effects

Notes:

1. Values based on Site Class D - Default.
2. MCE = Maximum Considered Earthquake
3. MCE_R = Risked-Targeted Maximum Considered Earthquake

Based on deaggregation of the probabilistic seismic hazard spectrum from the USGS Unified Hazard Tool, the mean and modal earthquakes for the 2% probability of exceedance in 50 years (2,475-year return period) event are 6.88 and 7.3 moment magnitudes, respectively.

Seismic design parameters were determined for a Site Class D, assuming that the proposed structures have fundamental periods of vibration equal to or less than 0.5 seconds.

The structural engineer should confirm the structural fundamental period of vibration and the seismic design approach. The structural engineer should provide the fundamental period of vibration to LANGAN and confirm if Exception No. 2 of Section 11.4.8 of ASCE 7-16 and if simplified design procedures in accordance with Section 12.14 of ASCE 7-16 will be used for seismic design. If the exception is not being used a site-specific seismic site response analysis will be required for final design.

Foundation Considerations

Our recommendations provided here are preliminary and should be reevaluated based on an additional site-specific field investigation. We understand that the proposed development will consist of a five-story apartment building on top of one level of basement garage parking.

One-Level Basement Garage - Based on our experience with similar projects, we expect approximately 15 feet of overburden removal for the construction of the below-grade parking garage and individual column loads of 300 to 500 kips are expected.

A shallow foundation system (spread or continuous footings) bearing on properly prepared and compacted subgrade can be designed with a preliminary bearing pressures of 3,000 to 4,000 pounds per square foot (psf). Recommended allowable bearing values including both dead and live loads, and may be increased by one-third for transient loads such as wind or seismic forces.

Recommended allowable bearing values including both dead and live loads, and may be increased by one-third for transient loads such as wind or seismic forces.

Permanent Below-Grade Walls

Below-grade walls for the proposed one-level parking garage are presumed to be fixed against rotation. Retained soils behind the below-grade walls are expected to be greater than 6 feet in height and should be designed for seismic loading conditions. Additionally, surcharge loading along the walls should consider adjacent structures, streets, vehicular traffic, and sidewalks.

The below-grade walls along the west and south side of the property should be designed to withstand lateral loading from neighboring foundations. Surcharge loading should be considered where the neighboring building foundations are supported on material above a one horizontal to one vertical (1H:1V) theoretical influence line extending upward along the respective foundation walls. Lateral loading from neighboring building foundations need not be considered if these foundations are supported outside the aforementioned influence line.

The below-grade walls along the north and east sides of the property should be designed to consider surcharges from adjacent streets, vehicular traffic, and sidewalks. Where vehicular traffic will pass within 10 feet of walls, traffic loads should be considered in the design of walls.

Expansive Soil Considerations

Potentially expansive soils are defined by the CBC 2019 as soils with expansion indices (EI) of greater than 20. Expansive soils swell or shrink when the moisture content of the soil changes. A soil's moisture content can change through cyclic wet/dry weather cycles, variations in the groundwater level, installation of irrigation systems, change in landscape plantings, and changes in site grading. Leaking utilities can also drastically change soil moisture content. Expansion index testing of the near-surface material indicates the soil exhibits a "medium" expansion potential (EI of 51).

The site should be designed to promote positive drainage away from the pavements and landscaping should consist of mainly drought-tolerant native planting that requires limited irrigation. Confirmatory expansion index testing should be performed in a design-level final geotechnical investigation to confirm expansion potential of soils near proposed foundation level.

Corrosion Considerations

Chemical analyses performed on select samples obtained in the upper 5 feet across the site are summarized in Table 1 below.

Table 1 – Chemical Analytical Results

Date of Investigation	Sample	Depth (feet)	Resistivity (ohm-cm)	pH	Soluble Sulfate (ppm)	Chloride (ppm)
25 June 2021	LB-2/ Bulk	1 - 5	540	7.8	130	45

Notes:

1. ppm = parts per million
2. NT = not tested for the select sample

According to our review of the minimum resistivity, pH, soluble sulfate, and chloride contents on the select soil samples, the surficial soil is considered class S0 (low sulfate concentration in contact with concrete) and corrosive to ferrous metals (ANSI/AWWA Standard C105/A21.5, ACI 318-19 and ASTM A674).

All subsurface structures and utilities in contact with the native soils should be protected against corrosion. Based on the samples collected to date, ACI 318-14 classified the soil as Exposure Class S0 for sulfate and Exposure Class C1 for chloride. A corrosion expert should be consulted if metal pipe is proposed to be in contact with soil. Based on the laboratory data summarized here, ACI 318-14 requires that concrete should be designed using Type II cement (ASTM C150), a maximum water-to-cement ratio of 0.5, and a minimum specified compressive strength (f'c) of 4,000 pounds per square inch (psi). A copy of the corrosion results is provided in Appendix C.

Confirmatory corrosion testing should be performed in a design-level final geotechnical investigation to confirm corrosivity of native soils at proposed foundation level.

CONSTRUCTION CONSIDERATIONS

Temporary Excavation Support

Based on the anticipated depths and limits of proposed excavation for the below-grade parking garage, temporary excavation support will be required and will need to be constructed in accordance with CAL-OSHA requirements and City of Huntington Beach Building Code. At this time, we do not have project-specific information to provide preliminary parameters for the design of the shoring system. In areas where sloped excavations cannot be performed, 2H:1V maximum (Horizontal:Vertical), we recommend the shoring system use soldier beams and lagging.

Deflection at the top of the excavation support system will be a function of the design and sequence of installation. Any temporary shoring system should be designed to limit deflections adjacent to existing public streets and neighboring buildings, but in no case should deformations be such that cause damage or loss of support to areas, structures, and utilities beyond the excavation.

Site Drainage

Proper drainage should be maintained at all times. Ponding or trapping of water in localized areas can cause differing moisture levels in the subsurface soil. Drainage should be directed away from the tops of slopes. Erosion protection and drainage control measures should be implemented during periods of inclement weather. Shallow perched water may be encountered at the site depending on seasonal rainfall. During rainfall events, backfill operations may need to be restricted to allow for proper moisture control during fill placement.

RECOMMENDED FUTURE STUDIES

Comments and preliminary recommendations provided herein are based on a review of publicly available documents and geotechnical information pertaining to the site and our subsurface investigation. At this time, we recommend performing the following supplemental studies:

- A design level geotechnical exploration and laboratory testing program to confirm the following:
 - Consistency of geotechnical conditions across the site,
 - Confirm the preliminary geotechnical recommendations,
 - Perform infiltration testing if required,
 - Confirm the magnitude of cyclic densification, and
 - A document search for adjacent structure foundations.

LIMITATIONS

This report has been prepared to assist Hines in their due diligence for site acquisition and development of the property at 4952 Warner Ave in Huntington Beach, California. The conclusions and recommendations provided in this report are preliminary and based on publicly available information performed by others, which we have relied upon as being accurate and representative of the conditions at the site. A design-level geotechnical investigation study (including field and laboratory testing) are necessary to develop design and construction recommendations for the proposed development.

This report has been prepared to assist the client in preliminary evaluation of the site and is only applicable to the design of the specific project identified. The information in this report cannot be used or depended on by engineers or contractors who are involved in evaluations or designs of facilities (including underpinning, grouting, stabilization, etc.) on adjacent properties which are beyond the limits of that which is the specific subject of this report.

A review of environmental issues (such as potentially contaminated soil and groundwater) has not been performed as part of this study, and should be addressed in a separate study.

CLOSURE

We appreciate the opportunity to have provided these services for this project. Should you have any questions regarding this letter, please feel free to contact us.

Sincerely,

Langan Engineering and Environmental Services, Inc.

