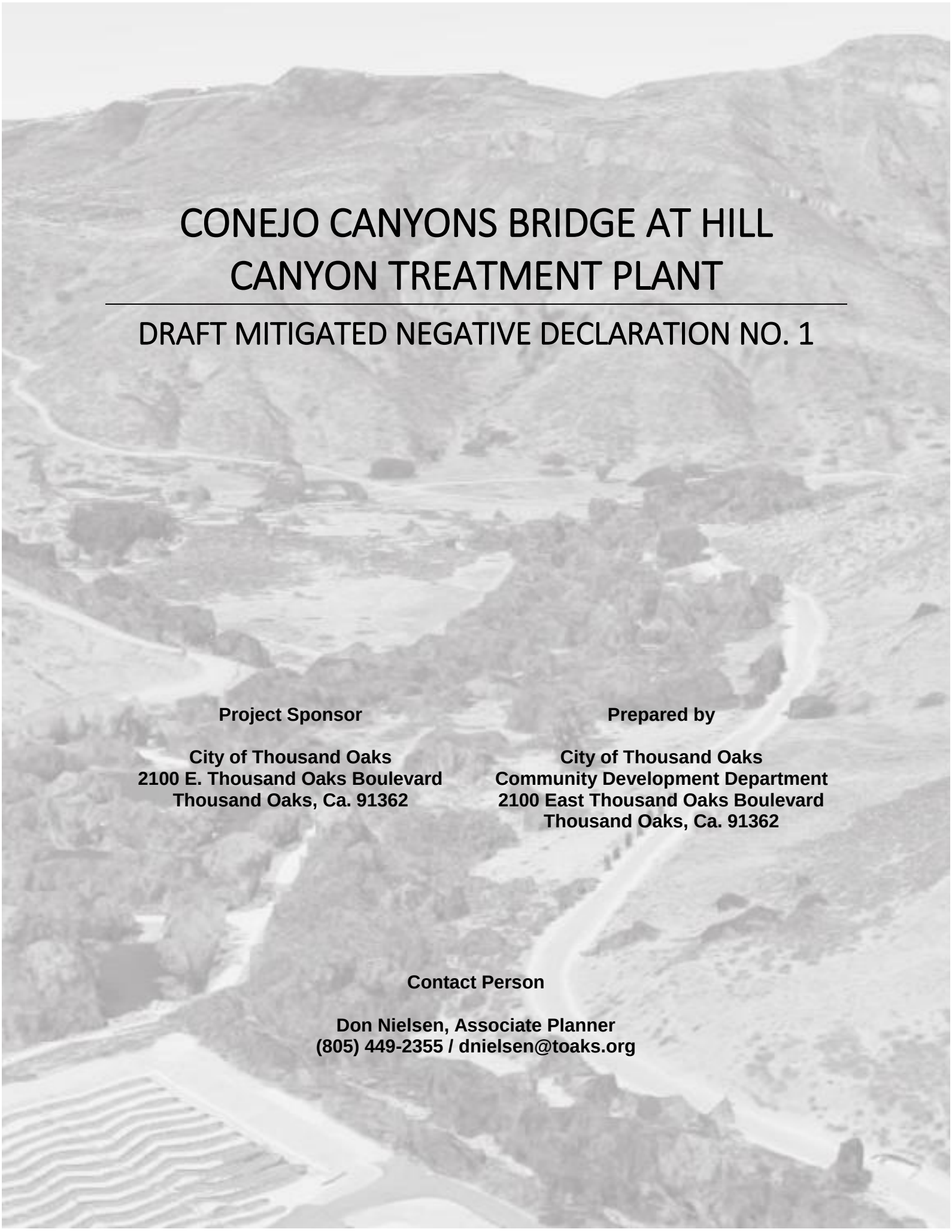
CONEJO CANYONS BRIDGE AT HILL CANYON TREATMENT PLANT

DRAFT MITIGATED NEGATIVE DECLARATION NO. 1



Project Sponsor

City of Thousand Oaks
2100 E. Thousand Oaks Boulevard
Thousand Oaks, Ca. 91362

Prepared by

City of Thousand Oaks
Community Development Department
2100 East Thousand Oaks Boulevard
Thousand Oaks, Ca. 91362

Contact Person

Don Nielsen, Associate Planner
(805) 449-2355 / dnielsen@toaks.org

DISCLAIMER

This environmental document has been prepared by the Community Development Department in accordance with State and City Guidelines, and is intended to be an information document fully disclosing the potential environmental effects of the proposed project. This disclaimer does not imply that other aspects of the proposed project are beneficial, detrimental, or of no significance.

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DRAFT
MITIGATED NEGATIVE DECLARATION No. 1

Case: Conejo Canyons Bridge at Hill Canyon Treatment Plant (DP 2019-70457)/ Oak Tree Permit (OTP 2019-70624)

Applicant: City of Thousand Oaks

Request: To allow the construction of a steel truss bridge across Conejo Creek with an accompanying short access road.

Location: In the northwest quadrant of the City of Thousand Oaks, on the west side of Hill Canyon Road, approximately 1.75 miles south of Santa Rosa Road and approximately 330 feet northwest of the treatment ponds at the Hill Canyon Treatment Plant.

Initial Study Determination / CEQA Findings

As required under the provisions set forth in Section 15063 of the California Environmental Quality Act (CEQA) Guidelines, an Initial Study has been prepared by the City of Thousand Oaks. The Initial Study, which is attached, evaluates the potential effects of this proposed project on the environment. Although the Initial Study has determined that the proposed project could have a potentially significant impact on the environment, feasible mitigation measures have been identified that will either avoid, or reduce them to a level of insignificance. Based on these findings, a Mitigated Negative Declaration (MND) has been prepared for the proposed project in compliance with the provisions set forth in Section 15070 of the CEQA Guidelines as amended.

Contact Person / Public Review Period

The contact person for this MND is: Don Nielsen, Associate Planner. The public review period is 30 days. Comments are solicited and must be submitted in writing to the Community Development Department, 2100 E. Thousand Oaks Blvd., Thousand Oaks, California 91362-2903, no later than _____, 2020.

Draft Mitigated Negative Declaration Issued

Date: _____ Signature: _____

Final Mitigated Negative Declaration Issued

☐ Public Comments and Staff Response Included in Final MND
☐ No Comments Received

Date: _____ Signature: _____

USE OF INITIAL STUDY

The Initial Study is intended to provide information for analysis of the project's environmental effects. Determining the significance of environmental impacts is a critical and often controversial aspect of the environmental review process. It is critical because a determination of significance may require that the project be either substantially altered, or that feasible mitigation measures be employed to avoid the impact or reduce it below the level of significance. Where a project is revised in response to an Initial Study so that potential adverse effects are effectively mitigated, a Negative Declaration shall be prepared instead of an EIR. If the project will still result in one or more significant effects on the environment after mitigation measures are added to the project, an EIR shall be prepared. Correspondingly, the Initial Study also provides documentation of the factual basis for making the finding that the project will, or will not have a significant effect on the environment.

INITIAL STUDY

1. Project Title:

   Conejo Canyons Bridge at Hill Canyon Treatment Plant

2. Lead Agency Name and Address:

   City of Thousand Oaks
   2100 E. Thousand Oaks Boulevard
   Thousand Oaks, CA 91362

3. Contact Person and Phone Number:

   Donald Nielsen
   Associate Planner
   805-449-2355
   dnielsen@toaks.org

4. Project Location:

   In the northwest quadrant of the City of Thousand Oaks, on the west side of Hill Canyon Road, approximately 1.75 miles south of the intersection of Santa Rosa Road and Hill Canyon Road, and approximately 330 feet northwest of the treatment ponds at the Hill Canyon Treatment Plant. The project site is located on approximately 0.61 acres of a larger 495.105-acre parcel more commonly referred to as Assessor's Parcel Number 667-0-120-160.

5. Project Sponsor's Name and Address:

   City of Thousand Oaks
   2100 East Thousand Oaks Boulevard
   Thousand Oaks, CA 91362

6. General Plan and Zoning Designation:

   Zoning: Existing Parks, Golf Courses, Open Space
   General Plan Land Use: Open Space (OS).

7. Description of the project:

   The City of Thousand Oaks (City), the Conejo Recreation and Park District (CRPD), and the Conejo Open Space Conservation Agency (COSCA) – a joint powers agency between the City and CRPD, are proposing to construct a steel truss bridge with an accompanying short access road across Conejo Creek. The western end of the bridge will be positioned to tie into the existing Hill Canyon Fire Road which descends into the canyon from Rancho Conejo Drive. The east end of the bridge will connect to Hill Canyon Road through construction of a short, new access road.

The proposed bridge is 12-feet wide and 140-feet long. The structure is a prefabricated steel truss bridge with a concrete walking surface. It will be secured to concrete abutments on either side of the creek; no supports in the creek will be necessary. The eastern abutments will utilize 24-inch Cast-In-Drilled-Hole (CIDH) piles, while the western abutments will be anchored in bedrock. The abutments will be poured on-site above the 100-year peak flow elevation.

The access road that will connect the bridge to Hill Canyon Road will be approximately 375 feet long. It will be 20-feet wide at Hill Canyon Road, and taper to 12 feet wide at the bridge connection. The road surface will consist of 4-inches of asphalt concrete, underlain with 10-inches of Class 2 aggregate base. Approximately 36-inch of native soil will be removed and recompacted, which will then be topped with approximately 3,000 cubic yards of imported fill. It will take approximately 215 truck trips to import this material based on trucks of 14 cubic yard capacity.

The bridge and new access road will provide several benefits to the City, COSCA, and CRPD. The bridge was identified in COSCA's Conejo Canyons Management Plan as a high priority open space amenity for improving public access (vicinity map and site plan are provided in Appendix A). The bridge will connect existing trails on either side of the creek and will be a key link in the trail system between the Conejo Canyons and Wildwood open space areas. It will provide trail users (hikers, mountain bikers, and equestrians) safe access between Wildwood Canyon and Santa Rosa Equestrian Park by allowing them to remain on the existing Hill Canyon trail rather than utilizing Hill Canyon Road, which was not designed to accommodate trail users. Improved trail connectivity is also anticipated to relieve overuse issues presently occurring at the main Wildwood trailhead parking lot at the western end of Avenida de los Arboles.

Additionally, the bridge will provide COSCA Park Rangers better accessibility to open space areas in support of maintenance and resource management. It will also provide a direct route for Public Works vehicles between the City's Municipal Service Center at the north end of Rancho Conejo Boulevard and the City's Hill Canyon Water Treatment Plant. The property where the bridge is planned is owned by the City of Thousand Oaks and managed by COSCA.

A culvert will be installed at approximately the midpoint of the road to accommodate an existing swale. The culvert will be an 18-inch corrugated HDPE pipe approximately 80 feet long with grouted riprap pads at either end. The riprap pads will be approximately 5 feet long by 4 feet wide, for a total volume of 40 cubic feet.

Water will not need to be extracted or diverted for this project. However, groundwater may be encountered when piles are constructed for the east abutment. In anticipation of this, the contractor will prepare and submit a dewatering plan for approval that covers how expelled water will be captured and/or contained and treated. If necessary, a location for a sump has been identified adjacent to the project site.

Construction is anticipated to take approximately 180 days. Equipment consistent with bridge construction and earth moving will be utilized for this project, such as loaders, dozers, drilling rigs, and cranes. No construction will occur in Conejo Creek and erosion control measures will be in place to prevent soil from entering the stream.

8. Surrounding land uses and setting:

The subject site is preserved as designated open space and located just west of Hill Canyon Road. Vegetation in the area was burned by the Hill Fire on November 8, 2019. Vegetation on flood plain areas presently consists of invasive non-native annual grasses and herbaceous species and recovering riparian woodland along Conejo Creek. Vegetation on surrounding hillslopes includes recovering coastal sage scrub and invasive non-native annual grasses and herbaceous species. The site is surrounded by undeveloped land to the north, west, and south sides. The City's Hill Canyon Treatment Plant is located approximately 330 feet to the southeast.

9. Other public agencies whose approval is required:

The U.S. Army Corps of Engineers has confirmed this elevation is beyond their jurisdictional boundary and no permit is required. As the project is located within the jurisdictions of the Ventura County Watershed Protection District and the California Department of Fish and Wildlife, regulatory approval is being sought from these agencies. Bridge engineering plans are included in Appendix B.

The City of Thousand Oaks will be processing a building permit, a development permit, and an oak tree permit for the proposed project. Additional regulatory approval will be obtained from the Ventura County Watershed Protection District and the California Department of Fish and Wildlife. The proposed project is situated outside the jurisdictional boundary for the U.S. Army Corps of Engineers.

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POTENTIALLY AFFECTED ENVIRONMENTAL FACTORS

The environmental factors checked below would be potentially affected by this project and warrant mitigation. Please refer to the checklist on the following pages for the individual issue areas:

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

☐ Mandatory Findings of Significance

INITIAL STUDY DETERMINATION

On the basis of this initial evaluation:

☐ I find the proposed project will not have a significant effect on the environment. Therefore, a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a potentially significant effect on the environment, feasible mitigation measures have been recommended that will either avoid such effects, or reduce them to a level of insignificance. Therefore, a MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find the proposed project may have one or more significant effects on the environment, which cannot be avoided or mitigated to a level of insignificance. Therefore, preparation of an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that although an earlier referenced environmental document has been prepared, resultant minor changes in the project design, environmental effects or mitigation measures, require that an ADDENDUM be prepared in order to address these modifications.

☐ I find that although an earlier referenced environmental document has been prepared, significant new information has become available pertaining to one or more potential effects of the proposed project, which could not have been known at that time and therefore were not addressed. As a result, a SUPPLEMENT will be prepared to analyze these new effects and recommend feasible mitigation measures.

☐ I find that all potentially significant effects have been adequately analyzed in an earlier referenced environmental document and that there are no new, or previously unknown, potentially significant effects associated with the proposed project that require additional mitigation or avoidance. Therefore, no further analysis is required.

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ENVIRONMENTAL IMPACT CHECKLIST

1. AESTHETICS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock, outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character of quality of public views of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

a. Have a substantial adverse effect on a scenic vista?

b. Substantially damage scenic resources, including, but not limited to, trees, rock, outcroppings, and historic buildings within a state scenic highway?

The project site is vacant and consists primarily of non-native annual grasses and herbaceous species and post-fire riparian woodland habitat. Sloping terrain exists beyond the project site on all sides. The bridge will be comprised of materials and colors that blend into the surrounding natural setting. Therefore, the project is not considered to constitute an adverse impact on a scenic vista.

The project site is vacant open space and is substantially surrounded by designated open space. The project site is not adjacent to a designated scenic tree(s), rock outcropping(s), historic building, or state scenic highway.

NO IMPACT

c. Substantially degrade the existing visual character of quality of public views of the site and its surroundings?

The project has been designed to be unobtrusive through the use of weathering steel for the bridge structure so that the color is more compatible with the natural

surroundings. Native vegetation will be installed adjacent to the bridge and access road to facilitate its integration with the surrounding undeveloped land. Construction of the project is not expected to constitute a significant adverse impact due to the temporary nature of construction.

LESS THAN SIGNIFICANT IMPACT

d. *Create a new source of substantial light or glare which would adversely affect day or* nighttime views in the area?

No lighting will be utilized on or in association with the project.

NO IMPACT

Cumulative Impact

The proposed project would have no direct or indirect adverse impacts on aesthetics. With incorporation of required development standards, impacts of the project will not be cumulatively considerable.

[End of Section.]

2. AGRICULTURE AND FORESTRY RESOURCES.

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the

Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

b. *Conflict with existing zoning for agricultural use, or a Williamson Act contract?*
c. *Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?*
d. *Result in the loss of forest land or conversion of forest land to non-forest use?*
e. *Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?*

The project site is owned by the Conejo Open Space Conservation Agency (COSCA) and is designated for the preservation of open space. The current zoning for the site is Existing Parks, Golf Courses, and Open Space which allows for the preservation of open space and for new recreational facilities. There are no agricultural or forest uses on the project site or adjacent properties. The project site is not under a Williamson Act contract. Therefore, the project would have no impact on agricultural and forest resources.

NO IMPACT

Cumulative Impact

Since the proposed project would not conflict with any existing zoning for agricultural use, Williamson Act contracts or other changes to the environment resulting in conversion of farmland to non-agricultural use or forestland or timberland to non-forest use, no adverse cumulative impacts would occur.

[End of Section.]

3. AIR QUALITY

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations.

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

a. Conflict with or obstruct implementation of the applicable air quality plan?

b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard?

The project entails construction of a pedestrian, equestrian, and municipal vehicle bridge and a short access road. It's construction and utilization will not have an impact on air quality

NO IMPACT.

c. Expose sensitive receptors to substantial pollutant concentrations?

Construction is anticipated to take 180 days. Due to the lack of sensitive receptors and the limited nature of the grading operation, there is little potential for significant impacts. However, to ensure that workers as well as sensitive wildlife and vegetation in the project vicinity are not exposed to excessive levels of suspended particulate matter the following mitigation measures are recommended.

Mitigation Measures

AQ-1 **Dust Control.** Employ water, as needed, for dust control during grading.

AQ-2 **High Winds.** Cease all grading, clearing, earth moving, or excavation operations during periods of high winds (20 mph or greater in one hour). The Ventura County APCD can be contacted for meteorological information.

AQ-3 **Covered Trucks.** All trucks shall be required to cover their loads as required by California Vehicle Code, Section 2311.4

AQ-4 **Personal Respiratory Protection.** Personnel involved in grading operations, including contractors and subcontractors, should be advised to wear respiratory protection in accordance with California Division of Occupational Safety and Health regulations.

AQ-5 **Clear Streets.** Sweep streets at the end of the day if visible soil material is carried over to adjacent roads.

AQ-6 **Equipment Maintenance.** Maintain equipment engines in good condition and in proper tune as per manufacturer's specifications.

AQ-7 **Heavy Equipment Proximity.** Keep all grading and construction equipment on or near the site until those phases of development are completed.

AQ-8 **Idling.** Equipment idling time shall be minimized.

AQ-9 **Alternative Fuels.** To the extent feasible, use alternately-fueled construction equipment, such as compressed natural gas (CNG), liquefied natural gas (LNG), bio-diesel, or electric.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

d. Result in other emissions such as those leading to odors adversely affecting a substantial number of people?

The proposed project is for a new pedestrian, equestrian, and city vehicle bridge and associated access road only within designated open space and no sensitive receptors are located nearby. Therefore, the construction and operation are not expected to create any objectionable odors affecting a substantial number of people.

NO IMPACT.

Cumulative Impacts

With incorporation of the mitigation measures listed above, the proposed project would have less than significant impacts on potential Air Quality Impacts. These measures would help protect the air quality of the surrounding environment and the greater air basin. Thus, project-related air quality impacts would not be cumulatively considerable.

4. BIOLOGICAL RESOURCES

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

a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Padre Associates (Padre) conducted a biological baseline assessment in June 2018 of approximately three (3) acres, composed of the proposed bridge site and access road/trail alignment between the bridge site and Hill Canyon Road, with a 100-foot buffer. The Study Area is located at the confluence of the North Fork and South Fork Arroyo Conejo, and approximately 600 feet northwest of the Hill Canyon Wastewater Treatment Plant (Appendix C).

The timing and methods of the survey were adequate for documenting the presence of any rare, endangered, or sensitive species. Field work was accompanied by literature research. Padre's assessment occurred prior to the Hill Fire of November 2018. Post-fire habitat assessment was conducted by staff in April 2019 which found the study area sustained significant changes to habitat quality. Prior to the Hill Fire, habitat within the study area was comprised of arroyo willow riparian forest, mulefat scrub, annual brome grasslands, and disturbed areas; disturbed areas mean portions of the site that have been cleared along Hill Canyon Road and the fire access road and covered in primarily invasive or non-native plants and comprise approximately 25% of the survey area. As a result of the Hill Fire, areas formerly classified as mulefat scrub and annual brome grasslands now consist largely of annual invasive non-native species, which are heavily dominated by black mustard (*Brassica nigra*), summer mustard (*Hirschfeldia incana*), milk thistle (*Silybum marianum*), and poison hemlock (*Conium maculatum*).

Padre's literature search and field surveys indicated that 14 special status plant species occur within 2 miles of the study area. The table below lists these species, their current regulatory status, habitat, and potential for occurrence at the project site. Special status plant species observed within the study area during Padre's field surveys were limited to coast live oak, scrub oak, western sycamore, and southern California black walnut; these four species were still present on site after the Hill Fire. Of the species observed, none are rare or declining, and do not meet the definition of rare or endangered under Section 15380 of the State Guidelines for implementation of CEQA.

Special Status Plant Species

Common Name (*Scientific Name*)	**Status**	**Habitat**	**Potential for Occurrence**
Catalina mariposa lily (*Calochortus catalinae*)	List 4	Clay soils in southern California grassland.	Not present. No suitable habitat on site.
Club-haired mariposa lily (*Calochortus clavatus* var. *clavatus*)	List 4	Rocky clay soils in southern California grassland or coastal sage scrub.	Not present. No suitable habitat on site.
Plummer's mariposa lily (*Calochortus plummerae*)	List 4	Rocky, sandy sites in southern California grassland or coastal sage scrub.	Not present. No suitable habitat on site.
Southern tarplant (*Centromadia parryi* ssp. *australis*)	List 1B	Marshes and vernally mesic areas of valley and foothill grasslands.	Not present. No suitable habitat on site.
Blochman's dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*)	List 1B	North-facing volcanic bluffs or thin rocky clay soils.	Not present. No suitable habitat on site.
Conejo dudleya (*Dudleya parva*)	FT, List 1B	North-facing volcanic bluffs or thin rocky clay soils.	Not present. No suitable habitat on site.

Special Status Plant Species			
Common Name (*Scientific Name*)	**Status**	**Habitat**	**Potential for Occurrence**
Conejo buckwheat (*Eriogonum crocatum*)	SR, List 1B	North-facing volcanic bluffs.	Not present. No suitable habitat on site.
Lyon's pentachaeta (*Pentachaeta lyonii*)	SE, FE, List 1B	Clay soils with cryptogamic crust in southern California grassland or coastal sage scrub.	Not present. No suitable habitat on site.
Coast live oak (*Quercus agrifolia*)	CTO	Sandy or loamy soils of alluvial terraces, canyon bottoms, stream banks.	Present in study area.
Scrub oak (*Quercus berberidifolia*)	CTO	Well-drained soils on steep, north-facing slopes.	Present in study area.
Southern California black walnut (*Juglans californica*)	List 4, CTO	Alluvial soils in riparian corridors and cismontane woodlands.	Present in study area.
Western sycamore (*Platanus racemosa*)	CTO	Alluvial soils along stream banks and floodplain terraces.	Present in study area.
Ojai navarretia (*Navarretia ojaiensis*)	List 1B	North-facing clay soils in valley and foothill grasslands.	Not present. No suitable habitat on site.
Chaparral ragwort (*Senecio aphanactis*)	List 2B	Clay soils with cryptogamic crust in southern California grassland or coastal sage scrub.	Not present. No suitable habitat on site.

Status Codes: FE Federally Endangered (USFWS)
CTO City of Thousand Oaks protected tree (oaks and landmark trees)
List 1B Plants rare, threatened, or endangered in CA and elsewhere (CNPS)
List 2B Plants rare, threatened, or endangered in CA but more common elsewhere (CNPS)
List 4 Plants of limited distribution (CNPS)
SE State Endangered (CDFW)
SR State Rare (CDFW)

Trees to be removed for the project consist of:

- one (1) coast live oak (*Quercus agrifolia*), 25” diameter, significantly burned in Hill Fire, large visible hollow cavity, in decline;
- seven (7) southern live oak (*Quercus virginiana*), 4” – 5.5” diameters, healthy.
- one (1) arroyo willow will require pruning. It was severely burned during the Hill Fire and is only resprouting from the base of the trunk. Branches and limbs interfering with the bridge span will be removed.

The above oak tree removals will require an Oak Tree Permit (OTP) from the City. Mitigation for removed trees will occur pursuant to the City’s Oak Tree Ordinance and requirements from the City’s Planning Commission.

Padre’s literature search and field surveys indicated that 15 special status wildlife species occur within 2 miles of the study area. The table below lists these species, their

current regulatory status, nearest known location, and potential for occurrence at the project site.

Special Status Wildlife Species			
Common Name (*Scientific Name*)	**Status**	**Nearest Known Location**	**Potential to Occur within the Study Area**
Arroyo chub (*Gila orcuttii*)	CSC	South Fork Arroyo Conejo upstream of the Study Area (Padre, 1999; Padre 2009)	High, suitable habitat present.
Coastal western whiptail (*Aspidoscelis tigris stejnegeri*)	CSC	Hill Canyon (LSA, 1996)	Low, minimal suitable habitat within Study Area.
Two-striped garter snake (*Thamnophis hammondii*)	CSC	South Fork Arroyo Conejo upstream of the Study Area (Padre, 1999)	High, suitable habitat present
San Diego mountain kingsnake (*Lampropeltis zonata pulchra*)	WL	Near South Fork Arroyo Conejo upstream of the Study Area (personal observation, M. Ingamells, 1998)	Low-None, no suitable habitat in proximity
Western pond turtle (*Emys marmorata*)	CSC	South Fork Arroyo Conejo upstream of the Study Area (Padre, 1999; Padre 2009)	High, suitable habitat present
Cooper's hawk (*Accipiter cooperi*)	WL, PR	Observed within the Study Area during wildlife survey	Present
Short-eared owl (*Asio flammeus*)	CSC	South Fork Arroyo Conejo, 0.7 miles upstream of the Study Area (Padre 2009)	Low, minimal suitable habitat within Study Area
White-tailed kite (*Elanus caeruleus*)	FP, PR	Wildwood Park, 0.9 miles to the northeast (Padre, 1998), near South Fork Arroyo Conejo upstream of the Study Area (Padre, 2009)	Low, minimal suitable habitat within Study Area
Osprey (*Pandion haliaetus*)	WL	South Fork Arroyo Conejo, 0.7 miles upstream of the Study Area (Padre 2009)	Low, minimal suitable habitat within Study Area
Yellow warbler (*Dendroica petechia brewsteri*)	CSC	Observed within the Study Area during least Bell's vireo surveys	Present
Yellow-breasted chat (*Icteria virens*)	CSC	Hill Canyon (LSA, 1996)	Moderate, could forage in Study Area
California gnatcatcher (*Polioptila californica*)	FT, CSC	Near Rancho Conejo Blvd., 0.5 miles to the southwest (CNDDB, 2018)	Low-None, no suitable habitat in proximity
Least Bell's vireo (*Vireo bellii pusillus*)	FE, SE	Arroyo Santa Rosa, 1.4 miles to the north (Ventura County WPD, 2006)	Low-None, not found during modified protocol surveys
Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)	WL	Slopes above South Fork Arroyo Conejo, ~0.6 miles upstream (Padre Associates, 2004)	Low, minimal suitable habitat within Study Area
California horned lark (*Eremophila alpestris actia*)	WL	Vicinity of South Fork Arroyo Conejo upstream of the Study Area (Padre, 1999)	Low-None, no suitable habitat within Study Area

Status Codes:	CSC California Species of Special Concern (CDFW) FE Listed as endangered under the Endangered Species Act FP Fully protected under the California Fish and Game Code (CDFW) FT Listed as threatened under the Endangered Species Act PR Raptor protected under Section 3503.5 of the Fish and Game Code (CDFW) SA Special Animal (CDFW) SE Listed as endangered under the California Endangered Species Act WL Watch List (CDFW)

Pursuant to the Padre report, arroyo chub, two-striped garter snake, western pond turtle, Cooper's hawk and yellow warbler were observed during field surveys or are anticipated to be present within the Study Area. Coastal western whiptail, San Diego mountain kingsnake, white-tailed kite, southern California rufous-crowned sparrow and California horned lark are anticipated to occur in habitats above the Arroyo Conejo riparian corridor, and unlikely to be present within the Study Area.

Short-eared owl and osprey were observed outside the breeding season along the South Fork Arroyo Conejo and are anticipated to be uncommon transients and unlikely to occur within the Study Area. Yellow-breasted chat was last reported from Hill Canyon in 1996 and was not observed by Padre biologists during construction monitoring from 1999-2009 along Arroyo Conejo. The status of this species in the Study Area is unclear.

Suitable habitat for California gnatcatcher does not occur within the Study Area and this species was not observed during field surveys. Therefore, California gnatcatcher is considered absent from the Study Area.

Suitable habitat for least Bell's vireo occurs within the Study Area. However, this species was not observed during modified protocol surveys of the Study Area conducted during the breeding season. Therefore, least Bell's vireo is considered absent from the Study Area.

A Cooper's hawk was observed during the April 2019 post-fire inspection; no other listed wildlife species were observed during this inspection.

As previously mentioned, no construction work will occur in the active channel in order to protect any aquatic species which may be present.

Mitigation Measures

The following preventative mitigation measures are recommended to avoid any potential impacts to biological resources:

BIO - 1 Bridge and access road construction will not occur within the bed and banks of the stream channel.

BIO - 2 Work will not occur at night.

BIO - 3 Construction will occur outside the bird breeding season to the extent feasible (February 15 – August 15).

BIO - 4 If the bird breeding season cannot be avoided, breeding bird surveys will be conducted. If breeding birds are documented, construction activity will be directed/scheduled to minimize disturbance of active nests.

BIO - 5 Biological surveys will be conducted immediately prior to the start of construction (vegetation removal) and wildlife species found in the construction area will be relocated.

BIO - 6 A qualified biological monitor will be on site during construction.

BIO - 7 Trees protected under City of Thousand Oaks ordinances will be mitigated at a 4:1 ratio.

BIO - 8 Temporary fencing will identify the extent of construction activity and any protected trees or vegetation within the construction zone, and no work is permitted beyond the temporary fencing's extent.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

b. *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?*

The project site is located in a riparian corridor. Construction of the project will permanently eliminate approximately 0.52 acre of habitat, and temporarily impact approximately 0.16 acre of habitat. No habitat impacts will occur to areas classified as arroyo willow forest. Rather, impacts will be limited to areas classified as mulefat scrub, post-fire non-native herbaceous annuals (annual brome grasslands prior to fire impacts), and previously disturbed areas.

Mitigation Measures

BIO - 9 1.65 acres of compensatory mitigation is being proposed (Appendix D) and will consist of giant reed (*Arundo donax*) removal and habitat restoration.

Giant reed removal will occur in the riparian corridor adjacent to and downstream of the project site. The length of the treatment area is approximately 1.2 miles. Approximately 76 stands of giant reed are proposed for removal. These stands total 0.9 acre in size and occur at 90-100% density.

Habitat restoration will occur in the 0.75 acre area classified as disturbed, located adjacent to the project site. Restoration activities will consist of hydroseeding the native seed mix shown below:

Botanical Name	**Common Name**
Acmispon glaber	deerweed
Artemisia californica	CA sagebrush
Bromus carinatus	Cucamonga brome
Encelia californica	California bush sunflower

Eriogonum cinereum	ashy leaf buckwheat
Eschscholzia californica	California poppy
Festuca microstachys	small fescue
Lupinus succulentus	arroyo lupine
Plantago insularis	plantain
Salvia leucophylla	purple sage

and installing the following container plants:

- Twenty (20) coast live oak trees (as mentioned in the preceding section);
- Twenty (20) blue elderberry seedlings;
- Forty (40) mulefat cuttings;
- Twelve (12) southern California black walnut (*Juglans californica*) seedlings.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

c. *Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?*

The project site is located in a riparian corridor consisting primarily of mule scrub and giant reed. Construction of the bridge abutments will occur on upper stream banks above the 100-year peak flow elevation. No work will occur in the stream channel. Construction of the access road will occur on a dry, historic floodplain terrace which does not contain any wetland areas.

NO IMPACT

d. *Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?*

The proposed projects for a new pedestrian, equestrian, and city vehicle bridge and associated access road only within designated open space. Therefore, the project is not expected to interfere with the movement of any aquatic, terrestrial, or avian species or impede usage of wildlife movement corridors or nursery sites.

LESS THAN SIGNIFICANT IMPACT

e. *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?*

As mentioned in Section 4(a), construction of the project will require the removal of eight (8) oak trees (please see Arborists Report in Appendix E). The trees consist of:

- one (1) coast live oak (*Quercus agrifolia*), 25” diameter, significantly burned in Hill Fire, large visible hollow cavity, in decline;
- seven (7) southern live oak (*Quercus virginiana*), 4” – 5.5” diameters, healthy.

Although the southern live oak trees are not native to California, all species of oak trees are protected under the City's Oak Tree Ordinance. These tree removals will require mitigation.

BIO - 10 Removed oak trees will be replaced at a 4:1 ratio. A total of 32 coast live oak trees will be planted in compensation for the removed trees. As mentioned in Section 4(b) twenty of these replacement trees will be planted in the onsite habitat restoration area in conjunction with other species in the restoration plant palette. The remainder of the trees will be planted in various offsite areas within the City such as city owned properties and right-of-way.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The project site is not located in an area that is included in a Habitat Conservation Plan, Natural Community Conservation Plan, or other conservation plan.

NO IMPACT

Cumulative Impact

The proposed project, with incorporated mitigation measures, would not impede or interfere with any identified or potential wildlife movement or migratory patterns, nor would it conflict with any adopted policy, regulation, or plan from the city, state, or federal governments.

Therefore, with incorporation of the mitigation measure listed above, the proposed project would have less than significant impacts on potential biological resources. Thus, project-related biological resource impacts would not be cumulatively considerable.

[End of Section.]

5. CULTURAL RESOURCES.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archeological resource pursuant to § 15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

a. *Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5??*

The proposed project location does not contain and is not adjacent to any known or potential historic structure or site. The proposed project site is not located within or adjacent to any known or potential historic district. Therefore, the project will not cause a substantial adverse impact to a historical resource.

NO IMPACT

b. *Cause a substantial adverse change in the significance of an archaeological resource?*

Based on the City's Sensitive Cultural Resource map, the project area is not expected to harbor any previously undiscovered cultural resources. However, given that the project site is located downstream from identified significant cultural sites within the Conejo Valley, there is the possibility, albeit small, that some artifacts may have been washed away over time and were deposited at the project site.

Mitigation Measures

The following mitigation measures will be implemented during construction to avoid damaging and/or inadvertent destruction of undiscovered cultural resources:

CR - 1 ***Pre-Construction Training.*** Prior to earthmoving activities, a qualified archeologist meeting the Secretary of the Interior's Professional Qualifications Standards for archeology (2008) shall conduct cultural resources sensitivity training for construction personnel completing rough grading and trenching.

Construction personnel shall be informed of the types of cultural and paleontological resources that may be encountered, and of the proper procedures to be enacted in the event of an inadvertent discovery of archaeological resources or human remains (see Mitigation Measure CR-4). Construction personnel completing rough grading and trenching shall attend the training and shall retain documentation demonstrating attendance.

CR - 2 ***Inadvertent Archaeological Discoveries*****.** In compliance with Thousand Oaks Municipal Code Section 7-3.09(i), in the event of the discovery of archaeological materials, all grading shall cease, and the grading permit shall be deemed suspended. The finding of a site which may be a significant archaeological, paleontological, or historical site shall be reported to the Public Works Director and the Community Development Director within seventy-two (72) hours from the time the site is found. The Community Development Director, upon receiving such a report, shall cause a preliminary investigation of the site to be made by qualified professionals within five (5) working days after the time such a report is received. If the preliminary investigation should confirm that the site is or may be a significant archaeological, paleontological, or historical site, the grading permit shall remain suspended for a period not to exceed forty-five (45) days after the date the finding of the site was first reported to or learned by the City. During the period of suspension, and as promptly as reasonably possible, the Community Development Director shall develop conditions to be attached to the grading permit pursuant to the provisions of subsection (1) of this subsection. When such conditions are developed and attached to the permit, the permit shall be deemed reissued subject to such conditions, and the suspension shall be deemed terminated. In extraordinary circumstances, the suspension may exceed forty-five (45) days if, upon application of the Community Development Director to the Council, the Council shall concur.

CR - 3 ***Inadvertent Paleontological Discoveries*****.** In compliance with Thousand Oaks Municipal Code Section 7-3.09(i), in the event of the discovery of fossil materials all grading shall cease, and the grading permit shall be deemed suspended. All future actions will then follow those identified in Mitigation Measure CR-2.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

c. Disturb or displace any human remains, including those interred outside dedicated cemeteries?

Based on the City's Sensitive Cultural Resource map, the project area is not expected to harbor any previously undiscovered burial sites. However, given that the project site is located downstream from identified significant cultural sites within the Conejo Valley, there is the possibility, albeit small, that some remains may have been washed away over time and were deposited at the project site.

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Mitigation Measures

The following mitigation measure will be implemented during construction to avoid damaging and/or inadvertent destruction of undiscovered burial sites.

CR - 4 ***Discovery of Human Remains.*** In compliance with Thousand Oaks Municipal Code Section 7-3.09(i), in the event of the discovery of human remains, all grading shall cease, the grading permit shall be deemed suspended, and the Ventura County Coroner shall be contacted in accordance with Public Resources Code Section 5097.98 and Health and Safety Code Section 7050.5. If the County Coroner determines that the remains are Native American in origin, the Native American Heritage Commission shall be notified, in accordance with Health and Safety Code Section 7050.5, subdivision (c), and Public Resources Code Section 5097.98 (as amended by AB 2641). The Native American Heritage Commission shall designate a Most Likely Descendant for the remains per PRC Section 5097.98. The Thousand Oaks Community Development Department shall ensure that the immediate vicinity where the Native American human remains are located is not damaged or disturbed by further development activity, according to generally accepted cultural or archaeological standards or practices, until the landowner has discussed and conferred with the Most Likely Descendant regarding their recommendations, as prescribed in Public Resources Codes Section 5097.98, taking into account the possibility of multiple human remains.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

Cumulative Impacts

With incorporation of the mitigation measures listed above, the proposed project would have less than significant impacts on potential cultural resources and human remains. These measures would protect the resources or remains from destruction when determined necessary by a qualified archeologist, coroner, Native American Heritage Commission, or most likely descendant. Thus, project-related cultural resource impacts would not be cumulatively considerable.

[End of Section.]

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6. ENERGY

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Result in potentially significant environmental impact due to wasteful inefficient, or unnecessary consumption of energy resources?	☐	☐	☐	☒
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

a. *Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?*

b. *Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?*

Construction and utilization of the proposed bridge is not anticipated to result in any significant impacts to energy resources nor will not conflict with renewable energy or energy efficiency

NO IMPACT

Cumulative Impact

The proposed project consists of the new construction of a pedestrian, equestrian, and maintenance Vehicle Bridge. Therefore, the project would not conflict with any existing state or local plan for renewable energy or energy efficiency and will not result in potentially significant environmental impacts due to wasteful, inefficient and/or unnecessary energy consumption. No adverse cumulative impacts would occur.

[End of Section.]

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7. GEOLOGY AND SOILS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii. Strong seismic ground shaking?	☐	☐	☐	☒
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv. Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐

e)	Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
f)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒

a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault (refer to Division of Mines and Geology Special Publication 42)?
ii. Strong seismic ground shaking?
iii. Seismic-related ground failure, including liquefaction?
iv. Landslides?

Geotechnical analysis conducted for the project (Appendix F) indicates the project site is not located within an earthquake fault zone. The closest mapped Earthquake Fault Zone, the Simi-Santa Rosa Fault Zone, is located approximately 1.6 miles to the north. The geotechnical report for the project indicates that the likelihood of fault rupture occurring at the site is low. In addition, bridge design will comply with seismic requirements in the California Building Code.

According to the 2014 Safety Element of the General Plan this fault is anticipated to be capable of generating the highest peak ground accelerations for the City. A maximum credible earthquake of 6.9 on the Simi-Santa Rosa Fault would be capable of generating peak ground accelerations of 0.6g and a Modified Mercalli Intensity (MMI) of X. Seismic experts believe that within the next 30 years, there is about a 40% chance of peak ground accelerations exceeding 0.2g for the Thousand oaks area, which corresponds to a MMI of VIII or greater.

According to the California Geological Survey/State Geologist, the project site is located within a Zone for Required Investigation for Liquefaction. However, geotechnical analysis for the project site indicates that the soils at the site are not susceptible to liquefaction. Based on site conditions, project installation or utilization upon completion of construction is also not anticipated to cause liquefaction.

According to the California Geological Survey/State Geologist, the project site is located within a Zone of Required Investigation for Earthquake-Induced Landslides. However, geotechnical analysis for the project site indicates that the potential for earthquake-induced landslides is low. Based on site conditions, project installation or utilization upon completion of construction is also not anticipated to cause landslides.

However, the bridge and access road design shall comply with the seismic requirements in the California Building Code.

NO IMPACT

b. Result in substantial soil erosion or the loss of topsoil?

Project construction will entail pile drilling for the abutments; and import of fill and grading for the access road. Project installation and utilization upon completion of construction will not cause erosion or loss of topsoil. In the event precipitation events are forecast to occur during the construction process, standard erosion control measures will be implemented.

Additionally, the bridge and access road design shall comply with the seismic requirements in the California Building Code.

NO IMPACT

c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

According to the project's geotechnical report, the project site is not located on a geologic unit that is unstable or would become unstable as a result project installation or utilization.

NO IMPACT

d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

According to the project's geotechnical report, exposed soils at the project site have a medium expansion potential. Recommendations presented in the geotechnical report will be incorporated into the project.

LESS THAN SIGNIFICANT IMPACT

e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

The proposed project does not include aspects pertaining to septic tanks or waste water disposal.

NO IMPACT

f. Directly or indirectly cause the loss of a unique paleontological resource or site or unique geologic feature?

No fossil bearing subsurface sedimentary bedrock or surface outcroppings are present on site.

NO IMPACT

Cumulative Impacts

The construction of the bridge and access road will be required to comply with all applicable seismic, landslide, liquefaction and expansive soil requirements of the California Building Code. The project poses no potentially significant project-specific geologic hazard impacts; therefore, project-related geology and soils impacts would not be cumulatively considerable.

[End of Section.]

8. GRADING AND TOPOGRAPHIC MODIFICATION

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Result in encroachment into natural terrain exceeding 25% twenty-five percent gradient?	☐	☐	☐	☒
b) Result in the creation of any manufactured cuts or fills exceeding twenty-five (25') feet in height?	☐	☐	☐	☒
c) Require the import or export of earthen soil or rock materials to, or from the site?	☐	☐	☒	☐

a. Result in encroachment into natural terrain exceeding 25% twenty-five percent gradient?

b. Result in the creation of any manufactured cuts or fills exceeding twenty-five (25') feet in height?

The proposed project does not entail construction of manufactured slopes exceeding twenty-five feet in height and the bridge abutments will be poured on site and will involve little significant grading.

NO IMPACT

c. Require the import or export of earthen soil or rock materials to, or from the site?

According to the project engineer, project grading will result in the import or approximately 3,000 cubic yards of soil. It will take approximately 215 truck trips to import this material based on trucks of 14 cubic yard capacity. However there are no sensitive receptors in the project area. Furthermore, the grading contractor shall adhere to a haul route approved by the Public Works Department prior to the issuance of the grading permit. The approved haul route shall be designed to import the soil to the site while minimizing impacts to residential roads and commuter routes outside the project area during peak traffic hours.

LESS THAN SIGNIFICANT IMPACT

Cumulative Impact

The construction of the bridge and access road will not encroach into any slopes of 25%, and there are no plans for additional bridge construction for the trail network in the near future that would encroach into significant slopes. Therefore, project-related Grading and Topographic Modification impacts would not be cumulatively considerable.

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9. GREENHOUSE GAS EMISSIONS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
d) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
e) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Construction is anticipated to take 180 days. Upon completion the project will sustain approximately 14 vehicle trips per week. Construction and utilization of the project will not generate greenhouse gas emissions that have a significant impact on the environment.

LESS THAN SIGNIFICANT IMPACT

b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The project will sustain approximately 14 vehicle trips per week. Construction and utilization of the project does not conflict with efforts to reduce emissions of greenhouse gases.

LESS THAN SIGNIFICANT IMPACT

Cumulative Impacts

The construction of the project represents the most significant generation of emissions; however, they are not such a quantity that exceeds thresholds. Additionally, as the project is the construction of a bridge it will not generate any emissions after the end of construction activities. Therefore, project-related emissions would not be cumulatively considerable.

[End of Section.]

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10. HAZARDS AND HAZARDOUS MATERIALS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☐	☐	☒	☐

a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

c. *Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?*

d. *Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 (eg. Ventura County Environmental Health Department LUFT list) and, as a result, would it create a significant hazard to the public or the environment?*

e. *Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?*

f. *Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?*

Construction and utilization of the project does not entail transport, use, or disposal of hazardous materials so will not pose a significant hazard involving the release of hazardous materials into the environment. Construction and utilization of the project will not result in hazardous emissions, nor entail handling of hazardous materials or waste. In addition, there are no schools located with ¼ mile of the project site.

The project site is not located on a hazardous materials site.

The project will not impair or interfere with emergency response or evacuation plans. Installation of the project is anticipated to improve ingress/egress to the Hill Canyon and Conejo Canyons area.

NO IMPACT

g. *Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?*

The project site is located within a CalFire identified Very High Fire Hazard Severity Zone; the project site and surroundings also experienced a major wildfire in 2018 (Hill Fire). However, the project will increase connectivity between Hill Canyon Road and Hill Canyon Fire Road by providing a more accessible mode of escape for hikers, bicyclists, equestrians, and potentially municipal workers from the Hill Canyon Wastewater Treatment Plant in the event of a wildland fire. The bridge will be constructed of materials resistant to fire, composed primarily of steel and concrete. Furthermore, the proposed project will improve access for firefighting capabilities, primarily for non-vehicle personnel.

Therefore, the project will not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires

LESS THAN SIGNIFICANT

Cumulative Impact

The construction of the project does not involve the use or transport of any hazardous materials. Therefore, project-related Hazards and Hazardous Materials would not be cumulatively considerable.

[End of Section.]

11. HYDROLOGY AND WATER QUALITY

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☐	☐	☒
b) Substantially decrease groundwater supplies on interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i. Result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☒	☐
iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
iv. Impede or redirect flood flows?	☐	☐	☒	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or	☐	☐	☐	☒

	sustainable groundwater management plan?				
f)	Construct housing within a 100-year flood hazard area as delineated on a federal Flood Hazard Boundary or Flood Insurance Rate Map?	☐	☐	☐	☒

a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

The project will not violate any state or federal water quality standards, waste discharge requirements, or substantially degrade surface or groundwater quality and supplies nor be affected by groundwater.

NO IMPACT

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

i *Result in a substantial erosion or siltation on- or off-site?*

ii *Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?*

The project does not entail alteration of a stream course and is not expected to create erosion or siltation on- or off-site. Project grading will take place outside of the stream channel and will be restricted to grading necessary for the concrete abutments and short access road. Standard erosion control measures will be implemented in compliance with project plans and associated SWPPP.

Due to the overall scale of the project it is not expected to create surface runoff that would result in flooding. Project design for the access road includes a culvert which is sized to accommodate any surface run-off that might occur during precipitation events.

LESS THAN SIGNIFICANT IMPACT

iii *Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or*

The overall scale of the project is small and is not expected to have an effect on the capacity of the existing channel or create polluted runoff.

NO IMPACT

iv *Impede or redirect flood flows?*

The project will be constructed above the 100-year peak flow elevation and access road design includes a culvert which is sized to accommodate any surface run-off that might occur during precipitation events.

LESS THAN SIGNIFICANT IMPACT

d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

f. Construct housing within a 100-year flood hazard area as delineated on a federal Flood Hazard Boundary or Flood Insurance Rate Map?

The proposed project is for a new pedestrian, equestrian, and city vehicle bridge and associated access road only within designated open space and does not involve the use or storage of any pollutants, does not consume water (groundwater or otherwise), or discharge water, and does not entail construction of housing.

NO IMPACT

Cumulative Impact

The construction of the proposed project will introduce opportunities for new erosion on the site; however, through the implementation of stormwater control measures and best practices, this would be reduced to a less than significant level.

Furthermore, the limited amount of new impervious surface area would still allow a significant amount of stormwater to percolate on-site. Through compliance of existing regulations and implementation of best practice measures, the cumulative impacts to the existing hydrological system would be less than significant.

[End of Section.]

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12. LAND USE AND PLANNING

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

a. Physically divide an established community or conflict with a General Plan designation or zoning?

The project site is undeveloped open space and does not support an established community. The Land Use Element of the General Plan designates the site as existing Parks, Golf Courses, Open Space and the property is zoned Open Space (OS). The construction of a pedestrian bridge is compatible with these provisions. The project meets the intent of following goals and policies of the General Plan:

Goal

- *To provide and maintain a system of natural open space and trails.*
- *To provide and maintain a permanent park and recreational system of sufficient size and quality to serve current and future needs, consonant with community expectations.*

Policies – Recreational, Parks and Natural Open Space

- *A multi-use system of equestrian, biking and hiking trails should be implemented to provide access between and within open space reserves.*

Therefore, the project will not physically divide an established community or conflict with the General Plan designation and zoning.

NO IMPACT

b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

The project does not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

NO IMPACT

Cumulative Impact

The proposed project would have no direct or indirect impacts on land use planning. As the project would have no impact, no cumulative impacts would occur.

[End of Section.]

13. MINERAL RESOURCES

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

a. Result in the loss of availability of a known mineral resource that would be of a value to the region, or the residents of the state?

b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

The region does not contain any known significant mineral resources, and has not been identified to support, mineral resource recovery activities in any general, specific, or other land use plans.

NO IMPACT

Cumulative Impact

Given that the project site is not known to contain nor is it adjacent to a known mineral resource that is of value to the region or state, the proposed project would have no direct or indirect impacts on mineral resources.

[End of Section.]

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14. NOISE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) Result in a significant, 3 dBA, or greater cumulative increase in ambient noise levels?	☐	☐	☐	☒

a. Result in a substantial temporary or permanent increase in ambient local noise levels in the vicinity of the project in excess of standards established in the general plan or noise ordinance, or applicable standards of other agencies?

b. Result in excessive groundborne vibration or groundborne noise levels?

The project will not result in a negligible increase in noise levels above existing ambient noise levels. Existing ambient noise levels are expected to periodically peak during the construction phase, however, there are no sensitive land uses located near the site. Due to the short-term nature of these events, this impact is not considered to be significant.

The project will not generate excessive groundborne vibration or noise. Construction activities may generate periodic groundborne vibration or noise, however due to the short-term nature of these events, this impact is not considered to be significant. Additionally there are no sensitive receptors within the project area.

The proposed project is for a new pedestrian, equestrian, and city vehicle bridge and associated access road only within designated open space and will not generate excessive groundborne vibration or groundborne noise levels during its operation.

LESS THAN SIGNIFICANT IMPACT

c. Result in a significant, 3 dBA, or greater cumulative increase in ambient noise levels?

As the project is for the new construction of a pedestrian, equestrian, and Maintenance Bridge, the project will not have an effect on long-term ambient noise levels.

NO IMPACT

Cumulative Impact

The proposed project will result in a temporary increase in noise level during construction activity, however existing City policy will reduce the impacts to a less than significant level. Additionally, the operation of the project will not generate any significant amount of noise as it consists of bridge. Thus, no cumulative impacts would occur.

[End of Section.]

15. POPULATION AND HOUSING

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extensions of roads or other infrastructure)?

b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

The project will not induce substantial unplanned population growth as the project consists of a new pedestrian, equestrian, and city vehicle bridge and associated access road only within designated open space. The project site is also substantially surrounded by designated open space. The project will have no effect on local population projections.

NO IMPACT

Cumulative Impact

The proposed project would have no direct or indirect impacts on population and housing. Thus, no cumulative impacts would occur.

[End of Section.]

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16. PUBLIC SERVICES

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

a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:

i. Fire Protection?
ii. Police Protection?
iii. Public Schools?
iv. Parks?
v. Other public facilities?

The project will not result in the need for new or expanded fire protection, police, public schools, park facilities or services beyond what is already received in the area.

NO IMPACT

Cumulative Impact

The proposed project would have no direct or indirect impacts on public services. As the project would have no impact, no cumulative impacts to public services would occur.

[End of Section.]

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17. RECREATION

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

a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

The proposed project is expected to help balance out the existing overcrowding at the primary Wildwood Trailhead on West Avenida de Los Arboles and will improve connectivity of the Conejo Canyons/Wildwood Regional Park trail system thereby enabling visitors to better access open space from a variety of existing entry points.

LESS THAN SIGNIFICANT IMPACT

b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

The proposed project will expand and connect existing recreational trail network and will help ease overcrowding at existing facilities. However, previously identified mitigation measures will be implemented to ensure any potential impacts would be less than significant.

NO IMPACT

Cumulative Impact

The proposed project would help to close a gap in the existing trail network of the designated open space. This would not adversely impact the environment of the site. As the project would have no impact, no cumulative impacts to recreational facilities would occur.

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18. TRANSPORTATION

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	☐	☐	☐	☒
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3 subdivision (b)?	☐	☐	☐	☒
c) Substantially increase hazards due to a geometric design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	☐	☐	☐	☒
d) Result in inadequate emergency access?	☐	☐	☐	☒

a. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

b. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

c. Cause a significant effect on traffic congestion where it increases the volume / capacity (V/C) ratio at an intersection by 0.02 or more in the peak hour and the resultant level of service at that intersection is C or worse?

d. Result in inadequate emergency access?

The project does not conflict with a program, plan, ordinance, or policy addressing the City's circulation system. The project will not sustain usage by public vehicles and is thus not expected to generate any additional traffic or create any significant impacts on local intersections. The project provides connectivity over a stream channel where none currently exists. The improved connectivity will also allow open space users to remain on trails and stay off Hill Canyon Road, increasing overall safety.

The project will not result in inadequate emergency access.

NO IMPACT

Cumulative Impacts

The proposed project would have no direct or indirect impacts on transportation. As the project would have no impact, no cumulative impacts to transportation would occur.

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19. TRIBAL CULTURAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?	☐	☐	☐	☒
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?	☐	☒	☐	☐

a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?

The Cultural Resources Assessment conducted for the proposed project included a search of the City of Thousand Oaks Archeology Records and General Plan Conservation Element. No tribal cultural resources (either listed or eligible for listing) were identified within the project site as a result of the records search

NO IMPACT

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

On October 15, 2019 the City received a tribal consultation request, in compliance with AB 52 (California Public Resources Code, Section 21074), from the Fernandeño Tataviam Band of Mission Indians as their records indicated the presence of significant

cultural resources within distance of the project location. While the project site has been impacted by previous grading activity and natural erosion, a range of tribal cultural sites and isolated artifacts have been documented throughout the vicinity and warrant precautions when proposing any ground disturbing activities.

Nevertheless, there is always a possibility that tribal cultural resources could be encountered during subsurface construction activities. In the unlikely event that potentially significant cultural resources are encountered during project construction, the below mitigation measures would ensure the find is protected in place and receives an appropriate level of evaluation to determine significance and, if necessary, additional work, such as preparation of an archaeological treatment plan, testing, or data recovery.

Mitigation Measures

TCR - 1 In the event that Native American cultural resources are discovered during Project activities, all work in the immediate vicinity of the find (within a 60-foot buffer) shall cease and a qualified archaeologist meeting Secretary of Interior standards shall assess the find. All tribes that that had consultation with the City shall be contacted to consult if any such find occurs. The archaeologist shall complete all relevant California State Department of Parks and Recreation (DPR) 523 Series forms to document the find and submit this documentation to the applicant, Lead Agency, and the respective tribes.

TCR - 2 The Lead Agency and/or applicant shall, in good faith, consult with any tribe that had consultation with City on the disposition and treatment of any Tribal Cultural Resource encountered during the Project grading.

TCR - 3 If human remains or funerary objects are encountered during any activities associated with the Project, work in the immediate vicinity (within a 100-foot buffer of the find) shall cease and the County coroner shall be contacted. If the human remains are determined to be Native American in origin by the County coroner, the applicant shall immediately notify the Lead Agency, and any tribe that had consultation with City.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED.

Cumulative Impacts

With the incorporated mitigation measures, the proposed project’s cumulative impacts to tribal cultural resources would be less than significant.

[End of Section.]

20. UTILITIES AND SERVICE SYSTEMS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	☒
b) Have sufficient water supplies available to serve the project and reasonable foreseeable future development during normal, dry and multiple dry years?	☐	☐	☐	☒
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☐	☒
e) Comply with federal, state, and local, management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

a. *Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?*

b. *Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?*

c. *Result in a determination by the waste water treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?*

d. Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

The project will not utilize water, generate wastewater or stormwater runoff, or consume electricity or natural gas.

The project will not generate solid waste. Green waste will be generated during construction in relation to initial clearing and grubbing activities. This material will be transported to a green waste recycling facility to be composted for beneficial reuse.

NO IMPACT

Cumulative Impacts

The proposed project consists of a pedestrian, equestrian, and maintenance vehicle bridge and access road that will not generate any additional wastewater or solid waste during operation. The project would create a temporary minimal increase in wastewater and solid waste during construction only. Additionally, the proposed project would create minimal new areas of impervious surface, and stormwater runoff from the project site would be expected to be similar to existing runoff rates at the site. Therefore, the project would have no impact.

[End of Section.]

21. WILDFIRE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

a. *Substantially impair an adopted emergency response plan or emergency evacuation plan?*

b. *Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?*

c. *Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?*

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

The project site is located within a CalFire identified Very High Fire Hazard Severity Zone; the project site and surroundings also experienced a major wildfire in 2018 (Hill Fire). However, the project will increase connectivity between Hill Canyon Road and Hill

Canyon Fire Road by providing a more accessible mode of escape for hikers, bicyclists, equestrians, and potentially municipal workers from the Hill Canyon Wastewater Treatment Plant in the event of a wildland fire. The proposed project will also provide greater emergency access for non-vehicular fire-fighting services. The bridge will be constructed of materials resistant to fire, composed primarily of steel and concrete

The project will not have occupants and is not expected to exacerbate wildfire risks. The proposed project will provide greater emergency access for non-vehicular fire-fighting services.

The project will not require the installation of associated infrastructure that will exacerbate fire risk or result in ongoing impacts to the environment.

The project site is undeveloped open space. Construction of the bridge and accompanying short access road are not expected to expose people or structures flooding or landslides as a result of post-fire conditions.

NO IMPACT

Cumulative Impacts

The proposed project consists of a pedestrian, equestrian, and maintenance vehicle bridge that will not require significant installation and maintenance of associated infrastructure. Therefore, the project would have less than significant impact.

[End of Section.]

22. MANDATORY FINDINGS OF SIGNIFICANCE.

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

a. *Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?*

The project site is located within an area that is recognized to contain sensitive wildlife and floral species and habitats as described under the Biological Resources section. However, impacts to the environment have been determined to be less than significant

with mitigation. In addition, the proposed project would not cause a fish or wildlife population to drop below self-sustaining levels or threaten to eliminate a plant or animal community.

The Cultural Resources section describes the potential for cultural or significant paleontological resources to be encountered due to the proposed project. Because the Project activities would be confined to areas that have experienced long-term and repeated disturbances, it is unlikely that significant cultural or paleontological resources would be encountered during project implementation. Nevertheless, because the potential remains that previously undiscovered resources could be exposed, inclusion of standard mitigation measures during construction would ensure that potential impacts to such resources are less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?

The project consists of a new pedestrian, equestrian, and city vehicle bridge and associated access road only within designated open space that will provide a connection between two existing trails. Therefore, the project will not inhibit or disadvantage any long-term environmental goals.

NO IMPACT

c. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

Based on the analysis provided in this IS-MND, the proposed project would not result in any significant impacts on an individual or cumulative level. Since the project site is designated open space and is substantially surrounded by designated open space, and there are no other recreational projects proposed at this time within the project area, it would not cumulatively increase demand on City public services and utilities.

NO IMPACT

d. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Based on the analysis provided in this IS-MND, the proposed project would not result in any environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly. The project site is located within designated open space and is substantially surrounded by designated open space. The project will also connect two existing recreational trails.

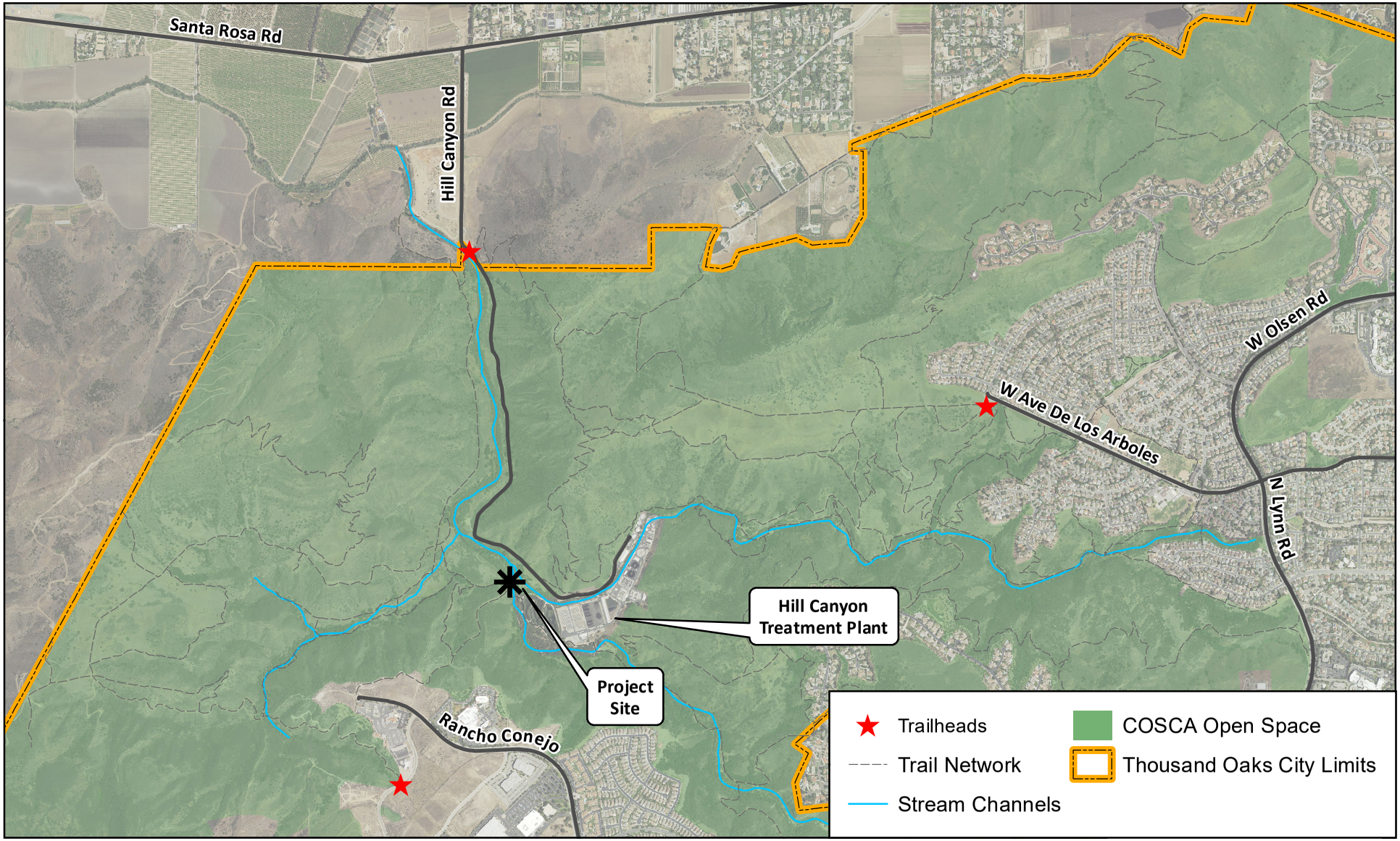
NO IMPACT

*****

ADDITIONAL SOURCE REFERENCES	
1	Thousand Oaks Municipal Code
2	City of Thousand Oaks General Plan
3	Biological Baseline Assessment. Padre Associates, June 2018.
4	Arborist Report. Stantec Consulting Services, June 2019.
5	Update of Geotechnical Engineering Report. Twining, January 2019.
6	Manual of California Vegetation, 2nd ed. Sawyer, Keeler-Wolf, Evens
7	California Native Plant Society, Inventory of Rare Plants.

APPENDIX A

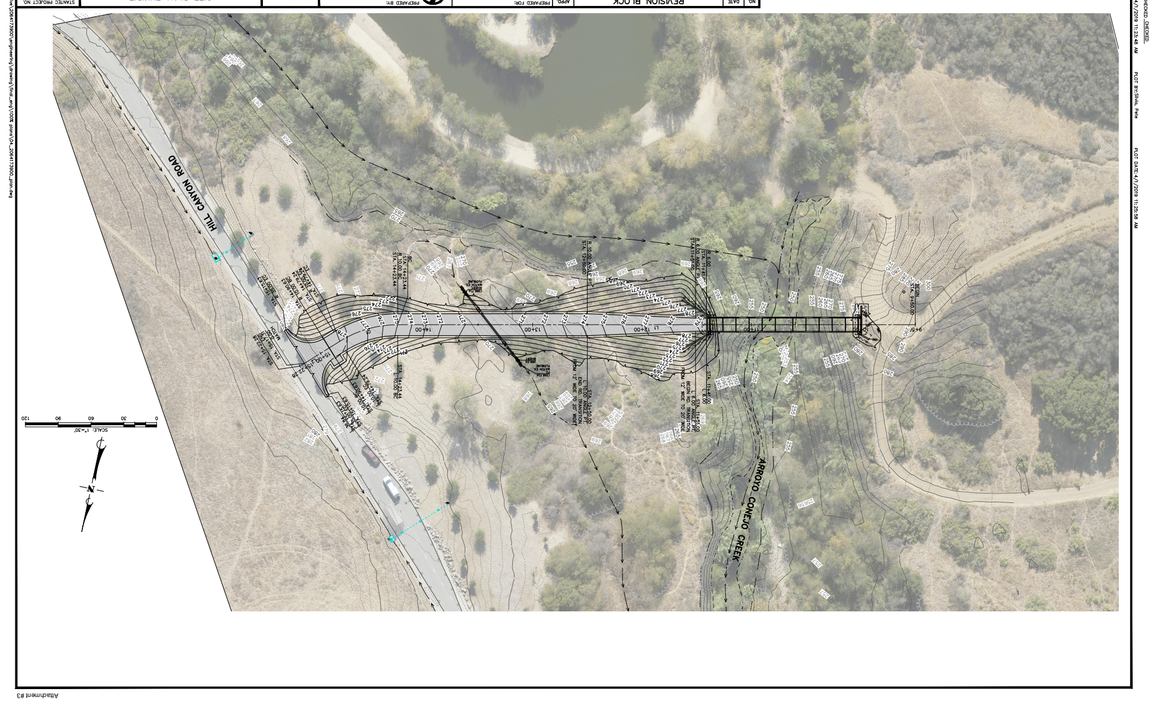
Conejo Canyons Bridge at Hill Canyon Treatment Plant
Vicinity Map



0 0.5 1 Miles

CONEJO OPEN SPACE CONSERVATION AGENCY

U:_COSCA\Location Maps\Conejo Cyns Bridge\Conejo Cyns Bridge-SAA Att2.mxd



No.	DATE	REVISION BLOCK	APPD.

Stantec

PROJECT MANAGER	P.E.
PROJECT ENGINEER	P.E.

