

Memorandum

*Serious drought.
Help save water!*

To: ED DOLAN
DISTRICT 12
ENVIRONMENTAL ANALYSIS

Date: August 24, 2015

File: 12-0N910_
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12-ORA-1
PM 18.38

From: HECTOR SALAS
WATER QUALITY SPECIALIST
NPDES/ STORM WATER UNIT

Subject: Water Quality Technical Memorandum for the Replacement of Slope Paving at the West Abutment of Newport Bay Bridge at Pacific Coast Highway (SR-1)

Approach to the Water Quality Technical Memorandum

The purpose of the Water Quality Technical Memorandum (WQ Tech Memo) is to fulfill the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), and to provide information, to the extent possible, for National Pollution Discharge Elimination System (NPDES) permitting. The WQ Tech Memo includes a discussion of the proposed project, the physical setting of the project area, and the regulatory framework with respect to water quality; it also provides data on surface water and groundwater resources within the project area and the water quality of these waters, describes water quality impairments and beneficial uses, and identifies potential water quality impacts/benefits associated with the proposed project, and recommends avoidance and/or minimization measures for potentially adverse impacts.

Background

The Structures Maintenance and Investigation (SM&I) has been inspecting structures and reporting their findings in their Bridge Inspection Reports. In a report dated October 2000, there was indication of undermining of the concrete slope paving at the west side of the northerly end (abutment 1) of the State Route 1 (also known as Pacific Coast Highway) bridge over Newport Bay in the city of Newport Beach. The slope paving failure was first reported in March 2003 and routine bridge inspections the following years all indicated the undermining of the concrete slope paving.

The City of Newport Beach contacted Caltrans District 12 in July 2014 regarding the bike path failure in the same area. Part of the asphalt section along the edge of the bike path between the south end of the Newport Bay bike bridge (Figure 1) and west end of pier 2 (Figure 2) has collapsed due to tidal erosion. In July 2014, Caltrans developed a Project Initiation package to address the slope paving failures at the Pacific Coast Highway (PCH) Newport Bay Bridge.



Figure 1: Failed portion of bike path facing Newport Bay

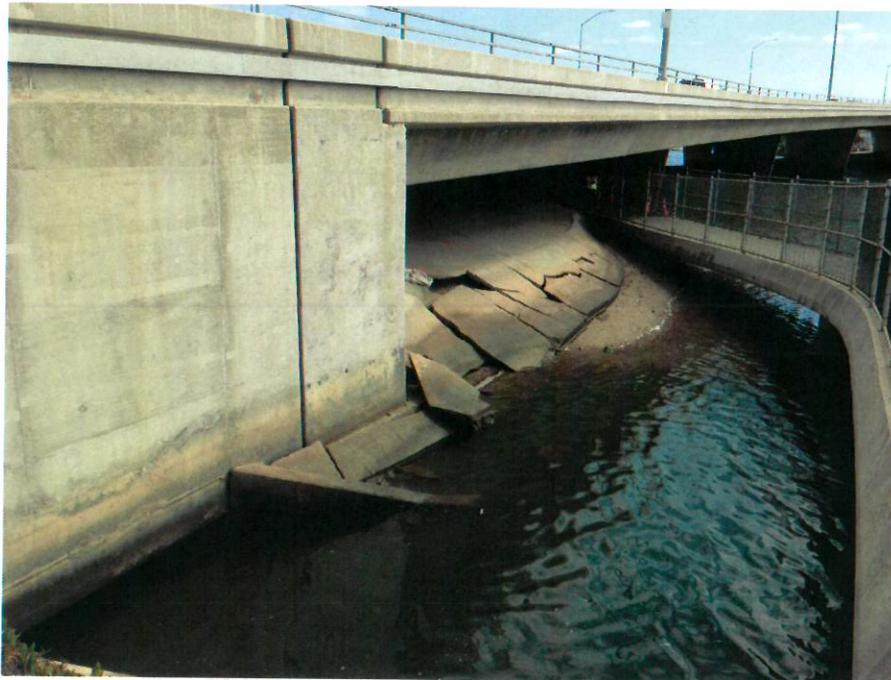


Figure 1: Failed slope paving at west end of pier

Project Description

The project is on southbound (SB) State Route 1, also known as Pacific Coast Highway (PCH), at the northwest corner of the North Arm Newport Bay Bridge (henceforth known as Newport Bay Bridge) in the city of Newport Beach in Orange County.

The recommended preferred alternative (Alternative 1) proposes to replace:

1. The failed sloped paving at the west side of abutment 1 with a deeper concrete slope paving keyed in with a 20 foot deep sheet pile and geo-composite material to stop tidal erosion. In addition, the existing scoured channel bed will be filled with rock to match existing channel bed.
2. The failed asphalt concrete bike path with a deeper concrete slope paving keyed in with a 20-foot deep sheet pile and geo-composite material to stop tidal erosion.

