

**INFORMATION HANDOUT
FOR
08-0M94U4**

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CALIFORNIA DEPARTMENT OF FISH AND GAME
INLAND DESERTS REGION
3602 INLAND EMPIRE BLVD., SUITE C-220
ONTARIO, CA 91764



STREAMBED ALTERATION AGREEMENT
NOTIFICATION No. 1600-2011-0158-R6 (REVISION 1)

SAN BERNARDINO ASSOCIATED GOVERNMENTS
I-215 BI-COUNTY HOV LANE GAP CLOSURE PROJECT

This Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Game (DFG) and San Bernardino Associated Governments (Permittee), represented by Mr. Garry Cohoe.

RECITALS

WHEREAS, pursuant to Fish and Game Code (FGC) section 1602, Permittee notified DFG on May 16, 2011, that Permittee intends to complete the project described herein.

WHEREAS, pursuant to FGC section 1603, DFG has determined that the project could substantially adversely affect existing fish or wildlife resources and has included measures in the Agreement necessary to protect those resources.

WHEREAS, Permittee has reviewed the Agreement and accepts its terms and conditions, including the measures to protect fish and wildlife resources.

NOW THEREFORE, Permittee agrees to complete the project in accordance with the Agreement.

PROJECT LOCATION

The project is located within the Santa Ana River, and within two named (Cooley Road Channel and Grand Terrace Channel) and multiple unnamed tributaries to the Santa Ana River, along Interstate 215 from just south of the Spruce Street Bridge Overcrossing of Interstate 91 to just north of Orange Show Road Bridge Overcrossing of Interstate 215, within the Cities of Colton, Grand Terrace, Highgrove, and Riverside, in the Counties of Riverside and San Bernardino, State of California between Latitude 33.990607, Longitude -117.359213 to the south and Latitude 34.080974, Longitude -117.298346 to the north.

PROJECT DESCRIPTION

The project is limited to the construction of approximately 7.5 miles of high occupancy vehicle (HOV) lanes in each direction within the existing median of the Interstate 215 freeway, and includes:

- Widening of Interstate 215
- Reconstruction of existing storm drains/drainage swales
- Widening of the existing north and south bound Interstate 215 bridges over the Santa Ana River and placement of bridge pilings and foundation
- Pavement expansion along the length of the Interstate 215 corridor within the project area
- Road improvements to on- and off-ramps along the length of the Interstate 215 corridor within the project area
- Construction of sound barriers
- Replacement of the existing Burlington Northern Santa Fe (BNSF) two-track bridge and the existing Union Pacific Railroad (UPR) single-track bridge over Interstate 215 between the Iowa Avenue/Cadena Drive interchange and the Barton Road Interchange
- Construction of temporary railroad shoofly bridges over Interstate 215 for both the BNSF and UPR lines
- Use of construction easements.

PROJECT IMPACTS

Existing native fish and wildlife resources the project could potentially substantially adversely affect include: BIRDS – American crow (*Corvus brachyrhynchos*), American goldfinch (*Carduelis tristis*), American kestrel (*Falco sparverius*), American robin (*Turdus migratorius*), Anna's hummingbird (*Calypte anna*), ash-throated flycatcher (*Myiarchus cinerascens*), barn owl (*Tyto alba*), barn swallow (*Hirundo rustica*), Bewick's wren (*Thryomanes bewickii*), black phoebe (*Sayornis nigricans*), black-chinned hummingbird (*Archilochus alexandri*), black-crowned night-heron (*Nycticorax nycticorax*), black-headed grosbeak (*Pheucticus melanocephalus*), blue grosbeak (*Passerina caerulea*), Brewer's blackbird (*Euphagus cyanocephalus*), Bullock's oriole (*Icterus bullockii*), burrowing owl (*Athene cunicularia*), bushtit (*Psaltriparus minimus*), California thrasher (*Toxostoma redivivum*), California towhee (*Pipilo crissalis*), Cassin's kingbird (*Tyrannus vociferans*), cliff swallow (*Petrochelidon pyrrhonota*), coastal California gnatcatcher (*Polioptila californica californica*), common raven (*Corvus corax*), common yellowthroat (*Geothlypis trichas*), Cooper's hawk (*Accipiter cooperii*), downy woodpecker (*Picoides pubescens*), great egret (*Ardea alba*), greater roadrunner (*Geococcyx californianus*), hooded oriole (*Icterus cucullatus*), house finch (*Carpodacus mexicanus*), house wren (*Troglodytes aedon*), killdeer (*Charadrius vociferous*), Lawrence's goldfinch (*Spinus lawrencei*), least Bell's vireo (*Vireo bellii pusillus*), lesser goldfinch (*Carduelis psaltria*), loggerhead shrike (*Lanius ludovicianus*), mallard (*Anas platyrhynchos*), mourning dove (*Zenaidura macroura*), northern mockingbird (*Mimus polyglottos*), northern rough-winged swallow (*Stelgidopteryx serripennis*), Nuttall's woodpecker (*Picoides nuttallii*), red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), red-winged blackbird (*Agelaius phoeniceus*), Say's phoebe (*Sayornis saya*), song sparrow (*Melospiza melodia*), spotted towhee (*Pipilo crissalis*), tree swallow (*Tachycineta bicolor*), turkey vulture (*Cathartes aura*), western bluebird (*Sialia mexicana*), western kingbird (*Tyrannus verticalis*), white-crowned sparrow (*Zonotrichia leucophrys*), white-

throated swift (*Aeronautes saxatalis*), yellow-breasted chat (*Icteria virens*), yellow-rumped warbler (*Dendroica coronata*), yellow warbler (*Dendroica petechia brewsteri*); FISH – arroyo chub (*Gila orcutti*); MAMMALS – Big brown bat (*Eptesicus fuscus*), Botta's pocket gopher (*Thomomys bottae*), California ground squirrel (*Spermophilus beecheyi*), California myotis (*Myotis californicus*), coyote (*Canis latrans*), deer mouse (*Peromyscus maniculatus*), desert cottontail (*Sylvilagus audubonii*), Mexican free-tailed bat (*Tadarida brasiliensis*), pallid bat (*Antrozous pallidus*), raccoon (*Procyon lotor*), San Diego black-tailed jackrabbit (*Lepus californicus bennettii*), silver-haired bats (*Lasionycteris noctivagans*), western mastiff bat (*Eumops perotis*), western pipistrelle (*Parastrellus hesperus*), western red bat (*Lasiurus blossevillii*), western small-footed myotis (*Myotis ciliolabrum*), western yellow bat (*Lasiurus xanthinus*), Yuma myotis (*Myotis yumanensis*); REPTILES –side-blotched lizard (*Uta stansburiana*), western fence lizard (*Sceloporus occidentalis*); PLANTS – Southern California black walnut (*Juglans californica*); and all other fish and wildlife resources in the project vicinity.

The adverse effects the project could have on the fish and wildlife resources identified above include the permanent loss of nesting/breeding and foraging habitat, and alteration of wildlife corridors. The construction of the project will result in temporary impacts to 2.80 acres of DFG jurisdictional areas, consisting of 2.60 acres of streambed within the Santa Ana River, 0.12 acres of disturbed concrete trapezoidal channel within unnamed tributaries to the Santa Ana River, 0.03 acres of disturbed concrete-lined storm drain within unnamed tributaries to the Santa Ana River, 0.03 acres of riparian habitat within the earthen-bottom portion of Grand Terrace Channel, and 0.02 acres of disturbed concrete trapezoidal channel within Grand Terrace Channel. The construction of the project will result in permanent impacts to 0.31 acres of jurisdictional areas, consisting of 0.23 acres of riparian habitat, 0.02 acres of disturbed/nonnative vegetated streambed, and 0.01 acres of unvegetated streambed within the Santa Ana River; 0.01 acres of disturbed concrete-lined storm drain within unnamed tributaries to the Santa Ana River; 0.03 acres of riparian habitat at Grand Terrace Channel; and 0.01 acres of disturbed/nonnative vegetated concrete trapezoidal channel at Grand Terrace Channel. The construction of the project will also result in permanent shading impacts to 0.27 acres of jurisdictional areas, consisting of 0.17 acres of disturbed/nonnative vegetated streambed, 0.04 acres of riparian habitat, and 0.03 acres of unvegetated streambed within the Santa Ana River; and 0.03 acres of disturbed vegetated channel within Cooley Road Channel/Drain. In addition, a maximum of five southern California black walnut trees (*Juglans californica*) may be removed as a result of the project.

MEASURES TO PROTECT FISH AND WILDLIFE RESOURCES

1. Administrative Measures

Permittee shall meet each administrative requirement described below.

- 1.1 Documentation at Project Site. Permittee shall make the Agreement, any extensions and amendments to the Agreement, and all related notification

materials and documents, readily available at the project site at all times to present to DFG personnel, or personnel from another state, federal, or local agency upon request.

- 1.2 Providing Agreement to Persons at Project Site. Permittee shall provide copies of the Agreement and any extensions and amendments to the Agreement to all persons who will be working on the project at the project site on behalf of Permittee, including but not limited to contractors, subcontractors, inspectors, and monitors.
- 1.3 Notification of Conflicting Provisions. Permittee shall notify DFG if Permittee determines or learns that a provision in the Agreement might conflict with a provision imposed on the project by another local, state, or federal agency. In that event, DFG shall contact Permittee to resolve any conflict.
- 1.4 Project Site Entry. Permittee agrees that DFG personnel may enter the project site at any time to verify compliance with the Agreement.
- 1.5 Compliance with the MSHCP and Take of Listed Species. The issuance of this Agreement does not authorize the take of any state and/or federally listed threatened, endangered, or fully protected species. Additionally, it does not infer that the project is consistent with the Western Riverside Multiple Species Habitat Conservation Plan (MSHCP) or that the project is a Biologically Equivalent or Superior Preservation Alternative. If modifications to the project are necessary to meet MSHCP requirements because the project is found during the MSHCP review process to be inconsistent with the MSHCP and/or the Western Riverside County Regional Conservation Authority (RCA) and/or Wildlife Agencies (DFG and/or U.S. Fish and Wildlife Service) do not agree the project is a Biologically Equivalent or Superior Preservation Alternative, then a request for an amendment to this Agreement will be required.
- 1.6 Take of Nesting Birds. Sections 3503, 3503.5, and 3513 of the FGC prohibit take of all birds and their active nests, including raptors and other migratory non-game birds (as listed under the Migratory Bird Treaty Act).

2. Avoidance and Minimization Measures

To avoid or minimize adverse impacts to the fish and wildlife resources identified above, Permittee shall implement each measure listed below.

- 2.1 Biological Monitor. A qualified biologist shall be onsite to monitor all activities that result in the clearing of sensitive habitat as well as grading, excavation, and/or other ground-disturbing activities in jurisdictional areas. Permittee shall flag the limits of grading and the jurisdictional areas, perform necessary surveys, and take photographs during the construction process, as required by this Agreement. The

biological monitor is required to halt construction activities if threatened or endangered species are identified and notify the appropriate agencies immediately.

- 2.2 Lighting Impacts. No lighting shall be allowed to impact jurisdictional areas, and the lighting and fencing for infrastructure adjacent to jurisdictional areas shall be designed or reviewed by a qualified biologist to allow wildlife to move within the open space and conserved areas without hindrance.
- 2.3 Bat Surveys. Using an appropriate combination of structure inspection, sampling, exit counts, and acoustic surveys, a DFG approved biologist shall survey each structure and the surrounding area that may be impacted by the project for bats. If bats are found using any bridges or culverts within the project area, the biologist shall identify the bats to the species level, and evaluate the colony to determine its size and significance. The bat survey shall include: 1) the exact location of all roosting sites (location shall be adequately described and drawn on a map), 2) the number of bats present at the time of visit (count or estimate), 3) each species of bat present shall be named (include how the species was identified), 4) the location, amount, distribution and age of all bat guano shall be described and pinpointed on a map, and 5) the type of roost: night roost (rest at night while out feeding) versus a day roost (maternity colony) must also be clearly stated. The results of the bat survey shall be submitted to DFG prior to the initiation of construction activities. Reports shall be mailed to DFG Inland Deserts Region at the address below under Contact Information. **Please reference SAA # 1600-2011-0158-R6.**

If any structures house a maternity colony of bats, construction activities shall not occur during the recognized bat breeding season (March 1 to October 1). This agreement does not authorize the take of adult or juvenile bats.

- 2.4 Bridge-dwelling Wildlife Protection. Permittee shall comply with the following bridge-dwelling wildlife protection measures. All contractors, subcontractors, and employees shall also comply with these measures and it shall be the responsibility of Permittee to ensure compliance.
- 2.4.1 A DFG approved biologist shall design and direct implementation of exclusionary devices designed to prevent birds and bats from utilizing bridges/culverts before construction activities begin. Exclusionary devices shall be installed on all bridges prior to the initiation of nesting season (February 15) and shall cover both the sides and bottom of each bridge. Passage underneath each bridge (through the channel) shall not be impeded. An acceptable example is bird block netting with ½" x ½" mesh or smaller. Exclusionary mesh netting must be thick plastic with no exposed overlap joints, applied tightly, regularly maintained, and shall only be installed seven days (or earlier) after a survey has been conducted. If bats

are found using any bridge, roost entrances shall be fitted with one-way doors that allow exits but prevent entrance for a period of several days to encourage bats to relocate.

- 2.4.2. Bridge widening designs shall contain and be constructed with similar structural features to encourage continued roosting by bats. Replacement roosts should have comparable thermal stability and durability, the same or similar search image, and the same cryptic roosting conditions as the roosts they replace.
- 2.4.3. Alternate bat roosting structures (i.e., light-weight concrete panels) shall be installed on bridges not anticipated to be impacted by construction within the vicinity of the project area at the Santa Ana River. Construction and installation of roosting structures shall be supervised by a DFG-approved biologist. The total length of the roosting structures shall be no less than one-half the total length of the expansion joints that will be impacted during construction. The roosting structures shall remain in place following construction and shall not be removed. **Alternate bat roosting structures shall be installed as soon as possible and no less than nine months prior to construction at the Santa Ana River.** A report on the construction, placement, and timing of installation of the roosting structures shall be submitted to DFG for review and concurrence. **Please reference SAA # 1600-2011-0158-R6**
- 2.4.4. No gasoline or diesel engines shall be stored or operated under any bridge, unless the bridge has been cleared of all bats.
- 2.4.5. All night work (dusk until dawn) in the vicinity of the structure (i.e., roadway widening, resurfacing, lighting, land-closure setup, etc.) shall have concurrence from DFG and the Caltrans biologist prior to any work or scheduling of any work between March 1 and September 1.
- 2.4.6. The dimensions of existing hinges/expansion joints shall remain the same during and after construction.
- 2.4.7. Construction activities on, under, or around, or within close proximity to bridges/culverts will be limited to September 1 to March 1, unless all bats have been excluded from the structure and concurrence has been received from DFG.
- 2.4.8. Vegetation removal around structures shall be minimized.
- 2.4.9. If any roosting bats are discovered during construction activities all work shall stop on, under, around, or within 500-feet of the structure.

- 2.5 Nesting Bird Surveys. Permittee shall not remove vegetation from the project site during the period of March 15 through September 15 to avoid impacts to nesting birds. If project construction cannot be avoided during the period of March 15 through September 15, Permittee shall have a qualified biologist survey all potential nesting vegetation within the project site for nesting birds, prior to commencing project activities (including construction and/or site preparation). Surveys shall be conducted at the appropriate time of day, no more than three days prior to vegetation removal and/or disturbance. Documentation of surveys and findings shall be submitted to DFG for review and concurrence prior to conducting project activities. **Please reference SAA # 1600-2011-0158-R6.** If no nesting birds were observed and concurrence was received from DFG, project activities may begin. If an active bird nest is located, the nest site shall be fenced a minimum of 200 feet (500 feet for least Bell's vireo, southwestern willow flycatcher, and/or raptors) in all directions, and this area shall not be disturbed until after September 15 and until the nest becomes inactive. If threatened or endangered species are observed in the area, no work shall occur during the breeding season (March 15 through September 15) to avoid direct or indirect (noise) take of listed species.
- 2.6 Burrowing Owl. Prior to the initiation of any project activities in jurisdictional areas, Permittee shall conduct a burrowing owl habitat assessment. The assessment shall be conducted by a biologist knowledgeable of burrowing owl habitat, ecology, and field identification of the species and burrowing owl sign. The assessment shall consist of walking the project site to identify the presence of burrowing owl habitat. Burrowing owls use a variety of natural and modified habitats for nesting and foraging that is typically characterized by low growing vegetation. Burrowing owl habitat includes, but is not limited to: native and nonnative grassland, interstitial grassland with shrub lands, shrub lands with low density shrub cover, golf courses, drainage ditches, earthen berms, unpaved airfields, pastureland, dairies, fallow fields, and agricultural use areas. Burrowing owls typically use burrows made from fossorial (adapted for burrowing or digging) mammals such as ground squirrels or badgers, and often manmade structures such as earthen berms; cement culverts; cement, asphalt, rock, or wood debris piles; or openings beneath cement or asphalt pavement. **A report summarizing the results of the habitat assessment shall be submitted to DFG within 30 days following the completion of the assessment.** Please note that burrowing owl habitat assessments dated more than one year prior to the construction start date will not be accepted by DFG. If no suitable habitat is found on-site (i.e., if the site is completely covered in chaparral habitat, cement, or asphalt), no additional surveys are necessary. If suitable habitat is found onsite, burrowing owl surveys must be conducted by a qualified biologist during the breeding season of March 1 through August 31 in accordance with the attached *Burrowing Owl Survey Protocol and Mitigation Guidelines* (California Burrowing Owl Consortium, April 1993). Survey results shall be submitted to DFG within 30 days of completion of surveys. If

burrowing owls are found onsite, the Permittee shall contact DFG for further guidance prior to commencing project activities.

Please note that if burrowing owl surveys or passive relocation of owls is not conducted over other portions of the project site, including areas outside of State jurisdictional areas, the Permittee risks being in violation of the FGC and other laws that protect the burrowing owl. The burrowing owl is protected under the Federal Migratory Bird Treaty Act (MBTA) of 1918 (50 C.F.R. Section 10.13) and Sections 3503, 3503.5 and 3513 of the FGC, which prohibit take of all birds and their active nests, including raptors. Therefore, it is the responsibility of the Permittee to ensure compliance with these laws for the entire project site. DFG recommends focused burrowing owl surveys be conducted over all potential suitable habitat within the entire project site (even areas outside State jurisdiction pursuant to FGC section 1600), and to relocate owls in accordance with the 1993 California Burrowing Owl Consortium Guidelines to ensure there are not violations of other laws.

- 2.7 Nonnative plant species. DFG recommends the use of native plants to the greatest extent feasible in the landscaped areas adjacent to and/or near mitigation/open space areas and within or adjacent to stream channels. Permittee shall not plant, seed, or otherwise introduce invasive nonnative plant species to the landscaped areas adjacent to and/or near mitigation/open space areas and within or adjacent to stream channels (minimum 100 foot setback from open space areas and 150 foot setback from stream channels and wetland/riparian mitigation sites). Invasive nonnative plant species not to be used include those species listed on the "California Invasive Plant Inventory, February 2006" and the "February 2007 Inventory Update", (which are updates to Lists A & B of the California Exotic Pest Plant Council's list of "Exotic Pest Plants of Greatest Ecological Concern in California as of October 1999"). This list includes: pepper trees, pampas grass, fountain grass, ice plant, myoporum, black locust, capeweed, tree of heaven, periwinkle, bush lupine, sweet alyssum, English ivy, French broom, Scotch broom, Spanish broom, and pepperweed. A copy of the complete list can be obtained by contacting the California Invasive Plant Council by phone at (510) 843-3902, at their website at www.cal-ipc.org, or by email at info@cal-ipc.org.
- 2.8 Best Management Practices. Permittee shall actively implement best management practices (BMPs) to prevent erosion and the discharge of sediment in to streams and lakes during project activities. BMPs shall be monitored daily and repaired if necessary to ensure maximum erosion and sediment control. All fiber rolls, straw waddles, and/or hay bales utilized within and adjacent to the project site shall be free of nonnative plant materials. Fiber rolls or erosion control mesh shall be made of loose-weave mesh that is not fused at the intersections of the weave, such as jute, or coconut (coir) fiber, or other products without welded weaves. Non-welded weaves reduce entanglement risks to wildlife by allowing animals to push through the weave, which expands when spread.

- 2.9 **Pollution and Litter.** Permittee shall comply with all litter and pollution laws. All contractors, subcontractors, and employees shall also obey these laws and it shall be the responsibility of Permittee to ensure compliance.
- 2.9.1 Permittee shall not allow water containing mud, silt, or other pollutants from grading, aggregate washing, or other activities to enter a lake, streambed, or flowing stream or be placed in locations that may be subjected to high storm flows.
- 2.9.2 Spoil sites shall not be located within a lake, streambed, or flowing stream or locations that may be subjected to high storm flows, where spoil shall be washed back into a lake, streambed, or flowing stream where it will impact streambed habitat and aquatic or riparian vegetation.
- 2.9.3 Raw cement/concrete or washings thereof, asphalt, paint, or other coating material, oil or other petroleum products, or any other substances which could be hazardous to fish and wildlife resources resulting from project related activities shall be prevented from contaminating the soil and/or entering the waters of the State. These materials, placed within or where they may enter a lake, streambed, or flowing stream by Permittee or any party working under contract or with the permission of Permittee, shall be removed immediately.
- 2.9.4 No broken concrete, cement, debris, soil, silt, sand, bark, slash, sawdust, rubbish, or washings thereof, oil or petroleum products, or other organic or earthen material from any construction or associated activity of whatever nature shall be allowed to enter into or be placed where it may be washed by rainfall or runoff into waters of the State. When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any lake, streambed, or flowing stream.
- 2.9.5 No equipment maintenance shall be done within or near any lake, streambed, or flowing stream where petroleum products or other pollutants from the equipment may enter these areas under any flow.

3. Mitigation Measures

To mitigate for adverse impacts to the fish and wildlife resources identified above that cannot be avoided or minimized, Permittee shall implement each measure listed below.

- 3.1 **Habitat Restoration.** **Within 30 days of project completion,** Permittee shall restore all temporary impact areas, consisting of 2.60 acres in the Santa Ana River and 0.03 acres in the earthen-bottom vegetated portion within the Grand Terrace

Channel, by contouring the areas to pre-impact grade. In addition, the 2.30 acres of temporary impact to disturbed/nonnative vegetation within the Santa Ana River shall be replanted/seeded with an appropriate local California native plant/seed mix, and the 0.03 acres of temporary impacts to the earthen-bottomed vegetated portion within Grand Terrace Channel shall be replanted with riparian woodland species. **No later than 60 days prior to the initiation of project activities in jurisdictional areas**, Permittee shall submit to the Department for review and approval a Restoration Plan for the temporary impact areas that includes a contouring/grading plan, plant palette, and planting plan. A report shall be submitted to the Department upon completion of the restoration effort, and **no later than 90 days following project completion**, that includes a description of the restoration activities performed and photographs of the temporary impact areas before and after restoration.

Any mature (greater than 2-inches diameter at breast height) riparian trees that are removed as a result of the project shall be replanted at a minimum ratio of 5:1. All replanted trees shall be local California native species and shall be provided by container stock from a local nursery.

- 3.2 Habitat Restoration – Offsite. Permittee shall mitigate permanent structural impacts to 0.31 acres of DFG jurisdictional areas and shading impacts to 0.27 acres of jurisdictional areas by providing sufficient funds to a local habitat conservation entity, such as the Riverside-Corona Resource Conservation District (RCRCD), for the restoration of 1.40 acres of stream and riparian habitat within a tributary to the Santa Ana Watershed. Habitat “restoration” activities shall include: removal of nonnative plant species, trash, and debris, and the installation of native riparian and riparian-upland transitional plant species where appropriate. The restoration location shall be approved by DFG prior to contribution of funds. Proof of contribution of funds shall be provided to DFG **no later than 180 days after signature to this Agreement and prior to the initiation of any project activities in jurisdictional areas**. **The 1.40 acre restoration areas shall be monitored and maintained for a minimum of five years with reports and photographs submitted to DFG annually.**
- 3.3 Plant Palette. All plant species installed within temporary impact areas shall include only **local California native** container plants, cuttings, and/or seed mix, and shall be typical of the existing native plant species present in the existing riparian areas within and adjacent to the project site. DFG recommends that plant material be installed between October 1 and April 30 to maximize the benefits of the winter rainy season.

4. Reporting Measures

Permittee shall meet each reporting requirement described below.

- 4.1 Notification to CNDDDB. If any sensitive species are observed on or in proximity to the project site, or during project surveys, Permittee shall submit California Natural Diversity Data Base (CNDDDB) forms and maps to the CNDDDB within five working days of the sightings, and provide the regional DFG office with copies of the CNDDDB forms and survey maps. The CNDDDB form is available online at: www.dfg.ca.gov/whdab/pdfs/natspec.pdf. **This information shall be mailed within five days to:** DFG Natural Diversity Data Base, 1807 13th Street, Suite 202, Sacramento, CA 95814, Phone (916) 324-3812. A copy of this information shall also be mailed within five days to DFG Inland Deserts Region at the address below under Contact Information. **Please reference SAA # 1600-2011-0158-R6.**
- 4.2 Notification of Start of Construction. Permittee shall notify DFG, in writing, at least five (5) days prior to initiation of project activities in jurisdictional areas, and at least five (5) days prior to completion of project activities in jurisdictional areas. Notification should be mailed to DFG Inland Deserts Region at the address below under Contact Information. **Please reference SAA # 1600-2011-0158-R6.**

CONTACT INFORMATION

Any communication that Permittee or DFG submits to the other shall be in writing and any communication or documentation shall be delivered to the address below by U.S. mail, fax, or email, or to such other address as Permittee or DFG specifies by written notice to the other.

To Permittee:

Mr. Garry Cohoe
San Bernardino Associated Governments
1170 West 3rd Street
San Bernardino, CA 92410
(909) 885-4407 (fax)
garry@sanbag.ca.gov

To DFG:

Department of Fish and Game
Inland Deserts Region
Lake and Streambed Alteration Program
Attn: Ms. Joanna Gibson
3602 Inland Empire Blvd., Suite C-220
Ontario, CA 91764
Notification #1600-2011-0158-R6
(909) 481-2945 (fax)
jgibson@dfg.ca.gov

LIABILITY

Permittee shall be solely liable for any violations of the Agreement, whether committed by Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents or contractors and subcontractors, to complete the project or any activity related to it that the Agreement authorizes.

This Agreement does not constitute DFG's endorsement of, or require Permittee to proceed with the project. The decision to proceed with the project is Permittee's alone.

SUSPENSION AND REVOCATION

DFG may suspend or revoke in its entirety the Agreement if it determines that Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, is not in compliance with the Agreement.

Before DFG suspends or revokes the Agreement, it shall provide Permittee written notice by certified or registered mail that it intends to suspend or revoke. The notice shall state the reason(s) for the proposed suspension or revocation, provide Permittee an opportunity to correct any deficiency before DFG suspends or revokes the Agreement, and include instructions to Permittee, if necessary, including but not limited to a directive to immediately cease the specific activity or activities that caused DFG to issue the notice.

ENFORCEMENT

Nothing in the Agreement precludes DFG from pursuing an enforcement action against Permittee instead of, or in addition to, suspending or revoking the Agreement.

Nothing in the Agreement limits or otherwise affects DFG's enforcement authority or that of its enforcement personnel.

OTHER LEGAL OBLIGATIONS

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from obtaining any other permits or authorizations that might be required under other federal, state, or local laws or regulations before beginning the project or an activity related to it.

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from complying with other applicable statutes in the FGC including, but

not limited to, FGC sections 2050 et seq. (threatened and endangered species), 3503 (bird nests and eggs), 3503.5 (birds of prey), 5650 (water pollution), 5652 (refuse disposal into water), 5901 (fish passage), 5937 (sufficient water for fish), and 5948 (obstruction of stream).

Nothing in the Agreement authorizes Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, to trespass.

AMENDMENT

DFG may amend the Agreement at any time during its term if DFG determines the amendment is necessary to protect an existing fish or wildlife resource.

Permittee may amend the Agreement at any time during its term, provided the amendment is mutually agreed to in writing by DFG and Permittee. To request an amendment, Permittee shall submit to DFG a completed DFG "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the corresponding amendment fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

TRANSFER AND ASSIGNMENT

This Agreement may not be transferred or assigned to another entity, and any purported transfer or assignment of the Agreement to another entity shall not be valid or effective, unless the transfer or assignment is requested by Permittee in writing, as specified below, and thereafter DFG approves the transfer or assignment in writing.

The transfer or assignment of the Agreement to another entity shall constitute a minor amendment, and therefore to request a transfer or assignment, Permittee shall submit to DFG a completed DFG "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the minor amendment fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

EXTENSIONS

In accordance with FGC section 1605(b), Permittee may request one extension of the Agreement, provided the request is made prior to the expiration of the Agreement's term. To request an extension, Permittee shall submit to DFG a completed DFG "Request to Extend Lake or Streambed Alteration" form and include with the completed form payment of the extension fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5). DFG shall process the extension request in accordance with FGC 1605(b) through (e).

If Permittee fails to submit a request to extend the Agreement prior to its expiration, Permittee must submit a new notification and notification fee before beginning or continuing the project the Agreement covers (Fish & G. Code, § 1605, subd. (f)).

EFFECTIVE DATE

The Agreement becomes effective on the date of DFG's signature, which shall be: 1) after Permittee's signature; 2) after DFG complies with all applicable requirements under the California Environmental Quality Act (CEQA); and 3) after payment of the applicable FGC section 711.4 filing fee listed at:
http://www.dfg.ca.gov/habcon/ceqa/ceqa_changes.html.

TERM

This Agreement shall expire on **January 30, 2017**, unless it is terminated or extended before then. All provisions in the Agreement shall remain in force throughout its term. Permittee shall remain responsible for implementing any provisions specified herein to protect fish and wildlife resources after the Agreement expires or is terminated, as FGC section 1605(a)(2) requires.

AUTHORITY

If the person signing the Agreement (signatory) is doing so as a representative of Permittee, the signatory hereby acknowledges that he or she is doing so on Permittee's behalf and represents and warrants that he or she has the authority to legally bind Permittee to the provisions herein.

AUTHORIZATION

This Agreement authorizes only the project described herein. If Permittee begins or completes a project different from the project the Agreement authorizes, Permittee may be subject to civil or criminal prosecution for failing to notify DFG in accordance with FGC section 1602.

CONCURRENCE

The undersigned accepts and agrees to comply with all provisions contained herein.

**FOR SAN BERNARDINO ASSOCIATED
GOVERNMENTS**



Garry Cohoe

2/08/12

Date

FOR DEPARTMENT OF FISH AND GAME



David Elms
Environmental Program Manager

2-9-12

Date

Prepared by: Joanna Gibson
Environmental Scientist

CALIFORNIA DEPARTMENT OF FISH AND GAME
INLAND DESERTS REGION
3602 INLAND EMPIRE BLVD., SUITE C-220
ONTARIO, CA 91764



STREAMBED ALTERATION AGREEMENT
NOTIFICATION No. 1600-2011-0280-R6 (REVISION 1)

SAN BERNARDINO ASSOCIATED GOVERNMENTS
I-215 NEWPORT AVENUE OVERCROSSING BRIDGE REPLACEMENT PROJECT

This Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Game (DFG) and San Bernardino Associated Governments (Permittee), represented by Mr. Garry Cohoe.

RECITALS

WHEREAS, pursuant to Fish and Game Code (FGC) section 1602, Permittee notified DFG on December 23, 2011, that Permittee intends to complete the project described herein.

WHEREAS, pursuant to FGC section 1603, DFG has determined that the project could substantially adversely affect existing fish or wildlife resources and has included measures in the Agreement necessary to protect those resources.

WHEREAS, Permittee has reviewed the Agreement and accepts its terms and conditions, including the measures to protect fish and wildlife resources.

NOW THEREFORE, Permittee agrees to complete the project in accordance with the Agreement.

PROJECT LOCATION

The project is located within two unnamed shallow concrete-lined trapezoidal channels, both tributary to the Santa Ana River, within APNs 027-501-102, 027-525-129, 027-521-144, and 027-525-154, located on each side of Newport Avenue Bridge overcrossing of Interstate 215, in the City of Grand Terrace, County of San Bernardino, State of California; Latitude 34.038793, Longitude -117.319314.