Enrique A. Riutort, PE, GE
Senior Project Manager
GE 2683

Diane M. Fiorelli, PE, GE
Principal/Vice President
GE 3042

Enclosures: References
 Figure 1 – Site Location Map
 Figure 2 – Map of Major Faults and Earthquake Epicenters Proximity of Site
 Figure 3 – Geologic Hazards Map
 Figure 4 – Historical Groundwater Map
 Figure 5 – Flood Insurance Rate Map
 Figure 6 – Inundation Hazard Map
 Figure 7 – Annual Subsidence Rates
 Figure 8 – Boring Location Plan
 Appendix A – Seismic Research Results
 Appendix B – Boring Logs
 Appendix C – Laboratory Test Results

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FIGURES

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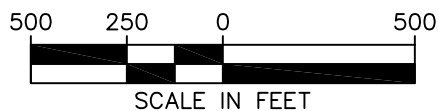


NOTES:

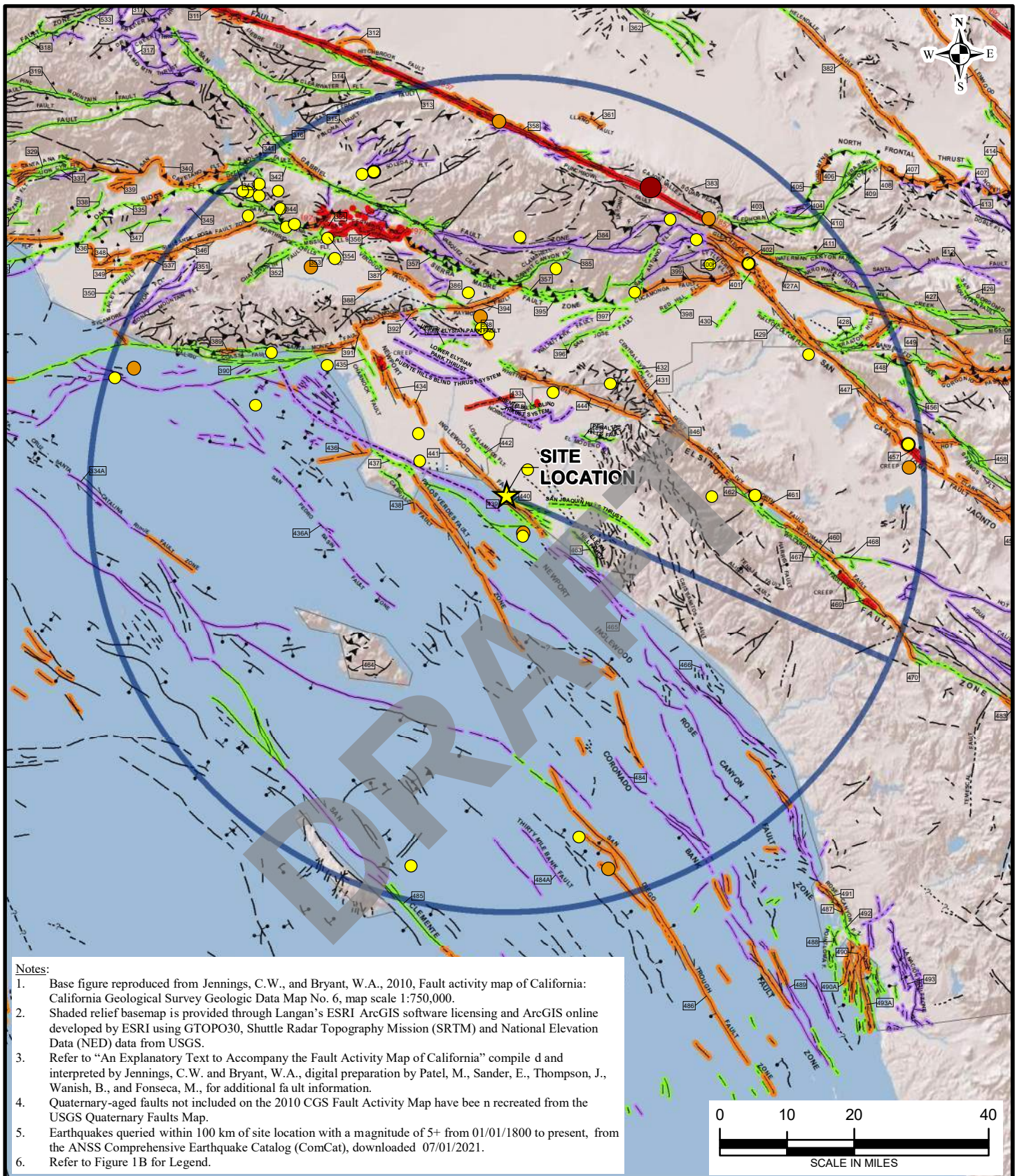
1. BACKGROUND IMAGE REFERENCED FROM BING MAPS ON 23 JUNE 2021.

LEGEND:

— APPROXIMATE SITE LIMITS



LANGAN 18575 Jamboree Road, Suite 150, Irvine, CA 92614 T: 949.561.9200 F: 949.561.9201 www.langan.com NEW JERSEY NEW YORK CONNECTICUT PENNSYLVANIA OHIO VIRGINIA WEST VIRGINIA WASHINGTON DC FLORIDA TEXAS ARIZONA CALIFORNIA ABU DHABI ATHENS DOHA DUBAI ISTANBUL PANAMA Langan Engineering & Environmental Services, Inc.	Project PROPOSED SENIOR HOUSING DEVELOPMENT HUNTINGTON BEACH ORANGE COUNTY CALIFORNIA	Figure Title SITE VICINITY MAP	Project No. 700101401	Figure No. 1
			Date JUNE 2021	
			Scale 1" = 500'	
			Drawn By DJJS	



LANGAN

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Environmental Services, Inc.

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Project

**PROPOSED
SENIOR HOUSING
DEVELOPMENT**
HUNTINGTON BEACH

ORANGE COUNTY CALIFORNIA

Figure Title

**QUATERNARY FAULT
ACTIVITY AND
EARTHQUAKE
EPICENTER MAP**

Project No.

700101401

Date

JULY 2021

Scale

1 inch = 20 miles

Drawn By

OG

Figure

2A

LEGEND:

Fault Age

The age classifications are based on geologic evidence to determine the youngest faulted unit and the oldest unfaulted unit along each fault or fault section

- Historic
- Holocene
- Late Quaternary
- Quaternary

Earthquake Epicenter

- Magnitude 5.0 to 5.9
- Magnitude 6.0 to 6.9
- Magnitude 7.0 to 7.4
- Magnitude 7.5 to 8.0

Pre-Quaternary Faults

- fault, certain
- - - fault, approx. located
- fault, concealed
- ▲— thrust fault, certain
- ▲ - thrust fault, approx. located
- ...▲... thrust fault, approx. located, queried
- †— fault, certain
- ...†... fault, concealed
- † - fault, approx. located

Quaternary Faults

- fault, certain
- fault, approx. located
- ? - fault, approx. located, queried
- † - fault, inferred, queried
- fault, concealed
- ...?... fault, concealed, queried
- ▼— thrust fault, certain
- ▼ - thrust fault, approx. located
- ...▼... thrust fault, concealed
- dextral fault, certain
- - - dextral fault, approx. located
- dextral fault, concealed
- sinistral fault, certain
- - - sinistral fault, approx. located
- sinistral fault, concealed
- thrust fault, certain (2)
- - - thrust fault, approx. located (2)
- thrust fault, concealed (2)
- †— fault, solid
- † - fault, dashed
- ...†... fault, dotted
- †— dextral fault, solid
- † - fault, dotted, queried
- ...†... fault, dotted, queried (2)
- fault, solid, dip
- fault, dashed, dip
- fault, dotted, dip
- †— reverse fault, solid
- † - reverse fault, dashed
- ...†... reverse fault, dotted

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Project

PROPOSED
SENIOR HOUSING
DEVELOPMENT

HUNTINGTON BEACH

ORANGE COUNTY CALIFORNIA

Figure Title

QUATERNARY FAULT
ACTIVITY AND
EARTHQUAKE
EPICENTER MAP

Project No.