The following were rejected alternatives:

- **No Build Alternative:** This alternative proposed to do nothing but it does not address the ongoing concrete slope paving and bike path failure at Newport Bay Bridge.
- **Rock Slope Protection (RSP):** The project proposed to replace the concrete slope paving with large rock to dissipate energy caused by tidal flows and to prevent the scour of the bridge abutments. This alternative was rejected due to the larger footprint required to place the proper size of rock to dissipate the tidal flows. The RSP would have extended further into Newport Bay causing permanent impact to the bay floor.

Surface Water Features

The proposed project is located adjacent/ within Lower Newport Bay (801.11) part of the Santa Ana River Hydrologic Unit (HU) of the Santa Ana Regional Water Quality Control Board located in Orange County. Tributaries that feed into Lower Newport bay include Upper Newport Bay, San Diego Creek, Peters Canyon Wash and Bonita Creek.

Based on the Final *2010 Integrated Report (CWA Section 303(d) List /305(b) Report)* approved by the SWRCB on August 4, 2010 and the US EPA on October 11, 2011 Lower Newport Bay at the project location is on the 2010 Clean Water Act 303(d) list of Water Quality Limited Segments Requiring TMDLs for unknown sources of Chlordane, Copper, DDT (Dichlorodiphenyltrichloroethane), Indicator Bacteria, Nutrients, PCBs (Polychlorinated biphenyls), Pesticides, and Sediment Toxicity.

The Newport Bay watershed is highly urbanized with some agriculture. Nine cities are located partly or fully within the watershed: Costa Mesa, Irvine, Lake Forest, Laguna Hills, Laguna Woods, Newport Beach, Orange, Santa Ana, and Tustin. The watershed also includes several unincorporated areas of Orange County. The total estimated population within the watershed is 640,000.

The Santa Ana RWQCB Basin Plan has designated the following surface water beneficial uses for Newport Bay (lower) at the project location:

- **Navigation (NAV):** Waters used for shipping, travel or other transportation by private, commercial, or military vessels.
- **Water Contact Recreation (REC-1):** waters are used for recreation activities involving body contact with water where ingestion of water is reasonably possible. These uses may include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, whitewater activities, fishing and use of natural hot springs.
- **Non-Contact Water Recreation (REC-2):** water are used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water would be reasonably possible. These uses may include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tide pool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.
- **Commercial and Sport fishing (COMM):** waters are used for commercial or recreational collection of fish or other organisms including those collected for bait. These uses may include, but are not limited to, uses involving organisms intended for human consumption.
- **Preservation of Biological Habitats of Special Significance (BIOL):** waters support designated areas or habitats, including but not limited to established refuges, parks, sanctuaries, ecological reserves or preserves and Areas of Special Biological Significance (ASBS) where the preservation and enhancement of natural resources requires special protection.
- **Wildlife Habitat (WILD):** water support wildlife habitats that may include, but are not limited to, the preservation and enhancement of vegetation and prey species used by waterfowl and other wildlife.
- **Rare (RARE):** Threatened or Endangered Species waters support the habitats necessary for the survival and successful maintenance of plant or animal species designated under state or federal law as rare, threatened or endangered.

- **Spawn (SPWN):** Spawning, reproduction and development waters support high quality aquatic habitats necessary for reproduction and early development of fish and wildlife.
- **Marine Habitat (MAR):** Waters support marine ecosystems that include but are not limited to preservation and enhancement of marine habitats, vegetation (e.g. Kelp), fish and shellfish and wildlife (e.g. marine mammals and shorebirds)
- **Shellfish Harvesting (SHEL):** waters support habitats necessary for shellfish collected for human consumption, commercial or sport purposes.

Groundwater Features

Groundwater in the San Diego Creek/ Newport Bay watershed consists of a deep regional aquifer overlain by a shallow perched aquifer. The deep aquifer used as a water supply for Orange County is recharged naturally via infiltration in the Santa Ana Mountains and by design in spreading basins along the Santa Ana River. The shallow aquifer is poorly transmissive and found mainly in the central portion of the watershed.¹

Groundwater in the area contains nitrates and salts in the shallow groundwater that is a result of irrigated agriculture in the area beginning in the early part of the 20th Century.² This resulted in leaching of nitrates and other salts to shallow groundwater. In addition, the groundwater flows in the watershed have come into contact with naturally occurring selenium which resulted in the increase in selenium mobility in the groundwater.