PROJECT DESCRIPTION

The project is limited to the removal and replacement of the Newport Avenue Overcrossing Bridge at the Interstate 215; modifications to storm water drainage facilities on the east and west side of Interstate 215; the installation of four retaining walls; and the use of temporary construction easements. The new bridge will be approximately four feet higher than the current 14-foot 10-inch high bridge, and will be lengthened and widened in both directions by adding 6-foot wide sidewalks, and 6-foot

wide shoulders to the existing 12-foot wide lanes. The bridge widening and lengthening will result in the removal of approximately 80 linear feet of concreted-lined channel on the east and west side of the bridge and the replacement of approximately 63-linear feet of concrete lined channel on the southwest side of the bridge.

PROJECT IMPACTS

Existing native fish and wildlife resources the project could potentially substantially adversely affect include: BIRDS – American crow (*Corvus brachyrhynchos*), American goldfinch (*Carduelis tristis*), American kestrel (*Falco sparverius*), Anna's hummingbird (*Calypte anna*), barn owl (*Tyto alba*), black phoebe (*Sayornis nigricans*), common raven (*Corvus corax*), Cooper's hawk (*Accipiter cooperii*), house finch (*Carpodacus mexicanus*), lesser goldfinch (*Carduelis psaltria*), mourning dove (*Zenaida macroura*), northern mockingbird (*Mimus polyglottos*), red-tailed hawk (*Buteo jamaicensis*), Say's phoebe (*Sayornis saya*), turkey vulture (*Cathartes aura*), white-crowned sparrow (*Zonotrichia leucophrys*); MAMMALS – Audubon's cottontail (*Sylvilagus audubonii*), California ground squirrel (*Spermophilus beecheyi*), Big brown bat (*Eptesicus fuscus*), Western mastiff bat (*Eumops perotis californicus*), Western yellow bat (*Lasiurus xanthinus*); REPTILES – western fence lizard (*Sceloporus occidentalis*); and all other fish and wildlife resources in the project vicinity.

The adverse effects the project could have on the fish and wildlife resources identified above include the disturbance to, alteration of, and/or loss of nesting and foraging habitat and wildlife corridors. The construction of the project will impact a total of 0.024 acres of jurisdictional areas, including 0.015 acres of permanent impacts and 0.009 acres of temporary impacts. If any mature trees are removed, and/or any additional unanticipated impacts occur to riparian habitat and/or streambed during project activities, the Permittee shall submit an application for an amendment to this Agreement for authorization of those impacts.

MEASURES TO PROTECT FISH AND WILDLIFE RESOURCES

1. Administrative Measures

Permittee shall meet each administrative requirement described below.

- 1.1 Documentation at Project Site. Permittee shall make the Agreement, any extensions and amendments to the Agreement, and all related notification materials and documents, readily available at the project site at all times to present to DFG personnel, or personnel from another state, federal, or local agency upon request.
- 1.2 Providing Agreement to Persons at Project Site. Permittee shall provide copies of the Agreement and any extensions and amendments to the Agreement to all persons who will be working on the project at the project site on behalf of

Permittee, including but not limited to contractors, subcontractors, inspectors, and monitors.

- 1.3 Notification of Conflicting Provisions. Permittee shall notify DFG if Permittee determines or learns that a provision in the Agreement might conflict with a provision imposed on the project by another local, state, or federal agency. In that event, DFG shall contact Permittee to resolve any conflict.
- 1.4 Project Site Entry. Permittee agrees that DFG personnel may enter the project site at any time to verify compliance with the Agreement.
- 1.5 Take of Listed Species. The issuance of this Agreement does not authorize the take of any state and/or federally listed threatened, endangered, or fully protected species.
- 1.6 Take of Nesting Birds. Sections 3503, 3503.5, and 3513 of the FGC prohibit take of all birds and their active nests, including raptors and other migratory non-game birds (as listed under the Migratory Bird Treaty Act).

2. Avoidance and Minimization Measures

To avoid or minimize adverse impacts to the fish and wildlife resources identified above, Permittee shall implement each measure listed below.

- 2.1 Biological Monitor. A qualified biologist shall be onsite to monitor all activities that result in the clearing of sensitive habitat as well as grading, excavation, and/or other ground-disturbing activities in jurisdictional areas. Permittee shall flag the limits of grading and the jurisdictional areas, perform necessary surveys, and take photographs during the construction process, as required by this Agreement. The biological monitor is required to halt construction activities if threatened or endangered species are identified and notify the appropriate agencies immediately.
- 2.2 Lighting Impacts. No lighting shall be allowed to impact jurisdictional areas, and the lighting and fencing for infrastructure adjacent to jurisdictional areas shall be designed or reviewed by a qualified biologist to allow wildlife to move within the open space and conserved areas without hindrance.
- 2.3 Bat Surveys. Using an appropriate combination of structure inspection, sampling, exit counts, and acoustic surveys, a DFG-approved biologist shall survey each structure and the surrounding area that may be impacted by the project for bats. If bats are found using the bridge, the biologist shall identify the bats to the species level, and evaluate the colony to determine its size and significance. The bat survey shall include: 1) the exact location of all roosting sites (location shall be adequately described and drawn on a map), 2) the number of bats present at the

time of visit (count or estimate), 3) each species of bat present shall be named (include how the species was identified), 4) the location, amount, distribution and age of all bat guano shall be described and pinpointed on a map, and 5) the type of roost; night roost (rest at night while out feeding) versus a day roost (maternity colony) must also be clearly stated. The results of the bat survey shall be submitted to DFG prior to the initiation of construction activities. Reports shall be mailed to DFG Inland Deserts Region at the address below under Contact Information. **Please reference SAA # 1600-2011-0280-R6.**

If the existing Newport Avenue Overcrossing Bridge houses a maternity colony of bats, construction activities shall not occur during the recognized bat breeding season (March 1 to October 1). This agreement does not authorize the take of adult or juvenile bats.

2.4 Bridge-dwelling Wildlife Protection. Permittee shall comply with the following bridge-dwelling wildlife protection measures. All contractors, subcontractors, and employees shall also comply with these measures and it shall be the responsibility of Permittee to ensure compliance.

2.4.1 A DFG approved biologist shall design and direct implementation of exclusionary devices designed to prevent birds and bats from utilizing bridges before construction activities begin. Exclusionary devices shall be installed on all bridges prior to the initiation of nesting season (February 15) and shall cover both the sides and bottom of each bridge. Passage underneath each bridge (through the channel) shall not be impeded. An acceptable example is bird block netting with $\frac{1}{2}$ " x $\frac{1}{2}$ " mesh or smaller. Exclusionary mesh netting must be thick plastic with no exposed overlap joints, applied tightly, regularly maintained, and shall only be installed seven days (or earlier) after a survey has been conducted. If bats are found using any bridge, roost entrances shall be fitted with one-way doors that allow exits but prevent entrance for a period of several days to encourage bats to relocate.

2.4.2. Replacement bridges shall be constructed with similar structural features (including the dimensions of hinges/expansion joints) to encourage continued roosting by bats. Replacement roosts should have comparable thermal stability and durability, the same or similar search image, and the same cryptic roosting conditions as the roosts they replace.

2.4.3. No gasoline or diesel engines shall be store or operated under any bridge, unless the bridge has been cleared of all bats.

2.4.4. All night work (dusk until dawn) in the vicinity of the structure (i.e., roadway widening, resurfacing, lighting, land-closure setup, etc.) shall have

concurrence from DFG and the Caltrans biologist prior to any work or scheduling of any work between March 1 and September 1.

- 2.4.5. Construction activities on, under, or around, or within close proximity to the structure will be limited to September 1 to March 1, unless all bats have been excluded from the structure and concurrence has been received from DFG.
- 2.4.6. Vegetation removal around structures shall be minimized.
- 2.4.7. If any roosting bats are discovered during construction activities all work shall stop on, under, around, or within 500-feet of the structure.
- 2.5 Nesting Bird Surveys. Permittee shall not remove vegetation from the project site during the period of March 15 through September 15 to avoid impacts to nesting birds. If project construction cannot be avoided during the period of March 15 through September 15, Permittee shall have a qualified biologist survey all potential nesting vegetation within the project site for nesting birds, prior to commencing project activities (including construction and/or site preparation). Surveys shall be conducted at the appropriate time of day, no more than three days prior to vegetation removal and/or disturbance. Documentation of surveys and findings shall be submitted to DFG for review and concurrence prior to conducting project activities. **Please reference SAA # 1600-2011-0280-R6.** If no nesting birds were observed and concurrence was received from DFG, project activities may begin. If an active bird nest is located, the nest site shall be fenced a minimum of 200 feet (500 feet for least Bell's vireo, southwestern willow flycatcher, and/or raptors) in all directions, and this area shall not be disturbed until after September 15 and until the nest becomes inactive. If threatened or endangered species are observed in the area, no work shall occur during the breeding season (March 15 through September 15) to avoid direct or indirect (noise) take of listed species.
- 2.6 Burrowing Owl. Prior to the initiation of any project activities in jurisdictional areas, Permittee shall conduct a burrowing owl habitat assessment. The assessment shall be conducted by a biologist knowledgeable of burrowing owl habitat, ecology, and field identification of the species and burrowing owl sign. The assessment shall consist of walking the project site to identify the presence of burrowing owl habitat. Burrowing owls use a variety of natural and modified habitats for nesting and foraging that is typically characterized by low growing vegetation. Burrowing owl habitat includes, but is not limited to: native and nonnative grassland, interstitial grassland with shrub lands, shrub lands with low density shrub cover, golf courses, drainage ditches, earthen berms, unpaved airfields, pastureland, dairies, fallow fields, and agricultural use areas. Burrowing owls typically use burrows made from fossorial (adapted for burrowing or digging) mammals such as ground squirrels or badgers, and often manmade structures such as earthen

berms; cement culverts; cement, asphalt, rock, or wood debris piles; or openings beneath cement or asphalt pavement. **A report summarizing the results of the habitat assessment shall be submitted to DFG within 30 days following the completion of the assessment.** Please note that burrowing owl habitat assessments dated more than one year prior to the construction start date will not be accepted by DFG. If no suitable habitat is found on-site (i.e., if the site is completely covered in chaparral habitat, cement, or asphalt), no additional surveys are necessary. If suitable habitat is found onsite, burrowing owl surveys must be conducted by a qualified biologist during the breeding season of March 1 through August 31 in accordance with the attached *Burrowing Owl Survey Protocol and Mitigation Guidelines* (California Burrowing Owl Consortium, April 1993). Survey results shall be submitted to DFG within 30 days of completion of surveys. If burrowing owls are found onsite, the Permittee shall contact DFG for further guidance prior to commencing project activities.

Please note that if burrowing owl surveys or passive relocation of owls is not conducted over other portions of the project site, including areas outside of State jurisdictional areas, the Permittee risks being in violation of the FGC and other laws that protect the burrowing owl. The burrowing owl is protected under the Federal Migratory Bird Treaty Act (MBTA) of 1918 (50 C.F.R. Section 10.13) and Sections 3503, 3503.5 and 3513 of the FGC, which prohibit take of all birds and their active nests, including raptors. Therefore, it is the responsibility of the Permittee to ensure compliance with these laws for the entire project site. DFG recommends focused burrowing owl surveys be conducted over all potential suitable habitat within the entire project site (even areas outside State jurisdiction pursuant to FGC section 1600), and to relocate owls in accordance with the 1993 California Burrowing Owl Consortium Guidelines to ensure there are not violations of other laws.

- 2.7 Nonnative plant species. DFG recommends the use of native plants to the greatest extent feasible in the landscaped areas adjacent to and/or near mitigation/open space areas and within or adjacent to stream channels. Permittee shall not plant, seed, or otherwise introduce invasive nonnative plant species to the landscaped areas adjacent to and/or near mitigation/open space areas and within or adjacent to stream channels (minimum 100 foot setback from open space areas and 150 foot setback from stream channels and wetland/riparian mitigation sites). Invasive nonnative plant species not to be used include those species listed on the "California Invasive Plant Inventory, February 2006" and the "February 2007 Inventory Update", (which are updates to Lists A & B of the California Exotic Pest Plant Council's list of "Exotic Pest Plants of Greatest Ecological Concern in California as of October 1999"). This list includes: pepper trees, pampas grass, fountain grass, ice plant, myoporum, black locust, capeweed, tree of heaven, periwinkle, bush lupine, sweet alyssum, English ivy, French broom, Scotch broom, Spanish broom, and pepperweed. A copy of the complete list can be obtained by

contacting the California Invasive Plant Council by phone at (510) 843-3902, at their website at www.cal-ipc.org, or by email at info@cal-ipc.org.

- 2.8 **Best Management Practices.** Permittee shall actively implement best management practices (BMPs) to prevent erosion and the discharge of sediment in to streams and lakes during project activities. BMPs shall be monitored daily and repaired if necessary to ensure maximum erosion and sediment control. All fiber rolls, straw waddles, and/or hay bales utilized within and adjacent to the project site shall be free of nonnative plant materials. Fiber rolls or erosion control mesh shall be made of loose-weave mesh that is not fused at the intersections of the weave, such as jute, or coconut (coir) fiber, or other products without welded weaves. Non-welded weaves reduce entanglement risks to wildlife by allowing animals to push through the weave, which expands when spread.
- 2.9 **Pollution and Litter.** Permittee shall comply with all litter and pollution laws. All contractors, subcontractors, and employees shall also obey these laws and it shall be the responsibility of Permittee to ensure compliance.
- 2.9.1 Permittee shall not allow water containing mud, silt, or other pollutants from grading, aggregate washing, or other activities to enter a lake, streambed, or flowing stream or be placed in locations that may be subjected to high storm flows.
- 2.9.2 Spoil sites shall not be located within a lake, streambed, or flowing stream or locations that may be subjected to high storm flows, where spoil shall be washed back into a lake, streambed, or flowing stream where it will impact streambed habitat and aquatic or riparian vegetation.
- 2.9.3 Raw cement/concrete or washings thereof, asphalt, paint, or other coating material, oil or other petroleum products, or any other substances which could be hazardous to fish and wildlife resources resulting from project related activities shall be prevented from contaminating the soil and/or entering the waters of the State. These materials, placed within or where they may enter a lake, streambed, or flowing stream by Permittee or any party working under contract or with the permission of Permittee, shall be removed immediately.
- 2.9.4 No broken concrete, cement, debris, soil, silt, sand, bark, slash, sawdust, rubbish, or washings thereof, oil or petroleum products, or other organic or earthen material from any construction or associated activity of whatever nature shall be allowed to enter into or be placed where it may be washed by rainfall or runoff into waters of the State. When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any lake, streambed, or flowing stream.

2.9.5 No equipment maintenance shall be done within or near any lake, streambed, or flowing stream where petroleum products or other pollutants from the equipment may enter these areas under any flow.

3. Mitigation Measures

To mitigate for adverse impacts to the fish and wildlife resources identified above that cannot be avoided or minimized, Permittee shall implement each measure listed below.

- 3.1 Habitat Restoration – Offsite. Permittee shall mitigate permanent impacts to 0.015 acres of DFG jurisdictional areas by providing sufficient funds to the Santa Ana Watershed Association (SAWA) In-lieu Fee Program for the removal of 0.03 acres of nonnative plants within the Santa Ana Watershed. Proof of purchase shall be provided to the Department **no later than 60 days prior to the initiation of any project activities in jurisdictional areas.**
- 3.2 Plant Palette. All plant species installed within temporary impact areas shall include only **local California native** container plants, cuttings, and/or seed mix, and shall be typical of the existing native plant species present in the existing riparian areas within and adjacent to the project site. DFG recommends that plant material be installed between October 1 and April 30 to maximize the benefits of the winter rainy season.

4. Reporting Measures

Permittee shall meet each reporting requirement described below.

- 4.1 Notification to CNDDDB. If any sensitive species are observed on or in proximity to the project site, or during project surveys, Permittee shall submit California Natural Diversity Data Base (CNDDDB) forms and maps to the CNDDDB within five working days of the sightings, and provide the regional DFG office with copies of the CNDDDB forms and survey maps. The CNDDDB form is available online at: www.dfg.ca.gov/whdab/pdfs/natspec.pdf. **This information shall be mailed within five days to:** DFG Natural Diversity Data Base, 1807 13th Street, Suite 202, Sacramento, CA 95814, Phone (916) 324-3812. A copy of this information shall also be mailed within five days to DFG Inland Deserts Region at the address below under Contact Information. **Please reference SAA # 1600-2011-0280-R6.**
- 4.2 Notification of Start of Construction. Permittee shall notify DFG, in writing, at least five (5) days prior to initiation of project activities in jurisdictional areas, and at least five (5) days prior to completion of project activities in jurisdictional areas. Notification should be mailed to DFG Inland Deserts Region at the address below under Contact Information. **Please reference SAA # 1600-2011-0280-R6.**

CONTACT INFORMATION

Any communication that Permittee or DFG submits to the other shall be in writing and any communication or documentation shall be delivered to the address below by U.S. mail, fax, or email, or to such other address as Permittee or DFG specifies by written notice to the other.

To Permittee:

Mr. Garry Cohoe
San Bernardino Associated Governments
1170 West 3rd Street
San Bernardino, CA 92410
(909) 885-4407 (fax)
garry@sanbag.ca.gov

To DFG:

Department of Fish and Game
Inland Deserts Region
Lake and Streambed Alteration Program
Attn: Ms. Joanna Gibson
3602 Inland Empire Blvd., Suite C-220
Ontario, CA 91764
Notification #1600-2011-0280-R6
(909) 481-2945 (fax)
jgibson@dfg.ca.gov

LIABILITY

Permittee shall be solely liable for any violations of the Agreement, whether committed by Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents or contractors and subcontractors, to complete the project or any activity related to it that the Agreement authorizes.

This Agreement does not constitute DFG's endorsement of, or require Permittee to proceed with the project. The decision to proceed with the project is Permittee's alone.

SUSPENSION AND REVOCATION

DFG may suspend or revoke in its entirety the Agreement if it determines that Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, is not in compliance with the Agreement.

Before DFG suspends or revokes the Agreement, it shall provide Permittee written notice by certified or registered mail that it intends to suspend or revoke. The notice shall state the reason(s) for the proposed suspension or revocation, provide Permittee an opportunity to correct any deficiency before DFG suspends or revokes the Agreement, and include instructions to Permittee, if necessary, including but not limited to a directive to immediately cease the specific activity or activities that caused DFG to issue the notice.

ENFORCEMENT

Nothing in the Agreement precludes DFG from pursuing an enforcement action against Permittee instead of, or in addition to, suspending or revoking the Agreement.

Nothing in the Agreement limits or otherwise affects DFG's enforcement authority or that of its enforcement personnel.

OTHER LEGAL OBLIGATIONS

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from obtaining any other permits or authorizations that might be required under other federal, state, or local laws or regulations before beginning the project or an activity related to it.

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from complying with other applicable statutes in the FGC including, but not limited to, FGC sections 2050 et seq. (threatened and endangered species), 3503 (bird nests and eggs), 3503.5 (birds of prey), 5650 (water pollution), 5652 (refuse disposal into water), 5901 (fish passage), 5937 (sufficient water for fish), and 5948 (obstruction of stream).

Nothing in the Agreement authorizes Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, to trespass.

AMENDMENT

DFG may amend the Agreement at any time during its term if DFG determines the amendment is necessary to protect an existing fish or wildlife resource.

Permittee may amend the Agreement at any time during its term, provided the amendment is mutually agreed to in writing by DFG and Permittee. To request an amendment, Permittee shall submit to DFG a completed DFG "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the

corresponding amendment fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

TRANSFER AND ASSIGNMENT

This Agreement may not be transferred or assigned to another entity, and any purported transfer or assignment of the Agreement to another entity shall not be valid or effective, unless the transfer or assignment is requested by Permittee in writing, as specified below, and thereafter DFG approves the transfer or assignment in writing.

The transfer or assignment of the Agreement to another entity shall constitute a minor amendment, and therefore to request a transfer or assignment, Permittee shall submit to DFG a completed DFG "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the minor amendment fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

EXTENSIONS

In accordance with FGC section 1605(b), Permittee may request one extension of the Agreement, provided the request is made prior to the expiration of the Agreement's term. To request an extension, Permittee shall submit to DFG a completed DFG "Request to Extend Lake or Streambed Alteration" form and include with the completed form payment of the extension fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5). DFG shall process the extension request in accordance with FGC 1605(b) through (e).

If Permittee fails to submit a request to extend the Agreement prior to its expiration, Permittee must submit a new notification and notification fee before beginning or continuing the project the Agreement covers (Fish & G. Code, § 1605, subd. (f)).

EFFECTIVE DATE

The Agreement becomes effective on the date of DFG's signature, which shall be: 1) after Permittee's signature; 2) after DFG complies with all applicable requirements under the California Environmental Quality Act (CEQA); and 3) after payment of the applicable FGC section 711.4 filing fee listed at:
http://www.dfg.ca.gov/habcon/ceqa/ceqa_changes.html.

TERM

This Agreement shall expire on **January 30, 2017**, unless it is terminated or extended before then. All provisions in the Agreement shall remain in force throughout its term. Permittee shall remain responsible for implementing any provisions specified herein to protect fish and wildlife resources after the Agreement expires or is terminated, as FGC section 1605(a)(2) requires.

AUTHORITY

If the person signing the Agreement (signatory) is doing so as a representative of Permittee, the signatory hereby acknowledges that he or she is doing so on Permittee's behalf and represents and warrants that he or she has the authority to legally bind Permittee to the provisions herein.

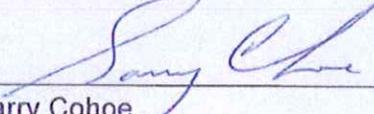
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CONCURRENCE

The undersigned accepts and agrees to comply with all provisions contained herein.

**FOR SAN BERNARDINO ASSOCIATED
GOVERNMENTS**

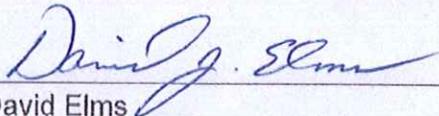


Garry Cohoe

2/08/12

Date

FOR DEPARTMENT OF FISH AND GAME



David Elms
Environmental Program Manager

2-9-2012

Date

Prepared by: Joanna Gibson
Environmental Scientist



Linda S. Adams
Acting Secretary for
Environmental Protection

California Regional Water Quality Control Board Santa Ana Region

3737 Main Street, Suite 500, Riverside, California 92501-3348
(951) 782-4130 • Fax (951) 781-6288
<http://www.waterboards.ca.gov/santaana>



Edmund G. Brown Jr.
Governor

July 26, 2011

Matt Smith
San Bernardino Associated
Governments
1170 W. 3rd St.
San Bernardino, CA 92410

RECEIVED

JUL 27 2011

SAN BERNARDINO
ASSOCIATED GOVERNMENTS

**CLEAN WATER ACT SECTION 401 WATER QUALITY STANDARDS
CERTIFICATION FOR THE I-215 BI-COUNTY LINE HOV LANE GAP CLOSURE
PROJECT, COUNTY OF SAN BERNARDINO, CALIFORNIA (ACOE REFERENCE
NO. NOT AVAILABLE) (SARWQCB PROJECT NO. 362011-08)**

Dear Mr. Smith:

On May 13, 2011, we received an application for Clean Water Act Section 401 Water Quality Standards Certification ("Certification") from San Bernardino Associated Governments for the construction of approximately 7.5 miles of high occupancy vehicle (HOV) lanes in each direction on I-215, between Orange Show Road in San Bernardino County and the State Route 91/I-215 interchange in Riverside County (Project). This letter responds to your request for certification that the proposed project, described in your application and summarized below, will comply with State water quality standards outlined in the Water Quality Control Plan for the Santa Ana River Basin (1995) (Basin Plan) and subsequent Basin Plan amendments:

Project Description: The Project includes construction of approximately 7.5 mi of HOV lanes in each direction within the existing median, with minimal widening within the current right-of-way (ROW), and median barrier replacement. Permanent impacts to jurisdictional waters will occur as a result of the following construction activities: The widening will require improvements to on- and off-ramps along the corridor, with a reduction in the lengths of some acceleration and deceleration lanes. All widening will occur within existing ROW. The existing BNSF two-track railroad bridge over the freeway and the existing UPRR single-track railroad bridge over the freeway between the Iowa Avenue/La Cadena Drive interchange and the Barton Road interchange will be

replaced. This will require construction of a railroad shoofly bridge over the freeway for each railroad line, so that railroad operations can continue during the construction period. The I-215 structures over the UPRR tracks south of I-10, over I-10, and over the Santa Ana River will be widened to accommodate the additional HOV lane in each direction. The work will take place within Sections 6, 7, and 32 of Township 1 and 2 South, Range 4 West, of the U.S. Geological Survey *San Bernardino South* quadrangle map (34° 01' 46.114" N/ 117° 19' 27.310" W).

Receiving water: Santa Ana River, Reche Canyon Channel, Highgrove Channel, and other unnamed tributaries to the Santa Ana River

Fill area: 0.04 acres of permanent impact to wetland habitat, 0.20 acres of temporary impact to wetland habitat; 0.38 acres of permanent impact to riparian habitat, 2.32 acres of temporary impact to riparian habitat

Dredge/Fill volume: N/A

Federal permit: U.S. Army Corps of Engineers Nationwide Permit No. 14

You have proposed to mitigate water quality impacts as described in your Certification application. The proposed mitigation is summarized below:

Onsite Water Quality Standards Mitigation Proposed:

- Standard water quality related best management practices (BMPs) will be employed during construction activities.
- All temporary impacted areas will be restored to pre-project conditions, according to the project's Mitigation Plan

Offsite Water Quality Standards Mitigation Proposed:

- Contribution to the Santa Ana Watershed Association In-Lieu Fee Program, at a minimum 2:1 mitigation ratio for permanent impacts to riparian habitat and 4:1 mitigation ratio for impacts to wetland habitat.

Should the proposed project impact state- or federally-listed endangered species or their habitat, implementation of measures identified in consultation with U.S. Fish and Wildlife Service and the California Department of Fish and Game will ensure those impacts are mitigated to an acceptable level. Appropriate BMPs will be implemented to reduce construction-related impacts to Waters of the State according to the requirements of State Water Resources Control Board Order No. 99-06-DWQ (NPDES Permit No. CAS618036), commonly known as the Statewide CalTrans Storm Water Permit, and subsequent iterations thereof.

Pursuant to California Code of Regulations, Title 14, Chapter 3, Section 15096, as a responsible agency, the Regional Board is required to consider an EIR or Negative Declaration prepared by the lead agency in determining whether to approve a project. A responsible agency has responsibility for mitigating and avoiding only the direct and indirect environmental effects of those parts of the project which it decides to carry out, finance, or approve. Further, the responsible agency must make findings as required by Sections 15091 and, if necessary, 15093, for each and every significant impact of the project.

As required by Section 15096, the Regional Board has considered CalTrans' Mitigated Negative Declaration (MND) prepared for the proposed project, particularly those sections of the MND that relate to water quality, and information provided subsequently in the agency's application, in approving this Certification. Based on the mitigation proposed and the conditions set forth in this Certification, Board staff concludes that the proposed project's impacts to water quality will be reduced to a less than significant level and beneficial uses will be protected. The Regional Board independently finds that changes or alterations have been required or incorporated into the project that avoid or mitigate impacts to water quality to a less than significant level.

This 401 Certification is contingent upon the execution of the following conditions:

- 1) The applicant must comply with the requirements of the applicable Clean Water Act section 404 permit.
- 2) Proposed mitigation and BMPs shall be timely implemented. Materials documenting the purchase of necessary mitigation credits shall be provided to this office prior to discharge of fill to, or to the dredging or excavation of material from, waters of the state. Off-site mitigation credits shall be applied to riparian and wetland habitat located along or tributary to Reach 5 of the Santa Ana River.

- 3) All materials generated from construction activities associated with this project shall be managed appropriately. This shall include identifying all potential pollution sources within the scope of work of this project, and incorporating all necessary pollution prevention BMPs as they relate to each potential pollution source identified.
- 4) The project proponent shall utilize BMPs during project construction to minimize the controllable discharges of sediment and other wastes to drainage systems or other waters of the state and of the United States.
- 5) Post-construction BMP's shall be developed, implemented and maintained in accordance to provisions contained within the State Water Resources Control Board Order No. 99-06-DWQ (NPDES Permit No. CAS618036), commonly known as the Statewide CalTrans Storm Water Permit, and subsequent iterations thereof.
- 6) Substances resulting from project-related activities that could be harmful to aquatic life, including, but not limited to, petroleum lubricants and fuels, cured and uncured cements, epoxies, paints and other protective coating materials, portland cement concrete or asphalt concrete, and washings and cuttings thereof, shall not be discharged to soils or waters of the state. All waste concrete shall be removed.
- 7) Motorized equipment shall not be maintained or parked within or near any stream crossing, channel or lake margin in such a manner that petroleum products or other pollutants from the equipment may enter these areas under any flow conditions. Vehicles shall not be driven or equipment operated in waters of the state on-site, except as necessary to complete the proposed project. No equipment shall be operated in areas of flowing water.
- 8) This Water Quality Certification is subject to the acquisition of all local, regional, state, and federal permits and approvals as required by law. Failure to meet any conditions contained herein or any the conditions contained in any other permit or approval issued by the State of California or any subdivision thereof may result in the revocation of this Certification and civil or criminal liability.
- 9) BMPs to stabilize disturbed soils must include the use of native plant species whenever feasible.

- 10) Construction de-watering discharges, including temporary stream diversions necessary for project construction, may be regulated under Regional Board Order No. R8-2009-0003, General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (De Minimus) Threat to Water Quality. For more information, please review Order No. R8-2009-0003 at www.waterboards.ca.gov/santaana/

Under California Water Code, Section 1058, and Pursuant to 23 CCR §3860, the following shall be included as conditions of all water quality certification actions:

- (a) Every certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to Section §13330 of the Water Code and Article 6 (commencing with Section 3867) of this Chapter.
- (b) Certification is not intended and shall not be construed to apply to any activity involving a hydroelectric facility and requiring a FERC license or an amendment to a FERC license unless the pertinent certification application was filed pursuant to Subsection §3855(b) of this Chapter and that application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.
- (c) Certification is conditioned upon total payment of any fee required under this Chapter and owed by the applicant.

If the above stated conditions are changed, any of the criteria or conditions as previously described are not met, or new information becomes available that indicates a water quality problem, the Regional Board may require the applicant to submit a report of waste discharge and obtain Waste Discharge Requirements.

In the event of any violation or threatened violation of the conditions of this certification, the holder of any permit or license subject to this certification shall be subject to any remedies, penalties, process or sanctions as provided for under state law. For purposes of section 401(d) of the Clean Water Act, the applicability of any state law authorizing remedies, penalties, process or sanctions for the violation or threatened violation constitutes a limitation necessary to assure compliance with the water quality standards and other pertinent requirements incorporated into this certification. Violations of the conditions of this certification may subject the applicant to civil liability pursuant to Water Code section 13350 and/or 13385.

Matt Smith
San Bernardino Associated
Governments

- 6 -

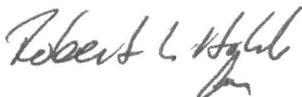
July 26, 2011

This letter constitutes a Water Quality Standards Certification issued pursuant to Clean Water Act Section 401. I hereby issue an order certifying that any discharge from the referenced project will comply with the applicable provisions of Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 303 (Water Quality Standards and Implementation Plans), 306 (National Standards of Performance), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act, and with other applicable requirements of State law.

This discharge is also regulated under State Water Resources Control Board Order No. 2003-0017-DWQ (Order No. 2003-0017-DWQ), "General Waste Discharge Requirements for Dredge and Fill Discharges That Have Received Water Quality Certification" which requires compliance with all conditions of this Water Quality Standards Certification. Order No. 2003-0017-DWQ is available at:
www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo_2003-0017.pdf

Should there be any questions, please contact Marc Brown at (951) 321-4584, or Mark Adelson at (951) 782-3234.