700101401

Date

JULY 2021

Scale

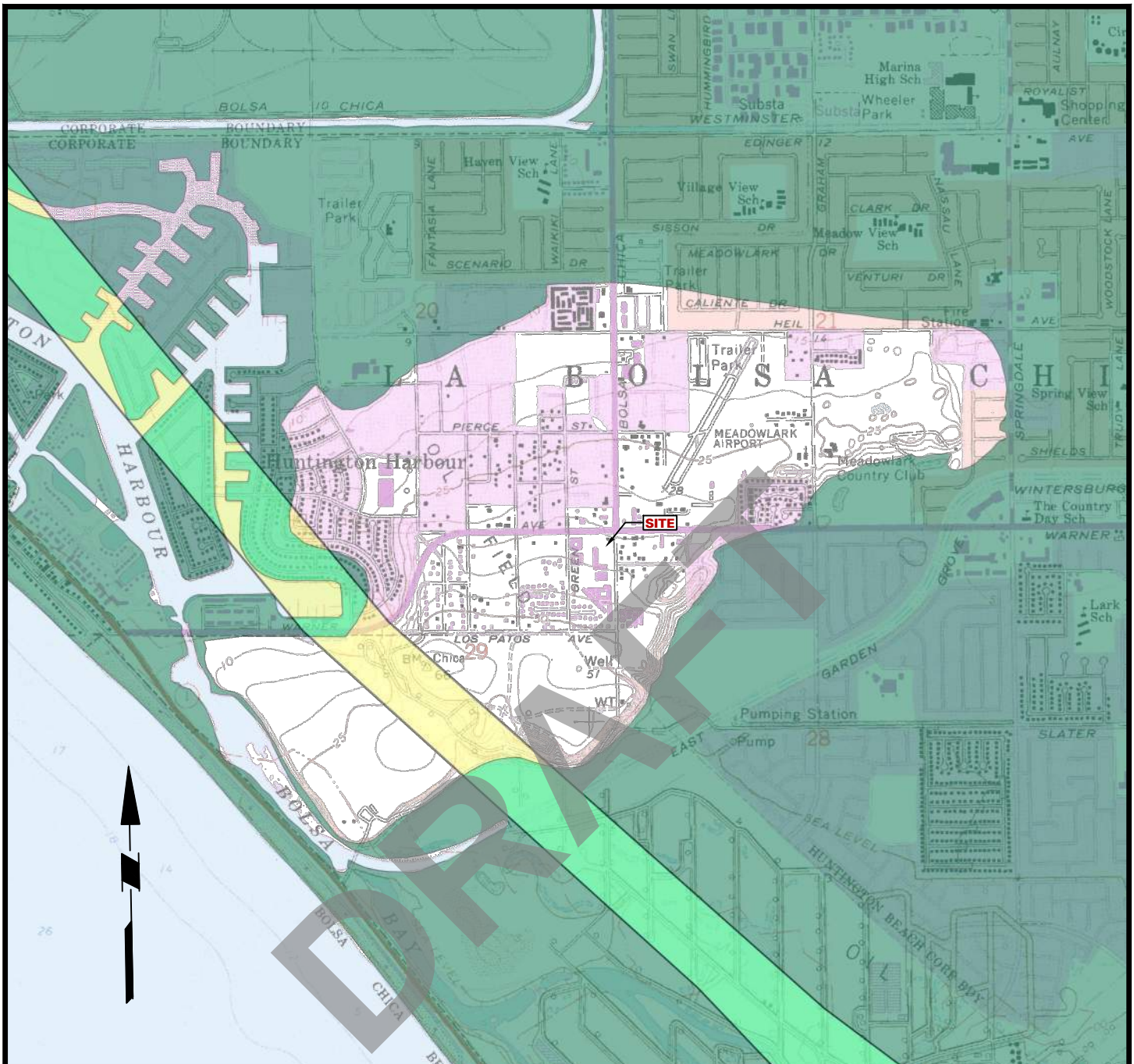
NOT TO SCALE

Drawn By

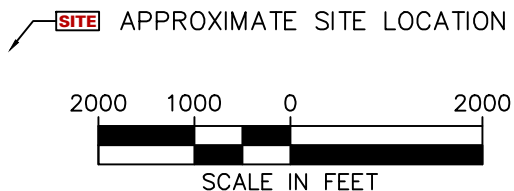
OG

Figure

2B



LEGEND:



NOTES:

1. BACKGROUND REFERENCED FROM EARTHQUAKE ZONES OF REQUIRED INVESTIGATION SEAL BEACH QUADRANGLE, CALIFORNIA GEOLOGICAL SURVEY, DATED 25 MARCH 1999.

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TEXAS ARIZONA CALIFORNIA

ABU DHABI ATHENS DOHA
DUBAI ISTANBUL LONDON PANAMA
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DEVELOPMENT**
HUNTINGTON BEACH

ORANGE COUNTY

CALIFORNIA

Drawing Title

**GEOLOGIC
HAZARDS MAP**

Project No.

700101401

Date

13 JULY 2021

Scale

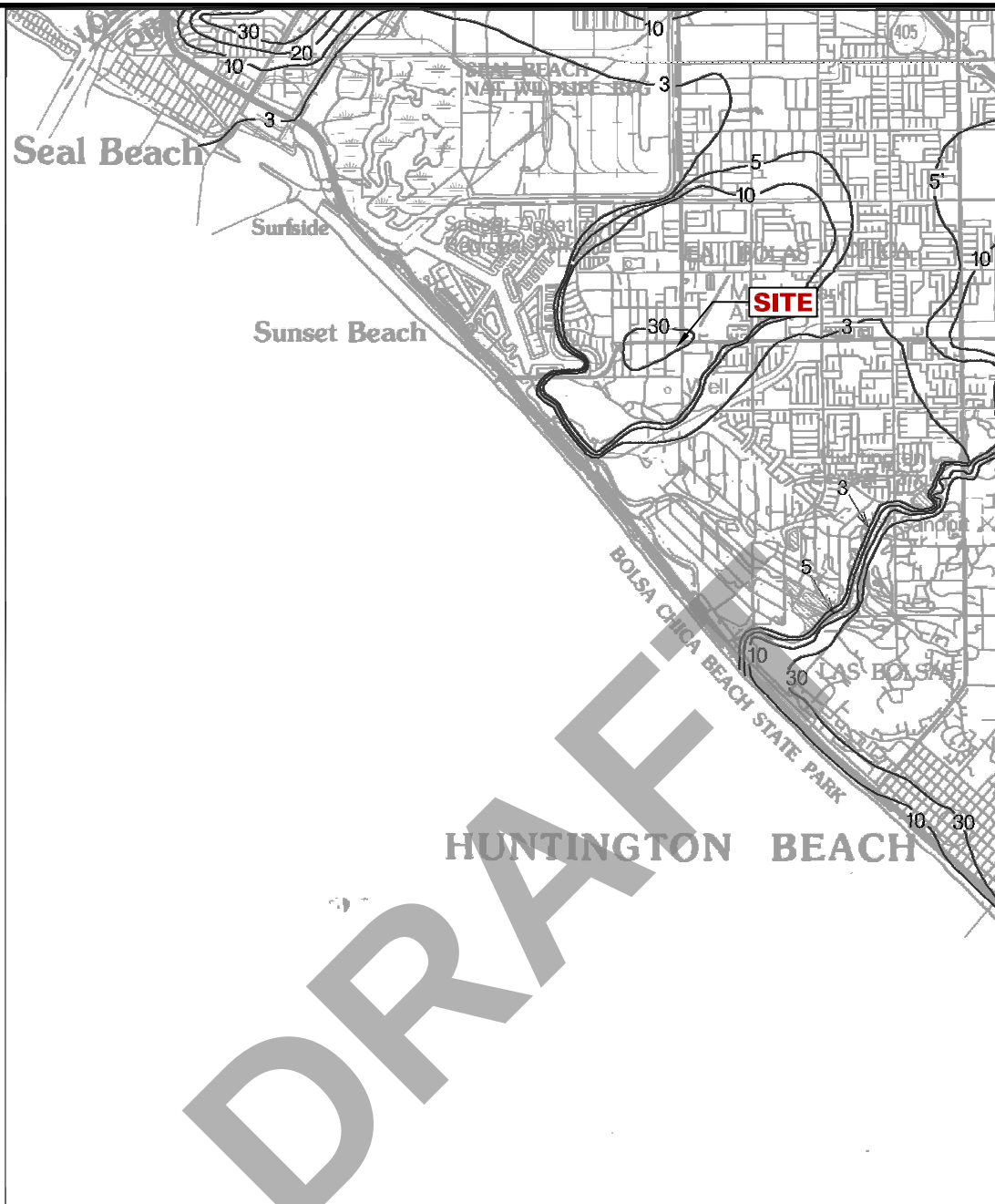
1" = 2000'

Drawn By

AC

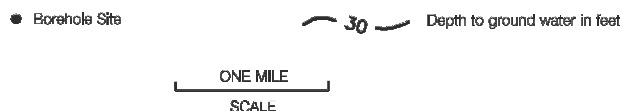
Drawing No.

3



Base map enlarged from U.S.G.S. 30 x 60-minute series

Plate 1.2 Historically Highest Ground Water Contours and Borehole Log Data Locations, Seal Beach Quadrangle.



LEGEND:

 APPROXIMATE SITE

NOTES:

1. BACKGROUND REFERENCED FROM SEISMIC HAZARD ZONE REPORT FOR THE SEAL BEACH 7.5-MINUTE QUADRANGLE, ORANGE COUNTY, CALIFORNIA

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ORANGE COUNTY

CALIFORNIA

Drawing Title

**HISTORIC
GROUNDWATER
MAP**

Project No.