The Santa Ana RWQCB Basin Plan has designated beneficial uses for ground waters of the Lower Santa Ana River Basin. The existing beneficial uses for ground water in Santa Ana Hydrologic Unit are:

- **Municipal and Domestic Supply (MUN):** waters are used for community, military, municipal or individual water supply systems. These uses may include, but are not limited to drinking water supply.
- **Agriculture Supply (AGR):** waters are used for farming, horticulture or ranching. These uses include but are not limited to irrigation, stock watering, and support of vegetation for range grazing.
- **Industrial Service Supply (IND):** waters are used for industrial activities that do not depend primarily on water quality. These uses may include, but are not limited to,

^{1 2} Santa Ana Regional Water Quality Control Board General Waste Discharge Requirements for Short Term Related Discharges and DE MINIMUS Wastewater Discharges to Surface Waters within the San Diego Creek/ Newport Bay Watershed, Order No. R8-2004-0021, NPDES No. CAG998002

mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, and oil well re-pressurization.

- **Industrial Process Supply (PROC):** waters are used for industrial activities that depend primarily on water quality. These uses may include but are not limited to process water supply and all uses of water related to product manufacture or food preparation.

Regulatory Settings

This project must conform to all applicable water quality regulations and/or permit requirements of the State Water Resources Control Board (SWRCB) and any applicable local Regional Water Quality Control Board(s) (RWQCB) requirements including, but not limited to, the *Caltrans Statewide NPDES Permit* (Order No. 2012-0011-DWQ, NPDES No. CAS000003), and the *Caltrans Storm Water Management Plan* (May 2003 or subsequent SWMP), and any subsequent revisions and/or additional requirements at the time of construction. It is anticipated that the project will have a Disturbed Soil Area (DSA) less than 1.0 acre. If the project has a DSA greater than 1.0 acre, the project will be subject to the *Statewide NPDES General Permit for Storm Water Discharges Associated With Construction and Land Disturbance Activities* (Order No. 2009-0009-DWQ, NPDES No. CAS000002).

Dewatering must comply with the Santa Ana Regional Water Quality Control Board's *General Waste Discharge Permit for Discharges to Surface Waters of Groundwater Resulting from Groundwater Dewatering Operations and/or Groundwater Cleanup Activities at Sites Within the San Diego Creek/ Newport Bay Watershed Polluted by Petroleum Hydrocarbons, Solvents, Metals, and/ or Salts*. (Order No. R8-2007-0042, NPDES No. CAG918002) or any subsequent permits or amendments in effect at the time of construction.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the United States must obtain a 401 Certification, which certifies that the project will be in compliance with State water quality standards. The most common federal permit triggering 401 Certification is a CWA Section 404 permit, issued by USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before USACE issues a 404 permit.

In some cases the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as Waste Discharge Requirements (WDRs) under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals

that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

Environmental Evaluation

Short Term Impacts During Construction

Under the build alternative the proposed project will repair the failed slope paving at the west side of abutment one and the bike path with a deeper concrete slope paving keyed in with a 20 foot deep sheet pile and geo-composite material to stop tidal erosion. In addition, the existing scoured channel bed will be filled with rock to match existing channel bed. Based on proposed project it is anticipated that the Disturbed Soil Area (DSA) for Build Alternative will be 0.04 acres.

Potential temporary impacts to water quality anticipated during construction for the Build Alternative include sediments caused by the temporary access of construction equipment into the Newport Bay, sediment/ sand displacement from installation of sheet pile using vibrating compactor, concrete waste from the deep concrete slope paving, trash from workers and construction waste, petroleum products from construction equipment and/or vehicles, sanitary wastes from portable toilets and any other chemicals used for construction such as coolants used for equipment and/or concrete curing compounds.

It is anticipated that the Build Alternative may encounter groundwater during the construction from the fluctuating tides of Newport Bay. The proposed project will install sheet piles that will be used as the key (toe) of the concrete slope. During construction, the sheet piles installed will be tall enough to prevent high tides from entering the construction zone. Although the sheet piles will prevent the Newport Bay surface tidal flows from entering construction zone, there is the potential for the tidal flows to rise behind the sheet piles and inundate the construction zone from the ground (groundwater). If this occurs during construction, and if the contractor proposes to remove and discharge the rising groundwater from behind the sheet piles, the discharge will be subject to the *General Waste Discharge Permit for Discharges to Surface Waters of Groundwater Resulting from Groundwater Dewatering Operations and/or Groundwater Cleanup Activities at Sites Within the San Diego Creek/ Newport Bay Watershed Polluted by Petroleum Hydrocarbons, Solvents, Metals, and/ or Salts. (Order No. R8-2007-0042, NPDES No. CAG918002)* or any subsequent permits or amendments in effect at the time of construction issued by the Santa Ana RWQCB. This Permit addresses temporary dewatering operations during construction and the requirements for the discharge of dewatering effluent to surface waters. This dewatering operation may require the implementation of BMPs (i.e. Baker Tank, Weir Tank, Gravity Bag Filter, etc.) to treat and remove pollutants from the dewatering effluent to meet the discharge requirements called out in the permit issued by the Santa Ana RWQCB. This dewatering permit will require to comply with a Monitoring and Reporting Program (MRP) in addition to notifying

the Santa Ana RWQCB prior to the dewatering operation and provide a laboratory analysis of the existing water quality.