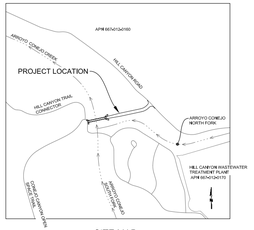
SITE PLAN EXHIBIT
CI 5537 CONCJO CANYONS BRIDGE AT MCTP
CITY OF THOUSAND OAKS
THOUSAND OAKS, CA

STANTEC PROJECT NO.	
215110727000	
SHEET	
1 of 1	
CAD SAVE	
03/14/2019	

Attachment #3

APPENDIX B

ATTACHMENT #4



SITE MAP
NTS

PUBLIC UTILITIES WITHIN CITY OF THOUSAND OAKS

WATER:
CALIFORNIA AMERICANS WATER COMPANY
2439 W. HILLCREST DRIVE
NEWBURY PARK, CA 91320
THOMAS BOYLE
805-498-1266, EXT. 2802

CALLEGUAS MUNICIPAL WATER DISTRICT
2100 EAST OLSEN ROAD
THOUSAND OAKS, CA 91360
KRISTINE MCCAFFREY
805-579-7173

WASTEWATER:
CITY OF THOUSAND OAKS
2100 EAST THOUSAND OAKS BOULEVARD
THOUSAND OAKS, CA 91362
JOHN NELSON
805-449-5033

GAS:
SOUTHERN CALIFORNIA GAS COMPANY
9400 OAKDALE AVENUE
CHATSWORTH, CA 91311
KEVIN EDWARDS
818-701-3322

CABLE TV:
SPECTRUM
2525 KNOLL DRIVE
VENTURA, CA 93003
PATRICIA ROBERTSON
805-732-5155

FRONTIER
JON TRELATSKY
201 FLYNN ROAD
CAMARILLO, CA 93012
805-388-2266

ELECTRICITY:
SOUTHERN CALIFORNIA EDISON COMPANY
3589 FOOTHILL DRIVE
THOUSAND OAKS, CA 91361
BOB MIGLIORE
805-494-7015

TELEPHONE:
FRONTIER
201 FLYNN ROAD
CAMARILLO, CA 93010
THOMAS PEARSON
805-445-9116

NOTICE TO CONTRACTOR:
CONTRACTOR SHALL POSSES A VALID CLASS "A" GENERAL ENGINEERING LICENSE

NOTICE TO CONTRACTOR:
IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO CALL THE USA UNDERGROUND SERVICE ALERT LOCATION OF EXISTING UNDERGROUND UTILITIES NO LESS THAN TWO DAYS NOR MORE THAN SEVEN DAYS PRIOR TO CONSTRUCTION.
811
THE CONTRACTOR SHALL ASSUME SOLE RESPONSIBILITY FOR ANY DAMAGE DONE TO EXISTING UTILITIES DURING CONSTRUCTION

City of
Thousand Oaks

PUBLIC WORKS DEPARTMENT

CONEJO CANYONS BRIDGE AT HCTP

CI 5527

SPECIFICATION NO. 2018/2019 - 20

CITY COUNCIL

ROB MCCOY, MAYOR

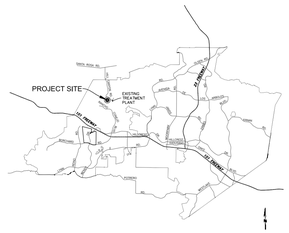
CLAUDIA BILL-DE LA PEÑA — ED JONES

AL ADAM — ROB ENGLER

CITY MANAGER
ANDREW P. POWERS

PUBLIC WORKS DIRECTOR
JAY T. SPURGIN

CITY ENGINEER
CLIFFORD G. FINLEY



VICINITY MAP
NO SCALE

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100% SUBMITTAL

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UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

REV'D	DATE	DESCRIPTION	R.C.E.	DATE	C.T.O.	DATE

DATE 03/19/2019
PETI M.SIL.VE.
DESIGNED
DATE 03/19/2019
PHILIP ROSENBERG
DRAWN BY
DATE 03/19/2019
HAZI ESHTIYAKHA, PE
CHECKED

REGISTERED CIVIL ENGINEER — NO. 45823 — STATE OF CALIFORNIA

PREPARED BY
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532 Fax: (805) 966-9801
HAZI ESHTIYAKHA, PE — 03/19/2019
REGISTERED ENGINEER — DATE

CITY OF THOUSAND OAKS
REVIEWED BY:
PROJECT ENGINEER — DATE
REVIEWED BY:
ENGINEERING DIVISION MANAGER — DATE
APPROVED BY:
CLIFFORD G. FINLEY, CITY ENGINEER — DATE

CITY OF THOUSAND OAKS

CI 5527 CONEJO CANYONS BRIDGE AT HCTP

COVER SHEET

CITY OF THOUSAND OAKS DWG. 19-02A

SHEET 1 OF 11

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GENERAL NOTES

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE PROVISIONS OF THE LATEST EDITION OF THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" (SSPWC, THE LATEST GREEN BOOK), THE "STANDARD PLANS FOR PUBIC WORKS CONSTRUCTION" (SPPWC), AND THEIR SUPPLEMENTS, PREPARED AND PROMULGATED BY THE SOUTHERN CALIFORNIA CHAPTERS OF THE AMERICAN PUBLIC WORKS ASSOCIATION AND THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA, EXCEPT AS MODIFIED BY THE CITY OF THOUSAND OAKS ROAD STANDARDS WHERE REFERENCED, ATTACHED SPECIFICATIONS, AND THE NOTES THAT FOLLOW.
2. ALL WORK SHALL COMPLY WITH THE CITY OF THOUSAND OAKS ROAD STANDARDS, 2018 VERSION.
3. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE STATE OF CALIFORNIA DIVISION OF INDUSTRIAL SAFETY.
4. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS AND RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT PREPARED BY TWINING DATED JANUARY 30, 2019, AND IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
5. CONTRACTOR SHALL POSSESS A CONTRACTOR'S LICENSE OF A TYPE APPROPRIATE FOR THE WORK AND SHALL FURNISH EVIDENCE OF THE SAME AT THE TIME THE CONTRACT IS AWARDED.
6. AT LEAST TWO (2) WORKING DAYS (48 HOURS) PRIOR TO COMMENCING CONSTRUCTION, THE CONTRACTOR SHALL CONTACT THE REGIONAL NOTIFICATION CENTER (UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA – U.S.A. AT 811) TO OBTAIN AN INQUIRY IDENTIFICATION NUMBER AND TO REQUEST THE UTILITY OWNERS TO MARK OR OTHERWISE INDICATE THE LOCATION OF THEIR SUBSURFACE FACILITIES. THE CONTRACTOR SHALL DETERMINE THE LOCATION AND DEPTH OF ALL UTILITIES, INCLUDING ALL SERVICE CONNECTIONS, WHICH HAVE BEEN MARKED BY THE RESPECTIVE OWNERS WHICH MAY AFFECT OR BE AFFECTED BY ITS OPERATIONS. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO PROTECT ALL UTILITIES AND ALL STRUCTURES FOUND AT THE SITE.
7. ALL PERMITS NECESSARY PRIOR TO BEGINNING CONSTRUCTION SHALL BE ISSUED BY THE CITY AT NO COST TO THE CONTRACTOR.
8. WORK DONE IN CONFLICT WITH THESE PLANS WILL BE SUBJECT TO REJECTION.
9. THE CONTRACTOR SHALL KEEP A STRICT RECORD OF ALL CHANGES AND SUBMIT THIS RECORD TO THE CITY OF THOUSAND OAKS PUBLIC WORKS DEPARTMENT. CERTIFIED "AS–BUILT" PLANS SHALL BE PROVIDED TO THE CITY OF THOUSAND OAKS BEFORE FINAL ACCEPTANCE.
10. ALL DAMAGE CAUSED TO PUBLIC STREETS, INCLUDING HAUL ROUTES, ALLEYS, SIDEWALKS, CURBS OR STREET FURNISHINGS, OR TO PRIVATE PROPERTY SHALL BE REPAIRED AT THE SOLE EXPENSE OF THE CONTRACTOR TO THE ENGINEER'S SATISFACTION.
11. THROUGHOUT ALL PHASES OF CONSTRUCTION, INCLUDING SUSPENSION OF WORK, UNTIL FINAL ACCEPTANCE OF THE PROJECT, THE CONTRACTOR SHALL KEEP THE WORK SITE CLEAN AND FREE FROM RUBBISH AND DEBRIS. THE CONTRACTOR SHALL ALSO ABATE DUST NUISANCE BY CLEANING, SWEEPING AND SPRINKLING WITH WATER AND USING DUST FENCES OR OTHER METHODS AS DIRECTED BY THE CITY THROUGHOUT THE CONSTRUCTION OPERATION.
12. THE CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY, AND SHALL NOT BE LIMITED TO NORMAL WORKING HOURS.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADEQUATE BRACING AND SHORING FOR EXCAVATIONS, TEMPORARY STRUCTURES, AND ANY AND ALL PARTIALLY COMPLETED PORTIONS OF THE WORK. SHEETING, SHORING, BRACING OR EQUIVALENT PROTECTION FOR ALL EXCAVATIONS SHALL BE PROVIDED AS REQUIRED BY INDUSTRIAL SAFETY LAWS.
12. UNDERGROUND UTILITIES AND SUBSTRUCTURES AS SHOWN HEREON WERE OBTAINED FROM AVAILABLE SOURCES, THE ACCURACY OF WHICH HAS NOT BEEN DETERMINED. CONTRACTOR SHALL VERIFY DEPTH AND LOCATION OF ALL EXISTING UTILITIES AND SUBSTRUCTURES PRIOR TO CONSTRUCTION, AND SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES DURING CONSTRUCTION.
13. ALL DRAWINGS ARE CONSIDERED TO BE A PART OF THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REVIEW AND COORDINATION OF ALL DRAWINGS AND SPECIFICATIONS, AS AVAILABLE, PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES THAT OCCUR SHALL BE BROUGHT TO THE ATTENTION TO THE ENGINEER PRIOR TO THE START OF CONSTRUCTION SO THAT A CLARIFICATION CAN BE ISSUED. ANY WORK PERFORMED IN CONFLICT WITH THE CONTRACT DOCUMENTS OR ANY CODE REQUIREMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT THEIR OWN EXPENSE AND AT NO EXPENSE TO THE OWNER OR ENGINEER.

GENERAL GRADING NOTES

1. ALL GRADING SHALL CONFORM WITH THE CITY OF THOUSAND OAKS GRADING ORDINANCE, TITLE 7, CHAPTER 3, REGULATING THE EXCAVATION, GRADING AND FILLING OF LAND AND ANY AMENDMENTS THERETO EXCEPT AS WAIVED OR MODIFIED AS SET FORTH IN THE CONDITIONS OF APPROVAL AND THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER.
2. ALL GEOLOGIC AND SOIL RECOMMENDATIONS IMPOSED BY THE SOILS ENGINEER OR CONTAINED IN THE SOILS AND GEOLOGIC REPORT ARE TO BE COMPLIED WITH AND ARE HEREBY MADE AN INTEGRAL PART OF THE GRADING PLANS AND PERMIT.
3. CONTRACTOR TO NOTIFY THE CITY GRADING INSPECTOR AND SOILS LABORATORY AT LEAST 48 HOURS BEFORE START OF GRADING WORK OR ANY PRE–CONSTRUCTION MEETING.
4. THE GEOTECHNICAL ENGINEER SHALL PROVIDE OBSERVATION AND TESTING DURING GRADING OPERATIONS IN THE FIELD AND SHALL SUBMIT A FINAL REPORT STATING THAT ALL EARTH WORK WAS PROPERLY COMPLETED AND IS IN SUBSTANTIAL CONFORMANCE WITH THE REQUIREMENTS OF THE GRADING ORDINANCE.
5. NO CUT OR FILL SLOPES MAY BE STEEPER THAN 2:1 (H:V) MAXIMUM.
6. ALL FILL SLOPES WHICH ARE CREATED DURING THE GRADING OPERATION SHALL BE PROPERLY SHAPED TO A MAXIMUM SLOPE ANGLE OF TWO HORIZONTAL TO ONE VERTICAL, AND COMPACTED BY ROLLING THE SHEEPSFOOT ROLLER OR SIMILAR COMPACTION EQUIPMENT OVER THE SLOPE FACE AT VERTICAL LIFT INTERVALS OF 30 INCHES OR LESS.
6. ALL OAK TREES WITHIN THE PROJECT BOUNDARIES AND WITHIN 100 FEET OF THE PROJECT BOUNDARIES SHALL BE FENCED AT THE PROTECTED ZONE (5 FEET OUTSIDE THE DRIPLINE). ALL OAK TREE WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY OF THOUSAND OAKS OAK TREE ORDINANCE 937–NS AND OAK TREE PRESERVATION AND PROTECTION GUIDELINES RESOLUTION NO. 2010–14. UNDER NO CONDITION SHALL ANY WORK BE DONE WITHIN THE PROTECTED ZONES OF ANY OAK TREE, WITHOUT OBTAINING AN OAK TREE ENCROACHMENT PERMIT AND GIVING 48 HOURS ADVANCE NOTICE TO THE CITY. NO PROTECTIVE FENCING SHALL BE RELOCATED OR MOVED WITHOUT CITY APPROVAL.

GRADING INSPECTION

THE SUPERVISION REQUIREMENTS OF THE CITY OF THOUSAND OAKS SHALL BE COMPLIED WITH AS FOLLOWS:

1. THE ENGINEER SHALL BE A REPRESENTATIVE OF STANTEC.
2. LINE AND GRADE STAKES SHALL BE SET BY SURVEYORS UNDER THE GENERAL SUPERVISION OF THE ENGINEER.
3. THE ENGINEER SHALL PROVIDE GENERAL CONSTRUCTION REVIEW.
4. THE GEOTECHNICAL ENGINEER SHALL PROVIDE GENERAL REVIEW OF THE GRADING AND SUBGRADE PREPARATION AND PERFORM COMPACTION TESTING.
5. UPON COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE A COPY OF THE "REDLINE" SET OF DRAWINGS, FROM WHICH THE ENGINEER SHALL PREPARE "RECORD DRAWING" PLANS AND SUBMIT A REPORT ATTESTING THAT THE IMPROVEMENTS HAVE BEEN COMPLETED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS.

ESTIMATED EARTHWORK QUANTITIES – RAW QUANTITIES

	CUT (C.Y.)	FILL (C.Y)	NET (C.Y.)
ACCESS ROAD:	0	3,000	(3,000)

NET EXPORT (C.Y.) 0
NET IMPORT (C.Y.) 3,000

THE ABOVE QUANTITIES ARE APPROXIMATE IN PLACE VOLUMES CALCULATED FROM THE EXISTING GROUND TO THE PROPOSED FINISH GRADE OR SUBGRADE. EXISTING GROUND IS DEFINED BY THE TOPOGRAPHIC CONTOURS AND/OR SPOT ELEVATIONS ON THE PLAN. PROPOSED FINISH GRADE IS DEFINED AS THE DESIGN SURFACE ELEVATION OF EARTH TO BE CONSTRUCTED. PROPOSED SUBGRADE ELEVATION IS DEFINED AS THE DESIGN SURFACE ELEVATION OF EARTH TO BE CONSTRUCTED BENEATH PAVEMENTS OR STRUCTURES.

THE ABOVE QUANTITIES ARE FOR BUILDING PERMIT PURPOSES ONLY AND HAVE NOT BEEN FACTORED TO INCLUDE ALLOWANCES FOR BULKING, CLEARING AND GRUBBING, SUBSIDENCE, SHRINKAGE, OVER EXCAVATION AND RECOMPACTION, UNDERGROUND UTILITY AND SUBSTRUCTURE SPOILS, STRUCTURAL SECTIONS AND CONSTRUCTION METHODS.

THE CONTRACTOR SHALL PERFORM AN EARTHWORK ESTIMATE FOR THE PURPOSE OF PREPARING A BID PRICE FOR EARTHWORK. THE BID PRICE SHALL INCLUDE COSTS FOR ANY NECESSARY IMPORT AND PLACEMENT OF EARTH MATERIALS OR THE EXPORT AND PROPER DISPOSAL OF EXCESS EARTH MATERIALS.

EROSION CONTROL NOTES

1. IN ADDITION TO THESE NOTES, THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL EROSION CONTROL REQUIREMENTS SPECIFIED BY THE CITY OF THOUSAND OAKS.
2. THE CONTRACTOR SHALL ENSURE ALL PROTECTION MEASURES ARE IN PLACE PRIOR TO THE RAINY SEASON. THE PROTECTION MEASURES MAY NEED TO BE INSTALLED DURING OTHER PARTS OF THE YEAR SHOULD RAIN BE IMMINENT.
3. THE CONTRACTOR SHALL ADJUST THE LIMITS OF THE PROTECTION MEASURES AS HIS WORK PROGRESSES, AND SHALL REMOVE SILT FROM ALL STORM DRAIN APPURTENANCES AND EROSION CONTROL DEVICES AFTER EACH RAIN.
4. THE PROTECTION MEASURES MAY BE TEMPORARILY MOVED OUT OF THE CONTRACTOR'S WAY TO FACILITATE CONSTRUCTION, PROVIDED THEY ARE REINSTALLED PRIOR TO THE NEXT RAIN STORM.
5. THE CONTRACTOR SHALL ADVISE HIS CREW OF THE INTENT OF THE PROTECTION MEASURES PRIOR TO THE START OF THE RAINY SEASON. THE CREW IS ENCOURAGED TO MONITOR THE EFFECTIVENESS OF THE SYSTEM AND ALERT THE CONTRACTOR OF ANY FAILURES OR PROBLEMS.
6. STAGING, REFUELING OF EQUIPMENT AND STORAGE OF MATERIALS SHOULD BE IN ONE CENTRAL AREA. THIS AREA MAY CHANGE THROUGHOUT CONSTRUCTION, AS REQUIRED. THE AREA SHALL BE INSPECTED FREQUENTLY TO ENSURE NO SPILLED HAZARDOUS MATERIALS CONTAMINATE THE EXISTING GROUND. SHOULD THIS OCCUR, THE SPILL SHALL BE CLEANED UP IMMEDIATELY PER CITY OF THOUSAND OAK STANDARDS. THIS SITE SHALL NOT BE LOCATED NEAR STORM DRAIN INLETS, EXISTING RESIDENCES, DRAINAGE SWALES OR ADJACENT TO A FILL SLOPE.
7. APPROVED EROSION CONTROL DEVICES ARE REQUIRED AND THEY SHALL BE INSTALLED PRIOR TO OCTOBER 1ST AND SHALL BE MAINTAINED ON THE SITE THROUGH APRIL 15TH OF THE FOLLOWING YEAR.
8. ONCE A GRADING AREA IS COMPLETED, THE DISTURBED AREAS SHALL BE PROTECTED FROM BEING ERODED BY WIND OR WATER EROSION BY APPLICATION OF EROSION CONTROL DEVICES AND METHODS SPECIFIED BY THESE PLANS.

DUST CONTROL NOTES

1. CONTRACTOR SHALL EMPLOY ALL LABOR, EQUIPMENT AND METHODS REQUIRED TO PREVENT HIS OPERATIONS FROM PRODUCING DUST IN AMOUNTS DAMAGING TO ADJACENT PROPERTY, CULTIVATED VEGETATION AND DOMESTIC ANIMALS OR CAUSING A NUISANCE TO PERSONS OCCUPYING BUILDINGS IN THE VICINITY OF THE JOB SITE. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE CAUSED BY DUST FROM HIS GRADING OPERATION.

DURING CONSTRUCTION:
1. WATER TRUCKS OR SPRINKLER SYSTEMS SHALL BE USED TO KEEP ALL AREAS OF VEHICLE MOVEMENT DAMP ENOUGH TO PREVENT DUST FROM LEAVING THE SITE. AT A MINIMUM, THIS WILL INCLUDE WETTING DOWN SUCH AREAS IN THE LATE MORNING AND AFTER WORK IS COMPLETED FOR THE DAY. INCREASED WATERING FREQUENCY WILL BE REQUIRED WHENEVER THE WIND SPEED EXCEEDS 15 MPH. RECLAIMED WATER SHOULD BE USED WHENEVER POSSIBLE.
2. AFTER CLEARING, GRADING, EARTH MOVING OR EXCAVATION IS COMPLETED, TREAT THE DISTURBED AREA BY WATERING, OR RE–VEGETATING, OR BY SPREADING SOIL BINDERS UNTIL THE AREA IS PAVED OR OTHERWISE DEVELOPED SO THAT DUST GENERATION WILL NOT OCCUR.
3. ALL ROADWAYS, DRIVEWAYS, SIDEWALKS, ETC., SHOULD BE PAVED AS SOON AS POSSIBLE.
4. MINIMIZE AMOUNT OF DISTURBED AREA AND REDUCE ONSITE VEHICLE SPEEDS TO 15 MILES PER HOUR OR LESS.
5. IF IMPORTATION, EXPORTATION AND STOCKPILING OF FILL MATERIAL IS INVOLVED, SOIL STOCKPILED FOR MORE THAN TWO DAYS SHALL BE COVERED, KEPT MOIST, OR TREATED WITH SOIL BINDERS TO PREVENT DUST GENERATION.
6. TRUCKS TRANSPORTING FILL MATERIAL TO AND FROM THE SITE SHALL BE TARPED FROM THE POINT OF ORIGIN.

AFTER CLEARING, GRADING, EARTH MOVING OR EXCAVATION IS COMPLETED THE ENTIRE AREA OF DISTURBED SOIL SHALL BE TREATED TO PREVENT WIND PICK UP OF THE SOIL. THIS MAY BE ACCOMPLISHED BY:
1. SEEDING AND WATERING UNTIL GRASS COVER IS GROWN.
2. SPREADING SOIL BINDERS.
3. WETTING THE AREA DOWN, SUFFICIENT TO FORM A CRUST ON THE SURFACE WITH REPEATED SOAKINGS AS NECESSARY TO MAINTAIN THE CRUST AND PREVENT DUST PICK UP BY THE WIND.
4. OTHER METHODS APPROVED IN ADVANCE BY THE AIR POLLUTION CONTROL DISTRICT.

ACTIVATION OF INCREASED DUST CONTROL MEASURES:
1. THE CONTRACTOR OR BUILDER SHALL DESIGNATE A PERSON OR PERSONS TO MONITOR THE DUST CONTROL PROGRAM AND TO ORDER INCREASED WATERING, AS NECESSARY, TO PREVENT TRANSPORT OF DUST OFF SITE. THEIR DUTIES SHALL INCLUDE HOLIDAY AND WEEKEND PERIODS WHEN WORK MAY NOT BE IN PROGRESS. THE NAME AND TELEPHONE NUMBER OF SUCH PERSONS SHALL BE PROVIDED TO THE CITY'S ENVIRONMENTAL ANALYST. THE ENVIRONMENTAL ANALYST SHALL REVIEW THE MITIGATION PROGRAM REQUEST FOR PROPOSAL AND CONTRACT.

GEOTECHNICAL REPORT RECOMMENDATIONS

(UPDATE OF GEOTECHNICAL ENGINEERING REPORT BY TWINING INC., DATED JANUARY 30, 2019)

GENERAL GRADING RECOMMENDATIONS
THE GRADING CONTRACTOR IS RESPONSIBLE TO NOTIFY GOVERNMENTAL AGENCIES, AS REQUIRED, AND A REPRESENTATIVE OF TWINING, INC. AT THE START OF SITE CLEANUP, AT THE INITIATION OF GRADING, AND ANY TIME THAT GRADING OPERATIONS ARE RESUMED AFTER AN INTERRUPTION. EACH STEP OF THE GRADING SHALL BE EVALUATED IN A SPECIFIC AREA BY A REPRESENTATIVE OF TWINING, INC., AND WHERE REQUIRED, SHOULD BE APPROVED BY THE APPLICABLE GOVERNMENTAL AGENCIES PRIOR TO PROCEEDING WITH SUBSEQUENT WORK.

1. PRIOR TO GRADING, EXISTING VEGETATION, TRASH, SURFACE STRUCTURES AND DEBRIS SHOULD BE REMOVED AND DISPOSED OFF–SITE AT A LEGAL DUMPSITE. ANY EXISTING UTILITY LINES, OR OTHER SUBSURFACE STRUCTURES, WHICH ARE NOT TO BE UTILIZED SHOULD BE REMOVED, DESTROYED, OR ABANDONED IN COMPLIANCE WITH CURRENT GOVERNMENTAL REGULATIONS AND WITH CONCURRENCE FROM TWINING, INC.
2. SUBSEQUENT TO CLEANUP OPERATIONS, AND PRIOR TO INITIAL GRADING, A REASONABLE SEARCH SHOULD BE MADE FOR SUBSURFACE OBSTRUCTIONS AND/OR POSSIBLE LOOSE FILL OR DETRIMENTAL SOIL TYPES. THIS SEARCH SHOULD BE CONDUCTED BY THE CONTRACTOR, WITH ADVICE FROM AND UNDER THE OBSERVATION OF A REPRESENTATIVE OF TWINING, INC.
3. FILL SHOULD BE SPREAD IN 6– TO 8–INCH LIFTS AND SHOULD BE MOISTURE CONDITIONED AND COMPACTED IN ACCORDANCE WITH THE RECOMMENDATIONS PRESENTED IN THE 'SITE PREPARATION' SUBSECTION OF THIS REPORT. ALL UNDOCUMENTED FILL OR UNSUITABLE SOILS WITHIN THE BUILDING AREAS SHOULD BE REMOVED AND COMPACTED UNDER OBSERVATION AND TESTING OF A REPRESENTATIVE OF TWINING, INC.
4. THE EXPOSED SUBGRADE AND/OR EXCAVATION BOTTOM SHOULD BE OBSERVED AND EVALUATED BY A REPRESENTATIVE OF TWINING, INC. FOR CONFORMANCE WITH THE INTENT OF THE RECOMMENDATIONS PRESENTED IN THIS REPORT AND PRIOR TO ANY FURTHER PROCESSING OR FILL PLACEMENT. IT SHOULD BE UNDERSTOOD THAT THE ACTUAL ENCOUNTERED CONDITIONS MAY WARRANT EXCAVATION AND/OR SUBGRADE PREPARATION BEYOND THE EXTENT RECOMMENDED AND/OR ANTICIPATED IN THIS REPORT.
5. ON–SITE INORGANIC GRANULAR SOILS THAT ARE FREE OF DEBRIS OR CONTAMINATION AND ARE NOT GREATER THAN 6 INCHES IN LARGEST DIMENSION ARE CONSIDERED SUITABLE FOR PLACEMENT AS COMPACTED FILL. A REPRESENTATIVE OF TWINING, INC. SHOULD PROVIDE GUIDANCE FOR SUITABILITY AND PLACEMENT OF ON–SITE CLAY FILL MATERIALS.
6. OBSERVATION AND FIELD TESTS SHALL BE PERFORMED DURING GRADING BY A REPRESENTATIVE OF TWINING, INC. IN ORDER TO ASSIST THE CONTRACTOR IN OBTAINING THE PROPER MOISTURE CONTENT AND REQUIRED DEGREE OF COMPACTION. WHERE LESS THAN THE REQUIRED DEGREE OF COMPACTION IS INDICATED, ADDITIONAL COMPACTIVE EFFORT AND ANY NECESSARY ADJUSTMENTS IN THE MOISTURE CONTENT OF THE SOIL SHOULD BE MADE TO OBTAIN THE REQUIRED COMPACTION.
7. TO EVALUATE THE PRESENCE OF SATISFACTORY MATERIALS AT DESIGN ELEVATIONS, FOOTING EXCAVATIONS SHOULD BE OBSERVED TO BE CLEAN OF LOOSENED SOIL AND DEBRIS BEFORE PLACING STEEL OR CONCRETE AND PROBED FOR SOFT AREAS. IF SOFT OR LOOSE SOILS OR UNSATISFACTORY MATERIALS ARE ENCOUNTERED, THESE MATERIALS SHOULD BE REMOVED AND REPLACED WITH COMPACTED FILL.
8. IN THE EVENT THAT UNDERGROUND FACILITIES SUCH AS PIPES OR UNDERGROUND STORAGE TANKS ARE ENCOUNTERED DURING GRADING, THE APPROPRIATE AUTHORITIES, PROPERTY OWNERS, AND REGULATORY AUTHORITIES SHOULD BE NOTIFIED. REMOVAL OF UNDERGROUND STORAGE TANKS IS REGULATED BY CITY OR COUNTY HEALTH DEPARTMENTS AND/OR BY THE FIRE DEPARTMENT. IN THE EVENT THAT TANKS CONTAINING UNKNOWN SUBSTANCES ARE ENCOUNTERED, NO ATTEMPTS SHOULD BE MADE TO REMOVE SUCH OBJECTS UNTIL THEIR CONTENTS HAVE BEEN ASCERTAINED AND DIRECTIONS ISSUED BY COMPETENT PROFESSIONALS OR REGULATORS. SEPTIC TANKS SHOULD BE REMOVED ENTIRELY. CESSPOOLS OR SEEPAGE PITS SHOULD BE PUMPED OF THEIR CONTENTS AND REMOVED IN THEIR ENTIRETY. WATER WELLS SHOULD BE CAPPED IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPROPRIATE REGULATORY AGENCIES.
9. WHEREVER, IN THE OPINION OF A REPRESENTATIVE OF TWINING, INC., AN UNSATISFACTORY CONDITION IS BEING CREATED IN ANY AREA, WHETHER BY CUTTING OR FILLING, THEN THE WORK SHOULD NOT PROCEED IN THAT AREA UNTIL THE CONDITION HAS BEEN CORRECTED.

SITE PREPARATION
1. ALL DELETERIOUS, ORGANIC, AND OVERSIZED MATERIALS (GREATER THAN 6 INCHES IN MAXIMUM DIMENSION) SHALL BE REMOVED FROM ANY EXISTING AREAS THAT WILL RECEIVE FILL AND DISPOSED OUTSIDE OF THE CONSTRUCTION LIMITS. PRIOR TO PLACEMENT OF FILL AT THE SITE, THE UPPER 3 FEET OF THE EXISTING SOIL SHALL BE OVEREXCAVATED AND REPLACED AS ENGINEERED FILL. THE EXPOSED BOTTOMS OF OVEREXCAVATIONS SHALL BE OBSERVED BY THE GEOTECHNICAL ENGINEER AND/OR HIS REPRESENTATIVE PRIOR TO PROCESSING. THE BOTTOMS OF OVEREXCAVATIONS SHALL BE PROCESSED BY SCARIFYING TO A DEPTH OF APPROXIMATELY 8 INCHES, MOISTURE–CONDITIONED TO ABOUT 2 PERCENT ABOVE THE OPTIMUM MOISTURE CONTENT OF THE SOIL AND COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY BASED ON THE LATEST VERSION OF ASTM D1557. MOISTURE CONDITIONING MAY CONSIST OF DRYING BACK OF THE SOILS IF THEY ARE EXCESSIVELY WET.
2. FOOTINGS FOR LIGHTLY–LOADED ANCILLARY STRUCTURES BEARING ON SOIL SHOULD BE OVEREXCAVATED A MINIMUM OF 3 FEET BELOW THE PROPOSED FOOTING BOTTOM. OVEREXCAVATION SHOULD EXTEND LATERALLY A MINIMUM DISTANCE OF 5 FEET. OVEREXCAVATION IS NOT REQUIRED IF THE FOOTINGS ARE FOUNDED ON COMPETENT, INTACT BEDROCK.
3. THE SANDY SOILS ON SITE SHOULD BE CONSIDERED SUITABLE FOR USE AS ENGINEERED FILL PROVIDED THAT ALL DELETERIOUS, ORGANIC AND OVERSIZED MATERIALS (GREATER THAN 6 INCHES IN MAXIMUM DIMENSION) ARE REMOVED PRIOR TO PLACEMENT. ENGINEERED FILL SHOULD BE PLACED IN LIFTS OF LOOSE THICKNESS NOT EXCEEDING 8 INCHES, MOISTURE–CONDITIONED TO APPROXIMATELY 2 PERCENT OF THE OPTIMUM MOISTURE CONTENT AND COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY BASED ON THE LATEST VERSION OF ASTM D1557.
4. PUMPING SOILS OR UNSTABLE SOILS MAY BE ENCOUNTERED AT OVEREXCAVATION BOTTOMS BASED ON THE SOIL MOISTURE CONTENTS DURING OUR SUBSURFACE EXPLORATION. PROVISIONS IN THE PROJECT SPECIFICATIONS SHOULD BE MADE TO ADDRESS THE POTENTIAL FOR ENCOUNTERING UNSTABLE CONDITIONS. EXCAVATION BOTTOMS MAY BE STABILIZED BY DRYING BACK OF THE SOILS, WORKING THIN LIFTS OF 1–1/2–INCH (MINIMUM SIZE) FLOAT ROCK INTO THE EXCAVATION BOTTOMS UNTIL STABILIZATION IS ACHIEVED, OR CEMENT TREATMENT OF THE SOILS. USE OF FILTER FABRIC WRAPPED AROUND THE GRAVEL SECTION IS RECOMMENDED. OTHER METHODS OF STABILIZATION MAY BE RECOMMENDED DEPENDING ON THE CONDITIONS ENCOUNTERED IN THE FIELD DURING CONSTRUCTION.

PAVEMENT DESIGN:
1. THE R–VALUE MEASURED ON A SAMPLE OF NEAR SURFACE SOILS WAS 14. A TRAFFIC INDEX (TI) OF 6 IS REQUIRED FOR THE PROJECT. ASSUMING A TI OF 6 AND USING THE MEASURED R–VALUE OF 14, ASPHALT PAVEMENT SECTIONS SHOULD HAVE A MINIMUM GRAVEL EQUIVALENT OF 1.65 FEET. THIS CAN BE ACHIEVED BY USING 4 INCHES OF ASPHALT CONCRETE OVER 10 INCHES OF AGGREGATE BASE.
2. AGGREGATE BASE SHOULD BE COMPACTED TO A MINIMUM OF 95% MAXIMUM DENSITY AND SHOULD BE FIRM AND UNYIELDING.

ABBREVIATIONS

AB	AGGREGATE BASE OR ANCHOR BOLT
AC	ASPHALT CONCRETE
ACI	AMERICAN CONCRETE INSTITUTE
ACP	ASBESTOS CEMENT PIPE
ADDL	ADDITIONAL
ARCH	ARCHITECT
BC	BEGIN CURVE
BCR	BEGIN CURB RETURN
BD	BASEMENT DRAIN
BFV	BUTTERFLY VALVE
BLKG	BLOCKING
BM	BENCHMARK
BN	BOUNDARY NAIL
BOT	BOTTOM
BP	BOTTOM OF PILE
BRD	BOARD
BV	BALL VALVE
BVC	BEGIN VERTICAL CURVE
BW	BACK OF WALK
CBC	CONCRETE BUILDING CODE
CIP	CAST IRON PIPE
CIRCUM.	CIRCUMFERENTIAL
CJ	CRACK CONTROL JOINT
CL	CLASS
℄ OR C/L	CENTERLINE
CMP	CORRUGATED METAL PIPE
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
COMP	COMPOSITE
CONC	CONCRETE
CONT	CONTINUOUS
CTV	CABLE TELEVISION
DI	DUCTILE IRON
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
D	DRAIN
DUCT	DUCTILE
E	ELECTRICAL
EA	EACH
EL	ELEVATION
EMBED	EMBEDMENT
EW	EACH WAY
DI	DROP INLET
EC	END CURVE
ECR	END CURB RETURN
EG	EXISTING GRADE
EJ	EXPANSION JOINT
EL	ELEVATION
EP	EDGE OF PAVEMENT
EVC	END VERTICAL CURVE
EW	EACH WAY
EX	EXISTING
FD	FLOOR DRAIN
FDTN	FOUNDATION
FF	FINISHED FLOOR
FG	FINISHED GRADE
FH	FIRE HYDRANT
FL	FLOWLINE
FLG	FLANGED
FS	FINISHED SURFACE
G	GAS
GALV	GALVANIZED
GB	GRADE BREAK
GM	GAS METER
GSP	GALVANIZED STEEL PIPE
GSV	GAS VALVE
GV	GATE VALVE
HB	HOSE BIB
HORIZ	HORIZONTAL
HP	HIGH POINT
ID	INSIDE DIAMETER
INV	INVERT
L	LENGTH
LF	LINEAL FEET
MAX	MAXIMUM
MB	MACHINE BOLT
MH	MANHOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT
NIC	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
OC	ON CENTER
OCEW	ON CENTER EACH WAY
OD	OUTSIDE DIAMETER
PCC	POINT OF COMPOUND CURVATURE
PERF	PERFORATED
PI	POINT OF INTERSECTION (OF CURVE TANGENTS)
ℙ OR P/L	PROPERTY LINE
PRC	POINT OF REVERSE CURVATURE
PT	PRESSURE TREATED
PVC	POLYVINYL CHLORIDE PIPE
PV	PLUG VALVE
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
REINF	REINFORCEMENT
RG	RETAINING GLAND
RSJ	ROUGH SURFACE JOINT
R/W	RIGHT–OF–WAY
S	SEWER
SD	STORM DRAIN
SL	STREET LIGHT
SS	STAINLESS STEEL
ST STL	STAINLESS STEEL
STA	STATION
STD DTL	STANDARD DETAIL
T	TELEPHONE
T BLK	THRUST BLOCK
TB	TOP OF BERM
TC	TOP OF CURB
TCN	TOP OF CONCRETE
TD	TOP OF DIKE
TF	TOP OF FOOTING
TG	TOP OF GRATE
THK	THICK
TI	TRAFFIC INDEX
TL	TRAFFIC LIGHT
TP	TOP OF PAVEMENT OR TOP OF PILE
TYP	TYPICAL
TW	TOP OF WALL
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
VPI	VERTICAL POINT OF INTERSECTION (OF VERTICAL CURVE TANGENTS)
W	WATER
W/	WITH
WD	WALL DRAIN
WM	WATER METER
WV	WATER VALVE
△	DELTA (CURVE CENTRAL ANGLE)
±	APPROXIMATELY
%	PERCENT
<	LESS THAN
>	GREATER THAN

CASQA BMP INDEX

CALIFORNIA STORMWATER QUALITY ASSOCIATION (CASQA) CONSTRUCTION HANDBOOK, 2012.

BMP NO.	TITLE
EC–1	SCHEDULING
SE–4	CHECK DAMS
SE–6	GRAVEL BAG BERMS
SE–7	STREET SWEEPING AND VACUUMING
WE–1	WIND EROSION CONTROL
NS–1	WATER CONSERVATION PRACTICES
NS–6	ILLICIT CONNECTION/DISCHARGE
NS–8	VEHICLE AND EQUIPMENT CLEANING
NS–9	VEHICLE AND EQUIPMENT FUELING
NS–10	VEHICLE AND EQUIPMENT MAINTENANCE
NS–11	PILE DRIVING OPERATIONS
NS–12	CONCRETE CURING
NS–13	CONCRETE FINISHING
WM–1	MATERIAL DELIVERY AND STORAGE
WM–2	MATERIAL USE
WM–3	STOCKPILE MANAGEMENT
WM–4	SPILL PREVENTION AND CONTROL
WM–5	SOLID WASTE MANAGEMENT
WM–6	HAZARDOUS WASTE MANAGEMENT
WM–8	CONCRETE WASTE MANAGEMENT
WM–9	SANITARY/SEPTIC WASTE MANAGEMENT

LINETYPE LEGEND

275 EXISTING MINOR CONTOUR
EXISTING MAJOR CONTOUR
EXISTING FLOW LINE
EXISTING EDGE OF PAVEMENT
EXISTING TOP OF BANK
EXISTING TOE OF BANK
PROPOSED MINOR CONTOUR
470 PROPOSED MAJOR CONTOUR
PROPOSED GRADING DAYLIGHT LINE
PROPOSED SAWCUT LINE
PROPOSED ROAD CENTERLINE
SD PROPOSED STORM DRAIN LINE
PROPOSED ASPHALT PAVEMENT

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REV.	SYMBOL	DESCRIPTION	R.C.E.	DATE	C.T.O.	DATE

DATE 03/19/2019 PETE SILVIA, PE DESIGNED
DATE 03/19/2019 EMILIO ROSSI, PE DRAFTED BY
DATE 03/19/2019 HADY IZADPANAH, PE CHECKED

REGISTERED PROFESSIONAL ENGINEER HADY IZADPANAH NO 45823 CIVIL STATE OF CALIFORNIA

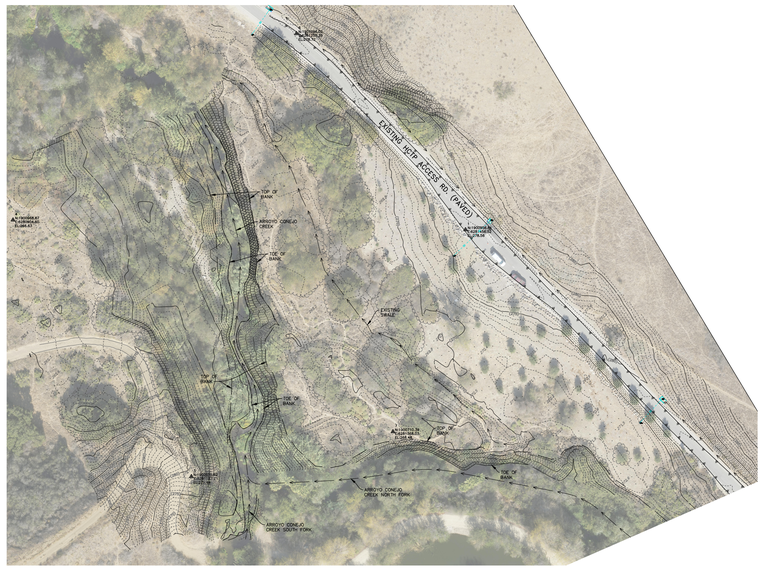
PREPARED BY
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532 Fax: (805) 966-9801
HADY IZADPANAH, PE 03/19/2019
REGISTERED ENGINEER DATE

CITY OF THOUSAND OAKS
REVIEWED BY: PROJECT ENGINEER DATE
REVIEWED BY: ENGINEERING DIVISION MANAGER DATE
APPROVED BY: CLIFFORD G. FINLEY, CITY ENGINEER DATE

CITY OF THOUSAND OAKS
CI 5527 CONEJO CANYONS BRIDGE AT HCTP
GENERAL NOTES

CITY OF THOUSAND OAKS DWG. 19-02A
SHEET 2 OF 11

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SURVEYOR'S NOTES

1. AERIAL MAPPING
TOPOGRAPHIC MAPPING WAS COMPILED AT A SCALE OF 1"=40', WITH A 1 FOOT CONTOUR INTERVAL, FROM AERIAL IMAGERY COLLECTED ON OCTOBER 29, 2018.

AERIAL PHOTOGRAPHY
THE AERIAL PHOTOGRAPHY USED AS THE BACKGROUND FOR THIS MAP WAS OBTAINED ON OCTOBER 29, 2018. THE PHOTOGRAPHY HAS BEEN CONVERTED INTO A DIGITAL FORMAT AND CORRECTED FOR HORIZONTAL AND VERTICAL DISTORTION USING STANDARD PHOTOGRAMMETRIC METHODS.

2. BASIS OF BEARINGS AND COORDINATES
BEARINGS SHOWN ON THIS MAP ARE REFERENCED TO THE CALIFORNIA COORDINATE SYSTEM, NAD 83, ZONE 5 GRID (EPOCH 2010.00), DEFINED LOCALLY BY CONTINUOUSLY OPERATING REFERENCE STATIONS OPERATED BY THE CALIFORNIA SPATIAL REFERENCE CENTER. THIS SURVEY TIED TO STATIONS CSS1, TOS1, AND VDCY.

ALL DISTANCES AND COORDINATES ARE REFERENCED TO SAID CALIFORNIA COORDINATE SYSTEM AND ARE EXPRESSED IN US SURVEY FOOT UNITS.

THE SITE COMBINATION FACTOR IS 0.999958245 AND THE SITE MAPPING ANGLE IS -0°01'43", BOTH CALCULATED AT CONTROL POINT 1. TO OBTAIN GROUND LEVEL DISTANCES, MULTIPLY GRID DISTANCES BY THE COMBINATION FACTOR. TO OBTAIN GRID BEARINGS OF THE PROJECT COMBINATION FACTOR, TO OBTAIN TRUE NORTH AZIMUTHS, SUBTRACT THE MAPPING ANGLE FROM THE GRID AZIMUTHS.

SEE CONTROL POINT LISTING

3. ELEVATIONS
ELEVATIONS SHOWN HEREON ARE EXPRESSED IN U.S. SURVEY FEET AND ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), DEFINED LOCALLY BY CONTROL POINT 1. THIS SURVEY TIED TO NGS BENCHMARK DESIGNATION "AH1284 RESET 1998" LOCATED 0.4 MILE WESTERLY ALONG SANTA ROSA ROAD FROM ITS INTERSECTION WITH BARRANCA DRIVE, AT THE SOUTHEAST CORNER OF THE INTERSECTION OF SANTA ROSA ROAD AND HILL CANYON ROAD, 52 FEET EASTERLY FROM THE CENTER OF HILL CANYON ROAD, 15.3 FEET EASTERLY FROM A SITE TELEPHONE POLE. ELEVATION=232.027 US SURVEY FEET.

CONTROL POINT LISTING

HORIZONTAL: NAD83(2011), EPOCH 2010.00, CALIFORNIA STATE PLANE COORDINATES (SPCS83) ZONE 5, U.S. SURVEY FEET
VERTICAL: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), U.S. SURVEY FEET

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	1900956.81	278.56	278.56	APNL SET MAG AND
2	1900561.22	284.98	284.98	APNL
3	1900655.62	279.44	279.44	APNL
4	1900988.67	266.63	266.63	APNL
5	1900534.46	272.25	272.25	APNL
6	1901196.02	278.72	278.72	APNL
7	1900710.39	268.48	268.48	APNL
200	1909321.80	232.03	232.03	MNSC

ASPRS (2014) PRODUCED TO MEET ACCURACIES

PRODUCED HORIZONTAL ACCURACY CLASS
THIS DATA SET WAS PRODUCED TO MEET ASPRS (AMERICAN SOCIETY FOR PHOTOGRAMMETRY AND REMOTE SENSING) POSITIONAL ACCURACY STANDARDS FOR DIGITAL GEOSPATIAL DATA (2014) FOR A 4.00 (CM) $RMSE_x$ / $RMSE_y$ HORIZONTAL ACCURACY CLASS WHICH EQUATES TO POSITIONAL HORIZONTAL ACCURACY = +/- 7.00 (CM) AT 95% CONFIDENCE LEVEL.

PRODUCED VERTICAL ACCURACY CLASS
THIS DATA SET WAS TESTED TO MEET ASPRS (AMERICAN SOCIETY FOR PHOTOGRAMMETRY AND REMOTE SENSING) POSITIONAL ACCURACY STANDARDS FOR DIGITAL GEOSPATIAL DATA (2014) FOR A 4.00 (CM) $RMSE_z$ VERTICAL ACCURACY CLASS EQUATING TO NVA = +/- 7.00 (CM) AT 95% CONFIDENCE LEVEL AND VVA = +/- 15.00 (CM) AT 95TH PERCENTILE.

N

SCALE: 1"=40'
0 40 80 120 160

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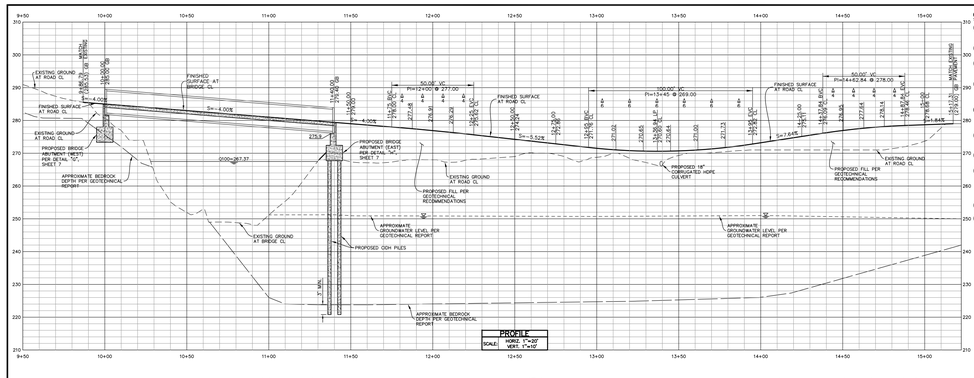
DESIGNED — DATE 03/19/2019
DRAFTED BY — DATE 03/19/2019
CHECKED — DATE 03/19/2019

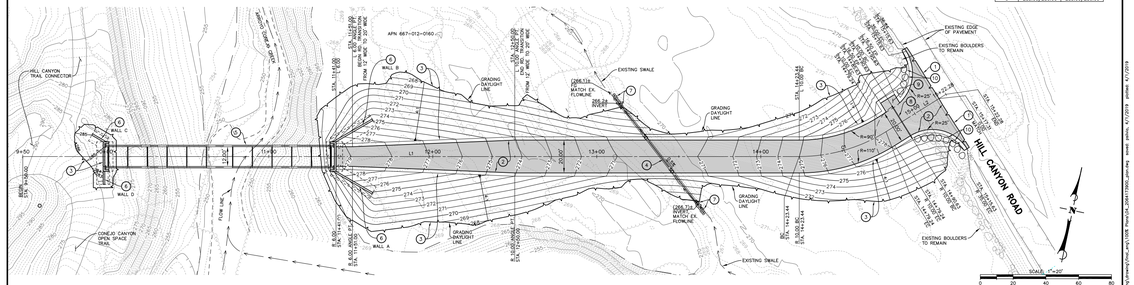
PREPARED BY
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532 Fax: (805) 966-4801
DANIEL B. EISENGART, L.S. — 03/19/2019
REGISTERED SURVEYOR — DATE

CITY OF THOUSAND OAKS
REVIEWED BY: PROJECT ENGINEER — DATE
REVIEWED BY: ENGINEERING DIVISION MANAGER — DATE
APPROVED BY: CLIFFORD D. FINLEY, CITY ENGINEER — DATE

CITY OF THOUSAND OAKS
CI 5527 CONEJO CANYONS BRIDGE AT HCTP
EXISTING TOPOGRAPHY
CITY OF THOUSAND OAKS DWG. 19-02A
SHEET 3 OF 11

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CONSTRUCTION NOTES

1. SAWCUT EXISTING PAVEMENT TO A CLEAN EDGE AND JOIN EXISTING PAVEMENT. SAWCUT 18" FROM EDGE OF EXISTING PAVEMENT.
2. CONSTRUCT A.C. ROAD PER TYPICAL SECTION DETAIL "E", SHEET 6.
3. CONSTRUCT FILL SLOPES PER GEOTECHNICAL RECOMMENDATIONS AND KEY & BENCHING DETAIL "J", SHEET 9.
4. CONSTRUCT 18" DIA. ADS N-12 CORRUGATED HIGH DENSITY POLYETHYLENE (HDPE) CULVERT OR APPROVED EQUAL AT 1% SLOPE PER TYPICAL TRENCH DETAIL "T", SHEET 9.
5. CONSTRUCT PREFABRICATED MODULAR COLONIAL STYLE RETAINING WALL PER DETAILS ON SHEETS 7.1 THROUGH 7.3. CONSTRUCT BRIDGE ABUTMENTS PER SHEETS 7.5 THROUGH 9.
6. CONSTRUCT MRO WALL PER TABLE "A", THIS SHEET AND DETAILS ON SHEET 6. SEE PLAN FOR WALL DESIGNATION. WALL BEGINS AT THE EDGE OF THE BRIDGE ABUTMENT.
7. CONSTRUCT RIP-RAP SLOPE PROTECTION AND APRON PER DETAIL "S", SHEET 9.
8. CONSTRUCT STANDARD PIPE SINGLE SWING GATE PER L.A.F.D. SECURITY GATE STANDARD. GATE SHALL BE SIMILAR TO THE EXISTING HILL CANYON BRIDGE GATE. SEE SHEET 6 FOR GATE DETAILS AND SPECIFICATIONS. SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL BY THE CITY.
9. CONSTRUCT ADA ACCESSIBLE WALKWAY PER DETAIL "E", SHEET 6.
10. PLACE MINIMUM 3'-3" DIAMETER BARRIER BOULDERS.

LINE TABLE

LINE	BEARING	DISTANCE
L1	N77°57'45"E	473.44'
L2	N45°59'48"E	43.04'

CURVE TABLE

CURVE	DELTA	RADIUS	LENGTH
C1	31°57'57"	100.00'	55.79'

TABLE "A" – WINGWALL

WALL NAME	BEGINNING TW/TF	END TW/TF
A	280.00/268.67	278.00/268.67
B	280.00/270.00	278.00/270.00
C	280.00/278.00	286.00/278.00
D	285.00/280.00	283.00/280.00

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REV'D	DESCRIPTION	R.O.E.	DATE	C.T.O.	DATE

DATE 03/19/2019
PETE M. BALAK, RE
DESIGNED
DATE 03/19/2019
PETE M. BALAK, RE
DRAWN BY
DATE 03/19/2019
HAZIM BOUKHRAIS, PE
CHECKED

REGISTERED CIVIL ENGINEER — NO. 45833 — STATE OF CALIFORNIA

PREPARED BY
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532 Fax: (805) 966-9801
HAZIM BOUKHRAIS, PE 03/19/2019
REGISTERED ENGINEER DATE

CITY OF THOUSAND OAKS
REVIEWED BY:
PROJECT ENGINEER DATE
REVIEWED BY:
ENGINEERING DIVISION MANAGER DATE
APPROVED BY:
CLIFFORD G. TRILEY, CITY ENGINEER DATE

CITY OF THOUSAND OAKS

CI 5527 CONEJO CANYONS BRIDGE AT HCTP

PLAN AND PROFILE

CITY OF THOUSAND OAKS DWG. 19-02A

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CBC 1705.2 & 1705.12.1
REQUIRED SPECIAL INSPECTION OF HIGH-STRENGTH BOLTING AND STRUCTURAL STEEL CONSTRUCTION

TYPE	REFERENCED STANDARD AISC 360	REFERENCED STANDARD AISC 341	CBC REFERENCE	APPLICABLE TO WORK IN THIS PLAN SET
High-strength anchors, bolts, nuts and washers:	Tables N5.6-1, N5.6-2 & N5.6-3	Tables J7-1, J7-2 & J7-3	1705.2 & 1705.12.1	X
Structural Steel Field Welding (100% weld testing is required by the contractor)	Tables N5.4-1, N5.4-2 & N5.4-3	Tables J6-1, J6-2 & J67-3	1705.2 & 1705.12.1	X

CBC TABLE 1705.3
REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD	IBC REFERENCE	APPLICABLE TO WORK IN THIS PLAN SET
1. Inspect reinforcement, including prestressing tendons, and verify placement.	-	X	ACI 318: Ch. 20,25.2, 25.3, 26.5.1-26.5.3	1908.4	X
2. Reinforcing bar welding:	-	-			
a. Verify weldability of reinforcement bars other than ASTM A706;	-	X	AWS D1.4 & ACI 318: 26.5.4	-	
b. Inspect single-pass fillet welds, maximum 5/16" and;	-	X		-	
c. Inspect all other welds.	X			-	
3. Inspect anchors cast in concrete.	-	X	ACI 318: 17.8.2	-	X
4. Inspection of anchors post-installed in hardened concrete members.	-	-		-	
a. Adhesive anchors installed in horizontally or upwardly inclined orientations to resist sustained tension loads.	X	-	ACI 318: 17.8.2.4	-	X
b. Mechanical anchors and adhesive anchors not defined in 4.a.	-	X	ACI 318: 17.8.2	-	X
5. Verifying use of required design mix.	-	X	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3	X
6. Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	-	ASTM C 172 ASTM C 31 ACI 318: 26.4.5, 26.12	1908.10	X
7. Inspect concrete and shotcrete placement for proper application techniques.	X	-	ACI 318: 26.4.5	1908.6, 1908.7, 1908.8	X
8. Verify maintenance of specified curing temperature and techniques.	-	X	ACI 318: 26.4.7-26.4.9	1908.9	X
9. Inspect prestressed concrete for:					
a. Application of prestressing forces.	X	-	ACI 318: 26.9.2.1	-	-
b. Grouting of bonded prestressing tendons.	X	-	ACI 318: 26.9.2.3		
10. Inspect erection of precast concrete members.	-	X	ACI 318: Ch. 26.8	-	-
11. Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.	-	X	ACI 318: 26.10.2	-	X
12. Inspect formwork for shape, location and dimensions of the concrete member being formed.	-	X	ACI 318: 26.10.1(b)	-	X

EXEMPT FROM SPECIAL INSPECTION:
Concrete footings that support walls of buildings <=3 stories, supported on earth and design f'c is <= 2,500 psi, per CBC 1705.3.2.3.
Concrete Patios, Driveways and Sidewalks on grade per CBC 1705.3.2.5

CBC TABLE 1705.6
REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	APPLICABLE TO WORK IN THIS PLAN SET
1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.	X	-	X
2. Verify excavations are extended to proper depth and have reached proper material.	-	X	X
3. Perform classification and testing of compacted fill materials.	-	X	X
4. Verify use of proper materials, densities, and lift thicknesses during placement and compaction of compacted fill.	X	-	X
5. Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly.	-	X	X

CBC TABLE 1705.8
REQUIRED SPECIAL INSPECTIONS AND TESTS OF CAST-IN-PLACE DEEP FOUNDATION ELEMENTS

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODICALLY SPECIAL INSPECTION	APPLICABLE TO WORK IN THIS PLAN SET
1. Inspect drilling operations and maintain complete and accurate records for each element.	X	-	X
2. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end-bearing strata capacity. Record concrete or grout volumes.	X	-	X
3. For concrete elements perform tests and additional special inspections in accordance with Section 1705.3.	-	-	X

GENERAL BRIDGE STRUCTURE NOTES & SPECIFICATIONS

1. CONSTRUCTION SHALL CONFORM TO THESE PLANS AND SPECIFICATIONS, THE 2016 CALIFORNIA BUILDING CODE (CBC), THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (2012 EDITION, "GREENBOOK"), AND THE CALTRANS 2015 STANDARD SPECIFICATIONS.
2. WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE STATE OF CALIFORNIA CONSTRUCTION SAFETY ORDERS (CAL-OSHA).
3. FOUNDATION DESIGN IS BASED ON THE RECOMMENDATIONS OF THE REPORT OF GEOTECHNICAL ENGINEERING REPORT FOR HILL CANYON TREATMENT PLANT SECONDARY ACCESS BRIDGE, PREPARED BY TWINING INC., DATED JANUARY 2019 AND ANY UPDATES.
4. A COPY OF THE APPROVED PROJECT PLANS, SPECIFICATIONS, GEOTECHNICAL REPORT AND APPLICABLE SUPPLEMENTAL/UPDATE DOCUMENTS SHALL BE AVAILABLE AT THE JOB SITE.
5. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, AND SITE CONDITIONS BEFORE STARTING WORK AND SHALL IMMEDIATELY NOTIFY THE COUNTY OF ANY DISCREPANCIES.
6. CONSTRUCTION SHALL BE AS INDICATED IN THE APPLICABLE TYPICAL DETAILS AND GENERAL NOTES UNLESS OTHERWISE NOTED. TYPICAL DETAILS ARE MEANT TO APPLY ALTHOUGH THEY MAY NOT BE REFERENCED AT SPECIFIC LOCATIONS ON THE CONSTRUCTION DRAWINGS. NOTES AND DETAILS ON THE DRAWINGS SHALL GOVERN OVER TYPICAL DETAILS AND GENERAL NOTES WHERE CONFLICT MAY OCCUR.
7. THE GENERAL CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT AND/OR APPROPRIATE UTILITY AGENCIES TO VERIFY AND LOCATE ALL EXISTING UNDERGROUND UTILITIES BEFORE COMMENCING ANY EXCAVATION.
8. TEMPORARY CUTS SHALL NOT EXCEED SLOPES RECOMMENDED IN THE SOILS REPORT NOR THOSE SHOWN ON THE PLANS.
9. ALL FOUNDATION EXCAVATIONS SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF CONCRETE OR REINFORCING STEEL.

METAL HARDWARE SPECIFICATIONS

1. ALL MACHINE BOLTS, LAG SCREWS, ANCHOR BOLTS, METAL EMBEDS, WASHERS, AND OTHER FABRICATED FASTENERS SHALL BE TYPE 316 STAINLESS STEEL. THE CONTRACTOR SHALL SUBMIT MATERIAL CERTIFICATIONS FOR ALL STRUCTURAL METAL HARDWARE.
2. STANDARD CUT STAINLESS STEEL LOCK WASHERS SHALL BE INSTALLED AT EACH BOLT AND LAG SCREW, UNLESS NOTED OTHERWISE.
3. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL FABRICATED FASTENERS FOR REVIEW AND APPROVAL BY THE ENGINEER A MINIMUM OF 14 DAYS PRIOR TO CONSTRUCTION.
4. STRUCTURAL WELDING SHALL CONFORM TO AWS D1.6.
5. ALL WELDERS SHALL BE CERTIFIED.
6. ANCHOR BOLTS FOR THE BRIDGE SHALL BE CAST INTO THE CONCRETE. WHERE SPECIFICALLY PERMITTED BY THE ENGINEER, ADHESIVE MAY BE USED TO SECURE ANCHORS SUPPORTING MINOR LOADS. SIMPSON SET XP EPOXY OR EQUIVALENT SHALL BE USED IF APPROVED BY THE ENGINEER.

REINFORCING STEEL SPECIFICATIONS

1. REINFORCING STEEL SHALL BE GRADE 60 PER ASTM A615 OR A706.
2. ALL REINFORCEMENT SHALL BE IN CONFORMANCE WITH THE REQUIREMENTS OF ASTM A615. REINFORCING STEEL SHALL BE CLEAN AND FREE FROM DELETERIOUS COATINGS OR DAMAGE THAT WOULD INHIBIT REINFORCING BOND. DAMAGED BARS WILL BE REJECTED.
3. REINFORCEMENT SHALL BE SECURED AGAINST DISPLACEMENT PRIOR TO PLACEMENT OF CONCRETE BY WIRE POSITIONERS OR OTHER SUITABLE DEVICES AT INTERVALS NOT EXCEEDING 200 BAR DIAMETERS.
4. MINIMUM LAP SPLICE SHALL BE PER THE LAP SPLICE SCHEDULE HEREON.
5. THE LOCATION OF THE VERTICAL REINFORCEMENT AS SHOWN IN THE DETAILS IS TO BE MEASURED FROM THE INDICATED SURFACE TO THE NEAREST SURFACE OF THE REINFORCING BAR (CLEAR DISTANCE).
6. HOOKS SHALL BE STANDARD HOOKS PER ACI 318, SECTION 7.1 UNLESS DETAILED OTHERWISE.

PREFABRICATED METAL BRIDGE

1. PREFABRICATED METAL BRIDGE SHALL BE CONSTRUCTED AT THE SECONDARY ACCESS TO THE TREATMENT PLANT FROM HILL CANYON ROAD. CONTRACTOR SHALL COORDINATE WITH THE PROJECT OWNER, ENGINEER, AND WITH THE METAL BRIDGE PREFABRICATOR, TO HAVE THE BRIDGE PREFABRICATED, DELIVERED TO THE SITE AND SET IN PLACE AND COMPLETED.
2. THE PREFABRICATED BRIDGE SHALL BE MADE OF SELF WEATHERING STEEL, ASTM A588 OR EQUIVALENT. THE BRIDGE SHALL BE DESIGNED TO THE AASHTO STANDARDS AND SUPPORT HL93 VEHICLE LOADING AND 95 PSF PEDESTRIAN LOADING. BRIDGE SHALL BE PRATT TRUSS CONFIGURATION OR APPROVED EQUIVALENT WITH ABOVE DECK VEHICLE, PEDESTRIAN AND BICYCLE BARRIERS. POSTED VEHICLE SPEED IS 20 MPH. THE WEST END OF THE BRIDGE SHALL BE THE FIXED END OF THE BRIDGE.
3. ONCE THE PREFABRICATED BRIDGE IS DELIVERED TO THE SITE THE CONTRACTOR SHALL PROTECT THE BRIDGE FROM DAMAGE THROUGHOUT THE ENTIRE CONSTRUCTION PERIOD. ANY DAMAGE CAUSED TO THE BRIDGE SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE AS DIRECTED BY THE ENGINEER.
4. THE PREFABRICATED BRIDGE SHALL NOT BE ERECTED ON THE BRIDGE ABUTMENTS UNTIL ALL CONCRETE SUPPORTS HAVE BEEN ADEQUATELY CURED. CONTRACTOR MAY PREPARE ADDITIONAL CONCRETE TEST CYLINDERS DURING CONSTRUCTION FOR USE IN TESTING THE STRENGTH OF THE CONCRETE AT 14-DAYS. IF THE 14-DAY CYLINDERS DEMONSTRATE THAT THE CONCRETE HAS ACHIEVED A MINIMUM OF 3,000 POUNDS PER SQUARE INCH COMPRESSIVE STRENGTH (AT 14 DAYS), AND RECEIVES APPROVAL FROM THE ENGINEER, THE CONTRACTOR MAY CAREFULLY SET THE BRIDGE ON THE ABUTMENTS PRIOR TO THE 28-DAY STRENGTH TEST RESULTS.
5. PREFABRICATED METAL BRIDGE SHALL BE CONSTRUCTED AT THE BRIDGE LOCATION AS INDICATED ON THE PROJECT PLANS. THE CLEAR DISTANCE BETWEEN BACK OF SEAT WALL FACE TO BACK OF SEAT WALL FACE IS 140' AND THE PREFABRICATED BRIDGE SHALL BE DESIGNED TO ACCOMMODATE THAT DISTANCE, NOMINALLY 140'. ABUTMENT SEATS SHALL BE 30" MINIMUM DEEP. THE CLEAR TRAVEL-WAY WIDTH OF THE BRIDGE SHALL BE A MINIMUM OF 12' WIDE. THE BRIDGE DECK SHALL SLOPE DOWN FROM WEST TO EAST AT 4%. THE PREFABRICATED BRIDGE DESIGN SHALL INCLUDE THE WEIGHT OF TWO UTILITY PIPES WITH A TOTAL ESTIMATED WEIGHT OF 200 PLF FOR THE LENGTH OF THE BRIDGE.
6. PREFABRICATED BRIDGE SHALL BE A TRUSS TYPE BRIDGE AND HAVE A METAL PAN TO RECEIVE A REINFORCED CONCRETE DECK. THE PREFABRICATED BRIDGE SHALL HAVE HAND RAILS FOR PEDESTRIANS. TOP RAILING SHALL BE 54" ABOVE THE SURFACE OF THE BRIDGE DECK. BRIDGE SHALL HAVE VEHICLE GUARDRAILS ALONG ITS LENGTH. GUARD RAILS SHALL EXTEND A MINIMUM OF 10' BEYOND THE ENDS OF THE BRIDGE AND CONFORM TO THE ADJOINING ROADWAY. SEE PLANS FOR ADDITIONAL INFORMATION.
7. THE PREFABRICATED BRIDGE SHALL BE DELIVERED TO THE PROJECT SITE. THE CONTRACTOR SHALL OFF LOAD THE BRIDGE AND SAFELY STORE ON-SITE UNTIL THE ABUTMENTS ARE READY TO RECEIVE THE BRIDGE. ASSEMBLY OF THE BRIDGE, IF ANY, SHALL BE THE RESPONSIBILITY OF THE BRIDGE PREFABRICATOR SUCH THAT THE GENERAL CONTRACTOR MAY SET THE ENTIRE LENGTH OF THE BRIDGE IN ONE PICK. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE A CRANE TO UNLOAD THE BRIDGE AT THE SITE AND TO SET THE BRIDGE ON THE ABUTMENTS.
8. ANCHORS, BOLTS AND OTHER MISCELLANEOUS HARDWARE SHALL BE STAINLESS STEEL.
9. AFTER THE BRIDGE HAS BEEN COMPLETED, THE CONTRACTOR SHALL INSTALL AN ELASTIC COMPRESSION SEAL AT EACH END OF THE BRIDGE BETWEEN THE STEEL BRIDGE DECK END PLATE AND THE INSIDE FACE OF THE ABUTMENT SEAT WALL. EXPANSION JOINT SHALL BE COMPRESSION OR J SERIES BY D.S. BROWN OR EQUIVALENT. BRIDGE BEARINGS AT THE EAST END SHALL BE STEEL IMPREGNATED ELASTOMERIC AS DESIGNED BY THE BRIDGE PREFABRICATOR.