700101401

Date

13 JULY 2021

Scale

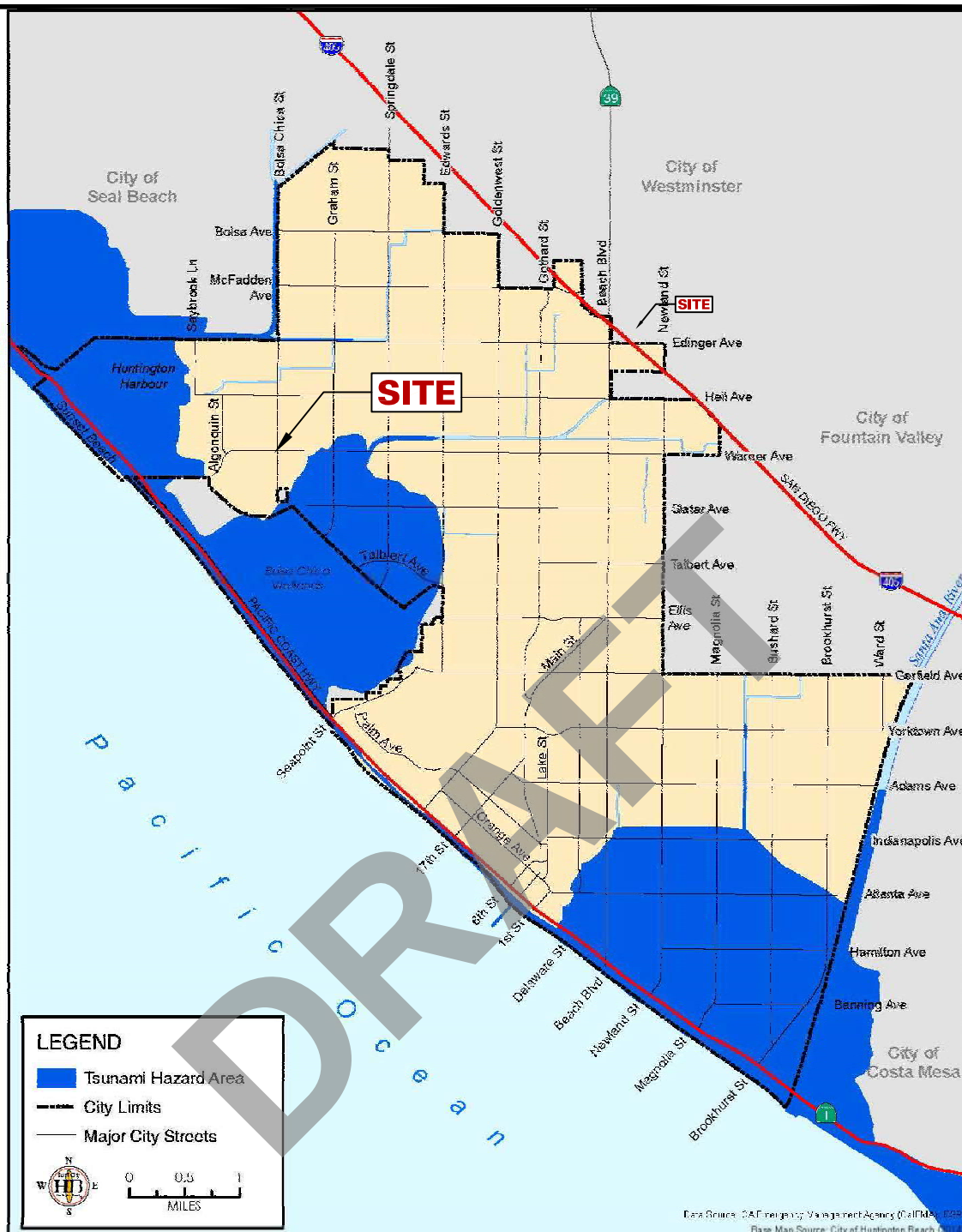
AS SPECIFIED ON MAP

Drawn By

AC

Drawing No.

4



LEGEND:

SITE APPROXIMATE SITE

NOTES:

1. BACKGROUND REFERENCED FROM CITY OF HUNTINGTON BEACH LOCAL HAZARD MITIGATION PLAN, ACCESSED 28 JUNE 2021

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ORANGE COUNTY

CALIFORNIA

Drawing Title

**TSUNAMI
INUNDATION
ZONE MAP**

Project No.

700101401

Date

13 JULY 2021

Scale

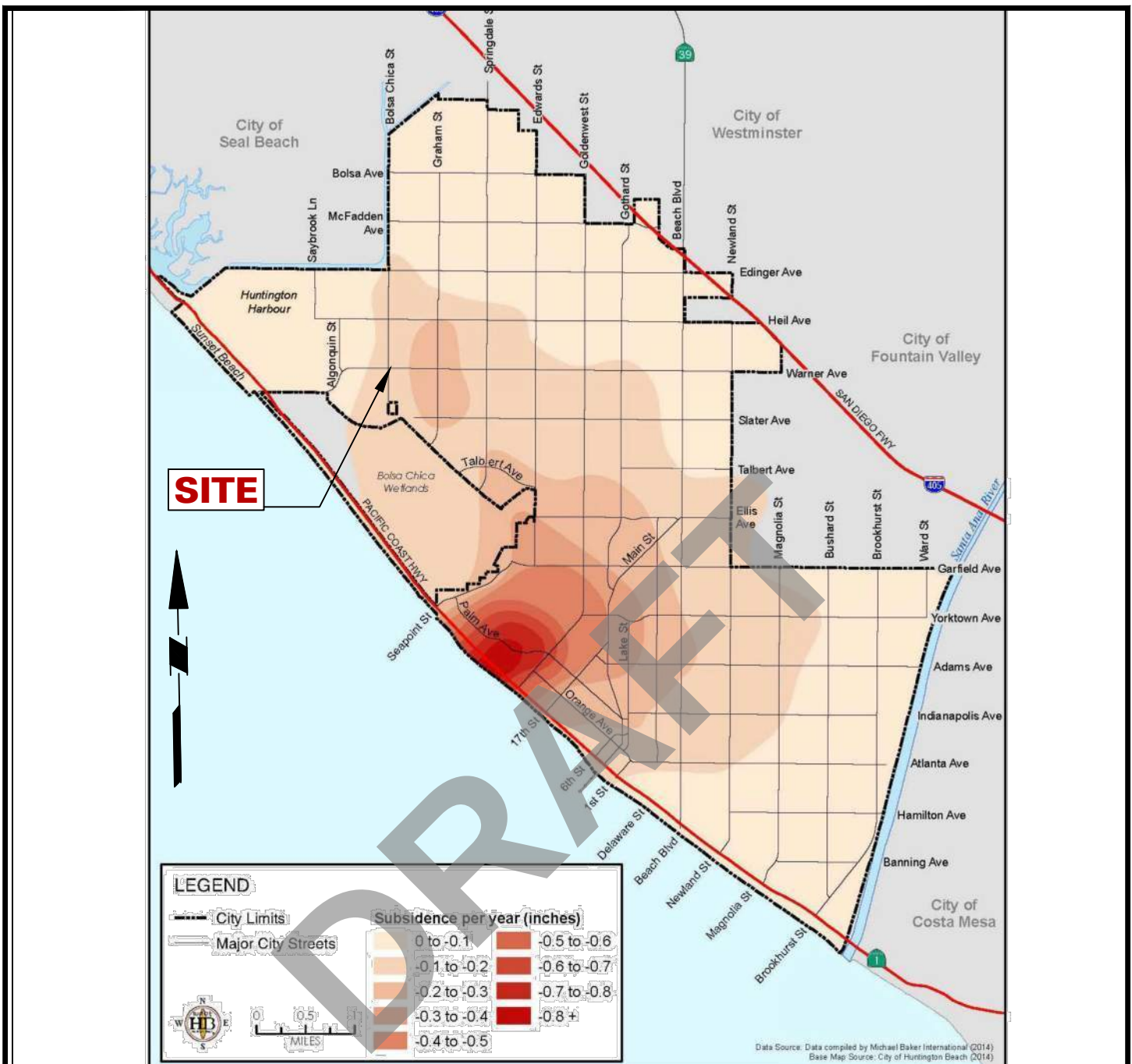
AS SPECIFIED ON MAP

Drawn By

AC

Drawing No.

6



LEGEND:

NOTES:

1. **SITE** APPROXIMATE SITE LOCATION 1. BACKGROUND REFERENCED FROM CITY OF HUNTINGTON BEACH LOCAL HAZARD MITIGATION PLAN, ACCESSED 28 JUNE 2021

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HUNTINGTON BEACH

ORANGE COUNTY

CALIFORNIA

Drawing Title

**ANNUAL
SUBSIDENCE
RATES**

Project No.