Sincerely,



Kurt V. Berchtold
Executive Officer
Santa Ana Regional Water Quality Control Board

cc (via electronic message):

U. S. Army Corps of Engineers, Los Angeles Office – Gerry Salas
State Water Resources Control Board, OCC – David Rice
State Water Resources Control Board, DWQ – Water Quality Certification Unit
CDFG, Region 6, Ontario Office – Joanna Gibson
U.S. EPA – Supervisor of the Wetlands Regulatory Office WTR- 8

x:\401\draft certs with comments\i-215_bi-county_hov_362011-08_draft_25jul11.doc



California Regional Water Quality Control Board Santa Ana Region



Matthew Rodriguez
Secretary for
Environmental Protection

3737 Main Street, Suite 500, Riverside, California 92501-3348
Phone (951) 782-4130 • FAX (951) 781-6288
www.waterboards.ca.gov/santaana

Edmund G. Brown Jr.
Governor

January 13, 2012

Garry Cohoe
San Bernardino Associated Governments
1170 West 3rd Street, 2nd floor
San Bernardino, CA 92410

**CLEAN WATER ACT SECTION 401 WATER QUALITY STANDARDS
CERTIFICATION FOR THE I-215/NEWPORT AVENUE OVERCROSSING BRIDGE
REPLACEMENT PROJECT, COUNTY OF SAN BERNARDINO, CALIFORNIA (ACOE
REFERENCE NO. NOT AVAILABLE) (SARWQCB PROJECT NO. 362011-28)**

Dear Mr. Cohoe:

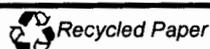
On November 15, 2011, we received an application for Clean Water Act Section 401 Water Quality Standards Certification ("Certification") from San Bernardino Associated Governments for its project to replace the Newport Avenue Bridge, in the community of Grand Terrace. This letter responds to your request for certification that the proposed project, described in your application and summarized below, will comply with State water quality standards outlined in the Water Quality Control Plan for the Santa Ana River Basin (1995) (Basin Plan) and subsequent Basin Plan amendments:

Project Description: The proposed project will replace the Newport Bridge with a bridge of higher vertical clearance to allow for safe passage of oversized trucks. The proposed project is expected to eliminate future truck strikes of the Newport Bridge, improving the safety of the motoring public and local residents. The work will take place within Section 32 of Township 1 South, Range 4 West, of the U.S. Geological Survey *San Bernardino South* quadrangle map (34° 01' 46.114" N/ -117° 19' 27.310" W).

Receiving water: Unnamed concrete-lined road-side drainage V-ditches

Fill area: 0.003 acres of permanent impact to streambed habitat (80 linear feet), 0.001 acres of temporary impact to streambed habitat (63 linear feet)

California Environmental Protection Agency



Dredge/Fill volume: N/A

Federal permit: U.S. Army Corps of Engineers Nationwide Permit No. 14

You have proposed to mitigate water quality impacts as described in your Certification application. The proposed mitigation is summarized below:

Onsite Water Quality Standards Mitigation Proposed:

- Standard water quality related best management practices (BMPs) will be employed during construction activities.

Offsite Water Quality Standards Mitigation Proposed:

- None

Should the proposed project impact state- or federally-listed endangered species or their habitat, implementation of measures identified in consultation with U.S. Fish and Wildlife Service and the California Department of Fish and Game will ensure those impacts are mitigated to an acceptable level. Appropriate BMPs will be implemented to reduce construction-related impacts to Waters of the State according to the requirements of Order No. R8-2010-0036 (NPDES Permit No. CAS618036), commonly known as the San Bernardino County Municipal Storm Water Permit, and subsequent iterations thereof. Order No. R8-2010-0036 requires that you substantially comply with the requirements of State Water Resources Control Board's General Permit for Storm Water Discharges Associated with Construction Activity, including the preparation of a Storm Water Pollution Protection Plan (SWPPP).

Pursuant to the California Environmental Quality Act (CEQA), San Bernardino Associated Governments determined that the proposed project is categorically exempt from provisions of CEQA according to Guidelines Section 15302 for a Class 2 project, which consists of the replacement or reconstruction of existing buildings and water supply facilities where the new structure will be located on the same site as the structure to be replaced and will have substantially the same purpose and capacity as the structure replaced. The Regional Board has independently evaluated the project and agrees with the applicant's determination that the project is categorically exempt from CEQA.

This 401 Certification is contingent upon the execution of the following conditions:

- 1) The applicant must comply with the requirements of the applicable Clean Water Act section 404 permit.
- 2) All materials generated from construction activities associated with this project shall be managed appropriately. This shall include identifying all potential pollution sources within the scope of work of this project, and incorporating all necessary pollution prevention BMPs as they relate to each potential pollution source identified.
- 3) The project proponent shall utilize BMPs during project construction to minimize the controllable discharges of sediment and other wastes to drainage systems or other waters of the state and of the United States.
- 4) Substances resulting from project-related activities that could be harmful to aquatic life, including, but not limited to, petroleum lubricants and fuels, cured and uncured cements, epoxies, paints and other protective coating materials, portland cement concrete or asphalt concrete, and washings and cuttings thereof, shall not be discharged to soils or waters of the state. All waste concrete shall be removed.
- 5) Motorized equipment shall not be maintained or parked within or near any stream crossing, channel or lake margin in such a manner that petroleum products or other pollutants from the equipment may enter these areas under any flow conditions. Vehicles shall not be driven or equipment operated in waters of the state on-site, except as necessary to complete the proposed project. No equipment shall be operated in areas of flowing water.
- 6) This Water Quality Certification is subject to the acquisition of all local, regional, state, and federal permits and approvals as required by law. Failure to meet any conditions contained herein or any the conditions contained in any other permit or approval issued by the State of California or any subdivision thereof may result in the revocation of this Certification and civil or criminal liability.
- 7) A copy of this Certification and any subsequent amendments must be maintained on site for the duration of work as a denoted element of any project SWPPP or WQMP.

- 8) Best management practices to stabilize disturbed soils must include the use of native plant species whenever feasible.
- 9) Construction de-watering discharges, including temporary stream diversions necessary for project construction may be regulated under Regional Board Order No. R8-2009-0003, General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (De Minimus) Threat to Water Quality. For more information, please review Order No. R8-2009-0003 at www.waterboards.ca.gov/santaana/
- 10) Applicant shall ensure that all fees associated with this project shall be paid to each respective agency prior to conducting any on-site construction activities.

Under California Water Code, Section 1058, and Pursuant to 23 CCR §3860, the following shall be included as conditions of all water quality certification actions:

- (a) Every certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to Section §13330 of the Water Code and Article 6 (commencing with Section 3867) of this Chapter.
- (b) Certification is not intended and shall not be construed to apply to any activity involving a hydroelectric facility and requiring a FERC license or an amendment to a FERC license unless the pertinent certification application was filed pursuant to Subsection §3855(b) of this Chapter and that application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.
- (c) Certification is conditioned upon total payment of any fee required under this Chapter and owed by the applicant.

If the above stated conditions are changed, any of the criteria or conditions as previously described are not met, or new information becomes available that indicates a water quality problem, the Regional Board may require the applicant to submit a report of waste discharge and obtain Waste Discharge Requirements.

In the event of any violation or threatened violation of the conditions of this certification, the holder of any permit or license subject to this certification shall be subject to any remedies, penalties, process or sanctions as provided for under state law. For purposes of section 401(d) of the Clean Water Act, the applicability of any state law authorizing remedies, penalties, process or sanctions for the violation or threatened

Garry Cohoe
San Bernardino Associated
Governments

- 5 -

January 13, 2012

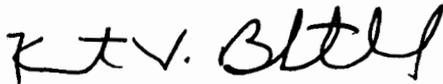
violation constitutes a limitation necessary to assure compliance with the water quality standards and other pertinent requirements incorporated into this certification. Violations of the conditions of this certification may subject the applicant to civil liability pursuant to Water Code section 13350 and/or 13385.

This letter constitutes a Water Quality Standards Certification issued pursuant to Clean Water Act Section 401. I hereby issue an order certifying that any discharge from the referenced project will comply with the applicable provisions of Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 303 (Water Quality Standards and Implementation Plans), 306 (National Standards of Performance), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act, and with other applicable requirements of State law. This discharge is also regulated under State Water Resources Control Board Order No. 2003-0017-DWQ (Order No. 2003-0017-DWQ), "General Waste Discharge Requirements for Dredge and Fill Discharges That Have Received Water Quality Certification" which requires compliance with all conditions of this Water Quality Standards Certification. Order No. 2003-0017-DWQ is available at:

www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo2003-0017.pdf

Should there be any questions, please contact Marc Brown at (951) 321-4584, or Mark Adelson at (951) 782-3234.

Sincerely,

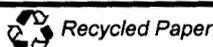


Kurt V. Berchtold
Executive Officer
Santa Ana Regional Water Quality Control Board

cc (via electronic mail):

VCS Environmental – President – Julie Vandermost
U. S. Army Corps of Engineers, Los Angeles Office- Mark Durham
State Water Resources Control Board, OCC- David Rice
State Water Resources Control Board, DWQ -Water Quality Certification Unit
California Department of Fish and Game - Joanna Gibson
U.S. EPA- Supervisor of the Wetlands Regulatory Office WTR- 8

California Environmental Protection Agency





California Regional Water Quality Control Board

Santa Ana Region



Matthew Rodriguez
Secretary for
Environmental Protection

3737 Main Street, Suite 500, Riverside, California 92501-3348
Phone (951) 782-4130 • FAX (951) 781-6288
www.waterboards.ca.gov/santaana

Edmund G. Brown Jr.
Governor

February 14, 2012

Garry Cohoe
San Bernardino Associated Governments
1170 W. 3rd St.
San Bernardino, CA 92410

SUBJECT: Amendment to Clean Water Act Section (CWA) 401 Water Quality Standards Certification (Certification) issued on July 26, 2011 for the I-215 Bi-County HOV Lane Gap Closure Project, San Bernardino County SARWQCB Project No. 362011-08

Dear Mr. Cohoe:

On July 26, 2011, I issued a Section 401 Certification for the subject project. On December 20, 2011, January 10, 2012, February 2, 2012, and February 13, 2012, we received email correspondence from VCS Environmental, your environmental consultant for the subject project, advising of changes in the project's impacts to waters of the U.S., necessitating revision of the Certification. Based on this correspondence, the project's revised impacts to waters of the U.S. are:

0.182 acres of permanent impact to wetland habitat, an increase from 0.04 acres identified in the July 26, 2011 certification

0.213 acres of temporary impact to wetland habitat, an increase from 0.20 acres

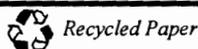
0.182 acres of permanent impact to riparian non-wetland waters of the U.S.

2.49 acres of temporary impact to riparian non-wetland waters of the U.S.

The certification is hereby revised to authorize the discharges of fill as outlined above.

In the May 13, 2011, application for certification, the applicant proposed to mitigate for project impacts to water quality standards by contributing to the Santa Ana Watershed Association's Santa Ana Watershed Association's Santa Ana River Watershed Trust Fund for Arundo Eradication and Habitat Enhancement, an approved in-lieu fee program, at a minimum 4:1 mitigation ratio for permanent impacts to wetland habitat and at a minimum 2:1 mitigation ratio for permanent impacts to riparian non-wetland waters of the U.S. VCS has indicated that the project's mitigation proposal would be revised to mitigate for permanent impacts to 0.182 acre of wetland habitat and 0.182

California Environmental Protection Agency



February 14, 2012

acre of riparian non-wetland waters of the U.S. The applicant shall provide documentation verifying purchase of 0.94 acre of credits for enhancement of wetland habitat waters of the U.S. and 0.36 acre of credits for the enhancement of riparian non-wetland waters of the U.S. from a Corps-approved in-lieu fee program.

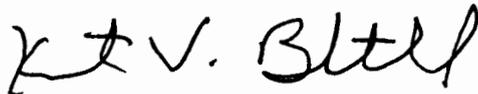
The July 26, 2011 Section 401 Certification issued for the project requires timely implementation of this mitigation proposal. This condition remains in effect.

Temporary fills and other areas of temporary impact shall be restored in the manner specified in the CWA Section 404 permit for the project.

All other terms and conditions of the July 26, 2011 Section 401 Certification issued for this project remain in effect.

If you have any questions, please contact Marc Brown at mbrown@waterboards.ca.gov or (951) 321-4584, or Mark Adelson at madelson@waterboards.ca.gov or (951) 782-3234.

Sincerely,



Kurt V. Berchtold
Executive Officer

Cc: VCS Environmental – Lennie Rae Cooke, Project Manager
lrcooke@vcsenvironmental.com

USACE, Los Angeles – Veronica Chan C SPL



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS LOS ANGELES DISTRICT
P.O. Box 532711
Los Angeles, CA 90017-3401

February 14, 2012

REPLY TO
ATTENTION OF:

Regulatory Division

DEPARTMENT OF THE ARMY NATIONWIDE PERMIT AUTHORIZATION

Garry Cohoe
Director of Project Delivery
San Bernardino Associated Governments
1170 West 3rd Street
San Bernardino, California 92410

Dear Mr. Cohoe:

This correspondence is in reply to your application (File No. SPL-2011-01164-VCC), dated December 22, 2011, for a Department of the Army Permit to discharge permanent fill into approximately 0.003 acre and temporary fill into approximately 0.001 acres of waters of the U.S., in association with the Newport Avenue Overcrossing Bridge Replacement at Interstate 215 Project. The proposed work would take place in two unnamed tributaries to the Santa Ana River within the city of Grand Terrace, San Bernardino County, California, as shown on the enclosed map.

Based on the information you have provided, the Corps of Engineers has determined that your proposed activity complies with the enclosed terms and conditions of Nationwide Permit (NWP) No. 14 Linear Transportation Projects, as described in enclosure 1.

Specifically, you are authorized to:

1. Discharge permanent fill material into approximately 0.003 acre (80 linear feet) of non-wetland waters of the U.S. and discharge temporary fill material for construction and equipment access into approximately 0.001 acre (63 linear feet) of non-wetland waters of the U.S. at the following drainage features:
 - Drainage A: 0.002 acre (2 cubic yards) of permanent fill material into non-wetland waters of the U.S; and
 - Drainage B: 0.001 acre (4 cubic yards) of permanent fill material into non-wetland

waters of the U.S. to place the concrete culvert into a pipe and 0.001 acre of temporary fill to divert the drainage during construction.

Furthermore, you must comply with the following non-discretionary Special Conditions:

1. The Permittee shall abide by the terms and conditions of the Clean Water Act (CWA) section 401 Water Quality Standards Certification, dated July 26, 2011.
2. Prior to initiating construction in waters of the U.S., the Permittee shall submit to the Corps Regulatory Division a complete set of final detailed grading/construction plans showing all work and structures in waters of the U.S. All plans shall be in compliance with the Final Map and Drawing Standards for the Los Angeles District Regulatory Division dated September 21, 2009 (http://www.spl.usace.army.mil/regulatory/pn/SPL-RG_map-drawing-standard_final_w-fig.pdf). All plan sheets shall be signed, dated, and submitted on paper no larger than 8.5x 11 inches. No work in waters of the U.S. is authorized until the Permittee receives, in writing (by letter or e-mail), Corps Regulatory Division approval of the final detailed grading/construction plans. The Permittee shall ensure that the project is built in accordance with the Corps-approved plans.
3. Within 45 calendar days of completing authorized work in waters of the U.S., the Permittee shall submit to the Corps a memo including the following:
 - a. Date(s) work within waters of the U.S. was initiated and completed;
 - b. Summary of compliance status with each special condition of this permit (including any noncompliance that previously occurred or is currently occurring and corrective actions completed or being taken to achieve compliance);
 - c. Color photographs taken at the project site before and after construction for those aspects directly associated with impacts to waters of the U.S.; and
 - d. One copy of as-built drawings for the impacted waters of the U.S.(all sheets must be signed, dated, to-scale, and no larger than 8.5 x 11 inches).
 - e. Signed Certification of Compliance.

Cultural Resources:

4. Pursuant to 36 C.F.R. section 800.13, in the event of any discoveries during construction of either human remains, archeological deposits, or any other type of historic property, the Permittee shall notify the Corps' Regulatory Division and Archeology Staff (Steve Dibble at 213-452-3849 or John Killeen at 213-452-3861) within 24 hours. The Permittee shall immediately suspend all work within 100 feet of any area(s) where potential cultural resources are discovered. The Permittee shall not resume construction in the

area surrounding the potential cultural resources until the Corps Regulatory Division re-authorizes project construction, per 36 C.F.R. section 800.13.

This verification is valid until the NWP is modified, reissued, or revoked. All of the existing NWPs are scheduled to be modified, reissued, or revoked prior to March 18, 2012. It is incumbent upon you to remain informed of changes to the NWPs. We will issue a public notice when the NWPs are reissued. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant nationwide permit is modified or revoked, you will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this nationwide permit.

A nationwide permit does not grant any property rights or exclusive privileges. Also, it does not authorize any injury to the property or rights of others or authorize interference with any existing or proposed Federal project. Furthermore, it does not obviate the need to obtain other Federal, state, or local authorizations required by law.

Thank you for participating in our regulatory program. If you have any questions, please contact Veronica Chan at 213-452-3292 or via e-mail at Veronica.C.Chan@usace.army.mil.

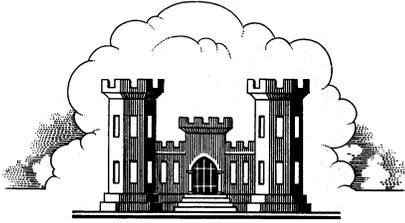
Please be advised that you can now comment on your experience with Regulatory Division by accessing the Corps web-based customer survey form at: <http://per2.nwp.usace.army.mil/survey.html>.

Sincerely,



Mark D. Cohen
Deputy Chief, Regulatory Division

Enclosure



LOS ANGELES DISTRICT
U.S. ARMY CORPS OF ENGINEERS

CERTIFICATION OF COMPLIANCE WITH
DEPARTMENT OF THE ARMY NATIONWIDE PERMIT

Permit Number: *SPL-2011-01164-VCC*

Name of Permittee: *San Bernardino Associated Governments, Garry Cohoe*

Date of Issuance: *February 14, 2012*

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:

U.S Army Corps of Engineers
Regulatory Division
ATTN: CESPL-RG-SPL-2010-00067-VCC
P.O. Box 532711
Los Angeles, CA 90017-3401

Please note that your permitted activity is subject to a compliance inspection by an Army Corps of Engineers representative. If you fail to comply with this nationwide permit you may be subject to permit suspension, modification, or revocation procedures as contained in 33 CFR section 330.5 or enforcement procedures such as those contained in 33 CFR sections 326.4 and 326.5.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation was completed in accordance with the permit condition(s).

Signature of Permittee

Date

Enclosure 1: NATIONWIDE PERMIT NUMBER(S) NWP 14 Linear Transportation Projects. TERMS AND CONDITIONS

1. Nationwide Permit(s) NWP 14 Linear Transportation Projects. Terms:

Your activity is authorized under Nationwide Permit Number(s) NWP 14 Linear Transportation Projects. subject to the following terms:

14. Linear Transportation Projects. Activities required for the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways, and taxiways) in waters of the United States. For linear transportation projects in non-tidal waters, the discharge cannot cause the loss of greater than 1/2-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge cannot cause the loss of greater than 1/3-acre of waters of the United States. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project. This NWP also authorizes temporary structures, fills, and work necessary to construct the linear transportation project. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate. This NWP cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars. Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) the loss of waters of the United States exceeds 1/10 acre; or (2) there is a discharge in a special aquatic site, including wetlands. (See general condition 27.) (Sections 10 and 404) Note: Some discharges for the construction of farm roads or forest roads, or temporary roads for moving mining equipment, may qualify for an exemption under Section 404(f) of the Clean Water Act (see 33 CFR 323.4).

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as appropriate, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP.

2. Nationwide Permit General Conditions:

The following general conditions must be followed in order for any authorization by an NWP to be valid:

1. *Navigation.*
 - (a) No activity may cause more than a minimal adverse effect on navigation.
 - (b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.
 - (c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.
2. *Aquatic Life Movements.* No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.
3. *Spawning Areas.* Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. *Migratory Bird Breeding Areas.* Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.
5. *Shellfish Beds.* No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48.
6. *Suitable Material.* No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).
7. *Water Supply Intakes.* No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.
8. *Adverse Effects From Impoundments.* If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.
9. *Management of Water Flows.* To the maximum extent practicable, the preconstruction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the preconstruction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).
10. *Fills Within 100-Year Floodplains.* The activity must comply with applicable FEMA-approved state or local floodplain management requirements.
11. *Equipment.* Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.
12. *Soil Erosion and Sediment Controls.* Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.
13. *Removal of Temporary Fills.* Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.
14. *Proper Maintenance.* Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety.
15. *Wild and Scenic Rivers.* No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).
16. *Tribal Rights.* No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.
17. *Endangered Species.*
 - (a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed.
 - (b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees

must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements.

(c) Non-federal permittees shall notify the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have "no effect" on listed species or critical habitat, or until Section 7 consultation has been completed.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific regional endangered species conditions to the NHPs. (e) Authorization of an activity by a NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. FWS or the NMFS, both lethal and non-lethal "takes" of protected species are in violation of the ESA. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. FWS and NMFS or their world wide Web pages at <http://www.fws.gov/> and <http://www.noaa.gov/fisheries.html> respectively.

18. *Historic Properties.*

(a) In cases where the district engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the preconstruction notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State Historic Preservation Officer or Tribal Historic Preservation Officer, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties which the activity may have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA has been completed.

(d) The district engineer will notify the prospective permittee within 45 days of receipt of a complete preconstruction notification whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). If NHPA section 106 consultation is required and will occur, the district engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed.

(e) Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect

created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, explaining the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

19. *Designated Critical Resource Waters.* Critical resource waters include: NOAA-designated marine sanctuaries, National Estuarine Research Reserves, state natural heritage sites, and outstanding national resource waters or other waters officially designated by a state as having particular environmental or ecological significance and identified by the district engineer after notice and opportunity for public comment. The district engineer may also designate additional critical resource waters after notice and opportunity for comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWP 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, and 50 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWP 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with general condition 27, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

20. *Mitigation.* The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10 acre and require preconstruction notification, unless the district engineer determines in writing that some other form of mitigation would be more environmentally appropriate and provides a project-specific waiver of this requirement. For wetland losses of 1/10 acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment. Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, wetland restoration should be the first compensatory mitigation option considered.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream restoration, to ensure that the activity results in minimal adverse effects on the aquatic environment.

(e) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2 acre, it cannot be used to authorize any project resulting in the loss of greater than 1/2 acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NWPs.

(f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(g) Permittees may propose the use of mitigation banks, in-lieu fee arrangements or separate activity-specific compensatory mitigation. In all cases, the mitigation provisions will specify the party responsible for accomplishing and/or complying with the mitigation plan.

(h) Where certain functions and services of waters of the United States are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

21. *Water Quality.* Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.
22. *Coastal Zone Management.* In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.
23. *Regional and Case-By-Case Conditions.* The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.
24. *Use of Multiple Nationwide Permits.* The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.
25. *Transfer of Nationwide Permit Verifications.* If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

“When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.”

(Transferee)

(Date)

26. *Compliance Certification.* Each permittee who received an NWP verification from the Corps must submit a signed certification regarding the completed work and any required mitigation. The certification form must be forwarded by the Corps with the NWP verification letter and will include:
 - (a) A statement that the authorized work was done in accordance with the NWP authorization, including any general or specific conditions;
 - (b) A statement that any required mitigation was completed in accordance with the permit conditions; and
 - (c) The signature of the permittee certifying the completion of the work and mitigation.
27. *Pre-Construction Notification.*

(a) *Timing.* Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is

complete within 30 calendar days of the date of receipt and, as a general rule, will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity:

- (1) Until notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or
- (2) If 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 17 that listed species or critical habitat might be affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 18 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation (see 33 CFR 330.4(g)) is completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee cannot begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) *Contents of Pre-Construction Notification:* The PCN must be in writing and include the following information:

- (1) Name, address and telephone numbers of the prospective permittee;
- (2) Location of the proposed project;
- (3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided result in a quicker decision.);
- (4) The PCN must include a delineation of special aquatic sites and other waters of the United States on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters of the United States, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, where appropriate;
- (5) If the proposed activity will result in the loss of greater than 1/10 acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan;
- (6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and
- (7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

(c) *Form of Pre-Construction Notification:* The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

(d) *Agency Coordination:*

- (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed

activity's compliance with the terms and conditions of the NWP and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

- (2) For all NWP 48 activities requiring pre-construction notification and for other NWP activities requiring preconstruction notification to the district engineer that result in the loss of greater than 1/2-acre of waters of the United States, the district engineer will immediately provide (e.g., via facsimile transmission, overnight mail, or other expeditious manner) a copy of the PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will then have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the preconstruction notification. The district engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each preconstruction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.
- (3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.
- (4) Applicants are encouraged to provide the Corps multiple copies of pre-construction notifications to expedite agency coordination.
- (5) For NWP 48 activities that require reporting, the district engineer will provide a copy of each report within 10 calendar days of receipt to the appropriate regional office of the NMFS.

(e) *District Engineer's Decision:* In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If the proposed activity requires a PCN and will result in a loss of greater than 1/10 acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for projects with smaller impacts. The district engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, after considering mitigation, the district engineer will notify the permittee and include any conditions the district engineer deems necessary. The district engineer must approve any compensatory mitigation proposal before the permittee commences work. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the district engineer to be minimal, the district engineer will provide a timely written response to the applicant. The response will state that the project can proceed under the terms and conditions of the NWP.

If the district engineer determines that the adverse effects of the proposed work are more than minimal, then the district engineer will notify the applicant either:

- (1) That the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit;
- (2) that the project is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level; or
- (3) that the project is authorized under the NWP with specific modifications or conditions.

Where the district engineer determines that mitigation is required to ensure no more than minimal adverse effects occur to the aquatic environment, the activity will be authorized within the 45-day PCN period. The authorization will include the necessary conceptual or specific mitigation or a requirement that the applicant submit a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level. When mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan.

28. *Single and Complete Project.* The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

3. Regional Conditions for the Los Angeles District:

In accordance with General Condition Number 23, "Regional and Case-by-Case Conditions," the following Regional Conditions, as added by the Division Engineer, must be met in order for an authorization by any Nationwide to be valid:

1. For coastal watersheds from the southern reach of the Santa Monica Mountains in Los Angeles County to the San Luis Obispo County/Monterey County boundary, all road crossings must employ a bridge crossing design that ensures passage and/or spawning of steelhead (*Oncorhynchus mykiss*) is not hindered in any way. In these areas, bridge designs that span the stream or river, including designs for pier- or pile-supported spans, or designs based on use of a bottomless arch culvert simulating the natural stream bed (i.e., substrate and streamflow conditions in the culvert are similar to undisturbed stream bed channel conditions) shall be employed unless it can be demonstrated the stream or river does not support resources conducive to the recovery of federally listed anadromous salmonids, including migration of adults and smolts, or rearing and spawning. This proposal also excludes approach embankments into the channel unless they are determined to have no detectable effect on steelhead.
2. For the State of Arizona and the Mojave and Sonoran (Colorado) desert regions of California in Los Angeles District (generally north and east of the San Gabriel, San Bernardino, San Jacinto, and Santa Rosa mountain ranges, and south of Little Lake, Inyo County), no nationwide permit, except Nationwide Permits 1 (Aids to Navigation), 2 (Structures in Artificial Canals), 3 (Maintenance), 4 (Fish and Wildlife Harvesting, Enhancement, and Attraction Devices and Activities), 5 (Scientific Measurement Devices), 6 (Survey Activities), 9 (Structures in Fleeting and Anchorage Areas), 10 (Mooring Buoys), 11 (Temporary Recreational Structures), 20 (Oil Spill Cleanup), 22 (Removal of Vessels), 27 (Stream and Wetland Restoration Activities), 30 (Moist Soil Management for Wildlife), 31 (Maintenance of Existing Flood Control Projects), 32 (Completed Enforcement Actions), 35 (Maintenance Dredging of Existing Basins), 37 (Emergency Watershed Protection and Rehabilitation), 38 (Cleanup of Hazardous and Toxic Waste) and 47 (Pipeline Safety Program Designated Time Sensitive Inspections and Repairs), or other nationwide or regional general permits that specifically authorize maintenance of previously authorized structures or fill, can be used to authorize the discharge of dredged or fill material into a jurisdictional special aquatic site as defined at 40 CFR Part 230.40-45 (sanctuaries and refuges, wetlands, mudflats, vegetated shallows, coral reefs, and riffle-and-pool complexes).
3. For all projects proposed for authorization by nationwide or regional general permits where prior notification to the district engineer is required, applicants must provide color photographs or color photocopies of the project area taken from representative points documented on a site map. Pre-project photographs and the site map would be provided with the permit application. Photographs should represent conditions typical or indicative of the resources before impacts.
4. Notification pursuant to general condition 27 shall be required for projects in all special aquatic sites as defined at 40 CFR Part 230.40-45 (sanctuaries and refuges, wetlands, mudflats, vegetated shallows, coral reefs, and riffle-and-pool complexes), and in all perennial waterbodies in the State of Arizona and the Mojave and Sonoran (Colorado) desert regions of California in Los Angeles District (generally north and east of the San Gabriel, San Bernardino, San Jacinto, and Santa Rosa mountain ranges, and south of Little Lake, Inyo County), excluding the Colorado River from Davis Dam downstream to the north end of Topock and downstream of Imperial Dam (Federal Register dated March 12, 2007 (72 FR 11092) - regional conditions requiring notification do not apply to Nationwide Permit 47).
5. Notification pursuant to general condition 27 shall be required for projects in all areas designated as Essential Fish Habitat by the Pacific Fishery Management Council (i.e., all tidally influenced areas - Federal Register dated March 12, 2007 (72 FR 11092), regional conditions requiring notification do not apply to Nationwide Permit 47).
6. Notification pursuant to general condition 27 shall be required for projects in all watersheds in the Santa Monica Mountains in Los Angeles and Ventura counties bounded by Calleguas Creek on the west, by Highway 101 on the north and east, and by Sunset Boulevard and Pacific Ocean on the south (Federal Register dated March 12, 2007 (72 FR 11092) - regional conditions requiring notification do not apply to Nationwide Permit 47).
7. Individual permits shall be required for all discharges of fill material in jurisdictional vernal pools.

8. Individual permits shall be required in Murrieta Creek and Temecula Creek watersheds in Riverside County for new permanent fills in perennial and intermittent watercourses otherwise authorized under NWP's 29, 39, 42 and 43, and in ephemeral watercourses for these NWP's for projects that impact greater than 0.1 acre of waters of the United States. In addition, when NWP 14 is used in conjunction with residential, commercial, or industrial developments the 0.1 acre limit would also apply.
9. Individual permits shall be required in San Luis Obispo Creek and Santa Rosa Creek in San Luis Obispo County for bank stabilization projects, and in Gaviota Creek, Mission Creek and Carpinteria Creek in Santa Barbara County for bank stabilization projects and grade control structures.
10. Notification pursuant to general condition 27 shall be required for projects in the Santa Clara River watershed in Los Angeles and Ventura counties, including but not limited to Aliso Canyon, Agua Dulce Canyon, Sand Canyon, Bouquet Canyon, Mint Canyon, South Fork of the Santa Clara River, San Francisquito Canyon, Castaic Creek, Piru Creek, Sespe Creek and the mainstem of the Santa Clara River (Federal Register dated March 12, 2007 (72 FR 11092) - regional conditions requiring notification do not apply to Nationwide Permit 47).

4. Further information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:
 - () Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).
 - (X) Section 404 of the Clean Water Act (33 U.S.C. 1344).
 - () Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).
2. Limits of this authorization.
 - (a) This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.
 - (b) This permit does not grant any property rights or exclusive privileges.
 - (c) This permit does not authorize any injury to the property or rights of others.
 - (d) This permit does not authorize interference with any existing or proposed Federal project.
3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:
 - (a) Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
 - (b) Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
 - (c) Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
 - (d) Design or construction deficiencies associated with the permitted work.
 - (e) Damage claims associated with any future modification, suspension, or revocation of this permit.
4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.
5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:
 - (a) You fail to comply with the terms and conditions of this permit.
 - (b) The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).
 - (c) Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 330.5 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measure ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you

for the cost.

6. This letter of verification is valid for a period not to exceed two years unless the nationwide permit is modified, reissued, revoked, or expires before that time.
7. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition H below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
8. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished with the terms and conditions of your permit.



VCS Environmental
 Map Created:
 January 5, 2012



0 37.5 75 150 225 300 Feet
 1 inch = 75 feet

**I-215/NEWPORT AVENUE OVERCROSSING BRIDGE REPLACEMENT
 PROJECT JURISDICTIONAL IMPACTS MAP**

FIGURE 1



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS LOS ANGELES DISTRICT
P.O. Box 532711
Los Angeles, CA 90017-3401

RECEIVED
APR -2 2012
SAN BERNARDINO
ASSOCIATED GOVTS

March 26, 2012

REPLY TO
ATTENTION OF:

Regulatory Division

DEPARTMENT OF THE ARMY NATIONWIDE PERMIT AUTHORIZATION

Mathew P. Smith
San Bernardino Associated Governments
1170 West 3rd Street
San Bernardino, California 92410

Dear Mr. Smith:

This correspondence is in reply to your letter (File No. SPL-2011-00550-VCC), dated March 16, 2012, regarding a Department of the Army Permit to discharge permanent fill into approximately 0.364 acre and temporary fill into approximately 2.703 acres of waters of the U.S., in association with the Interstate 215 Bi-County High Occupancy Vehicle Lane Project. The proposed work would take place in Santa Ana River and several of its tributaries within and near the city of San Bernardino, San Bernardino County, California. This verification of authorization supersedes the verification letter dated January 31, 2012.