GENERAL CONCRETE NOTES & SPECIFICATIONS

1. STRUCTURAL CONCRETE COMPRESSIVE STRENGTH SHALL BE 4,000 PSI BASED ON 28 DAY STRENGTHS. MIX DESIGN SHALL BE PROVIDED TO THE ENGINEER AT LEAST 14-DAYS PRIOR TO BATCHING. BATCHING SHALL BE SUBJECT TO REVIEW AND APPROVAL OF THE MIX DESIGN BY THE ENGINEER.
2. PORTLAND CEMENT SHALL CONFORM TO ASTM C150, TYPE II, LOW ALKALI. CEMENT MATERIALS SHALL BE FROM A SINGLE SOURCE THROUGHOUT THE CONSTRUCTION OF THE ENTIRE STRUCTURE. CONCRETE SHALL HAVE A MAXIMUM WATER / CEMENT RATIO OF 0.40 WITH A MAXIMUM SLUMP OF 8-INCHES.
3. THE CONCRETE MIX SHALL INCLUDE 25% CLASS F FLYASH (BY WEIGHT) CONFORMING TO ASTM C618.
4. THE MIX SHALL INCLUDE A HIGH RANGE WATER REDUCING ADMIXTURE CONFORMING TO ASTM C494, TYPE A AND ADDED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS. THE ADMIXTURE SHALL BE EUCON 1037 BY EUCLID CHEMICAL COMPANY, OR ADVA 100 SUPERPLASTICIZER BY GRACE CONSTRUCTION PRODUCTS, OR POZZOLITH 322N BY MASTER BUILDERS OR SIKAMENT 300 BY SIKA CORPORATION, OR APPROVED EQUAL.
5. A CORROSION INHIBITOR ADMIXTURE SHALL BE ADDED TO THE MIX AT THE RATE OF 3 GALLONS PER CUBIC YARD IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS FOR USE IN A SEVERE ENVIRONMENT. CORROSION ADMIXTURE SHALL BE EUCON CIA BY EUCLID CHEMICAL COMPANY, OR DCI BY W.R. GRACE CONSTRUCTION PRODUCTS, OR SIKA CNI BY SIKA CORPORATION, OR APPROVED EQUAL.
6. A SET RETARDER MAY BE USED TO COUNTERACT THE ACCELERATION EFFECTS OF THE CORROSION INHIBITOR. THE CONCRETE SUPPLIER SHALL PERFORM TRIAL BATCHES TO DETERMINE THE PROPER AMOUNT OF SET RETARDER TO USE FOR THIS PROJECT PRIOR TO BATCHING FOR USE ON SITE. RESULTS SHALL BE PROVIDED TO THE ENGINEER PRIOR TO BATCHING.
7. FLATWORK CONCRETE SHALL HAVE AN EVAPORATION RETARDANT THAT IS LIBERALLY APPLIED TO THE WALKING SURFACE OF THE WET CONCRETE. RETARDANT SHALL BE EUCOBAR BY EUCLID CHEMICAL COMPANY, OR SEALTIGHT EVAPRE COMPOUND BY W.R. MEADOWS OR APPROVED EQUAL.
8. FLATWORK CONCRETE SHALL HAVE SYNTHETIC FIBRILLATED POLYPROPYLENE FIBERS APPROXIMATELY 1.5 INCHES LONG MEETING THE REQUIREMENTS OF ASTM C 1116. FIBERS SHALL BE ADDED TO THE MIX AT THE RATE OF 3 POUNDS PER CUBIC YARD IN ACCORDANCE TO THE MANUFACTURERS RECOMMENDATIONS. FIBERS SHALL BE FIBERSTRAND F BY EUCLID CHEMICAL COMPANY, OR GRACE FIBERS BY GRACE CONSTRUCTION PRODUCTS, OR SIKA FIBER PPF BY SIKA CORPORATION, OR APPROVED EQUAL.
9. AIR ENTRAINING ADMIXTURES OR ANY ADMIXTURE CONTAINING CHLORIDES SHALL NOT BE ALLOWED.
10. AGGREGATE AND SAND SHALL BE NON-REACTIVE. TEST RESULTS FOR THE AGGREGATE SHALL BE PROVIDED ON ASTM STANDARD TESTS C289, C1260 AND C1293 AND EVALUATED IN ACCORDANCE WITH APPENDIX A-1 OF ASTM C33. ANNUAL RESULTS SHALL BE PROVIDED FOR THE PAST 3 YEARS OF OPERATION AS WELL AS CURRENT RESULTS THAT ARE LESS THAN 10 MONTHS OLD. TEST RESULTS SHALL BE STAMPED BY A REGISTERED ENGINEER AND INCLUDE THE INFORMATION AS DESCRIBED IN THE APPENDIX OF ASTM C33. AT THE DISCRETION OF THE PROJECT ENGINEER, REACTIVE OR POTENTIALLY REACTIVE AGGREGATE SOURCES WILL BE REJECTED.
11. COURSE AGGREGATE SHALL BE OBTAINED FROM RELIABLE CALIFORNIA SOURCES CONFORMING TO THE ABOVE. FINE AGGREGATE SHALL BE FROM THE COURSE AGGREGATE SOURCES. AGGREGATES FROM ANY SOURCES MAY NOT BE ACCEPTED UNLESS AGGREGATE IS ADEQUATELY DEMONSTRATED TO BE INNOCUOUS. AGGREGATE GRADATION SHALL CONFORM TO TYPE C AS DEFINED IN TABLE 201-1.3.2(A) IN THE GREENBOOK. THE COMBINED GRADATION SHALL BE PROVIDED WITH THE MIX DESIGN TO THE ENGINEER FOR REVIEW AND APPROVAL. AGGREGATE AND SAND SHALL BE FULLY SATURATED SURFACE DRY (SSD) WHEN BATCHING.
12. ALL WOOD USED IN FORMING THE CONCRETE SHALL CONFORM TO THE VOLUNTARY PRODUCT STANDARD PS 1-07 BY THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (SEE V345 PUBLICATION FROM APA). PLYWOOD SHALL BE CERTIFIED BY APA (THE ENGINEERED WOOD ASSOCIATION) AS EXTERIOR GLUE WITH B-B OR B-C SURFACES WITH CLASS 1 MATERIALS WITH A HIGH DENSITY OVERLAY (HDO) FOR USE IN THE FORMING OF CAST-IN-PLACE CONCRETE. THE HDO COATED PLYWOOD IS COMMONLY KNOWN AS PLYFORM CLASS 1 WITH A PHENOLIC SURFACE. A RELEASE AGENT SHALL BE APPLIED TO THE SURFACE OF THE FORM PRIOR TO PLACEMENT OF CONCRETE. CARE SHOULD BE TAKEN TO NOT COAT THE REINFORCING STEEL OR ANY EMBEDMENTS. STANDARD GRADES OF PLYWOOD ARE ACCEPTABLE WHERE FORM LINERS ARE USED.
13. ALL ANCHOR BOLTS, PLATES, INSERTS, PIPES, BASE PLATES, AND MISCELLANEOUS METAL WORK SHALL BE STAINLESS STEEL (316). ITEMS SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. ITEMS SHALL BE SET AND SECURED IN THE FORMS AND REVIEWED BY THE ENGINEER BEFORE ANY CONCRETE IS PLACED. ACCURACY OF THE SIZE, LOCATION, SPACING, CLEAR DISTANCE, AND QUANTITY IS THE RESPONSIBILITY OF THE CONTRACTOR.
14. THE SURFACE OF ALL METALWORK OR OTHER ITEMS TO BE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY CLEANED OF ALL DIRT, GREASE, LOOSE SCALE, CEMENT AND OTHER FOREIGN MATTER IMMEDIATELY BEFORE THE CONCRETE IS PLACED.
15. TRANSIT MIXED CONCRETE SHALL BE PLACED WITHIN 90 MINUTES FROM THE TIME WATER IS FIRST ADDED AND PRIOR TO 300 REVOLUTIONS OF THE MIXER. IF THE TEMPERATURE OF THE CONCRETE IS ABOVE 85 DEGREES FAHRENHEIT, CONCRETE SHALL BE PLACED WITHIN 60 MINUTES FROM THE TIME WATER IS FIRST ADDED AND IN ACCORDANCE WITH ACI 305. IF THE TEMPERATURE OF THE CONCRETE IS BELOW 40 DEGREES FAHRENHEIT, CONCRETE SHALL BE PLACED IN ACCORDANCE WITH ACI 306 FOR COLD WEATHER PLACEMENT.
16. CONCRETE PLACEMENT SHALL OCCUR IN 12-INCH LIFTS. LIFTS OF UP TO 24-INCHES MAY BE MADE PROVIDED ADEQUATE CONSOLIDATION INTO THE LAYER BELOW IS ACCOMPLISHED. LIFTS UP TO 48-INCHES MAY BE MADE PROVIDED THE CONCRETE MIX, FORMWORK, AND WALL HAVE BEEN DESIGNED TO ACCOMMODATE IT. FORMWORK SHALL CONFORM TO ACI 347.
17. THE CONSTRUCTION OF CONCRETE PILES, CONCRETE SHALL NOT BE PERMITTED TO FREE FALL. A 5" DIAMETER TREMIE SHALL BE USED FOR CONCRETE PILE CONSTRUCTION AND CONSTRUCTION COMPLY WITH THE REQUIREMENTS OF ACI 304.5.4.1
18. CONTRACTOR SHALL AVOID SEGREGATION OF MATERIALS DURING GENERAL CONCRETE PLACEMENT. CONCRETE SHALL BE DEPOSITED AS NEAR TO ITS FINAL POSITION AS PRACTICABLE. VIBRATORS SHALL NOT BE USED TO SIGNIFICANTLY SHIFT THE LOCATION OF THE PLACED CONCRETE. CONCRETE SHALL NOT BE PERMITTED TO FREE FALL IN EXCESS OF 4-FEET WITHOUT THE USE OF A TREMIE IN ACCORDANCE WITH ACI 304.5.4.1.
19. PILES SHALL BE PLACED IN DRILLED HOLES TO THE REQUIRED DEPTH. PILES AND HOLES (CIDH) SHALL BE PLUMB AND IN ACCORDANCE WITH THE ALIGNMENT AND SPACING PER THE PROJECT PLANS AND TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER. FILL THE CIDH EXCAVATION FROM THE BOTTOM OF THE HOLE TO THE TOP OF PILE ELEVATION (AKA BOTTOM OF THE PILE CAP, SEE PLANS), WITH STRUCTURAL CONCRETE. ALL CONCRETE SHALL BE ADEQUATELY CURED PRIOR TO BACKFILLING OR PLACEMENT OF ANY LOADS.
20. A CURING COMPOUND, CONFORMING TO ASTM C 309 CLASS B (RESIN TYPE ONLY), SHALL BE APPLIED TO THE CONCRETE SURFACE. THE LOSS OF WATER SHALL MEET THE REQUIREMENTS OF THE SPECIFICATION (C309). THE CURING COMPOUND SHALL BE TYPE 1-D, CLEAR OR TRANSLUCENT WITH FUGITIVE DYE, UNLESS NOTED OTHERWISE. CONTRACTOR SHALL PROVIDE ALL COMPOUNDS DELIVERED READY-MIXED IN SEALED CONTAINERS, LABELED IN ACCORDANCE WITH ASTM C 309, AND WITH THE DATE OF MANUFACTURER. WHEN NOT IN USE, CONTAINERS OF CURING COMPOUND SHALL REMAIN AIR-TIGHT. CURING COMPOUND SHALL BE KUREZ DR VOX BY EUCLID CHEMICAL COMPANY OR HYDROCURE 1WS BY W.R. MEADOWS, OR APPROVED EQUAL.
21. IN ADDITION TO THE CURING COMPOUND, THE CONCRETE SHALL BE MOIST CURED. ONCE THE CONCRETE HAS SET, IT SHALL BE KEPT MOIST FOR AT LEAST 7 DAYS. ONLY PURE POTABLE WATER SHALL BE USED FOR CURING (RECLAIMED OR NON-POTABLE WATER IS NOT ALLOWED). CONCRETE IN FORMS SHALL BE KEPT MOIST 24 HOURS A DAY BY CONTINUAL SOAKING WITH HAND WATERING OR AN AUTOMATED SPRINKLER SYSTEM. MOIST CURING SHALL ALSO BE FULLY MAINTAINED DURING NON-WORK HOURS INCLUDING NIGHTS, WEEKENDS AND HOLIDAYS. ONCE THE FORMS ARE STRIPPED, EXPOSED CONCRETE SHALL BE COVERED WITH HEAVY CARPET THAT IS SOAKED REGULARLY BY HAND OR AN AUTOMATED SYSTEM TO MAINTAIN A MOIST CURE FOR 7 DAYS. POLY COATED BURLAP (BURLENE) IS NOT CONSIDERED AS HEAVY CARPET AND WILL NOT BE ALLOWED. DURING THE 7 DAY PERIOD, DRY OR IMPROPERLY CURED CONCRETE SHALL BE SUBJECT TO REJECTION, SAWCUT, REMOVAL AND COMPLETE REPLACEMENT AT THE SOLE EXPENSE OF THE CONTRACTOR. POTABLE WATER FOR CURING IS THE RESPONSIBILITY OF THE CONTRACTOR. LOADS SHALL NOT BE PLACED UNTIL CONCRETE IS ADEQUATELY CURED.
22. AS SOON AS FORMS ARE REMOVED, ALL EXPOSED SURFACES SHALL BE CAREFULLY EXAMINED, AND ANY IRREGULARITIES SHALL BE IMMEDIATELY RUBBED OR GROUND IN A SATISFACTORY MANNER IN ORDER TO PROVIDE A SMOOTH, UNIFORM AND CONTINUOUS SURFACE. NO REPAIRS OR SACKING OF CONCRETE SHALL BE MADE UNTIL AFTER INSPECTION BY THE ENGINEER AND THEN ONLY IN ACCORDANCE WITH THEIR DIRECTION.

REINFORCING BAR LAP SPLICE SCHEDULE (in)

BAR SIZE (UNCOATED)	CONCRETE** f'c (psi) 4000
#4	25
#5	31
#6	37
#7	54
#8	62
#9	70

**PER ACI 318-14 25.4 & 25.5

BRIDGE DESIGN CRITERIA

BRIDGE DESIGN: VEHICLE BRIDGE: AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, LRFD

PEDESTRIAN/UTILITY BRIDGE: LRFD GUIDE SPECIFICATION FOR THE DESIGN OF PEDESTRIAN BRIDGES, 2015 INTERIM REVISIONS, 2016 CBC

WIND DESIGN DATA: CBC 1603.1.4

BASIC WIND SPEED	110 mph
WIND RISK CATEGORY	II
WIND IMPORTANCE FACTOR	1.00
WIND EXPOSURE CATEGORY	C
INTERNAL PRESSURE COEFF.	N/A
COMPONENTS AND CLADDING WIND PRESSURE	N/A
ADDITIONAL UPLIFT DECK LOADING PER ARTICLE 3.8.2	

EARTHQUAKE DESIGN DATA: CBC 1603.1.5, USGS & AASHTO

SEISMIC IMPORTANCE FACTOR	1.00
RISK CATEGORY	II
SITE CLASS	B
SEISMIC DESIGN CATEGORY	D OR E
USGS SPECTRAL RESPONSE ACCELERATIONS	S_s = 1.814, S_1 = 0.666, S_{DS} = 1.209, S_{D1} = 0.444, P_{GAM} = 0.606,
SEISMIC FORCE RESISTING SYSTEM	CANTILEVERED COLUMN, REINF. CONCRETE WITH SPECIAL DETAILING
SEISMIC RESPONSE COEFFICIENT	0.56 W, R=3 (LRFD)
RESPONSE MODIFICATION FACTOR	0.8 (ABUTMENT CONNECTION)
ANALYSIS PROCEDURE USED	EQUIVALENT LATERAL FORCE

LIVE LOADING: VEHICLE BRIDGE: HL93
PEDESTRIAN LOADS: 95 PSF LIVE LOAD
UTILITIES: (2) 6" WATER, (1) 8" WATER

HYDRAULIC FORCE DESIGN CRITERIA: ANALYSES BY STANTEC – HECRAS MODELING

BRIDGE OFF HILL CANYON ROAD: VEHICLE BRIDGE –
BASE FLOOD ELEVATION (MAXIMUM) = 267.37' (APPROXIMATE WATER SURFACE ELEVATION)
TOP OF DECK ELEVATION = 279.4 (AT EAST END LOL), FLOW LINE BELOW ELEVATION 250 ±

REINFORCED CONCRETE: fy= 60,000 PSI, f'c = 4,000 PSI, W/C = 0.40 MAX

REINFORCING STEEL: ASTM 615 REINFORCING

ANCHOR ROD: ASTM A240, SURFACE CLEANED FOR ACCEPTABLE BOND

STRUCTURAL STEEL: BRIDGES: ASTM A588 GRADE 50 WITH MISCL SHAPES, CONNECTORS, RAILINGS, ETC.

STATEMENT OF SPECIAL INSPECTIONS – BRIDGE & ACCESS

IN ADDITION TO THE REGULAR INSPECTIONS, THE OWNER SHALL EMPLOY A QUALIFIED SPECIAL INSPECTOR IN ACCORDANCE WITH SECTION 17 OF THE 2016 CALIFORNIA BUILDING CODE TO PERFORM THE FOLLOWING WORK:

CODE SECTION	TYPE OF WORK	DESCRIPTION
1705.3	CONCRETE	SEE CONCRETE SPECIAL INSPECTIONS TABLE 1705.3
1705.6	SOILS	SEE SOILS SPECIAL INSPECTIONS TABLE 1705.6
1705.8	CIP DEEP FOUNDATION	SEE CAST-IN-PLACE DEEP FOUNDATION TABLE 1705.8
1705.2	STRUCTURAL STEEL	SEE STEEL SPECIAL INSPECTIONS REFERENCE 1705.2 & 1705.12.1

DEWATERING AND SEDIMENT CONTROL PLAN

THE CONTRACTOR SHALL HAVE EXPERIENCED PERSONNEL PREPARE A DEWATERING AND SEDIMENT CONTROL PLAN THAT DEFINES THE REQUIRED TREATMENT OF SURFACE AND SUBSURFACE WATERS THAT MAY BE ENCOUNTERED DURING CONSTRUCTION OF THE PROPOSED IMPROVEMENTS. THE PLAN SHALL BE IN CONFORMANCE WITH THE REQUIREMENTS OF THE GOVERNING REGULATORY AGENCIES AND THE PROJECT PERMIT CONDITIONS. PLAN SHALL BE APPROVED PRIOR TO CONSTRUCTION OF IMPROVEMENTS.

CIDH PILE CONSTRUCTION –

DURING THE CONSTRUCTION OF THE BRIDGE FOUNDATIONS INCLUDING THE CAST-IN-DRILLED-HOLE (CIDH) PILES SURFACE WATER SHALL BE PREVENTED FROM ENTERING THE EXCAVATION. IT IS ANTICIPATED THAT GROUNDWATER (SUBSURFACE WATER) MAY BE ENCOUNTERED DURING CONSTRUCTION OF THE BRIDGE FOUNDATION AND PILES. CIDH PILE CONSTRUCTION MAY REQUIRE SPECIAL DRILLING MUDS OR CASING TO HOLD THE HOLE OPEN LONG ENOUGH TO COMPLETE CONSTRUCTION OF THE PILE. DEWATERING OF THE HOLE MAY BE PERFORMED IN ACCORDANCE WITH THE CONTRACTORS DEWATERING AND SEDIMENT CONTROL PLAN (PREPARED BY OTHERS). USE OF A TREMIE MAY ALSO BE REQUIRED FOR CIDH PILE CONSTRUCTION. THE TREMIE SHALL BE LOWERED TO THE BOTTOM OF THE EXCAVATION AND RAISED UP ONLY AS CONCRETE IS BEING PUMPED INTO THE HOLE (MAINTAINING A HEAD PRESSURE), EVENTUALLY FILLING THE HOLE WITH CONCRETE AND EXPELLING ANY WATER IN THE HOLE. CONTRACTOR SHALL ABIDE BY CIDH CONSTRUCTION RECOMMENDATIONS FOUND IN THE PROJECT GEOTECHNICAL REPORT. THE EXPELLED WATER SHALL BE CAPTURED AND/OR CONTAINED AND TREATED IN ACCORDANCE WITH THE APPROVED CONTRACTORS DEWATERING AND SEDIMENT CONTROL PLAN.

PILE CAP AND ABUTMENT CONSTRUCTION –

DURING THE CONSTRUCTION OF THE PILE CAPS AND BRIDGE ABUTMENTS SURFACE WATER SHALL BE PREVENTED FROM ENTERING THE EXCAVATION. IT IS ANTICIPATED THAT GROUND WATER (SUBSURFACE WATER) MAY BE ENCOUNTERED DURING CONSTRUCTION OF THE BRIDGE FOUNDATION ELEMENTS. A SEPARATE SUMP AREA OR PIT MAY BE REQUIRED IN ORDER TO DEWATER THE EXCAVATION. WATER EXPELLED OR DISPLACED DUE TO THE PLACEMENT OF CONCRETE FROM WITHIN THE EXCAVATION SHALL BE CAPTURED AND/OR CONTAINED AND TREATED IN ACCORDANCE WITH THE CONTRACTORS DEWATERING AND SEDIMENT CONTROL PLAN. REINFORCING STEEL AND EMBEDMENTS SHALL BE CLEANED PRIOR TO PLACEMENT OF CONCRETE SO THAT THE BOND TO THE REINFORCING STEEL AND EMBEDMENTS IS NOT INHIBITED DUE TO CONTAMINANTS FROM GROUND OR SURFACE WATERS.

Know what's below. Call before you dig.

100% SUBMITTAL

Know what's below. Call before you dig.
CALL 811
AT LEAST TWO DAYS BEFORE YOU DIG
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

REV.	SYMBOL	DESCRIPTION	R.C.E.	DATE	C.T.O.	DATE

DATE 03/19/2019 PETE SILVIA, PE — DESIGNED
DATE 03/19/2019 EMILIO ROSSI, PE — DRAFTED BY
DATE 03/19/2019 BRET E. FOSTER, PE — CHECKED

REGISTERED PROFESSIONAL ENGINEER — BRET E. FOSTER — NO 48267 — CIVIL — STATE OF CALIFORNIA

PREPARED BY
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532 Fax: (805) 966-9801
BRET E. FOSTER, PE 03/19/2019
REGISTERED ENGINEER DATE

CITY OF THOUSAND OAKS
REVIEWED BY: PROJECT ENGINEER DATE
REVIEWED BY: ENGINEERING DIVISION MANAGER DATE
APPROVED BY: CLIFFORD G. FINLEY, CITY ENGINEER DATE

CITY OF THOUSAND OAKS
CI 5527 CONEJO CANYONS BRIDGE AT HCTP
STRUCTURAL NOTES
CITY OF THOUSAND OAKS DWG. 19-02A
SHEET 5 OF 11

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HILL CANYON TREATMENT PLANT SECONDARY ACCESS ROAD BRIDGE

HYDRAULICS DATA :1:

CONDITION	ELEVATION (FT NAVD)	TOP WIDTH (FT.)	SCOUR VELOCITY	FREEBOARD (MIN)
Q100 = 22,633± CFS	261.33'	163.24'±	7.72' FPS	24"

BRIDGE ABUTMENT FOUNDATION AND PILE DATA TABLE – LRFD DESIGN FORCES

LOCATION	FOUNDATION TYPE	DESIGN LOADING (KIPS)	NOMINAL RESISTANCE (KIPS)		CUT OFF ELEVATION (FT)	DESIGN TIP ELEVATION (FT)	SPECIFIED TIP ELEVATION (FT)
			COMPRESSION	TENSION			
WEST ABUT EAST ABUT	SPREAD FOOTING CIDH 24" X 50'	332 TOTAL 136	450 TOT CAPACITY 231	328 CAP 162	NA +267.90	NA +222 (a), +235 (b)	NA +222

1. DESIGN TIP ELEVATIONS ARE CONTROLLED BY (a) COMPRESSION, (b) LATERAL LOAD, RESPECTIVELY.
2. PILE MATERIALS SHALL CONFORM TO THE REQUIREMENTS OF THE CIDH PILES SPECIFIED HEREIN.
3. THE DESIGN AND SPECIFIED TIP ELEVATIONS ARE PROVIDED FOR INFORMATION ONLY FOR BIDDING PURPOSES. THE ACTUAL TIP ELEVATION OF THE PRODUCTION PILES REQUIRED TO ACHIEVE THE REQUIRED NOMINAL RESISTANCE IN COMPRESSION SHALL BE ESTABLISHED BY THE CONTRACTOR AND IN ACCORDANCE WITH DIRECTION AND APPROVAL OF THE GEOTECHNICAL ENGINEER.
4. THE SPECIFIED 24" CIDH PILES SHALL CONFORM TO THE REQUIREMENTS OF THE GEOTECHNICAL ENGINEER AND THE CALTRANS CONSTRUCTION SPECIFICATIONS AND TESTING. AT PILES SHALL BE EQUIPPED WITH AT LEAST TWO TESTING TUBES AND SHALL ALSO BE IN ACCORDANCE WITH MTS-2012 3-1, 3-7. TESTING INCLUDES GAMMA-GAMMA LOGGING (GGL) AND CROSS-HOLE-SONIC LOGGING (CSL) TESTING, SEE MTS-2012 ATTACHMENTS 3 AND 4.
5. IN THE EVENT A PILE FAILS THE GGL OR CSL TESTING THE CONTRACTOR SHALL PREPARE A MITIGATION PLAN OF PILE REPLACEMENT TO BE REVIEWED AND APPROVED BY THE GEOTECHNICAL ENGINEER, REFERENCE BCM 130-12.0.
6. POSSIBLY APPLICABLE CALTRANS PLANS INCLUDE TO FOLLOWING:

2010 CALTRANS STANDARD PLANS, 2015 BRIDGE STD DETAILS, MEMO TO DESIGNERS

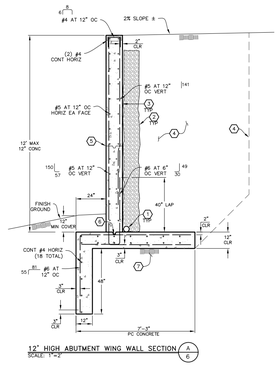
A10-6-E	LEGENDS
A62-A	EXCAVATION AND BACKFILL – MISCELLANEOUS DETAILS
A62-B	LIMITS OF PAYMENT FOR EXCAVATION AND BACKFILL – BRIDGE SURCHARGE
A62-C	LIMITS OF PAYMENT FOR EXCAVATION AND BACKFILL – BRIDGE
B0-1	BRIDGE DETAILS
B0-2	BRIDGE DETAILS
B2-3	24" CAST-IN-DRILLED-HOLE CONCRETE PILE
B2-8	PILE DETAILS CLASS 90 AND CLASS 140
B3-1	PILE DETAILS CLASS 200
X53-110	STRUCTURE APPROACH DRAINAGE DETAILS
MTD 3-7	PILE DESIGN DATA FORM (GGL) ATTACHMENT 3
MTD A2-1	CIDH PILE LAYOUT
MTD A2-2	CIDH INSPECTION PIPE LAYOUT
T51-T59	EROSION CONTROL DETAILS

GENERAL NOTES

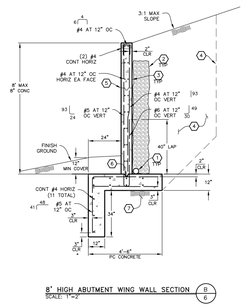
1. CONTRACTOR SHALL HAVE THE SOILS ENGINEER PROVIDE SOILS INSPECTION APPROVAL PRIOR TO PLACING REBAR.

WING WALL CONSTRUCTION NOTES

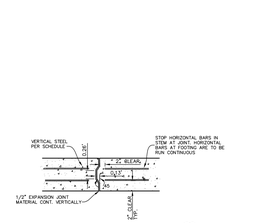
1. CONSTRUCT CONTINUOUS 4-INCH PERFORATED PIPE DRAIN TO DAYLIGHT.
2. CONSTRUCT MINIMUM 12" WIDE FILTER FABRIC WRAPPED GRAVEL COLUMN AT BACK OF WALL TO WITHIN 12" OF FINISH SURFACE BEHIND WALL.
3. APPLY CONTINUOUS WATERPROOFING AT BACK OF WALL.
4. CONSTRUCT GRANULAR NON-EXPANSIVE BACKFILL COMPACTED TO A MINIMUM 95% RELATIVE COMPACTION (UNLESS NOTED OTHERWISE) AT A 1:1 SLOPE FROM BOTTOM OF FOOTING OR GRADE BEAM TO A HORIZONTAL DISTANCE NO LESS THAN 60% OF RETAINED SOIL HEIGHT.
5. CONSTRUCT 2x KEYWAY AT CONCRETE CONSTRUCTION JOINTS.
6. OPTIONAL CONSTRUCTION JOINT WITH KEYWAY, MAY BE PLACED MONOLITHIC.
7. OVEREXCAVATE AND RECOMPACT A MINIMUM OF 36" OF SUBGRADE TO 95% COMPACTION. SEE GEOTECHNICAL REPORT FOR ADDITIONAL REQUIREMENTS.



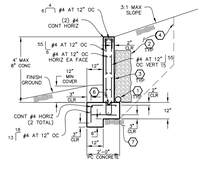
12" HIGH ABUTMENT WING WALL SECTION (A/C)
SCALE: 1"=2



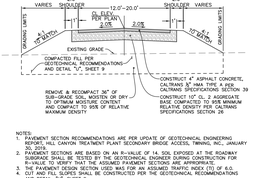
8" HIGH ABUTMENT WING WALL SECTION (B/C)
SCALE: 1"=2



6" HIGH ABUTMENT WING WALL SECTION (C/C)
SCALE: 1"=2



4" HIGH ABUTMENT WING WALL SECTION (D/C)
SCALE: 1"=2



NOTES:
1. PAVEMENT SECTION RECOMMENDATIONS ARE PER UPDATE OF GEOTECHNICAL ENGINEERING REPORT, HILL CANYON TREATMENT PLANT SECONDARY BRIDGE ACCESS, TWINING, INC., JANUARY 15, 2019.
2. PAVEMENT SECTIONS ARE BASED ON AN R-VALUE OF 14. SOIL EXPOSED AT THE ROADWAY SUBGRADE SHALL BE TESTED BY THE GEOTECHNICAL ENGINEER DURING CONSTRUCTION FOR R-VALUE TO VERIFY THAT THE ASSUMED PAVEMENT SECTIONS ARE APPROPRIATE.
3. ALL CURB RETURNS SHALL HAVE A MINIMUM 30' RADIUS UNLESS NOTED OTHERWISE ON P.C.C. OF R.O.
4. CUT AND FILL SLOPES SHALL BE CONSTRUCTED PER THE GEOTECHNICAL RECOMMENDATIONS AND DETAIL, "J", SHEET 9.

ROADWAY TYPICAL SECTION (E/C)
SCALE: N.T.S.

CONCRETE WALL STEM CRACK CONTROL JOINT (A1/C)
SCALE: 1"=1

100% SUBMITTAL

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Know what's below, Call before you dig.
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

REV'D	DATE	BY	DESCRIPTION	R.C.E.	DATE	C.T.O.	DATE

DATE 03/19/2019
TOTO IN BLK. NC
DESIGNED
DATE 03/19/2019
DRAWN
DRAWN BY
DATE 03/19/2019
BRET A. FOSTER, PE
CHECKED

REGISTERED CIVIL ENGINEER — BRET A. FOSTER — NO. 48267 — EXP. 6-30-20

PREPARED BY
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532 Fax: (805) 966-9801
BRET E. FOSTER, PE 03/19/2019
REGISTERED ENGINEER DATE

CITY OF THOUSAND OAKS
REVIEWED BY:
PROJECT ENGINEER DATE
REVIEWED BY:
ENGINEERING DIVISION MANAGER DATE
APPROVED BY:
CLIFFORD G. FINLEY, CITY ENGINEER DATE
CITY OF THOUSAND OAKS DWG. 19-02A

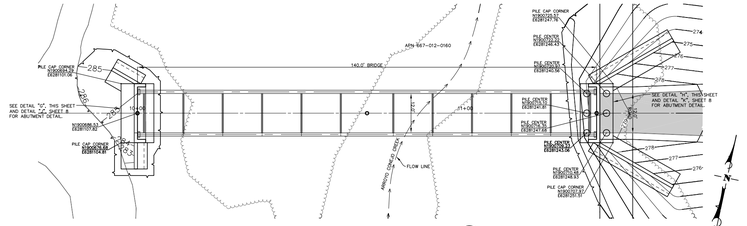
CITY OF THOUSAND OAKS

CI 5527 CONEJO CANYONS BRIDGE AT HCTP

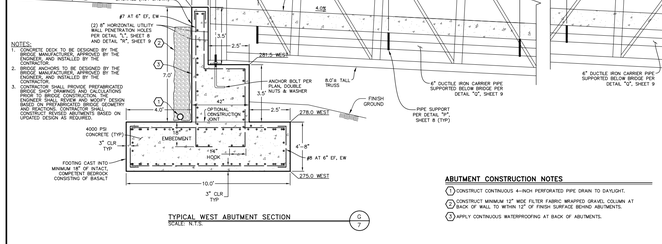
STRUCTURAL NOTES AND DETAILS

SHEET 6 OF 11

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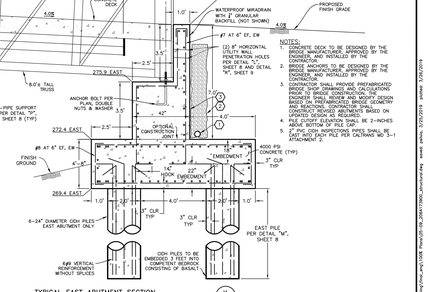
12' WIDE VEHICULAR BRIDGE LAYOUT PLAN VIEW (F / 7)
SCALE: 1"=10'



NOTES:
1. CONCRETE DECK TO BE DESIGNED BY THE BRIDGE MANUFACTURER, APPROVED BY THE ENGINEER, AND INSTALLED BY THE CONTRACTOR.
2. BRIDGE ANCHORS TO BE DESIGNED BY THE BRIDGE MANUFACTURER, APPROVED BY THE ENGINEER, AND INSTALLED BY THE CONTRACTOR.
3. CONTRACTOR SHALL PROVIDE PRETABRICATED BRIDGE SHOP DRAWINGS AND CALCULATIONS PRIOR TO BRIDGE CONSTRUCTION. THE ENGINEER SHALL REVIEW AND MODIFY DESIGN BASED ON PRETABRICATED BRIDGE GEOMETRY AND REACTIONS. CONTRACTOR SHALL CONSTRUCT REVISED ABUTMENTS BASED ON UPDATED DESIGN AS REQUIRED.

TYPICAL WEST ABUTMENT SECTION (G / 7)
SCALE: N.T.S.

ABUTMENT CONSTRUCTION NOTES
1. CONSTRUCT CONTINUOUS 4-INCH PERFORATED PIPE DRAIN TO DAYLIGHT.
2. CONSTRUCT MINIMUM 12" WIDE FILTER FABRIC WRAPPED GRAVEL COLUMN AT BACK OF WALL TO WITHIN 12" OF FINISH SURFACE BEHIND ABUTMENTS.
3. APPLY CONTINUOUS WATERPROOFING AT BACK OF ABUTMENTS.



NOTES:
1. CONCRETE DECK TO BE DESIGNED BY THE BRIDGE MANUFACTURER, APPROVED BY THE ENGINEER, AND INSTALLED BY THE CONTRACTOR.
2. BRIDGE ANCHORS TO BE DESIGNED BY THE BRIDGE MANUFACTURER, APPROVED BY THE ENGINEER, AND INSTALLED BY THE CONTRACTOR.
3. CONTRACTOR SHALL PROVIDE PRETABRICATED BRIDGE SHOP DRAWINGS AND CALCULATIONS PRIOR TO BRIDGE CONSTRUCTION. THE ENGINEER SHALL REVIEW AND MODIFY DESIGN BASED ON PRETABRICATED BRIDGE GEOMETRY AND REACTIONS. CONTRACTOR SHALL CONSTRUCT REVISED ABUTMENTS BASED ON UPDATED DESIGN AS REQUIRED.
4. ALL PILES SHALL EMBED MIN. BE 2-INCHES ABOVE BOTTOM OF PILE CAP.
5. 3" PVC CIDH INSPECTIONS PIPES SHALL BE PLACED EACH PILE PER CALTRANS MD 315 ATTACHMENT 2.

TYPICAL EAST ABUTMENT SECTION (H / 7)
SCALE: N.T.S.

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REV'S/SYMBOL	DESCRIPTION	R.C.E.	DATE	C.T.O.	DATE

DATE 03/19/2019
PETE GILLEA, PE
DESIGNED

DATE 03/19/2019
EMILY NGYEN, PE
DRAFTED BY

DATE 03/19/2019
BRET E. FOSTER, PE
CHECKED

PREPARED BY
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532 Fax: (805) 966-9801

BRET E. FOSTER, PE — 03/19/2019
REGISTERED ENGINEER — DATE

CITY OF THOUSAND OAKS
REVIEWED BY: PROJECT ENGINEER — DATE
REVIEWED BY: ENGINEERING DIVISION MANAGER — DATE
APPROVED BY: CLIFFORD G. TWILEY, CITY ENGINEER — DATE

CITY OF THOUSAND OAKS

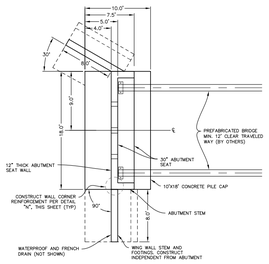
CI 5527 CONEJO CANYONS BRIDGE AT HCTP

STRUCTURAL DETAILS

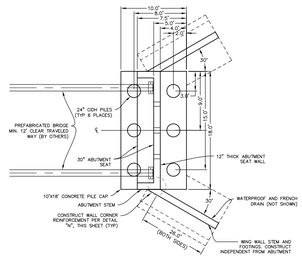
CITY OF THOUSAND OAKS DWG. 19-02A

SHEET 7 OF 11

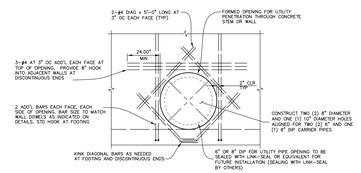
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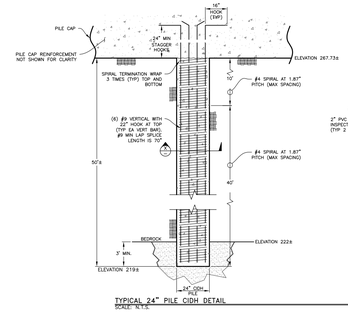
WEST BRIDGE ABUTMENT DETAIL – PLAN VIEW (J/S)
SCALE: N.T.S.



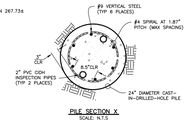
EAST BRIDGE ABUTMENT DETAIL – PLAN VIEW (K/S)
SCALE: N.T.S.



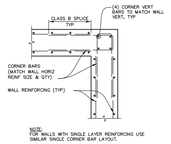
TYPICAL WALL UTILITY PIPE PENETRATION DETAIL (L/S)
SCALE: N.T.S.



TYPICAL 24" PILE CIDH DETAIL (M/S)
SCALE: N.T.S.

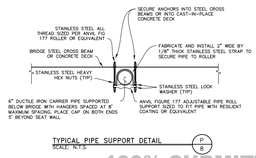


PILE SECTION X
SCALE: N.T.S



NOTE:
FOR WALLS WITH SINGLE LAYER REINFORCING USE SIMILAR SINGLE CORNER BAR LAYOUT.

TYPICAL CONCRETE WALL CORNER BAR DETAILS (N/S)
SCALE: N.T.S.



TYPICAL PIPE SUPPORT DETAIL (P/S)
SCALE: N.T.S.

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REV.	SYMBOL	DESCRIPTION	R.C.E.	DATE	C.T.O.	DATE

DESIGNED — DATE 03/19/2019 — TITE W./B./R./E.
DRAWN — DATE 03/19/2019 — EMILIO ROSS/E.P.
CHECKED BY — DATE 03/19/2019 — BRET E. FOSTER/E.P.
CHECKED — DATE 03/19/2019 — BRET E. FOSTER/E.P.

REGISTERED PROFESSIONAL ENGINEER — BRET L. FOSTER — NO 48287 — CIVIL — STATE OF CALIFORNIA

PREPARED BY
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532 Fax: (805) 966-4801
BRET E. FOSTER, PE — 03/19/2019
REGISTERED ENGINEER — DATE

CITY OF THOUSAND OAKS
REVIEWED BY:
PROJECT ENGINEER — DATE
REVIEWED BY:
ENGINEERING DIVISION MANAGER — DATE
APPROVED BY:
CLIFFORD S. FINLEY, CITY ENGINEER — DATE

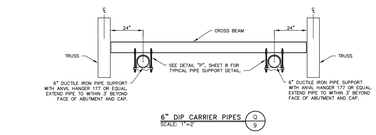
CITY OF THOUSAND OAKS

CI 5527 CONEJO CANYONS BRIDGE AT HCTP

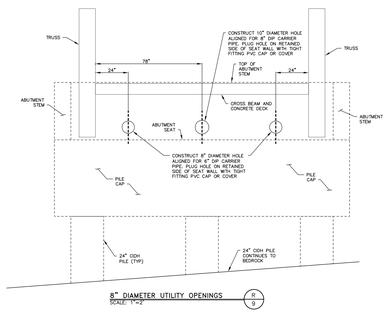
STRUCTURAL DETAILS

CITY OF THOUSAND OAKS DWG. 19-002A — SHEET 8 OF 11

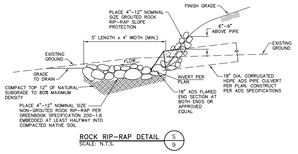
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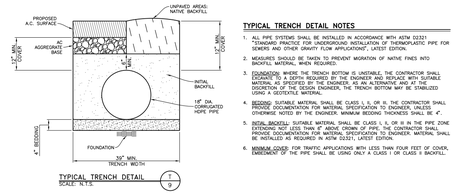
6" DIP CARRIER PIPES (G/9)
SCALE: 1"=2



8" DIAMETER UTILITY OPENINGS (R/9)
SCALE: 1"=2



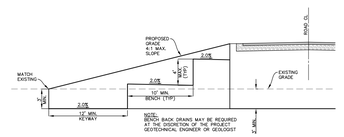
ROCK RIP-RAP DETAIL (S/9)
SCALE: N.T.S.



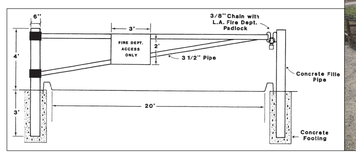
TYPICAL TRENCH DETAIL (T/9)
SCALE: N.T.S.

TYPICAL TRENCH DETAIL NOTES

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321 "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST EDITION.
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II, OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4".
5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II, OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
6. MINIMUM COVER: FOR TRAFFIC APPLICATIONS WITH LESS THAN FOUR FEET OF COVER, EMBEDMENT OF THE PIPE SHALL BE USING ONLY A CLASS I OR CLASS II BACKFILL.



FILL SLOPE KEY & BENCH DETAIL (U/9)
SCALE: N.T.S.





SECURITY GATE DETAIL & EXAMPLE (V/9)
SCALE: N.T.S.

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REV'S SYMBOL	DESCRIPTION	R.C.E.	DATE	C.T.A.	DATE

DATE 03/19/2019
PETE UBLIN, PE
DESIGNED

DATE 03/19/2019
EMILY HOYSE, EIT
DRAWN/CHECKED BY

DATE 03/19/2019
CHAD EDWARDS, EIT
CHECKED

REGISTERED PROFESSIONAL ENGINEER
HADY EDAFIANIRA
NO. 43823
CIVIL
03/19/2019
REGISTERED ENGINEER DATE

PREPARED BY
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532 Fax: (805) 966-9801

CITY OF THOUSAND OAKS

REVIEWED BY:
PROJECT ENGINEER DATE

REVIEWED BY:
ENGINEERING DIVISION MANAGER DATE

APPROVED BY:
CLIFFORD E. FINLEY, CITY ENGINEER DATE

CITY OF THOUSAND OAKS

CI 5527 CONEJO CANYONS BRIDGE AT HCTP

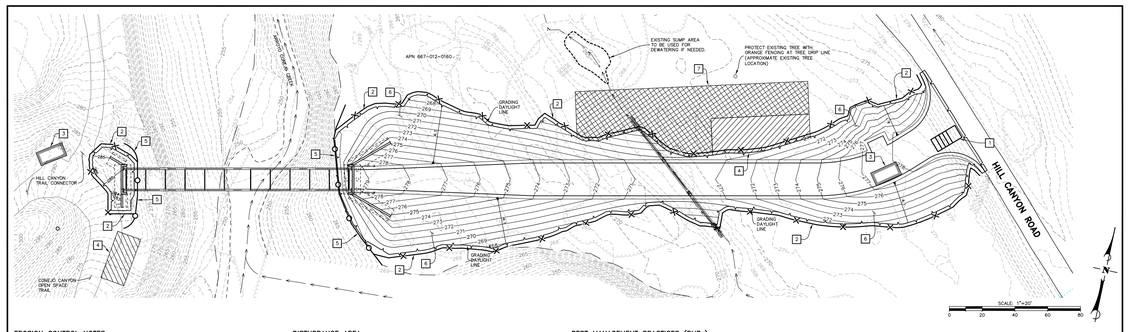
DETAILS

CITY OF THOUSAND OAKS DWG. 19-02A

SHEET 9 OF 11

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EROSION CONTROL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND CONTROLLING ALL DRAINAGE TO AND FROM THE SITE. CONTROL OF SURFACE WATERS SHALL BE SUCH THAT EXISTING DRAINAGE PATTERNS ARE NOT DISTURBED OR ALTERED TO INCREASE THE AMOUNT AND/OR INTENSITY OF RUNOFF WATER AND SILT TO ADJACENT PRIVATE PROPERTIES, RIGHT-OF-WAYS AND EXISTING DRAINAGE STRUCTURES.
2. THE CONTRACTOR SHALL ENSURE ALL PERIMETER CONTROLS ARE IN PLACE PRIOR TO COMMENCING CONSTRUCTION. THE PROTECTION MEASURES MUST BE IN PLACE AT THE END OF EACH WORKING DAY.
3. THE CONTRACTOR SHALL ADJUST THE LIMITS OF THE PROTECTION MEASURES SHOULD THEY BE INADEQUATE TO CONTROL RUNOFF.
4. THE CONTRACTOR SHALL REMOVE SILT FROM ALL STORM DRAIN APPURTENANCES AND EROSION CONTROL DEVICES AFTER EACH RAIN.
5. THE PROTECTION MEASURES MAY BE TEMPORARILY MOVED OUT OF THE CONTRACTOR'S WAY TO FACILITATE CONSTRUCTION, PROVIDED THEY ARE REINSTALLED AT THE END OF THE WORK DAY.
6. THE CONTRACTOR SHALL ADVISE HIS CREW OF THE INTENT OF THE PROTECTION MEASURES PRIOR TO THE START OF CONSTRUCTION. THE CREW IS ENCOURAGED TO MONITOR THE EFFECTIVENESS OF THE SYSTEM AND ALERT THE CONTRACTOR OF ANY FAILURES OR PROBLEMS.
7. STAGING, REFUELING OF EQUIPMENT AND MATERIALS STORAGE AREAS MAY CHANGE THROUGHOUT CONSTRUCTION, AS REQUIRED. THE AREAS SHALL BE INSPECTED FREQUENTLY TO ENSURE NO SPILLED MATERIALS ENTER THE STORM DRAIN SYSTEM. ANY SPILLS SHALL BE CLEANED UP IMMEDIATELY AND DISPOSED OF IMMEDIATELY. REFUELING OF EQUIPMENT AND STORAGE OF HAZARDOUS MATERIALS SHALL NOT BE LOCATED NEAR STORM DRAIN INLETS OR DRAINAGE SWALES.

SEDIMENT CONTROL NOTES

1. TEMPORARY SEDIMENT CONTROL DEVICES SHOWN ON THE GRADING PLAN WHICH INTERFERE WITH THE WORK MAY BE RELOCATED OR MODIFIED AS NEEDED AND WHEN THE INSPECTOR SO DIRECTS AS THE WORK PROGRESSES.
2. ALL LOOSE SOIL AND DEBRIS SHALL BE REMOVED FROM THE STREET AREAS DAILY.
3. STANDBY CREWS SHALL BE ALERTED BY THE PERMITEE OR CONTRACTOR FOR EMERGENCY WORK DURING RAINSTORMS.
4. EXCEPT WHEN THE INSPECTOR DIRECTS OTHERWISE, ALL DEVICES SHOWN SHALL BE IN PLACE AT THE END OF EACH WORKING DAY.
5. ALL SILT FENCES AND STRAW WATTLES SHALL HAVE THE DEBRIS AND SILT REMOVED AFTER EACH STORM TO RESTORE THEIR CAPACITY.
6. MATERIALS SHALL BE STOCKPILED AND READY TO BE PLACED IN POSITION WHEN RAIN IS FORECAST, OR WHEN THE INSPECTOR SO DIRECTS.
7. DURING CONSTRUCTION, WASHING OF CONCRETE TRUCKS, PAINT, EQUIPMENT OR SIMILAR ACTIVITIES SHALL OCCUR ONLY IN AREAS WHERE POLLUTED WATER AND MATERIALS CAN BE CONTAINED FOR SUBSEQUENT REMOVAL FROM THE SITE. WASH WATER SHALL NOT BE DISCHARGED TO THE STORM DRAINS, STREETS OR DRAINAGE COURSES. WASHOUT AREAS SHALL BE LOCATED A MINIMUM OF 50 FEET TO 100 FEET FROM ANY STORM DRAIN, WATERBODY OR SENSITIVE BIOLOGICAL RESOURCES. THE LOCATION OF THE WASHOUT AREA SHALL BE CLEARLY NOTED AT THE CONSTRUCTION SITE WITH SIGNS.
8. HYDROSEED, PER CASQA EC-4, AND STRAW MULCH, PER CASQA EC-6, SHALL BE APPLIED TO DISTURBED AREAS AFTER 14 DAYS OF INACTIVITY UNTIL PERMANENT STABILIZATION IS ESTABLISHED. HYDROSEED MIX SHALL BE APPROVED BY THE CITY OF THOUSAND OAKS.
10. INLETS SHALL ALWAYS BE PROTECTED FROM SEDIMENT DEPOSITION INCLUDING THE INSTALLATION OF FILTER FABRIC, FIBER ROLLS, AND/OR CHECK DAMS.

DISTURBANCE AREA

TOTAL AREA OF PERMANENT DISTURBANCE: 0.41 ACRES
TOTAL AREA OF TEMPORARY DISTURBANCE: 8,200 SQUARE FEET

EROSION CONTROL CONSTRUCTION NOTES

1. PROVIDE STABILIZED CONSTRUCTION ENTRANCE WITH RUMBLE RACKS PER DETAIL "A", SHEET 11 AND CASQA BEST MANAGEMENT PRACTICE TC-1
2. PROVIDE SILT FENCE PER DETAIL "B", SHEET 11 AND CASQA BEST MANAGEMENT PRACTICE SE-1.
3. PROVIDE WASHOUT/ REFUELING AREA PER DETAIL "C", SHEET 11 CASQA BEST MANAGEMENT PRACTICES WM-8.
4. PROVIDE STAGING AND MATERIAL STORAGE AREA.
5. PROVIDE SILT FENCE PER DETAIL "B", SHEET 11 AND CASQA BEST MANAGEMENT PRACTICE SE-1, MODIFIED TO BE ANCHORED WITH STEEL POSTS WITH 2' MINIMUM EMBEDMENT.
6. PROVIDE HYDROSEED ON GRADED SLOPES PER TABLES 1 & 2 THIS SHEET.
7. PROVIDE BRIDGE LAYDOWN AREA. THIS AREA WILL BE USED TO LAYDOWN AND ASSEMBLE THE BRIDGE. CONTRACTOR SHALL AVOID DAMAGING ANY EXISTING TREES IN THIS AREA.

LEGEND

- SILT FENCE
- SILT FENCE WITH 2' EMBEDMENT AND STEEL POSTS
- STABILIZED CONSTRUCTION ENTRANCE/EXIT WITH RUMBLE RACKS
- WASHOUT/REFUELING AREA
- STAGING AND MATERIAL STORAGE AREA
- BRIDGE LAYDOWN AREA

BEST MANAGEMENT PRACTICES (BMPs)

TEMPORARY EROSION CONTROL
- **EC1 – SCHEDULING**
- EC2 – PRESERVATION OF EXISTING VEGETATION
- EC3 – HYDRAULIC MULCH
- **EC4 – HYDROSEEDING**
- EC5 – SOIL BINDERS
- EC6 – STRAW MULCH
- EC7 – GEOTEXTILES AND MATS
- EC8 – WOOD MULCHING
- EC9 – EARTH DIKES/DRAINAGE SWALES AND DITCHES
- EC10 – OUTLET PROTECTION/VELOCITY DISSIPATION DEVICES
- EC11 – SLOPE DRAINS
- EC12 – STREAMBANK STABILIZATION
- EC14 – COMPOST BLANKETS
- EC15 – SOIL PREPARATION / ROUGHENING
- EC16 – NON-VEGETATED STABILIZATION

TEMPORARY SEDIMENT CONTROL
- **SE1 – SILT FENCE**
- SE2 – SEDIMENT/DESILTING BASIN
- SE3 – SEDIMENT TRAP
- SE4 – CHECK DAM
- SE5 – FIBER ROLLS
- SE6 – GRAVEL BAG BERM
- **SE7 – STREET SWEEPING AND VACUUMING**
- SE8 – SANDBAG BARRIER
- SE9 – STRAW BALE BARRIER
- SE10 – STORM DRAIN INLET PROTECTION
- SE11 – ACTIVE TREATMENT SYSTEMS
- SE12 – TEMPORARY SILICA SEDIMENT CONTROLS
- SE13 – COMPOST SOCKS AND BERMS
- SE14 – BIOFILTER BAGS

WIND EROSION CONTROL
- WE1 – WIND EROSION CONTROL

TRACKING CONTROL
- **TC1 – STABILIZED CONSTRUCTION ENTRANCE/EXIT**
- TC2 – STABILIZED CONSTRUCTION ROADWAY
- TC3 – ENTRANCE/OUTLET TIRE WASH

WASTE MANAGEMENT AND MATERIALS DISPOSAL/HANDLING
- WM1 – MATERIAL DELIVERY AND STORAGE
- WM2 – MATERIAL USE
- WM3 – STOCKPILE MANAGEMENT
- WM4 – SPILL PREVENTION AND CONTROL
- WM5 – SOLID WASTE MANAGEMENT
- WM6 – HAZARDOUS WASTE MANAGEMENT
- WM7 – CONTAMINATED SOIL MANAGEMENT
- **WM8 – CONCRETE WASTE MANAGEMENT**
- WM9 – SANITARY/SEPTIC WASTE MANAGEMENT
- WM10 – LIQUID WASTE MANAGEMENT

NON-STORMWATER MANAGEMENT
- NS0 – **WATER CONSERVATION PRACTICES**
- NS1 – DEWATERING OPERATIONS
- **NS2 – PAVING AND GRINDING OPERATIONS**
- NS3 – TEMPORARY STREAM CROSSING
- NS5 – CLEAR WATER DIVERSION
- NS6 – ILLICIT CONNECTION/ILLEGAL DISCHARGE DETECTION AND REPORTING
- NS7 – POTABLE WATER/IRRIGATION
- **NS8 – VEHICLE AND EQUIPMENT CLEANING**
- **NS9 – VEHICLE AND EQUIPMENT FUELING**
- **NS10 – VEHICLE AND EQUIPMENT MAINTENANCE**
- **NS11 – PILE DRIVING OPERATIONS**
- **NS12 – CONCRETE CURING**
- **NS13 – MATERIAL AND EQUIPMENT USE OVER WATER**
- **NS14 – CONCRETE FINISHING**
- NS15 – STRUCTURE DEMOLITION/REMOVAL OVER OR ADJACENT TO WATER

Table 1: Hydroseed Calcs
Area = 0.34 ac

	Lbs. needed per acre	Acreage	Total Lbs
Conwed Fibers Hydro Mulch 3000	2000.0	0.34	680.00
Biosol Forte 7-2-1 Fertilizer	800.0	0.34	272.00
EC M-Binder	100.0	0.34	34.00
AMI 320 Mycorrhizae	60.0	0.34	20.40
Seed Mix (see Table 2)	50	0.34	17.00

Table 2: Hydroseed Mix

Botanical Name	Common Name	Acreage	Lbs Needed per Acre	Total Pounds
Acmispon glaber	deerweed	0.34	3.37	1.1
Artemisia californica	CA sagebrush	0.34	0.62	0.2
Bromus carinatus	Cucamonga brome	0.34	13.34	4.5
Dodia californica	California bush sunflow	0.34	7.43	2.5
Eriogonum cinereum	ashy leaf buckwheat	0.34	7.14	2.4
Eschscholzia californica	California poppy	0.34	1.53	0.5
Festuca microstachys	small fescue	0.34	3.03	1.0
Lupinus succulentus	arroyo lupine	0.34	10.51	3.6
Plantago insularis	plantain	0.34	1.59	0.5
Salvia leucophylla	purple sage	0.34	1.44	0.5
	Total		**50.01**	**17.00**

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PETE DE LA PE
DESIGNED

DATE 04/12/2019
EMILY ROSE PE
DRAFTED BY

DATE 04/12/2019
HADI KHOFKHAN, PE
CHECKED

HADI KHOFKHAN, PE
REGISTERED ENGINEER — DATE 04/12/2019

PREPARED BY
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532 Fax: (805) 966-9801

CITY OF THOUSAND OAKS

REVIEWED BY:
PROJECT ENGINEER — DATE

REVIEWED BY
ENGINEERING DIVISION MANAGER — DATE

APPROVED BY:
CLIFFORD G. FINLEY, CITY ENGINEER — DATE

CITY OF THOUSAND OAKS

CI 5527 CONEJO CANYONS BRIDGE AT HCTP

EROSION CONTROL PLAN

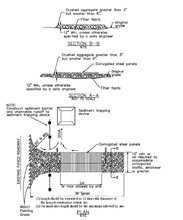
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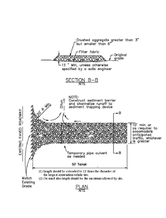
Stabilized Construction Entrance/Exit TC-1



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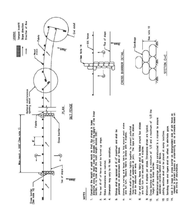
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Stabilized Construction Entrance/Exit TC-1



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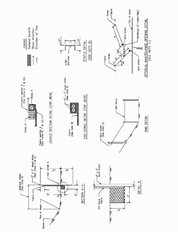
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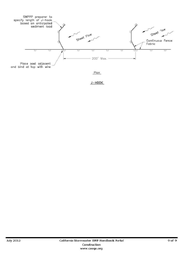
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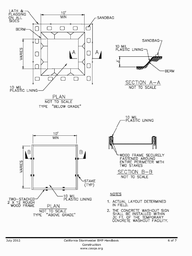
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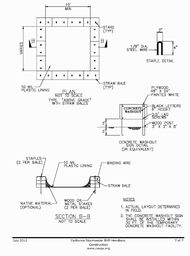
Concrete Waste Management WM-8



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CONCRETE WASTE MANAGEMENT – CASQA WM-8
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Concrete Waste Management WM-8



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DESIGNED
DATE 03/19/2019
EMILIO ROSSI, PE
DRAFTED BY
DATE 03/19/2019
HADI KNOOPMAN, PE
CHECKED

PREPARED BY:
Stantec
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532 Fax: (805) 966-4801
HADI KNOOPMAN, PE 03/19/2019
REGISTERED ENGINEER DATE

CITY OF THOUSAND OAKS
REVIEWED BY:
PROJECT ENGINEER DATE
REVIEWED BY:
ENGINEERING DIVISION MANAGER DATE
APPROVED BY:
CLIFFORD G. FINLEY, CITY ENGINEER DATE

CITY OF THOUSAND OAKS

CI 5527 CONEJO CANYONS BRIDGE AT HCTP

EROSION CONTROL DETAILS

CITY OF THOUSAND OAKS DWG. 15425A

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APPENDIX C

padre associates, inc.
ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS

BIOLOGICAL BASELINE ASSESSMENT CONEJO CANYONS BRIDGE PROJECT THOUSAND OAKS, CALIFORNIA



Prepared for:

Conejo Open Space Conservation Agency
2100 E. Thousand Oaks Blvd
Thousand Oaks, CA 91362

Prepared by:

Padre Associates, Inc.
1861 Knoll Drive
Ventura, California 93003
805/644-2220, 805/644-2050 (fax)

June 2018

Project No. 1802-1761

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A Vascular Plant Flora Observed in Observed within the Conejo Canyons Bridge Study Area, Thousand Oaks, California

B Vertebrate Animal Species Reported from Hill Canyon and Arroyo Conejo Upstream of the Wastewater Treatment Plant and those Observed within the Conejo Canyons Bridge Study Area, Thousand Oaks, California

1.0 STUDY PURPOSE AND METHODS

The purpose of this assessment is to identify biological resources and regulatory issues that may constraint/affect the future engineering design, environmental review and permitting of a proposed bridge over Arroyo Conejo.

1.1 PROJECT DESCRIPTION

The Conejo Open Space Conservation Agency (COSCA) and the City of Thousand Oaks Public Works Department plan to construct a bridge across Arroyo Conejo southwest of Hill Canyon Road within the Conejo Canyons Open Space area. The bridge will connect existing trails on either side of the creek and will be a key link in the trail system between the Conejo Canyons and Wildwood open space areas. By installing the bridge, trail users, including pedestrians, bicyclists, and equestrians will have an alternative route to the paved Hill Canyon Road between Santa Rosa Equestrian Park and Wildwood Canyon. The bridge will also provide emergency vehicular access out of Hill Canyon as well as a direct route for City Public Works vehicles between the Municipal Service Center at the north end of Rancho Conejo Boulevard and the Hill Canyon Wastewater Treatment Plant (HCWTP). COSCA Park Rangers and emergency vehicles will also use the bridge as needed. The bridge project is currently in the planning and preliminary design phase. Staff anticipates that the bridge will be a prefabricated steel truss structure approximately 14 feet wide and 130 feet long. An access road/trail will be provided to link the proposed bridge to Hill Canyon Road.

1.2 STUDY AREA LOCATION AND PHYSICAL DESCRIPTION

The Conejo Canyons Bridge Study Area is approximately three acres, and is comprised of the proposed bridge site and access road/trail alignment between the bridge site and Hill Canyon Road, with a 100-foot buffer (see Figure 1). The Study Area is located at the confluence of the North Fork and South Fork Arroyo Conejo, and approximately 600 feet northwest of the HCWTP. Wetlands constructed as mitigation for HCWTP improvements are located approximated 50 feet south of the Study Area.

The Study Area includes approximately 250 linear feet of the North Fork Arroyo Conejo channel and 240 linear feet of the Arroyo Conejo channel (downstream of the confluence), and the streambanks and the slope to the east extending to Hill Canyon Road. The elevation of the Study Area ranges between approximately 260 feet in the Arroyo Conejo channel to 290 feet above mean sea level just east of Hill Canyon Road.

Arroyo Conejo flows north approximately 1.7 stream miles to its confluence with Arroyo Santa Rosa, where the combined stream is known as Conejo Creek. Photographs of the Study Area are provided as Figure 2.

1.3 METHODS

Biological resources were assessed based upon field surveys and literature research. The field survey area encompassed the proposed bridge and access road/trail alignment with a 100-foot buffer, as shown in Figure 1. Dates of field surveys are summarized in Table 1.

Table 1. Dates of Field Surveys

Survey Type	Date
Botanical, protected trees and wildlife	May 23, 2018
Modified protocol least Bell's vireo survey 1	June 1, 2018
Modified protocol least Bell's vireo survey 2	June 4, 2018
Modified protocol least Bell's vireo survey 3	June 7, 2018

1.3.1 Botanical Surveys

Field surveys for plants were conducted by walking transects of opportunity through all habitat types. All plant species encountered were identified to species, subspecies or variety using The Jepson Manual (Baldwin et al., 2012) and a dissecting microscope. Surveys were conducted in late May and June when most spring-flowering herbaceous plants should have been detectable.

1.3.2 Wildlife Surveys

Field surveys for wildlife were conducted by walking transects of opportunity through all habitat types. All species encountered were identified to species based on direct visual observation (binoculars), vocalizations, scat, tracks, burrows and nests.

1.3.3 Modified Protocol Least Bell's Vireo Surveys

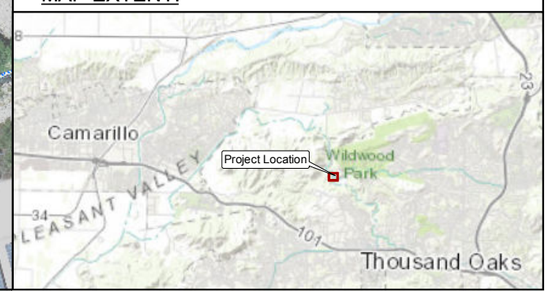
These surveys were conducted consistent with the January 19, 2001 Survey Guidelines developed by the U.S. Fish and Wildlife Service but modified to reduce the number and temporal spacing to three surveys spaced three days apart.



LEGEND:

- # Protected Tree
- Proposed Conjeo Canyons Bridge
- Proposed Access Road / Trail
- Proposed Abutment Location
- Study Area
- Vegetation Type
  - ABG - Annual brome grasslands
  - AWF - Arroyo willow forest
  - D - Disturbed
  - MS - Mulefat scrub

MAP EXTENT:



0 50 100
FEET

Source: City of Thousand Oaks, County of Ventura, USGS Blueline
Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
Notes: This map was created for informational and display purposes only.

padre associates, inc.
ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS

PROJECT NAME: CONJEO CANYONS BRIDGE THOUSAND OAKS, CA
PROJECT NUMBER: 1802-1761
DATE: June 2018

STUDY AREA MAP

FIGURE 1

Conejo Canyons Bridge\Study Area Map.mxd 6/14/2018



a. Eastern portion of the connector trail alignment, facing west



b. Western portion of the connector trail alignment, facing west



c. Arroyo Conejo at the proposed bridge crossing, facing downstream



d. Proposed western bridge abutment site, facing east

SITE PHOTOGRAPHS
FIGURE 2

Back of Figure 2

1.3.4 Literature Research

The literature research included reviewing the following documents:

- Unit W & F Interceptor Reconstruction EIR (Padre Associates, 1998) and mitigation monitoring reports through 2003.
- Unit W Interceptor Reconstruction Supplemental EIR (Padre Associates, 1999) and mitigation monitoring reports through 2006.
- Calleguas Municipal Water District Mesa Feeder Replacement Project Completion Report (Padre Associates, 2009).
- Hill Canyon Regional Recreational Facility Draft EIR with appendices (1997).
- On-line Inventory of Rare and Endangered Plants of California (California Native Plant Society, 2018).
- Personal computer version (RAREFIND 5) of the California Department of Fish and Wildlife (CDFW) Natural Diversity Data Base (CNDDB, 2018).
- City of Thousand Oaks General Plan Conservation Element.

2.0 DESCRIPTION OF THE RESOURCES

2.1 VEGETATION

Generally, the Study Area supports arroyo willow riparian forest along the North Fork and South Fork Arroyo Conejo, and downstream of the confluence. Mulefat scrub is present in areas near the stream channel where trees are absent. Vegetation mapping is provided on Figure 1 and is based on A Manual of California Vegetation prepared by Sawyer et al. (2009).

Arroyo Willow Riparian Forest *(Salix lasiolepis* Shrubland Alliance). This plant community occurs along Arroyo Conejo within the Study Area, and is dominated by arroyo willow (*Salix lasiolepis*) and giant reed (*Arundo donax*) with occasional red willow (*Salix laevigata*) and Mexican fan palm (*Washingtonia robusta*). Openings in this plant community support poison hemlock (*Conium maculat*um), rip-gut grass (*Bromus diandrus*), poison oak (*Toxicodendron diversilobum*) and mugwort (*Artemisia douglasiana*). Scattered coast live oak trees (*Quercus agrifolia*) occur within this community in the western portion of the Study Area. *Salix lasiolepis* Shrubland Alliance is considered to be secure State-wide and not rare or threatened.

Mulefat Scrub *(Baccharis salicifolia* Shrubland Alliance). This plant community occurs along Arroyo Conejo within the Study Area, primarily in areas removed from the low flow channel where stands of arroyo willows are absent. This plant community is dominated by mulefat (*Baccharis salicifolia*); however, small patches of riparian scrub dominated by blue elderberry (*Sambucus nigra* ssp. *caerulea*), sandbar willow (*Salix exigua*) or California rose (*Rosa californica*) are included in this classification. *Baccharis salicifolia* Shrubland Alliance is considered to be secure State-wide and not rare or threatened.

Annual Brome Grasslands. This plant community occurs in areas lacking woody vegetation, primarily due to previous ground disturbance. In the Study Area, Annual Brome Grasslands are dominated by rip-gut brome and slender wild oats (*Avena barbata*). Other species found in this plant community in the Study Area include summer mustard (*Hirschfeldia incana*), black mustard (*Brassica nigra*) and red-stem filaree (*Erodium cicutarium*).

Disturbed. This term is used to describe the tree planting area along Hill Canyon Road, which has been cleared, planted with southern live oak (*Quercus virginiana*), covered with mulch, irrigated and maintained using herbicide. Surviving plants are primarily colonizing weedy species including summer mustard, tumble-weed (*Amaranthus albus*) and horseweed (*Erigeron canadensis*).

2.2 VASCULAR FLORA

A total of 112 vascular plant species were identified within or immediately adjacent to the Study Area during the field surveys and are listed in Appendix A. Plants observed within the Study Area consisted of 61 (54 percent) native taxa and 51 (46 percent) non-native naturalized taxa. The percentage of non-native taxa is much greater than for the State as a whole (17.4 percent), likely due to disturbance associated with maintenance of wastewater treatment facilities, pipelines and access road as well as the contribution of non-native plant propagules from upstream developed areas.

Twenty-eight (25 percent) of the plant species observed are considered invasive species by the California Invasive Plant Council, including four species rated as “high” for invasiveness (may cause severe ecological impacts on physical processes, plant and animal communities), 13 species rated as “moderate” and 11 species rated as “limited” invasive potential. Appendix A provides the invasiveness rating for all plants observed in the Study Area.

2.3 SPECIAL-STATUS PLANT SPECIES

Special-status plant species are either listed as endangered or threatened under the Federal or California Endangered Species Acts, or rare under the California Native Plant Protection Act, or considered to be rare (but not formally listed) by resource agencies, professional organizations (California Native Plant Society), and the scientific community. For the purposes of this project, special-status plant species are defined in Table 2.

Table 2. Definitions of Special-Status Plant Species

- Plants listed or proposed for listing as threatened or endangered under the Federal Endangered Species Act (50 CFR 17.12 for listed plants and various notices in the Federal Register for proposed species).
- Plants that are candidates for possible future listing as threatened or endangered under the Federal Endangered Species Act (Federal Register December 2, 2016).
- Plants that meet the definitions of rare or endangered species under the CEQA Guidelines (Section 15380).
- Plants considered by the CNPS to be "rare, threatened, or endangered" in California (Lists 1B and 2 maintained by the California Native Plant Society).
- Plants listed by CNPS as plants about which we need more information and plants of limited distribution (Lists 3 and 4 maintained by the California Native Plant Society).
- Plants listed or proposed for listing by the State of California as threatened or endangered under the California Endangered Species Act (14 CCR 670.5).
- Plants listed under the California Native Plant Protection Act (California Fish and Game Code 1900 et seq.).
- Plants considered sensitive by other Federal agencies (i.e., U.S. Forest Service, Bureau of Land Management), state and local agencies or jurisdictions.
- Plants considered sensitive or unique by the scientific community or occurring at the limits of their natural range (S*tate CEQA Guidelines*, Appendix G).
- Trees protected under City of Thousand Oaks Ordinances Nos. 937-NS and 1217-NS.

The City of Thousand Oaks, Oak Tree Preservation and Protection Guidelines (City Council Resolution No. 87-93, Ordinance No. 937-NS) defines all oak trees as protected trees regardless of size. However, non-native oaks used for landscaping are not considered protected (e.g., holly oak). The City requires a tree report for all protected trees to establish the health and aesthetics of each tree that may be affected. An oak tree permit is required for removal or encroachment of oak trees with a two-inch diameter trunk or greater, measured at three feet above natural grade.

City Council Ordinance 1217-NS protects landmark trees, including western sycamores (*Platanus racemosa*) exceeding 12 inches in diameter at 4.5 feet above natural grade (dbh), southern California black walnut (*Juglans californica*) exceeding 8 inches dbh and California bay laurel (*Umbellularia californica*) exceeding 8 inches dbh. Although oak trees and landmark trees are considered special-status species for the purposes of this analysis, they do not meet the definition of rare or endangered under the California Environmental Quality Act (CEQA, Section 15380 of the Guidelines). Therefore, the assessment of impacts to these species are based on City requirements.