700101401

Date

13 JULY 2021

Scale

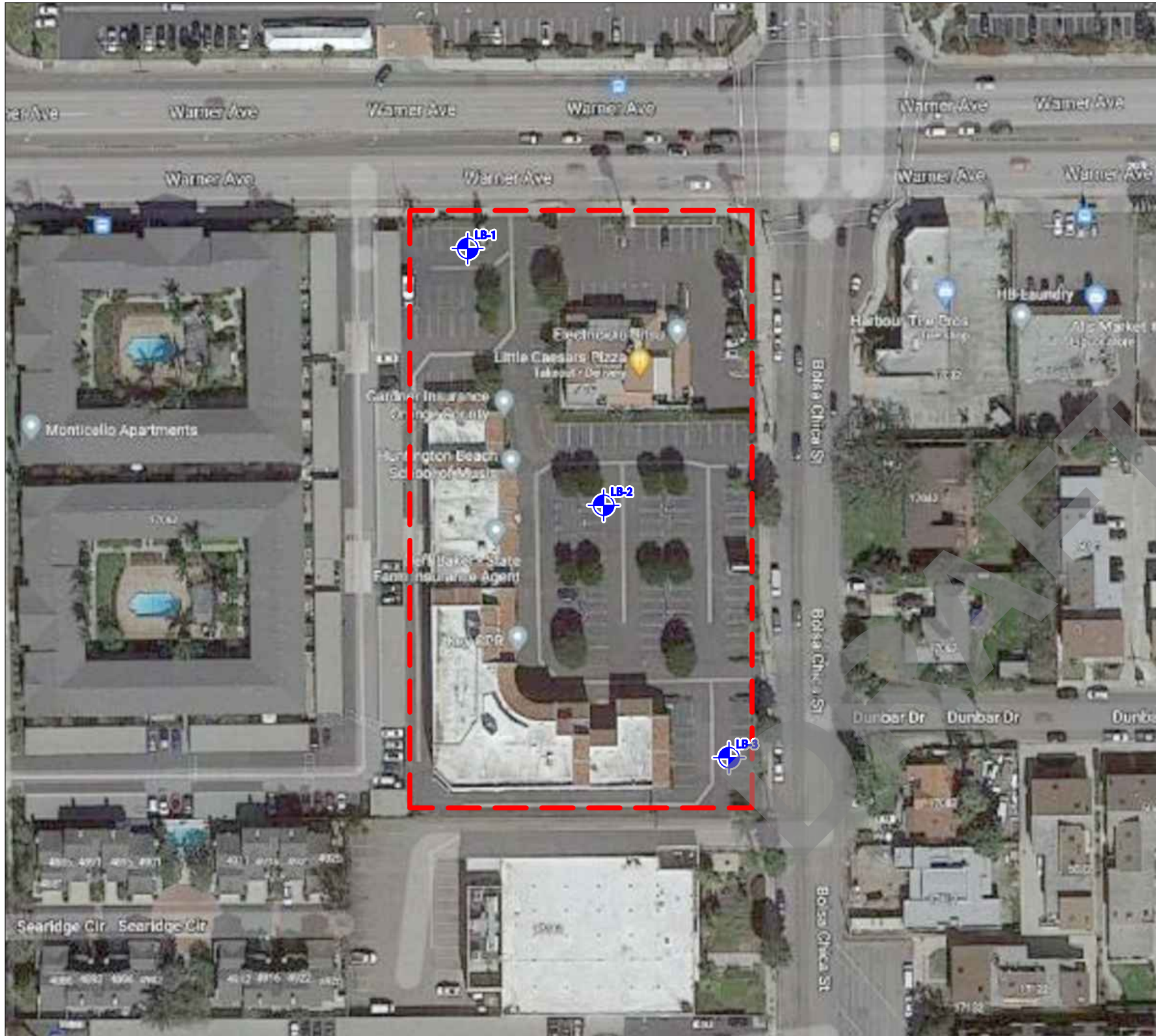
AS SHOWN ON MAP

Drawn By

AC

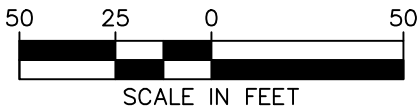
Drawing No.

7



- NOTES:
1. BACKGROUND IMAGE REFERENCED FROM GOOGLE MAPS, ACCESSED 29 JUNE 2021
 2. LANGAN BORINGS LB-1 THROUGH LB-3 WERE DRILLED BY MARTINI DRILLING ON 25 JUNE 2021 UNDER THE FULL-TIME ENGINEERING OBSERVATION OF A LANGAN FIELD ENGINEER.

- LEGEND:
- APPROXIMATE SITE LIMITS
 - LB-2 APPROXIMATE BORING LOCATION



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Project
**PROPOSED SENIOR
HOUSING
DEVELOPMENT**
HUNTINGTON BEACH

ORANGE CALIFORNIA

Figure Title		Project No.	Figure No.
BORING LOCATION PLAN		700101401	
		Date	
		29 JUNE 2021	
		Scale	8
		1" = 50'	
		Drawn By	
		AC	

APPENDIX A

Seismic Research Results

DRAFT

TABLE A.2 - USGS ANSS COMPREHENSIVE CATALOG SEARCH RESULTS

Date ^{1,3}	Latitude ^{1,3}	Longitude ^{1,3}	Approximate Magnitude ^{1,3}	Magnitude Type ²	Approximate Distance from Site (km) ^{1,3}
2014-03-29	33.9325	-117.9158	5.1	mw	27
2008-07-29	33.9485	-117.7663	5.44	mw	36
1997-04-26	34.3690	-118.6700	5.07	ml	93
1995-06-26	34.3940	-118.6690	5.02	ml	95
1994-03-20	34.2310	-118.4750	5.24	ml	70
1994-01-29	34.3060	-118.5790	5.06	ml	82
1994-01-19	34.3780	-118.6190	5.07	ml	91
1994-01-19	34.3790	-118.7120	5.06	ml	96
1994-01-18	34.3770	-118.6980	5.24	ml	95
1994-01-17	34.3260	-118.6980	5.58	ml	91
1994-01-17	34.3400	-118.6140	5.2	ml	87
1994-01-17	34.2750	-118.4930	5.89	ml	75
1994-01-17	34.2130	-118.5370	6.7	mw	72
1991-06-28	34.2700	-117.9930	5.8	mw	62
1990-02-28	34.1440	-117.6970	5.51	ml	57
1988-12-03	34.1510	-118.1300	5.02	ml	49
1987-10-04	34.0740	-118.0980	5.25	ml	40
1987-10-01	34.0610	-118.0790	5.9	mw	39
1986-07-13	32.9710	-117.8740	5.45	ml	84
1979-01-01	33.9165	-118.6872	5.21	ml	64
1973-02-21	33.9790	-119.0502	5.3	mw	98
1971-02-09	34.4160	-118.3700	5.3	mh	84
1971-02-09	34.4160	-118.3700	5.8	mh	84
1971-02-09	34.4120	-118.4000	5.8	ml	84
1971-02-09	34.4160	-118.3700	5.8	mh	84
1971-02-09	34.4160	-118.3700	6.6	mw	84
1970-09-12	34.2548	-117.5343	5.22	ml	76
1951-12-26	32.9162	-118.3052	5.75	ml	92
1941-11-14	33.7907	-118.2637	5.12	ml	22
1938-05-31	33.6993	-117.5112	5.23	ml	49
1933-03-11	33.8500	-118.2660	5	ml	26
1933-03-11	33.6238	-118.0012	5.29	mh	11
1933-03-11	33.7667	-117.9850	5.02	mh	8
1933-03-11	33.6308	-117.9995	6.4	mw	10
1930-08-31	34.0300	-118.6430	5.25	ms	66
1927-08-04	34.0000	-118.5000	5.3	uk	53
1923-07-23	34.0000	-117.2500	5.96	mw	80
1918-06-06	33.8000	-117.0000	5	ml	97
1918-04-21	33.7500	-117.0000	6.75	mw	96
1910-05-15	33.7000	-117.4000	5.3	mw	59
1910-05-13	33.7000	-117.4000	5	ml	59
1910-04-11	33.7000	-117.4000	5	ml	59
1899-12-25	33.8000	-117.0000	6.75	mw	97
1899-07-22	34.3000	-117.5000	6.36	mw	82
1899-07-22	34.2000	-117.4000	5.5	ml	80
1894-07-30	34.3000	-117.6000	5.9	ml	77
1893-04-04	34.3000	-118.6000	5.8	ml	83
1892-06-14	34.2000	-117.5000	5.5	ml	74
1889-08-28	34.2000	-117.9000	5.6	ml	55
1858-12-16	34.2000	-117.4000	6	ml	80
1857-01-16	34.5200	-118.0400	6.3	mw	89
1855-07-11	34.1000	-118.1000	6	ml	43
1827-09-24	34.0000	-119.0000	6	mw	94
1812-12-08	34.3700	-117.6500	7.5	mw	81
1800-11-22	32.9000	-117.8000	6.30	mw	93

Notes:

1. Earthquake Catalog Search results obtained from USGS ANSS Comprehensive Catalog accessed on 01 July 2021.
2. Refer to USGS ANSS Comprehensive Catalog and USGS Earthquake Hazards Program for additional information on magnitude types.
3. Earthquake Catalog search results include earthquake events within 100 km of the Site with magnitudes of 5.0 or greater since 1900.