Based on the information you have provided, the Corps of Engineers has determined that your proposed activity complies with the enclosed terms and conditions of Nationwide Permit (NWP) No. 14 Linear Transportation Projects, as described in enclosure 1.

Specifically, you are authorized to:

1. Discharge permanent fill material into approximately 0.182 acre (164 linear feet) of non-wetland waters of the U.S. and 0.182 acre (90 linear feet) of wetland waters of the U.S. and discharge temporary fill material for construction and equipment access into approximately 2.49 acre (1,741 linear feet) of non-wetland waters of the U.S. and 0.213 acre of wetland waters of the U.S. (69 linear feet) at the following drainage features:

- Santa Ana River: Permanent: 0.152 acre of non-wetland waters of the U.S. and

0.179 acre of wetland waters of the U.S.; Temporary: 2.361 acres of non-wetland waters of the U.S. and 0.197 acre of wetland waters of the U.S.

- Grand Terrace Channel: Permanent 0.005 acre of non-wetland waters of the U.S. and 0.003 acre of wetland waters of the U.S.; Temporary: 0.006 acre of non-wetland waters of the U.S. and 0.006 acre of wetland waters of the U.S.
- Cooley Road Channel: Permanent 0.014 acre of non-wetland waters of the U.S.;
- Unnamed Drainage 7a: Temporary: 0.006 acre of non-wetland waters of the U.S.;
- Unnamed Drainage 7b: Permanent: 0.002 acre of non-wetland waters of the U.S.; Temporary: 0.002 acre of non-wetland waters of the U.S.
- Reche Canyon Channel: Temporary: 0.023 acre of non-wetland waters of the U.S.;
- Unnamed Drainage 10b: Temporary: 0.001 acre of non-wetland waters of the U.S.
- Unnamed Drainage 11a: Permanent: 0.004 acre of non-wetland waters of the U.S.; Temporary: 0.002 acre of non-wetland waters of the U.S.
- Unnamed Drainage 11b: Temporary: 0.01 acre of wetland waters of the U.S.
- Unnamed Drainage 15b: Temporary: 0.037 acre of non-wetland waters of the U.S.
- Unnamed Drainage 16: Temporary: 0.001 acre of non-wetland waters of the U.S.
- Riverside Canal: Permanent: 0.005 acre of non-wetland waters of the U.S.; Temporary: 0.049 acre of non-wetland waters of the U.S.

Furthermore, you must comply with the following non-discretionary Special Conditions:

1. The Permittee shall abide by the terms and conditions of the Clean Water Act (CWA) section 401 Water Quality Standards Certification, dated July 26, 2011.
2. Prior to initiating construction in waters of the U.S., the Permittee shall submit to the Corps Regulatory Division a complete set of final detailed grading/construction plans showing all work and structures in waters of the U.S. All plans shall be in compliance with the Final Map and Drawing Standards for the Los Angeles District Regulatory Division dated September 21, 2009 (http://www.spl.usace.army.mil/regulatory/pn/SPL-RG_map-drawing-standard_final_w-fig.pdf). All plan sheets shall be signed, dated, and submitted on paper no larger than 8.5x 11 inches. No work in waters of the U.S. is authorized until the Permittee receives, in writing (by letter or e-mail), Corps Regulatory Division approval of the final detailed grading/construction plans. The Permittee shall ensure that the project is built in accordance with the Corps-approved plans.
3. The Permittee shall clearly mark the limits of the workspace with flagging or similar means to ensure mechanized equipment does not enter avoided waters of the U.S. and riparian wetland/habitat areas shown on Figure 1. Adverse impacts to waters of the U.S. beyond the Corps-approved construction footprint are not authorized. Such

impacts could result in permit suspension and revocation, administrative, civil or criminal penalties, and/or substantial, additional, compensatory mitigation requirements.

4. Upon project completion, temporary fills shall be removed and the stream shall be re-contoured to pre-construction conditions to the maximum extent practicable. In addition, the Permittee shall hydroseed, where possible, the disturbed portions of the earthen stream banks with native, non-invasive vegetation of facultative upland (FACU) or wetter species, as appropriate, to reduce the potential for erosion. The Permittee shall submit the proposed planting palette for review and approval by the Corps prior to initiation of construction. The Permittee shall ensure the hydroseeded areas are maintained and monitored for a period of two years after completing the seeding activities, such that less than 15 percent of the areas disturbed by the project are vegetated by non-natives and invasive plant species. Monitoring reports shall be submitted by the Permittee to the Corps by May 15th one year and two years following hydroseeding, documenting the recovery of the restored areas.
5. Within 45 calendar days of completing authorized work in waters of the U.S., the Permittee shall submit to the Corps a memo including the following:
 - a. Date(s) work within waters of the U.S. was initiated and completed;
 - b. Summary of compliance status with each special condition of this permit (including any noncompliance that previously occurred or is currently occurring and corrective actions completed or being taken to achieve compliance);
 - c. Color photographs taken at the project site before and after construction for those aspects directly associated with impacts to waters of the U.S.; and
 - d. One copy of as-built drawings for the entire project, including all on-site re-contoured and hydroseeded sites (all sheets must be signed, dated, to-scale, and no larger than 8.5 x 11 inches).
 - e. Signed Certification of Compliance.
6. Prior to initiating construction in waters of the U.S., and to mitigate for permanent impacts to 0.182 acre of non-wetland and 0.182 acre of wetland waters of the U.S. and for temporary impacts to 0.213 acre of wetland waters of the U.S., the Permittee shall provide documentation verifying purchase of 0.36 acres of credits for the enhancement of non-wetland waters of the U.S. and 0.94 acre of credits for enhancement of wetland waters of the U.S. from a Corps-approved in-lieu fee program (ILFP), Santa Ana River Watershed Trust Fund for Arundo Eradication and Habitat Enhancement (Fund). The Permittee shall not initiate work in waters of the U.S. prior to receiving written confirmation (by letter or e-mail) from the Corps Regulatory Division as to compliance with this special condition. The Permittee retains responsibility for providing the compensatory mitigation until the number and resource type of credits described

above have been secured from a sponsor and the Corps Regulatory Division has received documentation that confirms that the sponsor has accepted the responsibility for providing the required compensatory mitigation. This documentation may consist of a letter or form signed by the sponsor, with the permit number and a statement indicating the required number and resource type of credits that have been secured from the sponsor.

7. Prior to initiating construction in waters of the U.S., the Permittee shall submit to the Corps Regulatory Division the approved section 408 authorization or "no objection" letter from the Corps Engineering or Asset Management Divisions. Section 14 of the Rivers and Harbors Act (33 U.S.C. section 408) provides that the Secretary of the Army, on recommendation of the Chief of Engineers, may grant permission for the temporary occupation or use of or alterations/modifications to projects built by the USACE. Approval authority has been delegated to the Assistant Secretary of the Army (Civil Works). Permission under 33 U.S.C. section 408 is subject to the availability of funding and requires USACE District, Division, and Headquarters (HQUSACE) level reviews before a recommendation can be sent to the ASA(CW) or its delegated representative. A real estate instrument issued by a USACE District, Asset Management Division, may be necessary if the project is sited on federal lands under USACE administrative control. If the section 408 approval is elevated to HQUSACE (i.e., major 408), this verification letter is no longer valid. If section 408 approval by the District's Asset Management Division requires project changes that increase impacts to waters of the U.S., Corps Regulatory Division will evaluate the changes to determine whether this verification letter remains valid. A notice to proceed from the Corps Regulatory Division will be needed before work in waters of the U.S. begins.

Endangered Species Act:

8. This Corps permit does not authorize you to take any threatened or endangered species, in particular the southwestern willow flycatcher (*Empidonax traillii extimus*), least Bell's vireo (*Vireo bellii pusillus*), Santa Ana sucker (*Catostomus santannae*) and San Bernardino kangaroo rat (*Dipodomys merriami parvus*) or adversely modify its designated critical habitat. In order to legally take a listed species, you must have separate authorization under the Endangered Species Act (ESA) (e.g. ESA Section 10 permit, or a Biological Opinion (BO) under ESA Section 7, with "incidental take" provisions with which you must comply). Pursuant to the US Fish and Wildlife Service (USFWS) correspondence dated March 8, 2011, including the required avoidance and minimization measures, the Corps Regulatory Division has determined and the USFWS has concurred that your activity is not likely to adversely affect the above species. Your authorization under this Corps permit is conditional upon your

compliance with all of the required avoidance and minimization measures, which are incorporated by reference in this permit. Failure to comply with the required avoidance and minimization measures would constitute non-compliance with your Corps permit. The Corps and USFWS are the appropriate authority to determine compliance with the terms and conditions of its BO and with the ESA.

Cultural Resources:

9. Pursuant to 36 C.F.R. section 800.13, in the event of any discoveries during construction of either human remains, archeological deposits, or any other type of historic property, the Permittee shall notify the Corps' Regulatory Division and Archeology Staff (Steve Dibble at 213-452-3849 or John Killeen at 213-452-3861) within 24 hours. The Permittee shall immediately suspend all work within 100 feet of any area(s) where potential cultural resources are discovered. The Permittee shall not resume construction in the area surrounding the potential cultural resources until the Corps Regulatory Division re-authorizes project construction, per 36 C.F.R. section 800.13.

Your verification is valid through March 23, 2014. All nationwide permits will expire on March 18, 2017. It is incumbent upon you to remain informed of changes to the nationwide permits. A public notice of the change(s) will be issued when any of the NWP's are modified, reissued, or revoked. Furthermore, if you commence or are under contract to commence this activity before the date on which the relevant NWP is reissued, modified, or revoked, you will have twelve (12) months from the date of the reissuance, modification, or revocation of the NWP to complete the activity under the present terms and conditions of the relevant NWP.

A nationwide permit does not grant any property rights or exclusive privileges. Also, it does not authorize any injury to the property or rights of others or authorize interference with any existing or proposed Federal project. Furthermore, it does not obviate the need to obtain other Federal, state, or local authorizations required by law.

Thank you for participating in our regulatory program. If you have any questions, please contact Veronica Chan at 213-452-3292 or via e-mail at Veronica.C.Chan@usace.army.mil.

Please be advised that you can now comment on your experience with Regulatory Division by accessing the Corps web-based customer survey form at: <http://per2.nwp.usace.army.mil/survey.html>.

“Building Strong and Taking Care of People!”

Sincerely,

A handwritten signature in cursive script, appearing to read "Mark D. Cohen".

Mark D. Cohen
Deputy Chief, Regulatory Division

Enclosure



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS LOS ANGELES DISTRICT
P.O. Box 532711
Los Angeles, CA 90017-3401

January 31, 2012

REPLY TO
ATTENTION OF:

Regulatory Division

DEPARTMENT OF THE ARMY NATIONWIDE PERMIT AUTHORIZATION

Mathew P. Smith
San Bernardino Associated Governments
1170 West 3rd Street
San Bernardino, California 92410

Dear Mr. Smith:

This correspondence is in reply to your application (File No. SPL-2011-00550-VCC), dated May 12, 2011, for a Department of the Army Permit to discharge permanent fill into approximately 0.364 acre and temporary fill into approximately 2.703 acres of waters of the U.S., in association with the Interstate 215 Bi-County High Occupancy Vehicle Lane Project. The proposed work would take place in Santa Ana River and several of its tributaries within and near the city of San Bernardino, San Bernardino County, California.

Based on the information you have provided, the Corps of Engineers has determined that your proposed activity complies with the enclosed terms and conditions of Nationwide Permit (NWP) No. 14 Linear Transportation Projects, as described in enclosure 1.

Specifically, you are authorized to:

1. Discharge permanent fill material into approximately 0.182 acre (164 linear feet) of non-wetland waters of the U.S. and 0.182 acre (90 linear feet) of wetland waters of the U.S. and discharge temporary fill material for construction and equipment access into approximately 2.49 acre (1,741 linear feet) of non-wetland waters of the U.S. and 0.213 acre of wetland waters of the U.S. (69 linear feet) at the following drainage features:
 - Santa Ana River: Permanent: 0.152 acre of non-wetland waters of the U.S. and 0.179 acre of wetland waters of the U.S.; Temporary: 2.361 acres of non-wetland

- waters of the U.S. and 0.197 acre of wetland waters of the U.S.
- Grand Terrace Channel: Permanent 0.005 acre of non-wetland waters of the U.S. and 0.003 acre of wetland waters of the U.S.; Temporary: 0.006 acre of non-wetland waters of the U.S. and 0.006 acre of wetland waters of the U.S.
 - Cooley Road Channel: Permanent 0.014 acre of non-wetland waters of the U.S.;
 - Unnamed Drainage 7a: Temporary: 0.006 acre of non-wetland waters of the U.S.;
 - Unnamed Drainage 7b: Permanent: 0.002 acre of non-wetland waters of the U.S.; Temporary: 0.002 acre of non-wetland waters of the U.S.
 - Reche Canyon Channel: Temporary: 0.023 acre of non-wetland waters of the U.S.;
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 - Riverside Canal: Permanent: 0.005 acre of non-wetland waters of the U.S.; Temporary: 0.049 acre of non-wetland waters of the U.S.

Furthermore, you must comply with the following non-discretionary Special Conditions:

1. The Permittee shall abide by the terms and conditions of the Clean Water Act (CWA) section 401 Water Quality Standards Certification, dated July 26, 2011.
2. Prior to initiating construction in waters of the U.S., the Permittee shall submit to the Corps Regulatory Division a complete set of final detailed grading/construction plans showing all work and structures in waters of the U.S. All plans shall be in compliance with the Final Map and Drawing Standards for the Los Angeles District Regulatory Division dated September 21, 2009 (http://www.spl.usace.army.mil/regulatory/pn/SPL-RG_map-drawing-standard_final_w-fig.pdf). All plan sheets shall be signed, dated, and submitted on paper no larger than 8.5x 11 inches. No work in waters of the U.S. is authorized until the Permittee receives, in writing (by letter or e-mail), Corps Regulatory Division approval of the final detailed grading/construction plans. The Permittee shall ensure that the project is built in accordance with the Corps-approved plans.
3. The Permittee shall clearly mark the limits of the workspace with flagging or similar means to ensure mechanized equipment does not enter avoided waters of the U.S. and riparian wetland/habitat areas shown on Figure 1. Adverse impacts to waters of the U.S. beyond the Corps-approved construction footprint are not authorized. Such impacts could result in permit suspension and revocation, administrative, civil or

criminal penalties, and/or substantial, additional, compensatory mitigation requirements.

4. Upon project completion, temporary fills shall be removed and the stream shall be re-contoured to pre-construction conditions to the maximum extent practicable. In addition, the Permittee shall hydroseed, where possible, the disturbed portions of the earthen stream banks with native, non-invasive vegetation of facultative upland (FACU) or wetter species, as appropriate, to reduce the potential for erosion. The Permittee shall submit the proposed planting palette for review and approval by the Corps prior to initiation of construction. The Permittee shall ensure the hydroseeded areas are maintained and monitored for a period of two years after completing the seeding activities, such that less than 15 percent of the areas disturbed by the project are vegetated by non-natives and invasive plant species. Monitoring reports shall be submitted by the Permittee to the Corps by May 15th one year and two years following hydroseeding, documenting the recovery of the restored areas.
5. Within 45 calendar days of completing authorized work in waters of the U.S., the Permittee shall submit to the Corps a memo including the following:
 - a. Date(s) work within waters of the U.S. was initiated and completed;
 - b. Summary of compliance status with each special condition of this permit (including any noncompliance that previously occurred or is currently occurring and corrective actions completed or being taken to achieve compliance);
 - c. Color photographs taken at the project site before and after construction for those aspects directly associated with impacts to waters of the U.S.; and
 - d. One copy of as-built drawings for the entire project, including all on-site re-contoured and hydroseeded sites (all sheets must be signed, dated, to-scale, and no larger than 8.5 x 11 inches).
 - e. Signed Certification of Compliance.
6. Prior to initiating construction in waters of the U.S., and to mitigate for permanent impacts to 0.182 acre of non-wetland and 0.182 acre of wetland waters of the U.S. and for temporary impacts to 0.213 acre of wetland waters of the U.S., the Permittee shall provide documentation verifying purchase of 0.36 acres of credits for the enhancement of non-wetland waters of the U.S. and 0.94 acre of credits for enhancement of wetland waters of the U.S. from a Corps-approved in-lieu fee program (ILFP), Santa Ana River Watershed Trust Fund for Arundo Eradication and Habitat Enhancement (Fund). The Permittee shall not initiate work in waters of the U.S. prior to receiving written confirmation (by letter or e-mail) from the Corps Regulatory Division as to compliance with this special condition. The Permittee retains responsibility for providing the compensatory mitigation until the number and resource type of credits described above have been secured from a sponsor and the Corps Regulatory Division has

received documentation that confirms that the sponsor has accepted the responsibility for providing the required compensatory mitigation. This documentation may consist of a letter or form signed by the sponsor, with the permit number and a statement indicating the required number and resource type of credits that have been secured from the sponsor.

7. Prior to initiating construction in waters of the U.S., the Permittee shall submit to the Corps Regulatory Division the approved section 408 authorization or "no objection" letter from the Corps Engineering or Asset Management Divisions. Section 14 of the Rivers and Harbors Act (33 U.S.C. section 408) provides that the Secretary of the Army, on recommendation of the Chief of Engineers, may grant permission for the temporary occupation or use of or alterations/modifications to projects built by the USACE. Approval authority has been delegated to the Assistant Secretary of the Army (Civil Works). Permission under 33 U.S.C. section 408 is subject to the availability of funding and requires USACE District, Division, and Headquarters (HQUSACE) level reviews before a recommendation can be sent to the ASA(CW) or its delegated representative. A real estate instrument issued by a USACE District, Asset Management Division, may be necessary if the project is sited on federal lands under USACE administrative control. If the section 408 approval is elevated to HQUSACE (i.e., major 408), this verification letter is no longer valid. If section 408 approval by the District's Asset Management Division requires project changes that increase impacts to waters of the U.S., Corps Regulatory Division will evaluate the changes to determine whether this verification letter remains valid. A notice to proceed from the Corps Regulatory Division will be needed before work in waters of the U.S. begins.

Endangered Species Act:

8. This Corps permit does not authorize you to take any threatened or endangered species, in particular the southwestern willow flycatcher (*Empidonax traillii extimus*), least Bell's vireo (*Vireo bellii pusillus*), Santa Ana sucker (*Catostomus santanae*) and San Bernardino kangaroo rat (*Dipodomys merriami parvus*) or adversely modify its designated critical habitat. In order to legally take a listed species, you must have separate authorization under the Endangered Species Act (ESA) (e.g. ESA Section 10 permit, or a Biological Opinion (BO) under ESA Section 7, with "incidental take" provisions with which you must comply). Pursuant to the US Fish and Wildlife Service (USFWS) correspondence dated March 8, 2011, including the required avoidance and minimization measures, the Corps Regulatory Division has determined and the USFWS has concurred that your activity is not likely to adversely affect the above species. Your authorization under this Corps permit is conditional upon your compliance with all of the required avoidance and minimization measures, which are

incorporated by reference in this permit. Failure to comply with the required avoidance and minimization measures would constitute non-compliance with your Corps permit. The Corps and USFWS are the appropriate authority to determine compliance with the terms and conditions of its BO and with the ESA.

Cultural Resources:

9. Pursuant to 36 C.F.R. section 800.13, in the event of any discoveries during construction of either human remains, archeological deposits, or any other type of historic property, the Permittee shall notify the Corps' Regulatory Division and Archeology Staff (Steve Dibble at 213-452-3849 or John Killeen at 213-452-3861) within 24 hours. The Permittee shall immediately suspend all work within 100 feet of any area(s) where potential cultural resources are discovered. The Permittee shall not resume construction in the area surrounding the potential cultural resources until the Corps Regulatory Division re-authorizes project construction, per 36 C.F.R. section 800.13.

This verification is valid until the NWP is modified, reissued, or revoked. All of the existing NWPs are scheduled to be modified, reissued, or revoked prior to March 18, 2012. It is incumbent upon you to remain informed of changes to the NWPs. We will issue a public notice when the NWPs are reissued. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant nationwide permit is modified or revoked, you will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this nationwide permit.

A nationwide permit does not grant any property rights or exclusive privileges. Also, it does not authorize any injury to the property or rights of others or authorize interference with any existing or proposed Federal project. Furthermore, it does not obviate the need to obtain other Federal, state, or local authorizations required by law.

Thank you for participating in our regulatory program. If you have any questions, please contact Veronica Chan at 213-452-3292 or via e-mail at Veronica.C.Chan@usace.army.mil.

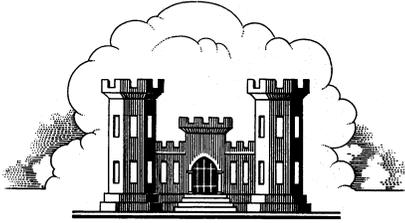
Please be advised that you can now comment on your experience with Regulatory Division by accessing the Corps web-based customer survey form at: <http://per2.nwp.usace.army.mil/survey.html>.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark D. Cohen". The signature is fluid and cursive, with the first name "Mark" being the most prominent.

Mark D. Cohen
Deputy Chief, Regulatory Division

Enclosure



LOS ANGELES DISTRICT
U.S. ARMY CORPS OF ENGINEERS

CERTIFICATION OF COMPLIANCE WITH
DEPARTMENT OF THE ARMY NATIONWIDE PERMIT

Permit Number: *SPL-2011-00550-VCC*

Name of Permittee: *San Bernardino Associated Governments, Mathew P. Smith*

Date of Issuance: *January 31, 2012*

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:

U.S Army Corps of Engineers
Regulatory Division
ATTN: CESPL-RG-SPL-2010-00067-VCC
P.O. Box 532711
Los Angeles, CA 90017-3401

Please note that your permitted activity is subject to a compliance inspection by an Army Corps of Engineers representative. If you fail to comply with this nationwide permit you may be subject to permit suspension, modification, or revocation procedures as contained in 33 CFR section 330.5 or enforcement procedures such as those contained in 33 CFR sections 326.4 and 326.5.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation was completed in accordance with the permit condition(s).

Signature of Permittee

Date

Enclosure 1: NATIONWIDE PERMIT NUMBER(S) NWP 14 Linear Transportation Projects. TERMS AND CONDITIONS

1. Nationwide Permit(s) NWP 14 Linear Transportation Projects. Terms:

Your activity is authorized under Nationwide Permit Number(s) NWP 14 Linear Transportation Projects. subject to the following terms:

14. Linear Transportation Projects. Activities required for the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways, and taxiways) in waters of the United States. For linear transportation projects in non-tidal waters, the discharge cannot cause the loss of greater than 1/2-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge cannot cause the loss of greater than 1/3-acre of waters of the United States. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project. This NWP also authorizes temporary structures, fills, and work necessary to construct the linear transportation project. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate. This NWP cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars. Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) the loss of waters of the United States exceeds 1/10 acre; or (2) there is a discharge in a special aquatic site, including wetlands. (See general condition 27.) (Sections 10 and 404) Note: Some discharges for the construction of farm roads or forest roads, or temporary roads for moving mining equipment, may qualify for an exemption under Section 404(f) of the Clean Water Act (see 33 CFR 323.4).

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as appropriate, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP.

2. Nationwide Permit General Conditions:

The following general conditions must be followed in order for any authorization by an NWP to be valid:

1. *Navigation.*
 - (a) No activity may cause more than a minimal adverse effect on navigation.
 - (b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.
 - (c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.
2. *Aquatic Life Movements.* No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.
3. *Spawning Areas.* Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. *Migratory Bird Breeding Areas.* Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.
5. *Shellfish Beds.* No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48.
6. *Suitable Material.* No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).
7. *Water Supply Intakes.* No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.
8. *Adverse Effects From Impoundments.* If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.
9. *Management of Water Flows.* To the maximum extent practicable, the preconstruction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the preconstruction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).
10. *Fills Within 100-Year Floodplains.* The activity must comply with applicable FEMA-approved state or local floodplain management requirements.
11. *Equipment.* Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.
12. *Soil Erosion and Sediment Controls.* Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.
13. *Removal of Temporary Fills.* Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.
14. *Proper Maintenance.* Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety.
15. *Wild and Scenic Rivers.* No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).
16. *Tribal Rights.* No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.
17. *Endangered Species.*
 - (a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed.
 - (b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees

must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements.

(c) Non-federal permittees shall notify the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have "no effect" on listed species or critical habitat, or until Section 7 consultation has been completed.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific regional endangered species conditions to the NHPs. (e) Authorization of an activity by a NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. FWS or the NMFS, both lethal and non-lethal "takes" of protected species are in violation of the ESA. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. FWS and NMFS or their world wide Web pages at <http://www.fws.gov/> and <http://www.noaa.gov/fisheries.html> respectively.

18. *Historic Properties.*

(a) In cases where the district engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the preconstruction notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State Historic Preservation Officer or Tribal Historic Preservation Officer, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties which the activity may have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA has been completed.

(d) The district engineer will notify the prospective permittee within 45 days of receipt of a complete preconstruction notification whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). If NHPA section 106 consultation is required and will occur, the district engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed.

(e) Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect

created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, explaining the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

19. *Designated Critical Resource Waters.* Critical resource waters include: NOAA-designated marine sanctuaries, National Estuarine Research Reserves, state natural heritage sites, and outstanding national resource waters or other waters officially designated by a state as having particular environmental or ecological significance and identified by the district engineer after notice and opportunity for public comment. The district engineer may also designate additional critical resource waters after notice and opportunity for comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWP 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, and 50 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWP 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with general condition 27, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

20. *Mitigation.* The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10 acre and require preconstruction notification, unless the district engineer determines in writing that some other form of mitigation would be more environmentally appropriate and provides a project-specific waiver of this requirement. For wetland losses of 1/10 acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment. Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, wetland restoration should be the first compensatory mitigation option considered.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream restoration, to ensure that the activity results in minimal adverse effects on the aquatic environment.

(e) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2 acre, it cannot be used to authorize any project resulting in the loss of greater than 1/2 acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NWPs.

(f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(g) Permittees may propose the use of mitigation banks, in-lieu fee arrangements or separate activity-specific compensatory mitigation. In all cases, the mitigation provisions will specify the party responsible for accomplishing and/or complying with the mitigation plan.

(h) Where certain functions and services of waters of the United States are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

21. *Water Quality.* Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.
22. *Coastal Zone Management.* In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.
23. *Regional and Case-By-Case Conditions.* The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.
24. *Use of Multiple Nationwide Permits.* The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.
25. *Transfer of Nationwide Permit Verifications.* If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

“When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.”

(Transferee)

(Date)

26. *Compliance Certification.* Each permittee who received an NWP verification from the Corps must submit a signed certification regarding the completed work and any required mitigation. The certification form must be forwarded by the Corps with the NWP verification letter and will include:
 - (a) A statement that the authorized work was done in accordance with the NWP authorization, including any general or specific conditions;
 - (b) A statement that any required mitigation was completed in accordance with the permit conditions; and
 - (c) The signature of the permittee certifying the completion of the work and mitigation.
27. *Pre-Construction Notification.*

(a) *Timing.* Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is

complete within 30 calendar days of the date of receipt and, as a general rule, will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity:

- (1) Until notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or
- (2) If 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 17 that listed species or critical habitat might be affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 18 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation (see 33 CFR 330.4(g)) is completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee cannot begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) *Contents of Pre-Construction Notification:* The PCN must be in writing and include the following information:

- (1) Name, address and telephone numbers of the prospective permittee;
- (2) Location of the proposed project;
- (3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided result in a quicker decision.);
- (4) The PCN must include a delineation of special aquatic sites and other waters of the United States on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters of the United States, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, where appropriate;
- (5) If the proposed activity will result in the loss of greater than 1/10 acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan;
- (6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and
- (7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

(c) *Form of Pre-Construction Notification:* The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

(d) *Agency Coordination:*

- (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed

activity's compliance with the terms and conditions of the NWP and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

- (2) For all NWP 48 activities requiring pre-construction notification and for other NWP activities requiring preconstruction notification to the district engineer that result in the loss of greater than 1/2-acre of waters of the United States, the district engineer will immediately provide (e.g., via facsimile transmission, overnight mail, or other expeditious manner) a copy of the PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will then have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the preconstruction notification. The district engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each preconstruction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.
- (3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.
- (4) Applicants are encouraged to provide the Corps multiple copies of pre-construction notifications to expedite agency coordination.
- (5) For NWP 48 activities that require reporting, the district engineer will provide a copy of each report within 10 calendar days of receipt to the appropriate regional office of the NMFS.

(e) *District Engineer's Decision:* In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If the proposed activity requires a PCN and will result in a loss of greater than 1/10 acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for projects with smaller impacts. The district engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, after considering mitigation, the district engineer will notify the permittee and include any conditions the district engineer deems necessary. The district engineer must approve any compensatory mitigation proposal before the permittee commences work. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the district engineer to be minimal, the district engineer will provide a timely written response to the applicant. The response will state that the project can proceed under the terms and conditions of the NWP.

If the district engineer determines that the adverse effects of the proposed work are more than minimal, then the district engineer will notify the applicant either:

- (1) That the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit;
- (2) that the project is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level; or
- (3) that the project is authorized under the NWP with specific modifications or conditions.

Where the district engineer determines that mitigation is required to ensure no more than minimal adverse effects occur to the aquatic environment, the activity will be authorized within the 45-day PCN period. The authorization will include the necessary conceptual or specific mitigation or a requirement that the applicant submit a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level. When mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan.

28. *Single and Complete Project.* The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

3. Regional Conditions for the Los Angeles District:

In accordance with General Condition Number 23, "Regional and Case-by-Case Conditions," the following Regional Conditions, as added by the Division Engineer, must be met in order for an authorization by any Nationwide to be valid:

1. For coastal watersheds from the southern reach of the Santa Monica Mountains in Los Angeles County to the San Luis Obispo County/Monterey County boundary, all road crossings must employ a bridge crossing design that ensures passage and/or spawning of steelhead (*Oncorhynchus mykiss*) is not hindered in any way. In these areas, bridge designs that span the stream or river, including designs for pier- or pile-supported spans, or designs based on use of a bottomless arch culvert simulating the natural stream bed (i.e., substrate and streamflow conditions in the culvert are similar to undisturbed stream bed channel conditions) shall be employed unless it can be demonstrated the stream or river does not support resources conducive to the recovery of federally listed anadromous salmonids, including migration of adults and smolts, or rearing and spawning. This proposal also excludes approach embankments into the channel unless they are determined to have no detectable effect on steelhead.
2. For the State of Arizona and the Mojave and Sonoran (Colorado) desert regions of California in Los Angeles District (generally north and east of the San Gabriel, San Bernardino, San Jacinto, and Santa Rosa mountain ranges, and south of Little Lake, Inyo County), no nationwide permit, except Nationwide Permits 1 (Aids to Navigation), 2 (Structures in Artificial Canals), 3 (Maintenance), 4 (Fish and Wildlife Harvesting, Enhancement, and Attraction Devices and Activities), 5 (Scientific Measurement Devices), 6 (Survey Activities), 9 (Structures in Fleeting and Anchorage Areas), 10 (Mooring Buoys), 11 (Temporary Recreational Structures), 20 (Oil Spill Cleanup), 22 (Removal of Vessels), 27 (Stream and Wetland Restoration Activities), 30 (Moist Soil Management for Wildlife), 31 (Maintenance of Existing Flood Control Projects), 32 (Completed Enforcement Actions), 35 (Maintenance Dredging of Existing Basins), 37 (Emergency Watershed Protection and Rehabilitation), 38 (Cleanup of Hazardous and Toxic Waste) and 47 (Pipeline Safety Program Designated Time Sensitive Inspections and Repairs), or other nationwide or regional general permits that specifically authorize maintenance of previously authorized structures or fill, can be used to authorize the discharge of dredged or fill material into a jurisdictional special aquatic site as defined at 40 CFR Part 230.40-45 (sanctuaries and refuges, wetlands, mudflats, vegetated shallows, coral reefs, and riffle-and-pool complexes).
3. For all projects proposed for authorization by nationwide or regional general permits where prior notification to the district engineer is required, applicants must provide color photographs or color photocopies of the project area taken from representative points documented on a site map. Pre-project photographs and the site map would be provided with the permit application. Photographs should represent conditions typical or indicative of the resources before impacts.
4. Notification pursuant to general condition 27 shall be required for projects in all special aquatic sites as defined at 40 CFR Part 230.40-45 (sanctuaries and refuges, wetlands, mudflats, vegetated shallows, coral reefs, and riffle-and-pool complexes), and in all perennial waterbodies in the State of Arizona and the Mojave and Sonoran (Colorado) desert regions of California in Los Angeles District (generally north and east of the San Gabriel, San Bernardino, San Jacinto, and Santa Rosa mountain ranges, and south of Little Lake, Inyo County), excluding the Colorado River from Davis Dam downstream to the north end of Topock and downstream of Imperial Dam (Federal Register dated March 12, 2007 (72 FR 11092) - regional conditions requiring notification do not apply to Nationwide Permit 47).
5. Notification pursuant to general condition 27 shall be required for projects in all areas designated as Essential Fish Habitat by the Pacific Fishery Management Council (i.e., all tidally influenced areas - Federal Register dated March 12, 2007 (72 FR 11092), regional conditions requiring notification do not apply to Nationwide Permit 47).
6. Notification pursuant to general condition 27 shall be required for projects in all watersheds in the Santa Monica Mountains in Los Angeles and Ventura counties bounded by Calleguas Creek on the west, by Highway 101 on the north and east, and by Sunset Boulevard and Pacific Ocean on the south (Federal Register dated March 12, 2007 (72 FR 11092) - regional conditions requiring notification do not apply to Nationwide Permit 47).
7. Individual permits shall be required for all discharges of fill material in jurisdictional vernal pools.