The literature search and field surveys conducted for this analysis indicates that 14 special-status plant species have the potential to occur in the project area. Table 3 lists these species, current regulatory status, and nearest known location relative to the Study Area.

Special-status plant species observed within the Study Area during field surveys were limited to coast live oak, scrub oak, western sycamore and southern California black walnut. None of these plant species are rare or declining, and do not meet the definition of rare or endangered under Section 15380 of the State Guidelines for implementation of CEQA. Trees found within the Study Area that are protected under City of Thousand Oaks ordinances requiring permits for removal are listed in Table 4. The location of these protected trees is provided in Figure 1.

Table 3. Special-Status Plant Species Reported within Two Miles of the Study Area

Common Name (*Scientific Name*)	Flowering Period	Status	Nearest Known Location
Catalina mariposa lily (*Calochortus catalinae*)	March-May	List 4	Hill Canyon (LSA Associates, 1996)
Club-haired mariposa lily (*Calochortus clavatus* var. *clavatus*)	April-June	List 4	Hill Canyon (David Bramlet, 1997)
Plummer's mariposa lily (*Calochortus plummerae*)	May-July	List 4	General Thousand Oaks area, 1 mile to the south (CNDDB, 2018)
Southern tarplant (*Centromadia parryi ssp. australis*)	June-October	List 1B	Southeast of the U.S. 101/Wendy Drive interchange, 1.8 miles to the south (CNDDB, 2018)
Conejo dudleya (*Dudleya parva*)	May-July	FT, List 1B	Eastern Hill Canyon, 0.7 miles to the east (CNDDB, 2018)
Blochman's dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*)	April-June	List 1B	1.1 miles to the southwest (CNDDB, 2018)
Conejo buckwheat (*Eriogonum crocatum*)	April-July	SR, List 1B	Eastern Hill Canyon, 0.7 miles to the east (CNDDB, 2018)
Lyon's pentachaeta (*Pentachaeta lyonii*)	March-August	SE, FE, List 1B	Hill Canyon, 0.3 miles to the northwest (CNDDB, 2018)
Coast live oak (*Quercus agrifolia*)	March-April	CTO	Five protected trees found within the Study Area during field surveys
Scrub oak (*Quercus berberidifolia*)	February-April	CTO	One protected tree found within the Study Area during field surveys
Southern California black walnut (*Juglans californica*)	March-May	List 4, CTO	Found scattered along Arroyo Conejo in the Study Area, but none meeting the City standard (8" diameter) for permits
Western sycamore (*Platanus racemosa*)	February-April	CTO	One protected tree found within the Study Area during field surveys
Ojai navarretia (*Navarretia ojaiensis*)	May-July	List 1B	1.1 miles to the southwest (CNDDB, 2018)
Chaparral ragwort (*Senecio aphanactis*)	February-May	List 2B	Eastern Hill Canyon, 0.7 miles to the northeast (CNDDB, 2018)

Status Codes:

FE	Federal Endangered (USFWS)
CTO	City of Thousand Oaks protected tree (oaks and landmark trees)
List 1B	Plants rare, threatened or endangered in California and elsewhere (CNPS)
List 4	Plants of limited distribution (CNPS)
SE	State Endangered (CDFW)
SR	State Rare (CDFW)

Table 4. Protected Trees within the Study Area

Tree no.	Species	Trunk Diameter (inches) at Breast Height (4.5 feet)	Estimated Impact
1	Coast live oak	25	Removed for the western bridge abutment
2	Coast live oak	24	None
3	Coast live oak	5	Possible encroachment into the protected zone during construction
4	Coast live oak	16	Possible encroachment into the protected zone during construction
5	Coast live oak	8	Possible encroachment into the protected zone during construction
6	Western sycamore	12	Possible encroachment into the protected zone during construction
7	Scrub oak	5,7	Removed for the western bridge abutment

2.4 SENSITIVE HABITATS

The California Natural Diversity Data Base maintained by the California Department of Fish and Wildlife (CDFW) has inventoried natural communities and ranked them according to their rarity and potential for loss. No sensitive habitats were found within the Study Area during the field surveys.

2.5 WILDLIFE

The wildlife habitat value of the Study Area is considered high because it is surrounded by open space and associated riparian wildlife habitat. Arroyo Conejo provides perennial surface water and extensive riparian habitat in an open space area, which is becoming rare in southern California. Factors that reduce the habitat value of the Study Area include nearby commercial, residential and light industrial land uses to the south and residential land uses to the east, and periodic disturbance associated with maintaining wastewater treatment facilities, pipelines and access roads. A summary of the results of field surveys conducted by Padre within the Study Area is provided as Table 5.

Table 5. Numbers of Wildlife Species Observed within the Study Area during Field Surveys

Species Group	Observed
Fish	1 species
Amphibians	1 species
Reptiles	2 species
Birds	25 species
Mammals	7 species

2.5.1 Wildlife of the Project Site

Observed vertebrate species include those seen or detected by track, scat, burrows or voice during field surveys conducted for this project. Vertebrate taxa expected for the area are based on sight records from other environmental documents (see Section 1.3.4) and range maps from Zeiner et al. (1988, 1990a, 1990b) and Garrett and Dunn (1981). A listing of fauna reported from Hill Canyon and Arroyo Conejo upstream of the HCWTP, and those observed within the Study Area during field surveys is provided as Appendix B.

Accurate assessment of wildlife populations would require extended periods of site research, trapping, and census taking. It is particularly difficult to detect nocturnal, rare or reclusive species to obtain accurate estimates of population size and geographical distribution. Other complications in the quantitative assessment of vertebrate (and invertebrate) populations include:

- Many species may occur in the area only for short periods during migrations;
- Many species of amphibians and reptiles become inactive during one or more seasons; and
- Seasonal or annual fluctuations in climate or weather patterns may confound observations.

Common carp (*Cyprinus carpio*) was only fish observed in the Study Area during the field surveys. However, focused fish surveys were not conducted as the fish fauna of Arroyo Conejo is well known due to construction-related stream dewatering observed by Padre biologists. Arroyo chub (*Gila orcuttii*) is the only California native fish known to occur in Arroyo Conejo, but this species is not native to this drainage.

Bullfrog (*Lithobates catesbeianus*) was the only amphibian observed in the Study Area during the field surveys, but common species such as Baja California treefrog (*Pseudacris hypochondriaca*) and western toad (*Anaxyrus boreas halophilus*) have also been reported from Arroyo Conejo.

Reptiles observed during field surveys of the Study Area conducted by Padre were limited to western fence lizard (*Sceloporus occidentalis*) and side-blotched lizard (*Uta stansburiana*). Other species reported from Hill Canyon and Arroyo Conejo may also be present (see Appendix B), including two-striped garter snake (*Thamnophis hammondii*).

A total of 25 bird species were observed within the Study Area during field surveys conducted by Padre Associates and are listed in Appendix B (see those preceded with an asterisk). Most of these species are expected to breed within or adjacent to the Study Area. Wildlife observations were conducted within the Study Area during spring; therefore, winter migrants would have not been recorded.

Mammals observed during field surveys conducted by Padre Associates included coyote (*Canis latrans*, scat and tracks), dog (tracks and scat), California ground squirrel (Sp*ermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*, burrows), black-tailed deer (*Odocoileus hemionus,* tracks), dusky-footed woodrat (*Neotoma fuscipes*, nest) and Audubon's cottontail (*Sylvilagus auduboni*).

2.5.2 Wildlife Corridors

Wildlife migration corridors are generally defined as connections between habitat patches that allow for physical and genetic exchange between otherwise isolated animal populations. Migration corridors may be local such as between foraging and nesting or denning areas, or they may be regional in nature. Migration corridors are not unidirectional access routes; however, reference is usually made to source and receiver areas in discussions of wildlife movement networks. "Habitat linkages" are migration corridors that contain contiguous strips of native vegetation between source and receiver areas. Habitat linkages provide cover and forage sufficient for temporary inhabitation by a variety of ground-dwelling animal species. Wildlife migration corridors are essential to the regional ecology of an area as they provide avenues of genetic exchange and allow animals to access alternative territories as fluctuating dispersal pressures dictate.

The Study Area is located within the Conejo Canyons Open Space area, and is connected to the Simi Hills via the Wildwood Open Space Area and Mountclef Ridge. The Simi Hills serve as a stepping stone of undeveloped land between the Santa Susana Mountains to the north, the Santa Monica Mountains to the south, and the San Gabriel Mountains (Angeles National Forest) to the east. Within the regional wildlife network, this land functions as a genetic and population reservoir that is important in maintaining species and genetic diversity through migration between source and receiver areas (Lieberstein, 1987).

Edelman (1990) conducted studies of the actual and potential movement of ground-dwelling animals at "choke points" between the coastal portions of the Santa Susana Mountains and the Simi Hills along the Simi Valley Freeway (State Route 118), and between the Simi Hills and the Santa Monica Mountains along U.S. 101. Edelman (1990) mapped the entire regional wildlife corridor network that includes actual and potential corridors for animal movement throughout the Santa Susana and San Gabriel Mountains, the Simi Hills and the Santa Monica Mountains.

For purposes of this analysis, the Santa Monica Mountains are considered the source area, and the Simi Hills are referred to as the receiver area. Recent studies (Edelman, 1990) indicate that the Simi Hills function as a corridor "stepping stone" between the Santa Susana and Santa Monica Mountains. Although ground-dwelling animal movements are highly constrained by lack of adequate open space connection, animals are attempting to access habitats on both sides of the 101 and 118 freeways as evidenced by road kill data collected by Edelman (1990).

Wildlife from source areas are likely to enter the region from the Simi Hills via Mountclef Ridge and from the Santa Monica Mountains via a culvert under U.S. 101 near the Camarillo Grove County Park. Arroyo Conejo is considered an important wildlife movement corridor because it allows wildlife to access the Conejo Canyons Open Space/Wildwood Open Space habitat block via a contiguous strip of native vegetation with minimal human presence. This habitat block is relatively isolated by the City of Thousand Oaks to the south and east, U.S. 101 to the south, and agricultural land to the west and north.

The South Coast Wildlands Missing Linkages Project (Penrod et al., 2006) has identified the Santa Monica-Sierra Madre Landscape Linkage which connects the Santa Monica Mountains to the south and the Sierra Madre Ranges of the Los Padres National Forest to the north. The east end of Las Posas Hills meets the southwestern strand of the Santa Monica-Sierra Madre Landscape Linkage near Tierra Rejada Valley, where the Linkage then heads toward the southeast through the western Simi Hills to Palo Comado Canyon and Point Mugu State Park. At its nearest point, the Linkage is located approximately 5.1 miles northeast of the Study Area and is separated by substantial residential development.

2.6 SPECIAL-STATUS WILDLIFE SPECIES

Special-status wildlife species are defined in Table 6. The potential for these species to occur in the vicinity of the Study Area was determined by personal experience, review of sight records from other environmental documents (see Section 1.3.4) and range maps from Zeiner et al. (1988, 1990a, 1990b) and Garrett and Dunn (1981). Table 7 lists special-status wildlife species that have the potential to occur within the Study Area for at least a portion of their life cycle, and provides a discussion of the potential for each special-status species to occur within the Study Area. “High” potential is defined as a probability of occurrence exceeding 67 percent, “Moderate” potential is defined as a probability of occurrence between 33 and 67 percent, and “Low“ potential is defined as a probability of occurrence less than 33 percent. “Occurrence” is defined as supporting a breeding population or providing a substantial amount of foraging resources.

Table 6. Definitions of Special-Status Wildlife Species

- Animals listed or proposed for listing as threatened or endangered under the Federal Endangered Species Act (50 CFR 17.11 for listed animals and various notices in the Federal Register for proposed species).
- Animals that are candidates for possible future listing as threatened or endangered under the Federal Endangered Species Act (Federal Register December 2, 2016).
- Animals that meet the definitions of rare or endangered species under the CEQA Guidelines (Section 15380).
- Animals listed or proposed for listing by the State of California as threatened and endangered under the California Endangered Species Act (14 CCR 670.5).
- Animal species of special concern to the CDFW.
- Animal species that are fully protected in California (California Fish and Game Code, Section 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]).

Table 7. Special-Status Wildlife Species Reported within Two Miles of the Study Area

Common Name (*Scientific Name*)	Status	Nearest Known Location	Potential to Occur within the Study Area
Arroyo chub (*Gila orcuttii*)	CSC	South Fork Arroyo Conejo upstream of the Study Area (Padre, 1999; Padre 2009)	High, suitable habitat present
Coastal western whiptail (*Aspidoscelis tigris stejnegeri*)	CSC	Hill Canyon (LSA, 1996)	Low, minimal suitable habitat within Study Area
Two-striped garter snake (*Thamnophis hammondii*)	CSC	South Fork Arroyo Conejo upstream of the Study Area (Padre, 1999)	High, suitable habitat present
San Diego mountain kingsnake (*Lampropeltis zonata pulchra*)	WL	Near South Fork Arroyo Conejo upstream of the Study Area (personal observation, M. Ingamells, 1998)	Low-None, no suitable habitat in proximity
Western pond turtle (*Emys marmorata*)	CSC	South Fork Arroyo Conejo upstream of the Study Area (Padre, 1999; Padre 2009)	High, suitable habitat present
Cooper's hawk (*Accipiter cooperi*)	WL, PR	Observed within the Study Area during wildlife survey	Present
Short-eared owl (*Asio flammeus*)	CSC	South Fork Arroyo Conejo, 0.7 miles upstream of the Study Area (Padre 2009)	Low, minimal suitable habitat within Study Area
White-tailed kite (*Elanus caeruleus*)	FP, PR	Wildwood Park, 0.9 miles to the northeast (Padre, 1998), near South Fork Arroyo Conejo upstream of the Study Area (Padre, 2009)	Low, minimal suitable habitat within Study Area
Osprey (*Pandion haliaetus*)	WL	South Fork Arroyo Conejo, 0.7 miles upstream of the Study Area (Padre 2009)	Low, minimal suitable habitat within Study Area
Yellow warbler (*Dendroica petechia brewsteri*)	CSC	Observed within the Study Area during least Bell's vireo surveys	Present
Yellow-breasted chat (*Icteria virens*)	CSC	Hill Canyon (LSA, 1996)	Moderate, could forage in Study Area
California gnatcatcher (*Polioptila californica*)	FT, CSC	Near Rancho Conejo Blvd., 0.5 miles to the southwest (CNDDB, 2018)	Low-None, no suitable habitat in proximity

Common Name (*Scientific Name*)	Status	Nearest Known Location	Potential to Occur within the Study Area
Least Bell's vireo (*Vireo bellii pusillus*)	FE, SE	Arroyo Santa Rosa, 1.4 miles to the north (Ventura County WPD, 2006)	Low-None, not found during modified protocol surveys
Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)	WL	Slopes above South Fork Arroyo Conejo, ~0.6 miles upstream (Padre Associates, 2004)	Low, minimal suitable habitat within Study Area
California horned lark (*Eremophila alpestris actia*)	WL	Vicinity of South Fork Arroyo Conejo upstream of the Study Area (Padre, 1999)	Low-None, no suitable habitat within Study Area

Status Codes:

CSC	California Species of Special Concern (CDFW)
FE	Listed as endangered under the Endangered Species Act
FP	Fully protected under the California Fish and Game Code (CDFW)
FT	Listed as threatened under the Endangered Species Act
PR	Raptor protected under Section 3503.5 of the Fish and Game Code (CDFW)
SA	Special Animal (CDFW)
SE	Listed as endangered under the California Endangered Species Act
WL	Watch List (CDFW)

Arroyo chub, two-striped garter snake, western pond turtle, Cooper's hawk and yellow warbler were observed during field surveys or are anticipated to be present within the Study Area. Coastal western whiptail, San Diego mountain kingsnake, white-tailed kite, southern California rufous-crowned sparrow and California horned lark are anticipated to occur in habitats above the Arroyo Conejo riparian corridor, and unlikely to be present within the Study Area.

Short-eared owl and osprey were observed outside the breeding season along the South Fork Arroyo Conejo and are anticipated to be uncommon transients and unlikely to occur within the Study Area. Yellow-breasted chat was last reported from Hill Canyon in 1996, and was not observed by Padre biologists during construction monitoring from 1999-2009 along Arroyo Conejo. The status of this species in the Study Area is unclear.

Suitable habitat for California gnatcatcher does not occur within the Study Area and this species was not observed during field surveys. Therefore, California gnatcatcher is considered absent from the Study Area.

Suitable habitat for least Bell's vireo occurs within the Study Area. However, this species was not observed during modified protocol surveys of the Study Area conducted during the breeding season. Therefore, least Bell's vireo is considered absent from the Study Area.

3.0 POTENTIAL BIOLOGICAL IMPACTS

The following biological impact assessment is provided to facilitate project planning, including impact avoidance and minimization. Note that engineering design for the bridge and access road/trail is in progress and the impact estimates provided below should be considered preliminary.

It is anticipated that most construction activity would be conducted on the east side of Arroyo Conejo, with equipment access from Hill Canyon Road. Equipment used to construct the western bridge abutment would access the site from Rancho Conejo Boulevard. Therefore, construction equipment or vehicles would not cross Arroyo Conejo and stream diversion would not be required.

3.1 VEGETATION/HABITAT

Based on an estimated 50-foot-wide construction disturbance corridor, approximately 0.11 acres of arroyo willow riparian forest, 0.08 acres of mulefat scrub and 0.09 acres of annual brome grasslands would be temporarily removed during bridge construction. Based on an estimated 50 by 50-foot bridge abutment footprint, permanent loss of approximately 0.03 acres of arroyo willow riparian forest, 0.01 acres of mulefat scrub and 0.04 acres of annual brome grasslands would occur. Table 8 provides a summary of the preliminary impact assessment.

This vegetation is considered suitable habitat for special-status wildlife species including arroyo chub, two-striped garter snake, western pond turtle, Cooper's hawk, yellow warbler and yellow-breasted chat.

Table 8. Preliminary Impact Assessment Summary

Plant Community	Temporary Impacts		Permanent Impacts	
	CDFW Jurisdiction	Outside CDFW Jurisdiction	CDFW Jurisdiction	Outside CDFW Jurisdiction
Arroyo willow riparian forest	0.11	0.00	0.03	0.00
Mulefat scrub	0.01	0.07	0.01	0.00
Annual brome grasslands	0.01	0.08	0.04	0.00
Total	**0.13**	**0.15**	**0.08**	**0.00**

3.2 SPECIAL-STATUS PLANT SPECIES

Special-status plant species observed on the Study Area during field surveys were limited to coast live oak, scrub oak, western sycamore and southern California black walnut. None of these plant species are rare or declining, and do not meet the definition of rare or endangered under Section 15380 of the State CEQA Guidelines.

Trees requiring permits for removal under City ordinances that may be removed are limited to one coast live oak and one scrub oak; however, other protected trees may be impacted by encroachment into the protected zone (extending from the trunk to 5 feet beyond the dripline) (see Table 4). No other special-status plant species would be adversely affected.

3.3 SPECIAL-STATUS WILDLIFE SPECIES

Special-status wildlife species observed during field surveys or are likely to occur within the Study Area are arroyo chub, two-striped garter snake, western pond turtle, Cooper's hawk and yellow warbler.

Fish and aquatic reptiles (arroyo chub, two-striped garter snake, western pond turtle) may suffer mortality and/or habitat degradation associated with vegetation removal (grubbing), and heavy equipment and construction vehicle activity during bridge installation and access road/trail construction. In addition, construction (inadvertent discharge of earth materials, storm run-off) may result in water quality impacts which may degrade aquatic habitat.

Cooper's hawk and yellow warbler may suffer mortality (nest removal or disturbance) and/or habitat degradation associated with vegetation removal (grubbing) and heavy equipment and construction vehicle activity during bridge installation and access road/trail construction.

4.0 RECOMMENDATIONS TO REDUCE IMPACTS

We recommend the bridge alignment be moved about 30 feet north (downstream) to avoid removal of tree no. 1 (coast live oak). In addition, the following construction-related measures should be implemented:

- Avoid the breeding bird season (February 15 through August 15) if feasible.
- If the breeding bird season cannot be avoided, conduct breeding bird surveys and postpone and/or re-direct construction activity to minimize disturbance of active nests.
- Conduct biological surveys immediately prior to the start of construction (vegetation removal) and relocate wildlife species found in the construction area.
- Provide a qualified biological monitor during construction.

5.0 CONCEPTUAL MITIGATION APPROACHES

The following mitigation approaches are based on likely mitigation requirements of the CDFW streambed alteration agreement, including a 3:1 ratio for temporary impacts and a 5:1 ratio for permanent impacts. Based on this assumption and the impact areas identified in Table 8, about 0.79 total acres of mitigation would be required. Revegetation of the temporary impact area with native plant species is recommended and would provide 0.13-acres of mitigation. Potential mitigation approaches to provide the balance of the required mitigation acreage may include:

- Conversion of annual brome grasslands located north of the Study Area and east of Arroyo Conejo to willow scrub and/or mulefat scrub.
- Giant reed removal in adjacent areas along Arroyo Conejo.
- Removal of the planted southern live oak trees and restoration with native oaks and native plant species such as toyon, mulefat, elderberry, black walnut and California rose.

6.0 REFERENCES

Baldwin, B., D. Goldman, D. Keil, R. Patterson, T. Rosatti and D. Wilken (editors). 2012. *The Jepson Manual, Vascular Plants of California*. University of California Press. Berkeley, CA.

Bramlet, D. 1997. Botanical Survey of the Tram Road Study Area. Memorandum to Carl Thelander, regarding the Hill Canyon Regional Recreational Facility.

California Native Plant Society. 2018. On-line Inventory of Rare and Endangered Vascular Plants of California, accessed May 22, 2018. Sacramento, CA.

California Natural Diversity Data Base (CNDDB). 2018. RAREFIND5 output for the Newbury Park 7.5-minute quadrangle. California Department of Fish and Wildlife. Sacramento, CA.

Edelman, P. 1990. *Critical Wildlife Corridor/Habitat Linkage Areas between the Santa Susana Mountains, the Simi Hills and the Santa Monica Mountains*. Prepared for The Nature Conservancy.

Garrett, Kimball and Jon Dunn. 1981. *Birds of Southern California, Status and Distribution*. Los Angeles Audubon Society. Los Angeles, CA.

Hall, E.R. 1981. *The Mammals of North America*. John Wiley & Sons. New York, NY.

Lieberstein, T. 1987. *Wildlife Corridor Design: A Case Study for Los Angeles and Ventura Counties*. Part III in a Series-Biogeography and the Zoo.

LSA Associates, Inc. 1996. *Updated Biological Constraints Analysis, Hill Canyon Regional Recreational Facility*. Prepared for Gold Dimensions.

Padre Associates, Inc. 1998. Environmental Impact Report for the Unit W & Unit F Interceptor Reconstruction Project. Prepared for the City of Thousand Oaks.

Padre Associates, Inc. 1999. Supplemental Environmental Impact Report for the Unit W Interceptor Phase II Reconstruction Project. Prepared for the City of Thousand Oaks.

Padre Associates, Inc. 2004. *Year 5 Monitoring Report for On-Site Mitigation for Phase I of the Unit W Interceptor Reconstruction Project*. Prepared for the City of Thousand Oaks.

Padre Associates, Inc. 2009. *Project Completion Report for the Mesa Feeder Crossing Relocation Project in the South Branch Arroyo Conejo, in the City of Thousand Oaks, Ventura County, California*. Prepared for the Calleguas Municipal Water District.

Penrod K., C. Cabanero, P. Beier, C. Luke, W. Spencer, E. Rubin, R. Sauvajot, S. Riley and D. Kamradt. 2006. *South Coast Missing Linkages Project: A Linkage Design for the Santa Monica-Sierra Madre Connection*.

Sawyer, J.O., T. Keeler-Wolf and J.M. Evens. 2009. *A Manual of California Vegetation (Second Edition).* California Native Plant Society.

Ventura County Watershed Protection District. 2006. Memorandum from Pam Lindsey to Antal Szijj, U.S Army Corps of Engineers, dated August 16, 2006.

Zeiner, David C., William F. Laudenslayer, Jr. and Kenneth E. Mayer. 1988. *California's Wildlife, Volume I, Amphibians and Reptiles*. California Department of Fish and Game. Sacramento, CA.

Zeiner, David C., William F. Laudenslayer, Jr., Kenneth E. Mayer, and Marshall White. 1990a. *California's Wildlife, Volume II, Birds*. California Department of Fish and Game. Sacramento, CA.

Zeiner, David C., William F. Laudenslayer, Jr., Kenneth E. Mayer, and Marshall White. 1990b. *California's Wildlife, Volume III, Mammals*. California Department of Fish and Game. Sacramento, CA.

APPENDIX A

VASCULAR PLANT FLORA OBSERVED WITHIN THE CONEJO CANYONS BRIDGE STUDY AREA, THOUSAND OAKS, CALIFORNIA

Appendix A
Vascular Plant Flora Observed within the Conejo Canyons Bridge Study Area, Thousand Oaks, California

Scientific Name	Common Name	Habit	Family	Wetland Status	Invasiveness Rating
Acmispon glaber var. glaber	Deerweed, California broom	PH	Fabaceae	*	
Acmispon strigosus	Strigose lotus	AH	Fabaceae	*	
*Amaranthus albus**	Tumble-weed	AH	Amaranthaceae	FACU	
Ambrosia psilostachya	Western ragweed	PH	Asteraceae	FACU	
Amsinckia menziesii var. intermedia	Fiddleneck	AH	Boraginaceae	*	
*Apium graveolens**	Celery	AH	Apiaceae	*	
Artemisia californica	California sagebrush	S	Asteraceae	*	
Artemisia douglasiana	Mugwort	PH	Asteraceae	FAC	
*Arundo donax**	Giant reed	PG	Poaceae	FACW	High
*Atriplex semibaccata**	Australian saltbush	PH	Chenopodiaceae	*	Moderate
*Avena barbata**	Slender wild oats	AG	Poaceae	*	Moderate
*Avena fatua**	Wild oats	AG	Poaceae	*	Moderate
Baccharis pilularis	Coyote brush	S	Asteraceae	*	
Baccharis salicifolia	Mule fat, seep-willow	S	Asteraceae	FAC	
*Brassica nigra**	Black mustard	AH	Brassicaceae	*	Moderate
*Bromus diandrus**	Ripgut grass	AG	Poaceae	*	Moderate
*Bromus hordeaceus**	Soft chess	AG	Poaceae	FACU	Limited
*Bromus madritensis ssp. rubens**	Red brome	AG	Poaceae	UPL	High
*Callistemon viminalis**	Weeping bottle-brush	T	Myrtaceae	*	
Camissoniopsis micrantha	Small evening primrose	AH	Onagraceae	*	
*Carduus pycnocephalus**	Italian thistle	AH	Asteraceae	*	Moderate
*Centaurea melitensis**	Tocalote	AH	Asteraceae	*	Moderate
*Chenopodium album**	Lamb's quarters	AH	Chenopodiaceae	FACU	
Chenopodium berlandieri var. sinuatum	Pit-seed goose-foot	AH	Chenopodiaceae	*	
Chenopodium californicum	Soap plant	AH	Chenopodiaceae	*	
*Chenopodium murale**	Nettle-leaf goose-foot	AH	Chenopodiaceae	FACU	
Clarkia cylindrica ssp. cylindrica	Speckled clarkia	AH	Onagraceae	*	
*Conium maculatum**	Poison hemlock	PH	Apiaceae	FACW	
*Convolvulus arvensis**	Bind-weed	PV	Convolvulaceae	*	
Croton setigerus	Turkey mullein	AH	Euphorbiaceae	*	
Cucurbita foetidissima	Calabazilla	AV	Cucurbitaceae	*	
*Cynodon dactylon**	Bermuda grass	PG	Poaceae	FACU	Moderate
*Cyperus involucratus**	Flat-sedge	PH	Cyperaceae	FACW	
Datura wrightii	Jimsonweed	PH	Solanaceae	UPL	
Deinandra fasciculata	Fascicled tarplant	AH	Asteraceae	FACU	
Elymus condensatus	Giant wild rye	PG	Poaceae	*	
Erigeron canadensis	Horseweed	AH	Asteraceae	*	
Eriodictyon crassifolium	Yerba santa	S	Boraginaceae	*	
Eriogonum elongatum var. elongatum	Wand buckwheat	S	Polygonaceae	*	
Eriogonum fasciculatum var. fasciculatum	California buckwheat	S	Polygonaceae	*	
*Erodium cicutarium**	Redstem filaree	AH	Geraniaceae	*	Limited
Eulobus californicus	Mustard evening primrose	AH	Onagraceae	*	
Euphorbia crenulata	Chinese caps	AH	Euphorbiaceae	*	
*Euphorbia serpens**	Matted sand mat	AH	Euphorbiaceae	FACU	
Euphorbia ocellata ssp. ocellata	Valley spurge	AH	Euphorbiaceae	*	
*Foeniculum vulgare**	Sweet-fennel	PH	Apiaceae	*	High
Fraxinus velutina	Velvet ash	T	Oleacea	FAC	
*Galium aparine**	Sticky-willy	AH	Rubiaceae	FACU	
Hesperoyucca whipplei	Our lord's candle	S	Agavaceae	*	
Heteromeles arbutifolia	Toyon	T	Rosaceae	*	
*Hirschfeldia incana**	Summer mustard	BH	Brassicaceae	*	Moderate
*Hordeum murinum**	Barley	AG	Poaceae	FACU	Moderate
Juglans californica	Southern California black walnut	T	Juglandaceae	FACU	
*Lactuca serriola**	Prickly lettuce	AH	Asteraceae	FACU	
*Lepidium didymum**	Lesser swine cress	AH	Brassicaceae	*	
Lupinus bicolor	Miniature lupine	AH	Fabaceae	*	
Madia elegans	Common madia	AH	Asteraceae	*	
Malacothrix saxatilis var. tenuifolia	Cliff aster	PH	Asteraceae	*	
*Malva parviflora**	Cheese weed	AH	Malvaceae	*	
Malvella leprosa	Alkali mallow	AH	Malvaceae	*	
Marah macrocarpus var. macrocarpus	Wild cucumber	PV	Cucurbitaceae	*	
*Marrubium vulgare**	Horehound	PH	Lamiaceae	FACU	Limited
*Matricaria discoidea**	Pineapple weed	AH	Asteraceae	FACU	
*Medicago polymorpha**	Bur clover	AH	Fabaceae	FACU	Limited
*Melilotus albus**	White sweet-clover	PH	Fabaceae	*	
*Melilotus indicus**	Sour-clover	BH	Fabaceae	FACU	
Mimulus aurantiacus	Bush monkeyflower	S	Phrymaceae	*	
Mimulus guttatus	Creek monkeyflower	PH	Phrymaceae	OBL	
Nasturtium officinale	Water-cress	PH	Brassicaceae	OBL	
*Nicotiana glauca**	Tree tobacco	S	Solanaceae	FAC	Moderate
*Parthenocissus quinquefolia**	Creeper	PV	Vitaceae	FAC	
Persicaria lapathifolia	Willow weed	AH	Polygonaceae	FACW	
Phacelia cicutaria var. hispida	Caterpillar phacelia	AH	Boraginaceae	*	
Phacelia ramosissima var. ramosissima	Branching phacelia	PH	Boraginaceae	FACU	
*Plantago lanceolata**	English plantain	PH	Plantaginaceae	FAC	Limited
*Plantago major**	Common plantain	PH	Plantaginaceae	FAC	
Platanus racemosa	Western sycamore	T	Plantanaceae	FAC	
Poa secunda	Bluegrass	PG	Poaceae	FACU	
*Polygonum aviculare**	Knot-weed	AH	Polygonaceae	FAC	
*Polypogon monspeliensis**	Annual beard grass	AG	Poaceae	FACW	Limited
Populus fremontii	Fremont cottonwood	T	Salicaceae	*	
Populus trichocarpa	Black cottonwood	T	Salicaceae	FAC	
Quercus agrifolia var. agrifolia	Coast live oak	T	Fagaceae	*	

Appendix A
Vascular Plant Flora Observed within the Conejo Canyons Bridge Study Area, Thousand Oaks, California

Scientific Name	Common Name	Habit	Family	Wetland Status	Invasiveness Rating
Quercus berberidifolia	Scrub oak	S	Fagaceae	*	
Rhamnus crocea	Red-berry	S	Rhamnaceae	*	
Rhamnus ilicifolia	Holly-leaved redberry	S	Rhamnaceae	*	
Rhus integrifolia	Lemonade berry	S	Anacardiaceae	*	
*Ricinus communis**	Castor bean	S	Euphorbiaceae	FACU	Limited
Rosa californica	California wildrose	S	Rosaceae	FAC	
*Rumex crispus**	Curly dock	PH	Polygonaceae	FAC	Limited
Rumex salicifolius	Willow dock	PH	Polygonaceae	FACW	
Salix exigua	Sandbar willow	S	Salicaceae	FACW	
Salix laevigata	Red willow	T	Salicaceae	FACW	
Salix lasiolepis	Arroyo willow	T	Salicaceae	FACW	
*Salsola tragus**	Russian thistle	AH	Chenopodiaceae	FACU	Limited
Salvia leucophylla	Purple sage	S	Lamiaceae	*	
Salvia mellifera	Black sage	S	Lamiaceae	*	
Sambucus nigra ssp. caerulea	Blue elderberry	T	Adoxaceae	FACU	
Schoenoplectus californicus	California bulrush	PH	Cyperaceae	OBL	
*Silybum marianum**	Milk thistle	AH	Asteraceae	*	Limited
*Sisymbrium altissimum**	Tumble mustard	AH	Brassicaceae	FACU	
*Sisymbrium irio**	London rocket	AH	Brassicaceae	*	Moderate
Solanum americanum	American nightshade	AH	Solanaceae	*	
Solanum xanti	Purple nightshade	PH	Solanaceae	*	
*Sonchus oleraceus**	Common sow thistle	AH	Asteraceae	UPL	
*Stenotaphrum secundatum**	Saint Augustine grass	PG	Poaceae	FAC	
*Stipa miliacea var. miliacea**	Smilo grass	PG	Poaceae	*	Limited
Toxicodendron diversilobum	Poison oak	S	Anacardiaceae	FACU	
Urtica dioca	Giant nettle	PH	Urticaceae	FAC	
*Urtica urens**	Dwarf nettle	AH	Urticaceae	*	
*Veronica anagallis-aquatica**	Water speed-well	PH	Plantaginaceae	OBL	
*Washingtonia robusta**	Mexican fan palm	T	Arecaceae	FACW	Moderate

Notes:
Scientific nomenclature follows The Jepson Manual Second Edition (Baldwin et al., 2012), including supplements (old names in brackets).
An "*" indicates non-native species which have become naturalized or persist without cultivation.
An "**" indicates species which have been planted and may not persist without cultivation.

Habit Definitions:
- AF = annual fern or fern ally.
- AG = annual grass.
- AH = annual herb.
- BH = biennial herb.
- PF = perennial fern or fern ally.
- PG = perennial grass.
- PH = perennial herb.
- PV = perennial vine.
- S = shrub.
- T = tree.

Invasiveness Rating from the online database of the California Invasive Plant Council

Wetland Status from Arid West 2016 Regional Wetland Plant List
- OBL - Obligate wetland: almost always occurs in wetlands (>99% probability)
- FACW - Facultative-Wetland: usually occurs in wetlands (67-99% probability)
- FAC - Facultative: equally likely to occur in wetlands or non-wetlands (34-66% probability)
- FACU - Facultative-Upland: usually occurs in non-wetlands (1-33% probability)
- UPL - Upland: almost always occurs in non-wetlands (>99% probability)
- *: not addressed in the wetland plant list, non-wetland species

APPENDIX B

VERTEBRATE ANIMAL SPECIES REPORTED FROM HILL CANYON AND THOSE OBSERVED WITHIN THE CONEJO CANYONS BRIDGE STUDY AREA, THOUSAND OAKS, CALIFORNIA

Appendix B

Vertebrate Animal Species Reported from Hill Canyon and Arroyo Conejo Upstream of the Wastewater Treatment Plant and those Observed within the Conejo Canyons Bridge Study Area, Thousand Oaks, California

FAMILY Common Name	Scientific Name	Habitat Use(1)	Status(2)
FISH			
Cyprinidae			
Goldfish	*Carassius auratus*	B/F	--
*Carp	*Cyprinus carpio*	B/F	--
Arroyo chub	*Gila orcuttii*	B/F	CSC
Ictaluridae			
Black bullhead	*Ameiurus melas*	B/F	--
Centrarchidae			
Green sunfish	*Lepomis cyanellus*	B/F	--
Poecilidae			
Western mosquitofish	*Gambusia affinis*	B/F	--
AMPHIBIANS AND REPTILES			
Bufonidae			
Western toad	*Anaxyrus boreas halophilus*	B/F	--
Ranidae			
*Bullfrog	*Lithobates catesbeianus*	B/F	--
Hylidae			
Baja California tree frog	*Pseudacris hypochondriaca*	B/F	--
Emydidae			
Western pond turtle	*Emys marmorata*	B/F	CSC
Iguanidae			
*Western fence lizard	*Sceloporus occidentalis longipes*	B/F	--
*Side-blotched lizard	*Uta stansburiana elegans*	B/F	--
Teiidae			
Coastal western whiptail	*Aspidoscelis tigris stejnegeri*	B/F	CSC
Scincidae			
Western skink	*Eumeces skiltonianus*	B/F	--
Anguidae			
San Diego alligator lizard	*Elgaria multicarinatus webbii*	B/F	--
Colubridae			
San Diego gopher snake	*Pituophis melanoleucus annectens*	B/F	--
Two-striped garter snake	*Thamnophis hammondii*	B/F	CSC
Southern Pacific rattlesnake	*Crotalus viridis helleri*	B/F	--
California kingsnake	*Lampropeltis getulus californiae*	B/F	--
San Diego mountain kingsnake	*Lampropeltis zonata pulchra*	B/F	WL

Appendix B

Vertebrate Animal Species Reported from Hill Canyon and Arroyo Conejo Upstream of the Wastewater Treatment Plant and those Observed within the Conejo Canyons Bridge Study Area, Thousand Oaks, California

FAMILY Common Name	Scientific Name	Habitat Use(1)	Status(2)
BIRDS			
Phalacrocoracidae			
Double-crested cormorant	*Phalacrocorax auritus*	F	WL (rookery)
Ardeidae			
Great blue heron	*Ardea herodias*	F	--
*Green heron	*Butorides striatus*	F	--
Great egret	*Ardea alba*	F	--
Snowy egret	*Egretta thula*	F	--
Anatidae			
*Mallard	*Anas platyrhynchos*	B/F	--
Lesser scaup	*Aythya affinis*	F	--
Rallidae			
Sora	*Porzana carolina*	F	--
American coot	*Fulica americana*	B/F	--
Charadriidae			
Killdeer	*Charadrius vociferus*	B/F	--
Scolopacidae			
Lesser yellowlegs	*Tringa flavipes*	F	--
Spotted sandpiper	*Actitis macularius*	F	--
Laridae			
Western gull	*Larus occidentalis*	F	--
Cathartidae			
Turkey vulture	*Cathartes aura*	B/F	--
Accipitridae			
*Red-tailed hawk	*Buteo jamaicensis*	B/F	--
Red-shouldered hawk	*Buteo lineatus*	B/F	--
*Cooper's hawk	*Accipiter cooperi*	B/F	WL (nesting)
Sharp-shinned hawk	*Accipiter striatus*	F	WL (nesting)
White-tailed kite	*Elanus caerulus*	B/F	CP
Pandionidae			
Osprey	*Pandion haliaetus*	F	WL (nesting)
Falconidae			
American kestrel	*Falco sparverius*	B/F	--
Phasanidae			
California quail	*Callipepla californicus*	B/F	--
Columbidae			
*Mourning dove	*Zenaida macroura*	B/F	--
Rock dove	*Columba livia*	B/F	--

Appendix B

Vertebrate Animal Species Reported from Hill Canyon and Arroyo Conejo Upstream of the Wastewater Treatment Plant and those Observed within the Conejo Canyons Bridge Study Area, Thousand Oaks, California

FAMILY Common Name	Scientific Name	Habitat Use(1)	Status(2)
Strigidae			
Great horned owl	*Bubo virginianus*	B/F	--
Short-eared owl	*Asio flammeus*	F	CSC (nesting)
Apodidae			
White-throated swift	*Aeronautes saxatilis*	B/F	--
Trochilidae			
*Anna's hummingbird	*Calypte anna*	B/F	--
Black-chinned hummingbird	*Archilochus alexandri*	B/F	--
Costa's hummingbird	*Calypte costae*	B/F	--
Allen's hummingbird	*Selasphorus sasin*	B/F	--
Picidae			
Northern flicker	*Colaptes cafer*	B/F	--
Acorn woodpecker	*Melanerpes formicivorous*	B/F	--
*Nuttall's woodpecker	*Picoides nuttallii*	B/F	--
*Downy woodpecker	*Picoides pubescens*	B/F	--
Hairy woodpecker	*Picoides villosus*	B/F	--
Tyrannidae			
*Black phoebe	*Sayornis nigricans*	B/F	--
Western kingbird	*Tyrannus verticalis*	B/F	--
Say's phoebe	*Sayornis saya*	B/F	--
*Pacific slope flycatcher	*Empiodonax difficilis*	B/F	--
Ash-throated flycatcher	*Myiarchus cinerascens*	B/F	--
Cassin's kingbird	*Tyrannus vociferans*	B/F	--
Alaudidae			
Horned lark	*Eremophila alpestris actia*	F	WL
Hirundinidae			
*Cliff swallow	*Petrochelidon pyrrhonota*	B/F	--
Barn swallow	*Hirundo rustica*	B/F	--
Violet-green swallow	*Tachycineta thalassina*	B/F	--
Northern rough-winged swallow	*Stelgidopteryx serripennis*	B/F	--
Tree swallow	*Tachycineta bicolor*	B/F	--
Alcedinidae			
Belted kingfisher	*Ceryle alcyon*	B/F	--
Corvidae			
*American raven	*Corvus corax*	B/F	--
*American crow	*Corvus brachyrhynchos*	B/F	--
*Western scrub jay	*Aphelocoma californica*	B/F	--
Paridae			
*Oak titmouse	*Baeolophus inornatus*	B/F	--
Aegithalidae			
*Common bushtit	*Psaltriparus minimus*	B/F	--

Appendix B

Vertebrate Animal Species Reported from Hill Canyon and Arroyo Conejo Upstream of the Wastewater Treatment Plant and those Observed within the Conejo Canyons Bridge Study Area, Thousand Oaks, California

FAMILY Common Name	Scientific Name	Habitat Use(1)	Status(2)
Troglodytidae			
Bewick's wren	*Thryomanes bewickii*	B/F	--
House wren	*Troglodytes aedor*	B/F	--
Cactus wren	*Campylorhynchus brunneicapillus*	B/F	--
Canyon wren	*Catherpes mexicanus*	B/F	--
Regulidae			
Ruby-crowned kinglet	*Regulus calendula*	F	--
Sylviidae			
*Wrentit	*Chamaea fasciata*	B/F	--
Turdidae			
American robin	*Turdus migratorius*	B/F	--
Swainson’s thrush	*Catharus ustulatus*	B/F	--
Apodidae			
White-throated swift	*Aeronautes saxatilis*	B/F	
Mimidae			
Northern mockingbird	*Mimus polyglottos*	B/F	--
California thrasher	*Toxostoma redivivum*	B/F	--
Vireonidae			
Least Bell's vireo	*Vireo belli pusillus*	B/F	SE, FE
Warbling vireo	*Vireo gilvus*	B/F	--
Hutton's vireo	*Vireo huttoni*	B/F	--
Sturnidae			
European starling	*Sturnus vulgaris*	B/F	--
Ptilogonatidae			
Phainopepla	*Phainopepla nitens*	B/F	--
Emberizidae			
*Orange-crowned warbler	*Vermivora celata*	B/F	--
Yellow-rumped warbler	*Dendroica coronata*	F	--
*Yellow warbler	*Setophaga petechia*	B/F	CSC
Yellow-breasted chat	*Icteria virens*	B/F	CSC
*Common yellowthroat	*Geothlypis trichas*	B/F	--
White-crowned sparrow	*Zonotrichia leucophrys*	B/F	--
*Song sparrow	*Melospiza melodia cooperii*	B/F	--
S. California rufous-crowned sparrow	*Aimophila ruficeps canescens*	B/F	WL
Brewer's blackbird	*Euphagus cyanocephalus*	B/F	--
Red-winged blackbird	*Agelaius phoeniceus*	B/F	--
*Spotted towhee	*Pipilo maculatus*	B/F	--
Dark-eyed junco	*Junco hyemalis*	B/F	--
Blue grosbeak	*Guiraca caerulea*	B/F	--
*Black-headed grosbeak	*Pheucticus melanocephalus*	B/F	--
*California towhee	*Melozone crissalis*	B/F	--
Lark sparrow	*Chondestes grammacus*	B/F	--

Appendix B

Vertebrate Animal Species Reported from Hill Canyon and Arroyo Conejo Upstream of the Wastewater Treatment Plant and those Observed within the Conejo Canyons Bridge Study Area, Thousand Oaks, California

FAMILY Common Name	Scientific Name	Habitat Use(1)	Status(2)
Hooded oriole	*Icterus cucullatus*	B/F	--
Bullock's oriole	*Icterus bullockii*	B/F	--
Brown-headed cowbird	*Molothrus ater*	B/F	--
Western meadowlark	*Sturnella neglecta*	B/F	--
Fringillidae			
House finch	*Carpodacus mexicanus*	B/F	--
*Lesser goldfinch	*Spinus psaltria*	B/F	--
American goldfinch	*Carduelis tristis*	B/F	--
Lawrence's goldfinch	*Carduelis lawrencei*	B/F	--
Purple finch	*Carpodacus purpureus*	B/F	--
Passeridae			
House sparrow	*Passer domesticus*	B/F	--
MAMMALS			
Didelphidae			
Virginia opossum	*Didelphis virginiana*	B/F	--
Vespertilionidae			
Yuma myotis	*Myotis yumanensis*	B/F	--
Canidae			
*Coyote	*Canis latrans*	B/F	--
Gray fox	*Urocyon cinereoargenteus*	B/F	--
*Dog	*Canis familiaris*	F	--
Procyonidae			
Raccoon	*Procyon lotor*	B/F	--
Mustelidae			
Striped skunk	*Mephitis mephitis*	B/F	--
Cervidae			
*Black-tailed deer	*Odocoileus hemionus*	B/F	--
Felidae			
Mountain lion	*Felis concolor*	F	--
Bobcat	*Lynx rufus*	B/F	--
Feral cat	*Felis catus*	B/F	--
Sciuridae			
*California ground squirrel	*Spermophilus beecheyi*	B/F	--
Western gray squirrel	*Sciurus griseus*	B/F	--
Geomyidae			
*Botta's pocket gopher	*Thomomys bottae*	B/F	--

Appendix B

Vertebrate Animal Species Reported from Hill Canyon and Arroyo Conejo Upstream of the Wastewater Treatment Plant and those Observed within the Conejo Canyons Bridge Study Area, Thousand Oaks, California

FAMILY Common Name	Scientific Name	Habitat Use(1)	Status(2)
Cricetidae			
Deer mouse	*Peromyscus maniculatus*	B/F	--
*Dusky-footed woodrat	*Neotoma fuscipes macrotis*	B/F	--
Leporidae			
*Audubon's cottontail	*Sylvilagus audubonii*	B/F	--
Brush rabbit	*Sylvilagus bachmanii*	B/F	--
Muridae			
Black rat	*Rattus rattus*	B/F	--
House mouse	*Mus musculus*	B/F	--

* Observed during field surveys of the Conejo Canyons Bridge Study Area

(1) Habitat Use
- B= Breeding
- F= Foraging

(2) Status
- CP= Protected under California Fish & Game Code
- CSC= CDFW Species of Special Concern
- SA= CDFW Special Animal
- SE= State Endangered
- FE= Federal Endangered
- WL= CDFW Watch List

Fish nomenclature based on Swift et al. (1993)
Amphibian and reptile nomenclature based upon Jensen (1983)
Bird nomenclature based upon American Ornithologists Union (2017)
Mammal nomenclature based upon Hall (1981)

APPENDIX D



Data Sources: Stantec project plans, p.10; City aerial imagery, March 2018; COSCA aerial imagery, March 2019.

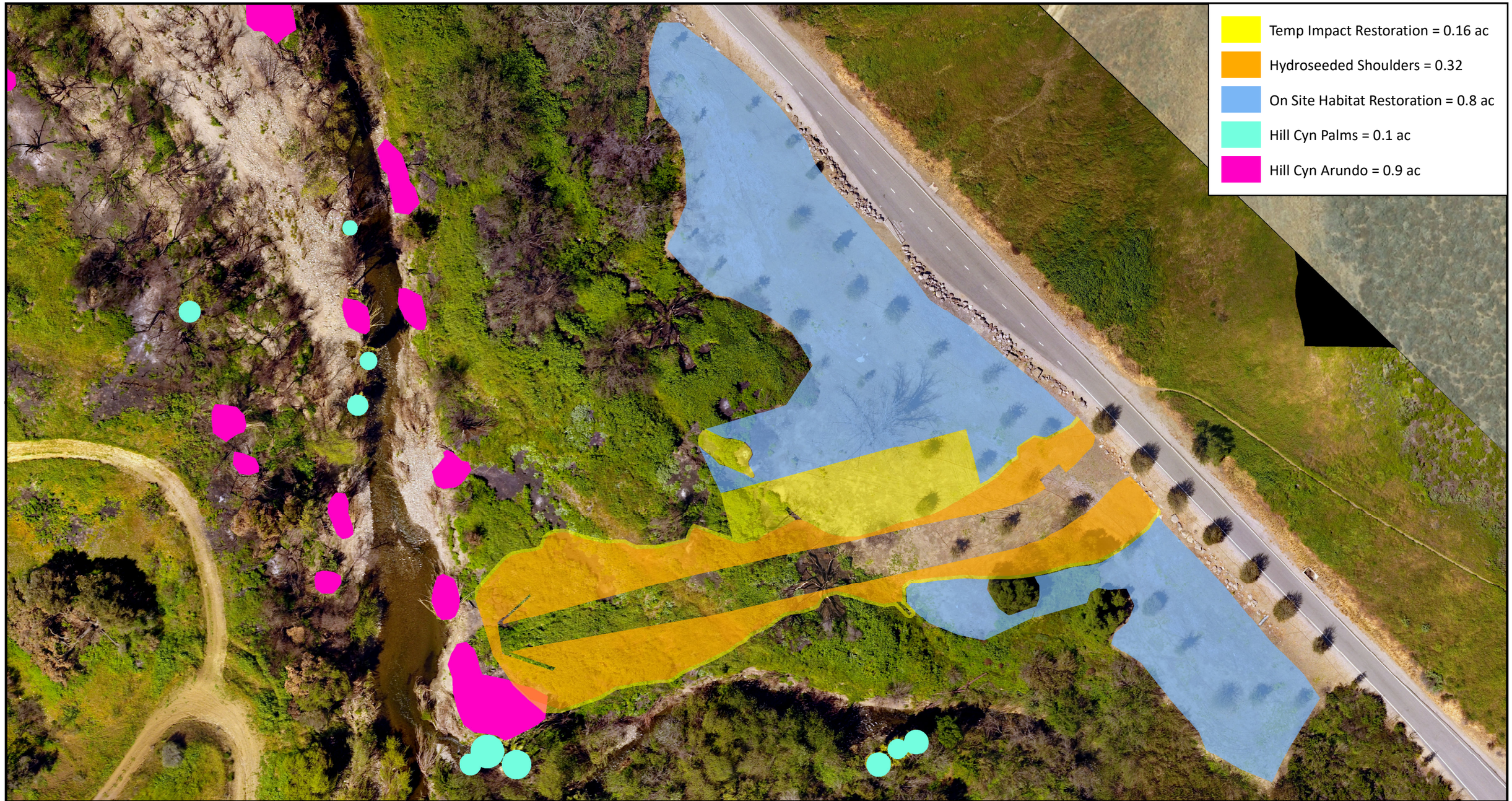
Giant Reed Removal & Habitat Restoration Areas

Conejo Canyons Bridge

0 250 500 1,000 Feet

CONEJO OPEN SPACE CONSERVATION AGENCY
COSCA

Document Path: U:_COSCA\Location Maps\Conejo Cyns Bridge\Conejo Cyns Bridge-arundo.mxd



Data Sources: Stantec project plans, p.10; COSCA aerial imagery, March 2019.

Site Map - Habitat Restoration Area

Conejo Canyons Bridge

0 50 100 200 Feet

CONEJO OPEN SPACE CONSERVATION AGENCY
COSCA

Document Path: U:_COSCA\Location Maps\Conejo Cyns Bridge\CC Bridge-Habitat Restoration.mxd

APPENDIX E

Arborist Report

Conejo Canyons Bridge at HCTP

Report Date

Prepared for:

City of Thousand Oaks
Public Works Department
2100 Thousand Oaks Blvd.
Thousand Oaks, CA 91362

Prepared by:

Stantec Consulting Services Inc.
290 Conejo Ridge Avenue
Thousand Oaks, California 91361

Sign-off Sheet

This arborist report was prepared by Stantec Consulting Services Inc. (Stantec) for City of Thousand Oaks (Client) Conejo Canyons Bridge at HCTP Project. Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by Ethan Martin

(signature)

Ethan Martin, Biologist/ISA Certified Arborist #WE-6832A

Independently Reviewed by Michael P. Weber

(signature)

Michael Weber, Principal Scientist

Technically Reviewed and Approved by

(signature)

Jared Varonin, Principal Biologist

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1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) conducted a tree survey in support of the Conejo Canyons Bridge at HCTP Project (proposed project). The purpose of the tree survey, led by an International Society of Arboriculture (ISA) certified arborist, was to collect data on the trees present within and adjacent to the project footprint for inclusion in the project planning and design, and to support the issuance of permits/authorizations from the City of Thousand Oaks (City) for the removal/trimming of trees within the project footprint. This report summarizes the information collected during the survey, provides details on the applicable tree ordinances/regulations that apply to the proposed project, and presents proposed mitigation efforts for the replacement of removed trees.

2.0 PROJECT DESCRIPTION

The proposed project is located in the City of Thousand Oaks in Ventura County, California. The proposed project is located in the Newbury Park, California 7.5-minute U.S. Geological Survey quadrangle within a parcel (APN 6670120160) zoned as Open Space (City of Thousand Oaks 2015). The area surveyed encompasses all currently planned project activities and infrastructure along with an approximate 25 foot buffer (Biological Study Area). The Biological Study Area for the arborist survey covers approximately 1.4 acres and is located to the west of the Hill Canyon Wastewater Treatment Plant, between Hill Canyon Fire Road and Rancho Conejo Boulevard (Appendix A, Figure 1).

3.0 REGULATORY REQUIREMENTS

Articles 42 and 43 of Chapter 4 of Title 9 of the City's Municipal Code state that no person shall cut, remove, encroach into the protected zone or relocate any oak tree on any public or private property within the City unless a valid permit has been issued by the City. The City defines an "oak tree" under Municipal Code Section 9-4.4202 as "any oak tree of the Genus Quercus including, but not limited to, Valley Oak (*Quercus lobata*), California Live Oak (*Quercus agrifolia*) and Scrub Oak (*Quercus berberidifolia*), regardless of size."

City of Thousand Oaks Municipal Code Article 42, Oak Tree Preservation and Protection, Section 9-4.4205 states "Trees that do not exceed two (2") inches in diameter when measured at a point four and a half (4.5) feet above trees natural grade" are exempt from municipal code requirements.

Article 43, Landmark Tree Preservation and Protection covers trees that are not oaks, Section 9-4.4302 parts (f) and (g) defines historic and landmark trees. "Historic tree shall mean a tree that because of its historic or cultural significance will be preserved and safeguarded as a symbol of the City's heritage and to the beauty and image of the City of Thousand Oaks. All historic trees shall be designated pursuant to the procedure set forth within this article." A landmark tree is defined as "a tree that because of its size, age, or unique and irreplaceable values to the community preserved and safeguarded as symbolic of the City's heritage, beauty and image." The City Municipal Code lists several tree species as Landmark Trees. The listed trees are California sycamore (*Platanus racemosa*), California bay laurel (*Umbellularia californica*), California black walnut (*Juglans californica*), and California holly (*Heteromeles arbutifolia*).

4.0 METHODS

The tree survey was conducted by Stantec biologist/ISA Certified Arborist Ethan Martin and Staff Biologist Mayra Martinez on May 28, 2019. All trees in the Biological Study Area were inventoried during the survey (Appendix A, Figure 2). Data collected during the arborist survey included tree species, trunk diameter at 4.5 feet off the ground (diameter at breast height [DBH]), and the overall health and structural condition. The trunk locations of all recorded trees were recorded using a Global Positioning System receiver capable of sub-meter accuracy.

Evaluation of the health and structural condition of each tree was observed using the following scale of 1 to 5:

- **5:** A healthy, vigorous tree, reasonably free of disease, with good structure and form typical of the species.
- **4:** A tree with slight decline in vigor, small amount of twig dieback, minor structural defects that could be corrected.
- **3:** A tree with moderate vigor, moderate twig and small branch dieback, thinning of crown, poor leaf color, moderate structural defects that may be mitigated with care.
- **2:** A tree in decline, epicormic growth, extensive dieback of medium to large branches, significant structural defects that cannot be abated.
- **1:** A tree in severe decline, dieback of scaffold branches and or trunk, mostly epicormic growth; extensive structural defects that cannot be abated.

5.0 RESULTS

A total of 21 trees were tagged and 22 mapped in the Biological Study Area. These trees were comprised of six different species which included 1 Mexican fan palm (*Washingtonian robusta*), 2 willow (*Salix* sp.), 3 elderberry (*Sambucus nigra*), 1 scrub oak (*Quercus berberidifolia*), 1 coast live oak (*Quercus agrifolia*), and 14 southern live oak (*Quercus virginiana)*. One of the mapped trees was unable to be measured and tagged because it was surrounded by poison hemlock. The data collected and photographs for each tree can be found in Table 1 below and Appendix B respectively.

Articles 42 and 43 of Chapter 4 of Title 9 of the City's Municipal Code protects oak trees within the City. In total, all 15 of the oak trees mapped within the Biological Study Area are considered ordinance-size (i.e., greater than 2 inches DBH at 4.5 feet above ground; refer to Appendix B for additional information). No exemptions listed in the Municipal Code were found to be applicable to the oak trees within the extent of the proposed grading limits (refer to Figure 2, Appendix A). Therefore, a permit will be required to remove any oaks within and adjacent to the project's construction footprint.

Since the remainder of the mapped/tagged trees are not a species of oak, their removal would not fall under the protection of Article 42 of Chapter 4 of Title 9 of the City's Municipal Code. Article 43 of Chapter 4 of Title 9, parts (f) and (g), of the City's Municipal Code defines historic and landmark trees. No tree mapped within the Biological Study Area meets the definition of historic or landmark trees as presented in the Municipal Code; therefore this category of permit will not be required for the proposed project. An inventory of the tagged trees, including health and DBH is as follows:

Table 1 – Tree Inventory

Tag Number	Common Name	Species	Diameter at Breast Height (in)	General Condition	Notes
1	Southern Live Oak	*Quercus virginiana*	5.89	4	Good structure and scaffolding; minor scorching
2	Southern Live Oak	*Quercus virginiana*	6.05	4	Good structure and scaffolding; minor scorching
3	Southern Live Oak	*Quercus virginiana*	5.73	4	Good structure and scaffolding; minor scorching
4	Southern Live Oak	*Quercus virginiana*	5.41	4	Good structure and scaffolding; minor scorching
5	Southern Live Oak	*Quercus virginiana*	5.41	4	Some branches with included bark[1]
6	Elderberry	*Sambucus nigra*	35.99	3	Poor branch structure, and included bark[1]
7	Southern Live Oak	*Quercus virginiana*	6.05	4	Included bark[1], good branch structure, girdling roots[3]
8	Elderberry	*Sambucus nigra*	28.98	3	Included bark[1], good structure; due to its size/height this elderberry, in its current condition, is considered a large shrub (instead of a tree).
9	Southern Live Oak	*Quercus virginiana*	4.46	3	Poor branch structure, many branches at 90 degrees, included bark[1]
10	Southern Live Oak	*Quercus virginiana*	4.78	4	Rubber tie grown into tree, good structure
11	Southern Live Oak	*Quercus virginiana*	5.73	4	Good branch structure, included bark[1], minor insect damage to the leaves
12	Southern Live Oak	*Quercus virginiana*	4.78	3	Too many branches growing straight up, a lot of branches rubbing together; included bark[1]
13	Southern Live Oak	*Quercus virginiana*	4.78	4	Fire damage, minor scorching, branching structure is moderate, many open spaces
14	Southern Live Oak	*Quercus virginiana*	4.78	5	Good branch structure; some branches rubbing
15	Southern Live Oak	*Quercus virginiana*	4.86	4	Good branch structure; minor scorching by fire, some branches close together, overgrown crown[2]
No Tree Tag	Elderberry	*Sambucs nigra*	Approx. 79.62	3	Declining, overgrown, several cracked branches, surrounded by poison hemlock
16	Mexican Fan Palm	*Washingtonia robusta*	10.19	5	Good health
17	Willow	*Salix* sp.	4.78	1	Declining health, many dead branches, all sprouts from a fallen tree
18	Willow	*Salix* sp.	52.55	2	Declining health, many dead branches, all sprouts from a fallen tree
19	Scrub Oak	*Quercus berberidifolia*	15.29	1	Fire damage, many dead branches, resprouting near base of trunk, new growth at tips of some branches

Tag Number	Common Name	Species	Diameter at Breast Height (in)	General Condition	Notes
20	Coast Live Oak	*Quercus agrifolia*	20.7	1	Boring insect damage, fire damage, major rot, large cavity in trunk
21	Southern Live Oak	*Quercus virginiana*	5.2	4	Good structure and scaffolding; minor scorching

1. Included bark is a place where the bark is turned inward, rather than pushed out.
2. An overgrown crown means the crown may be getting too heavy for the branches to support the weight.
3. Girdling roots are usually the result of a tree being kept in a container for too long and the roots begin to grow in a circular pattern. The result of this can sometimes be that the girdling roots choke off the trunk or another major root as the tree grows older, limiting the flow of nutrients and water.



6.0 RECOMMENDATIONS

There are a total of 10 trees (1 coast live oak, 7 southern live oaks and 2 elderberry) that will need to be removed as part of the project (tree numbers 1-2, 7-10, 13, 15, and 20 as depicted on Figure 2 [Appendix A]) will be removed as they are within the maximum extent of the proposed grading limits. Every oak tree that is removed will need to be replaced as per the City Municipal Code. Although not required per the Municipal Code the removed elderberry will be replaced in conjunction with mitigation requirements specified by the California Department of Fish and Wildlife. As shown on Figure 2 (Appendix A), tree numbers 14 and 19 are just outside the proposed grading/project limits and can be avoided during construction activities; therefore, they are not proposed for removal. Tree number 19 may require pruning of burnt limbs that extend into the proposed project area but the remaining limbs and root structure will remain intact.

For those trees occurring near, but not within, the extent of grading limits a tree protection zone should be set up around tree to protect them from accidental damage to their trunks, roots and canopies while heavy machinery and vehicles are operating in the vicinity. Tree protection zones of approximately eight feet in diameter, starting from the trunk (around the whole tree) and extending out towards the edge of the tree canopy, should be staked and barricaded from the active construction area. The approximate 8 foot diameter zone is based on the average canopy diameter for the trees within the Survey Area and can be adjusted a case by case basis depending on the size and/or species of tree.

For every oak tree that is removed another oak tree will be planted in its place. The City plans to replace the removed trees by planting a total of 32 oak trees as mitigation for the 8 removed. Approximately 20 of these trees will be planted adjacent to the newly constructed bridge in an area that has been historically maintained free of vegetation. The remaining 12 trees will be planted within City property at yet to be determined locations. To compensate for the removal of the 2 elderberries the City has included approximately 20 elderberries into the restoration palette that will be used within areas adjacent to the newly constructed bridge.

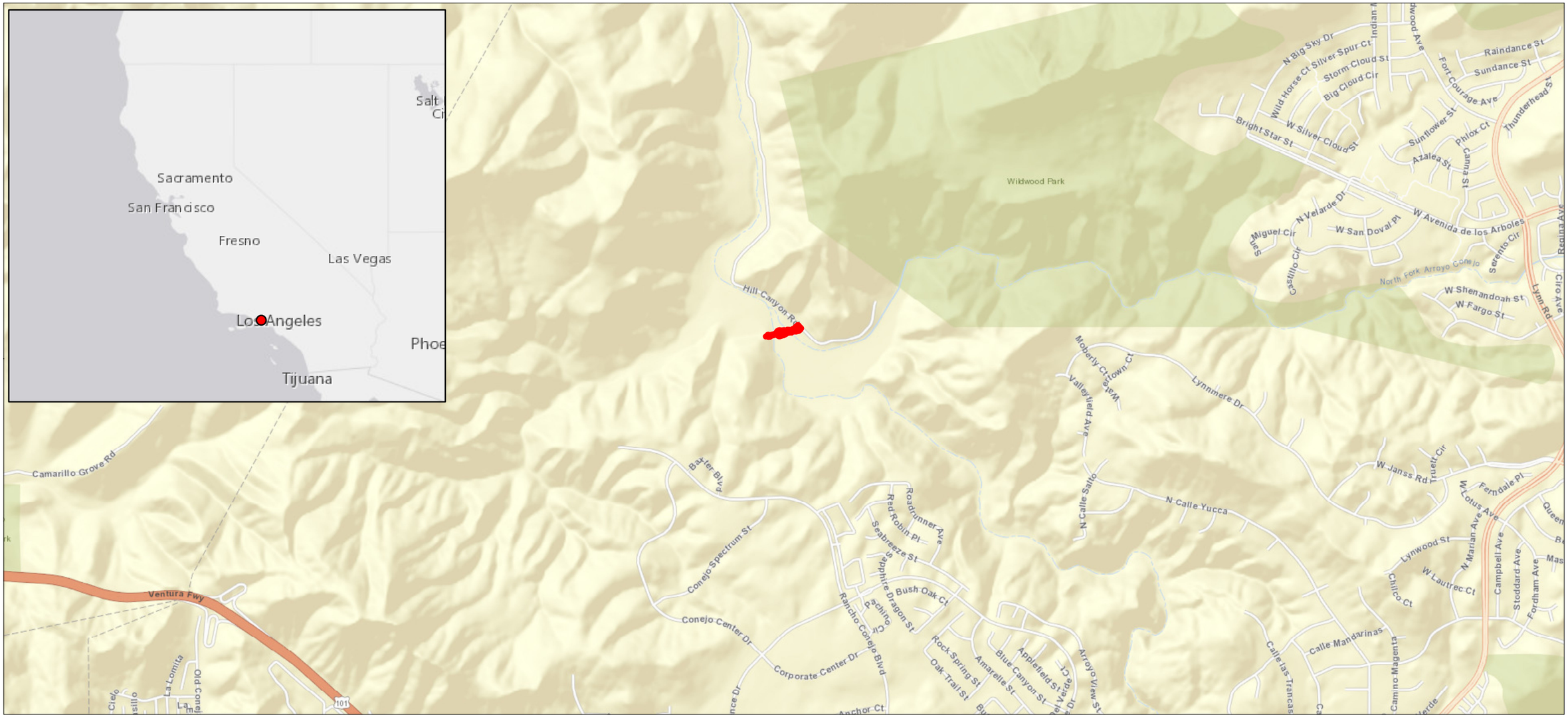
It is recommended that all replacement oak tree stock be 24-inch box trees as this size tree is generally able to establish its roots in a relatively short amount of time. A 24-inch box tree can catch up to and outgrow larger box trees because it takes less time for the smaller tree to establish a new root system if it is in good health.

7.0 REFERENCES

City of Thousand Oaks 1994. Oak Tree Preservation and Protection Standards. Amended January 15, 2016. Accessed online May 29, 2019. https://www.toaks.org/home/showdocument?id=21668

City of Thousand Oaks. 2015. Thousand Oaks General Plan: Land Use and Circulation Elements. Accessed online May 29, 2019. https://www.toaks.org/home/showdocument?id=336

APPENDIX A
Figures



Project Location

0 440 880 metres

(At original document size of 11x17)
1:23,279

N

Stantec

Project Location	Prepared by DL on 2019-05-31
	TR by EM on 2019-06-7
Thousand Oaks, CA	IR Review by JV on 2019-06-13
Client/Project	2064173900

Conejo Canyon Bridge

Figure No.