**TABLE A.1 - USGS 2014 CALIFORNIA SEISMIC SOURCE MODEL
 PARAMETERS**

Fault Name	Distance from Site (km)
Newport-Inglewood alt 2	0.84
Newport-Inglewood alt 1	1.03
Compton	4.1
San Joaquin Hills	10.3
Anaheim	11.2
Palos Verdes	16.2
Elysian Park (Lower CFM)	17.5
Newport-Inglewood (Offshore)	18.1
Puente Hills (Coyote Hills)	18.9
Peralta Hills	20.3
Yorba Linda	21.3
Puente Hills (Santa Fe Springs)	22.5
Richfield	23.1
Puente Hills	24.0
Whittier alt 2	28.3
Whittier alt 1	28.3
Puente Hills (LA)	29.2
Oceanside alt2	30.7
Oceanside alt1	30.8
Redondo Canyon alt 2	33.8
Redondo Canyon alt 1	34.5
San Diego Trough north alt1	36.7
San Pedro Basin	38.3
San Jose	39.0
Elysian Park (Upper)	39.3
San Pedro Escarpment	39.5
Chino alt 1	41.5
Chino alt 2	41.7
Elsinore (Glen Ivy) rev	43.7
San Vicente	45.4
Verdugo	45.4
Raymond	45.4
Hollywood	48.1
North Salt Lake	49.0
Santa Monica alt 2	49.1
Sierra Madre	49.1
Clamshell-Sawpit	51.5
Fontana (Seismicity)	51.9
Santa Monica alt 1	52.1
Cucamonga	53.2
Malibu Coast alt 1	56.7
Malibu Coast alt 2	56.7

Coronado Bank alt2	56.8
Santa Cruz Catalina Ridge alt1	57.8
Anacapa-Dume alt 2	58.1
San Diego Trough north alt2	58.1
Santa Cruz Catalina Ridge alt2	58.8
San Gabriel (Extension)	58.9
Elsinore (Temecula) rev	60.7
Elsinore (Stepovers Combined)	62.2
Sierra Madre (San Fernando)	66.7
Anacapa-Dume alt 1	67.4
Northridge Hills	68.5
Santa Monica Bay	69.2
Mission Hills 2011	69.9
San Gabriel	70.4
Coronado Bank alt1	72.1
Santa Susana alt 2	72.2
Northridge	72.9
Santa Susana East (connector)	73.6
Thirty Mile Bank	73.8
San Jacinto (Lytle Creek connector)	75.8
San Jacinto (San Bernardino)	78.9
Santa Susana alt 1	79.2
San Andreas (Mojave S)	80.1
San Andreas (San Bernardino N)	80.8
San Jacinto (San Jacinto Valley) rev	81.6
San Clemente	83.9
Cleghorn	84.2
Rose Canyon	85.1
Carlsbad	85.9
San Andreas (North Branch Mill Creek)	87.5
Holser alt 1	88.1
San Jacinto (Anza) rev	88.6
Simi-Santa Rosa	89.0
San Andreas (San Bernardino S)	89.9
Malibu Coast (Extension) alt 2	90.4
Malibu Coast (Extension) alt 1	90.4
San Jacinto (Stepovers Combined)	90.7
Holser alt 2	93.4
Del Valle	96.0
North Frontal (West)	97.7
Oak Ridge (Onshore)	98.4

Notes:

1. Seismic source model parameters obtained from USGS 2014 National Seismic Hazard Maps on 01 July 2021.
2. Search results include sources within 62 mi (100 km) of the Site.

APPENDIX B

Boring Logs

DRAFT

Project Proposed Senior Housing Development			Project No. 700101401		
Location 4952 Warner Avenue, Huntington Beach, CA			Elevation and Datum Approx. 40 feet (WGS84)		
Drilling Company MARTINI DRILLING			Date Started 06/25/2021		Date Finished 06/25/2021
Drilling Equipment TRUCK MOUNTED CME 75			Completion Depth 38 ft		Rock Depth
Size and Type of Bit 8-INCH O.D. HOLLOW STEM AUGER			Number of Samples 10		Disturbed 0
Casing Diameter (in) ---			Casing Depth (ft) ---		Core ---
Casing Hammer ---			Weight (lbs) ---		Drop (in) ---
Sampler 2-INCH O.D SPLIT SPOON & 3-INCH O.D. CALIFORNIA MOPTER			Drilling Foreman Gene Golar		
Sampler Hammer AUTOMATIC			Weight (lbs) 140 LBS.		
			Drop (in) 30-INCH		
			Field Engineer Alexander Corob		

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Reco. (in)	Penetr. resist	BL/6in	
		Asphalt = 3-inches / Aggregate Base = 8-inches	0						
		FILL Dark brown, CLAY, (CL), trace fine sand and gravel, dry	1						
			2						
			3						
			4						
		Stiff, dark brown, CLAY, (CL), trace fine sand, moist	5						
			6	S-1	CR	18	11	14	
			7						
		<u>TERRACE</u>	8						
			9						
		Medium dense, brown-gray, fine to medium SAND, (SP), trace clay, moist	10						
			11	S-2	SPT	18	3	4	
			12						
			13						
			14						
		Medium dense, brown-gray, fine SAND, (SP), trace silt, moist	15						
			16	S-3	CR	18	7	15	
		Very stiff, gray-brown, clayey SILT, (ML), some fine sand, moist	17						
			18						
			19						
			20						

Project	Proposed Senior Housing Development	Project No.	700101401
Location	4952 Warner Avenue, Huntington Beach, CA	Elevation and Datum	Approx. 40 feet (WGS84)

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data				Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recov. (in)	Penetr. resist. BL/6in	
		Medium dense, gray-brown, fine to medium SAND, (SP), dry	20	S-4	SPT	18	7	
			21				13	
			22				16	
			23					
			24					
		Medium dense, gray-brown, fine to medium SAND, (SP), dry	25	S-5	CR	18	7	
		Stiff, brown, CLAY, (CL), trace fine sand, moist	26				11	
			27				12	
			28					
			29					
		Firm, brown, CLAY, (CL), trace fine sand, moist	30	S-6	SPT	18	2	
			31				4	
			32				7	
			33					
			34					
		Very stiff, dark brown, sandy CLAY, (CL), moist	35	S-7	CR	0	9	
			36				19	
			37	S-7	CR	18	28	
		Dense, gray-brown, fine to medium SAND, (SP), trace clay, moist	38				19	
			39				23	
			40				35	
		End boring at 38 feet Groundwater not encountered Boring backfilled with grout tremie style Surface patch with cold patch asphalt.	41					Sample S-7: No Recovery
			42					
			43					
			44					
			45					

Project Proposed Senior Housing Development			Project No. 700101401		
Location 4952 Warner Avenue, Huntington Beach, CA			Elevation and Datum Approx. 40 feet (WGS84)		
Drilling Company MARTINI DRILLING			Date Started 06/25/2021		Date Finished 06/25/2021
Drilling Equipment TRUCK MOUNTED CME 75			Completion Depth 51.5 ft		Rock Depth
Size and Type of Bit 8-INCH O.D. HOLLOW STEM AUGER			Number of Samples Disturbed 10		Undisturbed 0
Casing Diameter (in) ---			Casing Depth (ft) ---		Core ---
Casing Hammer ---			Weight (lbs) ---		Drop (in) ---
Sampler 2-INCH O.D SPLIT SPOON & 3-INCH O.D. CALIFORNIA MOPTER			Drilling Foreman Gene Golar		
Sampler Hammer AUTOMATIC			Weight (lbs) 140 LBS.		
			Drop (in) 30-INCH		
			Field Engineer Alexander Corob		

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recov. (in)	Penetr. resist	BL/6in	
	0	Asphalt = 1.5-inches / Aggregate Base = 5.5-inches	0						
	1	FILL Dark brown, sandy CLAY, (CL), some gravel, dry	1						
	2		2						
	3		3						
	4		4						
	5	Dark brown, stiff, brown, CLAY, (CL), trace sand, dry	5						
	6		6	S-1	SPT	18	5	6	
	7		7				7		
	8	TERRACE	8						
	9		9						
	10		10						
	11	Medium dense, light brown, silty fine SAND, (SM), dry	11	S-2	CR	18	6	15	
	12		12				21		
	13		13						
	14		14						
	15	Medium dense, light brown, silty fine SAND, (SM), dry	15						
	16		16	S-3	SPT	18	4	6	
	17		17				11		
	18		18						
	19		19						
	20		20						

Project			Project No.						
Proposed Senior Housing Development			700101401						
Location			Elevation and Datum						
4952 Warner Avenue, Huntington Beach, CA			Approx. 40 feet (WGS84)						
MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recov. (in)	Penetr. resist BL/6in		
		Dense, light brown, fine to coarse SAND, (SP), some clay, moist	20	S-4	CR	17.5	13		
			21				24		
		Very stiff, dark brown, CLAY, (CL), trace fine sand, moist	22	S-5	SPT	18	2		
			23				4		
		Medium dense, light brown, silty fine SAND, (SM), dry	24	S-6	CR	18	6		
			25				12		
		Medium dense, brown, clayey fine SAND, (SC), trace silt, moist	26	S-7	SPT	18	21		
			27				10		
		Medium dense, gray-brown, silty fine to medium SAND, (SM), moist	28	S-8	CR	18	5		
			29				8		
		Stiff, gray-brown, CLAY, (CL), trace fine sand, moist	30				6		
			31				11		
			32				13		
			33						
			34						
			35						
			36						
			37						
			38						
			39						
			40						
			41						
			42						
			43						
			44						
			45						