8. Individual permits shall be required in Murrieta Creek and Temecula Creek watersheds in Riverside County for new permanent fills in perennial and intermittent watercourses otherwise authorized under NWP's 29, 39, 42 and 43, and in ephemeral watercourses for these NWP's for projects that impact greater than 0.1 acre of waters of the United States. In addition, when NWP 14 is used in conjunction with residential, commercial, or industrial developments the 0.1 acre limit would also apply.
9. Individual permits shall be required in San Luis Obispo Creek and Santa Rosa Creek in San Luis Obispo County for bank stabilization projects, and in Gaviota Creek, Mission Creek and Carpinteria Creek in Santa Barbara County for bank stabilization projects and grade control structures.
10. Notification pursuant to general condition 27 shall be required for projects in the Santa Clara River watershed in Los Angeles and Ventura counties, including but not limited to Aliso Canyon, Agua Dulce Canyon, Sand Canyon, Bouquet Canyon, Mint Canyon, South Fork of the Santa Clara River, San Francisquito Canyon, Castaic Creek, Piru Creek, Sespe Creek and the mainstem of the Santa Clara River (Federal Register dated March 12, 2007 (72 FR 11092) - regional conditions requiring notification do not apply to Nationwide Permit 47).

4. Further information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:
 - () Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).
 - (X) Section 404 of the Clean Water Act (33 U.S.C. 1344).
 - () Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).
2. Limits of this authorization.
 - (a) This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.
 - (b) This permit does not grant any property rights or exclusive privileges.
 - (c) This permit does not authorize any injury to the property or rights of others.
 - (d) This permit does not authorize interference with any existing or proposed Federal project.
3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:
 - (a) Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
 - (b) Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
 - (c) Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
 - (d) Design or construction deficiencies associated with the permitted work.
 - (e) Damage claims associated with any future modification, suspension, or revocation of this permit.
4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.
5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:
 - (a) You fail to comply with the terms and conditions of this permit.
 - (b) The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).
 - (c) Significant new information surfaces which this office did not consider in reaching the original public interest decision.

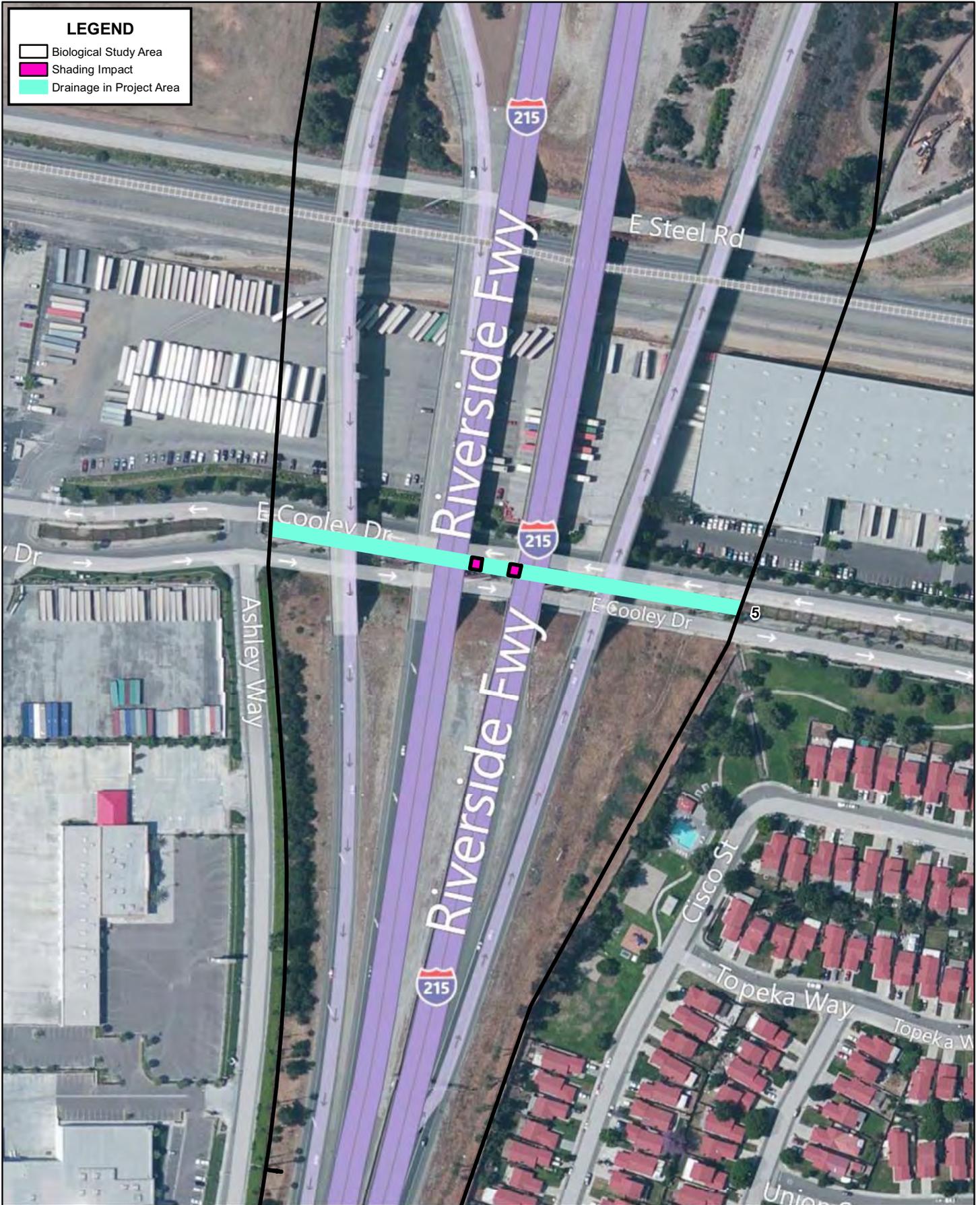
Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 330.5 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measure ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you

for the cost.

6. This letter of verification is valid for a period not to exceed two years unless the nationwide permit is modified, reissued, revoked, or expires before that time.
7. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition H below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
8. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished with the terms and conditions of your permit.

LEGEND

- Biological Study Area
- Shading Impact
- Drainage in Project Area



Prepared By:



VCS Environmental
949.489.2700

Map Created: 7/25/2011



0 50 100 200 Feet
1 inch = 200 feet

Data Sources: LSA Associates, Inc.
2010 Microsoft Corporation

I-215 BI-COUNTY HOV LANE GAP CLOSURE PROJECT
Corps Jurisdictional Area
Drainage 5



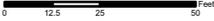
LEGEND

- Biological Study Area
- Temporary Impact
- Drainage in Project Area

Prepared By:

 VCS Environmental
 949.489.2700

Map Created: 2/3/2012



 1 inch = 50 feet

Data Sources: LSA Associates, Inc.
 2010 Microsoft Corporation

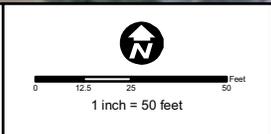
I-215 BI-COUNTY HOV LANE GAP CLOSURE PROJECT
Corps Jurisdictional Area
 Drainage 7a



Prepared By:

 VCS Environmental
 949.489.2700

Map Created: 2/3/2012



Data Sources: LSA Associates, Inc.
 2010 Microsoft Corporation

I-215 BI-COUNTY HOV LANE GAP CLOSURE PROJECT
 Corps Jurisdictional Area
 Drainage 7b



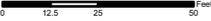
LEGEND

-  Biological Study Area
-  Temporary Impact
-  Drainage in Project Area

Prepared By:

 VCS Environmental
 949.489.2700

Map Created: 2/3/2012

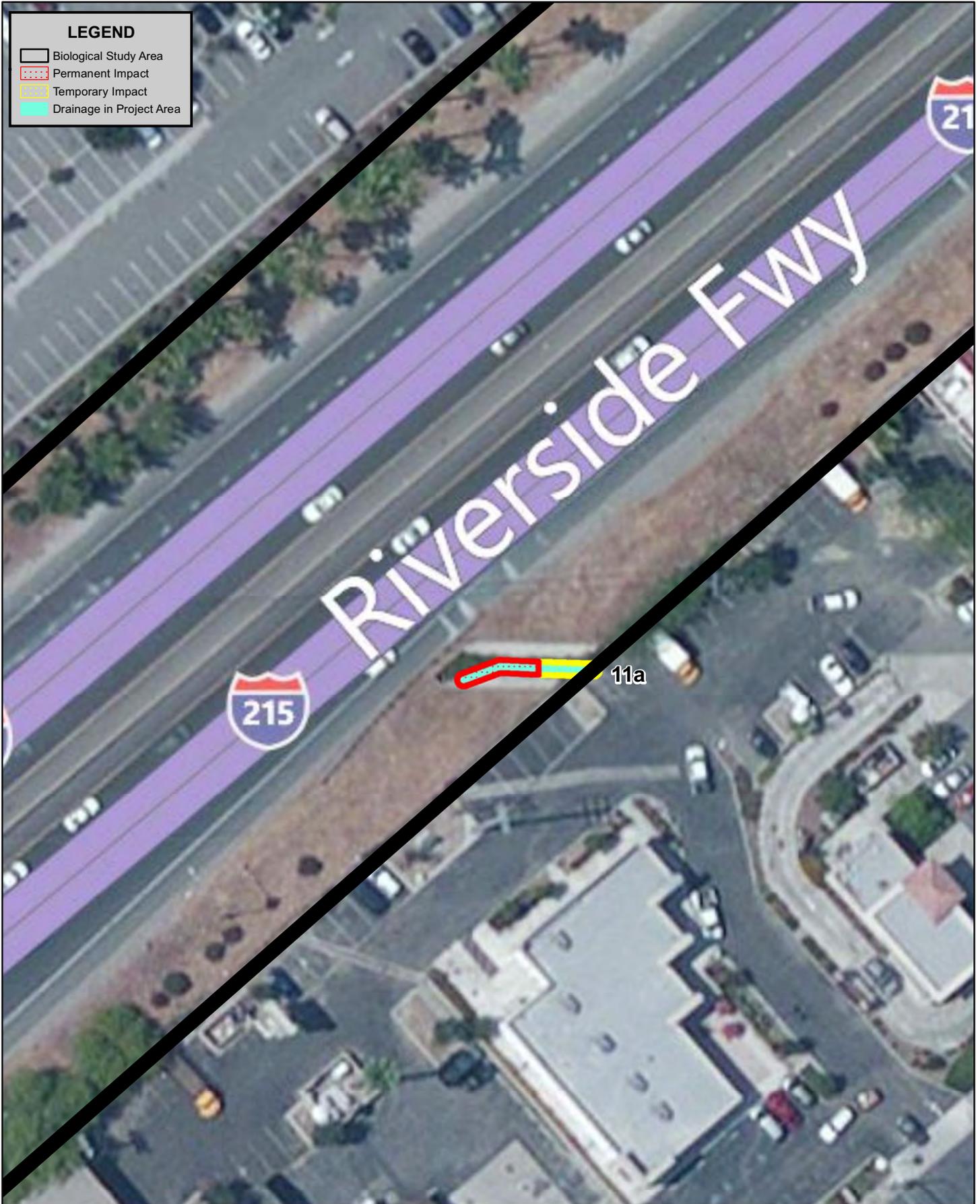


 1 inch = 50 feet

Data Sources: LSA Associates, Inc.
 2010 Microsoft Corporation

I-215 BI-COUNTY HOV LANE GAP CLOSURE PROJECT
 Corps Jurisdictional Area
 Drainage 8
 Reche Canyon Channel

LEGEND

-  Biological Study Area
-  Permanent Impact
-  Temporary Impact
-  Drainage in Project Area



Prepared By:



VCS Environmental
949.489.2700

Map Created: 2/3/2012



0 12.5 25 50 Feet
1 inch = 50 feet

Data Sources: LSA Associates, Inc.
2010 Microsoft Corporation

I-215 BI-COUNTY HOV LANE GAP CLOSURE PROJECT
Corps Jurisdictional Area
Drainage 11a

LEGEND

-  Biological Study Area
-  Temporary Impact
-  Drainage in Project Area



Prepared By:



VCS Environmental
949.489.2700

Map Created: 2/3/2012



0 12.5 25 50 Feet
1 inch = 50 feet

Data Sources: LSA Associates, Inc.
2010 Microsoft Corporation

I-215 BI-COUNTY HOV LANE GAP CLOSURE PROJECT
Corps Jurisdictional Area
Drainage 11b



LEGEND

-  Biological Study Area
-  Temporary Impact
-  Drainage in Project Area

Prepared By:

 VCS Environmental
 949.489.2700

Map Created: 2/3/2012



 1 inch = 100 feet

Data Sources: LSA Associates, Inc.
 2010 Microsoft Corporation

I-215 BI-COUNTY HOV LANE GAP CLOSURE PROJECT
 Corps Jurisdictional Area
 Drainage 15b



LEGEND

- Biological Study Area
- Temporary Impact
- Drainage in Project Area

Prepared By:

 VCS Environmental
 949.489.2700

Map Created: 2/3/2012



 1 inch = 100 feet

Data Sources: LSA Associates, Inc.
 2010 Microsoft Corporation

I-215 BI-COUNTY HOV LANE GAP CLOSURE PROJECT
Corps Jurisdictional Area
 Drainage 16



LEGEND

-  Biological Study Area
-  Permanent Impact
-  Temporary Impact
-  Drainage in Project Area

Prepared By:

 VCS Environmental
 949.489.2700

Map Created: 2/3/2012



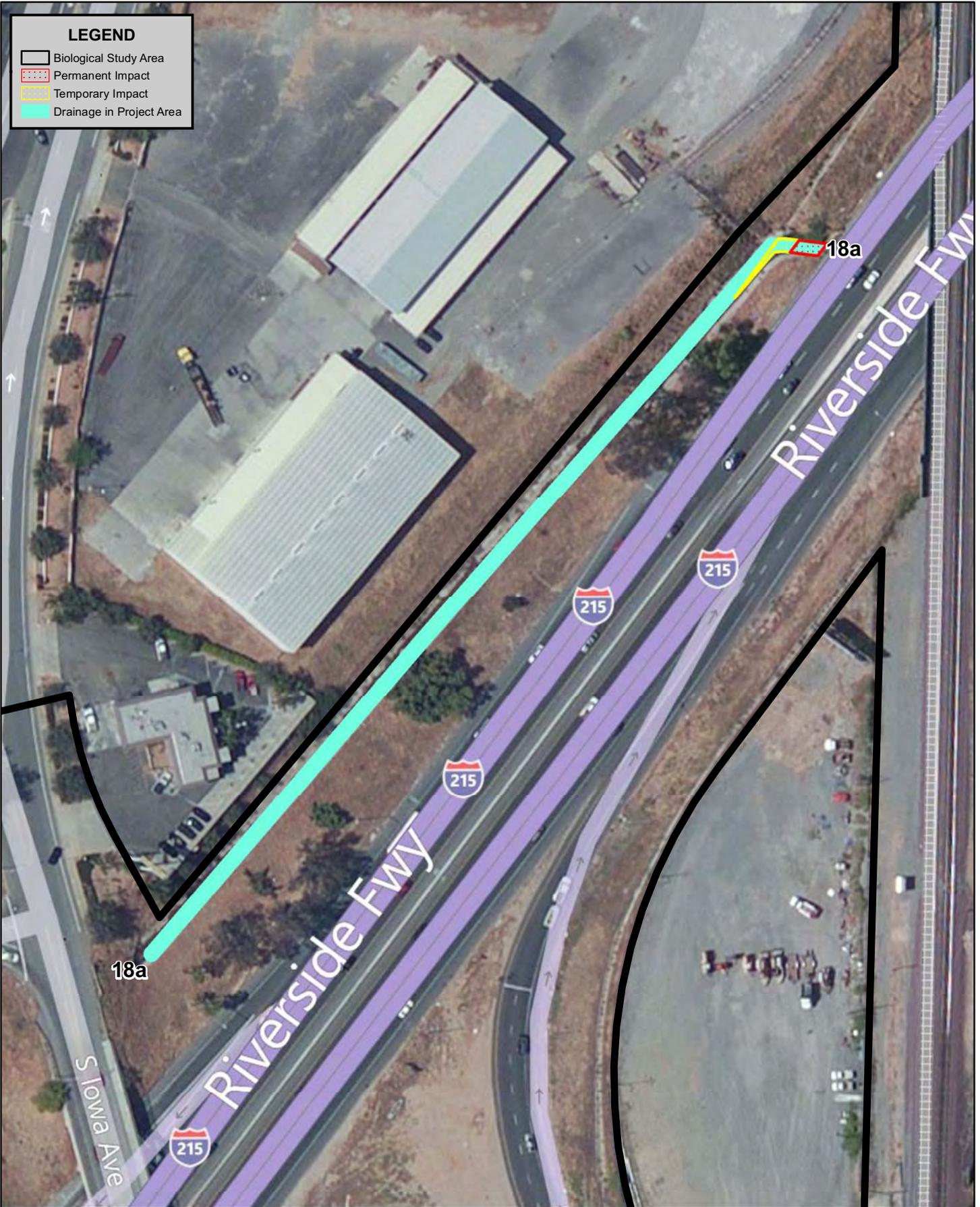
 1 inch = 50 feet

Data Sources: LSA Associates, Inc.
 2010 Microsoft Corporation

I-215 BI-COUNTY HOV LANE GAP CLOSURE PROJECT
Corps Jurisdictional Area
 Drainage 17b

LEGEND

- Biological Study Area
- Permanent Impact
- Temporary Impact
- Drainage in Project Area



Prepared By:



VCS Environmental
949.489.2700

Map Created: 2/3/2012



0 25 50 100 Feet
1 inch = 100 feet

Data Sources: LSA Associates, Inc.
2010 Microsoft Corporation

I-215 BI-COUNTY HOV LANE GAP CLOSURE PROJECT
Corps Jurisdictional Area
Drainage 18a
Grand Terrace Channel



LEGEND

-  Biological Study Area
-  Temporary Impact
-  Drainage in Project Area

Prepared By:

 VCS Environmental
 949.489.2700

Map Created: 2/3/2012



 1 inch = 100 feet

Data Sources: LSA Associates, Inc.
 2010 Microsoft Corporation

I-215 BI-COUNTY HOV LANE GAP CLOSURE PROJECT
Corps Jurisdictional Area
 Drainage 19/Page 1 of 2
Riverside Canal



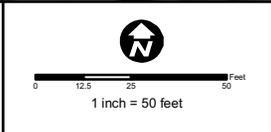
LEGEND

- Biological Study Area
- Permanent Impact
- Drainage in Project Area

Prepared By:

 VCS Environmental
 949.489.2700

Map Created: 2/3/2012



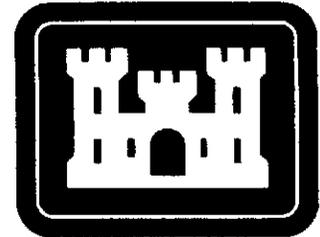
Data Sources: LSA Associates, Inc.
 2010 Microsoft Corporation

I-215 BI-COUNTY HOV LANE GAP CLOSURE PROJECT
 Corps Jurisdictional Area
 Drainage 19/Page 2 of 2

P-22011071
2-701/2.04#



DEPARTMENT OF THE ARMY
33 U.S.C. § 408 PERMIT
U. S. Army Corps of Engineers
Los Angeles District



PERMITTEE/LOCAL SPONSOR: County of San Bernardino, Department of Public Works,
825 East Third Street, San Bernardino, CA 92415-0835

PERMIT NUMBER: EE2012-18

ISSUING OFFICE: U.S. Army Corps of Engineers, Los Angeles District, Engineering Division

CORPS PERMIT COORDINATOR: Ms. Arnecia Williams (213) 452-3747,
arnecia.n.williams@usace.army.mil

AFFECTED FEDERAL PROJECT AND DESCRIPTION: Santa Ana River Channel

LOCATION: Interstate 215 LAT 34.06739 LON 117.29613

APPROVED MODIFICATION OR ALTERATION OF THE FEDERAL PROJECT:. To
widen the Interstate 215 within the Santa Ana River Channel right-of-way.

PERMIT CONDITIONS

I. General Conditions

1. The United States shall not be responsible for damages to property or injuries to persons which may arise from or be incident to the construction, operation, maintenance, repair, rehabilitation and replacement of the Authorized Activity, or for damages to the Federal Project. Permittee shall hold the United States harmless from any and all such claims not including damages due to the fault or negligence of the United States or its contractors.
2. Permittee shall comply with all applicable federal laws and regulations and with all applicable laws, ordinances and regulations of the state, county and municipality wherein the Federal Project is located, including, but not limited to, those regarding construction, health, safety, water supply, sanitation, use of pesticides, and licenses or permits necessary for the Authorized Activity.
3. Permittee shall maintain the Authorized Activity in good condition and in conformance with the terms and conditions of this Permit. Permittee shall not be relieved of this requirement even if the Authorized Activity is abandoned. Should the Permittee wish to cease to maintain the Authorized Activity or desire to abandon it, **Permittee must obtain**

SHEET	1	OF	3
EXHIBIT MAP	"B"		
ATTACHED TO	PERMIT NO. P-22011071		

from the Corps a modification of this permit, which may require additional construction activities to abandon the facility.

4. If previously unknown historic or archeological remains are discovered in carrying out the Authorized Activity, Permittee must cease activity, protect the site and immediately notify the Corps. The Corps will initiate Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
5. If the scope or details of the Authorized Activity change from the approved plans and specifications upon which this Permit is based, the Permittee must resubmit the permit application with the permit number and revisions clearly identified. Work associated with the Authorized Activity that does not pertain to the revised portion of the project, may continue while the revisions are being reviewed unless the Corps indicates otherwise.
6. Permittee shall keep the Permit Coordinator apprised of anticipated start and completion date of construction to the Permit Coordinator.
7. Permittee is required to invite the Permit Coordinator to an onsite kickoff meeting after the construction contract is awarded and prior to the date work is expected to begin. Permittee shall provide the Corps with the date, time and location of the meeting at least one week prior to the meeting, along with a copy of the construction schedule.
8. Permittee is required to allow Corps representatives to inspect the Authorized Activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of this Permit.
9. Permittee shall oversee the conduct of the work and ensure the Authorized Activity is being constructed in accordance with the approved plans and specifications.
10. Upon completion of the Authorized Activity, Permittee shall submit electronic copies of the as-built plans of the Authorized Activity to the Corps, which are signed by the Permittee's engineer of record. Electronic copies of the as-built plans shall be in pdf format.
11. **Granting of this Permit does not authorize work in waters of the United States. Work shall not begin in waters of the United States until Permittee first obtains a Department of the Army permit for activities which involve the discharge of dredge or fill material or the placement of fixed structures in the waters of the United States, pursuant to the provisions of Section 10 of the Rivers and Harbors Act of 3 March 1899 (33 USC 403), and Section 404 of the Clean Waters Act (33 USC 1344).**

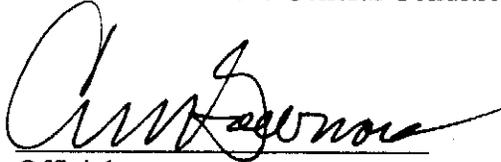
SHEET <u>2</u> OF <u>3</u>
EXHIBIT MAP <u>"B"</u>
ATTACHED TO
PERMIT NO. <u>P-22011071</u>

- i2. Should construction activities fail to commence within two (2) years after execution of the effective date of this Permit, this Permit shall be temporarily revoked upon further examination by the Corps. Work shall not begin until the Corps has examined this Permit and determines that the Permit conditions are sufficient or until new Permit conditions are incorporated.

II. Special Conditions

1. All Fill at site shall be compacted to at least 95 percent of ASTM D1557.

By signing this 33 U.S.C. Section 408 Permit, you are accepting the terms and conditions contained within the General Conditions and Special Conditions of this Permit.



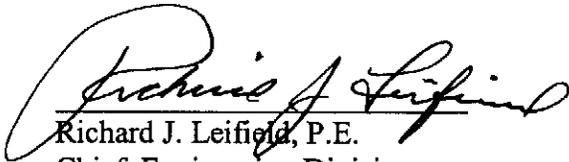
Official

Title SAN BERNARDINO FCD CHIEF

Entity Name

Date

3/29/2012



Richard J. Leifield, P.E.

Chief, Engineering Division

Los Angeles District

U.S. Army Corps of Engineers

Date

6 APRIL 2012

SHEET <u>3</u> OF <u>3</u>
EXHIBIT MAP <u>"B"</u>
ATTACHED TO
PERMIT NO. <u>P.22011071</u>



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road, Suite 101
Carlsbad, California 92011

In Reply Refer To:
FWS-SB/WRIV-09B0368-1110261

MAR 08 2011

Craig Wentworth
Senior Environmental Planner
Department of Transportation - District 8
Environmental Planning (MS 822)
464 West 4th Street, 6th Floor
San Bernardino, California 92401

Subject: Informal Section 7 Consultation Interstate 215 (I-215) Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project, Riverside and San Bernardino Counties, California

Dear Mr. Wentworth:

This is in response to your correspondence dated December 21, 2010, requesting our concurrence with your determination that the subject project is not likely to adversely affect the federally endangered southwestern willow flycatcher (*Empidonax traillii extimus*, "SWWF") and its designated critical habitat; least Bell's vireo (*Vireo bellii pusillus*, "vireo"); San Bernardino kangaroo rat (*Dipodomys merriami parvus*, "SBKR"); and the federally threatened Santa Ana sucker (*Catostomus santaanae*, "SAS") and its designated critical habitat in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*). Your agency, the California Department of Transportation (Caltrans), has assumed the Federal Highway Administration's (FHWA) responsibilities under the Act for this consultation in accordance with Section 6005 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) 2005, as described in the National Environmental Policy Act (NEPA) Delegation Pilot Program Memorandum of Understanding between FHWA and Caltrans.

Caltrans, in cooperation with San Bernardino Associated Governments (SANBAG) and the Riverside County Transportation Commission (RCTC), proposes to construct a High-Occupancy Vehicle (HOV) lane in each direction on Interstate 215 (I-215) in Riverside County from south of the I-215/State Route 60 (SR-60)/State Route 91 (SR-91) interchange to north of the I-215/Interstate 10 (I-10) interchange in San Bernardino County, ending at the Orange Show Road interchange. The total length of the proposed project is 12 kilometers (km) [7.5 miles (mi)]. The existing Burlington North Santa Fe (BNSF) two-track railroad bridge over the freeway and the existing Union Pacific Railroad (UPRR) single-track railroad bridge over the freeway between the Iowa Avenue/La Cadena Drive interchange and the Barton Road interchange would be replaced. This would require construction of a railroad shoofly bridge over the freeway for each railroad line so that railroad operations can continue during the construction period. The I-215 structures over the UPRR tracks

south of I-10, over I-10, and over the Santa Ana River would be widened to accommodate the additional HOV lane in each direction.

Work within the Santa Ana River is related to construction of bridge pilings and footings to support the bridge widening and the extension of seismic catcher structures. A temporary access road into the river would be provided from the north bank of the river. The road would be placed to avoid habitat to the maximum extent possible. The footing sites for the bridge extension would be cleared and grubbed. The footings would be excavated, the bridge piles would be driven, and footings would be poured. The duration of pile driving activities would be approximately 7 days.

In addition to the bridge pilings and footings, work crews will be in the Santa Ana River to construct the bridge columns and to extend the catcher structures. Lastly, the bridge deck will require temporary falsework, which will be placed in the river. Once the bridge is finished, the falsework will be removed. Construction for the proposed project is estimated to begin late in 2012, and last for 2 years.

We have reviewed the information provided to us, including the *I-215 Bi-County HOV Lane Gap Closure Project Natural Environmental Study* (November 2010) and *Draft Initial Study with Proposed Mitigated Negative Declaration* (November 2010). Protocol Surveys for SWWF and vireo were conducted within the Biological Study Area (BSA), which is defined as the area of potential direct effects and indirect effects such as dust and noise. The mule fat (*Baccharis salicifolia*) scrub habitat growing within the BSA is fairly sparse and disturbed because of the dense urban development surrounding the BSA, and it is unlikely that it provides suitable SWWF and vireo breeding habitat. Vireo do occur outside of the BSA within the Santa Ana River approximately 0.15 km [500 feet (ft)] east of the BSA; however, during biological surveys conducted for the project in 2009, no vireos or SWWF were observed. The SAS are known to occur in the Santa Ana River approximately 4 km (2.5 mi) downstream of the project site. A focused fish survey using electroshock and seine netting techniques was conducted in 2009 to determine the presence of the SAS within the BSA – no SAS were found in the survey area. Based on small mammal trapping surveys conducted in 2009, SBKR are not located within the BSA.

Implementation of the proposed project will result in permanent impacts to 0.21 hectare (ha) [0.52 acre (ac)] of habitat within the Santa Ana River, of which 0.04 ha (0.09 ac) is riparian scrub; 0.03 ha (0.08 ac) is open water; and 0.14 ha (0.35 ac) is nonnative grassland and developed areas. The proposed project will result in temporary impacts to 3.50 ha (8.66 ac) of habitat within the Santa Ana River, of which 0.36 ha (0.90 ac) is riparian scrub; 0.49 ha (1.21 ac) is open water; and 2.65 ha (6.55 ac) is nonnative grassland and developed areas. All areas impacted within the Santa Ana River include designated critical habitat for SWWF and SAS.

The proposed project is located within the Santa Ana Management Unit of designated critical habitat for the SWWF, which consists of 1,104 ha (2,727 ac) in San Bernardino County. The riparian scrub habitat is generally dominated by mule fat and non-native plants with a narrow bank of willows along the south bank of the channel. The habitat is disturbed due to urban expansion, flood control, and channelization of the Santa Ana River. Therefore, the habitat within the BSA is

not suitable for nesting SWWF, however, it may be used for foraging and dispersal. Permanent impacts to SWWF designated critical habitat is less than 0.02 percent of SWWF critical habitat within the Santa Ana Management Unit. Because of the small amount of designated critical habitat that will be permanently impacted and the marginal quality of the habitat, we do not expect measurable changes in the existing functions and values currently provided within the SWWF Santa Ana Management Unit.

The proposed project is located within Critical Habitat Subunit 1B for SAS, which consists of 1,931 ha (4,771 ac) within the Santa Ana River in Riverside and San Bernardino counties. Permanent impacts to SAS designated critical habitat represents approximately 0.01 percent of SAS critical habitat within Subunit 1B. A hydrological analysis conducted for the proposed project determined there would be no change in existing hydrologic conditions, e.g., water levels and scour, due to the proposed project. Additionally, because of the small amount of SAS designated critical habitat that would be permanently impacted, we do not expect measurable changes in the existing functions and values within the SAS critical habitat unit.