1

Title

Project Location Map

Notes
1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
2. Background: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community
Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community



Biological Study Area
Grading Limits (Impact Area)
Design Layout
Scrub Oak
Coast Live Oak
Elderberry
Mexican Fan Palm
Southern Live Oak
Willow
Elderberry (no tag)
Trees Proposed for Removal

0 10 20 metres
(At original document size of 11x17)
1:600

N

Stantec

Project Location
Thousand Oaks, CA

Prepared by JV on 2019-07-01
TR by EM on 2019-07-01
IR Review by JV on 2019-07-01

Client/Project
2064173900

Conejo Canyon Bridge

Figure No.
2

Title
Tree Location Map

Notes
1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

APPENDIX B

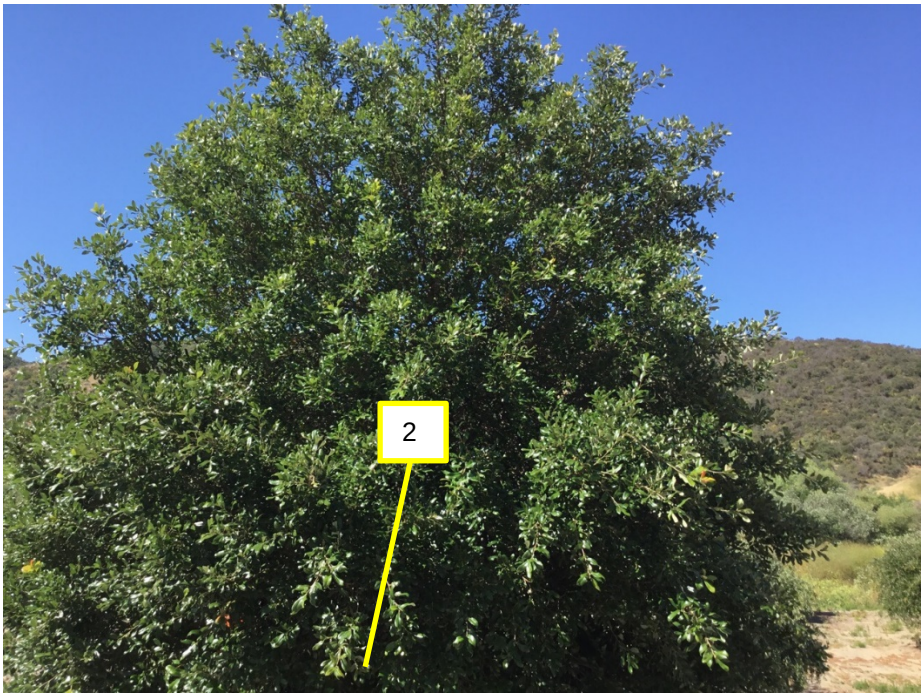
Photographic Log

Photographs of Conejo Canyons Bridge at HCTP Project Tree Survey

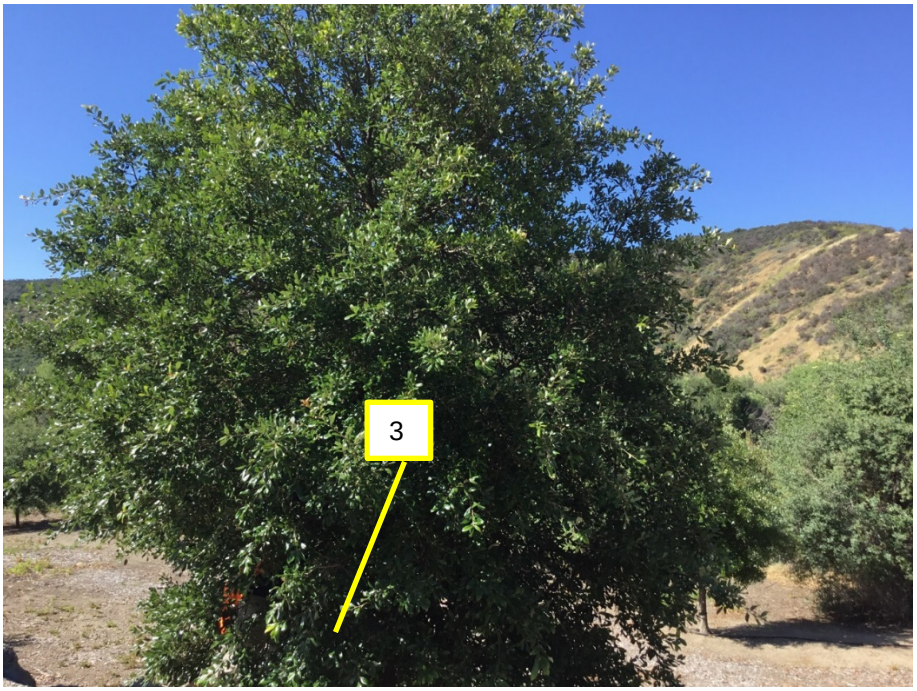
Photographs Taken May 28. 2019



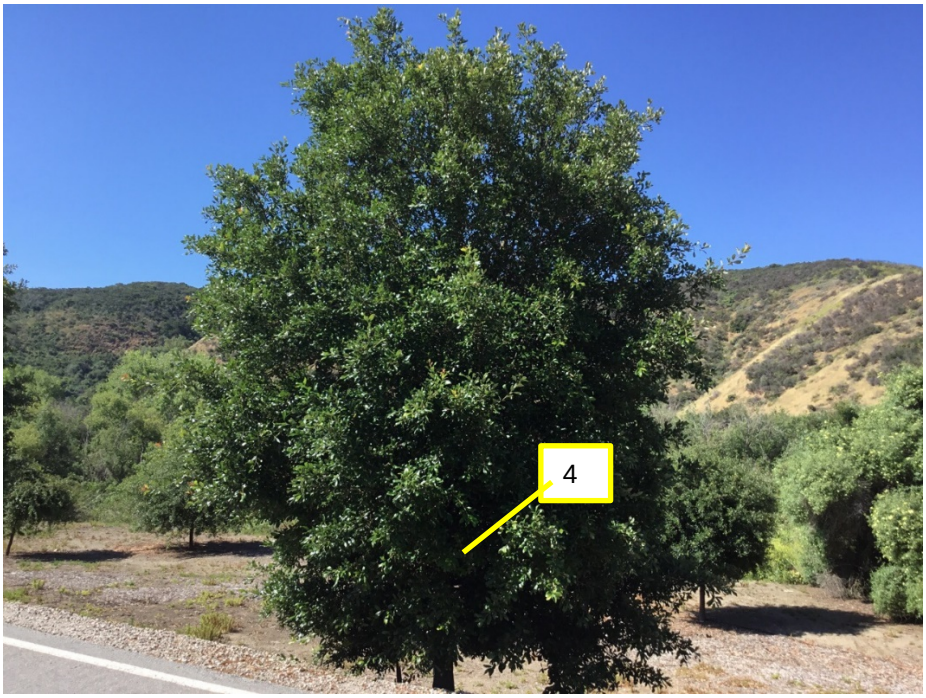
Photograph 1. Tree Number 1. Photograph taken facing southwest from Hill Canyon Fire Road.



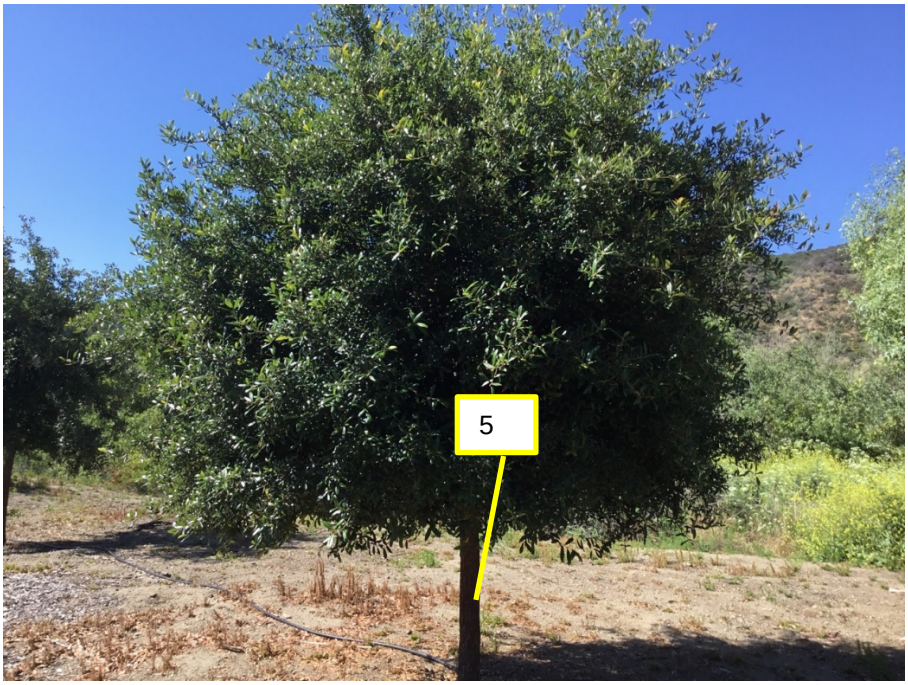
Photograph 2. Tree Number 2. Photograph taken facing southwest from Hill Canyon Fire Road.



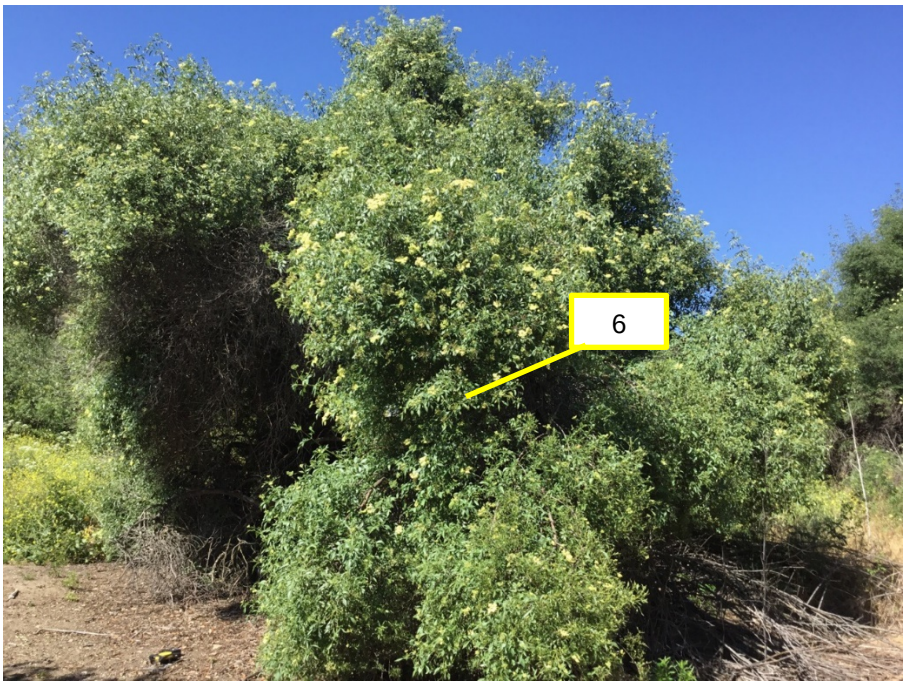
Photograph 3. Tree Number 3. Photograph taken facing south from Hill Canyon Fire Road.



Photograph 4. Tree Number 4. Photograph taken facing south from Hill Canyon Fire Road.



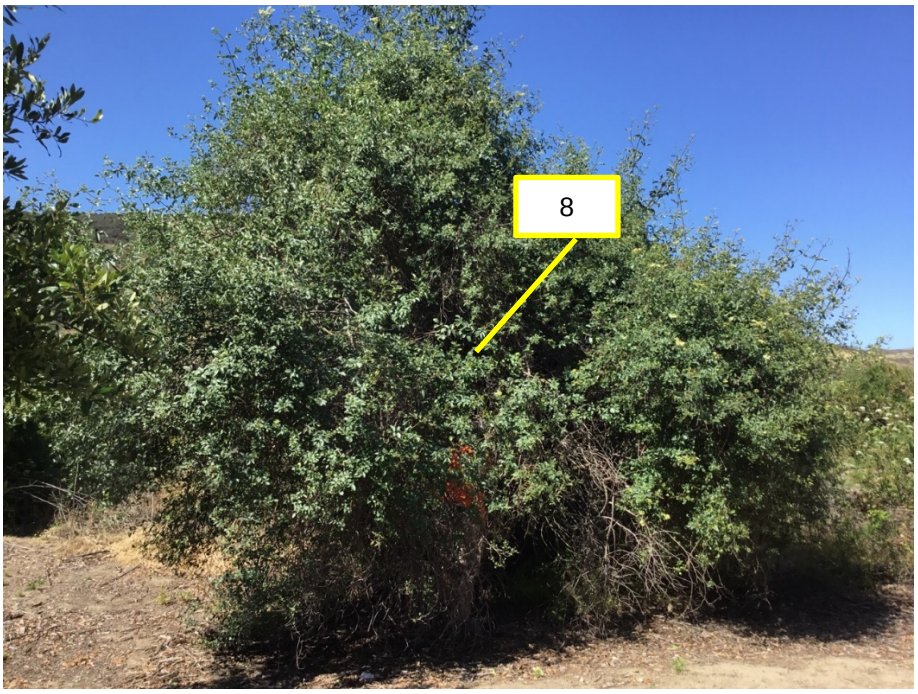
Photograph 5. Tree Number 5. Photograph taken facing south from Hill Canyon Fire Road.



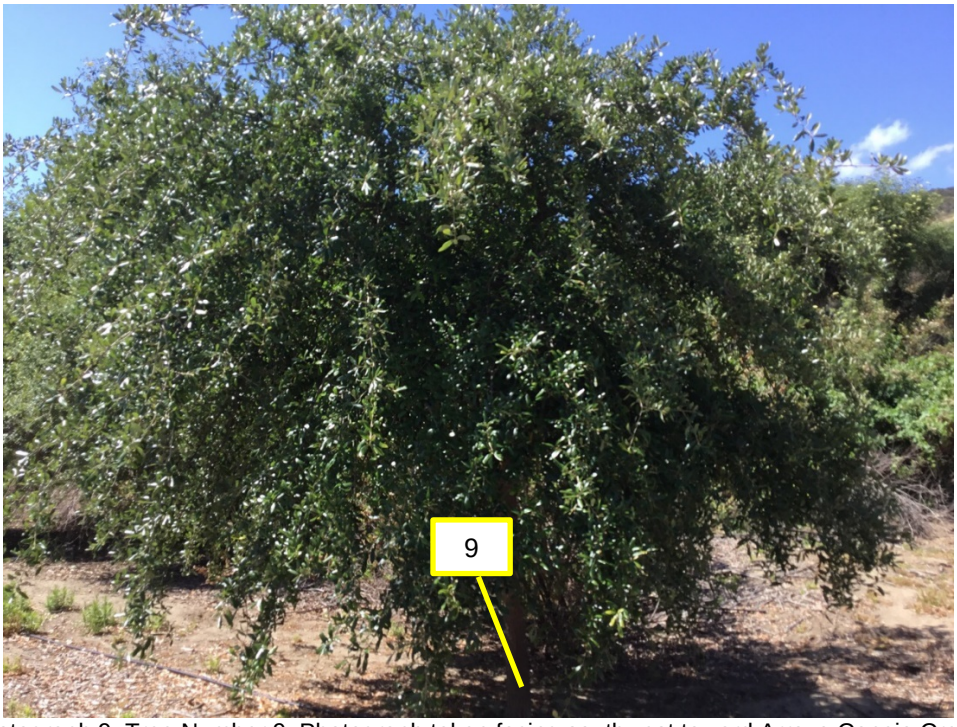
Photograph 6. Tree Number 6. Photograph taken facing west.



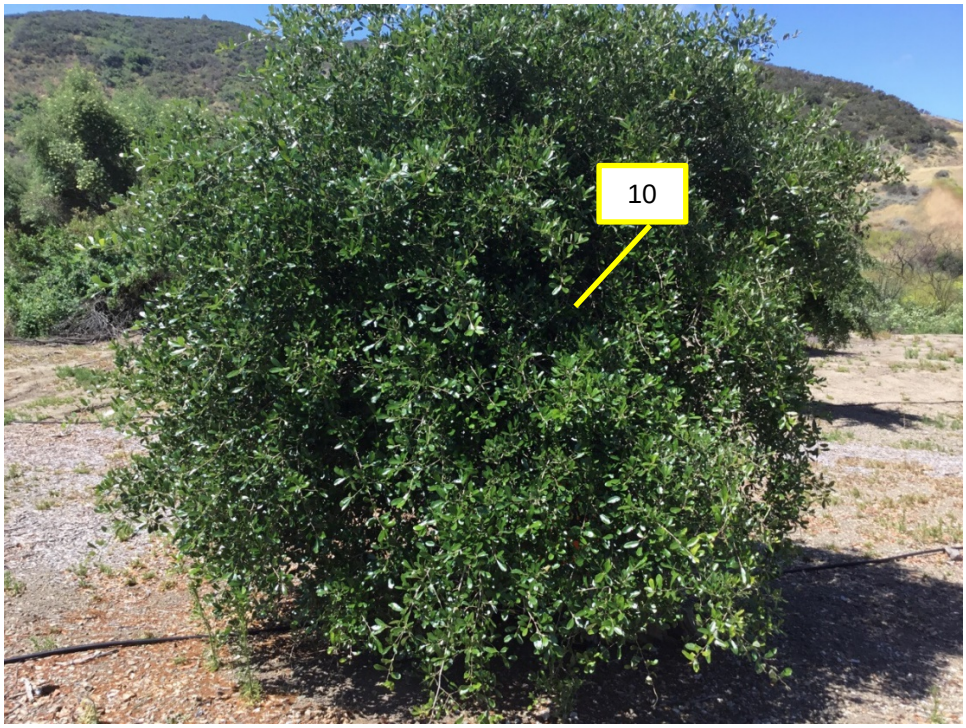
Photograph 7. Tree Number 7. Photograph taken facing northwest.



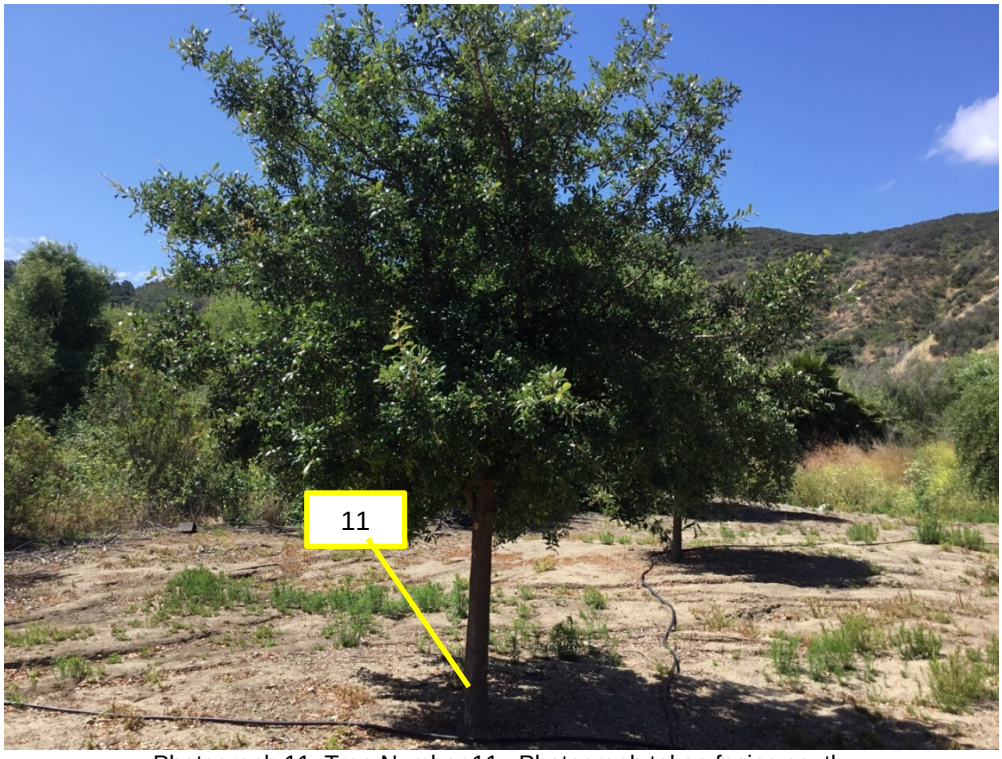
Photograph 8. Tree Number 8. Photograph taken facing southwest.



Photograph 9. Tree Number 9. Photograph taken facing southwest toward Arroyo Conejo Creek.



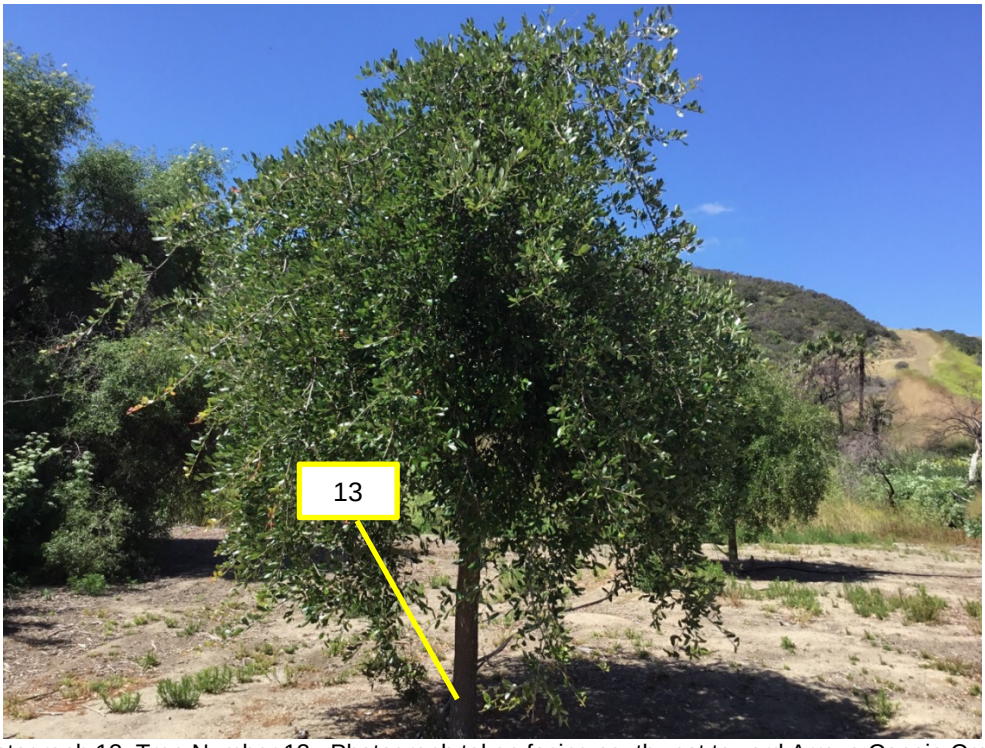
Photograph 10. Tree Number 10. Photograph taken facing southwest toward Arroyo Conejo Creek.



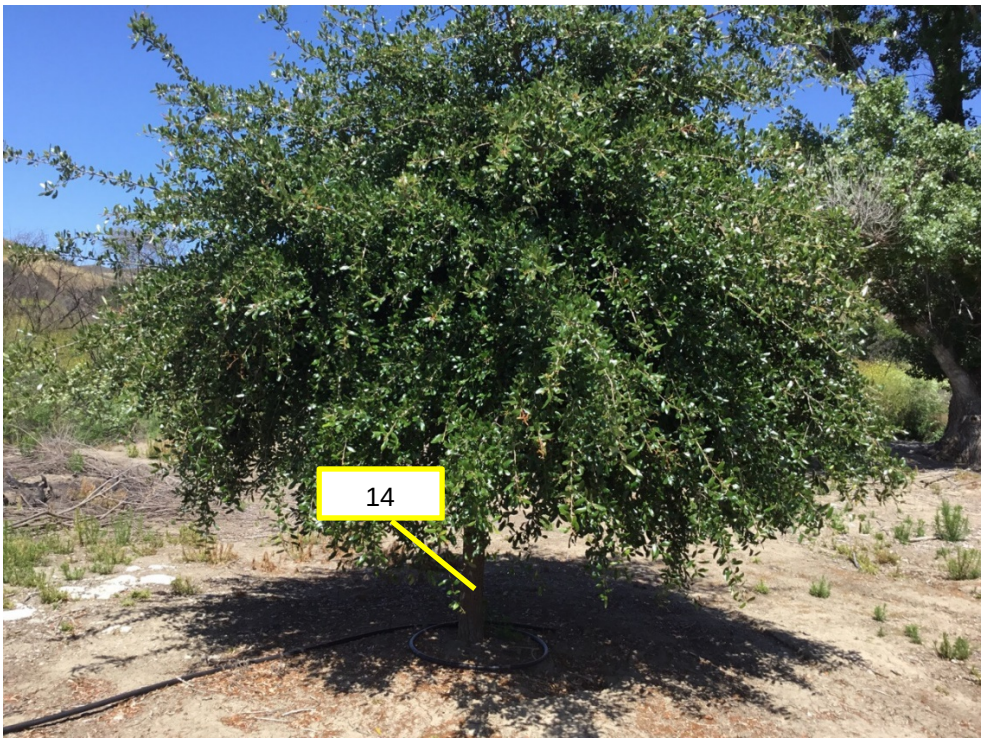
Photograph 11. Tree Number 11. Photograph taken facing south.



Photograph 12. Tree Number 12. Photograph taken facing southwest toward Arroyo Conejo Creek.



Photograph 13. Tree Number 13. Photograph taken facing southwest toward Arroyo Conejo Creek.



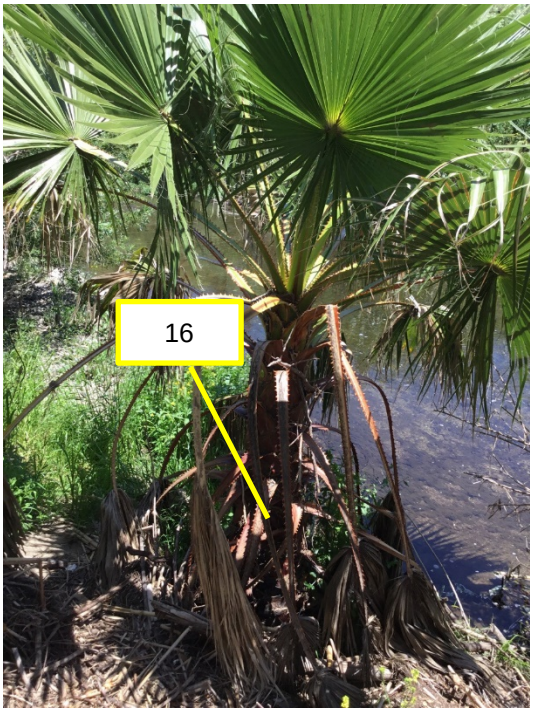
Photograph 14. Tree Number 14. Photograph taken facing northwest.



Photograph 15. Tree Number 15. Photograph taken facing southwest toward Arroyo Conejo Creek.



Photograph 16. Tree not tagged. Photograph taken facing south toward Arroyo Conejo Creek.



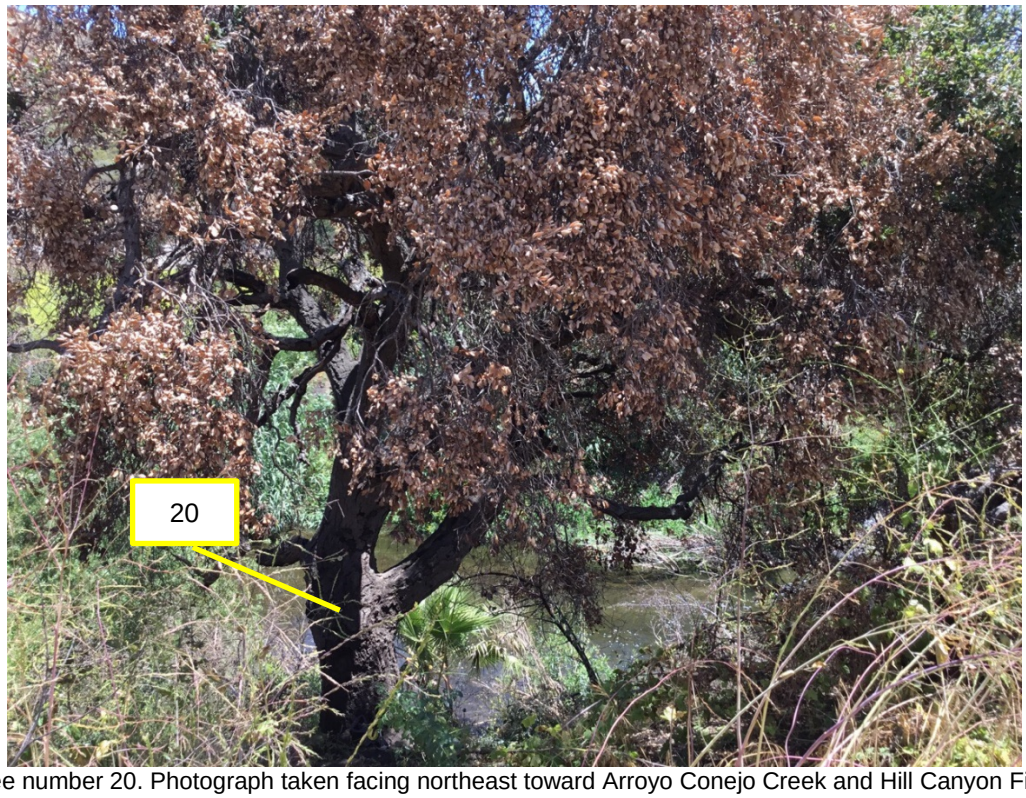
Photograph 17. Tree Number 16. Photograph taken facing northeast toward Arroyo Conejo Creek.



Photograph 18. Tree Number 18. Photograph taken facing west.



Photograph 19. Tree Number 19. Photograph taken facing west.



Photograph 20. Tree number 20. Photograph taken facing northeast toward Arroyo Conejo Creek and Hill Canyon Fire Road.



Photograph 21. Photograph of included bark on tree.



Photograph 22. Tree number 10. Photograph of rubber support tie grown into tree trunk.



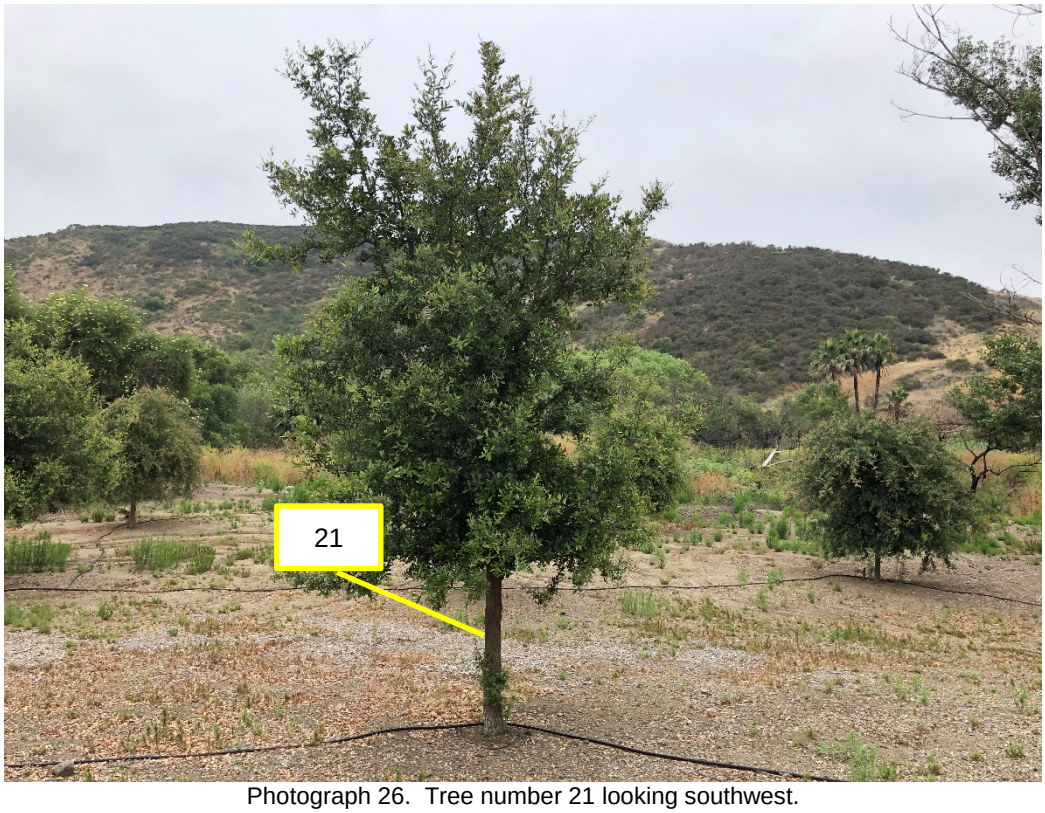
Photograph 23. Photograph of cracked and broken branches on unnumbered elderberry.



Photograph 24. Tree number 20. Photograph of branch rot and frass from boring insects.



Photograph 25. Tree number 20. Photograph of large trunk cavity.



Photograph 26. Tree number 21 looking southwest.

APPENDIX F

TWINING

Engineering a Better Tomorrow

Update of Geotechnical Engineering Report

Conejo Canyon Bridge at Hill Canyon Treatment Plant
(CI 5527)
Thousand Oaks, California

Prepared for:
Stantec
111 East Victoria Street
Santa Barbara, CA 93101

January 30, 2019
Project No.: 181010.4

TWINING

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Suite G
Ventura, CA 93003

Tel 805.644.5100
Fax 805.644.5179

January 30, 2019
Project No. 181010.4

Stantec
Attention: Hady Izadpanah
111 East Victoria Street
Santa Barbara, CA 93101

Subject: **Update of Geotechnical Engineering Report**
Conejo Canyon Bridge at Hill Canyon Treatment Plant (CI 5527)
Thousand Oaks, California

Dear Mr. Izadpanah:

In accordance with your request and authorization, we are presenting the results of our geotechnical study for the above-referenced project in Camarillo, California. The purpose of this investigation has been to evaluate the subsurface conditions at the site and to provide geotechnical engineering recommendations for the proposed project.

Please note that the recommendations presented within the report are based on assumptions stated herein. Should conditions encountered during development differ from those assumed in our analyses, or should the proposed development change, our recommendations may need to be modified accordingly. This report should be submitted to the appropriate authorities as part of the process of obtaining development permits for the project.

We appreciate the opportunity to be of service on this project. Should you have any questions regarding this report or if we can be of further service, please do not hesitate to contact the undersigned.

Respectfully submitted,
TWINING, INC.

Jeff Tawakoli, PE 51883
Project Engineer



Larry D. Gurrola Ph.D., P.G. 7865
Project Geologist



Distribution: (4) Addressee

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Figure 8 – Earthquake Fault Zone Map
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Appendix B – Laboratory Testing
Appendix C – Seismic Refraction Survey
Appendix D – Slope Stability
Appendix E – Lateral Pier Capacity
Appendix F – Seismic Design Parameters (AASHTO and ASCE 7-10)

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1. INTRODUCTION

This report presents an update to the geotechnical engineering evaluation performed for the proposed bridge, which will be located southwest of the Hill Canyon Treatment Plant within the city limits of Thousand Oaks (Figure 1, Site Location Map). The original report was compiled in January of 2012. The purpose of this study has been to evaluate the subsurface conditions at the site by advancing additional borings closer to the abutment location and to update the original report with geotechnical recommendations related to the design and construction of the proposed project.

2. SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The project site is located southwest of the Hill Canyon Treatment Plant and consists of an unpaved access road on the north-facing hillside stream, vegetated slopes adjacent to the Arroyo Conejo Creek and plateau area to the north of the stream. The project site in general consists of hilly terrain on both sides of the proposed bridge, sloping gently towards the existing creek. Vegetation on site consists of mostly brush and mature trees, some of which burnt during the recent fire. The City of Thousand Oaks is proposing to install a prefabricated steel bridge over the stream to provide City employees with access to Hill Canyon Treatment Plant from Rancho Conejo Boulevard. The proposed bridge is to be located near the bend at the unpaved access road on the north-facing slope and will span over the stream to the northeast. The approximate area of the proposed bridge is shown on Figure 2 and Figure 2A, Boring Location Map.

We understand that the proposed bridge will consist of a single-span, prefabricated steel structure with abutments on both ends. The bridge will be subject to vehicle traffic and is to be designed for AASHTO HL-93 wheel loads. We have assumed the bridge will have abutment walls that are approximately 10-feet high and that fill will be placed for embankments.

3. SCOPE OF SERVICES

Our scope of services for this project consisted of the following:

- We reviewed readily available background data, including the original geotechnical report from 2012 and data, geotechnical literature, geologic maps, topographic maps, stereo aerial photographs, seismic hazard maps and literature, and flood hazard maps relevant to the subject site.

- We performed geologic mapping of the project site and field observations of bedrock outcrops in the vicinity. A geologic map and geologic cross-section were produced presenting the field data and mapping.

- As part of the update, we performed a geotechnical and geological site reconnaissance to observe the general surficial conditions and selected two boring locations closer to the abutment location on the east side of the creek. After boring locations were delineated, Underground Service Alert was notified of the planned locations a minimum of 72 hours prior to excavation.

- We performed a seismic refraction survey in order to determine the depth to bedrock within the area for the proposed east abutment. This study was performed in 2011 during the original study.

- We performed a subsurface evaluation, including the excavation, logging, and sampling of three 8-inch-diameter exploratory borings during the original study and two borings as part of this update report. The borings were advanced to depths ranging between approximately 5 and 45 feet below the existing grade. We obtained samples of earth materials from the borings and transported them to our in-house laboratory for observation and testing.

- We performed laboratory testing on selected samples of earth materials in order to evaluate the geotechnical engineering properties of the on-site soils. Laboratory tests included in-situ moisture content and dry density, Atterberg limits, sieve, direct shear, consolidation, maximum dry density-optimum moisture content, expansion index, and potential for on-site soils to corrode construction materials.

- We compiled and analyzed the data collected from our site reconnaissance, subsurface evaluation, and laboratory testing. Specifically, our analyses included the following:

    - Evaluation of general subsurface conditions and description of types, distribution, and engineering characteristics of subsurface materials;

    - Evaluation of geologic hazards and engineering seismology, including evaluation of fault rupture hazard, seismic shaking hazard, liquefaction and seismic settlement potential;

    - Evaluation of current and historical groundwater conditions at the site and potential impact on design and construction;

    - Evaluation of seismic design parameters in accordance with the 2016 California Building Code;

    - Preparation of recommendations for site grading and subgrade preparation;

    - Evaluation of slope stability for the existing slopes at the abutment areas;

    - Evaluation of foundation design parameters including allowable bearing capacity for shallow foundations, estimated settlement, lateral earth pressures, and lateral resistance;

    - Evaluation of deep foundation design parameters including general construction guidelines;

    - Evaluation of lateral earth pressures for retaining walls and retaining wall backfill;

    - Evaluation of expansive soils; and

    - Evaluation of the potential for the on-site materials to corrode buried concrete and steel objects.

- We prepared this report that presents the work performed and data acquired, and summarizes our conclusions and geotechnical recommendations for the design and construction of the proposed project.

4. FIELD EXPLORATIONS AND LABORATORY TESTING

4.1. Field Exploration

The subsurface conditions were evaluated by advancing three 8-inch-diameter hollow-stem auger borings using a Mobile B-80 truck-mounted drill rig during the 2011 report and two 6-inch-diameter hollow-stem auger borings using a CME 75 truck-mounted drill rig as part of the update report. The approximate locations of the exploratory borings are shown on Figure 2, Boring Location Map. The Logs of Borings are presented in Appendix A.

The borings were advanced to depths between approximately 5 and 45-feet below the existing grades. Driven samples of the soil were obtained using a standard penetration test (SPT) sampler and a modified California split-spoon sampler. The samplers were driven using a 140-pound, cat-head hammer falling approximately 30 inches. The blow counts were recorded, and the materials encountered in the borings were logged by our field personnel. Upon completion of drilling, the borings were backfilled by the drilling subcontractor using soil derived from the cuttings.

A seismic refraction survey was conducted by Southwest Geophysics, Inc. in addition to the soil borings. The survey was performed as an additional method to evaluate the depth to bedrock and to develop subsurface velocity profiles. This method was utilized due to the access limitations of the site. Locations and results of the seismic refractions are presented in Appendix C.

4.2. Laboratory Testing

Laboratory tests were performed on selected samples obtained from the borings in order to aid in the soil classification and to evaluate the engineering properties of the foundation soils. The following tests were performed:

- In-situ moisture and density;
- Atterberg limits;
- Sieve;
- Maximum dry density-optimum moisture content;
- Direct shear;
- Consolidation;
- Expansion index; and
- Corrosivity.

The moisture content and density data are presented on the boring logs in Appendix A. The remaining laboratory test results are presented in Appendix B. Details of the laboratory testing program are also included in Appendix B.

5. REGIONAL GEOLOGIC SETTING AND SUBSURFACE CONDITIONS

The project site is situated in Arroyo Conejo canyon at the base of unnamed hills which are part of the Transverse Ranges geomorphic province. The Transverse Ranges are characterized by east-west trending mountain ranges formed as the result of uplift along east-west striking faults.

Geologic mapping performed by Dibblee and Ehrenspeck (1993), depict the project site as underlain by Quaternary alluvium overlying basaltic rocks of the Conejo Volcanics. A portion of the Dibblee and Ehrenspeck's geologic mapping is reproduced as Figure 4, Regional Geologic Map.

5.1. Aerial Photograph and Field Mapping

Mapping of the geomorphology of the site utilizing single-image and stereo aerial photographs dated 1938, 1945, 1965,1970, and 1980 was performed as a preliminary task for field mapping. Aerial photograph mapping of the project site identifies that the creek channels of the north and south forks of Arroyo Conejo migrate laterally over time. During the period of 1938 to 1965, the confluence of the north and south forks was located northwest of the proposed bridge, whereas presently the confluence is located southeast of the bridge location.

Field mapping of the project site and vicinity was performed on January 18, 2019, to map the surface geologic units, confirm aerial photograph mapping of the site, acquire bedding data of the Conejo Volcanics bedrock in the vicinity. Mapping of the geology of the project site utilized the site plan topographic map provided by Stantec and the geologic map is presented in Plate 1, Geologic Map. The geologic mapping and locations of subsurface exploration borings and seismic surveys were used to construct a geologic cross-section presented in Plate 2, Section A.

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5.2 Earth Material

Earth materials mapped at the project site and encountered during the subsurface exploration consist of artificial fill and alluvium deposits overlying basaltic rocks of the Conejo Volcanics (bedrock). Generalized descriptions of these units are provided below and supplemented with field observations and properties where acquired. Detailed descriptions of the earth materials encountered in the exploratory borings are presented in Appendix A, Field Exploration. The approximate locations of the exploratory borings are shown in Figure 2, Boring Location and Geologic Map.

5.2.1 Fill

Fill associated with previous grading of the site was ecnountered in Boring B-1. As encountered in our boring, the depth of fill extends to approximately 6 feet below the existing grade. The fill generally consists of dark brown, medium dense, clayey sand with gravel.

5.2.2 Alluvium

Alluvium of Holocene age (less than 11,700 years) was mapped in the Arroyo Conejo valley and is surrounded by hills underlain by Miocene-age basaltic rocks of the Conejo Volcanics. The alluvium consists of channelized, channel, fill, and stream terrace deposits. Former abandoned channels located northwest of the proposed bridge are preserved along the banks of Arroyo Conejo. The banks of the Arroyo Conejo are densly to moderately vegetated obscurring exposures of the alluvium

Alluvium was encountered in each of the exploratory borings and generally varied in thickness from five to eight feet near the proposed southwest bridge abutment, whereas the thickness of alluvium ranged from approximately 5 feet to over 40 feet below the ground surface based on the borings drilled on-site. The alluvium is underalin by Conejo Volcanics bedrock. Based on the aerial photograph, field mapping, and subsurface data, former channels of the north and south forks were located in the area of borings B-1, B-4, and B-5. Regional aggradation (filling in) of Holocene creek channels occurred due to rising Holocene sea levels resulting in the sequence of alluvium encountered in these borings. The north fork of Arroyo Conejo may have migrated southward to its current position on the south side of the vally in the last few hundred years as indicated by shallowing bedrock to the south of the valley.

The alluvium materials generally consists of yellow-brown to dark yellow-brown, moist, silty sand and brown, medium stiff to very stiff, sandy lean clay to sandy fat clay. Portions of the alluvial strata encountered were saturated due to perched groundwater condions and is described in the following section.

Refusal was encountered in each of the exploratory borings at the bedrock contact. Based on exposures observed in the field and published geologic maps, the bedrock consists of basaltic rocks of the Conejo Volcanics. Bedrock is approximately within five to eight feet below existing ground surface (B-2, and B-3) of the ground surface in the proposed area of the west abutment and approximately 38 to 43 feet below existing ground surface (B-1 and B-4) in the proposed area of the east abutment.

5.2.3 Conejo Volcanics

The rocks mapped and observed in the project site vicinity are basaltic rocks composed of flow breccias, and minor dacitic flow breccias. The rocks consist of gray, pale red, and olive fine to coarse-grained basalts to locally, andesites. The degree of weathering of the surficial rocks are faintly to slightly weathered with local areas exhibiting slightly-moderately weathered. Bedding generally ranges from massive to crudely bedded to unstratified.

Qualitative field strength estimates range from approximately very strong to strong with minor moderately strong rock strength where slightly-moderately weathered and fractured (Johnson and DeGraff, 1988). An outcrop located north of the northeastern bridge abutment exhibits crude bedding which strikes approximately N88E and is inclined 22 degrees to the northwest. The measured bedding attitude is consistent with mapped attitudes in the project site vicinity by Dibblee (1993).

5.3 Groundwater

Perched groundwater was encountered in exploratory borings B-1, B-4, and B-5 at equilibrated levels of approximately 32 feet, 18 feet, and 20 feet, respectively, below the existing ground surface. The California Department of Conservation, Division of Mines and Geology (2002a) has mapped the historical high groundwater conditions for the area as approximately 10 feet below the existing grades. Groundwater conditions may vary across the site due to stratigraphic and hydrologic conditions and may change over time as a consequence of seasonal and meteorological fluctuations and activities by humans at this and nearby sites.

5.4 Geologic Hazards

5.4.1 Seismic Hazard Zones

As part of our study, we performed a limited evaluation of possible geologic hazards at the site. Based on our review of the State of California Official Map of Seismic Hazard Zones for the Nebury Park Quadrangle (CGS, 2002b), the site is located within a Zone for Required Investigation for Liquefaction.

Our opinion regarding the potential for liquefaction at the project site is discussed in Section 6.4 below.

The site is not located within an area designated by the State of California as a Zone of Required Investigation for Earthquake-Induced Landslides (California Department of Conservation, Division of Mines and Geology, 2002b). Based on our review of the site conditions and our slope stability analysis, it is our opinion that the potential for earthquake-induced landslides to occur at the site is low.

5.4.2 Flooding

The Federal Emergency Management Agency has developed flood maps as part of the National Flood Insurance Program. Based on our review of these maps, the project site is partially located in a special flood hazard area subject to inundation by the 1% annual chance flood. The 100-year flood level was reported to us as at elevation 267.37 feet. No other base flood elevations have been determined for the area. It is our opinion that there is a potential flood hazard at the site.

6. ENGINEERING SEISMOLOGY AND DESIGN

The southern California region is known to be seismically active. Earthquakes occurring within approximately 60 miles of the site are generally capable of generating ground shaking of engineering significance to the proposed construction. The project area is located in the general proximity of several active and potentially active faults. Active faults are defined as those that have experienced surface displacement within Holocene time (approximately the last 11,700 years).

6.2 Active Faulting

Maps of Earthquake Fault Zones published by the California Geological Survey were reviewed to evaluate the location of the project site relative to known active fault zones. Alquist-Priolo Earthquake

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Fault Zones (known as Special Studies Zones prior to 1994) have been established in accordance with the Alquist-Priolo Special Studies Zones Act of 1972, as amended. The act directs the State Geologist to delineate the regulatory zones that encompass the surface traces of active faults that exhibit a potential for future surface fault rupture. The purpose of the act is to regulate development near active faults in order to mitigate the hazard of surface fault rupture.

The project site is located on the Newbury Park Quadrangle. The Newbury Quadrangle does contain delineated Earthquake Fault Zones. The closest mapped Earthquake Fault Zone is located approximately 1.6 miles north of the project site. A portion of the map prepared by the California Department of Conservation, Division of Mines and Geology (1999) is reproduced as Figure 8, Earthquake Fault Zones Map.

Neither our aerial photograph or field observations nor our review of published geologic literature indicate that the surface traces of any active faults are mapped underlying or near the project site. Therefore, the likelihood of fault rupture occurring at the site during the design life of the proposed improvements is considered to be low.

6.3 Historical Seismicity

In the absence of fault rupture, the greatest seismic hazard likely to affect the site is seismic shaking due to one or more earthquakes generated on nearby or distant active faults. The approximate locations of major faults in the region and their geographic relationship to the site are shown on Figure 9, Fault Location Map. The epicentral locations of selected historic earthquakes in southern California have been plotted by the California Division of Mines and Geology (Toppozada et al., 2000). A reproduction of this map is presented as Figure 10, Historical Seismicity, 1800-1999.

6.4 Code-Based Geotechnical Parameters for Earthquake Design

The earthquake design of the project should be performed using criteria presented in the 2010 California Building Code (California Building Standards Commission, 2010), Volume 2 of 2, Chapter 16, Section 1613. The earthquake design parameters are listed in Table 1. The graphs and seismic design parameters are also presented in Appendix F.

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Table 1
2010 California Building Code Seismic Design Parameters

2016 CBC Seismic Design Factor	Value
Occupancy Category	II
0.2-Second Mapped Spectral Acceleration Parameter, S_s	1.819
1-Second Mapped Spectral Acceleration Parameter, S_1	0.668
Site Class	B
Short Period Site Coefficient, F_a	1.0
1-Second Period Site Coefficient, F_v	1.0
Short Period Adjusted MCE[1] Spectral Response Acceleration Parameter, S_{MS}	1.819
1-Second Period Adjusted MCE[1] Spectral Response Acceleration Parameter, S_{M1}	0.668
Short Period Design Spectral Response Acceleration Parameter, S_{DS}	2/3 S_{MS} = 1.213
1-Second Period Design Spectral Response Acceleration Parameter, S_{D1}	2/3 S_{M1} = 0.445
Seismic Design Category	D
[1]Maximum considered earthquake	

6.5 Liquefaction and Seismic Settlement Potential

Liquefaction occurs when the pore pressures generated within a soil mass approach the effective overburden pressure. This results in a loss of strength, and the soil then possesses a certain degree of mobility sufficient to permit both horizontal and vertical movements. Liquefaction of soils may be caused by ground shaking during earthquakes. Liquefaction is generally known to occur in loose, saturated, relatively clean, fine-grained cohesionless soils at depths shallower than approximately 50 feet. Factors to consider in the evaluation of soil liquefaction potential include groundwater conditions, soil type, grain-size distribution, relative density, degree of saturation, and both the intensity and duration of ground motion.

The site is located in an area mapped as a Zone for Required Investigation for Liquefaction by the State of California (CGS, 2002). Earthquake moment magnitudes for the project site were evaluated based on fault parameter values published by CGS (Cao et al., 2003). The peak ground acceleration (PGA) at the project site is 0.694 g.

The average shear wave velocity estimated from the seismic refraction data was used for the liquefaction analysis. Historical high groundwater level was assumed to be at the ground surface of elevation 268 feet. Since the east abutment will be directly underlain by alluvium and the west abutment will be underlain by bedrock, the liquefaction analysis focused on the east abutment area. The assumed alluvium soil layers consist of silty sand underlain by a layer of fat clay. The silty sand layer is not susceptible to liquefaction due to its shear wave velocity greater than 215 meters/second. The fat clay is not susceptible to liquefaction based on the Chinese Criteria. The alluvium is underlain by bedrock and as such is not subject to liquefaction. Our liquefaction evaluation was performed in accordance with Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction Hazards in California by SCEC, dated March 1999, and also in accordance with Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils, by Youd et al., 2001.

Seismic settlement can occur when loose to medium dense granular materials densify during seismic shaking. Seismically-induced settlement may occur in dry, unsaturated, as well as saturated soils. Based on the results of our subsurface investigation, seismic settlement should be negligible.

7. SLOPE STABILITY

Static and pseudostatic slope stability analyses were performed to evaluate the gross stability of the slopes in the areas of the proposed abutments. Our results indicate minimum factors of safety greater than 1.5 for static and pseudostatic conditions, which is greater than the minimum factors of safety for slopes considered to be grossly stable in engineering practice in California. A uniform surcharge of 1,000 pounds per square foot was applied in our model. A value of 0.15 for the coefficient of horizontal acceleration was used in our pseudostatic analysis. The results of our analyses are presented in Appendix D, Slope Stability.

We used the computer program GSTABL7 developed by Gregory Geotechnical Software (2003) to employ Modified Bishop's Method and Janbu's Simplified Method of slope stability evaluation to evaluate the slopes. The computer program implements an automatic search routine to identify the lowest calculated factor of safety based upon user-defined limits.

Shear strength parameters were selected from direct shear test results from soil samples collected from Boring B-1. The direct shear tests consist of initial shear and residual shear data. The most conservative residual shear strength parameters, which are based on stresses at approximately ¼-inch displacement obtained during testing, were used. Shear strength parameters for the basaltic bedrock were obtained from the Seismic Hazard Zone Report for the Newbury Park Quadrangle, California Department of Conservation, Division of Mines and Geology.

8. DESIGN RECOMMENDATIONS

8.1 General

Based on the results of the field exploration, laboratory testing, and engineering analyses, it is our opinion that the proposed construction is feasible from a geotechnical standpoint, provided that the recommendations in this report are incorporated into the design plans and are implemented during construction. It is our opinion that the proposed bridge abutment walls should be supported on competent bedrock. The abutment walls may be supported by shallow foundations or deep foundations consisting of spread footings or cast-in-drilled-hole (CIDH) piles, respectively. For preliminary design, we have assumed 24-inch and 30-inch diameter CIDH piers in our analyses. Ancillary structures that are lightly loaded may be supported by shallow foundations bearing on bedrock or engineered fill.

Our geotechnical engineering analyses performed for this report were based on the soil encountered during the subsurface exploration. If the design substantially changes, our geotechnical engineering recommendations would be subject to revision based on the additional evaluation of the changes.

8.2 Site Preparation

All deleterious, organic, and oversized materials (greater than 6 inches in maximum dimension) should be removed from any existing areas that will receive fill and disposed outside of the construction limits. Prior to placement of fill at the site, the upper 3 feet of the existing soil should be overexcavated and replaced as engineered fill. The exposed bottoms of overexcavations should be observed by the geotechnical engineer and/or his representative prior to processing. The bottoms of overexcavations should be processed by scarifying to a depth of approximately 8 inches, moisture-conditioned to about 2 percent above the optimum moisture content of the soil and compacted to at least 90 percent of the maximum dry density based on the latest version of ASTM D1557. This Moisture conditioning may consist of drying back of the soils if they are excessively wet.

Footings for lightly-loaded ancillary structures bearing on soil should be overexcavated a minimum of 3 feet below the proposed footing bottom. Overexcavation should extend laterally a minimum distance of 5 feet. Overexcavation is not be required if the footings are founded on competent, intact bedrock.

The sandy soils on site should be considered suitable for use as engineered fill provided that all deleterious, organic and oversized materials (greater than 6 inches in maximum dimension) are removed prior to placement. Engineered fill should be placed in lifts of loose thickness not exceeding 8 inches, moisture-conditioned to approximately 2 percent of the optimum moisture content and compacted to at least 95 percent of the maximum dry density based on the latest version of ASTM D1557.

Pumping soils or unstable soils may be encountered at overexcavation bottoms based on the soil moisture contents during our subsurface exploration. Provisions in the project specifications should be made to address the potential for encountering unstable conditions. Excavation bottoms may be stabilized by drying back of the soils, working thin lifts of 1-1/2-inch (minimum size) float rock into the excavation bottoms until stabilization is achieved, or cement treatment of the soils. Use of filter fabric wrapped around the gravel section is recommended. Other methods of stabilization may be recommended depending on the conditions encountered in the field during construction.

8.3 Foundation Recommendations

The proposed abutment walls should be supported on shallow spread footings or CIDH piers founded on intact, competent bedrock consisting of basalt. Ancillary structures that are lightly loaded, such as site retaining walls, should be supported on shallow spread footings founded on engineered fill or intact, competent bedrock. Footing excavations and CIDH pier excavations should be observed by the geotechnical engineer prior to placement of reinforcing steel and concrete.

8.3.1 Footings for Ancillary Structures

Shallow spread or continuous footings for ancillary structures that are lightly loaded should be at least 12-inches wide and embedded a minimum of 18-inches below the lowest adjacent grade. The footings should be supported by at least 3 feet of engineered fill. The allowable bearing pressure should be a maximum of 2,500 pounds per square foot (psf) for the minimum dimensions stated above. The allowable bearing pressure may be increased by one-third for short-term wind or seismic loads. Estimated total and differential footing settlement should be less than approximately 1 inch and ½ inch, respectively.

Lateral loads acting on ancillary structures may be resisted by friction between the bottom of foundations and the supporting soils. An ultimate friction coefficient of 0.50 is recommended. In addition, resistance to lateral loading may be derived from the soil with an equivalent fluid weight of 300 pounds per cubic foot (pcf), provided the foundations are poured tight against undisturbed or compacted soil. Use of an appropriate factor of safety is recommended for both parameters. The aforementioned parameters are unfactored loads and may be increased by one-third for short-term loads such as wind or seismic loading.

8.3.2 Footings for Abutment Walls

Shallow spread or continuous footings for abutment walls should be at least 12 inches wide and be founded at least 18 inches into intact, competent bedrock consisting of basalt. The allowable bearing pressure should be a maximum of 4,500 psf for the minimum dimensions. The allowable bearing pressure may be increased by one-third for short-term wind or seismic loads. Estimated total and differential footing settlement should be less than approximately ½ inch and ¼ inch, respectively.

Lateral loads acting on structures may be resisted by friction between the bottom of foundations and the supporting soils. An ultimate friction coefficient of 0.55 is recommended. In addition,

resistance to lateral loading may be derived from bedrock with an equivelnt fluid weight of 425 pounds per cubic foot (pcf) may be assumed to act against the footings, provided the foundations are poured tight against undisturbed bedrock. The aforementioned parameters may be increased by one-third for short-term loads such as wind or seismic loading.

8.3.3 CIDH Piles

Abutment walls at both sides of the bridge should be supported by CIDH pilres utilizing both end-bearing and skin friction resistances. The piles should be embedded a minimum of 3 feet into competent bedrock. Bedrock was encountered in Boring No. 4 at an approximate depth of 43 feet below existing grade but not encountered in Boring No. 5 drilled to a depth of about 45 feet below existing ground surfcae. The actual depth to the bedrock should be determined in the field during construction by the Geotechnical Engineer or his representitive. The actual depth and reinforcing of the caissons should be determined by the Project Structural Engineer. The pier excavation bottom should be cleaned. Any loose soil or earth-material debris that has fallen into the excavation should be removed prior to placement of reinforcing steel and concrete.

The maximum allowable bearing pressure at the tip of the CIDH piles should not exceed 5,000 psf. In addition an allowable skin friction of 300 psf/ft of depth may also be utlized for design. Lateral capacities of 24- and 30-inch-diameter caissons were analyzed using Allpile software. The results are presented in Appendix E. The effective diameter of a caisson can be assumed to be twice its actual diameter in determining lateral resistance. Pier spacing should be at least three pier diameters from center to center to avoid capacity reduction due to group effect.

Values provided assume piles or piers will be located at least 5 feet horizontally from any adjacent descending slopes.

Groundwater was encountered at approximate depth of about 22 feet below existing ground surface (bgs) during drilling and was measured at a depth of approximately 20 feet bgs at the completion of drilling. Casing or other means may be necessary to stabilize the upper part of the caisson excavations. Use of a tremie is recommended to place to place concrete under water or if the reinforcement in the caisson requires a tight pattern that will restrict the freefall of the concrete without segregation. Free water is expected to be encountered during construction. Difficulty in excavation into the bedrock can be encountered and the drilling contractor should be aware of that difficulty and the presence of water in the excavations. Use of a competent caisson drilling contractor is strongly recommended. Additional recommendations are provided below.

8.3.3.1 General Construction Guidelines for CIDH Piles

Excavation: The medium dense to very dense sands should be excavatable using conventional pier excavation equipment. Because the wet, sandy soil may run into the excavation, the use of a temporary casing may be required to stabilize the sides of the pier excavation. The disposal of excavated soils must be executed in accordance with local, state, and federal regulations. We recommend that final cleanout of the excavations for the drilled piers be performed using a purpose-built, bottom-cleanout bucket. The cleanout bucket should have full-radius, straight-edged soil cutting blades that will trim and collect disturbed soil when lowered to the excavation bottom and rotated. The cleanout bucket should have bottom closure flaps to assist in complete cleanout of cuttings and to prevent loss of cuttings during bucket withdrawal.

Concrete Placement: The concrete for the piers should be placed using a down-hole tremie, or similar provision such that the falling concrete does not strike the sides of the shaft. Concrete should be placed in newly excavated piers as soon as practical. We recommend the caissons to be filled on the same day of drilling to reduce chance of caving. The concrete must be capable of propagating between the reinforcing bars to come in contact with the soil and to avoid arching during extraction of the casing. A 7 to 9 inch of concrete slump below water is

recommended. The reinforcing cage should be placed carefully in the hole in a manner such that the soil is not disturbed.

Tolerances: Quality of construction is of primary importance in the construction of CIDH piles. The piles should not deviate from a plumb line at the centerline by more than 2 percent of the caisson's length.

Observation: Full-time observation by the geotechnical engineer or his representative is highly recommended. The observation work should provide full documentation of the pier construction. Before construction, the status and performance of nearby existing structures should be documented. In addition, instrumentation of certain structures may be desirable during and after the construction operations to monitor movement.

Nondestructive Testing: On-site, continuous observations of drilling, placement of reinforcing steel and placement of concrete is recommended. We recommend that gamma-gamma testing tubes be placed in all caissons. It is our opinion that the placement of these tubes is a prident practice in case any anomolies occur during drilling. Gamma-gamma testing would be recommended only if observations during drilling warrant testing. Examples of such anomalies would be inconsistency in the theoretical versus actual volumes of concrete placement and observed caving during drilling operations. We note that the structural engineer should be involved in discussions where such anomalies occur and the decision to perform gamma-gamma testing will be based on input from both the geotechnical and structural engineers.

8.4 Retaining Walls

8.4.1 Lateral Earth Pressure

Conventional cantilever retaining walls backfilled with compacted on-site soils may be designed for active pressures developed from 42 pcf of equivalent fluid weight for well-drained, level backfill conditions and 52 pcf for a 2:1 sloping backfill. For a restrained retaining wall, an at-rest pressure of 55 pcf of equivalent fluid weight may be used. If a well-drained material such a sand is used as back fill, an equivalent fluid weight of 35 pcf may be used in design. The recommended design lateral earth pressure is calculated assuming that a drainage system will be installed behind the walls and that external hydrostatic pressure will not develop behind the wall.

Vertical surcharge loads within a 1:1 projection from the bottom of the wall distributed over retained soils should be considered as additional uniform horizontal pressure acting on the wall. The additional horizontal pressure acting on the wall can be estimated as approximately 40 percent and of the magnitude of the vertical surcharge pressure for the “active” conditions. Permanent surcharge loading conditions should be evaluated on a case-by-case basis by the geotechnical engineer.

8.4.2 Seismic Lateral Earth Pressure

Walls that retain less than 6 feet of soil need not be designed for seismic lateral earth pressures. Should the project require retaining structures taller than 6 feet, we recommend a seismic increment of 22H, where H is the height of the wall. This seismic increment is a triangular distribution along the height of the wall and increases with depth. The seismic increment should be added to the static active component of the lateral loading for both cantilevered and restrained walls.

8.4.3 Backfill and Drainage of Walls

Backfill material should extend a distance of at least H/2 behind the wall, where H is the height of the wall. Retaining walls should be adequately drained. Adequate backfill drainage is essential in order to provide a free-drained backfill condition and to limit hydrostatic buildup behind walls. The

wall should be appropriately waterproofed. Drainage behind the walls may be provided by a geosynthetic drainage composite such as TerraDrain, MiraDrain, or equivalent, attached to the outside perimeter of the wall. The drain should be placed continuously along the back of the wall and connected to a 4-inch-diameter perforated pipe. The pipe should be sloped at least 1 percent and should be surrounded by 1 cubic foot per foot of ¾-inch crushed rock wrapped in suitable non-woven filter fabric (Mirafi 140NL or equivalent). The crushed rock should meet the requirements defined in Section 200-1.2 of the latest edition of The "Greenbook" Standard Specifications for Public Works Construction (Public Works Standards, 2018). The drain should discharge through a solid pipe to an appropriate outlet.

8.5 Drainage Control

The control of surface water is essential to the satisfactory performance of the site improvements. Surface water should be controlled so that conditions of uniform moisture are maintained beneath the structure, even during periods of heavy rainfall.

8.6 Expansive Soils

Expansive soils are characterized by their ability to undergo significant volume changes (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from rainfall, landscape irrigation, utility leakage, roof drainage, perched groundwater, drought, or other factors, and may cause unacceptable settlement or heave of structures, concrete slabs supported on-grade, or pavements supported over these materials. Depending on the extent and location below finished subgrade, these soils could have a detrimental effect on the proposed construction.

Based on our laboratory test and classification of the near-surface soils, it is our opinion that these exposed soils will have a medium expansion potential. The recommendations provided in this report account for the presence of the on-site medium expansive soils. Every effort should be made to minimize large moisture content variations in the underlying soils. Testing of the final subgrade soils is imperative and should be conducted to evaluate their expansion potential and confirm or modify the recommendations presented herein.

8.7 Soil Corrosion

The potential for the on-site materials to corrode buried steel and concrete improvements was evaluated. Laboratory testing was performed on representative soil samples to evaluate pH, minimum resistivity, and chloride and soluble sulfate content. Table B-5 in Appendix B presents the results of our corrosivity testing. General recommendations to address the corrosion potential of the on-site soils are presented below. Imported fill materials, if used, should be tested to evaluate whether their corrosion potential is more severe than those assumed.

8.7.1 Reinforced Concrete

Laboratory tests indicate that the potential of sulfate attack on concrete in contact with the on-site soils is negligible based on ACI 318, Table 4.3.1.

Test results also indicate the potential for chloride attack of reinforcing steel in concrete structures and pipes in contact with soil is negligible.

8.7.2 Metallic

Laboratory resistivity testing indicates that the on-site soils are severely corrosive to buried ferrous metals. As a consequence of these conditions, we recommend that consideration be given to using plastic piping instead of metal, where possible. Alternatively, a corrosion specialist should be consulted regarding suitable types of piping and appropriate protection for underground metal conduits.

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9. PAVEMENT DESIGN

The R-Value measured on a sample of near surface soils was 14. We understand that a Traffic Index (TI) of 6 is required for the project. Assuming a TI of 6 and using the measured R-Value of 14, asphalt pavement sections should have a minimum gravel equivalent of 1.65 feet. This can be achieved by using 4 inches of asphalt concrete over 10 inches of aggregate base.

Subgrade for pavement should be overexcavated to a depth of 24 inches below the bottom of the new aggregate base layers. The exposed surface should be scarified and compacted to a minimum of 90 percent of maximum density in accordance with recommendations of the grading section. The subgrade should be firm and unyielding when proof rolled with a loaded water truck or similar heavy rubber-tired equipment. Aggregate base should be compacted to a minimum of 95% maximum density and should be firm and unyielding.

10. GENERAL GRADING RECOMMENDATIONS

The grading contractor is responsible to notify governmental agencies, as required, and a representative of Twining, Inc. at the start of site clearing and grubbing, at the initiation of grading, and any time that grading operations are resumed after an interruption. Each step of the grading should be evaluated in a specific area by a representative of Twining, Inc., and where required, should be approved by the applicable governmental agencies prior to proceeding with subsequent work.

The following site grading recommendations should be regarded as minimal. The site grading recommendations should be incorporated into the project plans and specifications.

1. Prior to grading, existing vegetation, trash, surface structures and debris should be removed and disposed off-site at a legal dumpsite. Any existing utility lines, or other subsurface structures, which are not to be utilized should be removed, destroyed, or abandoned in compliance with current governmental regulations and with concurrence from Twining, Inc.

2. Subsequent to clearing and grubbing operations, and prior to initial grading, a reasonable search should be made for subsurface obstructions and/or possible loose fill or detrimental soil types. This search should be conducted by the contractor, with advice from and under the observation of a representative of Twining, Inc.

3. Fill should be spread in 6- to 8-inch lifts and should be moisture conditioned and compacted in accordance with the recommendations presented in the "Site Preparation" subsection of this report. All undocumented fill or unsuitable soils within the building areas should be removed and compacted under observation and testing of a representative of Twining, Inc.

4. The exposed subgrade and/or excavation bottom should be observed and evaluated by a representative of Twining, Inc. for conformance with the intent of the recommendations presented in this report and prior to any further processing or fill placement. <u>It should be understood that the actual encountered conditions may warrant excavation and/or subgrade preparation beyond the extent recommended and/or anticipated in this report.</u>

5. On-site inorganic granular soils that are free of debris or contamination and are not greater than 6 inches in largest dimension are considered suitable for placement as compacted fill. A representative of Twining, Inc. should provide guidance for suitability and placement of on-site clay fill materials.

6. Observation and field tests shall be performed during grading by a representative of Twining, Inc. in order to assist the contractor in obtaining the proper moisture content and required degree of compaction. Where less than the required degree of compaction is indicated, additional

compactive effort and any necessary adjustments in the moisture content of the soil should be made to obtain the required compaction.

7. To evaluate the presence of satisfactory materials at design elevations, footing excavations should be observed to be clean of loosened soil and debris before placing steel or concrete and probed for soft areas. If soft or loose soils or unsatisfactory materials are encountered, these materials should be removed and replaced with compacted fill.

8. In the event that underground facilities such as pipes or underground storage tanks are encountered during grading, the appropriate authorities, property owners, and regulatory authorities should be notified. Removal of underground storage tanks is regulated by city or county health departments and/or by the fire department. In the event that tanks containing unknown substances are encountered, no attempts should be made to remove such objects until their contents have been ascertained and directions issued by competent professionals or regulators. Septic tanks should be removed entirely. Cesspools or seepage pits should be pumped of their contents and removed in their entirety. Water wells should be capped in accordance with the requirements of the appropriate regulatory agencies.