Project Proposed Senior Housing Development			Project No. 700101401						
Location 4952 Warner Avenue, Huntington Beach, CA			Elevation and Datum Approx. 40 feet (WGS84)						
MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recov. (in)	Penetr. resist	BL/6in	
		Stiff, gray-brown, CLAY, (CL), trace fine sand, moist	45	S-9	SPT	18	3	5	
			46				9		
			47						
			48						
			49						
		Stiff, gray-brown, CLAY, (CL), trace fine sand, wet	50	S-10	CR	18	1	2	
			51				14		
		Medium dense, brown, fine to coarse SAND, (SP), some clay, wet	52						
		End boring at 51.5 feet	53						
		Groundwater First measured @ 46 feet	54						
		Boring backfilled with grout tremie style	55						
		Surface patch with cold patch asphalt.	56						
			57						
			58						
			59						
			60						
			61						
			62						
			63						
			64						
			65						
			66						
			67						
			68						
			69						
			70						

Project Proposed Senior Housing Development			Project No. 700101401		
Location 4952 Warner Avenue, Huntington Beach, CA			Elevation and Datum Approx. 40 feet (WGS84)		
Drilling Company MARTINI DRILLING			Date Started 06/25/2021		Date Finished 06/25/2021
Drilling Equipment TRUCK MOUNTED CME 75			Completion Depth 36.5 ft		Rock Depth
Size and Type of Bit 8-INCH O.D. HOLLOW STEM AUGER			Number of Samples 7		Disturbed 0
Casing Diameter (in) ---			Casing Depth (ft) ---		Core ---
Casing Hammer ---			Weight (lbs) ---		Drop (in) ---
Sampler 2-INCH O.D. SPLIT SPOON & 3-INCH O.D. CALIFORNIA MOPTER			Drilling Foreman Gene Golar		
Sampler Hammer AUTOMATIC			Weight (lbs) 140 LBS.		
			Drop (in) 30-INCH		
			Field Engineer Alexander Corob		

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recov. (in)	Penetr. resist	BL/6in	
		Asphalt = 2.5-inches / Aggregate Base = 4.5-inches	0						
		FILL Dark brown, sandy CLAY, (CL), some gravel, dry	1						
			2						
			3						
			4						
		Dark brown, stiff, brown, CLAY, (CL), dry	5						
		TERRACE Medium dense, gray, clayey fine to medium SAND, (SC), dry	6	S-1	CR	18	7	9	
			7						
			8						
			9						
		Medium dense, gray-brown, fine SAND, (SP), some silt, dry	10	S-2	SPT	18	3	6	
			11				8		
			12						
			13						
			14						
		Medium dense, gray-brown, medium to coarse SAND, (SP), dry	15	S-3	CR	18	9	13	
			16				15		
			17						
			18						
			19						
			20						

Project Proposed Senior Housing Development			Project No. 700101401						
Location 4952 Warner Avenue, Huntington Beach, CA			Elevation and Datum Approx. 40 feet (WGS84)						
MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data				Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)	
		Medium dense, gray-brown, clayey fine SAND, (SC), trace silt, moist	20	S-4	SPT	18	4		
			21				8		
			22				13		
			23						
			24						
		Very stiff, dark brown, CLAY, (CL), trace fine sand, dry	25	S-5	CR	18	9		
			26				15		
			27				22		
			28						
			29						
		Very stiff, dark brown, CLAY, (CL), trace fine sand and siltstone fragment, dry	30	S-6	SPT	18	4		
			31				3		
			32				5		
			33						
			34						
		Stiff, brown, CLAY, (CL), trace fine to coarse sand, dry	35	S-7	CR	18	7		
			36				9		
		Medium dense, gray, fine SAND, (SP), trace silt, dry	37				20		
			End boring at 36.5 feet Groundwater Not Encountered Boring backfilled with grout tremie style Surface patch with cold patch asphalt.	38					
				39					
				40					
				41					
			42						
			43						
			44						
			45						

APPENDIX C

Laboratory Test Results

DRAFT

DENSITY TESTS

PROJECT Langan # 700101401

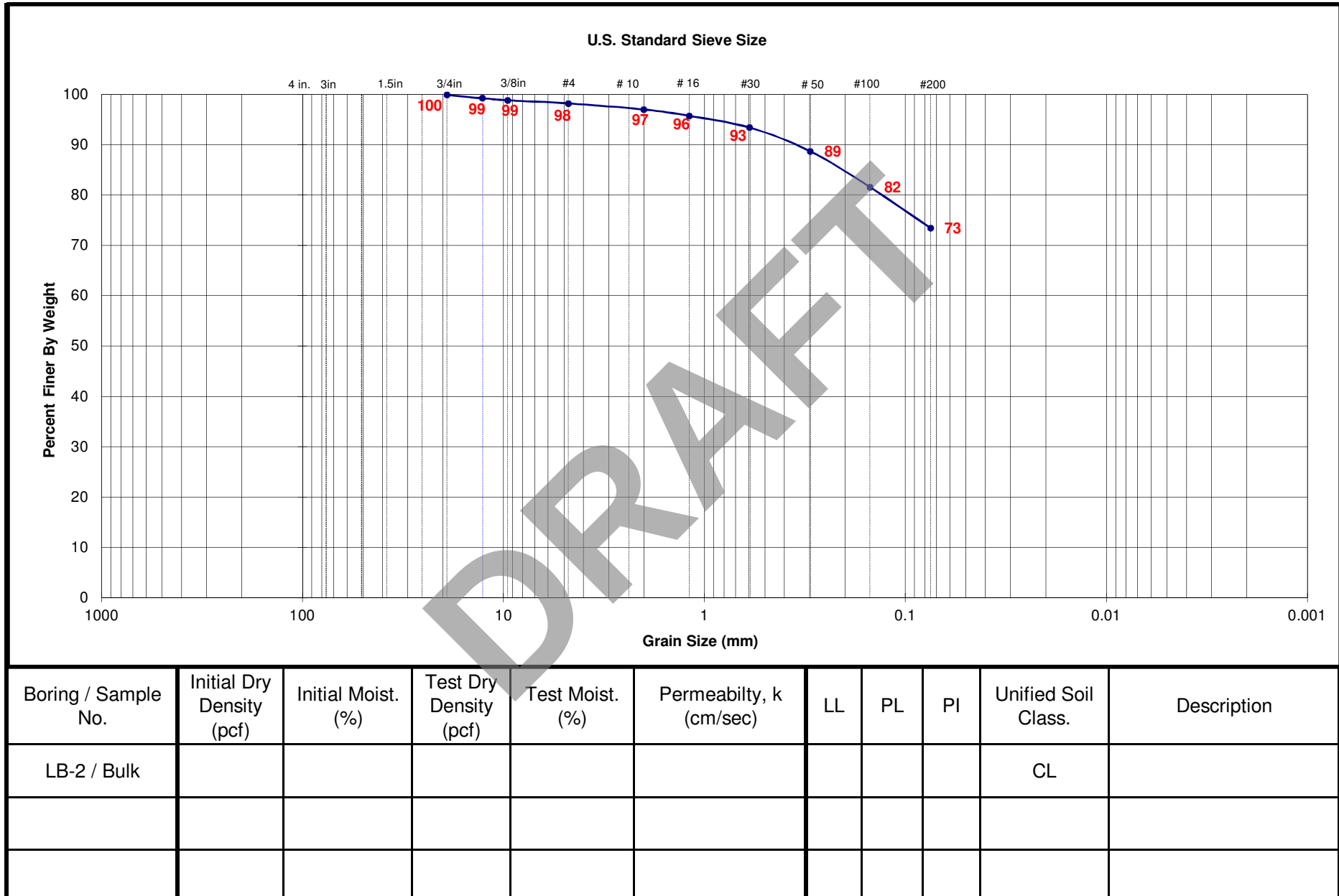
JOB NO. 2012-0057

BY LD

DATE 07/02/21

Sample No.	LB-2 / S-4	LB-2 / S-6	LB-3 / S-3	LB-3 / S-5				
Depth (ft)	20.0	30.0	15.0	25.0				
Testing								
Soil Type	Brown, Silty Sand	Brown, Sandy Clay	Brown, Silty Sand	Brown, Sandy Clay				
Wet+Tare	1113.3	935.6	670.4	1041.0				
No. Ring	6	5	4	6				
Wet Weight	137.1	109.7	134.4	158.9				
Dry Weight	134.2	90.4	129.0	138.9				
Wet density	118.2	119.5	103.2	108.1				
% Water	2.2	21.3	4.2	14.4				
Dry Density	115.7	98.5	99.1	94.5				
O.B.Press(psf)								
Sample No.								
Depth (ft)								
Testing								
Soil Type								
Wet+Tare								
No. Ring								
Wet Weight								
Dry Weight								
Wet density								
% Water								
Dry Density								
O.B.Press(psf)								