The following measures have been incorporated into the project design to avoid and minimize impacts to the SWWF, vireo, and SAS:

1. Prior to clearing or construction, highly visible barriers (such as orange construction fencing) will be installed around riparian/riverine vegetation adjacent to the project footprint to designate environmentally sensitive areas (ESAs) to be preserved. No grading or fill activity of any type will be permitted within these ESAs. In addition, heavy equipment, including motor vehicles, will not be allowed to operate within the ESAs. All construction equipment will be operated in such a manner as to prevent accidental damage to nearby ESAs. No structure of any kind or incidental storage of equipment or supplies will be allowed within these protected zones. Silt fence barriers will be installed at the ESA boundaries to prevent accidental deposition of fill material in areas where vegetation is adjacent to planned grading activities.
2. To the extent possible, vegetation clearing will take place outside of the bird breeding season, the bird breeding season is defined as February 15–September 15. In the event vegetation clearing is necessary during the bird breeding season, a qualified ornithologist will conduct a preconstruction survey within 91 meters (m) (300 ft) of construction areas, no more than 7 days prior to construction, to identify the locations of avian nests. Should nests be found, the ornithologist shall establish a 91-m [300-ft (152-m/500-ft for raptors)] exclusionary buffer around each nest site. To the extent feasible, no construction will take place within this buffer until the nest is no longer active. In the event that construction must occur within the 91-m (300-ft) buffer, the biological monitor will take steps to ensure that construction activities are not disturbing or disrupting nesting activities. If the biological monitor determines that construction activities are disturbing or disrupting nesting activities, the biologist shall notify the Resident Engineer who has the authority to halt construction in order to reduce the noise and/or disturbance to the nests. This may include, but is not limited to, turning off vehicle engines and other equipment whenever possible to reduce noise, installing a protective noise barrier between

the nest and the construction activities, or working in other areas until the young have fledged. In the case of raptors, no construction shall be allowed within the 152-m (500-ft) buffer.

3. Nighttime construction activities, if any, will use shielded lighting that is directed away from designated ESAs.
4. Pile-driving activities in the Santa Ana River will occur outside of the riparian bird nesting season (February 15–September 15).
5. Permanent impacts to native riparian habitat will be offset through contribution to an in-lieu fee program, if available, at a minimum 1:1 ratio. If an in-lieu fee program is not available, Caltrans will restore habitat on or off site within the same watershed. If this approach is required, appropriate restoration, maintenance, and monitoring procedures will be discussed and agreed upon with the resource agencies.
6. Temporary impacts to native riparian habitat within the Santa Ana River will be mitigated as follows:
 - Vegetation within temporary impact areas may be trimmed and/or crushed; however, root systems will be left in place to the fullest extent possible, allowing for natural revegetation to occur.
 - In temporary impact areas where vegetation is damaged to the extent natural regrowth will not occur, these areas will be restored to pre-construction conditions. Appropriate restoration, maintenance and monitoring procedures will be discussed and agreed upon with the resource agencies.
7. A construction Storm Water Pollution Prevention Plan (SWPPP) will be developed to minimize erosion and identify specific pollution prevention measures that will eliminate or control potential point and nonpoint pollution sources on site during and following the project's construction phase. The SWPPP will meet the requirements of the Construction General Permit and will identify potential pollutant sources associated with construction activities; identify non-storm water discharges; develop a water quality monitoring and sampling plan; and identify, implement, and maintain Best Management Practices (BMPs) to reduce or eliminate pollutants associated with the construction site.
8. If water diversion is required, a continuous flow within the Santa Ana River channel will be maintained. Water containing mud, silt, or other pollutants from grading, aggregate washing, or other activities will not be allowed to enter a flowing stream.

We do not anticipate adverse impacts to SWWF and its designated critical habitat; vireo; SAS and its designated critical habitat; and SBKR with implementation of the proposed project. We are basing this determination on lack of species occurrence within the BSA, maintenance of the functions and values to critical habitat, and implementation of the above avoidance and

minimization measures. Therefore, we concur with your determination that the proposed project is not likely to adversely affect the SWWF, vireo, and SAS, and designated critical habitat for SWWF and SAS. The interagency consultation requirements of section 7 of the Act have been satisfied. Although our concurrence ends informal consultation, obligations under section 7 of the Act will be reconsidered if new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not previously considered, or this action is subsequently modified in a manner that was not considered in this assessment.

Thank you for your coordination on this project. If you have any questions regarding this letter, please contact Felicia Sirchia of my staff at (760) 777-0163.

Sincerely,

A handwritten signature in blue ink that reads "Kennon A. Corey" with "for" written below it.

Kennon A. Corey
Assistant Field Supervisor

Memorandum

*Flex your power!
Be energy efficient!*

To: MR. MOHAMMAD RAVANIPOUR
Structure Design
Office of Bridge Design-South 2
Bridge Design Branch 19

Date: March 22, 2011
File: 08-SBD-215- PM 1.78
EA: 08-0P510
Project ID 0800020109
Newport Ave OC (Replace)
Br. #54-1294

Attention: Bartt Gunter

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Geotechnical Services
Office of Geotechnical Design – South 2 MS #5
Design Branch B

Subject: Foundation Report for Newport Avenue Overcrossing Replacement Bridge

This report presents the foundation recommendations for the proposed Newport Avenue Overcrossing Replacement Bridge (Br.#54-1294). The Office of Geotechnical Design-South 2, Branch B completed a foundation investigation pursuant to the November 19, 2010 request by Structures Design, Office of Bridge Design-South 2 for a foundation investigation and recommendations for the proposed structure.

The following foundation recommendations are based on subsurface information gathered during a foundation investigation (December 2010) performed by Caltrans. This report supercedes previous preliminary foundation recommendations for Newport Avenue OC. With regards to the current foundation recommendations, all elevations referenced within this report and shown on the recent Log of Test Boring sheets are based on the NAVD 1988 vertical datum, unless otherwise noted.

Project Description

The proposed bridge site is located on State Highway 215 approximately 1.8 miles east of Riverside County line. The existing Newport Avenue Overcrossing Bridge (Br.# 54-0529) will be removed and replaced by a new bridge which will consist of a two-span, cast-in-place, prestressed, concrete box-girder structure with seat abutments. The new proposed bridge is to accommodate the widening of both the northbound and southbound traffic lanes.

Geology

The Geologic Map of California, San Bernardino Sheet (1967) reveals the proposed bridge site is underlain by Quaternary Pleistocene Nonmarine Sedimentary Deposits and Cretaceous Tonalite and Diorite.

As-Built LOTBs exhibited loose red silty sands from about elevation 1021.0 ft to 1008.0 ft. Below the loose sands, dense to very dense red silty sands extended to the maximum explored elevation of 980.0 ft.

The foundation investigation performed in December 2010 consisted of two mud rotary borings drilled with a CME 750 drill rig. Boring R-10-01 revealed mainly loose to medium dense silty sands to about elevation 1009.5 ft and medium dense silty sands to elevation 995.0 ft. Below the medium dense sands, dense to very dense silty and poorly-graded sands were encountered to the maximum explored elevation of 952.6 ft. Boring R-10-02 revealed mainly loose to medium dense silty sands extending down to approximately elevation 1005.0 ft. Below elevation 1005.0 ft, dense to very dense silty sands and silt with sand were encountered to the maximum explored elevation of 945.95 feet. For more details regarding alluvium thickness and descriptions, refer to the LOTB sheets.

Ground Water

Ground water was not encountered in any of the exploratory borings during the December 2010 subsurface investigation.

Scour Potential

Scour is not considered an issue at this location, since the bridge does not span any watercourse.

Corrosion

Corrosion test results are shown below in Table 1. The tested soil sample was taken from a proposed retaining wall location near the bridge site. The soil sample tested is considered non-corrosive by current Caltrans standards.

Table 1 - Corrosion Test Summary					
Location	SIC Number	pH	Minimum Resistivity (Ohm-cm)	Sulfate Content (ppm)	Chloride Content (ppm)
FT-A-10-002, S3 20'-25'	C709301	7.96	2585	N/A	N/A

Note: Caltrans currently defines a corrosive environment as an area where the soil has either a chloride concentration of 500 ppm or greater, a sulfate concentration of 2000 ppm or greater, or has a pH of 5.5 or less. With the exception of MSE walls, soil and water are not tested for chlorides and sulfates if the minimum resistivity is greater than 1,000 ohm-cm.

Fault and Seismic Data

The structure site is potentially subject to strong ground motions from nearby earthquake sources during the design life of the new structure. The Office of Geotechnical Design – South 2, has provided Seismic Design Recommendations for the site in a memorandum dated February 15, 2011. The controlling fault for the site is the San Jacinto Fault Zone – San Bernardino Section (Fault ID 229, strike-slip, dip =90°) located approximately 1.2 miles (1.9 km) northeast of the site, which is capable of generating a Maximum Credible Earthquake with a moment magnitude (M_w) of 7.5. A Peak Ground Acceleration (PGA) of 0.76g is recommended for the project site.

Liquefaction Potential

The Seismic Design Recommendations, dated February 15, 2011, state the potential for soil liquefaction at this site is considered low. Based on the Seismic Design recommendations letter, the amount of settlement due to strong ground shaking is considered less than one inch.

Foundation Recommendations

The following recommendations are for the proposed Newport Avenue Over Crossing Replacement Bridge (Br. #54-1294). Abutments 1 and 3 as well as Bent 2 may be supported on spread footings as shown on the General Plan dated November 8, 2010.

Abutment 1 and 3 Locations

Abutments 1 and 3 can be supported on native material underlying the site as described in the Geology section. The Spread Footing Design Data for Abutments 1 and 3, provided by Structure Design, is presented in Tables 2 and 3 below.

Table 2 - Spread Footing Design Data

Support Location	Design Method	Finished Grade Elevation (ft)	Bottom of Footing Elevation (ft)	Footing Size (ft)		Permissible Settlement under Service Load (in)
				B	L	
Abutment 1	WSD	1007.57	1002.57	14	52.36	1
Abutment 3	WSD	1007.87	1002.87	14	52.36	1

Table 3 - Spread Footing Design Data – Service Loads

Support Location	Total Load					Permanent Load				
	P _{total} (kips)	M _x Kips-ft	M _y Kips-ft	V _x Kips	V _y Kips	P _{perm} (kips)	M _x Kips-ft	M _y Kips-ft	V _x Kips	V _y Kips
Abutment 1	2,690	7,467	N/A	N/A	103	2,354	7,467	N/A	N/A	103
Abutment 3	2,690	7,467	N/A	N/A	103	2,354	7,467	N/A	N/A	103

Table 4 - Foundation Design Recommendations for Abutments 1 and 3

Support Location	Total Load			Permanent Load		
	Vertical Load (kips)	Effective Dimensions (ft)		Vertical Load (kips)	Effective Dimensions (ft)	
		B'	L'		B'	L'
Abutment 1	2,690	8.45	52.36	2,354	7.66	52.36
Abutment 3	2,690	8.45	52.36	2,354	7.66	52.36

The recommended Permissible Gross Contact Stress, Gross Ultimate Bearing, and Allowable Gross Bearing Capacities for Abutments 1 and 3 are listed in Table 5 below.

Table 5 - Foundation Design Recommendations for Abutments 1 and 3

Support Location	Footing Size (ft)		Bottom of Footing Elevation (ft)	Minimum Footing Embedment Depth (ft)	Total Permissible Support Settlement (in)	Service Limit State	Gross Nominal Bearing Resistance (ksf)	Allowable Gross Nominal Bearing Resistance SF = 3 (ksf)
	L	B				Permissible Net Contact Stress (ksf)		
Abut 1	52.36	14	1002.57	5.0	1	9.8	69.0	23.0
Abut 3	52.36	14	1002.87	5.0	1	9.8	69.0	23.0

In Table 5 above, the recommended Permissible Net Contact Stress (q_{pn}), Gross Nominal Bearing Resistance (q_n), and Allowable Gross Nominal Bearing Resistance ($q_n/3$) to be used for design, are based on the following design criteria:

- 1) The final designed spread footing will have an effective width (B') that will produce an equivalent Net Uniform Bearing Stress ($q_{n,u}$), which does not exceed Permissible Net Contact Stress (q_{pn}) for Service Limit State.
- 2) The spread footings will be subjected to the loading conditions shown in Tables 3 and 4.

- 3) The spread footings are to be constructed at or below the recommended elevations shown in Table 2.

Contact the Office of Geotechnical Design-South 2, Branch B for re-evaluation if any of the following change:

- The Net Uniform Bearing Stress ($q_{n,u}$) for the Service Limit State exceeds the recommended Permissible Net Contact Stress (q_{pn}).
- The footing size (B) is reduced.
- The loading conditions change.
- The bottom of footing elevation is raised.
- The minimum vertical footing embedment depths are reduced.

Bent 2 Location

At Bent 2, individual spread footings are recommended for support at each bent column. Bent 2 will consist of two (2) support columns on individual spread footing foundations. Table 6 below, presents the Bent 2 Spread Footing Design Data provided by Structure Design.

Table 6 - Bent 2 Spread Footing Design Data

Support Location	Design Method	Finished Grade Elevation (ft)	Bottom of Footing Elevation (ft)	Footing Size (ft)		Permissible Settlement under Service Load (in)
				B	L	
Bent 2	LRFD	1010.05	1003.55	18.00	18.00	1

Tables 7 and 8 below, present the LRFD Service, Strength, and Extreme Limit State Design Data provided by Structure Design.

Table 7 - LRFD Service Limit State-I Spread Footing Design Data

Support Location	Total Load					Permanent Load				
	P_{total} (kips)	M_x Kips-ft	M_y Kips-ft	V_x Kips	V_y Kips	P_{perm} (kips)	M_x Kips-ft	M_y Kips-ft	V_x Kips	V_y Kips
Bent 2 Per column	1,845	0	0	N/A	N/A	1,155	0	0	N/A	N/A

Table 8 - LRFD Strength and Extreme Event Limit States

Support Location	Strength Limit State (Controlling Group)			Extreme Event Limit State (Control Group)		
	Vertical Load (kip)	Effective Dimensions (ft)		Vertical Load (kip)	Effective Dimensions (ft)	
		B'	L'		B'	L'
Bent 2 Per column	3,209	18.00	18.00	2,784	18.00	18.00

Foundation design recommendations for Bent 2, based on the spread footing design loading and approximate footing geometry provided by Structure Design, are presented below in Table 9.

Table 9 - Foundation Design Recommendations for Bent 2

Support Location	Footing Size (ft)		Bottom of Footing Elevation (ft)	Minimum Footing Embedment Depth (ft)	Total Permissible Support Settlement (in)	Service Limit State	Strength Limit State $\phi = 0.45$	Extreme Limit State $\phi = 1.0$
	L	B				Permissible Net Contact Stress (ksf)	Factored Gross Nominal Bearing Resistance (ksf)	Factored Gross Nominal Bearing Resistance (ksf)
Bent 2 per column	18.0	18.0	1003.55	5.0	1	10.3	48.2	107.1

In Table 9 above, the recommended Permissible Net Contact Stress (q_{pn}) and Factored Gross Nominal Bearing Resistances (q_R) to be used for design, are based on the following design criteria:

- 1) The final designed spread footing will have an effective width (B') such that:
 - The equivalent Net Uniform Bearing Stress ($q_{n,u}$), does not exceed Permissible Net Contact Stress (q_{pn}) for Service Limit State.
 - The Gross Uniform Bearing Stress ($q_{g,u}$) does not exceed the recommended design values for the Factored Gross Nominal Bearing Resistances (q_R) for Strength and Extreme Limit States.
- 2) The spread footings will be subjected to the loading conditions shown in Tables 7 and 8.
- 3) The spread footings are to be constructed at or below the recommended elevations shown in Table 6.

Contact the Office of Geotechnical Design-South 2, Branch B for re-evaluation if any of the following change:

- The Net Uniform Bearing Stress ($q_{n,u}$) for the Service Limit State exceeds the recommended Permissible Net Contact Stress (q_{pn}).
- The Gross Uniform Bearing Stress ($q_{g,u}$) for the Strength and Extreme Limit States exceed the recommended design values for the Factored Gross Nominal Bearing Resistances (q_R).
- The footing size (B) is reduced.
- The loading conditions change.
- The bottom of footing elevation is raised.
- The minimum vertical footing embedment depths are reduced.

General Notes:

All support locations are to be plotted in plan view on the Log of Test Borings as stated in "Memo to Designers" 4-2. The plotting of support locations should be made prior to requesting a final foundation review.

Construction Considerations:

1. At Abutments 1 and 3 and Bent 2 support locations, the bottom of footing is to be constructed on native material. Concrete for the support footings shall be placed neat against the undisturbed native material at the bottom of the footing excavation. Should the bottom of the footing excavation be disturbed then the bottom of the footing excavation shall be extended down at 0.5 ft intervals until undisturbed formational material is observed and approved by the Engineer. The disturbed native material shall be either replaced with lean concrete, re-compacted or replaced with structurally engineered backfill compacted to 95% relative compaction.
2. At the Abutment 1, Bent 2, and Abutment 3 support locations, the excavation are to be inspected and approved by a representative of the Office of Geotechnical Design-South 2, Branch B, prior to placing any concrete. The required inspection is to verify that the soil exposed at the bottom of the excavation complies with recommendations included in this report. Once the excavation has been completed to the specified elevations, the contractor is to allow the Office of Geotechnical Design-South 2, Branch B, five (5) working days to perform the inspection. The structures representative is to provide the Office of Geotechnical Design-South 2, Branch B, a one-week notification prior to beginning the five-day contractor waiting period.

The recommendations contained in this report are based on specific project information regarding structure type, location, and design loads that have been provided by the Office of Bridge Design Branch 19. If any conceptual changes are made during final project design, the Office of Geotechnical Design-South 2, Design Branch B should review those changes to determine if these foundation recommendations are still applicable. Any questions regarding the above recommendations should be directed to the attention of Fernando De Haro, (916) 227-4556 or Mark DeSalvatore, (916) 227-5391, at the Office of Geotechnical Design-South 2, Branch B.

Prepared by:

Date: 3-24-11



Fernando De Haro, R. C. E. 65289
Transportation Engineer
Office of Geotechnical Design-South 2
Design Branch B

Supervised by:

Date: 3/24/11



Mark DeSalvatore, R.C.E., 039499
Senior Materials & Research Engineer
Office of Geotechnical Design-South 2
Design Branch B

- cc: R.E. Pending File
- Abbas Abghari – OGDS-2
- Mark Willian - GS Corporate
- Jim Robinson – District Project Manager
- Bruce Kean – District 8 Materials Engineer
- Kelly Holden – PS&E

Memorandum

*Flex your power!
Be energy efficient!*

To: MR. MOHAMMAD RAVANIPOUR
Structure Design
Office of Bridge Design-South 2
Bridge Design Branch 19

Date: August 11, 2011
File: 08-SBD-215- PM 1.78
EA: 08-0P510
Project ID 0800020109
Retaining Walls at Newport Ave OC
Br. #54-1294

Attention: Bartt Gunter

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Geotechnical Services
Office of Geotechnical Design – South 2 MS #5
Design Branch B

Subject: Foundation Report for Retaining Walls at Newport Ave. OC (Br. #54-1294)

Pursuant to a request by Structure Design, Branch 19, dated May 5, 2011, the following Foundation Report provides foundation recommendations for the proposed Retaining Walls (RW) for Newport Avenue Overcrossing (OC) (Br. #54-1294). This report supplements the Foundation Report, dated March 22, 2011, for Newport Ave Overcrossing (OC) (Br. #54-1294). For project description, geology, groundwater and corrosion, refer to the Foundation Report for Newport Ave OC Replacement.

Retaining Wall Recommendations

The Retaining Wall Layout Sheet, dated July 8, 2011, shows three retaining walls (101A, 101B and 101C) at Abutment 1 and two retaining walls (102A and 102B) at Abutment 3. Retaining Walls 101C and 102B are Type I RW and Retaining Walls 101A, 101B and 102A are Type I SW retaining walls.

Retaining Walls may be supported on spread footing foundations that are constructed on native soil and/or existing and new engineering fills to be placed at the site. The recommended allowable bearing capacities (q_{all}), permissible soil pressures (q_{pn}), factored gross nominal bearing pressures (q_R) to be used for design, bottom of footing elevations, and minimum footing widths are summarized below in Tables 1 and 2.

Table 1
Type 1 Retaining Wall Footing Data (WSD)

Wall Number And Location	Approximate Support Location From CL Newport Ave Line	Design Height of Wall "H" (ft)	Bottom of Footing Elevation (ft)	¹ Footing Width (ft)	¹ Maximum Contact Pressure (q_{max}) (Ksf)	Gross Allowable Soil Bearing Capacity (q_{all}) (Ksf)
Wall 101C Abutment 1	86.5 ft Lt. Sta. 103+26.5 to 86.5 ft Lt. Sta. 103+32.1 From CL Rte 215	28	1000.9	15.25	5.7	15.9
Wall 102B Abutment 3	25.5 Rt. Sta. 15+96.2 to 25.5 ft Rt. Sta. 16+00.8 From CL Newport Ave Line	30	1000.6	16.75	6.3	27.1
	25.5 Rt. Sta. 16+00.8 to 25.5 ft Rt. Sta. 16+08.8 From CL Newport Ave Line	26	1004.6	14.25	5.3	15.3
	25.5 ft Rt. Sta. 16+08.8 to 25.5 ft Rt. Sta. 16+32.8 From CL Newport Ave Line	22	1008.6	12.08	4.6	13.7
	25.5 ft Rt. Sta. 16+32.8 to 25.5 ft Rt. Sta. 16+56.8 From CL Newport Ave Line	18	1012.6	10.00	4.0	12.1
	25.5 ft Rt. Sta. 16+56.8 to 25.5 ft Rt. Sta. 16+72.8 From CL Newport Ave Line	14	1016.5	8.00	3.3	7.8

Notes: Work Stress Design (WSD). The Maximum Contact Pressure, (q_{max}), is not to exceed the recommended Gross Allowable Soil Bearing Pressure, (q_{all}). The Ultimate Soil Bearing Capacity, (q_{ult}), will equal or exceed 3 times the recommended Gross Allowable Soil Bearing Pressure (q_{all}).

¹Source: Standard Plans 2006, Sheet B3-1.

Table 2 – Type 1 Retaining Sound Wall Footing Data (LRFD) ¹

Wall Number And Location	Approximate Support Location	Design Height of Wall "H" (ft)	Bottom of Footing Elevation (ft)	Loading Type	² Gross Uniform Bearing Stress (Ksf)	² Effective Footing Width (ft)	³ Permissible Net Contact Pressure (q_{pn}) (Ksf)	³ Factored Gross Nominal Bearing Resistance (q_R) (Ksf)
Wall 101B Abutment 1	Sta. 10+00.0 to Sta. 10+84.9 CL of "LOL" Line	6	1023.15	Service	$q'_o = 1.2$	5.9	2.7	--
				Strength	$q_o = 2.1$	3.2	--	4.7
				Extreme	$q_o = 2.8$	2.5	--	9.4
	Sta. 10+84.9 to Sta. 10+92.9 CL of "LOL" Line	8	1022.15	Service	$q'_o = 1.4$	6.0	4.6	--
				Strength	$q_o = 2.3$	3.2	--	4.7
				Extreme	$q_o = 4.3$	2.5	--	9.4
	Sta. 10+92.9 to Sta. 11+00.9 CL of "LOL" Line	12	1018.15	Service	$q'_o = 1.8$	7.0	4.8	--
				Strength	$q_o = 2.6$	3.2	--	7.0
				Extreme	$q_o = 10.9$	2.5	--	13.9
	Sta. 11+00.9 to Sta. 11+08.9 CL of "LOL" Line	16	1013.65	Service	$q'_o = 2.0$	9.7	11.4	--
				Strength	$q_o = 2.7$	3.2	--	9.2
				Extreme	$q_o = 12.4$	2.5	--	18.3
	Sta. 11+08.9 to Sta. 11+16.9 CL of "LOL" Line	20	1009.15	Service	$q'_o = 2.3$	12.1	21.0	--
				Strength	$q_o = 3.1$	3.2	--	9.2
				Extreme	$q_o = 17.6$	2.5	--	18.3
Sta. 11+16.9 to Sta. 11+28.0 From CL "LOL" Line	24 ⁴	1004.9	Service	$q'_o = 2.4^4$	16.6	24.8	--	
			Strength	$q_o = 4.7^4$	3.2	--	14.2	
			Extreme	$q_o = 11.2^4$	2.5	--	28.1	
Sta. 11+28.0 to Sta. 11+40.9 CL of "LOL" Line	N/A ⁴	N/A	Service	N/A	N/A	N/A	N/A	
			Strength	N/A	N/A	N/A	N/A	
			Extreme	N/A	N/A	N/A	N/A	
Wall 101A Abutment 1	86.5 ft Lt. Sta. 102+45.0 to 86.5 ft Lt. Sta. 102+69.0 From CL Rte 215	26	1000.9	Service	$q'_o = 2.6$	18.5	20.7	--
				Strength	$q_o = 3.8$	3.2	--	14.2
				Extreme	$q_o = 10.0$	2.5	--	28.1
	86.5 ft Lt. Sta. 102+69.0 to 86.5 ft Lt. Sta. 102+74.1 From CL Rte 215	28	1000.9	Service	$q'_o = 2.7$	20.7	19.8	--
				Strength	$q_o = 3.4$	3.2	--	14.2
				Extreme	$q_o = 9.6$	2.5	--	28.1
Wall 102A Abutment 3	86.5 ft Rt. Sta. 103+00 to 86.5 m Rt. Sta. 103+14.5 From CL Rte 215	24	1000.6	Service	$q'_o = 2.4$	16.6	23.4	--
				Strength	$q_o = 3.2$	3.2	--	14.2
				Extreme	$q_o = 10.2$	2.5	--	28.1

Notes:

¹ Load Factor Resistant Design (LFRD).

² Source: Retaining Wall Type I SW – Details No. 2 Sheet.

³ The Gross Uniform Bearing Stress, (q_o) is not to exceed the recommended Factored Gross Nominal Bearing Resistance, (q_R).

Where $q_R = \phi q_{ult}$; $\phi = 0.45$ for Strength and $\phi = 1.0$ for Extreme loading. The Net Uniform Bearing Stress, (q'_o) is not to exceed the recommended Permissible net bearing stress (q'_o) for Service loading.

⁴ Wall sections are special designs. All design pressures provided by designer.

The recommended Permissible Net Contact Pressure, Allowable and Factored Bearing Capacities provided in Tables 1 and 2, above, are based on the following design criteria:

- 1) The retaining wall footings are to be constructed at or below the elevations shown in Tables 1 and 2.
- 2) Spread footings for Retaining Walls 101B and 102B are to be constructed on the embankment slope. The footing for these walls are to be positioned such that they have a minimum horizontal footing embedment of 4 feet, measured from the top of the footing at the toe to the face of the finished slope (per Bridge design Specification 4.4.5.1) where applicable.
- 3) Spread footings for Retaining Walls 101C, 101A and 102A are to be constructed with a minimum 3 feet of footing embedment (per Bridge design Specification 4.4.5.1).

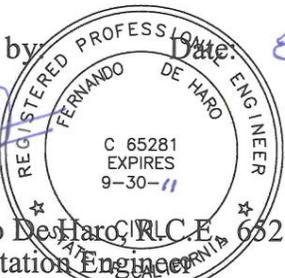
If any of the above wall heights are increased, or bottom of footing elevations raised, or Loading Case changed, the Office of Geotechnical Design-South II, Branch B, is to be contacted for reevaluation.

Construction Considerations:

At Retaining Wall support locations, the bottom of footing is to be constructed on native material. Concrete for the support footings shall be placed neat against the undisturbed material at the bottom of the footing excavation. Should the bottom of the footing excavation be disturbed then the bottom of the footing excavation shall be extended down at 0.5 ft intervals until undisturbed formational material is observed and approved by the Engineer. The disturbed native material shall be either replaced with lean concrete, re-compacted or replaced with structurally engineered backfill compacted to 95% relative compaction.

Any questions regarding the above recommendations should be directed to the attention of Fernando De Haro, (916) 227-4556, or Mark DeSalvatore, (916) 227-5391, at the Office of Geotechnical Design-South 2, Branch B.

Prepared by:



Date: 8-11-11

Supervised by:

Date:

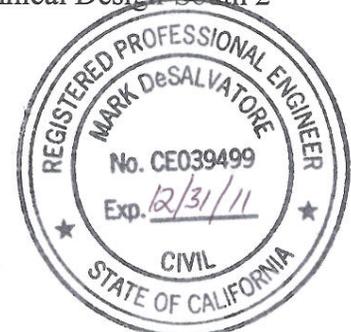
8/11/11

A handwritten signature in blue ink, likely belonging to Mark DeSalvatore.

Fernando De Haro, R.C.E., 65281
Transportation Engineer
Office of Geotechnical Design-South 2
Design Branch B

Mark DeSalvatore, R.C.E., 039499
Senior Materials & Research Engineer
Office of Geotechnical Design-South 2
Design Branch B

cc: R.E. Pending File
Abbas Abghari – OGDS-2
Mark Willian - GS Corporate
Jim Robinson – District Project Manager
Bruce Kean – District 8 Materials Engineer
John Stayton – PS&E



Memorandum

*Flex your power!
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To: MR DAN T. ADAMS
Division of Engineering Services
Office of Bridge Design Central
Bridge Design Branch 10

Attention: Mr. Larry Wu

Date: December 22, 2011

File: 08-SBd-215-PM 0.6
08-0M9401
Project No. 0800000506
- Highgrove UP (#1, #2, #3)
Br. #'s: 54-1304, 54-1305,
& 54-1303
- Highgrove UP (Shoofly) -
Br. # 54-1306

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES
OFFICE OF GEOTECHNICAL DESIGN – SOUTH 2
DESIGN BRANCH B, MS #5

Subject: Foundation Report for Highgrove UP and Highgrove UP (Shoofly)

This report presents the foundation recommendations for the proposed replacement of the existing Highgrove Underpass (UP), Br. No. 54-0518, and supercedes all previous foundation reports for this structure. The Office of Geotechnical Design South 2 completed a foundation investigation pursuant to a request by Structure Design (Office of Bridge Design Central, Branch 10) for foundation recommendations for the proposed replacement structures. The proposed replacement structures consist of three new bridge structures: Highgrove Underpass #1, #2, and #3 (Br. No.'s 54-1304, 1305, & 1303, respectively). Prior to constructing the proposed replacement structures, two temporary structures will need to be constructed. Those two temporary structures consist of the Highgrove Underpass (Shoofly) - Br. No. 54-1306 and the Shoofly Sidehill Viaduct – Br. No. 54-1306S. At the time of this report, the Shoofly Sidehill Viaduct did not have enough design information to develop foundation recommendations, therefore foundation recommendations for the Shoofly Sidehill Viaduct will be provided as a separate report at a future date when additional design information is available.

The following foundation recommendations are based on information gathered during the recent 2011 subsurface information performed by Office of Geotechnical Design South II, Branch B, as well as information from a 1957 subsurface investigations at the site. “As-Built” plans were also reviewed which included the “As-Built” Log of Test Borings (LOTB) from the original (1957) foundation investigation. Additional information available in the Geotechnical Services Archive included a foundation report (dated 7-3-57). With regards to the current foundation recommendations, all elevations referenced within this report and shown on the recent Log of Test Boring sheets are based on the NAVD88 vertical datum, unless otherwise noted. The “As-Built” elevation information contained in this report was updated to the NAVD88 vertical datum by adding 2.5 ft (per Office of Bridge Design – Central) to any elevations based on the NGVD29 datum.

Project Description

The existing structure site is located in the Highgrove area of San Bernardino County where Interstate 215 crosses under the Burlington Northern Santa Fe (BNSF) railroad which is supported by the existing Highgrove UP. The existing Highgrove UP is a 333 ft long and 36 ft wide, four-span bridge supported on a combination of spread footings and pile foundations, which spans over three northbound lanes and three southbound lanes of Interstate 215. The existing structure was originally constructed in 1959 and consists of a steel through plate, girder bridge which accommodates two active BNSF railroad tracks, that are aligned in a north-south direction. "As-Built" plans for the existing structure were obtained from the Bridge Inspection Records Information System (BIRIS).

The proposed replacement structures are necessary due to the existing bridge not being of sufficient length to accommodate the planned widening of the underlying Interstate 215 improvements. The proposed structures consist of three bridges each consisting of a two span, steel through truss bridge (approximately 406 ft in length and 23 ft wide). The proposed structures are shown on the Highgrove Underpass #1, General Plan No. # 1 & 2 (dated 9-16-11 & 7-25-11).