9. Wherever, in the opinion of a representative of Twining, Inc., an unsatisfactory condition is being created in any area, whether by cutting or filling, then the work should not proceed in that area until the condition has been corrected.

11. DESIGN REVIEW AND CONSTRUCTION MONITORING

Geotechnical review of plans and specifications is of paramount importance in engineering practice. The poor performance of many structures has been attributed to inadequate geotechnical review of construction documents. Additionally, observation and testing of the subgrade will be important to the performance of the proposed development. The following sections present our recommendations relative to the review of construction documents and the monitoring of construction activities.

11.1.1 Plans and Specifications

The design plans and specifications should be reviewed by Twining, Inc. prior to bidding and construction, as the geotechnical recommendations may need to be reevaluated in the light of the actual design configuration and loads. This review is necessary to evaluate whether the recommendations contained in this report and future reports have been properly incorporated into the project plans and specifications. Based on the work already performed, this office is best qualified to provide such review.

11.1.2 Construction Monitoring

Site preparation, removal of unsuitable soils, assessment of imported fill materials, fill placement, foundation installation, and other site grading operations should be observed and tested, as appropriate. The substrata exposed during the construction may differ from that encountered in the test excavations. Continuous observation by a representative of Twining, Inc. during construction allows for evaluation of the soil conditions as they are encountered, and allows the opportunity to recommend appropriate revisions where necessary.

12. LIMITATIONS

The recommendations and opinions expressed in this report are based on Twining, Inc.'s review of readily available background documents, on information obtained from field explorations, and on laboratory testing. It should be noted that this study did not evaluate the possible presence of hazardous materials on any portion of the site. In the event that any of our recommendations conflict with recommendations provided by other design professionals, we should be contacted to aid in resolving the discrepancy.

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Due to the limited nature of our field explorations, conditions not observed and described in this report may be present on the site. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation and laboratory testing can be performed upon request. It should be understood that conditions different from those anticipated in this report may be encountered during grading operations, for example, the extent of removal of unsuitable soil, and that additional effort may be required to mitigate them.

Site conditions, including groundwater elevation, can change with time as a result of natural processes or the activities of man at the subject site or at nearby sites. Changes to the applicable laws, regulations, codes, and standards of practice may occur as a result of government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Twining, Inc. has no control.

Twining, Inc.'s recommendations for this site are, to a high degree, dependent upon appropriate quality control of subgrade preparation, fill placement, and foundation construction. Accordingly, the recommendations are made contingent upon the opportunity for Twining, Inc. to observe grading operations and foundation excavations for the proposed construction. If parties other than Twining, Inc. are engaged to provide such services, such parties must be notified that they will be required to assume complete responsibility as the geotechnical engineer of record for the geotechnical phase of the project by concurring with the recommendations in this report and/or by providing alternative recommendations.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Twining, Inc. should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report has been prepared for the exclusive use by the City of Thousand Oaks and its agents for specific application to the proposed project. Land use, site conditions, or other factors may change over time, and additional work may be required with the passage of time. Based on the intended use of this report and the nature of the new project, Twining, Inc. may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the Client or anyone else will release Twining, Inc. from any liability resulting from the use of this report by any unauthorized party.

Twining, Inc. has endeavored to perform its evaluation using the degree of care and skill ordinarily exercised under similar circumstances by reputable geotechnical professionals with experience in this area in similar soil conditions. No other warranty, either express or implied, is made as to the conclusions and recommendations contained in this report.

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13. SELECTED REFERENCES

American Concrete Institute (ACI), 2008, Building Code Requirements for Structural Concrete and Commentary, ACI 318-08.

ASTM International, 2010, ASTM Volume 04.08, Soil and Rock (I): D 420 – D 5876: dated March, 1830 pp.

ASTM International, 2010, ASTM Volume 04.09, Soil and Rock (II): D 5877 – latest: dated March, 1532 pp.

California Buildings Standards Commission, 2010, 2010 California Building Code: California Code of Regulations, Title 24, Part 2.

California Department of Conservation, California Geological Survey, 2002, California Geomorphic Provinces: Note 36, 4 pp.

California Department of Conservation, California Geological Survey, 2008, Guidelines for Evaluation and Mitigation of Seismic Hazards in California: Special Publication 117A, 98 pp.

California Department of Conservation, Division of Mines and Geology, 1999, State of California, Earthquake Fault Zones, Newbury Park Quadrangle, Official Map: dated May1, scale 1:24,000.

California Department of Conservation, Division of Mines and Geology, 2002a, Seismic Hazard Evaluation of the Newbury Park 7.5-Minute Quadrangle, Ventura County, California: Seismic Hazard Zone Report 055, 45 pp. plus 3 plates.

California Department of Conservation, Division of Mines and Geology, 2002b, Seismic Hazard Zones, Newbury Park Quadrangle, Official Map: dated February 7, scale 1:24,000.

Cao, T., Bryant, W.A., Rowshandel, B., Branum, D., and Wills, C.J., 2003, The Revised 2002 California Probabilistic Seismic Hazard Maps: dated June.

Coduto, D.P., 2000, Foundation Design: Principles and Practices: Englewood Cliffs, New Jersey, Prentice Hall, second edition.

Dibblee, T.W., Jr., and Ehrenspeck, H.E., 1993, Geologic Map of the Camarillo and Newbury Park Quadrangles, Ventura County, California: Dibblee Geological Foundation Map #DF-28, scale 1:24,000.

Earthquake Engineering Research Center, 2003, Recent Advances in Soil Liquefaction Engineering: A Unified and Consistent Framework: Report No. EERC 2003-06.

Earthquake Engineering Research Institute, 2008, Soil Liquefaction During Earthquakes, Monograph No. MNO-12.

Federal Emergency Management Agency, 2010, FIRM, Flood Insurance Rate Map, Ventura County, California and Incorporated Areas, Panel 958 of 1275, Map Number 06111C958E: dated January 20, scale 1:2000.

Jennings, C.W. and Bryant, W.A., 2010, Fault Activity Map of California: California Geological Survey, Geologic Data Map No. 6, scale 1:750,000.

Johnson, R.B. and DeGraff, J.V., 1988, Principles of Engineering Geology, John Wiley and Sons, Inc.

Naval Facilities Engineering Command, 1986, NAVFAC Design Manual.

TWINING

1879 Portola Road,
Suite G
Ventura, CA 93003

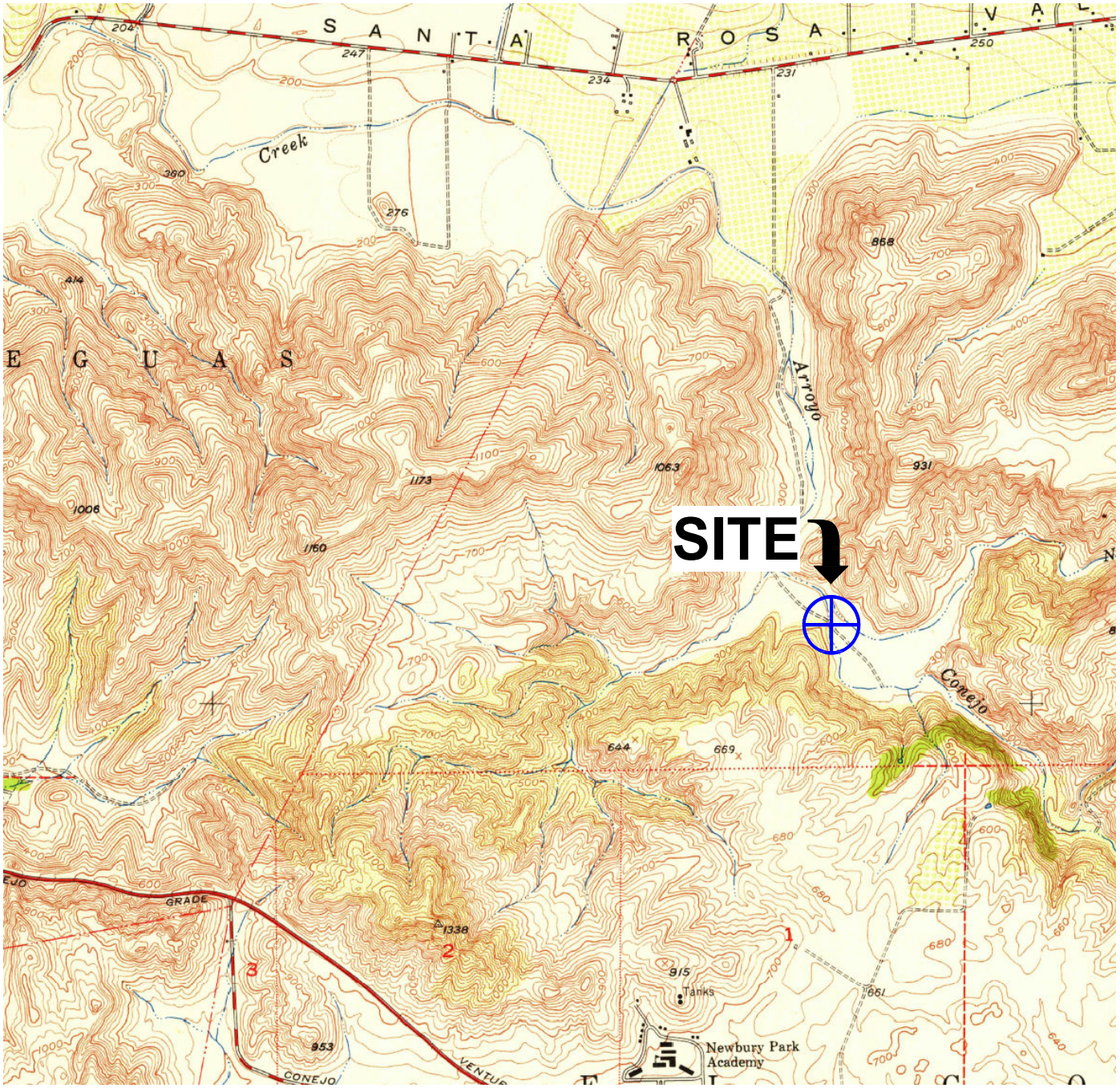
Tel 805.644.5100
Fax 805-644.5179

Public Works Standards, Inc., 2009, The "Greenbook" Standard Specifications for Public Works Construction.

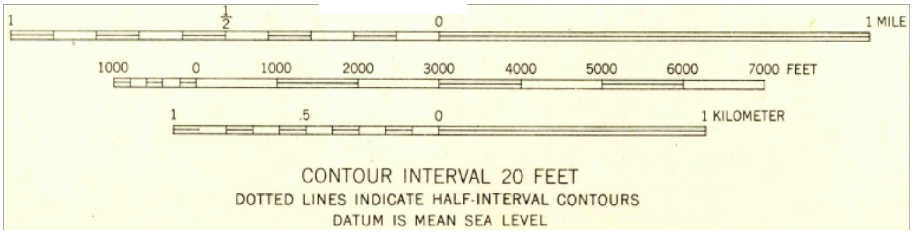
Southern California Earthquake Center, 1999, Recommended Procedures for Implementation of DMG Special Publication 117 Guidelines for Analyzing and Mitigating Liquefaction in California: dated March, 63 pp.

Toppozada, T., Branum, D., Petersen, M., Hallstrom, C., Cramer, C., and Reichle, M., 2000, Epicenters of and Areas Damaged by M≥5 California Earthquakes, 1800-1999: California Department of Conservation, Division of Mines and Geology Map Sheet 49, scale 1"=40 km.

FIGURES



SCALE



Site Coordinates
Latitude: 34.21164°N
Longitude: 118.92776°W

N

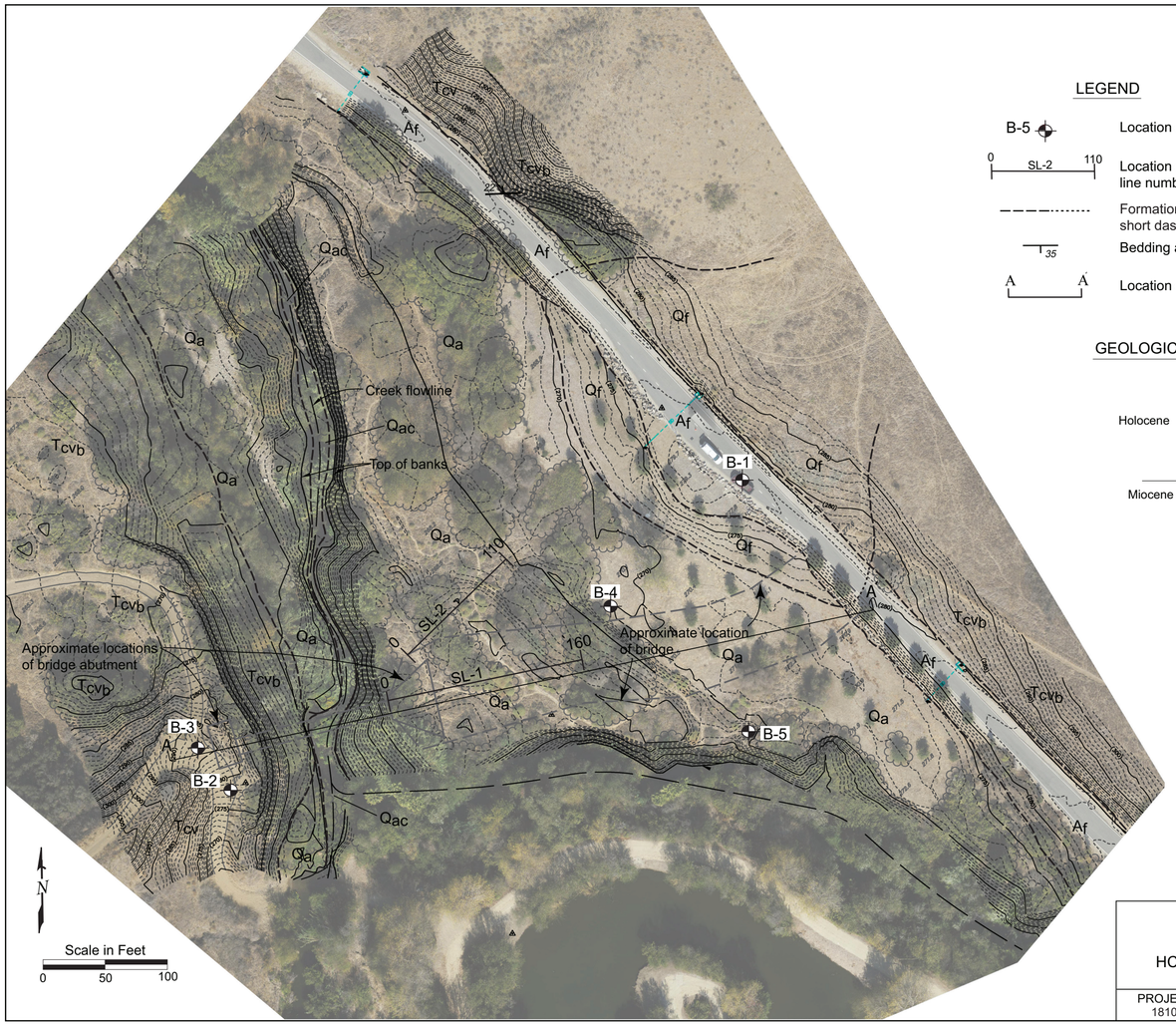
Reference: USGS 1951, Newbury Park Quadrangle, California - Ventura Co., 7.5 Minute Series (Topographic)

TWINING

SITE LOCATION MAP

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	FIGURE 1



LEGEND

- B-5 — Location of geotechnical boring number 5
- 0 SL-2 110 — Location of Southwest Geophysics, Inc. seismic line number 2, showing station locations
- Formation contact; long dashed where approximate; short dashed where concealed
- 35 — Bedding attitude
- A — A′ — Location of cross-section A

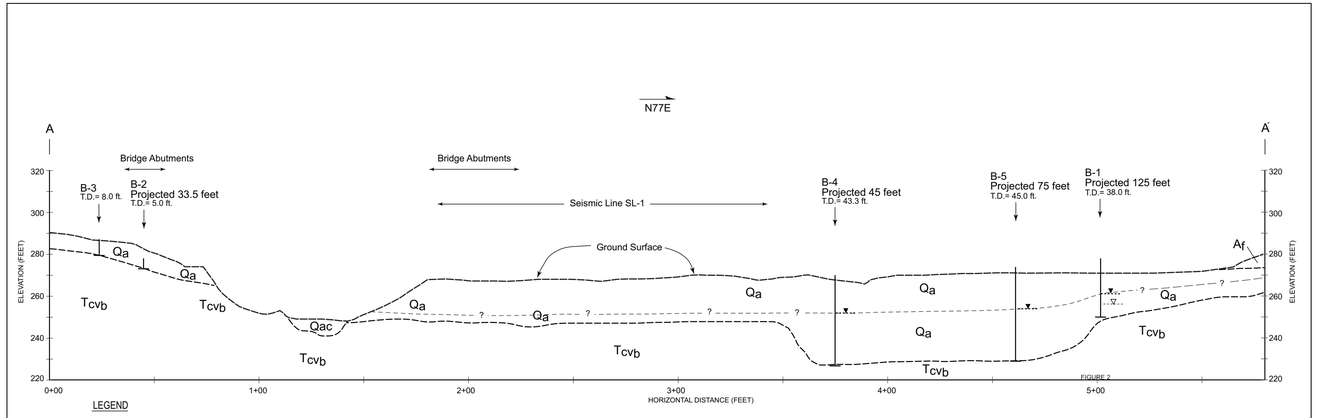
GEOLOGIC UNITS

Holocene	A_f	Artificial Fill
	Q_{ac}	Active Channel Alluvium
	Q_f	Alluvial Fan Deposits
	Q_a	Alluvium
Miocene	T_{cvb}	Conejo Volcanics

BORING LOCATION AND GEOLOGIC MAP

HCTP SECONDARY BRIDGE ACCESS

PROJECT NO.		
181010.4	JANUARY 2019	FIGURE 2



LEGEND

20 / 0 / 20 — Scale in feet
Horizontal = Vertical
1 Inch = 20 Feet

Geologic contact, long dashed where approximate; queried where uncertain

B-5
T.D. = 38.0 feet
Geotechnical boring number 5, total depth equals 38.0 feet

Equilibrated depth to perched water, measured after drilling
First encountered saturated materials

Groundwater, long dashed where approximate; short dashed and queried where uncertain

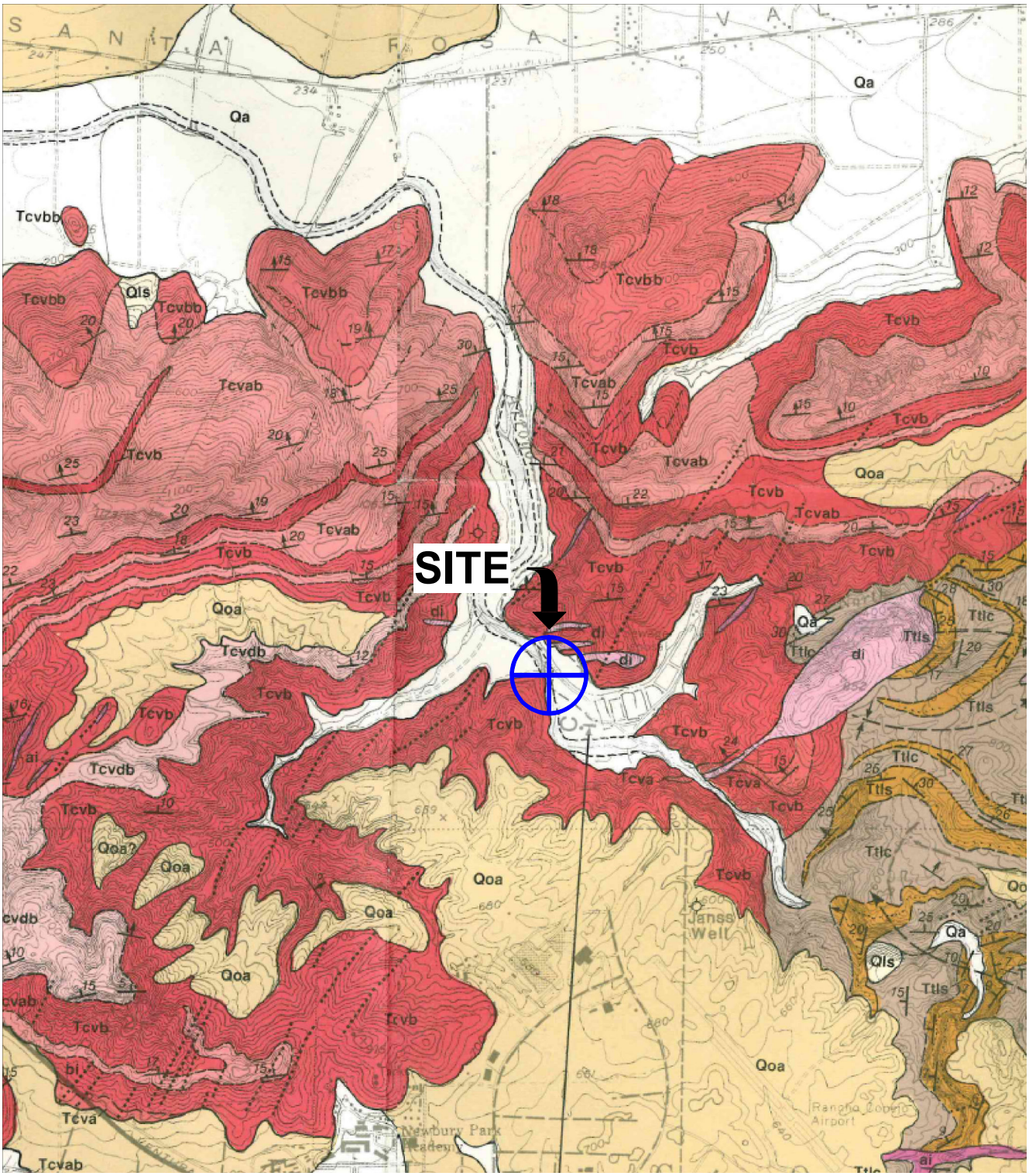
GEOLOGIC UNITS

	A_f	Artificial Fill
Holocene	Q_{ac}	Active Channel Alluvium
	Q_f	Alluvial Fan Deposits
	Q_a	Alluvium
Miocene	T_{cvb}	Conejo Volcanics

CROSS SECTION A-A'

HCTP SECONDARY BRIDGE ACCESS

PROJECT NO. 181010.4	JANUARY 2019	FIGURE 3



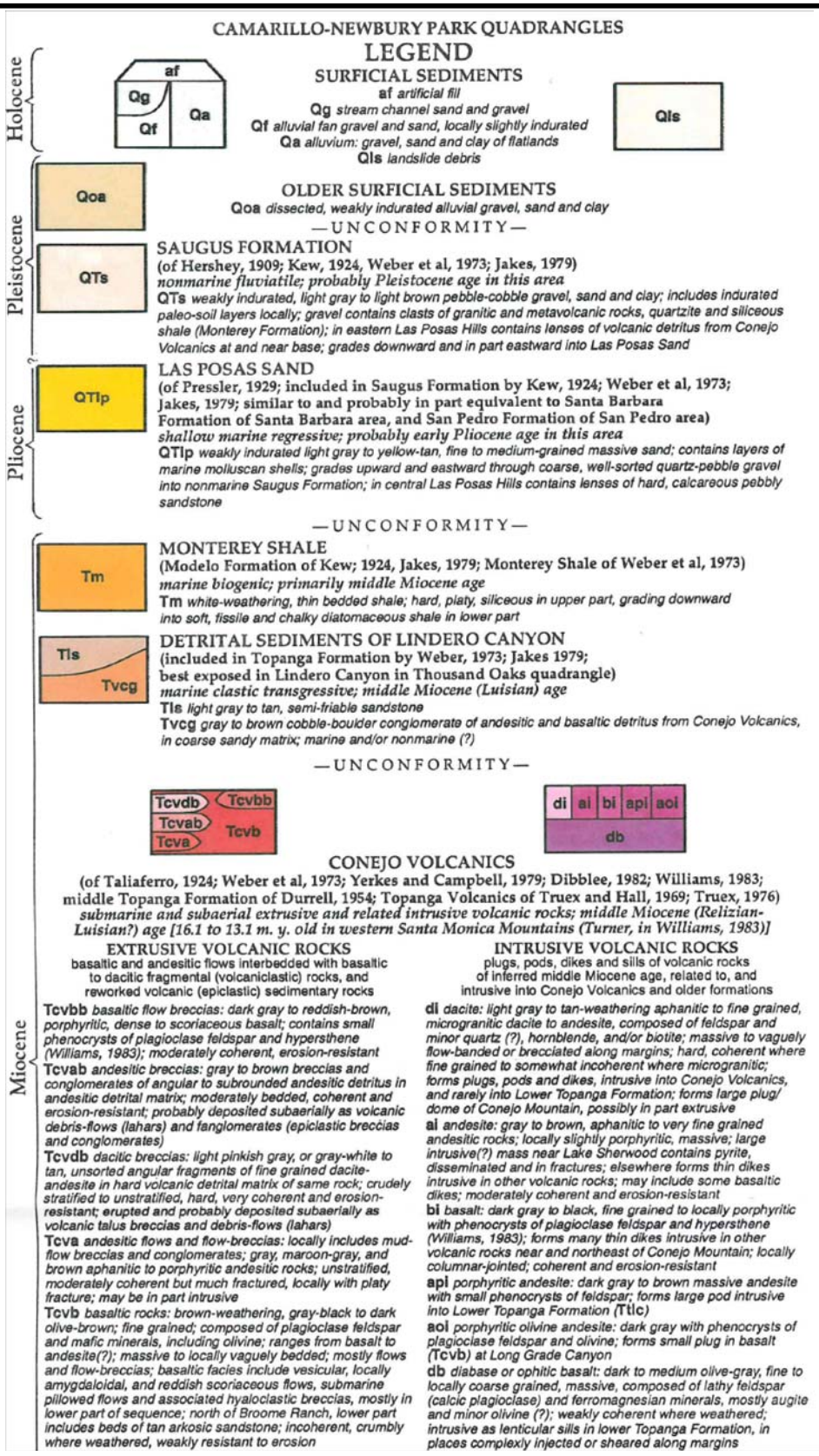
Reference: Dibblee, Jr. (1990)

TWINING

REGIONAL GEOLOGIC MAP

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE 4
181010.4	January 2019	Sheet 1 of 2

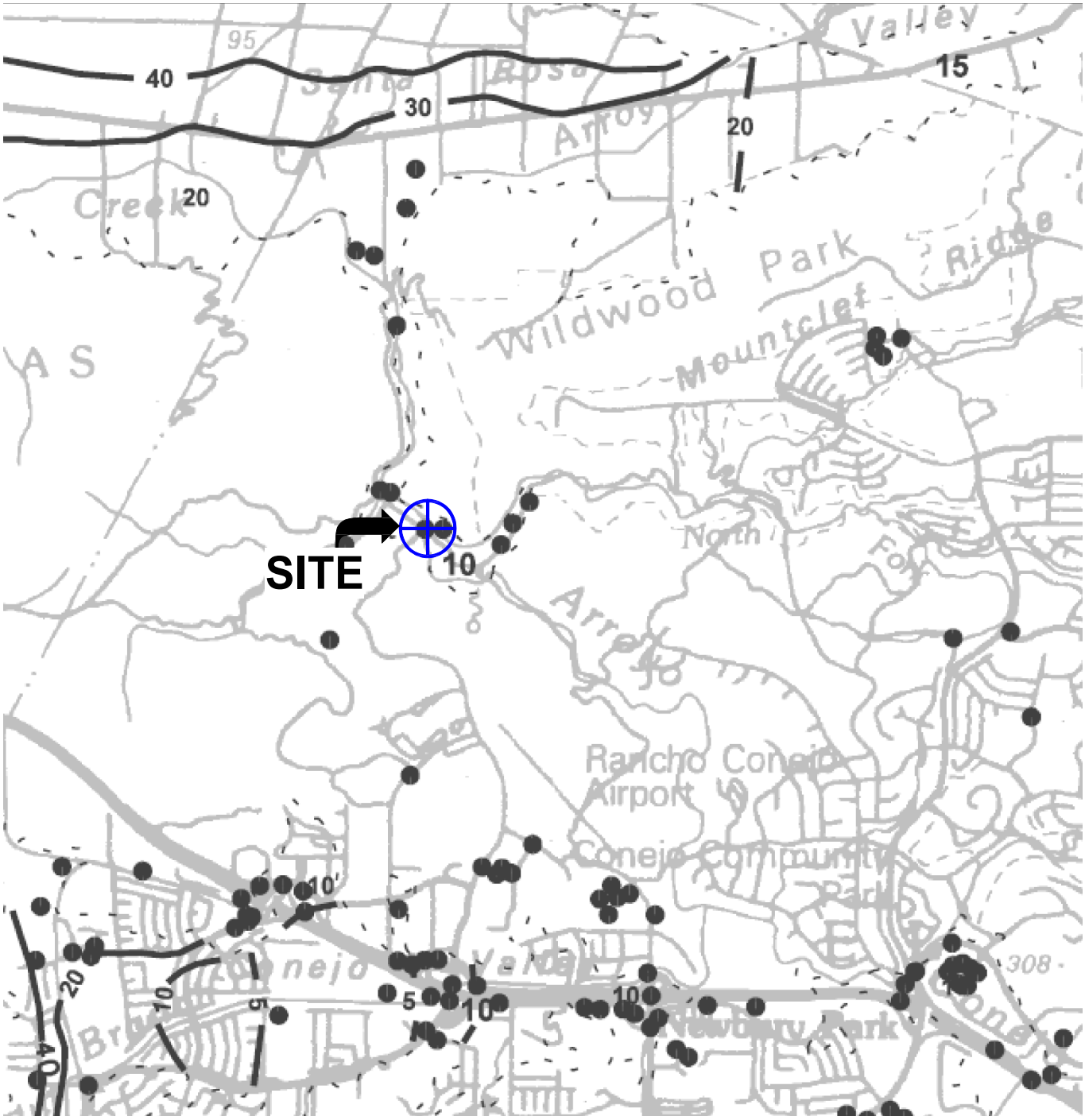


TWINING

REGIONAL GEOLOGIC MAP

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE 4
181010.4	January 2019	Sheet 2 of 2



APPROXIMATE SCALE

.5 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

.5 0 1 KILOMETER

N

LEGEND

Alluviated Valley

Borehole Site

20 Historically high ground–water depth contours (In feet)

15 Historically high ground–water depth where same value occurs over a broad area (In feet)

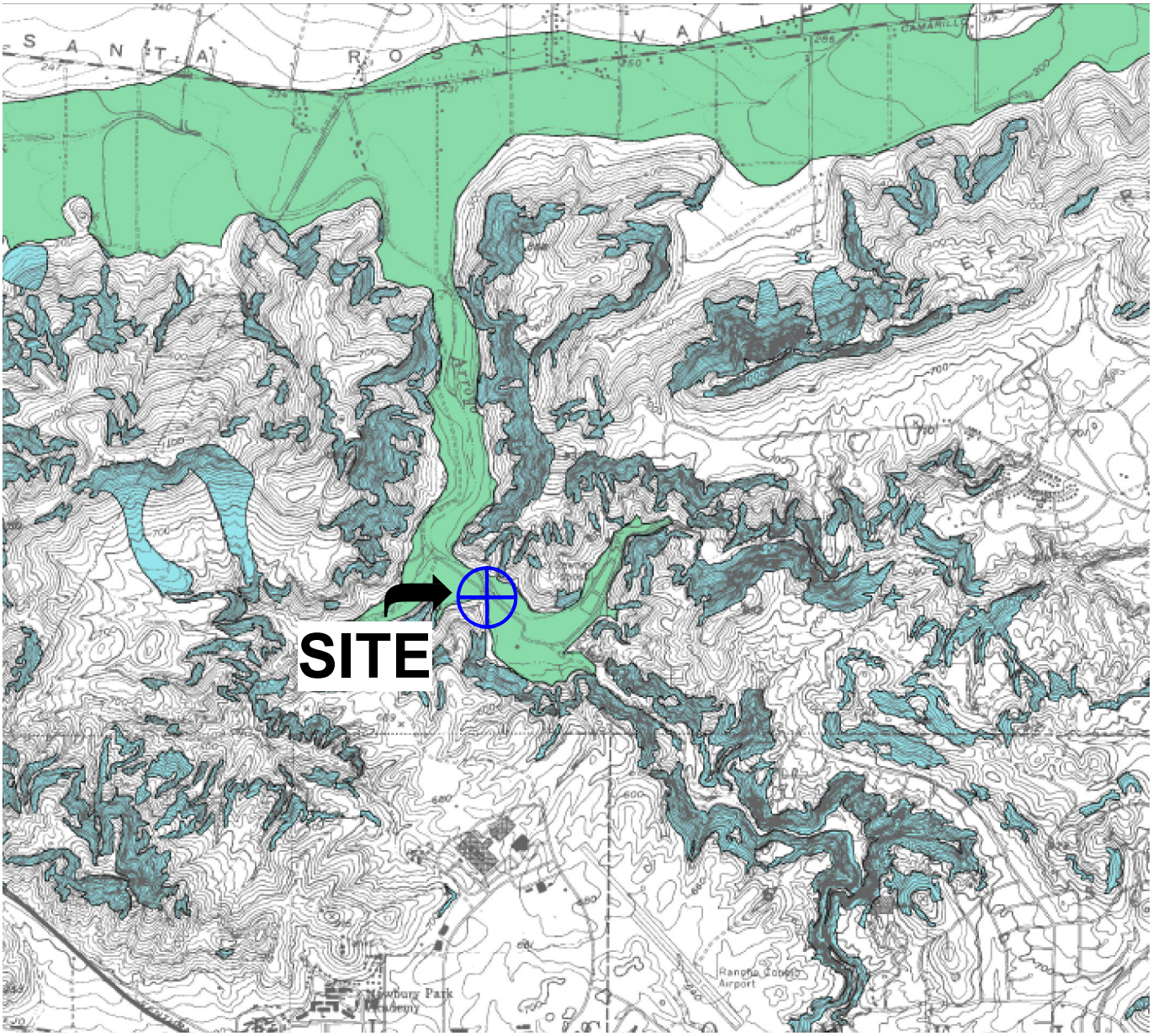
Reference: California Department of Conservation, Division of Mines and Geology (2002)

TWINING

HISTORICAL HIGH GROUNDWATER MAP

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE 5
181010.4	January 2019	



APPROXIMATE SCALE

1 .5 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

N

LEGEND

Liquefaction
Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslides
Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

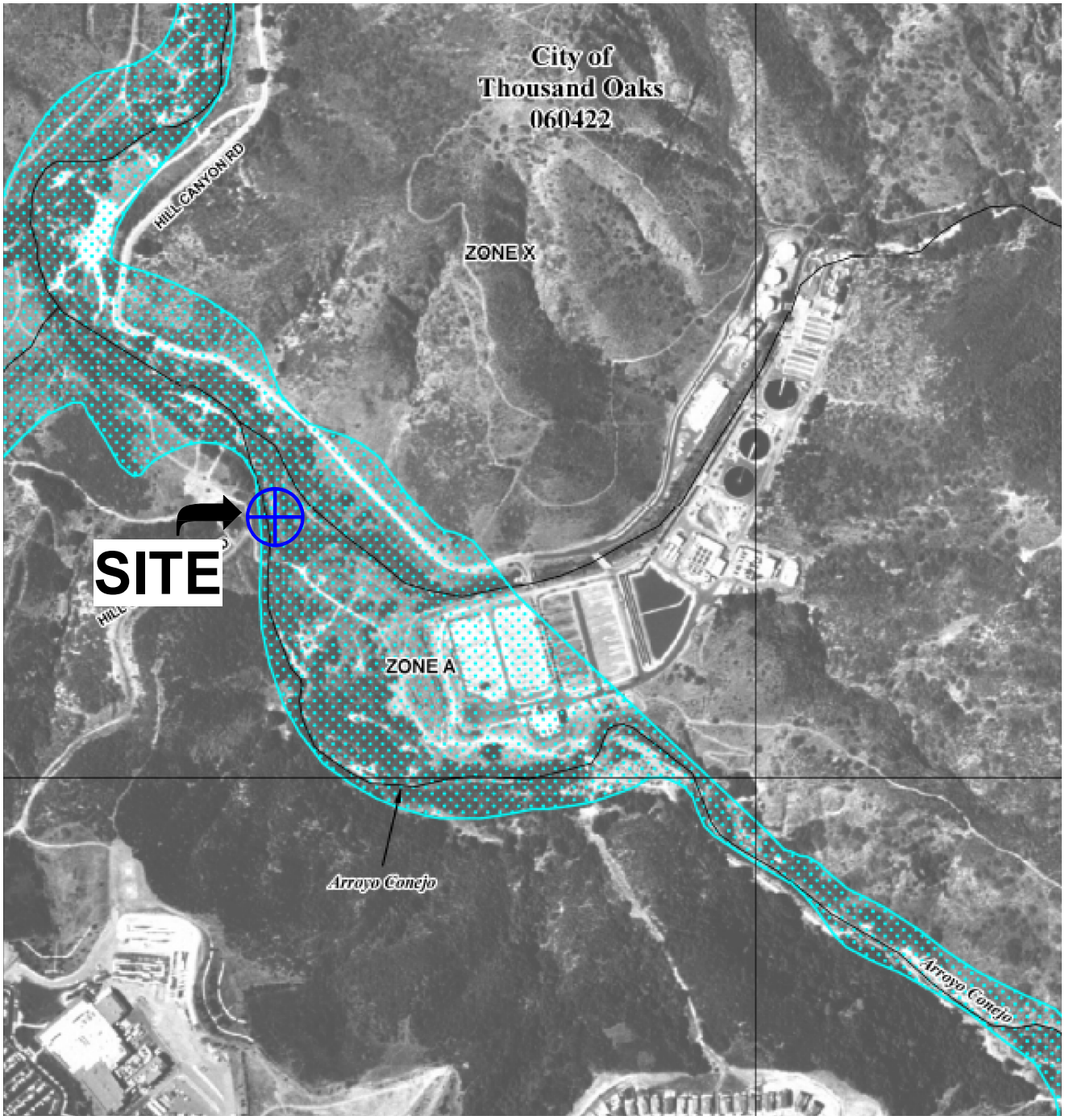
Reference: California Department of Conservation, Division of Mines and Geoogy (2002b)

TWINING

SEISMIC HAZARD ZONES

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	FIGURE 6



APPROXIMATE SCALE

350 0 500 1000 FEET

150 0 150 300 METERS

N

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

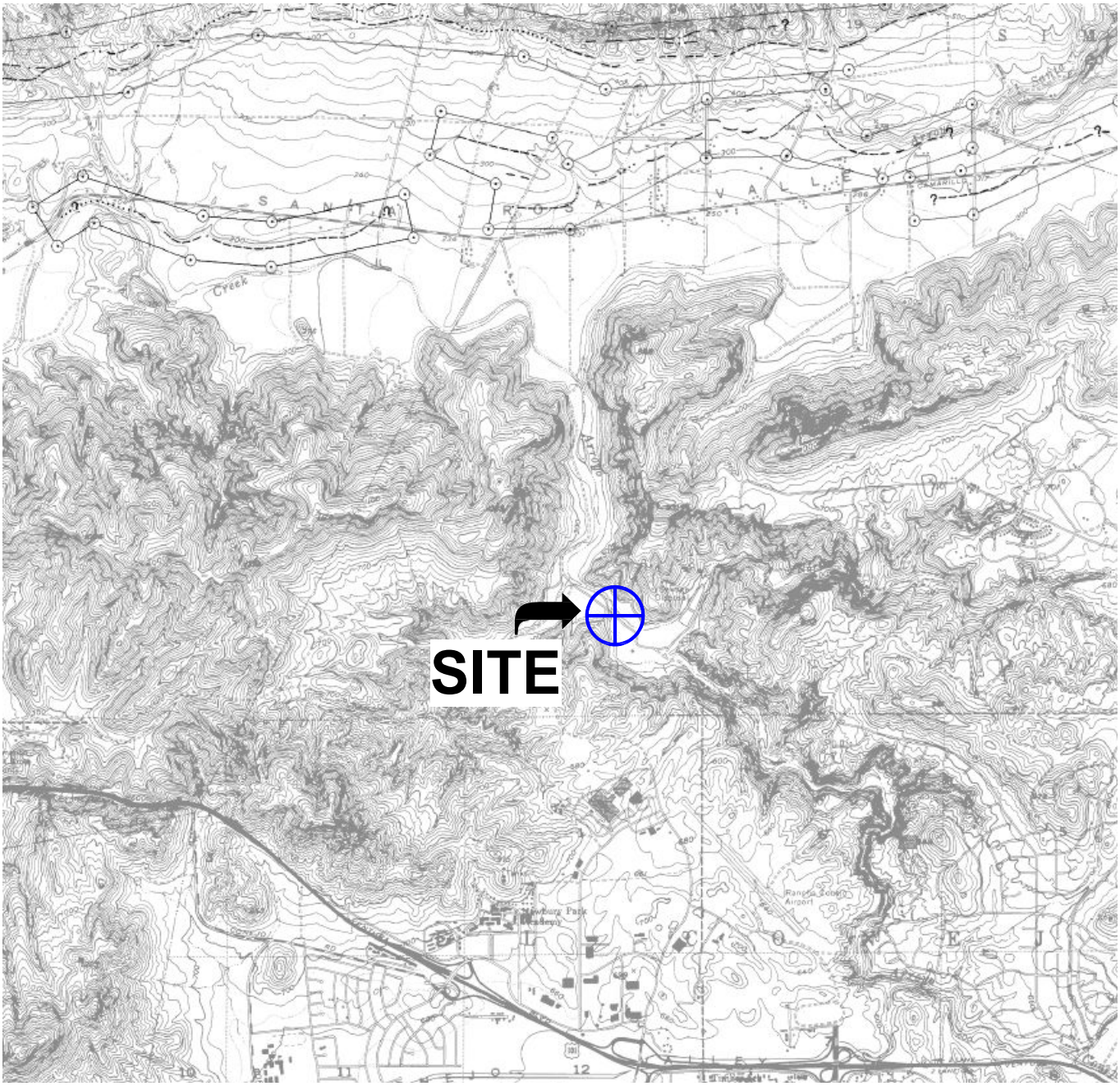
Reference: Federal Emergency Management (2010)

TWINING

FLOOD INSURANCE RATE MAP

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE 7
181010.4	January 2019	



APPROXIMATE SCALE

1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET

N

Reference: California Department of Conservation, Division of Mines and Geoogy (1999)

LEGEND

Active Faults

Faults considered to have been active during Holocene time and to have potential for surface rupture; solid line where accurately located, long dash where approximately located, short dash where inferred, dotted where concealed; query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by fault creep.

Earthquake Fault Zone Boundaries

These are delineated as straight-line segments that connect encircled turning points so as to define Earthquake Fault Zone segments.

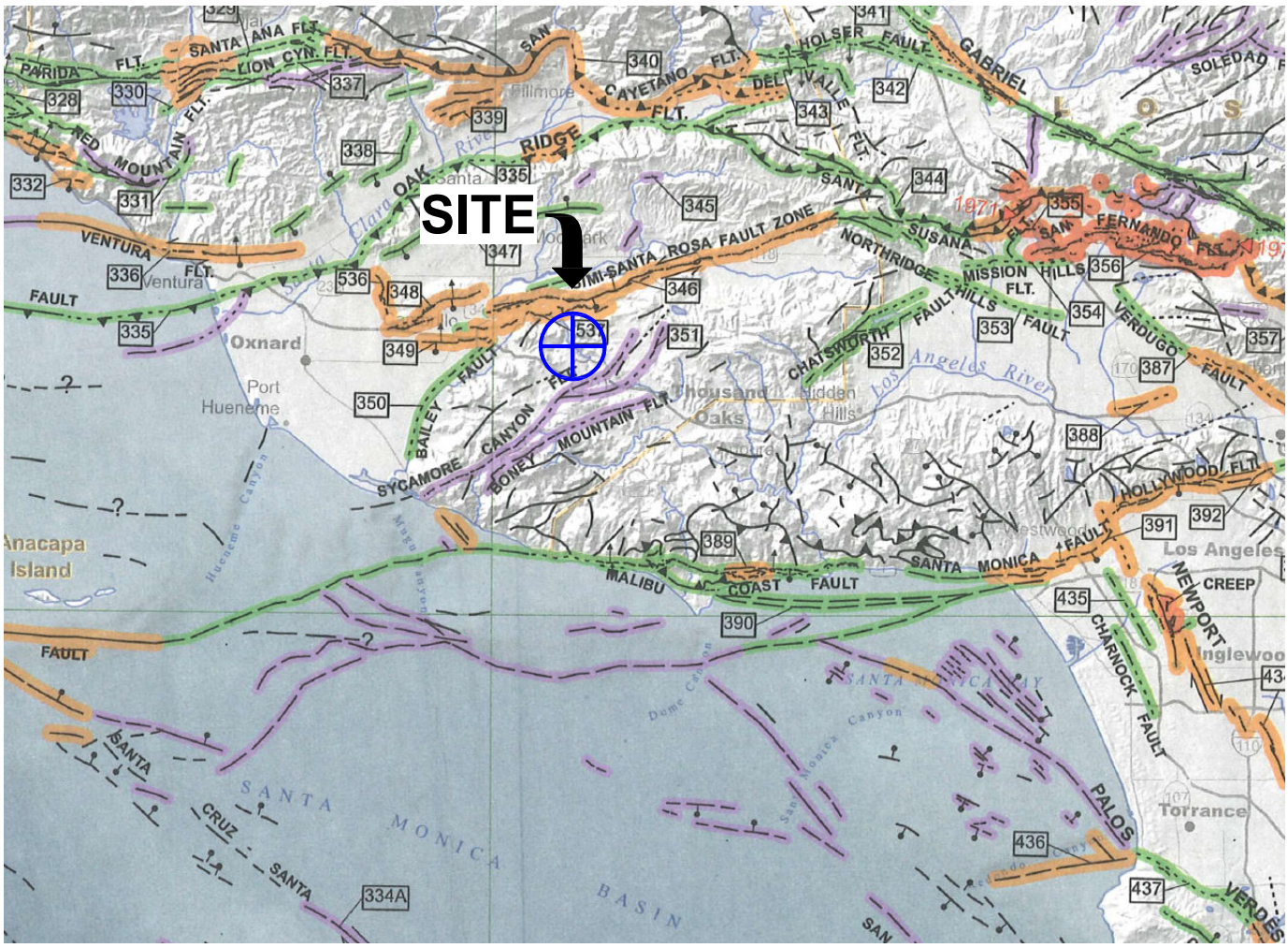
Seaward projection of zone boundary.

TWINING

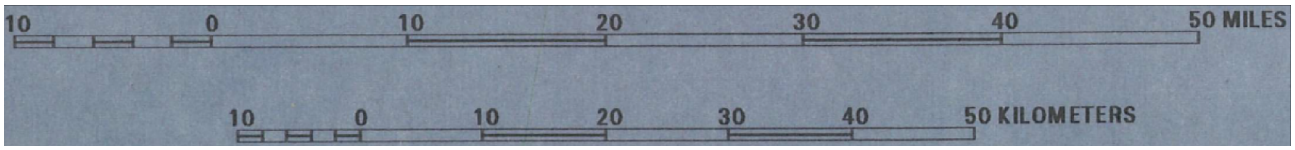
EARTHQUAKE FAULT ZONES MAP

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE 8
181010.4	January 2019	



APPROXIMATE SCALE



N

Reference: Jennings (2010)

TWINING

FAULT LOCATION MAP

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE 9
181010.4	January 2019	PAGE 1 OF 3

EXPLANATION

Fault traces on land are indicated by solid lines where well located, by dashed lines where approximately located or inferred, and by dotted lines where concealed by younger rocks or by lakes or bays. Fault traces are queried where continuation or existence is uncertain. Concealed faults in the Great Valley are based on maps of selected subsurface horizons, so locations shown are approximate and may indicate structural trend only. All offshore faults based on seismic reflection profile records are shown as solid lines where well defined, dashed where inferred, queried where uncertain.

FAULT CLASSIFICATION COLOR CODE
(Indicating Recency of Movement)

Fault along which historic (last 200 years) displacement has occurred and is associated with one or more of the following:

(a) a recorded earthquake with surface rupture. (Also included are some well-defined surface breaks caused by ground shaking during earthquakes, e.g. extensive ground breakage, not on the White Wolf fault, caused by the Arvin-Tehachapi earthquake of 1952). The date of the associated earthquake is indicated. Where repeated surface ruptures on the same fault have occurred, only the date of the latest movement may be indicated, especially if earlier reports are not well documented as to location of ground breaks.

(b) fault creep slippage - slow ground displacement usually without accompanying earthquakes.

(c) displaced survey lines.



A triangle to the right or left of the date indicates termination point of observed surface displacement. Solid red triangle indicates known location of rupture termination point. Open black triangle indicates uncertain or estimated location of rupture termination point.



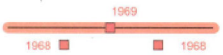
Date bracketed by triangles indicates local fault break.



No triangle by date indicates an intermediate point along fault break.



Fault that exhibits fault creep slippage. Hachures indicate linear extent of fault creep. Annotation (creep with leader) indicates representative locations where fault creep has been observed and recorded.



Square on fault indicates where fault creep slippage has occured that has been triggered by an earthquake on some other fault. Date of causative earthquake indicated. Squares to right and left of date indicate terminal points between which triggered creep slippage has occurred (creep either continuous or intermittent between these end points).

Holocene fault displacement (during past 11,700 years) without historic record. Geomorphic evidence for Holocene faulting includes sag ponds, scarps showing little erosion, or the following features in Holocene age deposits: offset stream courses, linear scarps, shutter ridges, and triangular faceted spurs. Recency of faulting offshore is based on the interpreted age of the youngest strata displaced by faulting.

Late Quaternary fault displacement (during past 700,000 years). Geomorphic evidence similar to that described for Holocene faults except features are less distinct. Faulting may be younger, but lack of younger overlying deposits precludes more accurate age classification.

Quaternary fault (age undifferentiated). Most faults of this category show evidence of displacement sometime during the past 1.6 million years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age. Unnumbered Quaternary faults were based on Fault Map of California, 1975. See Bulletin 201, Appendix D for source data.

Pre-Quaternary fault (older that 1.6 million years) or fault without recognized Quaternary displacement. Some faults are shown in this category because the source of mapping used was of reconnaissnce nature, or was not done with the object of dating fault displacements. Faults in this category are not necessarily inactive.

Reference: Jennings (2010)

TWINING

FAULT LOCATION MAP

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE 9
181010.4	January 2019	PAGE 2 OF 3

ADDITIONAL FAULT SYMBOLS

Bar and ball on downthrown side (relative or apparent).

Arrows along fault indicate relative or apparent direction of lateral movement.

Arrow on fault indicates direction of dip.

Low angle fault (barbs on upper plate). Fault surface generally dips less than 45° but locally may have been subsequently steepened. On offshore faults, barbs simply indicate a reverse fault regardless of steepness of dip.

OTHER SYMBOLS

Numbers refer to annotations listed in the appendices of the accompanying report. Annotations include fault name, age of fault displacement, and pertinent references including Earthquake Fault Zone maps where a fault has been zoned by the Alquist-Priolo Earthquake Fault Zoning Act. This Act requires the State Geologist to delineate zones to encompass faults with Holocene displacement.

Structural discontinuity (offshore) separating differing Neogene structural domains. May indicate discontinuities between basement rocks.

Brawley Seismic Zone, a linear zone of seismicity locally up to 10 km wide associated with the releasing step between the Imperial and San Andreas faults.

Geologic Time Scale			Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION	
						ON LAND	OFFSHORE
Quaternary	Late Quaternary	Historic				Displacement during historic time (e.g. San Andreas fault 1906). Includes areas of known fault creep.	
		Holocene	200		?	Displacement during Holocene time.	Fault offsets seafloor sediments or strata of Holocene age.
		Pleistocene	11,700		?	Faults showing evidence of displacement during late Quaternary time.	Fault cuts strata of Late Pleistocene age.
	Early Quaternary		700,000		?	Undivided Quaternary faults - most faults in this category show evidence of displacement during the last 1,600,000 years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age.	Fault cuts strata of Quaternary age.
Pre-Quaternary			1,600,000*			Faults without recognized Quaternary displacement or showing evidence of no displacement during Quaternary time. Not necessarily inactive.	Fault cuts strata of Pliocene or older age.
			4.5 billion (Age of Earth)				

* Quaternary now recognized as extending to 2.6 Ma (Walker and Geissman, 2009). Quaternary faults in this map were established using the previous 1.6 Ma criterion.

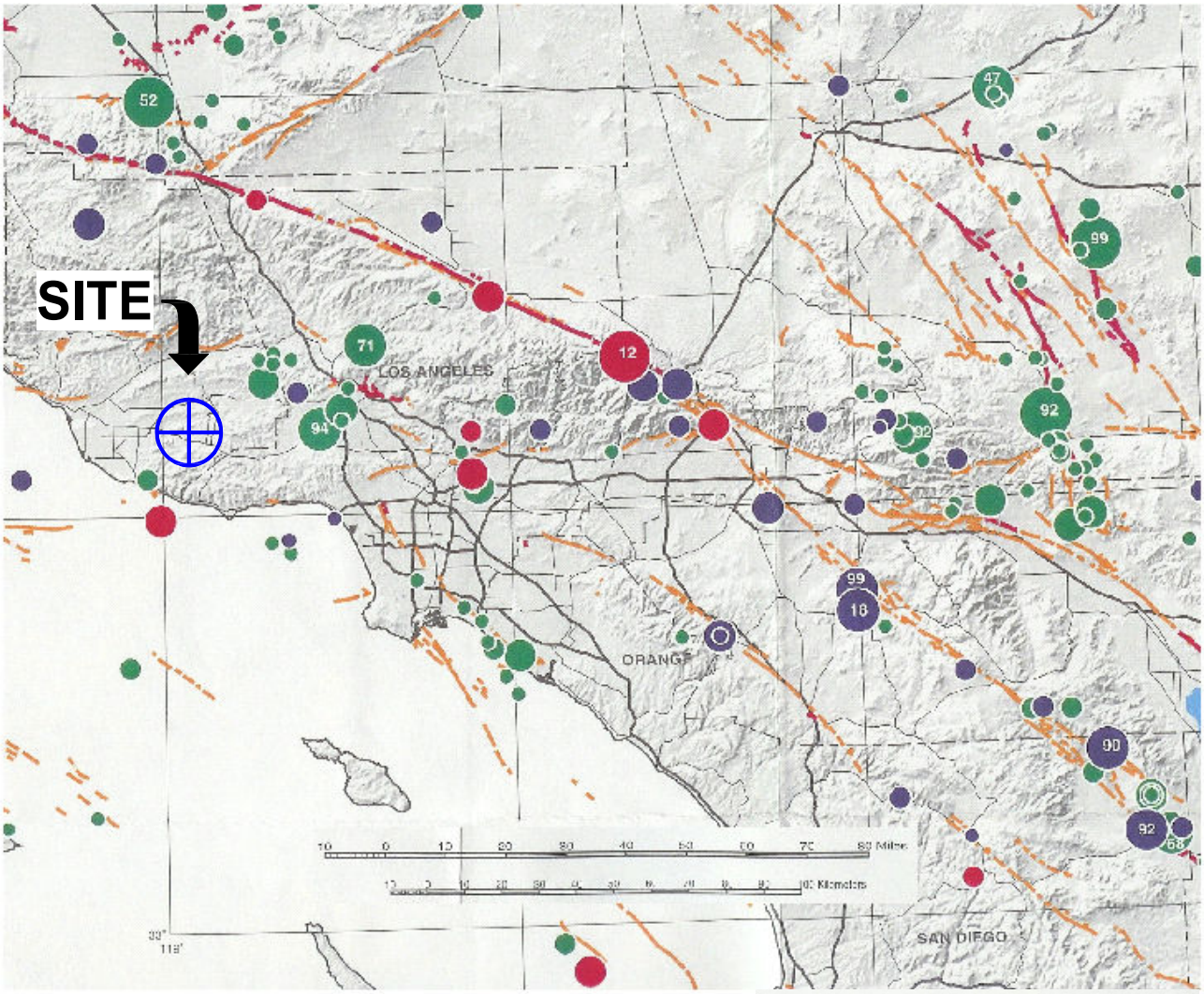
Reference: Jennings (2010)

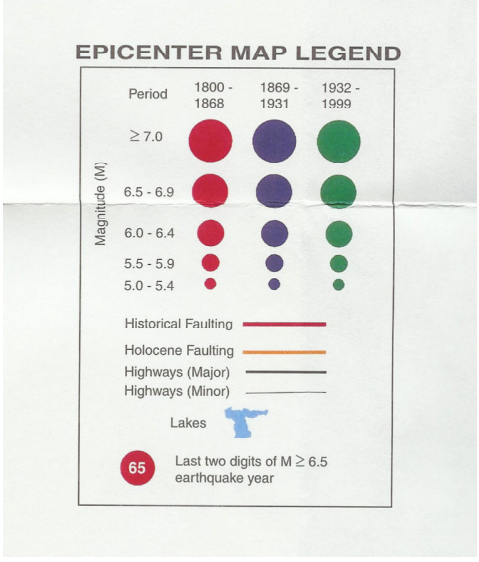
TWINING

FAULT LOCATION MAP

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE 9
181010.4	January 2019	PAGE 3 OF 3





N

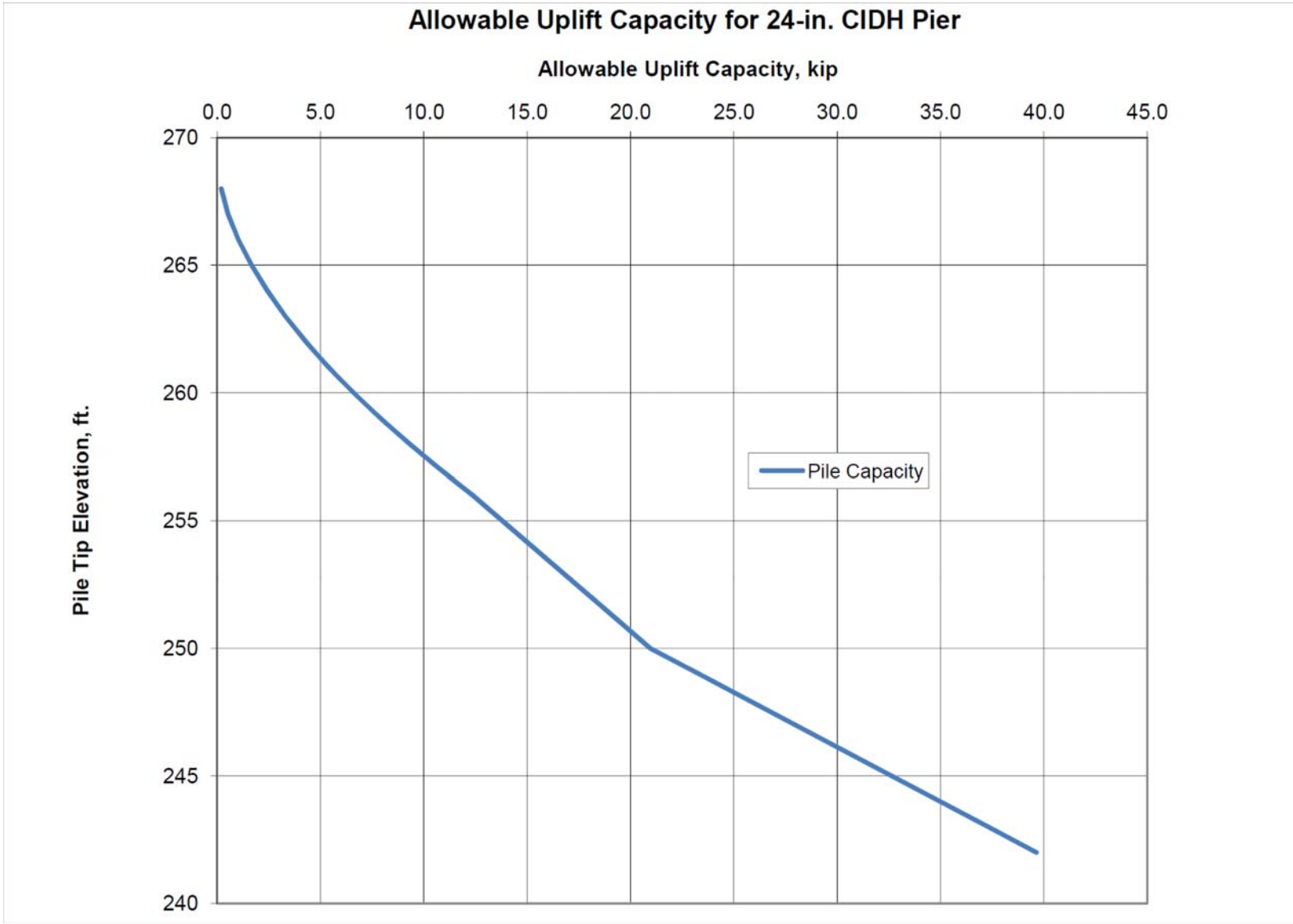
Reference: Toppozada et al. (2000)

TWINING

HISTORICAL SEISMICITY, 1800 - 1999

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	FIGURE 10



TWINING

ALLOWABLE UPLIFT CAPACITY

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	FIGURE 11

Appendix A
Field Exploration

Appendix A
Field Exploration

General

The initial subsurface exploration program for the proposed project consisted of drilling and logging three eight-inch-diameter hollow-stem-auger exploratory borings. The borings were advanced with a mobile B-80 drill rig. Drilling was performed by Badger Drilling of Oxnard, California.

The borings reached depths of approximately 5 to 38 feet below the existing grades. Upon completion of the borings, the boreholes were backfilled with soil from the cuttings.

Drilling and Sampling

The Boring Logs are presented as Figures A-2 through A-4. An explanation of these logs is presented as Figure A-1. The Boring Logs describe the earth materials encountered, samples obtained, and show the field and laboratory tests performed. The log also shows the boring number, drilling date, and the name of the logger and drilling subcontractor. The borings were logged by a Twining engineer/geologist using the Unified Soil Classification System. The boundaries between soil types shown on the logs are approximate because the transition between different soil layers may be gradual. Drive and bulk samples of representative earth materials were obtained from the borings.

A California modified sampler was used to obtain drive samples of the soil encountered. This sampler consists of a 3-inch outside diameter (O.D.), 2.4-inch inside diameter (I.D.) split barrel shaft that is driven a total of 18-inches into the soil at the bottom of the boring. The soil was retained in brass rings for laboratory testing. Additional soil from each drive remaining in the cutting shoe was usually discarded after visually classifying the soil. The number of blows required to drive the sampler the final 12 inches is presented on the boring logs.

Disturbed samples were obtained using a Standard Penetration Sampler (SPT). This sampler consists of a 2-inch O.D., 1.4-inch I.D. split barrel shaft that is advanced into the soil at the bottom of the drilled hole a total of 18 inches. The number of blows required to drive the sampler the final 12 inches is presented on the boring logs. Soil samples obtained by the SPT were retained in plastic bags.

Both the California modified and the SPT sampler were driven by an automatic-trip hammer weighing 140 pounds at a drop height of approximately 30 inches.

UNIFIED SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE)	GRAVEL AND GRAVELLY SOILS (MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE)	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS (MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE)	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE)	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

COARSE-GRAINED SOILS

Relative Density	SPT (blows/ft)	Relative Density (%)
Very Loose	<4	0 - 15
Loose	4 - 10	15 - 35
Medium Dense	10 - 30	35 - 65
Dense	30 - 50	65 - 85
Very Dense	>50	85 - 100

FINE-GRAINED SOILS

Consistency	SPT (blows/ft)
Very Soft	<2
Soft	2 - 4
Medium Stiff	4 - 8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	>30

NOTE: SPT blow counts based on 140 lb. hammer falling 30 inches

Sample Symbol	Sample Type	Description
	SPT	1.4 in I.D., 2.0 in. O.D. driven sampler
	California Modified	2.4 in. I.D., 3.0 in. O.D. driven sampler
	Bulk	Retrieved from soil cuttings
	Thin-Walled Tube	Pitcher or Shelby Tube

LABORATORY TESTING ABBREVIATIONS

ATT	Atterberg Limits
C	Consolidation
CORR	Corrosivity Series
DS	Direct Shear
EI	Expansion Index
GS	Grain Size Distribution
K	Permeability
MAX	Moisture/Density (Modified Proctor)
O	Organic Content
RV	Resistance Value
SE	Sand Equivalent
SG	Specific Gravity
TX	Triaxial Compression
UC	Unconfined Compression

TWINING

EXPLANATION FOR LOG OF BORINGS

Hill Canyon Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	A-1

STANDARD LOG EXPLANATION 181010.4 - HILL CANYON BRIDGE.GPJ TWINING LABS.GDT 1/15/19

DATE DRILLED 11/8/11 | LOGGED BY NJN | **BORING NO. B-1**

DRIVE WEIGHT 140 lbs. | DROP 30 inches | DEPTH TO GROUNDWATER (ft.) 32

DRILLING METHOD 8" HSA | DRILLER Badger Drilling | SURFACE ELEVATION (ft.) 278 +(MSL)

ELEVATION (feet)	DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	ADDITIONAL TESTS	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
						WASH, ATT, EI, CORR, MAX, DS		SC	Loose gravel ground cover; up to 2 inches in diameter FILL: CLAYEY SAND WITH GRAVEL, dark brown, moist, medium dense; trace gravel up to 0.5 inches in diameter -easy drilling
273	5		17	11.5	100.7	DS		SM	ALLUVIUM: SILTY SAND, dark yellow brown, moist, medium dense; trace pieces of basalt from coarse sand to fine gravel; white veinlets gravel layer
268	10		33	4.9	112.7	WASH, ATT, C			
263	15		27	10.7	104.8				dense; trace cobbles; difficult drilling
258	20		31						yellow brown; piece of basalt up to 3 inches in diameter; increase plasticity
253	25		37	19.8	101.0	WASH, ATT, DS		CH	SANDY FAT CLAY, dark brown, moist; very stiff; white veinlets; trace pieces of basalt up to 1 inch in diameter
248	30		25						▼
								SP	POORLY GRADED SAND WITH CLAY, yellow brown, wet, very dense; fine- to coarse-grained sand; pieces of gravel up to 1 inch in diameter
243	35								

TWINING

LOG OF BORING

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	A - 2 Sheet 1 of 2

BORING LOG 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 24/1/12

DATE DRILLED	11/8/11	LOGGED BY	NJN	**BORING NO.**	B-1
DRIVE WEIGHT	140 lbs.	DROP	30 inches	DEPTH TO GROUNDWATER (ft.)	32
DRILLING METHOD	8" HSA	DRILLER	Badger Drilling	SURFACE ELEVATION (ft.)	278 ±(MSL)

ELEVATION (feet)	DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	ADDITIONAL TESTS	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
			57					SP	POORLY GRADED SAND WITH CLAY, yellow brown, wet, very dense; fine- to coarse-grained sand; pieces of gravel up to 1 inch in diameter *(continued)*
			50/6						
238	40								REFUSAL Total Depth = 38.0 feet Backfilled on 11/8/2011 Groundwater encountered at 32 feet Water level rose to 29' after 20 minutes Backfilled with soil cuttings
233	45								
228	50								
223	55								
218	60								
213	65								
208	70								

TWINING

LOG OF BORING

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	A - 2 Sheet 2 of 2

BORING LOG 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 24/1/12

DATE DRILLED 11/8/11 | LOGGED BY NJN | **BORING NO. B-2**

DRIVE WEIGHT 140 lbs. | DROP 30 inches | DEPTH TO GROUNDWATER (ft.) not encountered

DRILLING METHOD 8" HSA | DRILLER Badger Drilling | SURFACE ELEVATION (ft.) 278 ±(MSL)

ELEVATION (feet)	DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
								CL	FILL: LEAN CLAY, yellow brown, moist
								SM	ALLUVIUM: SILTY SAND, yellow brown, moist, medium dense
273	5								REFUSAL Total Depth = 5.0 feet Backfilled on 11/8/2011 Groundwater not encountered Backfilled with soil cuttings
268	10								
263	15								
258	20								
253	25								
248	30								
243	35								

TWINING

LOG OF BORING

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	A - 3 Sheet 1 of 1

BORING LOG 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 24/1/12

DATE DRILLED	11/8/11	LOGGED BY	NJN	**BORING NO.**	B-3
DRIVE WEIGHT	140 lbs.	DROP	30 inches	DEPTH TO GROUNDWATER (ft.)	not encountered
DRILLING METHOD	8" HSA	DRILLER	Badger Drilling	SURFACE ELEVATION (ft.)	287 ±(MSL)

ELEVATION (feet)	DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	ADDITIONAL TESTS	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
								CL	FILL: LEAN CLAY, yellow brown, moist
								SM	ALLUVIUM: SILTY SAND, yellow brown, moist, medium dense
			33	13.7	99.6	WASH, ATT, DS			dark gray brown, moist; silty yellow and red patches; trace medium grained sand; pieces of weathered basalt
282	5		52/8	8.6	115.1	WASH, ATT, C			very dense weathered basalt
									REFUSAL at bedrock Total Depth = 8.0 feet Backfilled on 11/8/2011 Groundwater not encountered Backfilled with soil cuttings
277	10								
272	15								
267	20								
262	25								
257	30								
252	35								

TWINING

LOG OF BORING

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	A - 4 Sheet 1 of 1

BORING LOG 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 24/1/12

DATE DRILLED	12/19/18	LOGGED BY	JT	**BORING NO.**	B-4
DRIVE WEIGHT	140 lbs.	DROP	30 inches	DEPTH TO GROUNDWATER (ft.)	18
DRILLING METHOD	6" HSA	DRILLER	Baja Drilling	SURFACE ELEVATION (ft.)	N/A +(MSL)

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	ADDITIONAL TESTS	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
					GS, Att		CL	ALLUVIUM: Sandy lean CLAY; medium stiff; dark brown; moist; few gravel
5		12	23.4	73.3				Lean CLAY; medium stiff; dark brown; moist to wet
								-- drilling becomes more difficult
10		24	20.7	97.7				-- hard
15		23	26.5	97.5				-- same
								▼
20		19						-- groundwater encountered at 22 feet during drilling
25		21	20.4	106.2	DS			-- samples saturated
30		28						Sandy lean CLAY; hard; dark gray to brown; saturated; few GRAVEL
35								

BORING LOG 181010.4 - HILL CANYON BRIDGE.GPJ TWINING LABS.GDT 1/15/19

TWINING

LOG OF BORING

Hill Canyon Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	A - 2

DATE DRILLED 12/19/18 | LOGGED BY JT | **BORING NO. B-4**

DRIVE WEIGHT 140 lbs. | DROP 30 inches | DEPTH TO GROUNDWATER (ft.) 18

DRILLING METHOD 6" HSA | DRILLER Baja Drilling | SURFACE ELEVATION (ft.) N/A +(MSL)

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	ADDITIONAL TESTS	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
40		31					CL	ALLUVIUM: Sandy lean CLAY; medium stiff; dark brown; moist; few gravel *(continued)*
								-- very hard
		50/4"						CONEJO VOLCANICS: Conejo Volcanics Bedrock; very hard; light gray; wet -- difficulty drilling; boring terminated due to refusal
45								Total Depth = 43.3 feet Backfilled on 12/19/2018 Borehole terminated due to refusal at approximately 43.5 feet bgs. Groundwater recorded at approximate depth of 18 feet at the completion of drilling. Borehole backfilled with soil from cuttings.
50								
55								
60								
65								
70								

TWINING

LOG OF BORING

Hill Canyon Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	A - 2

BORING LOG 181010.4 - HILL CANYON BRIDGE.GPJ TWINING LABS.GDT 1/15/19

DATE DRILLED	12/19/18	LOGGED BY	JT	**BORING NO.**	B-5
DRIVE WEIGHT	140 lbs.	DROP	30 inches	DEPTH TO GROUNDWATER (ft.)	20
DRILLING METHOD	6" HSA	DRILLER	Baja Drilling	SURFACE ELEVATION (ft.)	N/A +(MSL)

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
0						CL	ALLUVIUM: Sandy lean CLAY; medium stiff; dark brown; moist; few gravel
5							Lean CLAY; medium stiff; dark brown; moist to wet
10							
15							
20							▼ -- groundwater encountered at depth of 20 feet during drilling
25							
30							Sandy lean CLAY; dark brown to gray; saturated; some GRAVEL
35							

TWINING

LOG OF BORING

Hill Canyon Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	A - 3

BORING LOG 181010.4 - HILL CANYON BRIDGE.GPJ TWINING LABS.GDT 1/15/19

DATE DRILLED	12/19/18	LOGGED BY	JT	**BORING NO.**	B-5
DRIVE WEIGHT	140 lbs.	DROP	30 inches	DEPTH TO GROUNDWATER (ft.)	20
DRILLING METHOD	6" HSA	DRILLER	Baja Drilling	SURFACE ELEVATION (ft.)	N/A ±(MSL)

DEPTH (feet)	SAMPLES: Bulk	SAMPLES: Driven	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
40							CL	ALLUVIUM: Sandy lean CLAY; medium stiff; dark brown; moist; few gravel *(continued)* -- same
45								CONEJO VOLCANICS: Conejo Volcanics Bedrock encountered; boring terminated due to refusal Total Depth = 45.0 feet Backfilled on 12/19/2018 Borehole terminated due to refusal at approximately 45 feet bgs. Groundwater recorded at approximate depth of 20 feet at the completion of drilling. Borehole backfilled with soil from cuttings.
50								
55								
60								
65								
70								

TWINING

LOG OF BORING

Hill Canyon Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	A - 3

BORING LOG 181010.4 - HILL CANYON BRIDGE.GPJ TWINING LABS.GDT 1/15/19

Appendix B

Laboratory Testing

Appendix B
Laboratory Testing

Laboratory Moisture Content and Density Tests

The moisture content and dry densities of driven samples obtained from the exploratory borings were evaluated in general accordance with the latest version of ASTM D 2937. The test results are presented on the logs of the exploratory borings in Appendix A and also summarized in Table B-1.