Date: 7/2/21



EXPANSION INDEX - UBC 18-2 & ASTM D 4829-88

PROJECT Langan # 700101401

JOB NO. 2012-0057

Sample <u>LB-2 / Bulk</u> By <u>LD</u>					Sample _____ By _____				
Sta. No. _____					Sta. No. _____				
Soil Type <u>Brown, Silty Clay</u>					Soil Type _____				
Date	Time	Dial Reading	Wet+Tare	616.4	Date		Dial Reading	Wet+Tare	
6/29/2021	16:20	0.2823	Tare	219.8				Tare	
		H2O	Net Weight	396.6				Net Weight	
6/30/2021	10:00	0.231	% Water	10.1				% Water	
			Dry Dens.	109.1				Dry Dens.	
			% Max					% Max	
			Wet+Tare	659.4				Wet+Tare	
			Tare	219.8				Tare	
			Net Weight	439.6				Net Weight	
INDEX	51	5.1%	% Water	22.0	INDEX			% Water	

Sample _____ By _____					Sample _____ By _____				
Sta. No. _____					Sta. No. _____				
Soil Type _____					Soil Type _____				
Date		Dial Reading	Wet+Tare		Date		Dial Reading	Wet+Tare	
			Tare					Tare	
			Net Weight					Net Weight	
			% Water					% Water	
			Dry Dens.					Dry Dens.	
			% Max					% Max	
			Wet+Tare					Wet+Tare	
			Tare					Tare	
			Net Weight					Net Weight	
INDEX			% Water		INDEX			% Water	

WASH #200 SIEVE - ASTM D 1140-92

Job Name Langan # 700101401

Date 7-2-21

Job No. 2012-0057

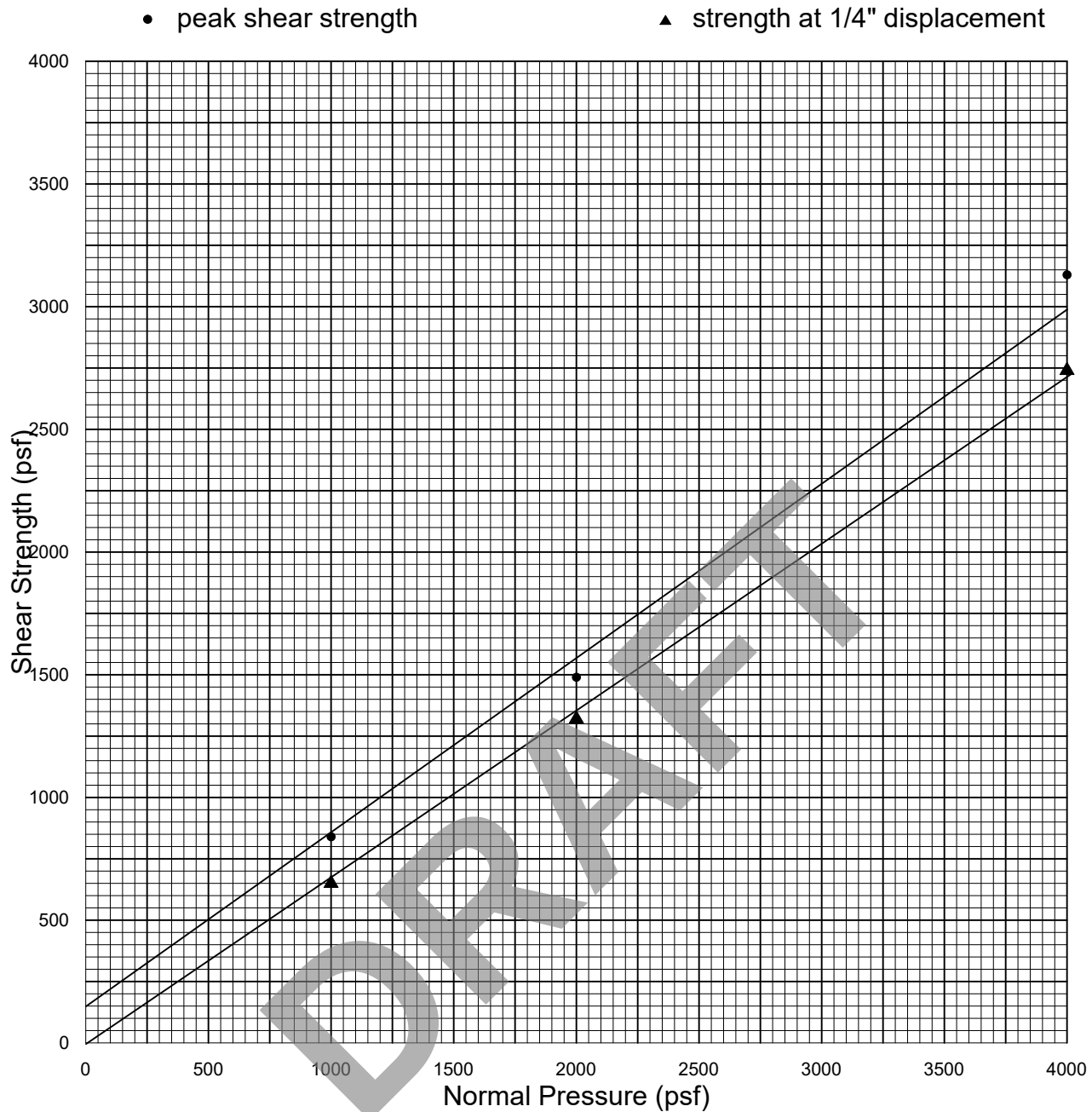
By LD

Sample	LB-1 / S-3	Sample		Sample	
Soil Type		Soil Type		Soil Type	
% water	16.4	% water		% water	
Wet weight	274.1	Wet weight		Wet weight	
Dry weight	235.5	Dry weight		Dry weight	
+ 200 sieve	146.5	+ 200 sieve		+ 200 sieve	
% Retained	62.2	% Retained		% Retained	
%Pass. #200	38	%Pass. #200		%Pass. #200	

Sample		Sample		Sample	
Soil Type		Soil Type		Soil Type	
% water		% water		% water	
Wet weight		Wet weight		Wet weight	
Dry weight		Dry weight		Dry weight	
+ 200 sieve		+ 200 sieve		+ 200 sieve	
% Retained		% Retained		% Retained	
%Pass. #200		%Pass. #200		%Pass. #200	

Sample		Sample		Sample	
Soil Type		Soil Type		Soil Type	
% water		% water		% water	
Wet weight		Wet weight		Wet weight	
Dry weight		Dry weight		Dry weight	
+ 200 sieve		+ 200 sieve		+ 200 sieve	
% Retained		% Retained		% Retained	
%Pass. #200		%Pass. #200		%Pass. #200	

Sample		Sample		Sample	
Soil Type		Soil Type		Soil Type	
% water		% water		% water	
Wet weight		Wet weight		Wet weight	
Dry weight		Dry weight		Dry weight	
+ 200 sieve		+ 200 sieve		+ 200 sieve	
% Retained		% Retained		% Retained	
%Pass. #200		%Pass. #200		%Pass. #200	



<u>Sample</u>	<u>Type</u>	<u>Description</u>	<u>Dry Density (pcf)</u>	<u>Initial W.C. (%)</u>	<u>Final W.C. (%)</u>
LB3/S3	Undisturbed & Saturated	Silty Sand	99.1	4.2	24.5

<u>Normal Pressure (psf)</u>	<u>Peak Shear Strength (psf)</u>	<u>Ultimate Shear Strength (psf)</u>
1000	840 @ 0.1155"	650
2000	1490 @ 0.1450"	1320
4000	3130 @ 0.1600"	2740
	C = 150 psf	C = 0 psf
	$\phi = 35 \text{ deg.}$	$\phi = 33.5 \text{ deg.}$

SAMPLE NO.:		LB-2 / Bulk					
Depth		1' - 5'					
DIRECT SHEAR TEST (type)							
Initial Moisture Content %							
Dry Density (pcf)							
Normal Stress (psf)							
Peak Shear Stress (psf)							
Ultimate Shear Stress (psf)							
Cohesion (psf)							
Internal Friction Angle (degrees)							
EXPANSION TEST UBC STD 18-2							
Initial Dry Density (pcf)							
Initial Moisture Content %							
Final Moisture Content %							
Pressure (psf)							
Expansion Index	Swell %						
CORROSIVITY TEST							
Resistivity (ASTM G57) (ohm-cm)		540					
pH (ASTM D4972)		7.8					
CHEMICAL TESTS							
Soluble Sulfate (ASTM D4327) (%)		0.1296					
Chloride Content (ASTM D4327) (%)		0.0447					
Wash #200 Sieve (ASTM-1140) %							
Sand Equivalent (ASTM D2419)							