In order to keep BNSF railroad operations from being interrupted during the demolition and construction of the replacement bridges, two temporary structures will need to be constructed: the Highgrove UP (Shoofly) and Shoofly Sidehill Viaduct. The proposed Highgrove UP (Shoofly) bridge consists of a four span, steel through girder bridge and will be approximately 373 ft in length and approximately 39 ft wide, as shown on the Highgrove Underpass (Shoofly), General Plan (dated 7-14-11). As mentioned earlier, foundation recommendations for the Shoofly Sidehill Viaduct will be provided as a separate report at a future date.

Historical Features

Historical aerial photographs from 1938 show evidence that originally a single track railroad (trending north-south) existed in the same general location as the existing railroad and crossed over possibly another railroad (trending northeast-southwest) in the same general location of the current highway location, which is within a large earth cut. It appears that both railroad tracks (trending north-south & northeast-southwest) intersected near Bent 2 of the existing bridge. It also can be inferred that the 1938 railroad (trending north-south) spanned a natural drainage channel possibly transmitted through a culvert. At this site, the drainage channel trends in an east-west direction and dissects the native alluvium-fan deposits. No "As-Built" information is available for these structures. For more details, refer to the historical aerial photographs from <http://www.historicaerials.com>.

Historical aerial photographs from 1948 show the original single track railroad (trending north-south) had been replaced by or/supplement to a double track railroad. The 1948 double track existed in the same general location as the original single track railroad. Based on the 1959 "As-Built" foundation plan (which shows the topography of the site prior to the 1959 construction), a twenty-five foot tall embankment supported the railroad track in 1948. It appears that during this time, the northeast-southwest railroad track shown in the 1938 aerial

photograph had been abandoned when the 1948 aerial photograph was taken. The 1959 “As-Built” foundation plan also shows a four foot tall, arch culvert transmitted water from the natural drainage channel at the base of the embankment.

During construction of the 1959 highway and bridge, the pre-existing embankment supporting the double track railroad was removed and replaced. Prior to the construction of the 1959 bridge, the previous arch culvert was abandoned or removed and relocated slightly to the south, and replaced with a double box culvert.

Site Geology

This bridge site is located within the Peninsular Range Geomorphic Providence of California. Geologic maps of the area identify that the site is underlain by very old alluvium-fan deposits which were deposited during the middle-early Pleistocene (Morton & Miller 2003).

The 1957 subsurface investigation, for the design of the 1959 bridge, consisted of one rotary boring and 12 dynamic cone penetration borings/soundings, which are shown on the “As-Built” LOTB. All elevations listed in this section have been updated to the current vertical datum.

The 1957 rotary boring and dynamic cone penetration borings were drilled from the top of pre-existing railroad embankment (~ Elev. 938 ft), down to the maximum explored depth of 65 feet (~Elev. 872 ft). During construction of the 1959 highway approximately 20 feet of fill was removed down to an approximate elevation of 918 feet. The 1957 rotary boring (B-3) was located near the west edge of the existing Bent 3 location, near a natural drainage channel. Inspection of the of the historical aerial photographs, and the site topography of the area, show the drainage channel that dissects the very old alluvium-fan deposits is located near the proposed Bent 2 (Highgrove UP - #1, #2, & #3) and Bent 4 (Highgrove UP -Shoofly).

The Rotary boring (B-3) revealed that the soil materials at this location can be separated into two units for the purposes of discussion. The upper unit is a thin layer of slightly compact to very loose, silty sand and sandy silt. This unit is interpreted as fill material and native deposits extending down to elevation 897 feet. Within the upper unit, a small zone of railroad roadbed, ties and ballast were encountered from elevation 908 to 910 feet. Below the railroad ballast and ties zone, shown on the “As-Built” LOTB, very loose to loose soil deposits were encountered. These deposits are interpreted as recently deposited alluvium associated with the natural drainage channel described in the previous section. Below this zone, the lower unit consists of a dense to very dense sand with gravel. The lowermost unit is interpreted as very old alluvium-fan deposits. This unit extends to the maximum explored depth of the borings, which is approximately 50 ft below the existing freeway level.

The 1957 foundation report mentions that the natural drainage channel at this site cuts through the very dense alluvial deposits and results in near surface loose to slightly compact soil materials. These loose/slightly compact granular soils associated with the drainage channel are shown in the rotary boring and some of the cone penetration borings near the existing Bent 3 location. This drainage channel is also identified in the “As-Built” Foundation Plan and shows that the drainage channel extended near the proposed Bent 4 location of the proposed “Shoofly”

structure. A brief review of the subsurface conditions at the Iowa Ave Overcrossing, Br. No. 54-0527 (located approximately 1000 ft to the southwest) shows evidence of approximately 15 feet of loose soils near the western extension of the same drainage channel.

The 2011 foundation investigation consisted of 6 borings drilled for the new proposed bridge structures associated with this project. The 2011 borings were advanced with wireline-punchcore, fully-cased drilling methods and hollow flight augers with Standard Penetration Tests (SPT) performed every 5 ft. The borings extended down to a maximum depth of 160.8 ft.

The 2011 rotary and auger borings were primarily drilled into native alluvium-fan deposits. For the purposes of discussion, the soil materials encountered at the site can be separated into two units. The upper unit is a thin layer of loose to medium dense sand, silt and clay with scattered gravels down to depths varying from 20 to 25 feet (elevations 910 - 915 feet). Below this zone, the lower unit consists primarily of dense to very dense sand and silt with gravel and localized clay layers. This unit extends to the maximum explored depth of 160.8 ft (Elev. 757.8 ft).

Railroad ballast and ties were not encountered in the 2011 investigation, but could be encountered at the proposed Bent 2 location (Highgrove UP – #1, #2, & #3) and Bent 2 & 3 (Highgrove UP – Shoofly) based on historical aerial photographs. For details regarding the information mentioned above, refer to the 2011 LOTB, “As-Built” LOTB and aerial photos.

Groundwater

During the 1957 subsurface investigation, groundwater was measured in one boring at elevation 898.6 feet (as shown on the “As-Built” LOTB). Additional groundwater information was obtained from the State Water Resources Control Board (SWRCB) website, which includes five borings monitored between 2002 to 2009 for a nearby Shell Gas Station located at 2718 South Iowa Avenue, Colton, CA, 92324 (approximately 1600 ft south of the bridge site). The website lists quarterly groundwater measurements for each boring at varying and sporadic depths over the span of nearly seven years. The groundwater data shows a minimum depth of approximately 80 feet and a maximum depth of approximately 105 feet. For detailed groundwater information, refer to the SWRCB website (<http://geotracker.waterboards.ca.gov/>).

During the 2011 foundation investigation, attempts to measure groundwater from two borings were conducted between June 2011 and November 2011. Boring RW-11-02 showed no evidence of groundwater down to the maximum explored depth of 120.5 feet (Elev. 817.7 ft). In Boring RW-11-05, groundwater was encountered at a depth of 111.4 feet (Elev. 807.2 ft). A summary of the groundwater information is listed below in Table 1.

Table 1: Summary of Groundwater Information

Location	Boring #	Year Measured	Elevation (feet)
Existing Highgrove UP, Bent 2	B-3	1957	898.6
Shell Gas Station – 2718 S. Iowa Ave, Colton*	MW-1 to MW-6	2002 - 2009	~ 837 to 812 **
Proposed Highgrove UP Shoofly – Bent 3	RW-11-05	2011	807.2

*Detailed groundwater information is available for each boring at SWRCB (<http://geotracker.waterboards.ca.gov/>).

** An estimated top of ground elevation of ~ 917 feet was estimated for boring MW-1 to MW-6.

As shown on the plans and discussed earlier in this report, a natural drainage channel exists at the site. It flows from the east to the west and is contained in a small section of a concrete lined channel leading into a double box culvert (each ~ 6 ft by 6 ft). The drainage channel and double box culvert are located near proposed Bent 2 (Highgrove UP – #1 & #3) and the proposed Bent 4 (Highgrove UP – Shoofly). Currently, the proposed General Plan (dated 9-16-11) show this box culvert and lining will be extended to the east.

Scour Potential

The drainage channel shown on the plans will be contained by a small section of concrete channel lining leading into a double box culvert. As a result, scour is not anticipated to be an issue at this site.

Corrosion

Soil samples were collected from 3 borings during the 2011 foundation investigation and tested for corrosive potential by the Office of Testing and Technology Services, Corrosive Technology Branch (CTB). Based on the current Caltrans Standards, the soil samples are not considered corrosive at this site. For specific test results, please refer to Table 2.

Table 2 – Corrosion Test Summary

Boring Number	Sample Depth (feet)	SIC Number	Minimum Resistivity (Ohm-Cm)	pH	Chloride Content (ppm)	Sulfate Content (ppm)
Boring RW-11-02	5.0 - 6.5	C701529A	1075	7.78	11	528
Boring RW-11-02	20 - 21.5	C701529B	1583	8.08	N/A	N/A
Boring RW-11-02	35 - 36.5	C701529C	1338	7.50	N/A	N/A
Boring RW-11-02	60 - 61.5	C701529D	5601	7.92	N/A	N/A
Boring RW-11-02	100 - 100.7	C701529E	8307	6.26	N/A	N/A
Boring RW-11-03	5 - 6.5	C701529F	3451	8.23	N/A	N/A
Boring RW-11-03	15 - 16.5	C701529G	1285	8.05	N/A	N/A
Boring RW-11-03	35 - 36.5	C701529H	1914	7.62	N/A	N/A
Boring RW-11-03	55 - 56.5	C701529I	7396	7.50	N/A	N/A
Boring RW-11-04	5 - 6.5	C701529J	2646	6.93	N/A	N/A
Boring RW-11-04	10 - 11.5	C701529K	1002	7.02	28	97
Boring RW-11-04	25 - 26.5	C701529L	2789	7.96	N/A	N/A
Boring RW-11-04	50 - 51.5	C701529M	3630	7.69	N/A	N/A

Note: Caltrans currently defines a corrosive environment as an area where the soil has a minimum resistivity of less than 1000 ohm-cm, and either contains a chloride concentration of 500 ppm or greater, a sulfate concentration of 2000 ppm or greater, or has a pH of 5.5 or less.

Seismic Data

The site is potentially subject to ground motions from nearby earthquake sources during the design life of the structure. Seismic design recommendations and fault information were provided as a separate memorandum for the proposed widening of the existing structures. For more information, please refer to the Seismic Design Recommendations (dated August 17, 2011) or contact Anhdan Le at 916-227-7211.

“As-Built” Information

The existing Highgrove UP was built in 1959 and consists of a four span bridge supported on spread footings at all supports except for Bent 3 where driven piles were used. The driven piles used at Bent 3 consisted of Raymond Step-Taper piles with a design load of 45 tons. “As-Built” information was obtained from the “As-Built” plans and “As-Built” LOTB’s and are listed below in Table 3.

Table 3 - 1959 “As-Built” Foundation Data

Support Location	Foundation Type*	Gross All. Bearing Capacity/ Design Load	Pile Cut-Off / Bottom of Footing Elev. (ft)	Min. Penet. Elev. (ft)**	Avg. Pile Tip Elev. (ft)**	Max. Penet. Elev. (ft)**
Abut 1	Spread Footing	2.0 tsf	926.7	N/A	N/A	N/A
Bent 2L & 2R	Spread Footing	4.0 tsf	912.7	N/A	N/A	N/A
Bent 3L	Raymond Step Taper*	45 Ton	908.6	897.0	895.7	894.3
Bent 3R	Raymond Step Taper*	45 Ton	908.6	Not Available	Not Available	Not Available
Bent 4L & 4R	Spread Footing	4.0 tsf	910.7	N/A	N/A	N/A
Abut 5	Spread Footing	4.0 tsf	926.7	N/A	N/A	N/A

* Raymond Step Taper piles dimensions consist of a tip = 8 inches; butt = 15.5 inches.
 ** Elevations scaled from 1959 “As-Built” LOTB but updated to current datum (NAVD88).

Foundation Recommendations

The following recommendations are for the proposed bridges: (1) Highgrove Underpass – #1, #2, & #3 (Br. No. 54-1304, 54-1305, & 54-1303, respectively), as shown on the 9-16-11 General Plan, No. 1 and (2) Highgrove Underpass – Shoofly, as shown on the 7-14-11 General Plan. The following foundation recommendations are based on a review of previous and recent subsurface investigations, as well as a review of “As-Built” plans and “As-Built” LOTB.

The information shown in Tables 4, 5, 7, & 8 is based on specific foundation design information provided to our office by Structure Design, Branch 10 for the Highgrove Underpass – #1, #2 & #3 (received on 11-14-11) and the Highgrove Underpass – Shoofly (received 12-22-11). The design for all proposed structures is based on working stress design (WSD) with considerations given to Part 3 and Part 4 of the American Railway Engineering and Maintenance-of-Way

Association (AREMA). Foundation design information and specified pile tip elevations for the all proposed structures are provided in Tables 6 & 9.

- Highgrove UP - Br. No. 54-1304, 1305 & 1303

Due to limited work area available during construction and large structural loads at the proposed bent locations, Cast-In-Drilled-Hole (CIDH) piles recommended at the bents and abutments. Alternate foundations types consisting of driven piles or spread footings could be utilized at the abutments, but were not analyzed based on feasibility discussions with Structure Design.

Table 4: Foundation and Structure Information Provided by Structure Design (Highgrove UP)

Support Location	Design Method	Pile Type	Finished Grade Elevation (ft)	Pile Cut-off Elevation (ft)	Pile Cap Size (ft)		Permissible Settlement Under Service Load (in)	Number of Piles per Support
					B	L		
Abutment 1	WSD	24 inch CIDH Piles	935.0	923.0	14.0	32.0	1.0	17
Bent 2	WSD	96 inch CIDH Piles	918.0	915.0	N/A	N/A	1.0	2
Abutment 3	WSD	24 inch CIDH Piles	935.0	923.0	14.0	32.0	1.0	17

Table 5: Foundation Design Loads Provided by Structure Design (Highgrove UP)

Support Location	Design Method	Pile Type	Design Loads (kips)					
			Primary Load Combination			Secondary Load Combination		
			Compression	Tension	Shear	Compression	Tension	Shear
Abutment 1	WSD	24 inch CIDH Piles	200	0	25	180	0	65
Bent 2	WSD	96 inch CIDH Piles	2400	0	50	2300	0	1770
Abutment 3	WSD	24 inch CIDH Piles	200	0	25	180	0	65

Table 6: Pile Data Table for Highgrove UP - #1, #2 & #3 (Br. No. 54-1304, 1305 & 1303)

Location	Pile Type	Required Nominal Resistance (kips)		Design Tip Elevation (feet)	Specified Tip Elevation (feet)
		Compression	Tension		
Abutment 1	24 inch CIDH Piles	400	0	894 (a)	894
Bent 2	96 inch CIDH Piles	4800	0	822 (a)	822
Abutment 3	24 inch CIDH Piles	400	0	887 (a)	887

Notes: 1) Design tip elevation is controlled by: (a) Compression

- Highgrove UP (Shoofly) – Br. No. 1306

Due to limited work area available during construction and large structural loads at the proposed bent locations, CIDH piles recommended at all support locations. At the request of Structures Design, two design scenarios (2 CIDH piles and 3 CIDH piles) are shown for Bent 3 in the tables listed below. Alternate foundations types consisting of driven piles could be utilized at the Abutment 1, Abutment 5 and the Abutment 5 retaining wall locations, but were not analyzed based on feasibility discussions with Structure Design.

Table 7: Foundation and Structure Information Provided by Structure Design ((Highgrove UP - Shoofly)

Support Location	Design Method	Foundation Type	Finished Grade Elevation (ft)	Pile Cut-off Elevation (ft)	Pile Cap Size (ft)		Permissible Settlement Under Service Load (in)	Number of Piles per Support
					B	L		
Abutment 1	WSD	24 inch CIDH Piles	930	925.5	18.5	50.0	1	24
Bent 2	WSD	96 inch CIDH Piles	920	918.5	N/A	N/A	1	3
Bent 3i	WSD	96 inch CIDH Piles	918	916.5	N/A	N/A	1	3
<i>Bent 3ii *</i>	<i>WSD</i>	<i>96 inch CIDH Piles</i>	<i>918</i>	<i>916.5</i>	<i>N/A</i>	<i>N/A</i>	<i>1</i>	<i>2</i>
Bent 4	WSD	96 inch CIDH Piles	917	915.5	N/A	N/A	1	3
Abutment 5	WSD	24 inch CIDH Piles	927	925.5	18.5	50.0	1	40
Abutment 5 Retaining Wall	WSD	16 inch CIDH Piles	932	925.5	15	64	1	23

Note: N/A = not applicable

*Alternate design scenario of 2 CIDH piles (provided 11-14-11). This alternative is not shown on the current plans.

Table 8: Foundation Design Loads Provided by Structure Design (Highgrove UP - Shoofly)

Support Location	Design Method	Foundation Type	Design Loads (kips or ksf)					
			Primary Load Combination			Secondary Load Combination		
			Compression	Tension	Shear	Compression	Tension	Shear
Abutment 1	WSD	24 inch CIDH Piles	200 kips	0	35 kips	140 kips	0	45 kips
Bent 2	WSD	96 inch CIDH Piles	1375 kips	0	30 kips	1430 kips	0	1175 kips
Bent 3i	WSD	96 inch CIDH Piles	1605 kips	0	21 kips	1270 kips	0	1140 kips
<i>Bent 3ii *</i>	<i>WSD</i>	<i>96 inch CIDH Piles</i>	<i>2240 kips</i>	<i>0</i>	<i>15 kips</i>	<i>1600 kips</i>	<i>0</i>	<i>1185 kips</i>
Bent 4	WSD	96 inch CIDH Piles	1375 kips	0	30 kips	1430 kips	0	1175 kips
Abutment 5	WSD	24 inch CIDH Piles	200 kips	0	35 kips	140 kips	0	45 kips
Abutment 5 Retaining Wall	WSD	16inch CIDH Piles	140 kips	0	35 kips	140 kips	0	45 kips

Note: *Alternate design scenario of 2 CIDH piles (provided 11-14-11). This alternative is not shown on the current plans.

Table 9: Pile Data Table for Highgrove UP - Shoofly (Br. No. 54-1306)

Location	Pile Type	Required Nominal Resistance (kips)		Design Tip Elevation (feet)	Specified Tip Elevation (feet)
		Compression	Tension		
Abutment 1	24 inch CIDH Piles	400	0	894 (a)	894
Bent 2	96 inch CIDH Piles	2750	0	857 (a)	857
Bent 3i	96 inch CIDH Piles	3210	0	847 (a)	847
<i>Bent 3ii *</i>	<i>96 inch CIDH Piles</i>	<i>4480</i>	<i>0</i>	<i>833 (a)</i>	<i>833</i>
Bent 4	96 inch CIDH Piles	2750	0	845 (a)	845
Abutment 5	24 inch CIDH Piles	400	0	887 (a)	887
Abutment 5 Retaining Wall	16 inch CIDH Piles	280	0	886 (a)	886

Notes: 1) Design tip elevation is controlled by: (a) Compression

*Alternate design scenario of 2 CIDH piles (provided 11-14-11). This alternative is not shown on the current plans.

General Notes

1. All support locations are to be plotted on the Log of Test Borings, in plan view, as stated in "Memos to Designers" 4-2. The plotting of the support locations should be made prior to the foundation review.
2. The structure engineer shall show on the plans, in the pile data table, the minimum pile design tip elevation required to meet the lateral load demands. If the specified pile tip elevation required to meet lateral load demands exceed the specified pile tip elevation given within this report, the Office of Geotechnical Design South 2, Branch B should be contacted for further recommendations.
3. The District engineer shall specify in the special provisions the requirements of Tunnel Safety Orders, for the CIDH shaft work that meets the definition of a tunnel or shaft as described in the Highway Design Manual, Section 110.12 "Tunnel Safety Orders."

Construction Considerations

- *CIDH Piles (Highgrove UP (Replace), Highgrove UP (Shoofly):*

1. Groundwater was encountered during the 2011 field investigation and it is anticipated that the contractor will encounter groundwater during CIDH pile construction. Groundwater levels indicated on the LOTB reflect the measured groundwater levels at the time of the Caltrans investigation. Groundwater surface elevations are subject to seasonal fluctuations and may occur higher or lower depending on the conditions and time of construction. In the groundwater section of this report, Table 1 shows groundwater fluctuations of up to 25 feet between 2002 and 2009 for a number of

borings located near the site. Similar variances in groundwater levels should be anticipated at the proposed site. Refer to groundwater section of this report and the LOTB's for details regarding the groundwater. Detailed quarterly groundwater measurements taken from 6 borings near the site between 2002 and 2009 are available at the State Water Resources Control Board (SWRCB) website (<http://geotracker.waterboards.ca.gov/>).

- Due to the anticipation that concrete placement for the CIDH piles will require slurry displacement methods, the calculated geotechnical capacity of all CIDH piles is based on skin friction only and no end-bearing was considered. For the 24-inch and 16-inch CIDH piles, the skin friction zones used to calculate geotechnical capacity of the CIDH piles are from approximately one diameter below the pile cut-off elevation down to within one pile diameter from the design tip elevation for compression. For the 96-inch CIDH piles, the skin friction zones used to calculate geotechnical capacity of the CIDH piles are from one diameter below the pile cut-off elevation down to within ½ of one pile diameter from the design tip elevation for compression.

Table 10 - CIDH Pile Skin Friction Zone for Highgrove UP (Replace) & Highgrove UP (Shoofly)

Structure	Support Location	Pile Type	Skin Friction Zone - Start Elevation	Skin Friction Zone - End Elevation
Highgrove UP #1, #2, #3	Abutment 1	24-inch CIDH	921	896
Highgrove UP #1, #2, #3	Bent 2	96-inch CIDH	907	826
Highgrove UP #1, #2, #3	Abutment 3	24-inch CIDH	921	889
Highgrove UP Shoofly	Abutment 1	24-inch CIDH	923	896
Highgrove UP Shoofly	Bent 2	96-inch CIDH	910.5	861
Highgrove UP Shoofly	Bent 3i (3 CIDH piles)	96-inch CIDH	908.5	851
<i>Highgrove UP Shoofly</i>	<i>Bent 3ii *</i> <i>(2 CIDH piles)</i>	<i>96-inch CIDH</i>	<i>908.5</i>	<i>837</i>
Highgrove UP Shoofly	Bent 4	96-inch CIDH	907.5	849
Highgrove UP Shoofly	Abutment 5	24-inch CIDH	923	889
Highgrove UP Shoofly	Abutment 5 Retaining Wall	16-inch CIDH	923	888

* Alternate design scenario of 2 CIDH piles. Currently, this alternative is not shown on the latest plans.

3. The contractor should anticipate having to use slurry displacement methods to construct the CIDH piles. Allowable slurries shall consist of mineral or synthetic slurry only. Use of water shall not be allowed.
4. Caving conditions may be encountered during CIDH pile construction due to the very loose to medium dense granular soils or due to gravelly zones and railroad ballast zones described in the geology section of this report and identified in some of the borings shown on the LOTB's. Temporary casing may be necessary to control caving during construction. All temporary casing is to be removed during concrete placement.
5. If the contractor chooses to use slurry to aid in the construction of CIDH piles, care should be exercised while advancing the drilled hole for the piles. Due to the non-cohesive nature of granular soils, rapid insertion and removal of the drilling tools during the drilling process can cause excessive scouring and caving of the walls of the drilled shaft.
6. Difficult drilling conditions may be encountered at elevations where zones of railroad ballast and ties were identified in the "As-Built" LOTB's. Based on aerial photographs from 1938 and 1948, it is possible that railroad roadbed, ballast and ties may be encountered when performing pile excavations near Bent 2 (Highgrove UP – #1, #2 & #3) and Bent 2 & 3 (Highgrove UP – Shoofly). For details refer to the "As-Built" LOTB's and the "Historical Features" section of this report.
7. Near the proposed Bent 4 location of the Highgrove UP (Shoofly), a concrete lined drainage channel flows from the east to west into a double box culvert. The culvert and channel lining are planned to be extended to the east, however, staging of that work is not available at the time of this report. If construction work of the proposed extension occurs during shaft excavation and during times of heavy precipitation, the contractor should be prepared to control near surface groundwater permeating through the granular soils and into the shaft excavations.

The recommendations contained in this report are based on specific project information regarding structure type, location, and design loads that have been provided by the Bridge Design Central, Branch 10. If any conceptual changes are made during final project design, the Office of Geotechnical Design-South 2, Design Branch B should review those changes to determine if these foundation recommendations are still applicable. Any questions regarding the above recommendations should be directed to the attention of Hector Valencia, (916) 227-4555, or Mark DeSalvatore, (916) 227-5391, at the Office of Geotechnical Design-South 2, Branch B.

Prepared by: Date: 12-22-11



Hector Valencia, P.E. Civil # 65257
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Design Branch B



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RE Pending File – HQ, Structures Construction
Shira Rajendra – GS Corporate
Abbas Abghari – OGDS2
Mark DeSalvatore – OGDS2



Memorandum

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To: MR DAN T. ADAMS
Division of Engineering Services
Office of Bridge Design Central
Bridge Design Branch 10

Attention: Mr. Larry Wu

Date: October 3, 2011
File: 08-SBd-215-PM 4.21
08-0M9401
Project No. 0800000506
Santa Ana River Bridge
Br. #54-0471 R/L

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES
OFFICE OF GEOTECHNICAL DESIGN – SOUTH II
DESIGN BRANCH B, MS #5

Subject: Foundation Report

This report presents the foundation recommendations for the proposed widening of the existing Santa Ana River Bridges, Br. No. 54-0471 R/L. The following foundation recommendations are based on information gathered during the recent 2010 subsurface information performed by Office of Geotechnical Design South II, Branch B, as well as “As-Built” Log of Test Borings from previous subsurface investigations at the site. “As-Built” pile driving records from the 1970’s and 1990’s were also reviewed. With regards to the current foundation recommendations, all elevations referenced within this report and shown on the recent Log of Test Boring sheets are based on the NAVD 88 vertical datum, unless otherwise noted. “As-Built” information containing elevation data was updated to the NAVD88 datum by adding 2.3 ft to the NGVD29 datum (per Office of Bridge Design – Central). This Foundation Report supercedes all previous foundation reports developed for the proposed widening of the existing Santa Ana River Bridges, Br. No. 54-0471 R/L.

Project Description

The existing structure site is located near the Colton area in San Bernardino County where Interstate 215 crosses over the Santa Ana River (just north of the I-215/I-10 Separation). At this location, the Santa Ana River Right and Left Bridges presently consist of a divided freeway with three southbound and three northbound lanes. Both bridges are approximately 710 feet long and 52 feet wide. The existing left bridge was originally constructed in 1958 and widened in 1972. It consists of a twelve-span, reinforced concrete T-beam, girder bridge. The existing right bridge was originally constructed in 1972 and also consists of a twelve span, reinforced concrete T-beam, girder bridge. In 1994 & 2003, both structures were earthquake retrofitted extensively utilizing bent foundation retrofit extensions and culvert retrofit extensions.

The proposed project will widen both the left and right bridge by approximately 18 feet and add one lane capacity to each bridge, which will accommodate the additional proposed High Occupancy Vehicles (HOV) lanes associated with the 7.5 mile long Interstate 215 Bi-County

Gap Closure Project. The layout of the proposed widened structure is shown on the Santa Ana River Bridge (Widen), General Plan No. 1 & 2 (dated 9-21-11 & 9-06-11).

Site Geology

The bridge site is located within the Peninsular Range Geomorphic Providence of California. In general, the site is underlain by very young alluvium and wash deposits associated with the Santa Ana River Valley, which were deposited during the late Holocene (Morton & Miller 2006).

The subsurface information provided below is based on the 1954, 1968 and the 2010 subsurface investigations available in the geotechnical bridge files and BIRIS. The 1954 subsurface investigation consisted of 7 rotary borings and 8 penetration borings. The 1968 subsurface investigation consisted of 4 rotary borings and 9 penetration borings. The recent 2010 subsurface investigation consisted of six rotary borings. The 2010 rotary borings were advanced with wireline-punchcore, fully-cased drilling methods with Standard Penetration Tests (SPT) performed every 5 feet. Regarding the recent 2010 investigation, the maximum explored depth was 121.5 ft (Elev. 877.4 ft).

In general, the soil materials at the site can be separated into three units for the purposes of discussion. At the abutment locations only, the upper unit consists of engineered fill which was placed during the 1958 and 1972 construction of the existing right and left bridges and extends down to the original ground shown on the "As-Built" plans. The upper unit consists of medium dense to very dense silty sand, clayey sand and poorly graded sand with scattered layers of gravel and cobbles. This unit extends from the existing ground surface down to approximately Elev. 967 at Abutment 1 and Elev. 975 at Abutment 13. Below the fill, the middle and lower units consist of the Santa Ana River plain deposits. The middle unit consists primarily of variably loose to dense (with local very dense layers) poorly graded and well graded sand with gravel and cobbles with scattered layers of silt, clay and silty sand. The middle unit typically extends from the existing ground surface of the river plain down to a depth of about 25 feet (varying from ~ Elev. 940 near Pier 2 to ~ Elev. 950 at Bent 12). The lower unit consists of very dense, poorly/well-graded sand with gravel and cobbles with thick interbeds of clay and silt. The lower unit extended down to the maximum explored depth of the borings, which was approximately 121.5 feet (Elev. 853.6 ft)

At the time of the investigation, the scattered boulders were exposed at the ground surface of the river plain, however, were not encountered in the borings associated with the 2010 subsurface investigation. Additionally, man-made obstructions consisting of reinforced concrete (near boulder sized) fragments were encountered at and below the ground surface near the existing support locations. For more details, please refer to the Log of Test Borings.

Ground Water

During the 1954 subsurface investigation, ground water was encountered at elevation 936.6 feet in one boring location. During the 1968 subsurface investigation, ground water was measured in several borings and encountered at varying levels varying from elevation 956.3 feet to

elevation 937.5 feet. During the 2010 subsurface investigation, ground water was encountered at levels ranging from elevation 919.3 feet near Abutment 1 to elevation 941.0 near Bent 12.

Ground water surface elevation are subject to seasonal fluctuations and may occur higher or lower depending on the conditions and time of construction. For more details, please refer to the LOTB sheets.

Scour Potential

The Santa Ana River is located in an active, meandering channel with potential for scour during the design life of the structure. Based on a review of the final hydraulic report (dated August 10, 2011), a local pier scour depth of 7.2 feet (Elev. 950.3 ft) and a contraction scour depth of 2.3 ft (Elev. 955.2 ft) was estimated for the proposed structures. For details, please refer to the final hydraulics report prepared by Anthony Nedwick.

Corrosion

Composite soil samples collected from four borings during the 2010 foundation investigation were tested for corrosive potential by the Office of Testing and Technology Services, Corrosive Technology Branch (CTB). A summary of the test results are shown in Table 1.

Table 1 – Corrosion Test Summary

Boring Number	Sample Depth (feet)	SIC Number	Minimum Resistivity (Ohm-Cm)	pH	Chloride Content (ppm)	Sulfate Content (ppm)
Boring RC-10-1	0 – 35	C701526A	4389	8.06	N/A	N/A
Boring RC-10-1	35 – 70	C701526B	10996	8.43	N/A	N/A
Boring RC-10-1	70 – 100	C701526C	1404	8.72	N/A	N/A
Boring RC-10-2	0 – 40	C701526D	10944	8.59	N/A	N/A
Boring RC-10-2	40 – 71.5	C701526E	3171	8.73	N/A	N/A
Boring RC-10-2	71.5 – 95	C701526F	2881	8.77	N/A	N/A
Boring RC-10-3	0 – 30	C701526G	11551	8.18	N/A	N/A
Boring RC-10-3	30 – 55	C701526H	10238	8.94	N/A	N/A
Boring RC-10-3	60 – 65.5	C701526I	1955	8.65	N/A	N/A
Boring RC-10-3	74.5 90.5	C701526J	3656	8.30	N/A	N/A
Boring RC-10-4	0 – 25	C701526K	6071	8.09	N/A	N/A
Boring RC-10-4	25 – 60	C701526L	1864	8.30	N/A	N/A
Boring RC-10-4	60 – 90	C701526M	5417	8.49	N/A	N/A
Boring RC-10-5	23 – 25.7	C701526N	6815	8.22	N/A	N/A
Boring RC-10-16	0 – 40	C701526O	12560	8.62	N/A	N/A
Boring RC-10-6	41.5 – 101.5	C701526P	12650	7.32	N/A	N/A

Caltrans currently defines a corrosive environment as an area where the soil has a minimum resistivity of less than 1000 ohm-cm, and either contains a chloride concentration of 500 ppm or greater, a sulfate concentration of 2000 ppm or greater, or has a pH of 5.5 or less. Based on the current Caltrans Standards, the test results from the samples indicate that the soil at site is not considered corrosive.