Wash Sieve

The amount of fines passing the No. 200 sieve was evaluated by the wash sieve on selected soil samples. The test procedure was in general accordance with ASTM D 1140. The test results are presented in Table B-2.

Atterberg Limits

Plasticity index testing was performed on selected samples obtained from the borings to evaluate plasticity characteristics and to aid in the classification of the soil. The tests were performed in general accordance with ASTM D 4318. The results are presented on Figure B-1, Atterberg Limits.

Direct Shear Tests

Direct shear tests were performed on selected samples in general accordance with the latest version of ASTM D 3080 to evaluate the shear strength characteristics of the selected materials. The samples were inundated during shearing to represent adverse field conditions. Test results are presented on Figures B-2 through B-5.

Consolidation Tests

Consolidation tests were performed on selected relatively undisturbed soil samples in general accordance with the latest version of ASTM D 2435. The samples were inundated during testing to represent adverse field conditions. The percent consolidation for each load cycle was recorded as a ratio of the amount of vertical compression to the original height of the sample. The results of the test are presented on Figures B-6 through B-7.

Expansion Index Tests

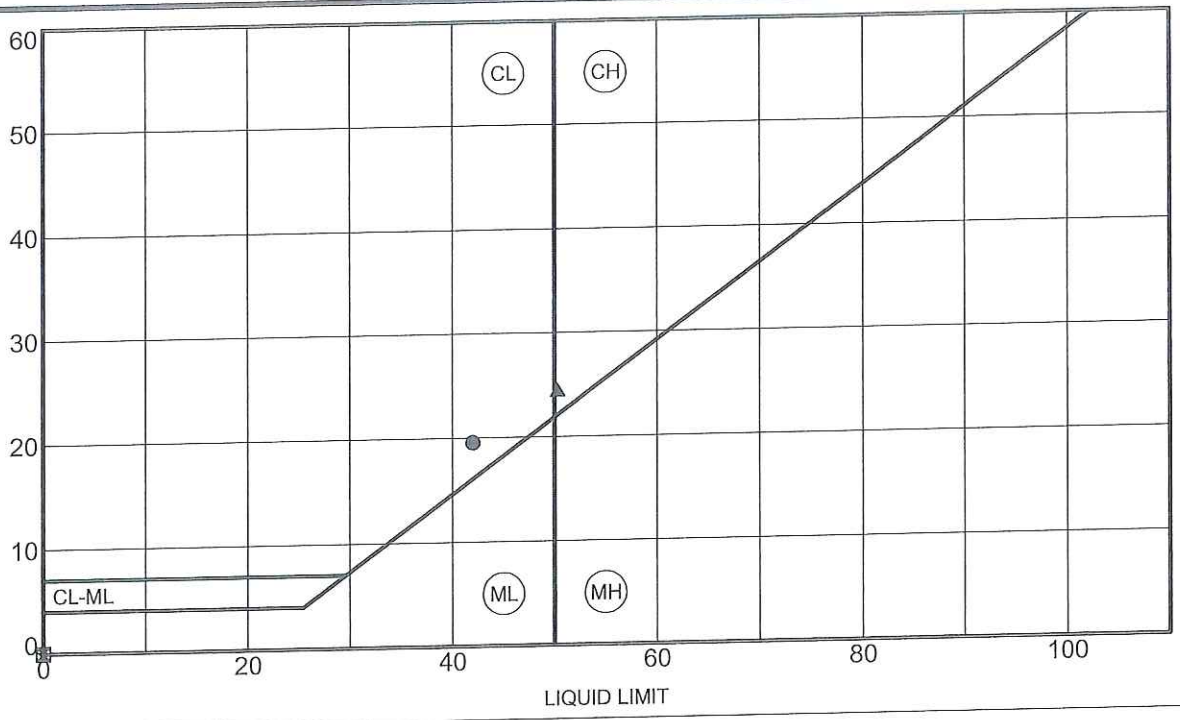
The expansion index of was evaluated in general accordance with ASTM D 4829. The specimen was molded under a specified compactive energy at approximately 50 percent saturation. The prepared 1-inch thick by 4-inch diameter specimen was loaded with a surcharge of 144 pounds per square foot and was inundated with tap water. Readings of volumetric swell were made for a period of 24 hours. The results of Expansion Index tests are presented on Table B-3.

Maximum Dry Density-Optimum Moisture Content

A selected bulk sample was tested to evaluate the maximum dry density and its optimum moisture content. The test was performed in general accordance with ASTM test method D 1557. The results are presented on Figure B-8.

Corrosivity

Soil pH and resistivity tests were performed by Anaheim Test Laboratories on a representative soil sample in general accordance with the latest version of California Test Method 643. The chloride content of a selected sample was evaluated in general accordance with the latest version of California Test Method 422. The sulfate content of a selected sample was evaluated in general accordance with the latest version of California Test Method 417. The test results are presented on Table B-4.



	Sample Location	LL	PL	PI	U.S.C.S. Classification
●	B-1 at 0-5 ft	42	22	20	CLAYEY SAND WITH GRAVEL
⊠	B-1 at 10 ft	NP	NP	NP	SILTY SAND
▲	B-1 at 25 ft	50	26	24	SANDY FAT CLAY
★	B-3 at 3 ft	NP	NP	NP	SILTY SAND
⊙	B-3 at 5 ft	NP	NP	NP	SILTY SAND

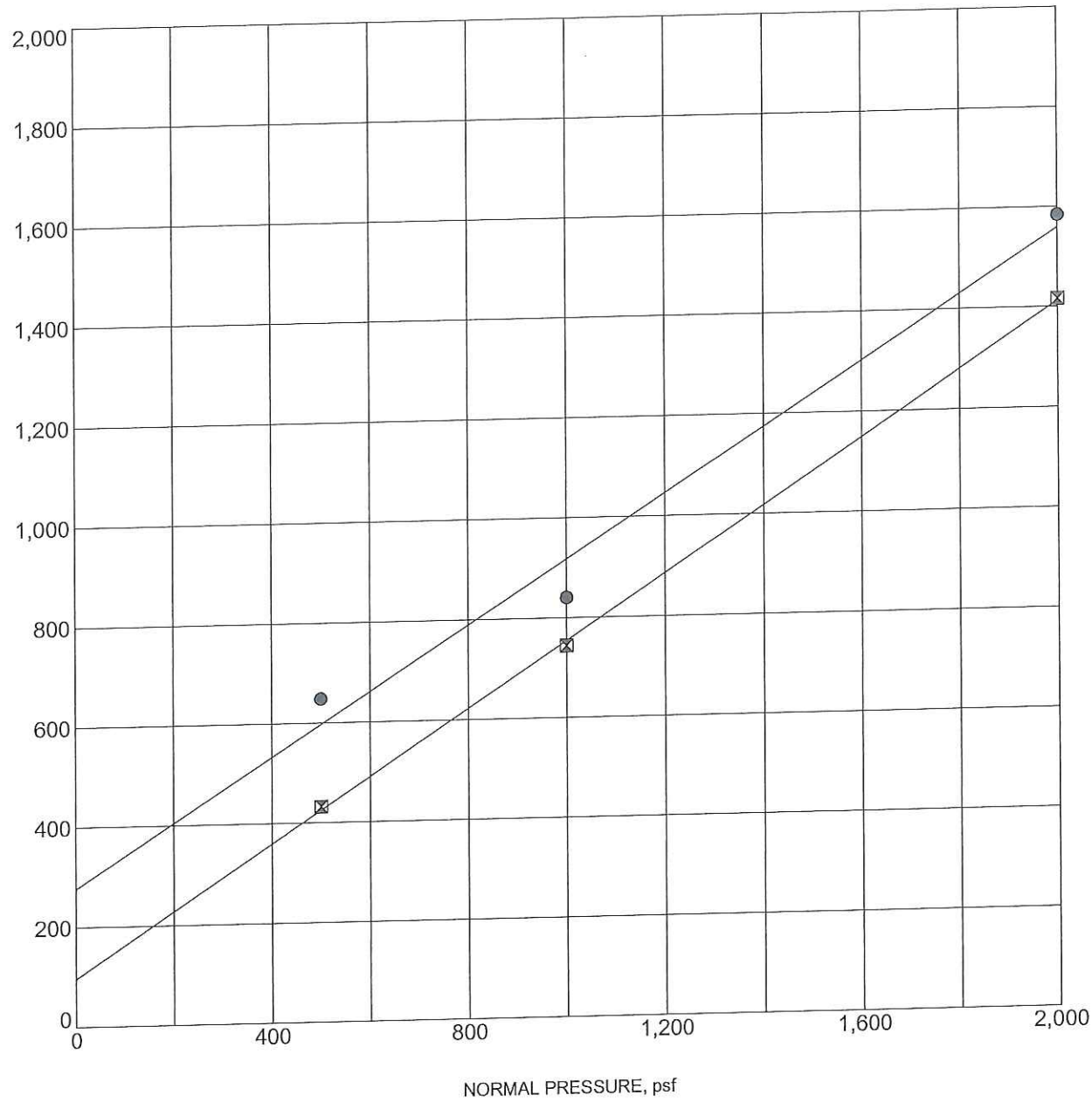
TWINING

ATTERBERG LIMITS

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	B-1

ATTERBERG LIMITS 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 14/12/11



Shear Strength Parameters

	Peak	Ultimate
Cohesion, C (psf):	275	95
Friction Angle, Ø (deg):	33	33

Boring No.: B-1
Sample Depth (ft): 0-5
Sample Description: CLAYEY SAND WITH GRAVEL
Strain Rate (in./min): 0.005
Dry Density (pcf): 105.7

Initial Moisture (%): 14.8
Final Moisture (%): 20.9

Remolded to 90 percent of the maximum dry density (ASTM D 1557)

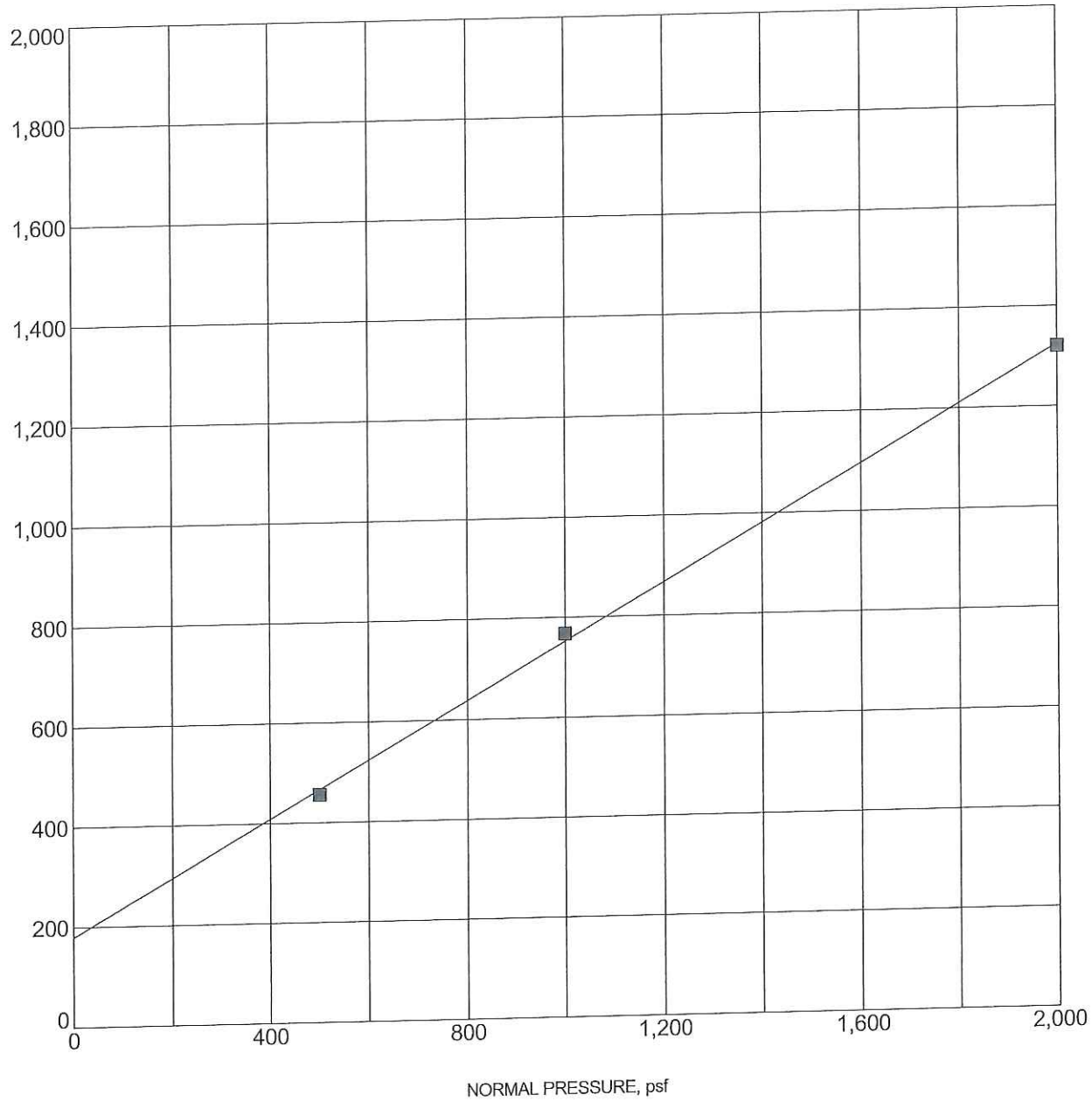
TWINING

DIRECT SHEAR TEST

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	B-2

DIRECT SHEAR 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 14/12/11



Boring No.:	B-1
Sample Depth (ft):	5
Sample Description:	CLAYEY SAND
Strain Rate (in./min):	0.005
Dry Density (pcf):	100.7

Shear Strength Parameters

	Peak	Ultimate
Cohesion, C (psf):	180	180
Friction Angle, Ø (deg):	30	30

Initial Moisture (%): 11.5
Final Moisture (%): 22.5

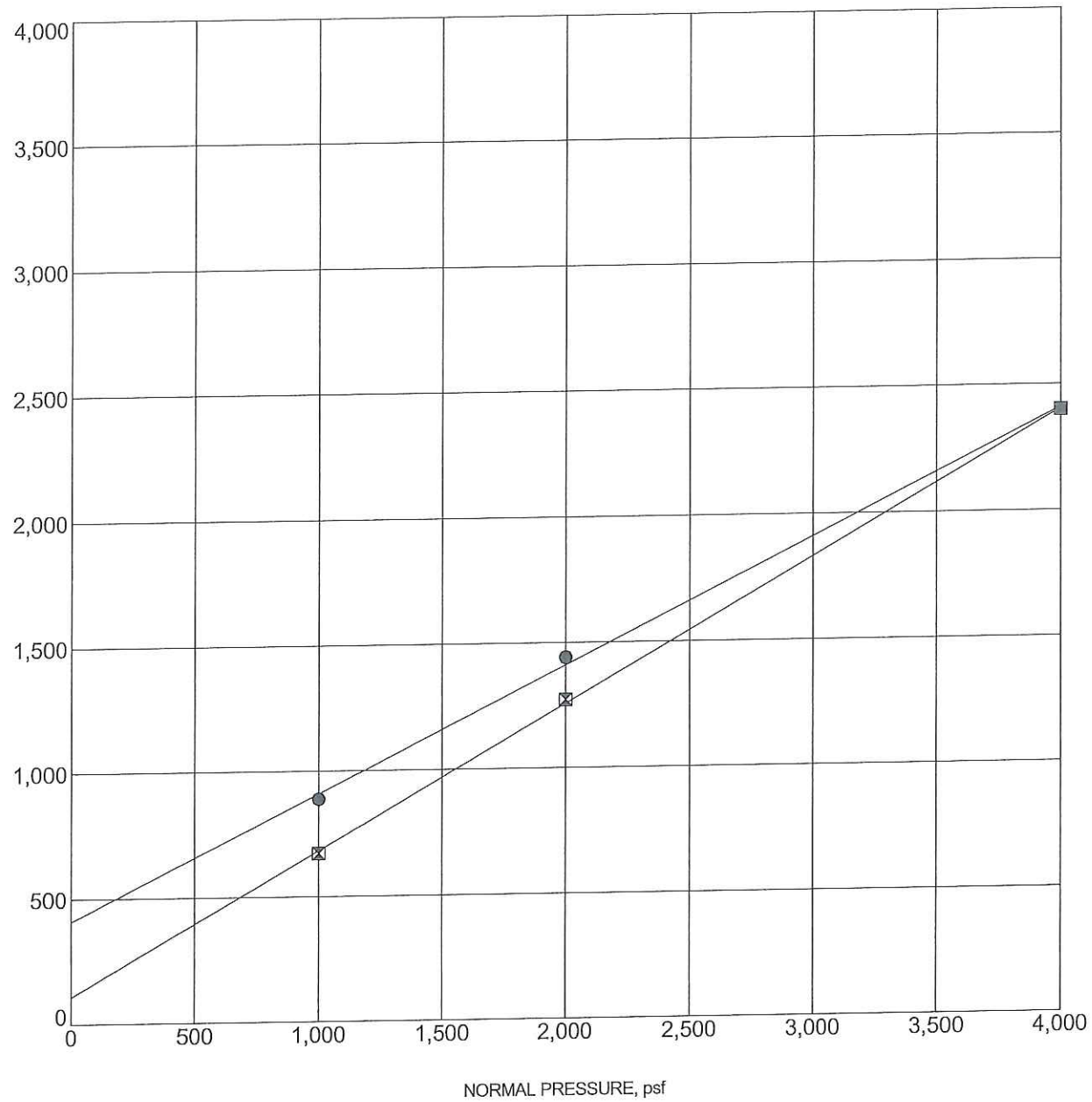
TWINING

DIRECT SHEAR TEST

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	B-3

DIRECT SHEAR 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 14/12/11



Boring No.:	B-1
Sample Depth (ft):	25
Sample Description:	SANDY FAT CLAY
Strain Rate (in./min):	0.005
Dry Density (pcf):	101.0

Shear Strength Parameters

	Peak —●—	Ultimate —⊠—
Cohesion, C (psf):	410	110
Friction Angle, Ø (deg):	27	30

Initial Moisture (%): 19.8
Final Moisture (%): 26.6

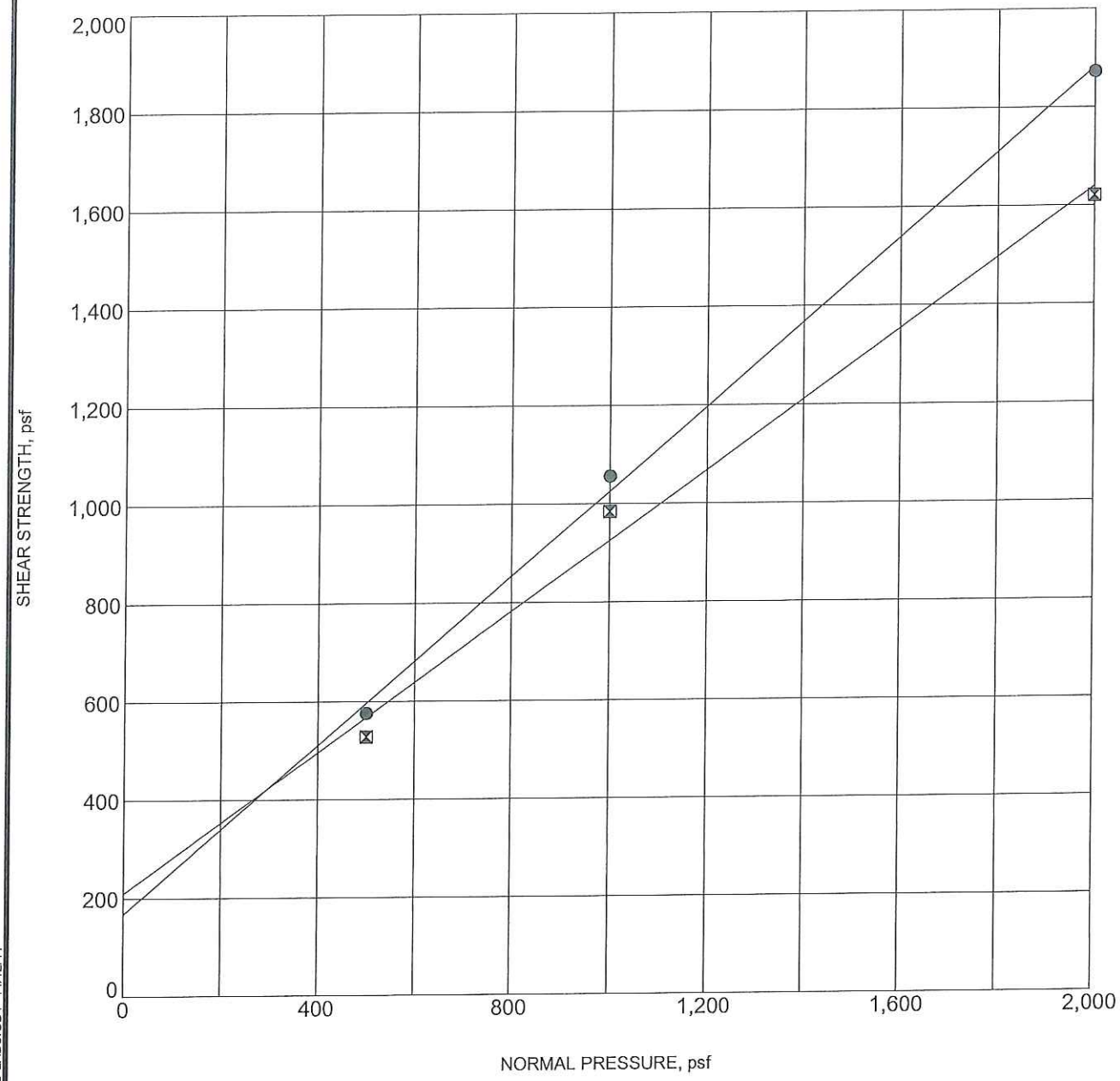
TWINING

DIRECT SHEAR TEST

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	B-4

DIRECT SHEAR 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 14/12/11



Boring No.:	B-3
Sample Depth (ft):	2.5
Sample Description:	SILTY SAND
Strain Rate (in./min):	0.005
Dry Density (pcf):	99.6

Shear Strength Parameters

	Peak —●—	Ultimate —⊠—
Cohesion, C (psf):	170	210
Friction Angle, Ø (deg):	41	36

Initial Moisture (%): 13.7
Final Moisture (%): 28.2

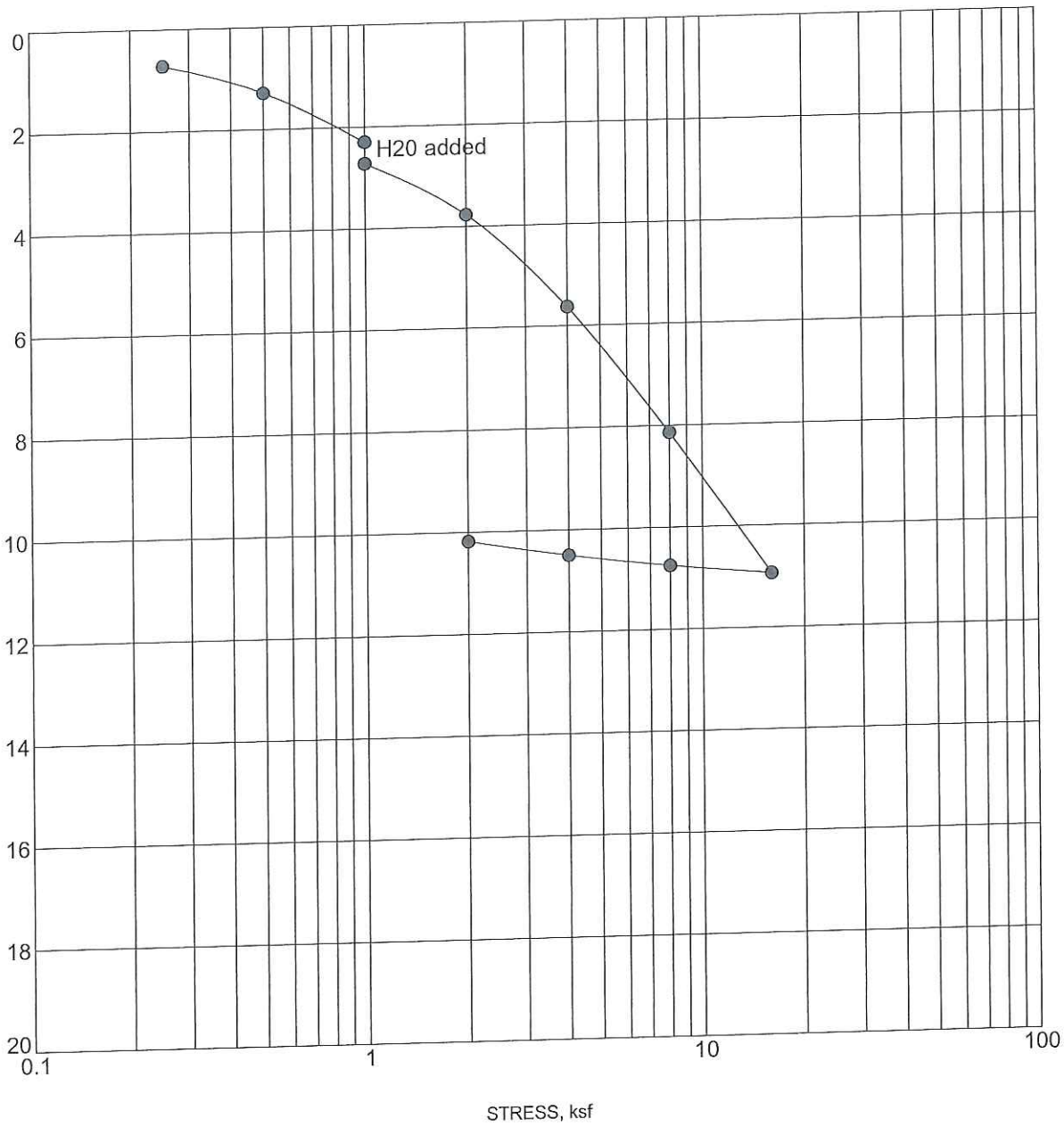
TWINING

DIRECT SHEAR TEST

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	B-5

DIRECT SHEAR 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 14/12/11



Sample Location	Soil Description	Dry Density (pcf)	Moisture Content (%)
● B-1 at 10 ft	**SILTY SAND**	**111.0**	**4.9**

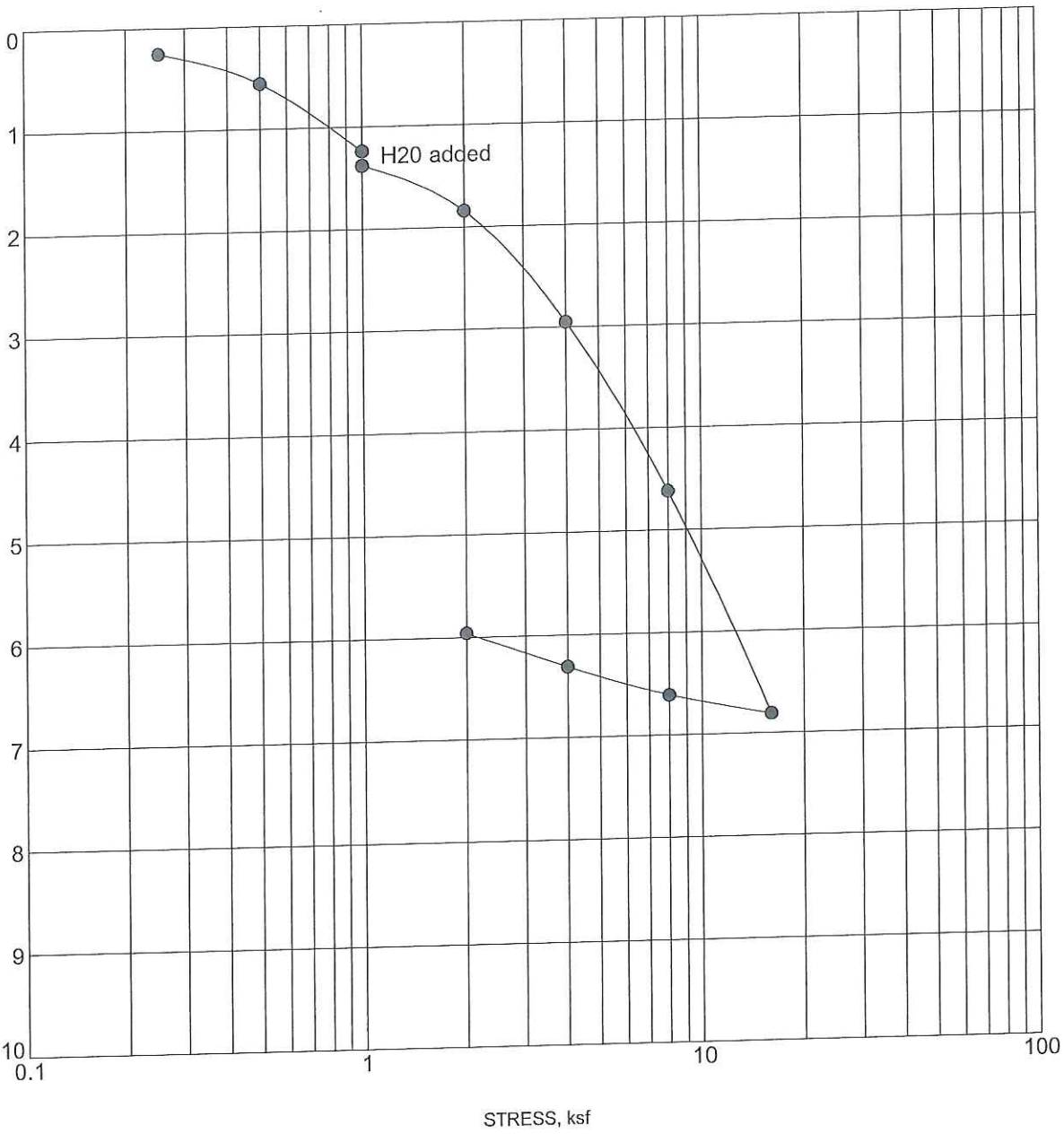
TWINING

CONSOLIDATION TEST

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	B-6

CONSOL STRAIN 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 14/12/11



Sample Location	Soil Description	Dry Density (pcf)	Moisture Content (%)
● B-3 at 5 ft	**SILTY SAND**	**102.9**	**8.6**

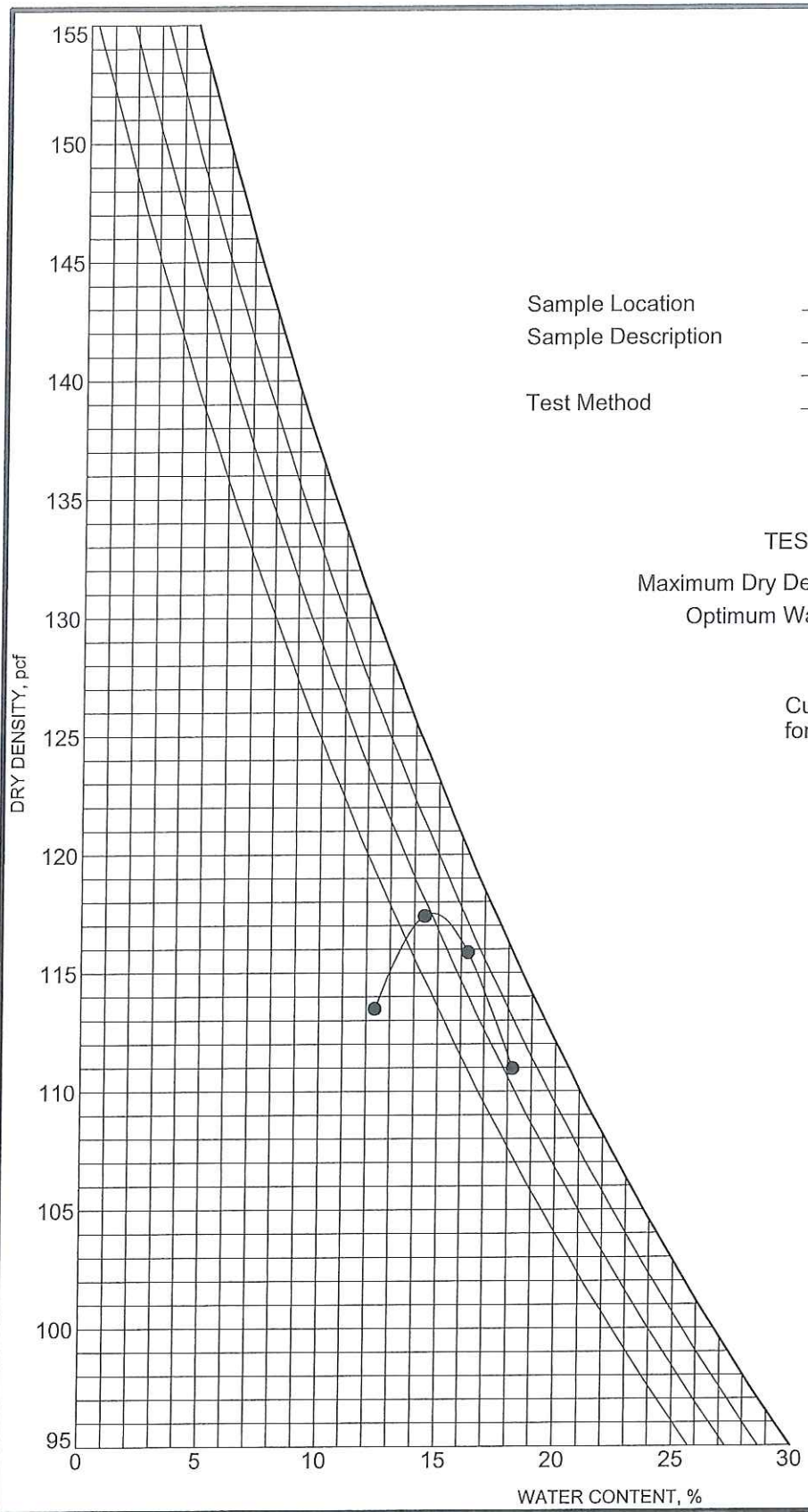
TWINING

CONSOLIDATION TEST

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	B-7

CONSOL STRAIN 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 14/12/11



Sample Location	B-1 at 0-5 ft
Sample Description	CLAYEY SAND WITH GRAVEL
Test Method	ASTM D1557 Method A

TEST RESULTS

Maximum Dry Density	117.5 pcf
Optimum Water Content	14.8 %

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

2.50

TWINING

MOISTURE-DENSITY RELATIONSHIP

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	B-8

COMPACTION 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 14/12/11

TWINING

Report of Soil Testing

To: Bulk Sample for Scour Determination

Project Name: Conejo Canyon Bridge

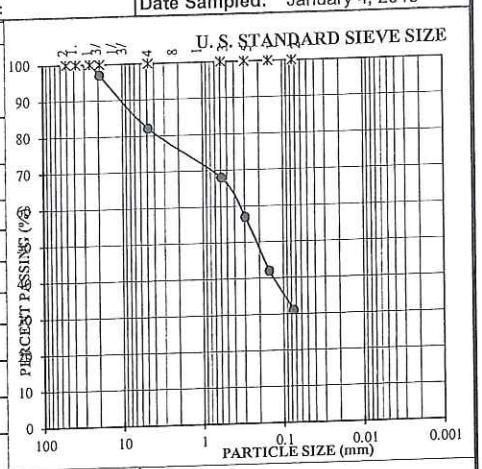
Project Number: 181010.4

Lab Number:

Sample Data:
Bulk sample from the stream

Date Sampled: January 4, 2019

Wet Wt:				
Dry Wt:	67926.0			
Sieve Size	Wt. (Grams)	% Retained	% Passing	% Passing
6 inch (150 mm)	0	0	100	100
5 inch (125 mm)	4917	7.2	92.8	93
4 inch (100 mm)	16540	24.4	75.6	76
3 inch (75 mm)	28645	42.2	57.8	58
2 1/2 inch (62.5 mm)	37661	55.4	45.6	46
2 inch (50 mm)	39296	57.9	42.1	42
1-1/2 inch (37 mm)	40931	60.3	39.7	40
1 inch (25 mm)	44002	64.8	35.2	35
3/4 inch (19 mm)	45196	66.5	33.5	34
1/2 inch (12.5 mm)	46810	68.9	31.1	31
3/8 inch (9.5 mm)	47824	70.4	29.6	30
#4 (4.75 mm)	49532	72.9	27.1	27
Weight Passing #4 sieve				
716.4				
#8 (2.36 mm)	148.3	20.7	79.3	22
#16 (1.18 mm)	319.2	44.6	55.4	15
#30 (0.6 mm)	526.9	73.5	26.5	7
#50 (0.3 mm)	644.3	89.9	10.1	3
#100 (0.15 mm)	673.3	94.0	6.0	2
#200 (0.075 mm)	683.1	95.4	4.6	1.2

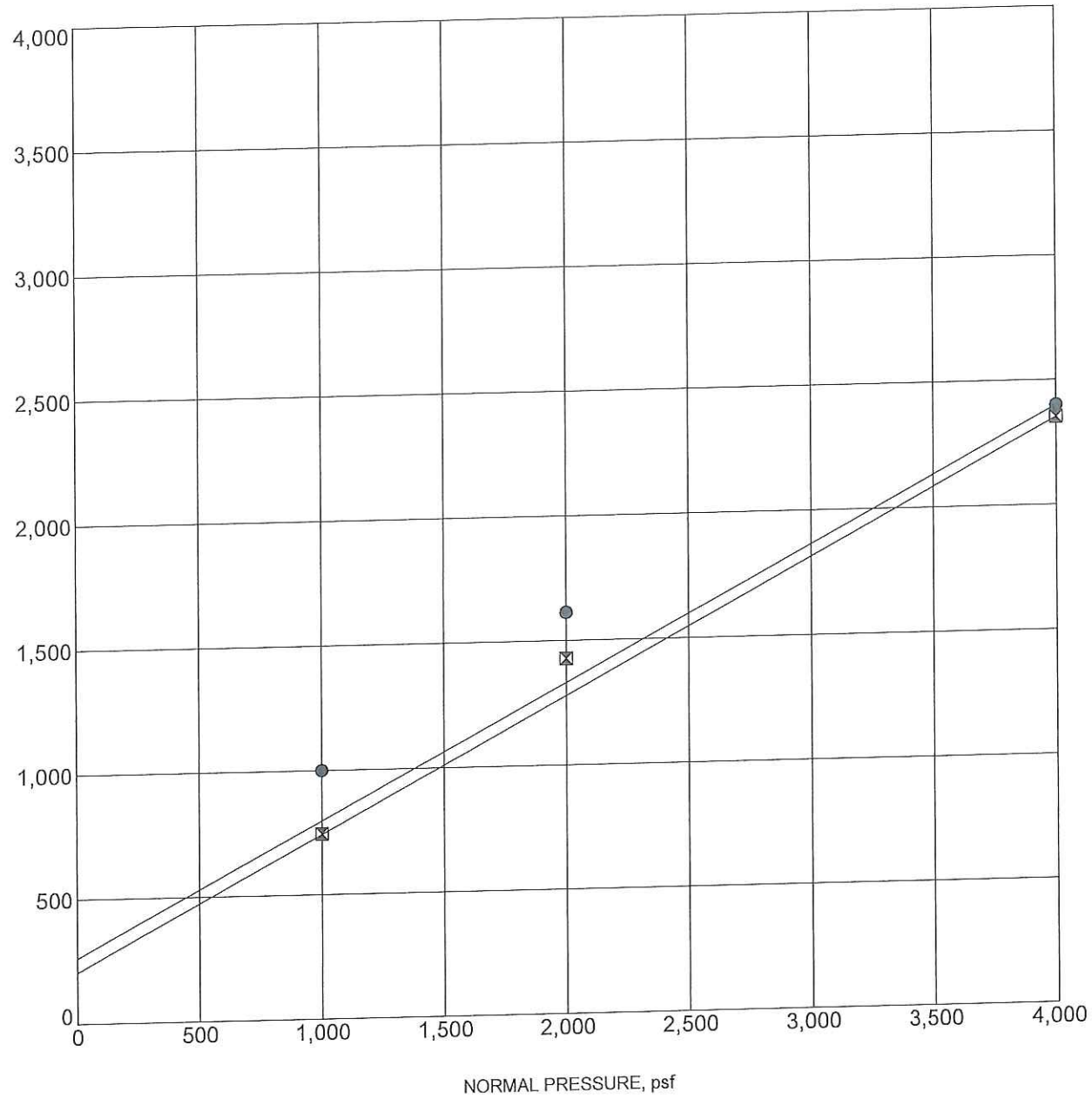


Tested in Accordance with Caltrans CTM:202

Technician: Glenn Taylor Date: January 8, 2019

Reviewed By: Glenn Taylor Date: January 8, 2019
Laboratory Manager

Twining Inc. 1879 Portola Road Suite G Ventura, Ca. 93003
Office:805-644-85100 Fax: 805-644-5179 Web: Twininginc.com



Shear Strength Parameters

	Peak	Ultimate
Cohesion, C (psf):	250	200
Friction Angle, Ø (deg):	28	28

Boring No.: B-4
Sample Depth (ft): 25
Sample Description: Lean Clay
Strain Rate (in./min): 0.005
Dry Density (pcf): 106.2

Initial Moisture (%): 20.4
Final Moisture (%): 20.4

TWINING

DIRECT SHEAR TEST

Hill Canyon Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	B-1

DIRECT SHEAR 181010.4 - HILL CANYON BRIDGE.GPJ TWINING LABS.GDT 1/16/19

Twining Inc
1879 Portola Rd., Suite G, Ventura, CA 93003
Ph: 805.644.5100
Fax: 562.426.6424
www.twininginc.com

Material Test Report

Report No: MAT:W01-18-29559-S1
Printed Date: 1/14/2019 Issue No: 1

Customer:	Stantec 111 E. Victoria Street Santa Barbara, CA 93101
Project:	Hill Canyon Bridge 9600 Santa Rosa Road Camarillo, CA 93012

Project No: 181010.4
Permit No:
OSHPD:
DSA File #:
DSA AP #:

Jurisdiction:
Distribution List:

Approved by: Adrian Moreno
Senior Staff Engineer

Sample Details

Sampled By: J. Tawakoli
Date Sampled: 12/18/2018
Sample Location: Boring B-4 at 0-5 feet depth
Test Specification: CTM 301

Date Received: 12/20/2018
Material Description: Lean Clay

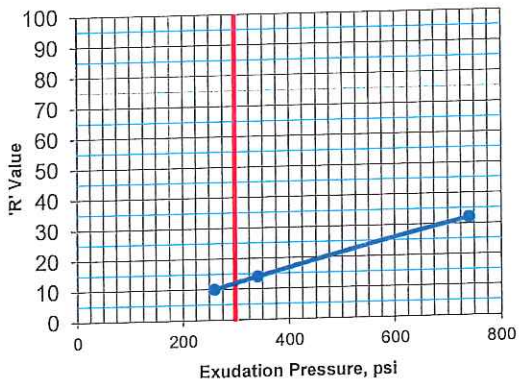
Test Details

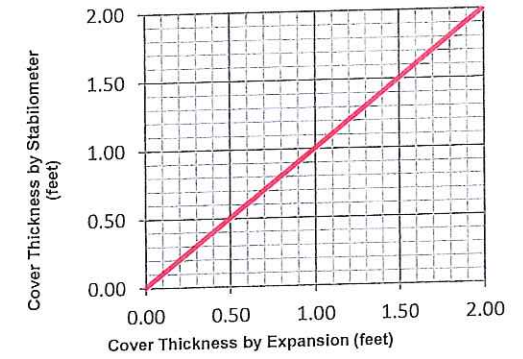
Date Tested: 12/26/2018 Tested By: B. Vollnogle

GRADING ANALYSIS, % Passing

Sieve Size		"As Received"	"As Used"
2"	50 mm	100	
1-1/2"	37.5 mm	100	100
1"	25 mm	100	100
3/4"	19.5 mm	100	100
3/8"	9.5 mm	100	
#4	4.75 mm	100	

TEST SPECIMEN DATA	A	B	C
Compactor Air Pressure (psi)	100	300	150
Initial Moisture Content	10.9%	10.9%	10.9%
Water Added (mL)	60.0	30.0	45.0
Final Moisture Content	17.0%	14.0%	15.5%
Sample Height (in)	2.69	2.57	2.61
Net Sample Weight (g)	1152.7	1126.0	1139.0
Dry Density (pcf)	111.0	116.6	114.6
Exudation Load (lbs)	3262	9312	4276
Exudation Pressure (psi)	260	741	340
Expansion Dial (x 0.0001)			
Expansion Pressure (psf)			
P_h at 1000lbs (psi)	56	37	53
P_h at 2000lbs (psi)	134	96	127
Displacement (turns)	3.88	3.46	3.63
R' Value	11	33	15
Corrected 'R' Value	10	32	14
Stabilometer Thickness (ft)			
Expansion Press. Thickness (ft)			





TI =
Gf =
R-Value by Exudation Pressure: 14
R-Value by Expansion Pressure: —

Compliance:

Comments

© TWINING INC.

Table B-1
Laboratory Moisture Content and Dry Density

Boring No.	Depth (feet)	Moisture Content (%)	Dry Unit Weight (pcf)
B-1	5	11.5	100.7
B-1	10	4.9	112.7
B-1	15	10.7	104.8
B-1	25	19.8	101.0
B-3	2.5	13.7	99.6
B-3	5	8.6	115.1

Table B-2
No. 200 Wash Sieve Results

Boring No.	Depth (feet)	Percent Passing #200
B-1	0-5	34.2
B-1	10	16.0
B-1	25	52.1
B-3	2.5	40.4
B-3	5	33.5

Table B-3
Expansion Index Test Result

Boring No.	Depth (feet)	Expansion Index
B-1	0-5	60

Table B-5
Corrosivity Test Results

Boring No.	Depth (feet)	pH	Water Soluble Sulfate (%)	Water Soluble Chloride (%)	Minimum Resistivity (ohm-cm)
B-1	0-5	6.7	0.0066	0.0099	788

Appendix C

Seismic Refraction Survey

SEISMIC REFRACTION SURVEY
HILL CANYON TREAMENT PLANT
CAMARILLO, CALIFORNIA

PREPARED FOR:
Twining, Inc.
1879 Portola Road, Suite G
Ventura, CA 93003

PREPARED BY:
Southwest Geophysics, Inc.
8057 Raytheon Road, Suite 9
San Diego, CA 92111

November 25, 2011
Project No. 111360

SOUTHWEST GEOPHYSICS, INC.

YOUR SUBSURFACE SOLUTION

November 25, 2011
Project No. 111360

Mr. Nicholas Novoa
Twining, Inc.
1879 Portola Road, Suite G
Ventura, CA 93003

Subject: Seismic Refraction Survey
Hill Canyon Treatment Plant
Camarillo, California

Dear Mr. Novoa:

In accordance with your authorization, we have performed a seismic refraction survey pertaining to the proposed bridge construction project at the Hill Canyon Treatment Plant in Camarillo, California. Specifically, our survey consisted of performing two seismic refraction traverses at the project site. The purpose of our study was to develop subsurface velocity profiles of the areas surveyed, and to assess the apparent rippability of the subsurface materials. This data report presents our survey methodology, equipment used, analysis, and results.

We appreciate the opportunity to be of service on this project. Should you have any questions related to this report, please contact the undersigned at your convenience.

Sincerely,
SOUTHWEST GEOPHYSICS, INC.

Patrick Lehrmann

Patrick Lehrmann, P.G., P.Gp.
Principal Geologist/Geophysicist

Hans van de Vrugt

Hans van de Vrugt, C.E.G., P.Gp.
Principal Geologist/Geophysicist

PFL/HV/hv

Distribution: (1) Electronic



8057 Raytheon Road, Suite 9 • San Diego • California 92111 • Telephone 858-527-0849 • Fax 858-225-0114

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Figure 4b – Seismic Profiles, SL-2

1. INTRODUCTION

In accordance with your authorization, we have performed a seismic refraction survey pertaining to the proposed bridge construction project at the Hill Canyon Treatment Plant in Camarillo, California (Figure 1). Specifically, our survey consisted of performing two seismic refraction traverses at the project site. The purpose of our study was to develop subsurface velocity profiles of the areas surveyed. This data report presents our survey methodology, equipment used, analysis, and results.

2. SCOPE OF SERVICES

Our scope of services included:

- Performance of two seismic refraction lines at the project site.
- Compilation and analysis of the data collected.
- Preparation of this data report presenting our results, conclusions and recommendations.

3. SITE AND PROJECT DESCRIPTION

The project site is located along the west side of Hill Canyon Road, just north of the Hill Canyon Treatment Plant in Camarillo (Figures 1 and 2). Vegetation in the project area predominantly consists of annual grass, brush and scattered trees. Both seismic lines are located along the east side of a running creek. Based on our discussions with you, it is our understanding that a bridge will be built over the creek bed at this location. Figures 2 and 3 depict the general site conditions.

4. SURVEY METHODOLOGY

A seismic P-wave (compression wave) refraction survey was conducted at the site to evaluate the rippability characteristics of the subsurface materials and to develop subsurface velocity profiles of the areas surveyed. The seismic refraction method uses first-arrival times of refracted seismic waves to estimate the thicknesses and seismic velocities of subsurface layers. Seismic P-waves generated at the surface, using a hammer and plate, are refracted at boundaries separating materials of contrasting velocities. These refracted seismic waves are then detected by a series of surface vertical component geophones and recorded with a 24-channel Geometrics StrataView

seismograph. The travel times of the seismic P-waves are used in conjunction with the shot-to-geophone distances to obtain thickness and velocity information on the subsurface materials.

Two seismic lines (SL-1 and SL-2) were conducted at the project site. The general locations of the lines were selected by your office. Five shot points were conducted along SL-1 and three shot points were conducted along SL-2. The shot points (signal generation locations) were conducted along the lines at the ends, midpoint, and for SL-1 at intermediate points between the ends and the midpoint.

The refraction method requires that subsurface velocities increase with depth. A layer having a velocity lower than that of the layer above will not generally be detectable by the seismic refraction method and, therefore, could lead to errors in the depth calculations of subsequent layers. In addition, lateral variations in velocity, such as those caused by core stones or intrusions can also result in the misinterpretation of the subsurface conditions.

5. RESULTS AND CONCLUSIONS

As previously indicated, two seismic traverses were conducted as part of our study. The collected data were processed using SIPwin (Rimrock Geophysics, 2003), a seismic interpretation program, and analyzed using both SIPwin and SeisOpt Pro (Optim, 2008). Both programs use first arrival picks and elevation data to produce subsurface velocity models. SIPwin uses layer-based modeling techniques to produce a layered velocity model, where changes in velocities are depicted as discrete contacts. SeisOpt Pro uses a nonlinear optimization technique called adaptive simulated annealing. The resulting velocity model provides a tomography image of the estimated geologic conditions. Both vertical and lateral velocity information is contained in the tomography model. Changes in layer velocity are revealed as gradients rather than discrete contacts, which typically are more representative of actual conditions.

Table 2 lists the approximate P-wave velocities and depths calculated from the seismic refraction traverse using the layered modeling method. The approximate locations of the seismic refraction traverses are shown on the Seismic Line Location Map (Figure 2). The velocity models are in-

cluded in Figures 4a and 4b. In general, the effective depth of evaluation for a seismic refraction traverse is approximately one-third to one-fifth the length of the traverse.

Table 1 – Seismic Traverse Results[1]

Traverse No. And Length	P-wave Velocity feet/second	Approximate Depth to Bottom of Layer in feet	Geology
SL-1 160 feet	V1 = 1,180 V2 = 4,850	12 – 14 ---	Alluvium Bedrock
SL-2 110 feet	V1 = 1,265 V2 = 5,040	13 – 17 ---	Alluvium Bedrock

1 Results based on the model generated using SIPwin, 2003

The results revealed the presence of two distinct layers. Based on our site observations and discussions with you, the layers detected have been interpreted to be alluvium overlying crystalline rock with varying degrees of decomposition/weathering.

6. LIMITATIONS

The field evaluation and geophysical analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be present. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface surveying will be performed upon request.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Southwest Geophysics, Inc. should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document. This report is intended exclusively for use by the client. Any use or reuse of the findings and conclusions of this report by parties other than the client is undertaken at said parties' sole risk.

7. SELECTED REFERENCES

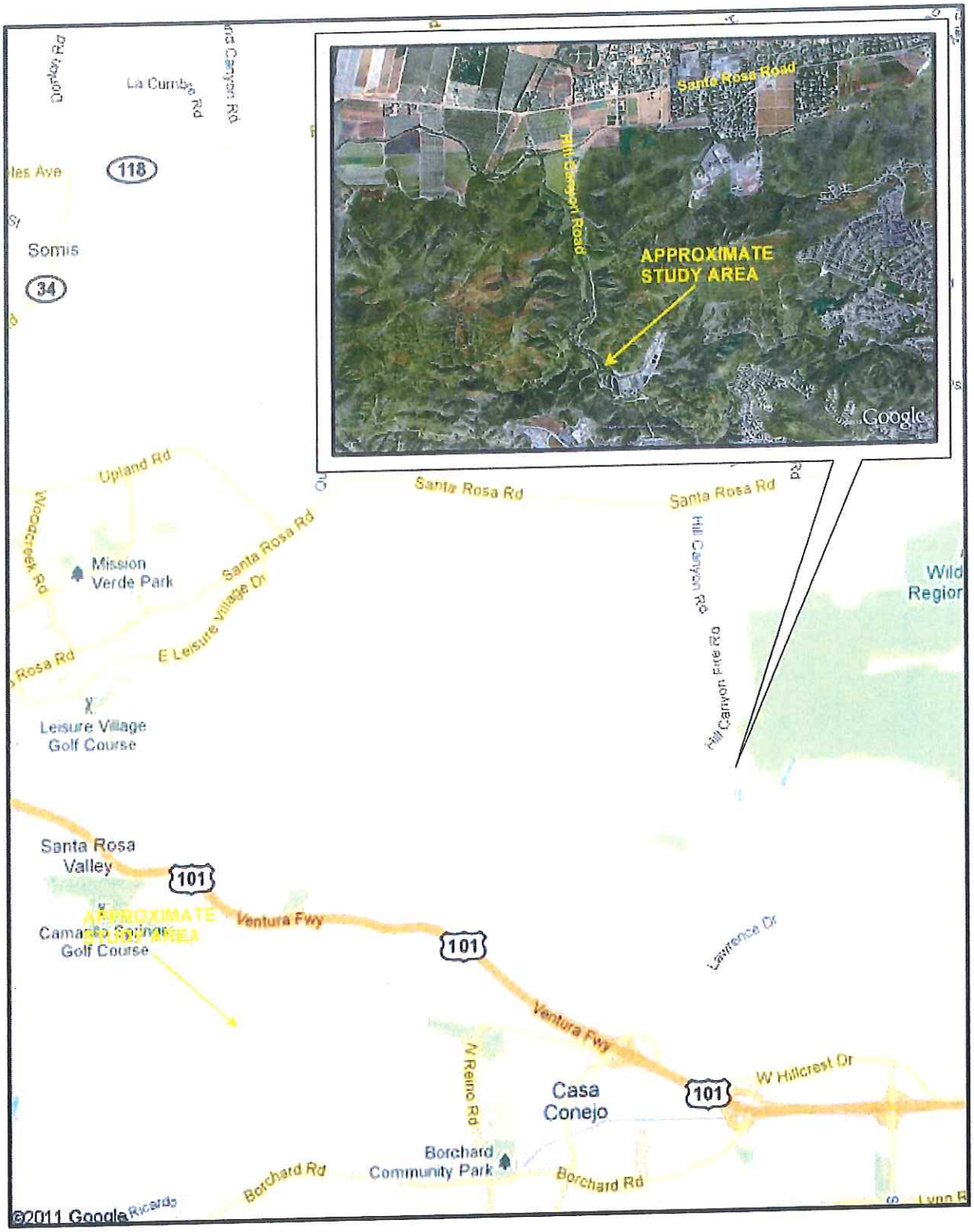
Caterpillar, Inc., 2004, Caterpillar Performance Handbook, Edition 35, Caterpillar, Inc., Peoria, Illinois.

Mooney, H.M., 1976, Handbook of Engineering Geophysics, dated February.

Optim, Inc., 2008, SeisOpt Pro, V-5.0.

Rimrock Geophysics, 2003, Seismic Refraction Interpretation Program (SIPwin), V-2.76.

Telford, W.M., Geldart, L.P., Sheriff, R.E., and Keys, D.A., 1976, Applied Geophysics, Cambridge University Press.



SITE LOCATION MAP

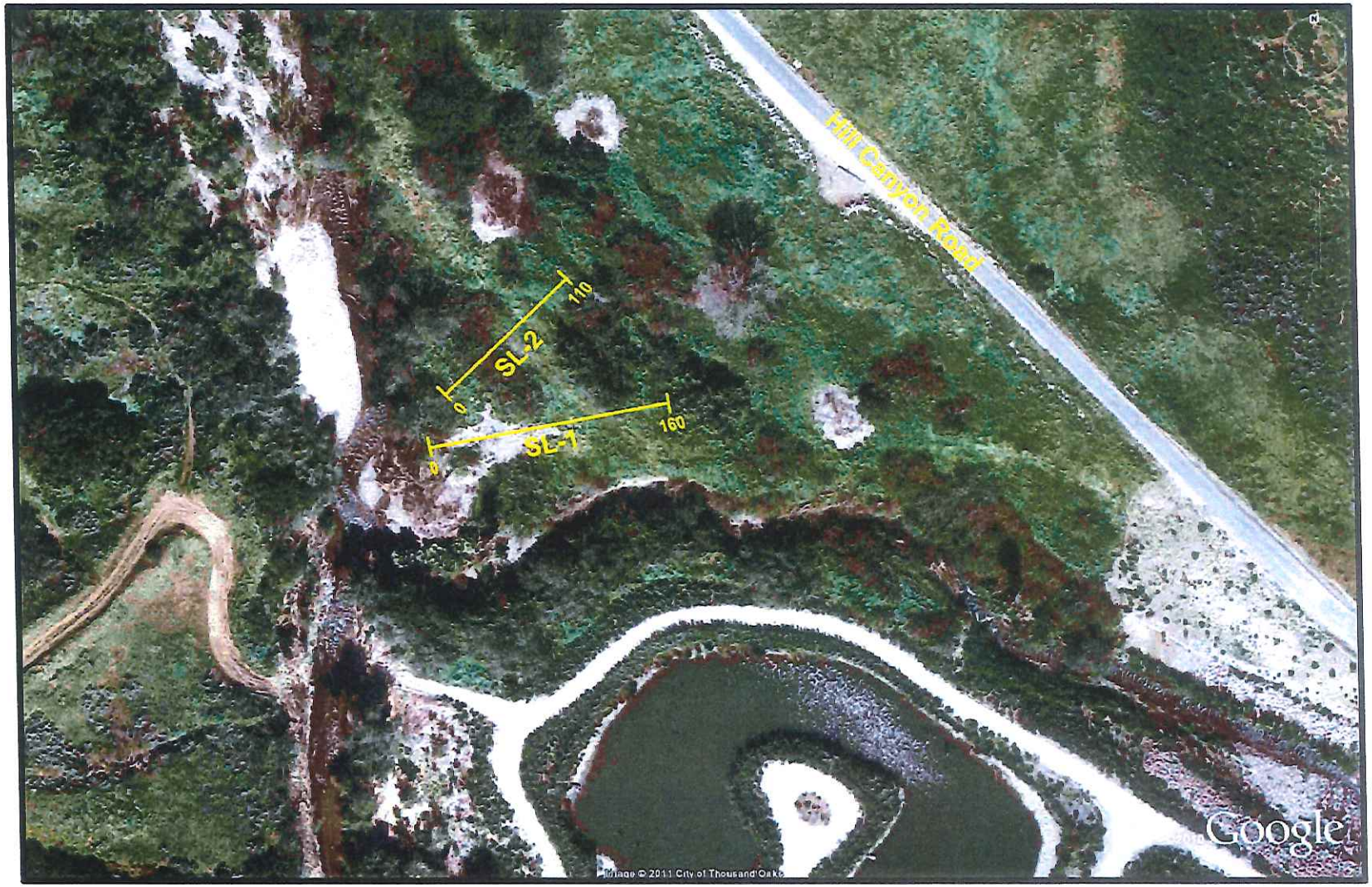
N

Hill Canyon Treatment Plant
Camarillo, California

Project No.: 111360 | Date: 1111

SOUTHWEST GEOPHYSICS INC.

Figure 1



SEISMIC LINE LOCATION MAP

N

Hill Canyon Treatment Plant
Camarillo, California

Project No.: 111360 | Date: 11/11

SOUTHWEST GEOPHYSICS INC.