The Disturbed Soil Area (DSA) is less than 1.0 acres thus not subject to the State Water Resources Control Board (SWRCB) NPDES Construction General Permit (CGP). Under the Caltrans Statewide NPDES Permit, the Build Alternative will be required to prepare and implement a Water Pollution Control Program (WPCP) to address the temporary impacts to water quality. The WPCP will identify temporary Best Management Practices (BMPs) to address the potential temporary impacts to water quality. The BMPs identified in the project's WPCP will include measures such as temporary soil stabilization measures, linear sediment barriers (i.e. silt fence, gravel bag berms, fiber rolls), and construction site waste management (i.e. concrete washout, construction materials storage, litter/ waste management). The proposed project is within an area that is inundated twice a day with tidal flows from Newport Bay usually during high tides. The project area inundated by tidal flows have the potential to come in contact with the construction work areas (Areas with disturbed soil, contact with construction materials, etc.) and export the construction related pollutants that come contact with tidal flows from Newport Bay. To avoid and/ or minimize this potential impact, the project will be implementing a turbidity control curtain. A turbidity curtain is a flexible, impermeable barrier used to trap sediment in water bodies. The curtain generally weighted at the bottom to ensure that sediment does not travel under the curtain, which is supported at the top through a flotation system.

Long Term Impacts During Operation

Under the build alternative the proposed project will repair the failed slope paving at the west side of abutment one and bike path with a deeper concrete slope paving keyed in with a 20 foot deep sheet pile and geo-composite material to stop tidal erosion. In addition, the existing scoured channel bed will be filled with rock to match existing channel bed. There is no work proposed on the roadway that will increase the impervious surface nor will there be an increase in the typical pollutants generated during the operation of a transportation facility (sediment/ turbidity, nutrients, trash and debris, bacteria and viruses, oxygen demanding substances, organic compounds, oil and grease, pesticides and metals). The slope-paving repair includes installing sheet piles at the toe of the concrete slope to stabilize the slope from tidal erosion. This alternative does not involve any lane additions and there will be a minimal increase of impervious surface (concrete slope paving). The Department will incorporate Design Pollution Prevention (source control) BMPs to ensure that adequate measures are included to minimize any potential long-term impacts caused by the project such as erosion/ scour from tidal flows of Newport Bay.

Avoidance and Minimization Measures

The Department's Storm Water Management Plan (SWMP) describes BMPs and practices to reduce the discharge of pollutants associated with the storm water drainage systems of State highways, facilities, and activities. The following measures have been identified to minimize impacts to water resources and water quality:

WQ-1

The project will comply with the provisions of the *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for State of California Department of Transportation (Order No. 2012-0011-DWQ, NPDES No. CAS000003)*.

WQ-2

A Water Pollution Control Program (WPCP) will be prepared and implemented to address all construction-related activities, equipment, and materials that have the potential impact water quality. The WPCP will identify the sources of pollutants that may affect the quality of storm water and include BMPs to control the pollutants, such as sediment control, catch basin inlet protection, construction materials management and non-storm water BMPs. All work must conform to the Construction Site BMP requirements specified in the latest edition of the *Storm Water Quality Handbooks: Construction Site Best Management Practices Manual* to control and minimize the impacts of construction and construction related activities, material and pollutants on the watershed. These include, but are not limited to temporary sediment control, temporary soil stabilization, scheduling, waste management, materials handling, and other non-storm water BMPs.

WQ-3

Design Pollution Prevention Best Management Practices (BMPs) shall be implemented such as preservation of existing vegetation, slope/ surface protection systems (permanent soil stabilization), concentrated flow conveyance systems such as ditches, berms, dikes and swales, overside drains, flared end sections, and outlet protection/ velocity dissipation devices.

WQ-4

If dewatering is required, Construction site dewatering must comply with the *General Waste Discharge Permit for Discharges to Surface Waters of Groundwater Resulting from Groundwater Dewatering Operations and/or Groundwater Cleanup Activities at Sites Within the San Diego Creek/ Newport Bay Watershed Polluted by Petroleum Hydrocarbons, Solvents, Metals, and/ or Salts. (Order No. R8-2007-0042, NPDES No. CAG918002)* and any subsequent updates to the permit at the time of construction. This Permit addresses temporary dewatering operations during construction. Dewatering BMPs will be used to control sediment and pollutants, and the discharges must comply with the WDRs issued by the Santa Ana RWQCB

You can contact me at (949) 724-2625 with any questions you may have regarding Water Quality Technical Memorandum.

Attachment

- (1) Preliminary Design Plans August 2015

NOTE:
FOR COMPLETE RIGHT OF WAY DATA,
SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.

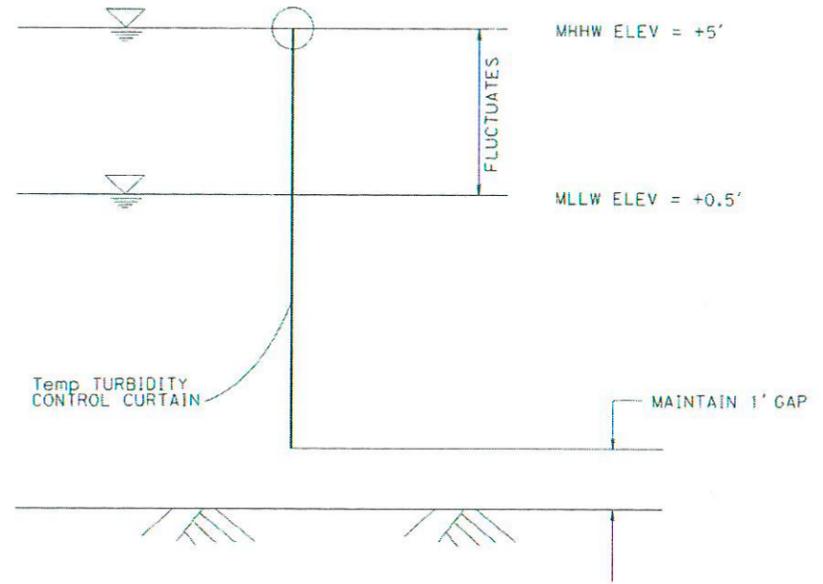
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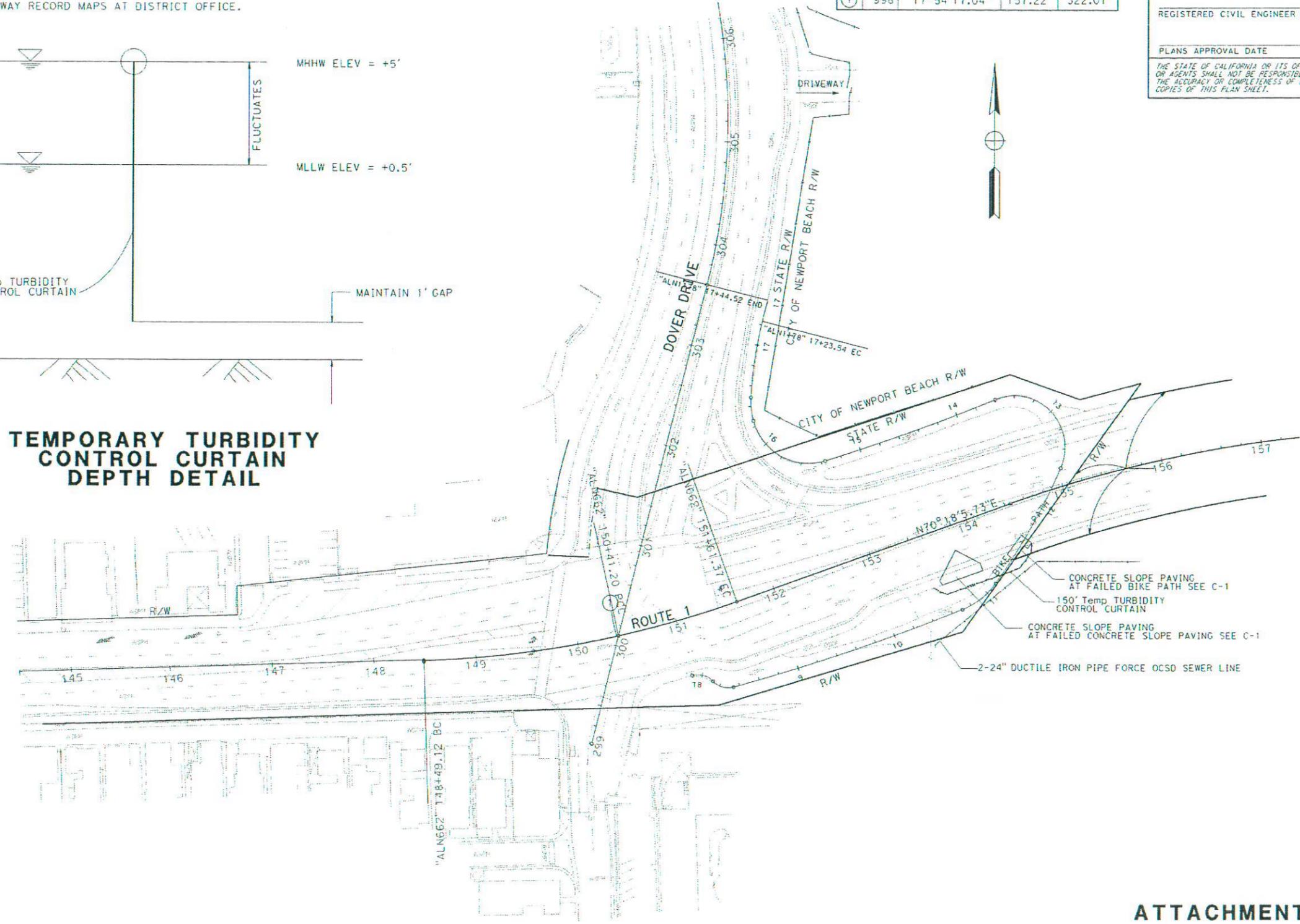
REGISTERED CIVIL ENGINEER DATE _____