Figure 2

0 100 200

approximate scale in feet





SITE PHOTOGRAPHS

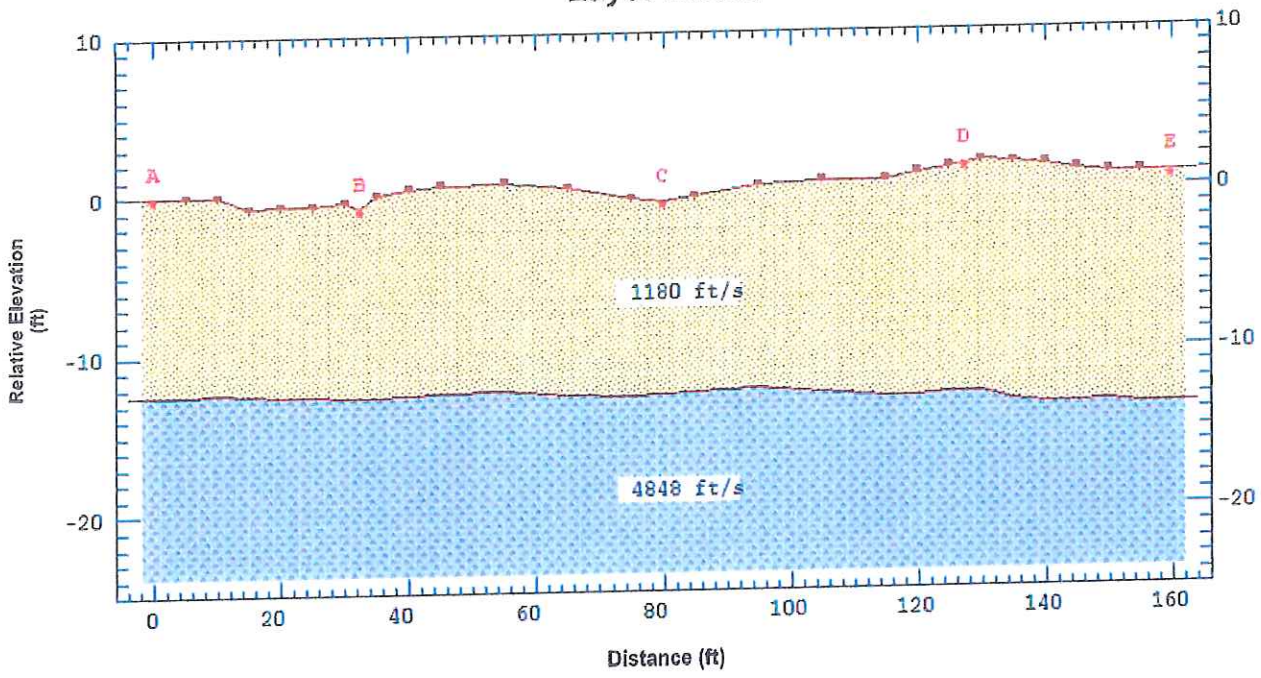
Hill Canyon Treatment Plant
Camarillo, California

Project No.: 111360 | Date: 11/11

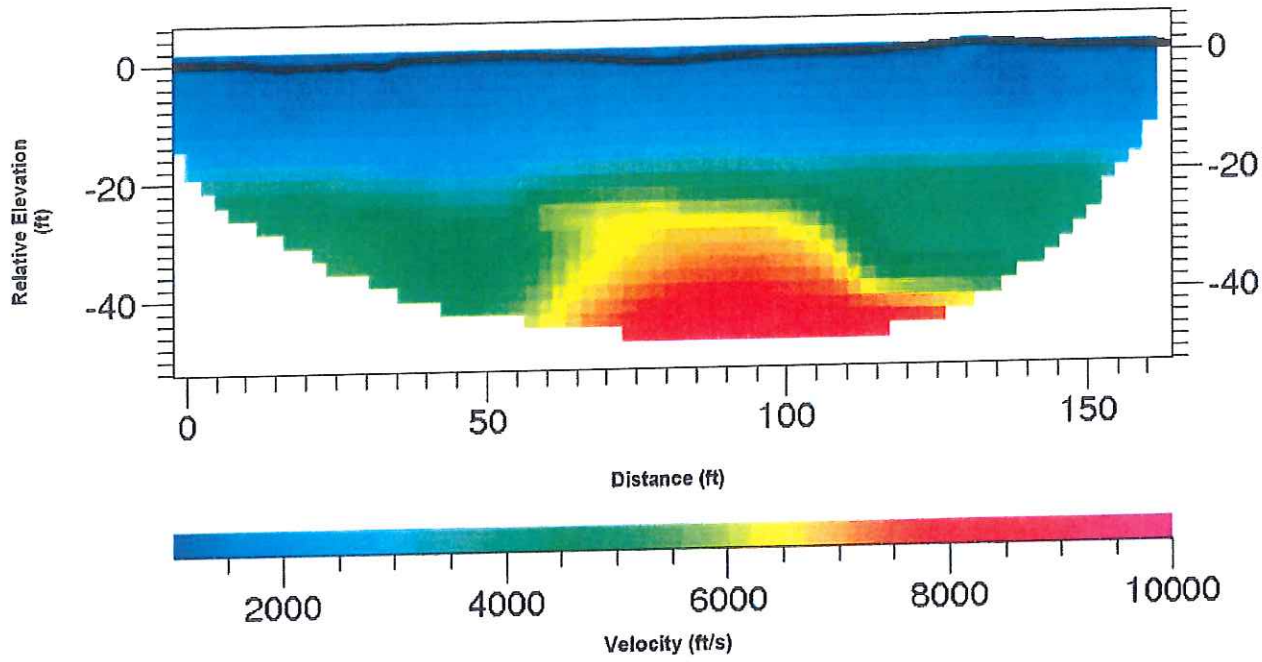
SOUTHWEST GEOPHYSICS INC

Figure 3

Layer Model



Tomography Model



SEISMIC PROFILE SL-1

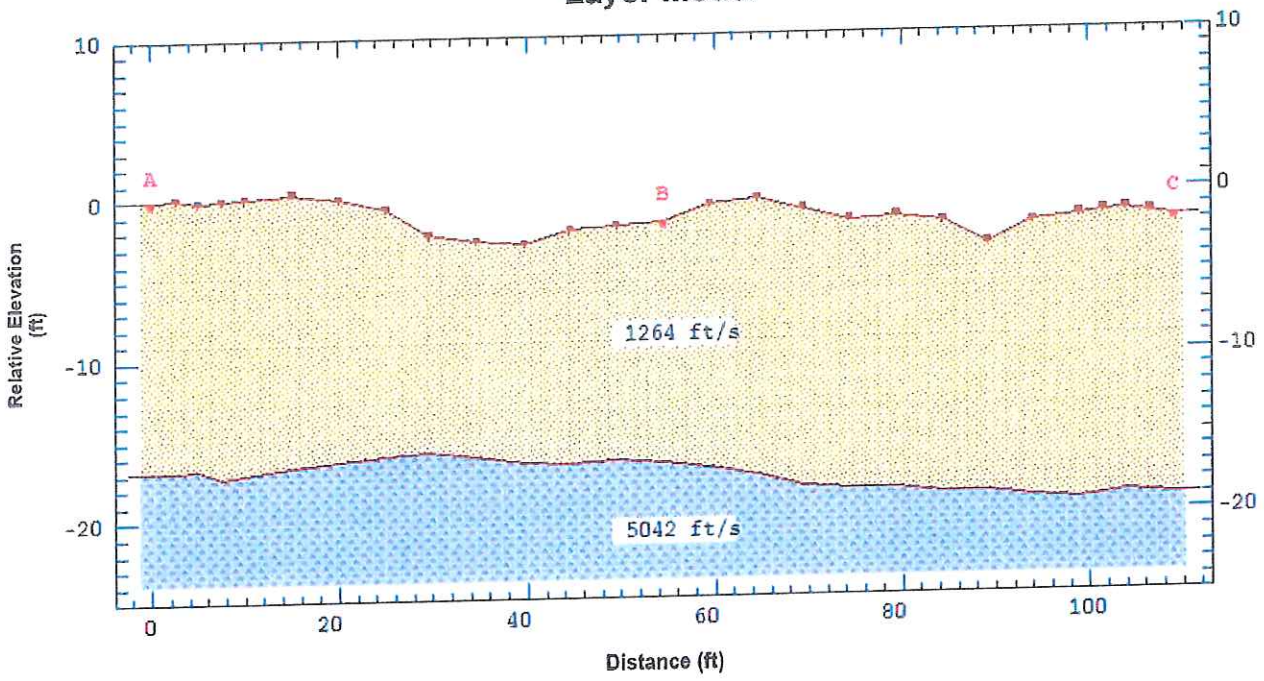
Hill Canyon Treatment Plant
Camarillo, California

Project No.: 111360 | Date: 11/11

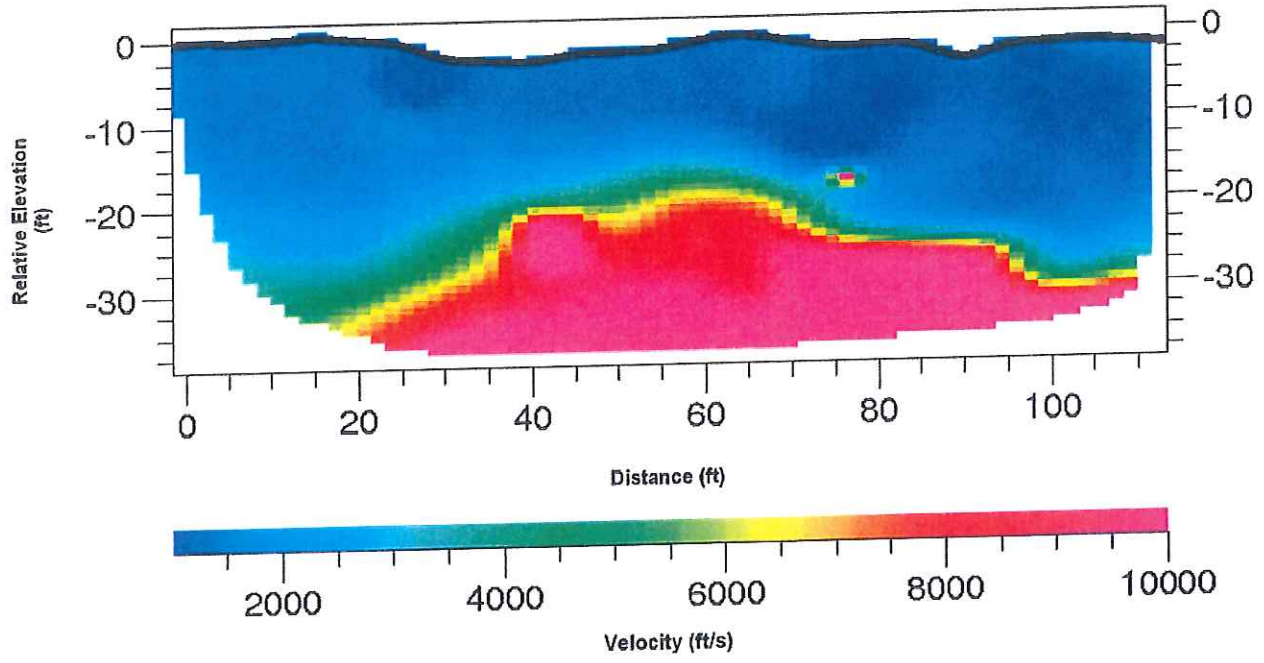
SOUTHWEST GEOPHYSICS INC

Figure 4a

Layer Model



Tomography Model



SEISMIC PROFILE SL-2	Hill Canyon Treatment Plant Camarillo, California	SOUTHWEST GEOPHYSICS INC Figure 4b
	Project No.: 111360 | Date: 11/11	

Appendix D

Slope Stability

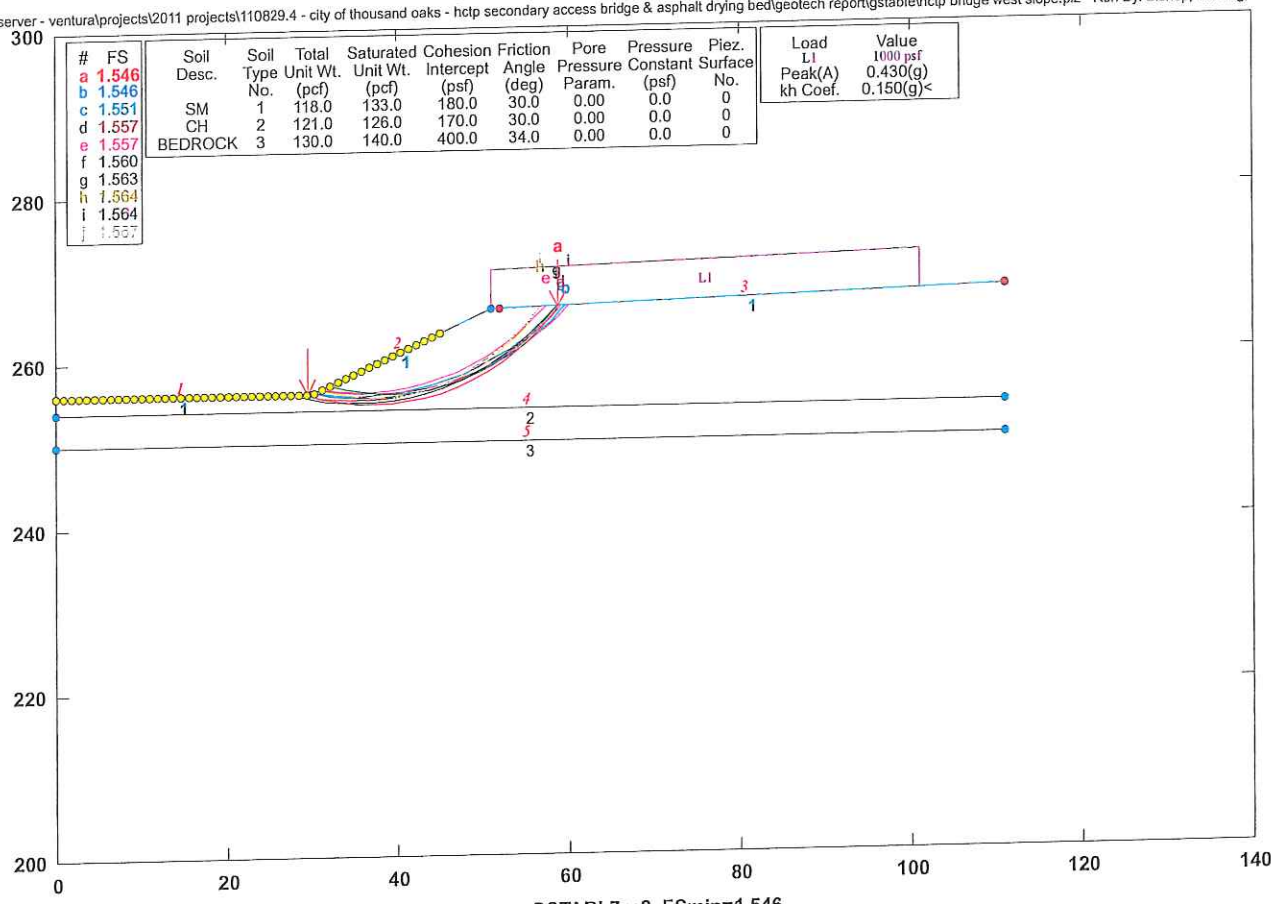
HCTP Secondary Access Bridge East Slope Camarillo, California

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#	FS
a	1.546
b	1.546
c	1.551
d	1.557
e	1.557
f	1.560
g	1.563
h	1.564
i	1.564
j	1.567

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
SM	1	118.0	133.0	180.0	30.0	0.00	0.0	0
CH	2	121.0	126.0	170.0	30.0	0.00	0.0	0
BEDROCK	3	130.0	140.0	400.0	34.0	0.00	0.0	0

Load	Value
LI	1000 psf
Peak(A)	0.430(g)
kh Coef.	0.150(g)<



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Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

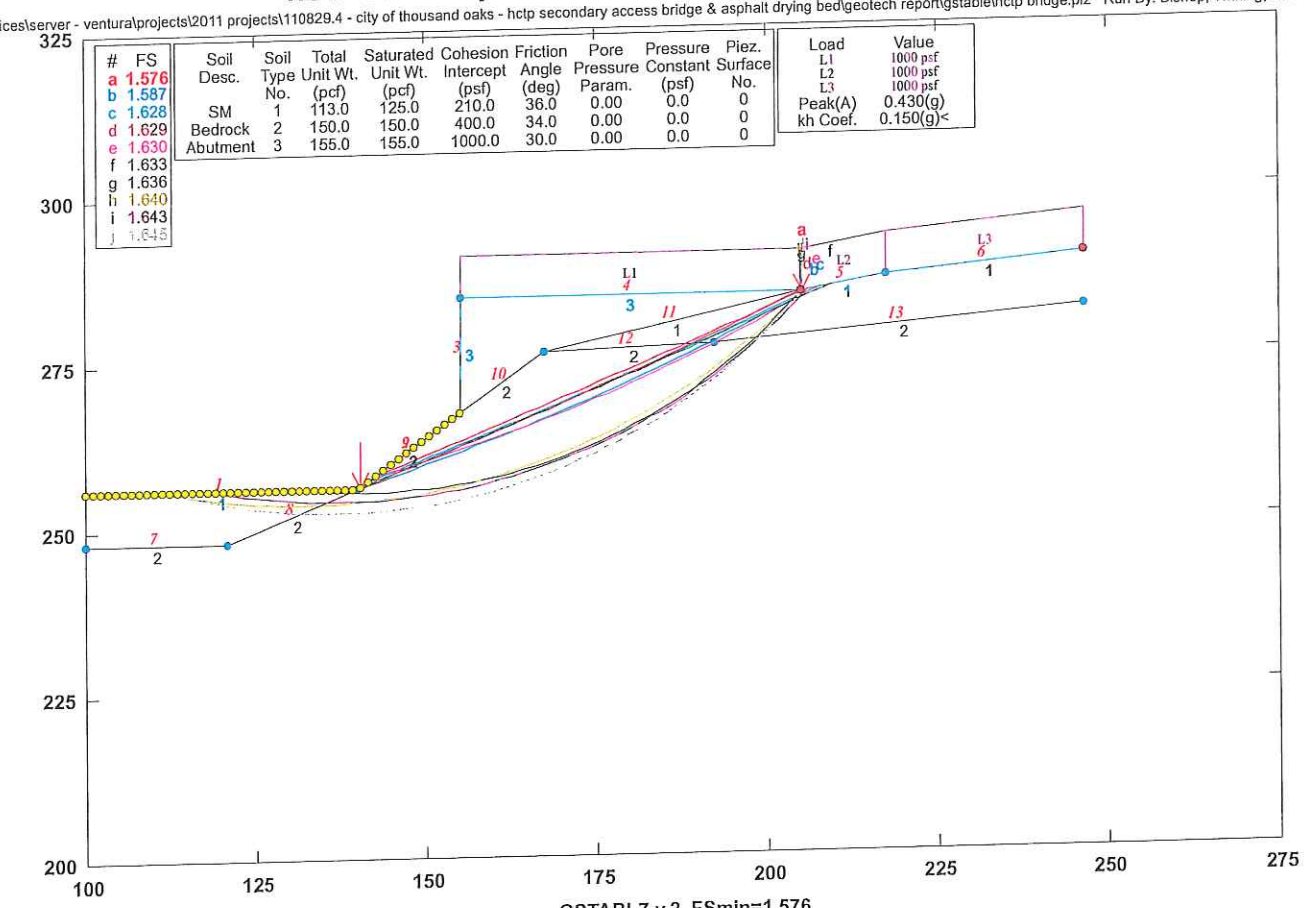
HCTP Secondary Access Bridge West Slope Camarillo, California

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#	FS
a	1.576
b	1.587
c	1.628
d	1.629
e	1.630
f	1.633
g	1.636
h	1.640
i	1.643
j	1.645

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
SM	1	113.0	125.0	210.0	36.0	0.00	0.0	0
Bedrock	2	150.0	150.0	400.0	34.0	0.00	0.0	0
Abutment	3	155.0	155.0	1000.0	30.0	0.00	0.0	0

Load	Value
L1	1000 psf
L2	1000 psf
L3	1000 psf
Peak(A)	0.430(g)
kh Coef.	0.150(g)<



GSTABL7 v.2 FSmin=1.576

Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

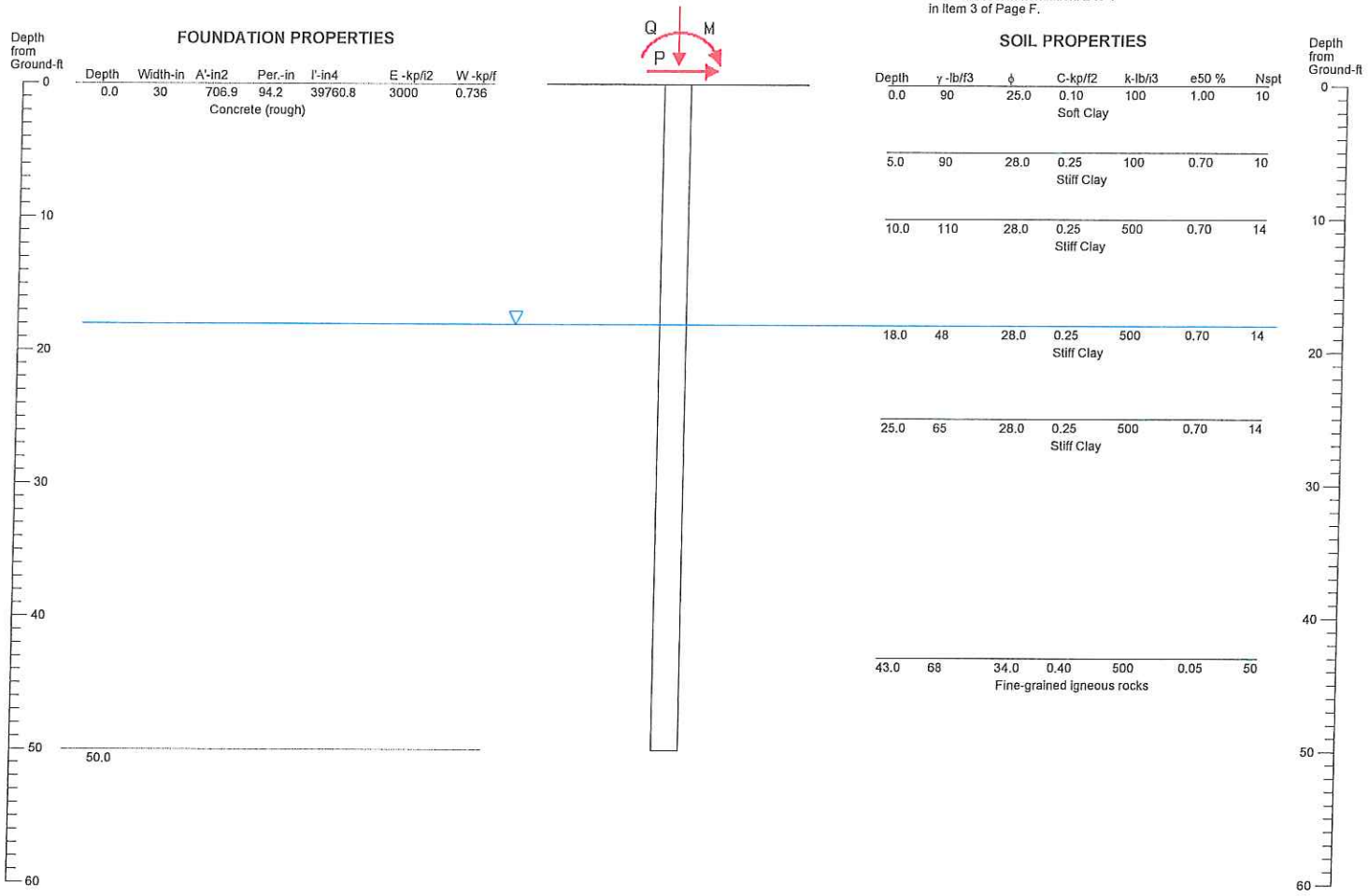
Appendix E

Lateral Pier Capacity

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FOUNDATION PROFILE & SOIL CONDITIONS

Diameter more than 24in (61cm).
For bell section, select "Belled" in Diameter Variation of Pile Section Screen. Recommendation: 2 to 4 in Item 3 of Page F.

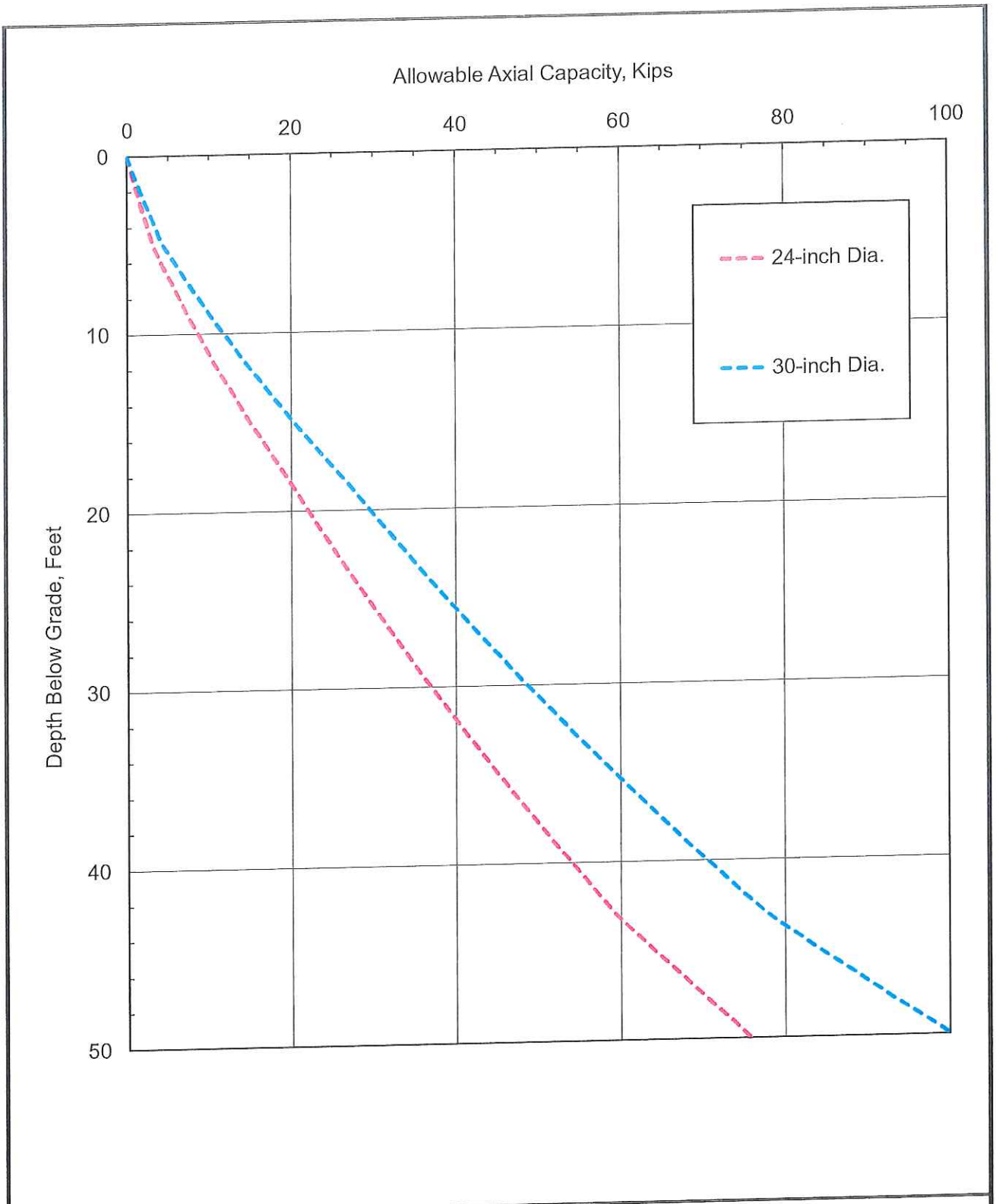


Batter Angle=0 (Pile diameter not to scale) Surface Angle=0



Hill Canyon Bridge Project
Camarillo, California

Figure 1



TWINING

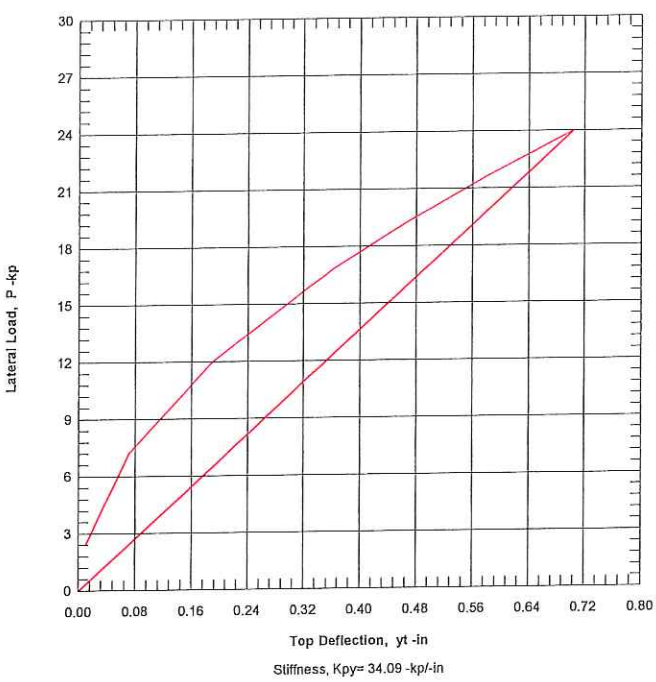
UPLIFT PILE CAPACITY

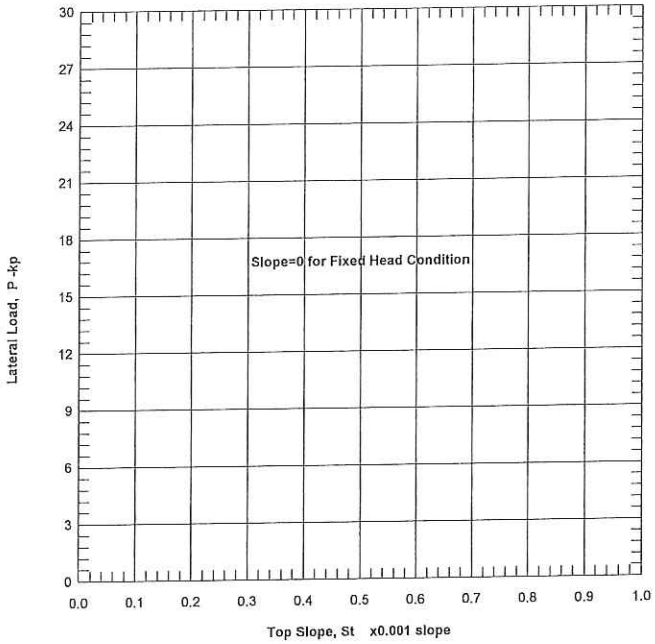
Hill Canyon Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	DATE	FIGURE 2
181040.4	January 2019	

LATERAL LOAD vs DEFLECTION & SLOPE

Single Pile, Fixed, Kbc=2





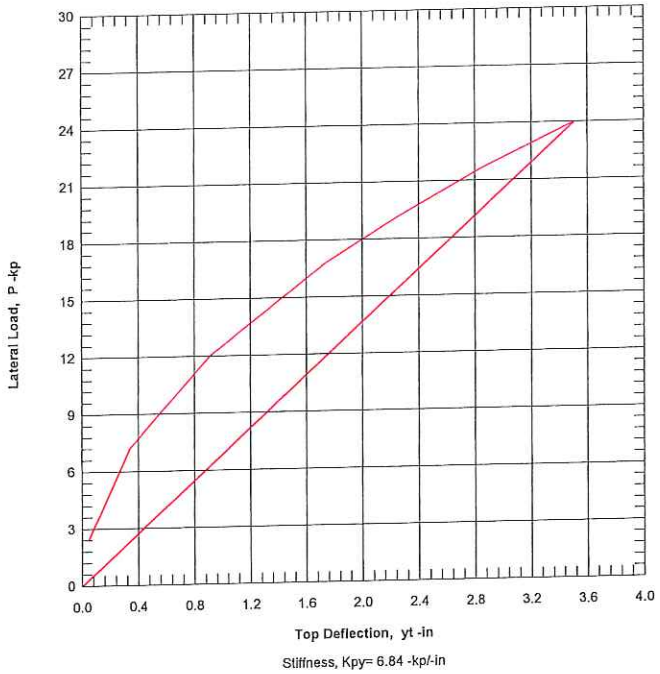


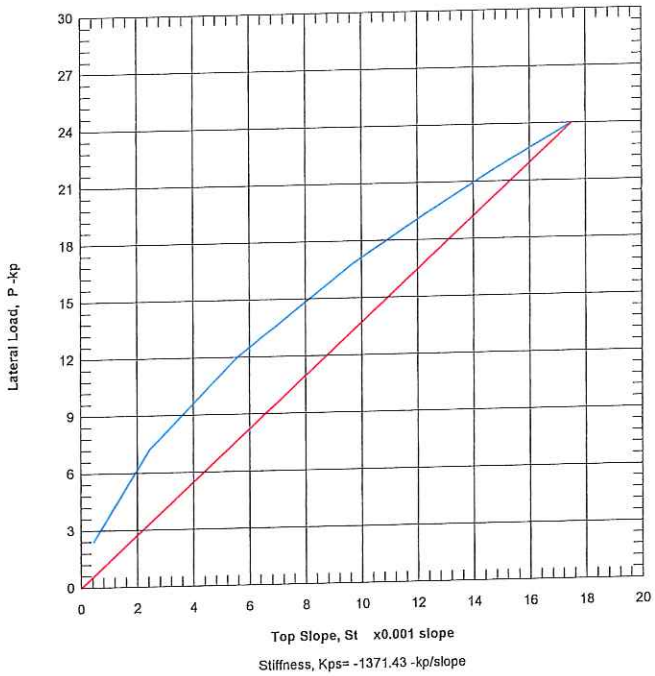
Hill Canyon Bridge Project
Camarillo, California

Figure 2

LATERAL LOAD vs DEFLECTION & SLOPE

Single Pile, Free, Kbc=1



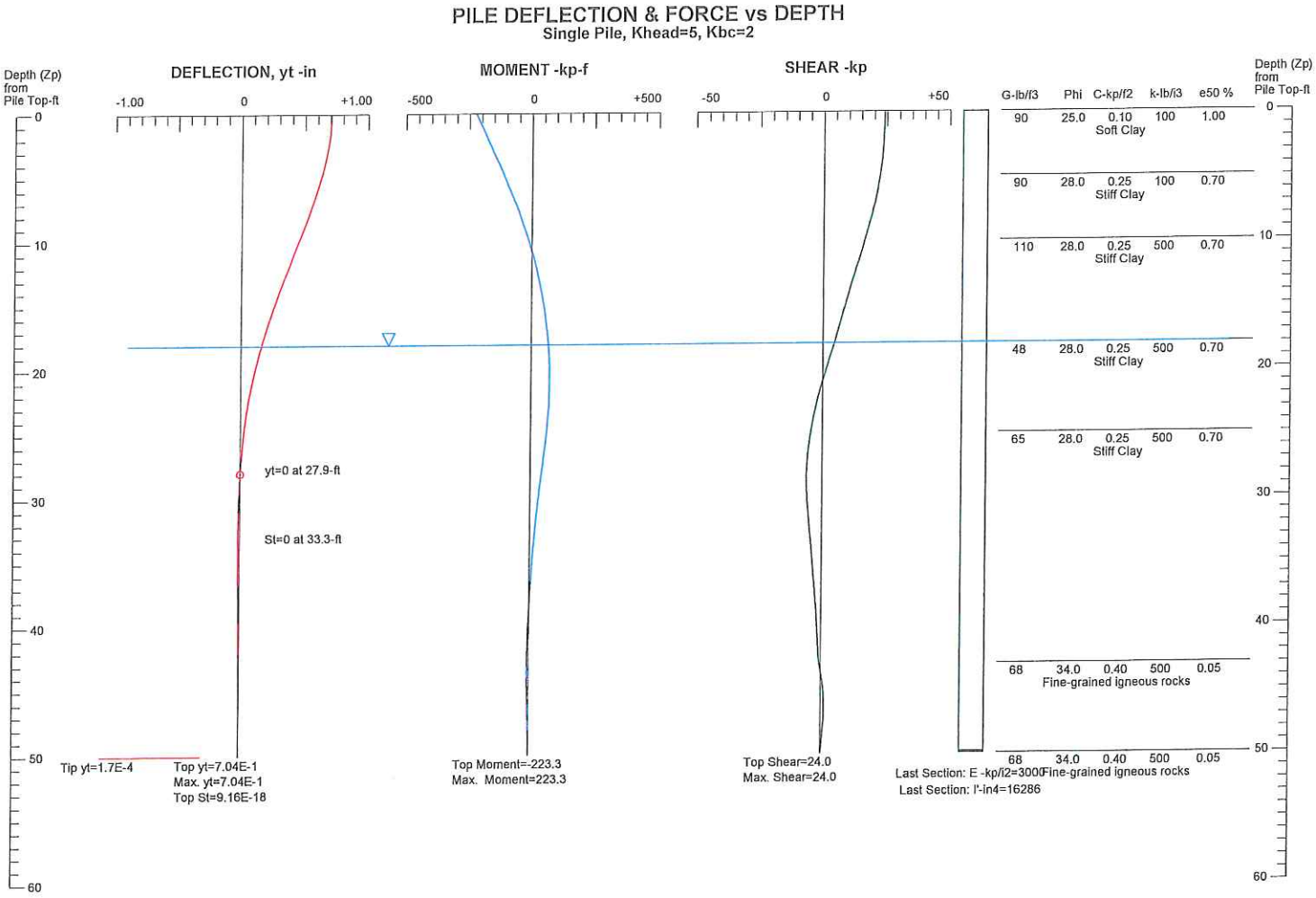


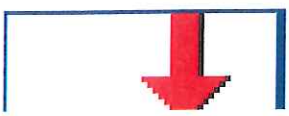


Hill Canyon Bridge Project
Camarillo, California

Figure 2

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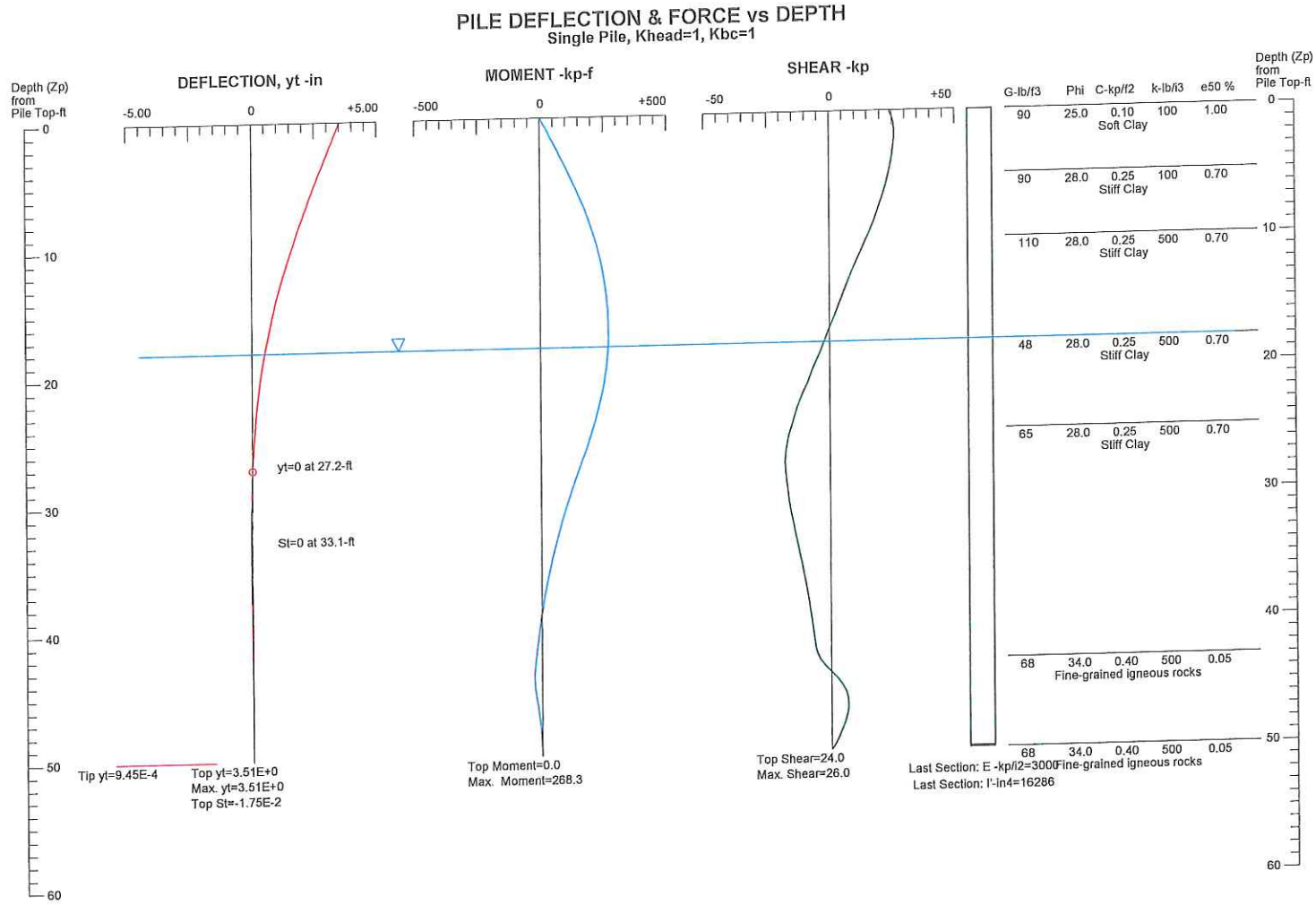




Hill Canyon Bridge Project
Camarillo, California

Figure 2

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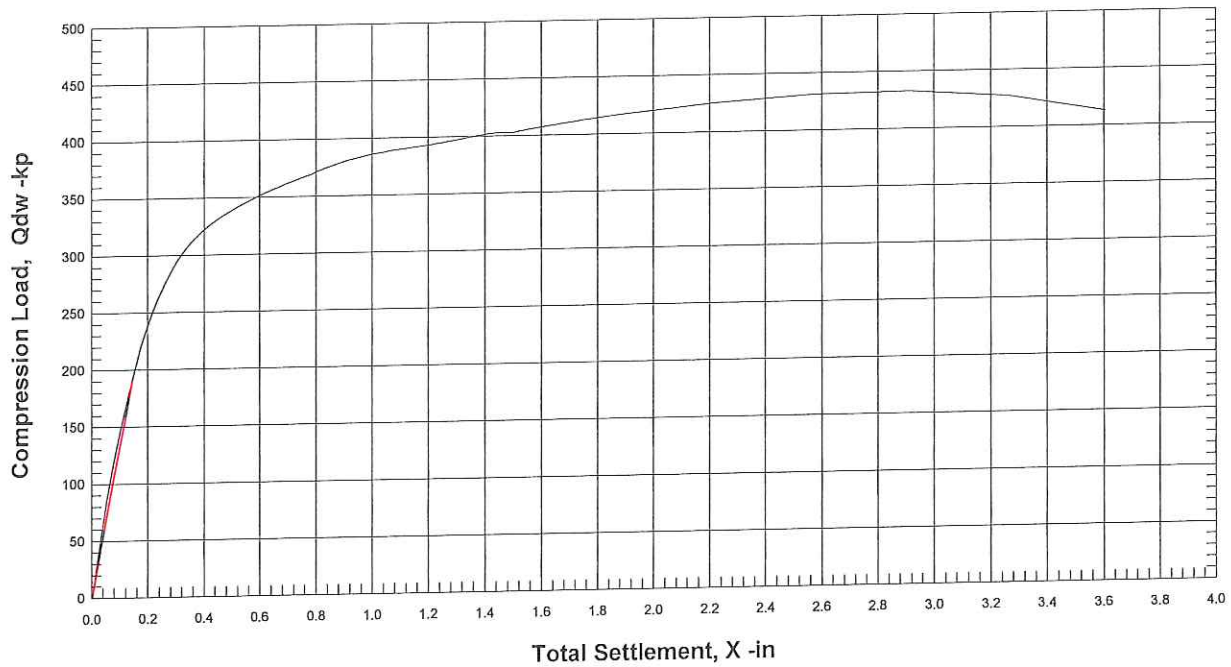




Hill Canyon Bridge Project
Camarillo, California

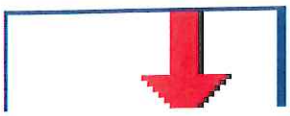
Figure 2

Vertical Load vs. Total Settlement



Total _____

Stiffness, Kqx= 1332.67 -kp/-in

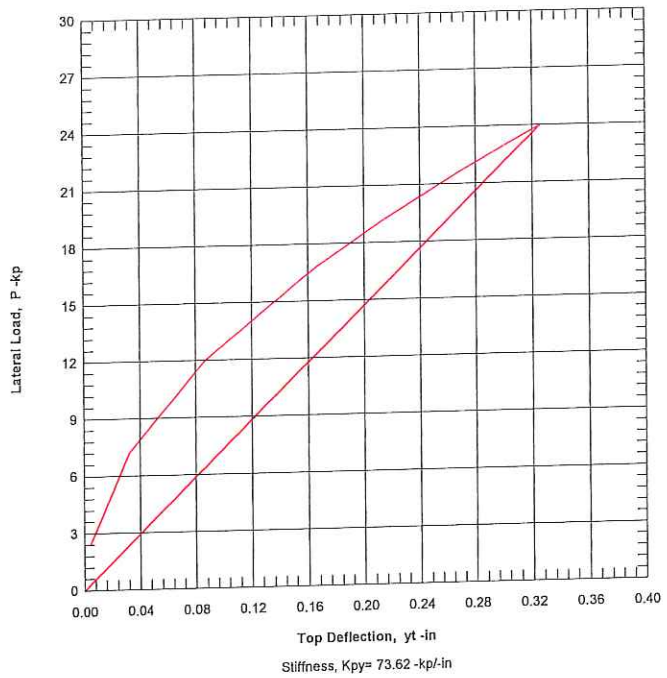


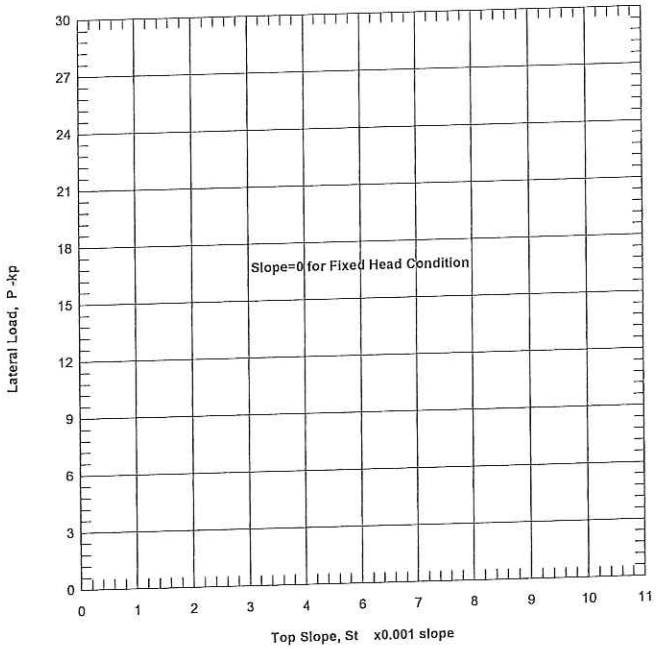
Hill Canyon Bridge Project
Camarillo, California

Figure 1

LATERAL LOAD vs DEFLECTION & SLOPE

Single Pile, Fixed, Kbc=2





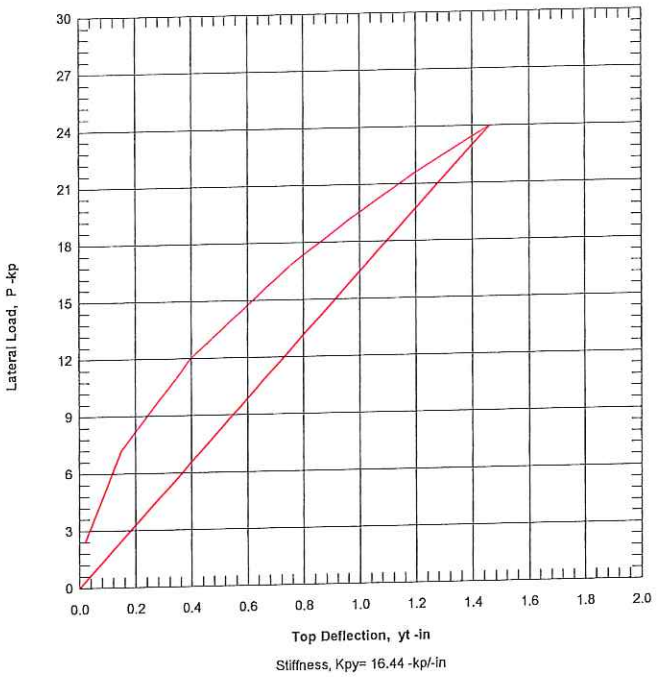


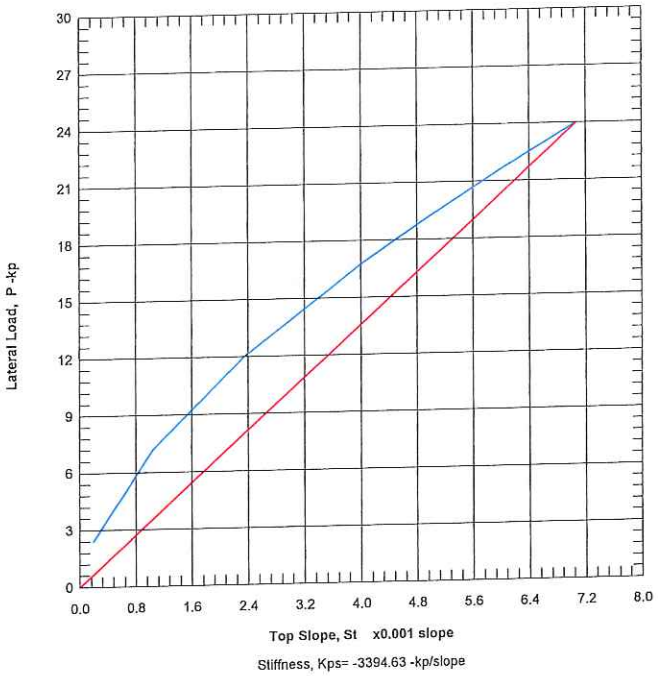
Hill Canyon Bridge Project
Camarillo, California

Figure 2

LATERAL LOAD vs DEFLECTION & SLOPE

Single Pile, Free, Kbc=1



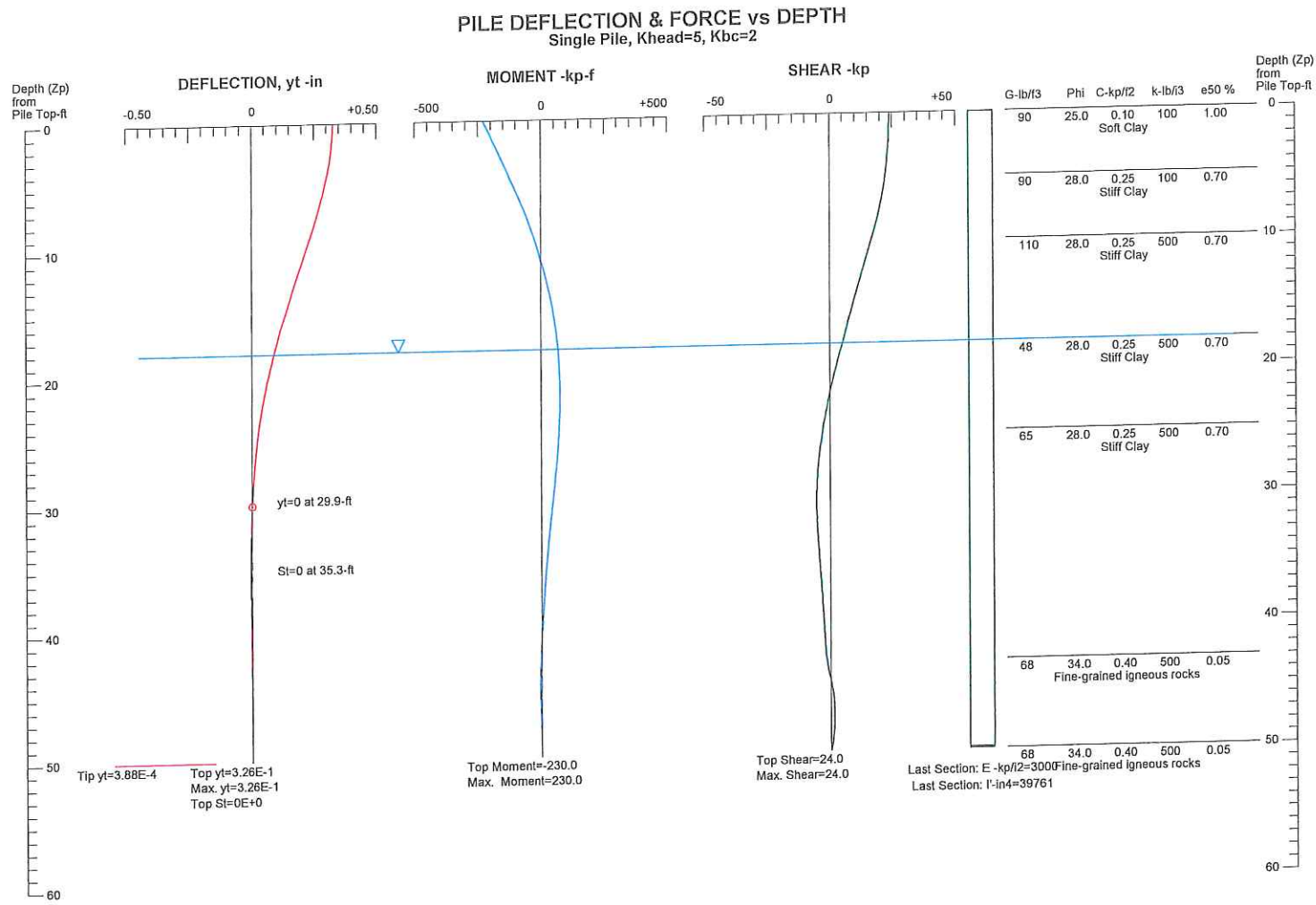




Hill Canyon Bridge Project
Camarillo, California

Figure 2

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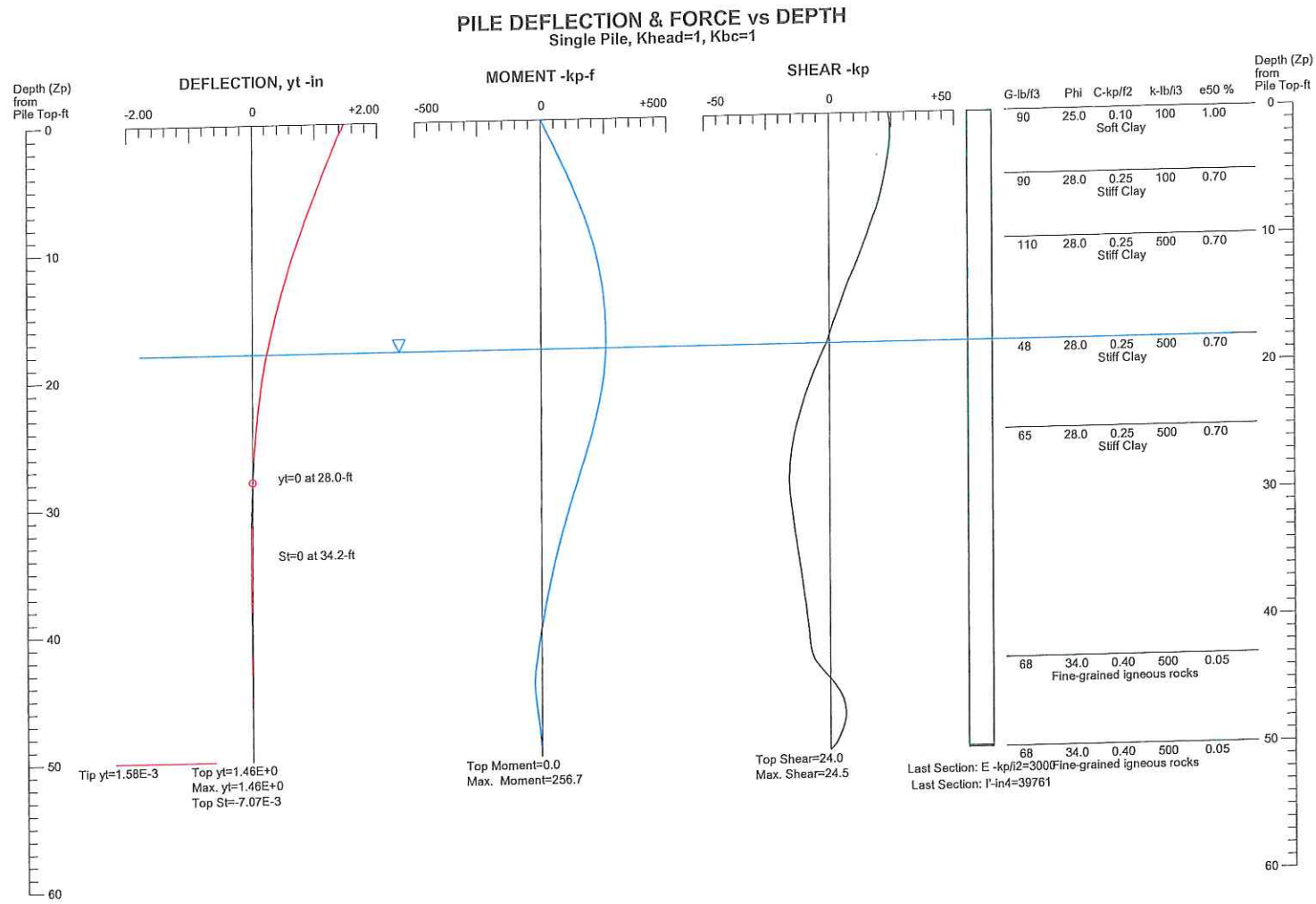


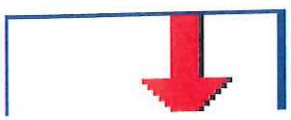


Hill Canyon Bridge Project
Camarillo, California

Figure 2

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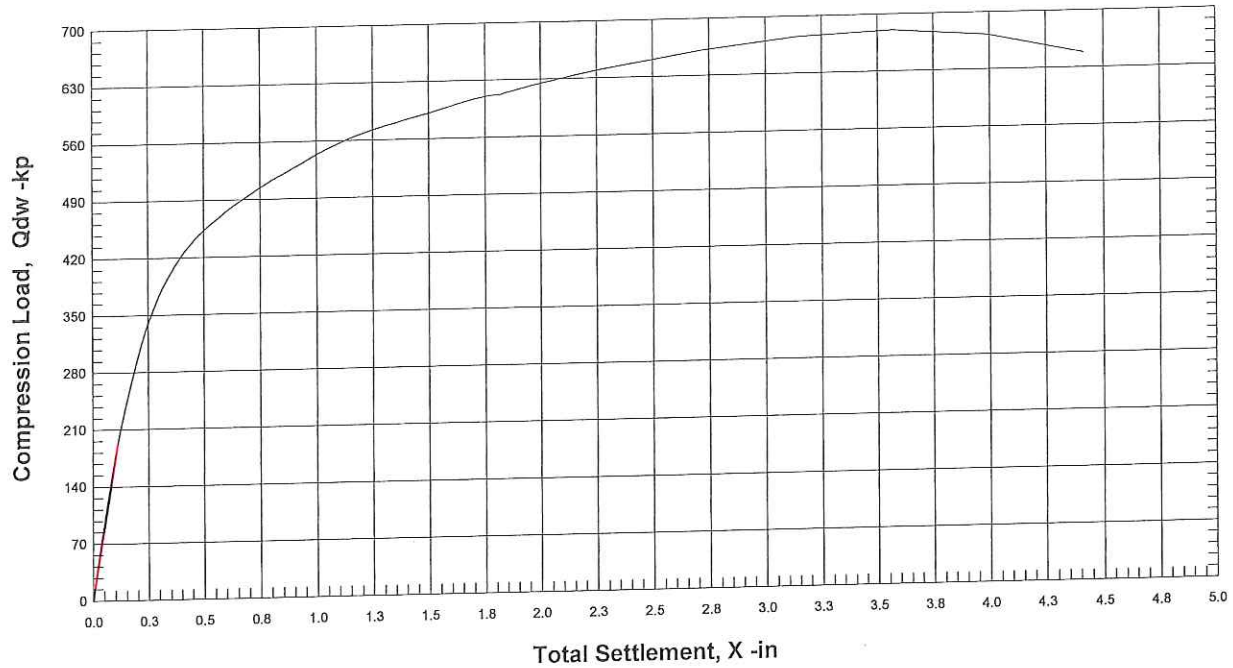




Hill Canyon Bridge Project
Camarillo, California

Figure 2

Vertical Load vs. Total Settlement



Total _____

Stiffness, Kqx= 1730.43 -kp/-in



Hill Canyon Bridge Project
Camarillo, California

Figure 1

Appendix F

Seismic Design Parameters
AASHTO and ASCE 7-10

Design Maps Detailed Report

ASCE 7-10 Standard (34.212°N, 118.927°W)

Site Class B – "Rock", Risk Category I/II/III

Section 11.4.1 — Mapped Acceleration Parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain S_S) and 1.3 (to obtain S_1). Maps in the 2010 ASCE-7 Standard are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 11.4.3.

From Figure 22-1 [1]	S_S = 1.819 g
From Figure 22-2 [2]	S_1 = 0.668 g

Section 11.4.2 — Site Class

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class B, based on the site soil properties in accordance with Chapter 20.

Table 20.3–1 Site Classification

Site Class	$\bar{v}_s$	$\bar{N}$ or $\bar{N}_{ch}$	$\bar{s}_u$
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
	Any profile with more than 10 ft of soil having the characteristics: • Plasticity index PI > 20, • Moisture content $w \geq 40\%$, and • Undrained shear strength $\bar{s}_u$ < 500 psf		
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Section 11.4.3 — Site Coefficients and Risk-Targeted Maximum Considered Earthquake (MCE_R) Spectral Response Acceleration Parameters

Table 11.4-1: Site Coefficient F_a

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at Short Period				
	$S_S \leq 0.25$	$S_S = 0.50$	$S_S = 0.75$	$S_S = 1.00$	$S_S \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_S

For Site Class = B and S_S = 1.819 g, F_a = 1.000

Table 11.4-2: Site Coefficient F_v

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at 1-s Period				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_1

For Site Class = B and S_1 = 0.668 g, F_v = 1.000

Equation (11.4–1): $S_{MS} = F_a S_S = 1.000 \times 1.819 = 1.819$ g

Equation (11.4–2): $S_{M1} = F_v S_1 = 1.000 \times 0.668 = 0.668$ g

Section 11.4.4 — Design Spectral Acceleration Parameters

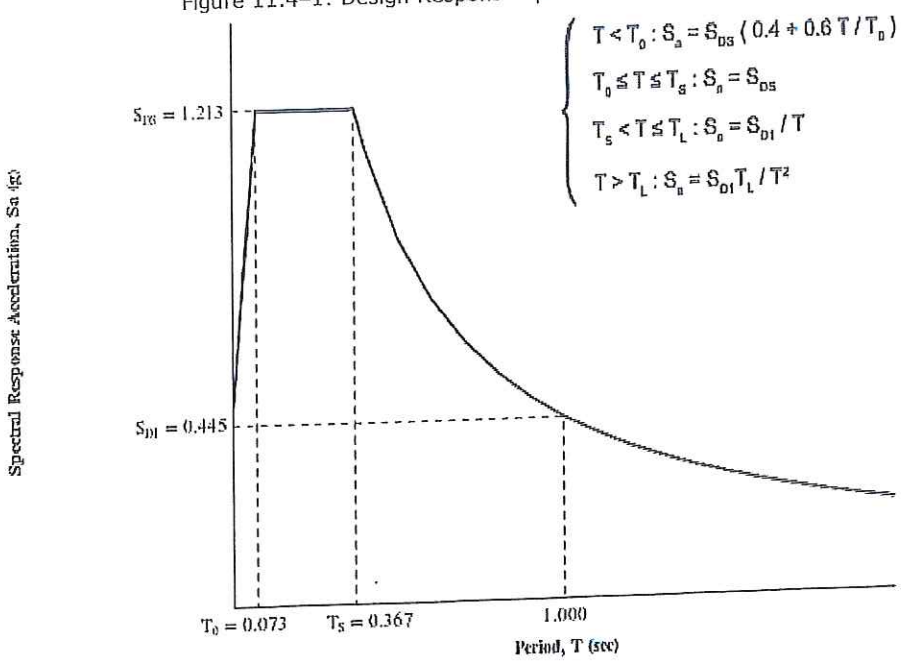
Equation (11.4–3): $S_{DS} = \frac{2}{3} S_{MS} = \frac{2}{3} \times 1.819 = 1.213$ g

Equation (11.4–4): $S_{D1} = \frac{2}{3} S_{M1} = \frac{2}{3} \times 0.668 = 0.445$ g

Section 11.4.5 — Design Response Spectrum

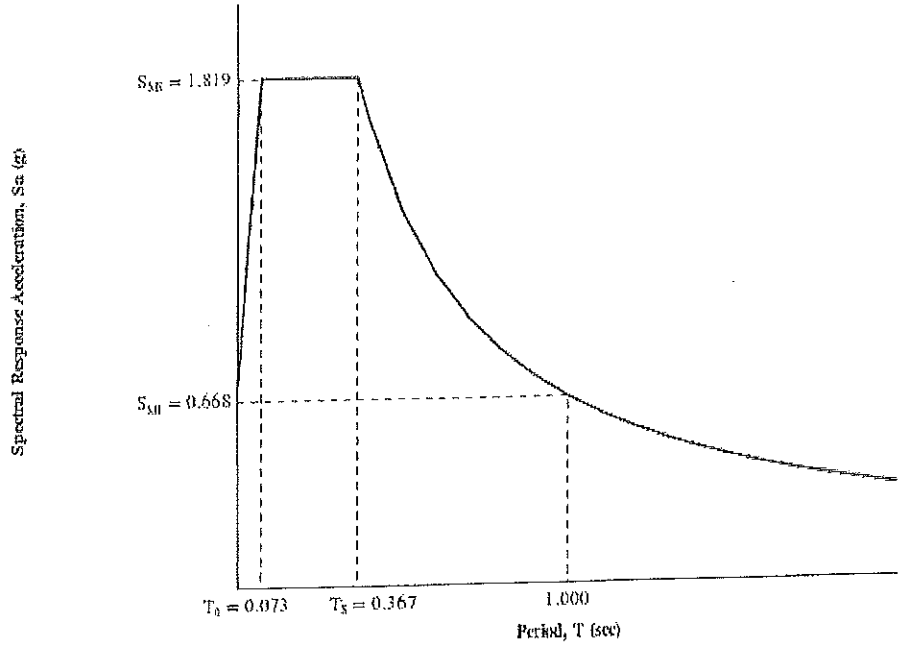
From Figure 22-12 [3] $T_L = 8$ seconds

Figure 11.4–1: Design Response Spectrum



Section 11.4.6 — Risk-Targeted Maximum Considered Earthquake (MCE_R) Response Spectrum

The MCE_R Response Spectrum is determined by multiplying the design response spectrum above by 1.5.



Section 11.8.3 — Additional Geotechnical Investigation Report Requirements for Seismic Design Categories D through F

From Figure 22-7 [4] PGA = 0.694

Equation (11.8-1): $PGA_M = F_{PGA}PGA = 1.000 \times 0.694 = 0.694$ g

Table 11.8-1: Site Coefficient F_{PGA}

Site Class	Mapped MCE Geometric Mean Peak Ground Acceleration, PGA				
	PGA ≤ 0.10	PGA = 0.20	PGA = 0.30	PGA = 0.40	PGA ≥ 0.50
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of PGA

For Site Class = B and PGA = 0.694 g, F_{PGA} = 1.000

Section 21.2.1.1 — Method 1 (from Chapter 21 – Site-Specific Ground Motion Procedures for Seismic Design)

From Figure 22-17 [5] C_{RS} = 1.001

From Figure 22-18 [6] C_{R1} = 1.006

Section 11.6 — Seismic Design Category

Table 11.6-1 Seismic Design Category Based on Short Period Response Acceleration Parameter

VALUE OF S_{DS}	RISK CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \leq S_{DS} < 0.33g$	B	B	C
$0.33g \leq S_{DS} < 0.50g$	C	C	D
$0.50g \leq S_{DS}$	D	D	D

For Risk Category = I and S_{DS} = 1.213 g, Seismic Design Category = D

Table 11.6-2 Seismic Design Category Based on 1-S Period Response Acceleration Parameter

VALUE OF S_{D1}	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \leq S_{D1} < 0.133g$	B	B	C
$0.133g \leq S_{D1} < 0.20g$	C	C	D
$0.20g \leq S_{D1}$	D	D	D

For Risk Category = I and S_{D1} = 0.445 g, Seismic Design Category = D

Note: When S_1 is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category ≡ "the more severe design category in accordance with Table 11.6-1 or 11.6-2" = D

Note: See Section 11.6 for alternative approaches to calculating Seismic Design Category.

References

1. *Figure 22-1*:
   https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-1.pdf
2. *Figure 22-2*:
   https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-2.pdf
3. *Figure 22-12*:
   https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-12.pdf
4. *Figure 22-7*:
   https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-7.pdf
5. *Figure 22-17*:
   https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-17.pdf
6. *Figure 22-18*:
   https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-18.pdf

USGS Design Maps Summary Report

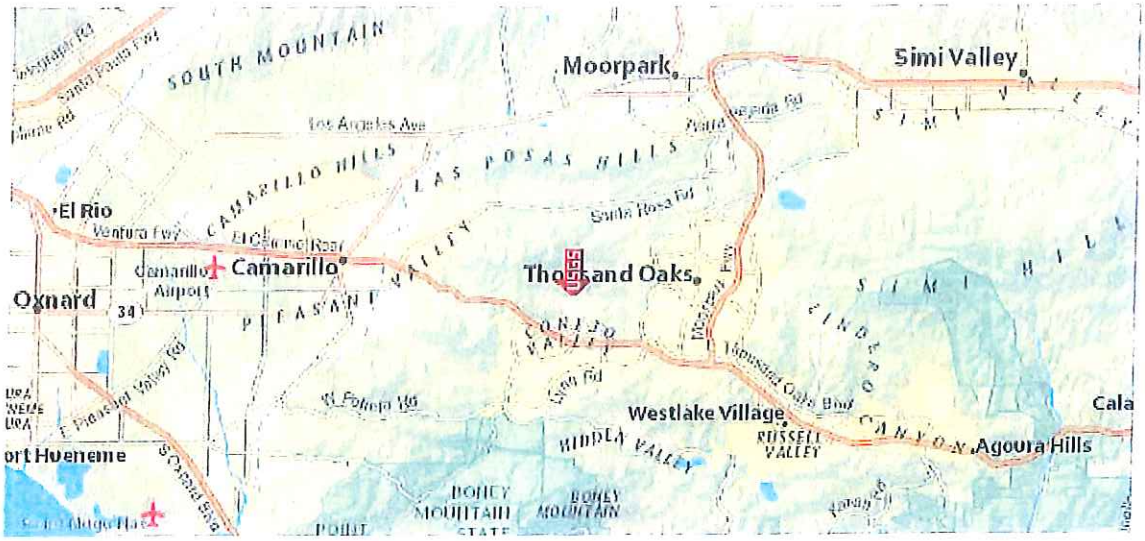
User-Specified Input

Report Title Hill Canyon Treatment Plant Bridge
Tue December 4, 2018 15:34:29 UTC

Building Code Reference Document 2009 AASHTO Guide Specifications for LRFD Seismic Bridge Design
(which utilizes USGS hazard data available in 2002)

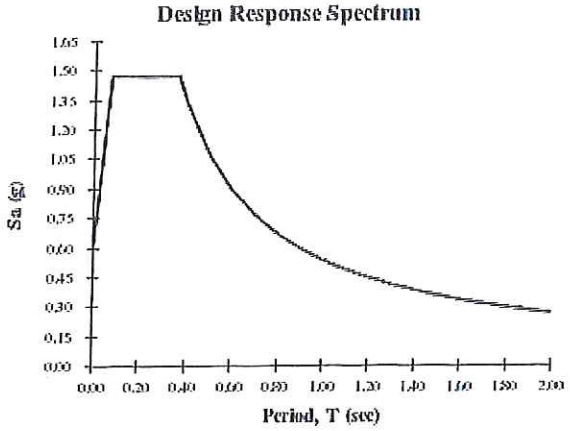
Site Coordinates 34.212°N, 118.927°W

Site Soil Classification Site Class B – "Rock"



USGS-Provided Output

PGA =	0.606 g	**A_s =**	0.606 g
S_s =	1.473 g	**S_{DS} =**	1.473 g
S_1 =	0.536 g	**S_{D1} =**	0.536 g



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