PLANS APPROVAL DATE _____

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TEMPORARY TURBIDITY CONTROL CURTAIN DEPTH DETAIL



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans DESIGN

FUNCTIONAL SUPERVISOR
ANDREW OSHRIN

REVISOR BY
DATE REVISOR

CHECKED BY

DESIGNED BY

RAJU VORA

ATTACHMENT B
1 OF 2
LAYOUT AND UTILITY
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LAST REVISION DATE PLOTTED => 17-AUG-2015
00-00-00 TIME PLOTTED => 10:32

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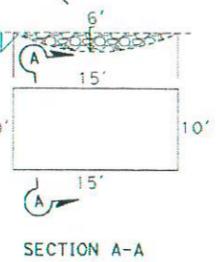
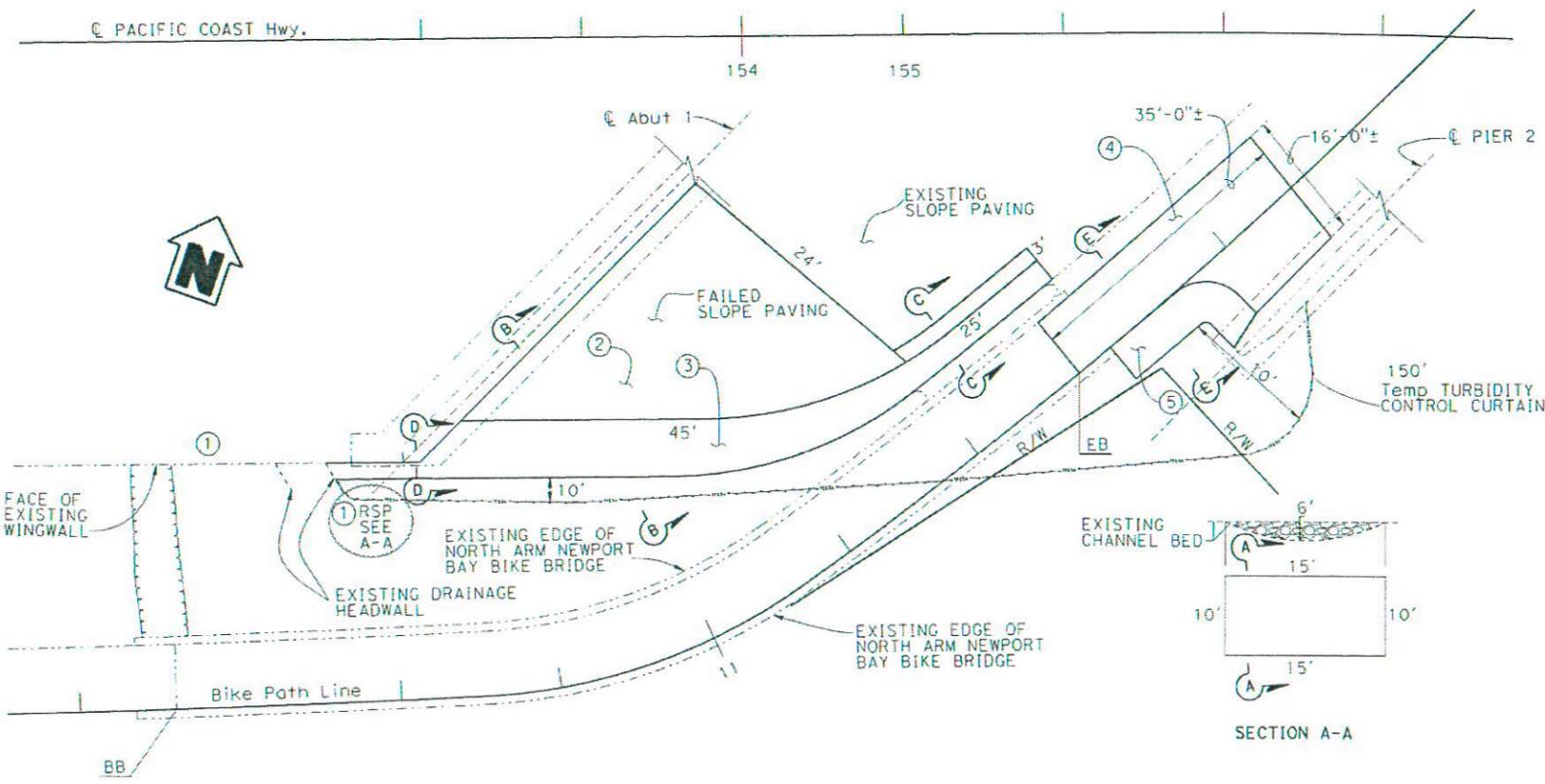
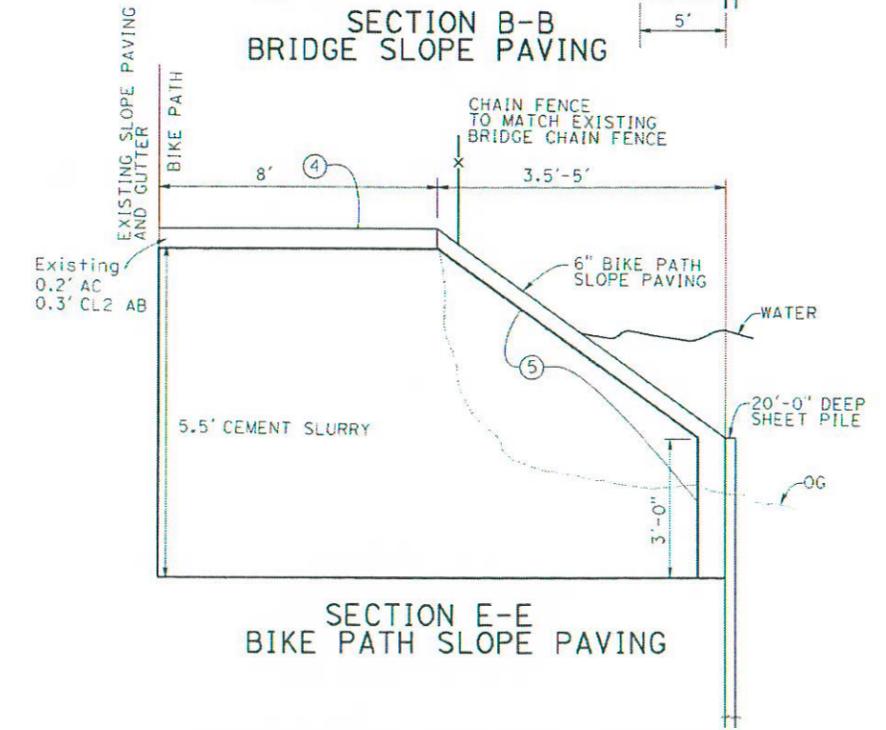
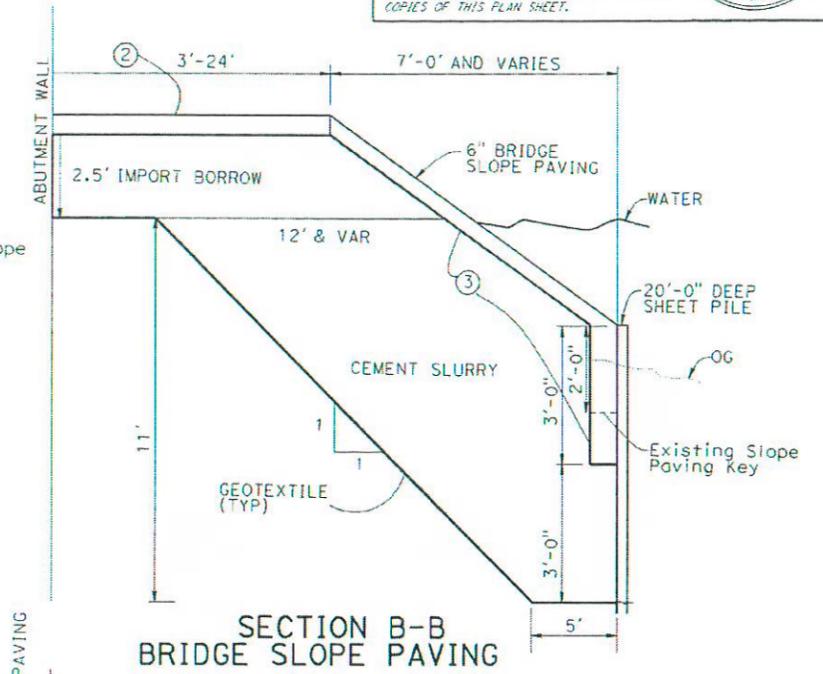
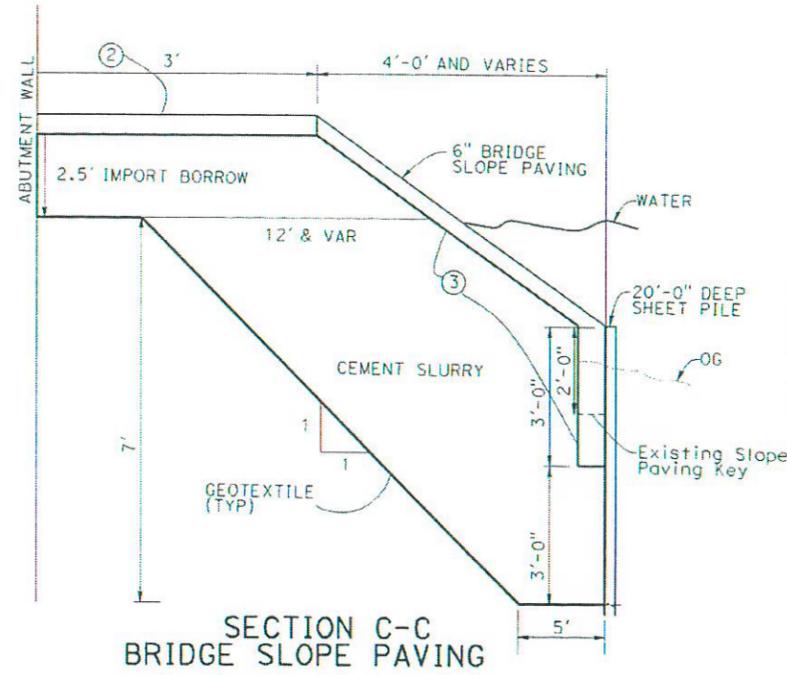
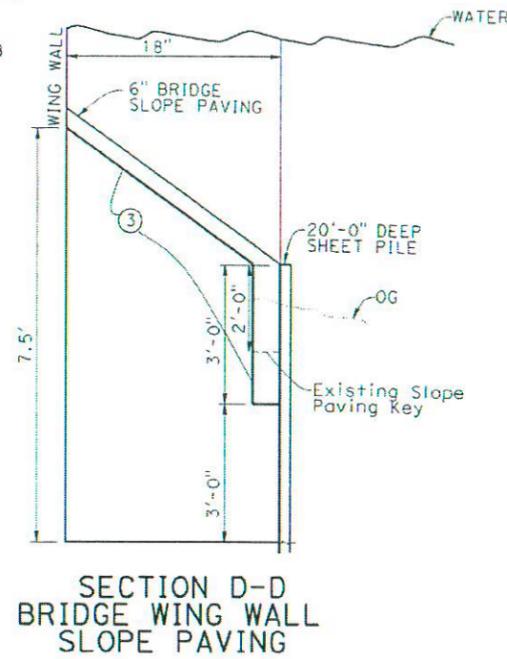
- ① RSP
- ② NEW EDGE OF SLOPE PAVING
- ③ BRIDGE SLOPE PAVING
- ④ CONCRETE APPROACH SLAB
- ⑤ BIKE PATH SLOPE PAVING

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	1	R18.2		

REGISTERED CIVIL ENGINEER	DATE
RAJU VORA	
No. C22222	
Exp. 00-00-16	
CIVIL	

PLANS APPROVAL DATE

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PROPOSED SLOPE PAVING ATTACHMENT B
2 OF 2 NO SCALE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Andrew Oshrin
 DESIGN

REVISOR: RAJU VORA
 CHECKED BY: ANDREW OSHRIN

REVISIONS:

LAST REVISION: DATE PLOTTED => 17-AUG-2015 TIME PLOTTED => 10:17