Fault Data

The north-end of the bridge site is intersected by the northwest trending San Jacinto Fault Zone (Morton & Miller 2006). A review of the surface fault rupture hazard was developed for this structure and an estimate of 8 feet horizontal (right-lateral) displacement and 1 foot of vertical displacement was estimated. For details, refer the “Review of Fault Rupture Hazard at 215 Bridges” memorandum developed by Martha Merriam and attached to this report.

Seismic Data

The site is potentially subject to ground motions from nearby earthquake sources during the design life of the structure. Seismic design recommendations were provided as a separate memorandum for the proposed widening of the existing structures. For more information, please refer to the Seismic Design Recommendations (dated August 17, 2011) or contact Anhdan Le at 916-227-7211.

“As-Built” Information

The “As-built” bridge records indicate that the existing left bridge was constructed in 1958 and is supported on pile foundations (Steel H-piles and Cast-In-Place Alt “W” piles) at the abutment and bent support locations. The Cast-In-Place, Alt “W” piles used for the 1958 structure consist of hollow, precast reinforced concrete (PC/RC) piles backfilled with class concrete after the piles were installed in the ground.

In 1972, the existing left bridge was widened and the existing right bridge was constructed. All pile foundations for the 1972 left bridge widening and the 1972 right bridge (original construction) consisted of steel “H”-piles.

In 1996, as a part of seismic retrofit project, both the left and right bridges were supplemented with piles (Steel Pipe Piles, Alt “W”) around the perimeter of the existing Piers 10, Bent 11 and Bent 12 support locations.

In 2003, as a part of seismic retrofit project, both the left and right bridges were strengthened with double and single cell culverts placed between the existing support locations. The “As-Built” foundation information for these bridges are listed below in Tables 2- 6.

Table 2 – “As-Built” Pile Data - 1958 Left Bridge (Original Construction)

Support Locations	Pile Type*	Design Load	Pile Cut-Off Elev. (ft)	Avg. Pile Tip Elev. (ft)
Abut 1	Steel H-Piles, 10BP42	45 Tons	999.5**	930.1
Pier 2	Cast-In-Place, Alt "W"	45 Tons	955.4	925.9
Pier 3	Cast-In-Place, Alt "W"	45 Tons	955.4	924.8
Pier 4	Cast-In-Place, Alt "W"	45 Tons	955.4	928.6
Pier 5	Cast-In-Place, Alt "W"	45 Tons	955.4	927.8
Pier 6	Cast-In-Place, Alt "W"	45 Tons	955.4	926.5
Pier 7	Cast-In-Place, Alt "W"	45 Tons	955.4	923.8
Pier 8	Cast-In-Place, Alt "W"	45 Tons	955.4	926.2
Pier 9	Cast-In-Place, Alt "W"	45 Tons	955.4	927.3
Pier 10	Cast-In-Place, Alt "W"	45 Tons	955.4	927.2
Bent 11	Cast-In-Place, Alt "W"	45 Tons	963.4	949.5
Bent 12	Cast-In-Place, Alt "W"	45 Tons	969.4	953.8
Abut 13	Steel H-Piles, 10BP42	45 Tons	998.5**	943.5

* Alt "W" Piles are hollow, PC/RC Pile backfilled with class concrete

** Estimated from 1958 “As-Built” plans

Table 3 – “As-Built” Pile Data - 1972 Left Bridge (Widening)

Support Locations	Pile Type: Steel H-Pile	Design Load	Pile Cut-Off Elev. (ft)	Min. Penet. Elev. (ft)	Avg. Pile Tip Elev. (ft)	Max. Penet. Elev. (ft)
Pier 2*	8H40***	45 Tons	955.4	N / A	928.1	N / A
Pier 3*	8H40***	45 Tons	955.4	N / A	928.3	N / A
Pier 4	8H40***	45 Tons	955.4	929.2	929.3	929.4
Pier 5	8H40***	45 Tons	955.4	928.2	928.2	927.5
Pier 6	8H40***	45 Tons	955.4	929.9	929.3	928.5
Pier 7	8H40***	45 Tons	955.4	928.9	928.6	928.2
Pier 8	8H40***	45 Tons	955.4	929.7	926	920.2
Pier 9	8H40***	45 Tons	955.4	928.9	928.2	927.2
Pier 10**	8H40	45 Tons	955.4	930.4	927.2	923.9
Bent 11**	8H40	45 Tons	963.4	940.0	940.0	940.0
Bent 12**	8H40	45 Tons	969.4	947.4	947.2	946.9
Abut 13	8H40***	45 Tons	989.8	939.8	939.8	939.8

* Only one pile driven at this location, so there is no range to report

** Only two piles driven at this location. Other locations not identified with * or ** had 3 piles driven.

*** Pile driving records indicate that piles were lugged at 10 ft from tip

Table 4 – “As-Built” Pile Data - 1972 Right Bridge (Original Construction)

Support Locations	Pile Type: Steel H-Pile	Design Load	Pile Cut-Off Elev. (ft)	Min. Penet. Elev. (ft)	Avg. Pile Tip Elev. (ft)	Max. Penet. Elev. (ft)
Abut 1	8H40*	45 Tons	991.7 - 992.7	940.0	938.9	932.1
Pier 2	8H40*	45 Tons	954.4	928.3	926.7	922.2
Pier 3	8H40*	45 Tons	954.4	929.0	926.3	907.9
Pier 4	8H40*	45 Tons	954.4	929.6	928.6	927.7
Pier 5	8H40*	45 Tons	954.4	928.3	921.9	907.0
Pier 6	8H40*	45 Tons	953.4	933.2	925.3	914.1
Pier 7	8H40*	45 Tons	953.4	929.1	925.8	918.8
Pier 8	8H40*	45 Tons	954.4	930.9	929.0	927.0
Pier 9	8H40*	45 Tons	954.4	929.7	925.5	917.2
Pier 10	8H40*	45 Tons	952.4	933.9	926.4	899.0
Bent 11	8H40	45 Tons	963.4	942.4	937.0	931.0
Bent 12	8H40	45 Tons	969.4	940.0	938.9	936.9
Abut 13	8H40	45 Tons	988.0 - 987.8	939.2	935.6	933.0

* Driving records indicates that most piles (90+%) at this support location were lugged at 10 ft (+/- 2 ft) from tip

Table 5 - “As-Built” Pile Data - 1996 Left Bridge (Seismic Retrofit)

Support Locations	Pile Type: Steel Pipe Pile	Design Load	Pile Cut-Off Elev. (ft)	Min. Penet. Elev. (ft)	Avg. Pile Tip Elev. (ft)	Max. Penet. Elev. (ft)
Pier 10	Alt. "W"	45 Tons	955.4	916.9	916.3	915.8
Bent 11	Alt. "W"	45 Tons	963.4	931.0	931.0	931.0
Bent 12	Alt. "W"	45 Tons	969.4	938.8	938.5	938.4

Table 6 - “As-Built” Pile Data - 1996 Right Bridge (Seismic Retrofit)

Support Locations	Pile Type: Steel Pipe Pile	Design Load	Pile Cut-Off Elev. (ft)	Min. Penet. Elev. (ft)	Avg. Pile Tip Elev. (ft)	Max. Penet. Elev. (ft)
Pier 10	Alt. "W"	45 Tons	952.4	913.9	913.6	913.0
Bent 11	Alt. "W"	45 Tons	963.4	931.0	931.0	931.0
Bent 12	Alt. "W"	45 Tons	969.4	938.4	938.4	938.4

Foundation Recommendations

The following recommendations are for the proposed widening of the Santa Ana River Bridge (Br. No. 54-0471 R/L) as shown on the General Plan No. 1 & 2 (dated 9-21-11 & 9-06-11, respectively). The recommendations are based on a review of previous subsurface investigations, the available “As-Built” information, the available pile driving records, the 2010

subsurface investigation and foundation design information provided to our office by Structure Design, Branch 10.

Due to variability of soil conditions identified in previous field investigations and variable driving conditions identified in an “As-Built” driving report, driven pre-cast concrete piles are not recommended. CIDH piles are not recommended due to construction issues associated with potential caving soils and minimum pile size requirements for potential ground water conditions. Due to potential variable driving conditions and that there are no tension demands on the piles, steel “H”-Piles with lugs are recommended at all support locations.

The information shown in Table 7 & 8 is based on specific foundation design information provided to our office by Structure Design on October 3, 2011. The design is based on working stress design (WSD) at the abutments and Load Resistance Factored Design (LRFD) at the Pier/Bent locations. Foundation design information and specified pile tip elevations for the abutments and the bent locations are provided in Table 9 & 10, respectively.

Table 7: Foundation and Structure Information Provided by Structure Design

Support Location	Design Method	Pile Type	Finished Grade Elevation (ft)	Pile Cut-off Elevation (ft)	Pile Cap Size (ft)		Permissible Settlement Under Service Load (in)	Number of Piles per Support
					B	L		
Abutment 1 Lt. & Rt. Bridge	WSD	HP 10x57 “H”-Piles	993.1 (L) 995.5 (R)	992.3 (L) 993.9 (R)	N/A	N/A	1 or 2	6
Pier 2 Lt. & Rt. Bridge	LRFD	HP 14x89 “H”-Piles	962.0 (L) 961.0 (R)	957.9 (L) 956.9 (R)	3	20	1 or 2	6
Pier 3 Lt. & Rt. Bridge	LRFD	HP 14x89 “H”-Piles	962.0 (L) 961.0 (R)	957.9 (L) 956.9 (R)	3	20	1 or 2	6
Pier 4 Lt. & Rt. Bridge	LRFD	HP 14x89 “H”-Piles	962.0 (L) 961.0 (R)	957.9 (L) 956.9 (R)	3	20	1 or 2	6
Pier 5 Lt. & Rt. Bridge	LRFD	HP 14x89 “H”-Piles	962.0 (L) 961.0 (R)	957.9 (L) 956.9 (R)	3	20	1 or 2	6
Pier 6 Lt. & Rt. Bridge	LRFD	HP 14x89 “H”-Piles	962.0 (L) 960.0 (R)	957.9 (L) 955.9 (R)	3	20	1 or 2	6
Pier 7 Lt. & Rt. Bridge	LRFD	HP 14x89 “H”-Piles	962.0 (L) 960.0 (R)	957.9 (L) 955.9 (R)	3	20	1 or 2	6
Pier 8 Lt. & Rt. Bridge	LRFD	HP 14x89 “H”-Piles	962.0 (L) 961.0 (R)	957.9 (L) 956.9 (R)	3	20	1 or 2	6
Pier 9 Lt. & Rt. Bridge	LRFD	HP 14x89 “H”-Piles	962.0 (L) 961.0 (R)	957.9 (L) 956.9 (R)	3	37	1 or 2	12
Pier 10 Lt. & Rt. Bridge	LRFD	HP 14x89 “H”-Piles	962.0 (L) 959.0 (R)	957.9 (L) 954.9 (R)	3	32	1 or 2	10
Bent 11 Lt. & Rt. Bridge	LRFD	HP 14x89 “H”-Piles	970.0 (L) 970.0 (R)	965.9 (L) 965.9 (R)	3	28	1 or 2	9
Bent 12 Lt. & Rt. Bridge	LRFD	HP 14x89 “H”-Piles	976.0 (L) 976.0 (R)	971.9 (L) 971.9 (R)	3	23	1 or 2	7
Abutment 13 Lt. & Rt. Bridge	WSD	HP 10x57 “H”-Piles	991.4 (L) 992.0 (R)	990.6 (L) 990.4 (R)	N/A	N/A	1 or 2	6

Table 8: Foundation Design Loads Provided by Structure Design

Support Location	Service 1 Limit State (kips)			Strength Limit State (Controlling Group, kips)				Extreme Limit State (Controlling Group, kips)			
	Total Loads		Permanent Loads	Compression		Tension		Compression		Tension	
	Per Support	Max Per Pile	Per Support	Per Support	Max Per Pile	Per Support	Max Per Pile	Per Support	Max Per Pile	Per Support	Max Per Pile
Abutment 1 Lt. & Rt. Bridge	600	110	280	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pier 2 Lt. & Rt. Bridge	850	N/A	620	1350	250	0	0	635	120	0	0
Pier 3 Lt. & Rt. Bridge	850	N/A	620	1350	250	0	0	635	120	0	0
Pier 4 Lt. & Rt. Bridge	850	N/A	620	1350	250	0	0	635	120	0	0
Pier 5 Lt. & Rt. Bridge	900	N/A	620	1420	250	0	0	725	120	0	0
Pier 6 Lt. & Rt. Bridge	860	N/A	620	1370	250	0	0	635	120	0	0
Pier 7 Lt. & Rt. Bridge	860	N/A	620	1370	250	0	0	635	120	0	0
Pier 8 Lt. & Rt. Bridge	860	N/A	620	1370	250	0	0	645	120	0	0
Pier 9 Lt. & Rt. Bridge	1800	N/A	1300	2800	280	0	0	1260	140	0	0
Pier 10 Lt. & Rt. Bridge	1650	N/A	1080	2460	280	0	0	1150	120	0	0
Bent 11 Lt. & Rt. Bridge	1400	N/A	925	2400	280	0	0	935	120	0	0
Bent 12 Lt. & Rt. Bridge	1200	N/A	700	1900	280	0	0	720	120	0	0
Abutment 13 Lt. & Rt. Bridge	450	100	155	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 9: Foundation Design Recommendations for Abutments 1 and 13

Location	Pile Type	Cut-Off Elevation (ft)	LRFD Service-I Limit State Load per Support		LRFD Service-I Limit State Total Load per Pile – Compression (kips)	Required Nominal Resistance (kips)	Design Tip Elevation (ft)	Specified Tip Elevation (ft)
			Total (kips)	Permanent (kips)				
Abutment 1 Lt. & Rt. Bridge	HP 10x57 "H"-Piles	992.3 (L) 993.9 (R)	600	280	110	220	932.0 (a)	932.0
Abutment 13 Lt. & Rt. Bridge	HP 10x57 "H"-Piles	990.6 (L) 990.4 (R)	450	155	100	200	938.0 (a)	938.0

Note: 1) Design tip elevations are controlled by: (a) Compression

Table 10: Foundation Design Recommendations for Piers/Bents 2-12

Support Location	Pile Type	Cut-Off Elevation (feet)	Service-I Limit State Load per Support (kips)	Total Permissible Support Settlement (in)	Required Nominal Resistance (kips)				Design Tip Elevation (feet)	Specified Tip Elevation (feet)
					Strength Limit		Extreme Event			
					Comp. ($\phi=0.7$)	Tension ($\phi=0.7$)	Comp. ($\phi=1$)	Tension ($\phi=1$)		
Pier 2 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	957.9 (L) 956.9 (R)	850	1.0	360	0	120	0	918.0 (a)	918.0
Pier 3 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	957.9 (L) 956.9 (R)	850	1.0	360	0	120	0	918.0 (a)	918.0
Pier 4 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	957.9 (L) 956.9 (R)	850	1.0	360	0	120	0	918.0 (a)	918.0
Pier 5 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	957.9 (L) 956.9 (R)	900	1.0	360	0	120	0	915.0 (a)	915.0
Pier 6 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	957.9 (L) 955.9 (R)	860	1.0	360	0	120	0	906.0 (a)	906.0
Pier 7 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	957.9 (L) 955.9 (R)	860	1.0	360	0	120	0	906.0 (a)	906.0
Pier 8 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	957.9 (L) 956.9 (R)	860	1.0	360	0	120	0	917.0 (a)	917.0
Pier 9 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	957.9 (L) 956.9 (R)	1800	1.0	400	0	140	0	915.0 (a)	915.0
Pier 10 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	957.9 (L) 954.9 (R)	1650	1.0	400	0	120	0	903.0 (a)	903.0
Bent 11 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	965.9 (L) 965.9 (R)	1400	1.0	400	0	120	0	925.0 (a)	925.0
Bent 12 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	971.9 (L) 971.9 (R)	1200	1.0	400	0	120	0	925.0 (a)	925.0

Note: Design tip elevations are controlled by (a) Compression

The Pile Data Table for all support locations is presented below in Table 11. The ultimate geotechnical pile capacity for the "H" piles will meet or exceed the required nominal resistance in compression.

Table 11: Pile Data Table for Santa Ana River (Lt. & Rt. Bridge) - Widening

Location	Pile Type	Required Nominal Resistance (kips)		Design Tip Elevation (feet)	Specified Tip Elevation (feet)	Nominal Driving Resistance (kips)
		Compression	Tension			
Abutment 1 Lt. & Rt. Bridge	HP 10x57 "H"-Piles	220	0	932.0 (a)	932.0	220
Pier 2 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	360	0	918.0 (a)	918.0	360
Pier 3 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	360	0	918.0 (a)	918.0	360
Pier 4 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	360	0	918.0 (a)	918.0	360
Pier 5 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	360	0	915.0 (a)	915.0	360
Pier 6 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	360	0	906.0 (a)	906.0	360
Pier 7 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	360	0	906.0 (a)	906.0	360
Pier 8 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	360	0	917.0 (a)	917.0	360
Pier 9 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	400	0	915.0 (a)	915.0	400
Pier 10 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	400	0	903.0 (a)	903.0	400
Bent 11 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	400	0	925.0 (a)	925.0	400
Bent 12 Lt. & Rt. Bridge	HP 14x89 "H"-Piles	400	0	925.0 (a)	925.0	400
Abutment 13 Lt. & Rt. Bridge	HP 10x57 "H"-Piles	200	0	938.0 (a)	938.0	200

Notes: 1) Design tip elevations are controlled by: (a) Compression

Construction Considerations

- Groundwater was encountered during the 2010 subsurface investigation and previous foundation investigations. Refer to groundwater section of this report and the LOTB's for details regarding the groundwater. Groundwater levels indicated on the LOTB reflect the measured groundwater levels at the time of the subsurface investigation.
- At all support locations, the support piles shall be driven with lugs installed to aid in achieving the required Nominal Resistance at the specified pile tip elevation. Lug placement, details and installation shall be as specified in the Bridge Construction Records and Procedures Manual, Bridge Construction Memo 130-5.0.
- At Abutments 1 and 13 locations (Left & Right Bridge), pre-drilling through the existing fill material down to the elevation listed in Table 12 will be required prior to driving each "H" pile. All pre-drilling through the existing fill shall be done in accordance with Standard Specification Section 49-1.06 "Pre-drilled Holes". For details regarding the

soils that will need to be excavated to reach the bottom of the pre-drilled elevations shown in Table 12, please refer to the geology section of the report and the Log of Test Boring Sheets.

Table 12: Predrilled Holes for the Santa Ana River Bridge - Widening

Location	Bottom of Predrilled Hole Elevation (ft)
Abutment 1 (Left & Right Bridge)	962
Abutment 13 (Left & Right Bridge)	973

- Pile acceptance is to be based on Standard Specifications 49-1.08, "Bearing Value and Penetration". The recommended pile foundations are designed utilizing both skin friction and end bearing.
- At all support locations, any pile that achieves 1½ times the required nominal resistance in compression, as shown on Table 11, within 5 feet of the specified pile tip elevation, may be considered satisfactory and cut off with written approval from the engineer.

The recommendations contained in this report are based on specific project information regarding structure type, location, and design loads that have been provided by the Bridge Design Central, Branch 10. If any conceptual changes are made during final project design, the Office of Geotechnical Design-South 2, Design Branch B should review those changes to determine if these foundation recommendations are still applicable. Any questions regarding the above recommendations should be directed to the attention of Hector Valencia, (916) 227-4555, or Mark DeSalvatore, (916) 227-5391, at the Office of Geotechnical Design-South 2, Branch B.

Prepared by: Date: 10-03-11

Hector Valencia, R.C.E # 65257
Engineering Geologist
Office of Geotechnical Design-South 2
Design Branch B



cc: Jim Robninson – District 8 Project Manager
Ben Amiri – District 8 Design Manager
Alex Sanchez – District 8 Project Engineer
Bruce Kean – District 8 Materials Engineer
John Stayton – HQ, Specifications and Estimates
RE Pending File – HQ, Structures Construction
Mark Willian – GS Corporate
Abbas Abghari – OGDS2
Mark DeSalvatore – OGDS2
Erich Neupert – OGDS2

Memorandum

*Flex your power!
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To: MR DAN T. ADAMS
Division of Engineering Services
Office of Bridge Design Central
Bridge Design Branch 10

Attention: Mr. Larry Wu

Date: December 15, 2011
File: 08-SBd-215-PM 4.21
08-0M9401
Project No. 0800000506
Santa Ana River Bridge
Br. #54-0471 R/L

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES
OFFICE OF GEOTECHNICAL DESIGN – SOUTH 2
DESIGN BRANCH B, MS #5

Subject: Supplemental Foundation Report

This report presents supplemental foundation recommendations for the proposed widening of the existing Santa Ana River Bridges, Br. No. 54-0471 R/L. The sole purpose of this report is to provide one additional construction consideration which was not included in the “original” foundation report (dated 10-3-11). All other foundation recommendations and construction considerations contained in the “original” foundation report (dated 10-3-11) are still applicable.

Supplemental Construction Consideration

- At all support locations, the contractor should anticipate hard and erratic driving due to the presence of variable loose to very dense sand, gravel and cobbles described in the geology section of the “original” foundation report (dated 10-3-11) and shown in the Log of Test Boring sheets. Field splicing and cutting off of steel piling should be anticipated due to these variations in the subsurface conditions.

The recommendations contained in this report are based on specific project information regarding structure type, location, and design loads that have been provided by the Bridge Design Central, Branch 10. If any conceptual changes are made during final project design, the Office of Geotechnical Design-South 2, Design Branch B should review those changes to determine if these foundation recommendations are still applicable.

Any questions regarding the above recommendations should be directed to the attention of Hector Valencia, (916) 227-4555, or Mark DeSalvatore, (916) 227-5391, at the Office of Geotechnical Design-South 2, Branch B.

Prepared by: Date: 12-15-11



Hector Valencia, R.C.E # 65257
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Office of Geotechnical Design-South 2
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cc: Jim Robninson – District 8 Project Manager
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Angel Perez-Cobo – OGDS2 *APC*
Mark DeSalvatore – OGDS2

Memorandum

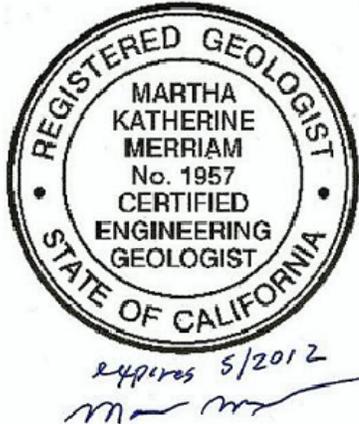
*Flex your power!
Be energy efficient!*

To: **MAHMOUD KHOJASTEH
GEOTECHNICAL DESIGN SOUTH - II**

Date: July 1, 2010

File: 08-SBd-215
PM 0.6-4.21

EA: 08-0M9400



Santa Ana River Bridges
(54-0471 R/L)
Colton-Loma Linda Yard OHs
(54-0482 R/L)
Interstate 215/10 Separation
(54-0479 R/L)
Highgrove UP (54-0518)
Grand Terrace UP (54-0519)

From: **MARTHA MERRIAM, CEG #1957
GEOTECHNICAL SUPPORT**

Subject: Review of Fault Rupture Hazard at 215 Bridges

In response to your request, I have evaluated the potential for surface fault rupture at eight bridges on Rte 215 in San Bernardino County. Where necessary, I have estimated expected displacement and where the particular bridge must be designed for displacement. Findings are summarized here and further discussed below.

Summary

The nearest faults to all eight bridges are segments of the San Jacinto fault zone, San Bernardino section, all considered Caltrans-active. The San Jacinto fault zone is a major strike-slip fault with frequent moderate to large earthquakes. The main fault zone trends about 60N and is assumed vertical with a MMax of 7.5 and a slip rate in the San Bernardino Valley of as much as 12 mm/yr (UCERF, 2008).

The Santa Ana River bridges (54-0471 L/R) are crossed by the main trace and must be designed for 8 ft of right-lateral displacement and 1 ft of vertical displacement in all areas shown as within the 300 ft-wide "expected fault rupture zone" (Figure 4).

MAHMOUD KHOJASTEH

July 1, 2010

Page 2

The Colton-Loma Linda Yard overheads (54-0482 L/R) are crossed by shorter normal faults also included in the San Jacinto fault zone that are oriented 68NW and dip 35-65NE. The Colton-Loma Linda Yard OHs must be designed for a foot of vertical displacement (northeast side down) occurring anywhere beneath the bridges. Please see figures for fault orientation with respect to these bridges.

Interstate 210/10 Separation bridges (54-0479 L/R) are 900 ft or more from the fault zone and will not be impacted by surface rupture.

Highgrove UP (54-0518) and Grand Terrace UP (54-0519) are more than 2 miles from the fault zone and will not be impacted by surface rupture.

Grand Terrace UP (54-0519) is more than 2 miles from the fault zone and will not be impacted by surface rupture.

Discussion

Highgrove UP (54-0518)

Please see Figure 1 for location of this structure with respect to the San Jacinto fault, San Bernardino section, Rialto-Colton fault. Highgrove UP is 2.3 miles south of the fault; and therefore is not crossed by an active fault and has no displacement design requirements.

Grand Terrace UP (54-0519)

Please see Figure 1 for location of this structure with respect to the San Jacinto fault, San Bernardino section, Rialto-Colton fault. Grand Terrace UP is 2.2 miles south of the fault, and therefore is not crossed by an active fault and has no displacement design requirements.

Interstate 215/10 Separation Bridges (54-0479 R/L)

Please see Figures 2 and 3 for location of these structures with respect to the San Jacinto fault, San Bernardino section, San Jacinto fault. The left structure is 1,000 ft west of the nearest mapped fault trace; the right structure is 900 feet west of the trace. Additionally, geophysical surveys conducted in the Santa Ana River do not suggest faulting beneath these bridges (Stephenson et al, 2002; Catchings et al, 2008). Therefore, these bridges have no displacement design requirements.

Santa Ana River Bridges (54-0471 R/L)

Please see Figures 2 and 3 for location of these structures with respect to the San Jacinto fault, San Bernardino section, San Jacinto fault. Both structures are crossed by the main trace of the fault. Figure 4 shows a 300 ft wide fault zone where the bridges must be designed for fault displacement. This width is primarily based on work done by Knott (1991) which included review of numerous consultant reports and trenching.

In 1991, expected displacement at nearby bridge 54-0823G was estimated at 2.5 m horizontal and 0.25 m vertical and those values were used for design. I reviewed those values for use at this time. My review consisted of evaluating research and methodologies developed since the earlier estimate was developed. Trenches excavated 1/2 mile southeast of the Santa Ana bridges (Wesnousky et al 1991) revealed 11.5 ft of displacement on the main fault trace during an unknown number of Holocene (last 11,000 yrs) events. Trenches excavated 2 miles northwest of these bridges by Fumal and Kendrick (2008) revealed a recurrence interval for “large” earthquakes of 270 years (three events in 800 years). So the displacement observed by Wesnousky et al (1991) probably occurred during several events. No attempt was made to quantify individual events in these investigations, so we need to use empirical relationships to estimate median displacement.

Using Wells and Coppersmith (1994), 8.5 ft of net displacement is estimated. I recommend the Santa Ana River bridges be designed for 8 ft horizontal and 1 ft vertical displacement per the Wells and Coppersmith values and the earlier recommendations. Location of the fault zone where this displacement might occur is as shown in Figure 4.

Colton-Loma Linda Yard Overheads (54-0482 R/L)

Please see Figures 2 and 3 for location of these structures with respect to the San Jacinto fault, San Bernardino section, San Jacinto fault, southern or secondary (?) segment. Both

structures are crossed by the fault and must be designed for fault displacement. A literature review (EMI, 2010, Leighton and Associates Inc., 1978) and examination of historic air photos (Caltrans 1954, 1962, 1964) failed to reveal more detail regarding location of the fault trace, with the nearest mapped trace being located ½ mile to the west. The fault must be assumed at this time to cross anywhere beneath these bridges.

The fault trace is shown on the EFZ map as concealed with additional uncertainty (Figure 2). A half mile west of the structures, three surface traces are shown on the map which actually are representative of a zone of many small faults encountered during a DWR study for a new pipeline (EMI, 2010). These fault traces do not appear on the current San Bernardino 30x60 Sheet (Morton and Miller, 2006) and have not been studied as extensively as those which underlie the Santa Ana River bridges, and may be secondary to the main San Jacinto fault trace.

Previous work on these traces includes a 1978 AP study conducted for a development subdivision, the DWR study, and a recent study for fault rupture potential at Warm Creek Bridges (Figure 5). The trench completed for the subdivision was located across a possible eastern extent of the fault, and did not detect faulting at depths up to 12 to 16 ft. While these results are encouraging, the depth may not have been sufficient to encounter the fault. The DWR investigation, cited in EMI, 2010, and the EMI, 2010 work indicate that the fault traces west of the overheads comprise a zone of normal faults dipping from 35-65NE and up to 300 ft wide. An earlier EMI study referenced in EMI, 2010 and Jerry Treiman (p.c.) of the CGS included trenching just south of the trace near Cooley Lane which revealed principally rootless liquefaction-related shears.

Seismic reflection surveys carried out by the USGS (Gandhok et al 2003) imaged the Rialto-Colton fault as a 1-km wide zone of small-offset faults with no single large offset imaged among any of the seismic profiles which extended to depths of at least 800 m. EMI (2010) interprets the fault trace beneath the overheads as a cross fault between the San Jacinto and Rialto-Colton faults. If the fault trace is a cross fault, its length would be about 2 miles. Other work (Stephenson et al, 2002; Catchings et al, 2008) support the idea that the fault attaches to the San Jacinto or Rialto-Colton fault at a depth of 2-3 miles and suggest the fault is recently active because of near-surface traces detected in geophysical surveys. Anderson and others (2004) interpret the fault trace (or part of the Rialto-Colton fault) as the western edge of a graben structure with a fault length of about 7 miles, and consider the Rialto-Colton fault an older strand of the San Jacinto fault.

If we assume an active fault length of 7 miles and apply Wells and Coppersmith (1994), the estimated displacement is 2/3 ft on a 65NE-dipping fault plane, east side down. I

recommend that one foot of displacement oriented vertically (northeast side down) be used for design. As noted above, this displacement must be assumed to occur anywhere beneath these bridges.

Additional Work

No additional work is required for Highgrove UP, Grand Terrace UP, or the I215/10 Separation bridges. Design requirements for the Santa Ana River bridges and Colton-Loma Linda Yard OHs could be modified with additional work briefly described below.

Santa Ana River bridges - A different amount of displacement (likely smaller) might be estimated if more trenching were performed within a km of these bridges with the goal in mind of estimating displacement per event. However, given that the San Jacinto fault is arguably the most active fault in southern California, results obtained might not be conservative given the return period for “large” earthquakes of a few hundred years (Fumal and Kendrick, 2008). Fumal and Kendrick have also noted that the San Jacinto fault width in this area is about 30 ft. More trenching might be carried out near Bridge 54-821F or E Street as was recommended by Knox (1991) to refine the 300’ fault width required here. Unless this refinement is warranted, no further work is needed.

Colton-Loma Linda Yard Overheads – It is possible that the displacement estimated for these structures could be localized through further work. The foundation boring program to be carried out later this year may add information regarding location of the fault traces, in particular changes in ground water levels across the fault which is often associated with faulting. Passive shear wave velocity surveys (ReMi or refraction microtremor profiling which employs ambient noise) and/or trenching could also be used to refine the location and perhaps get a better estimate of the amount of displacement expected. This area is of particular interest to researchers at this time, and we would likely get participation in any studies from the scientific community as well.

I recommend submitting values outlined in the *Summary* to the designer and find out if any further work as outlined above for the Colton-Loma Linda Yard overheads would be worth undertaking. If so I would be happy to write up a work plan.

MAHMOUD KHOJASTEH
July 1, 2010
Page 6

Please let me know if you have further questions or comments.

Martha Merriam

c: Gem-Yeu Ma
Mark Yashinsky
Hector Valencia

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MAHMOUD KHOJASTEH

July 1, 2010

Page 8

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Figure 1. Location map for Highgrove and Grand Terrace UPs. Other structures evaluated are shown in red here and in more detail in Figures 2-5. The Rialto-Colton, San Jacinto, and Loma Linda faults are all part of the San Jacinto fault zone, San Bernardino section and considered Caltrans-active. Only the San Jacinto fault is within a regulatory Earthquake (AP) fault zone.

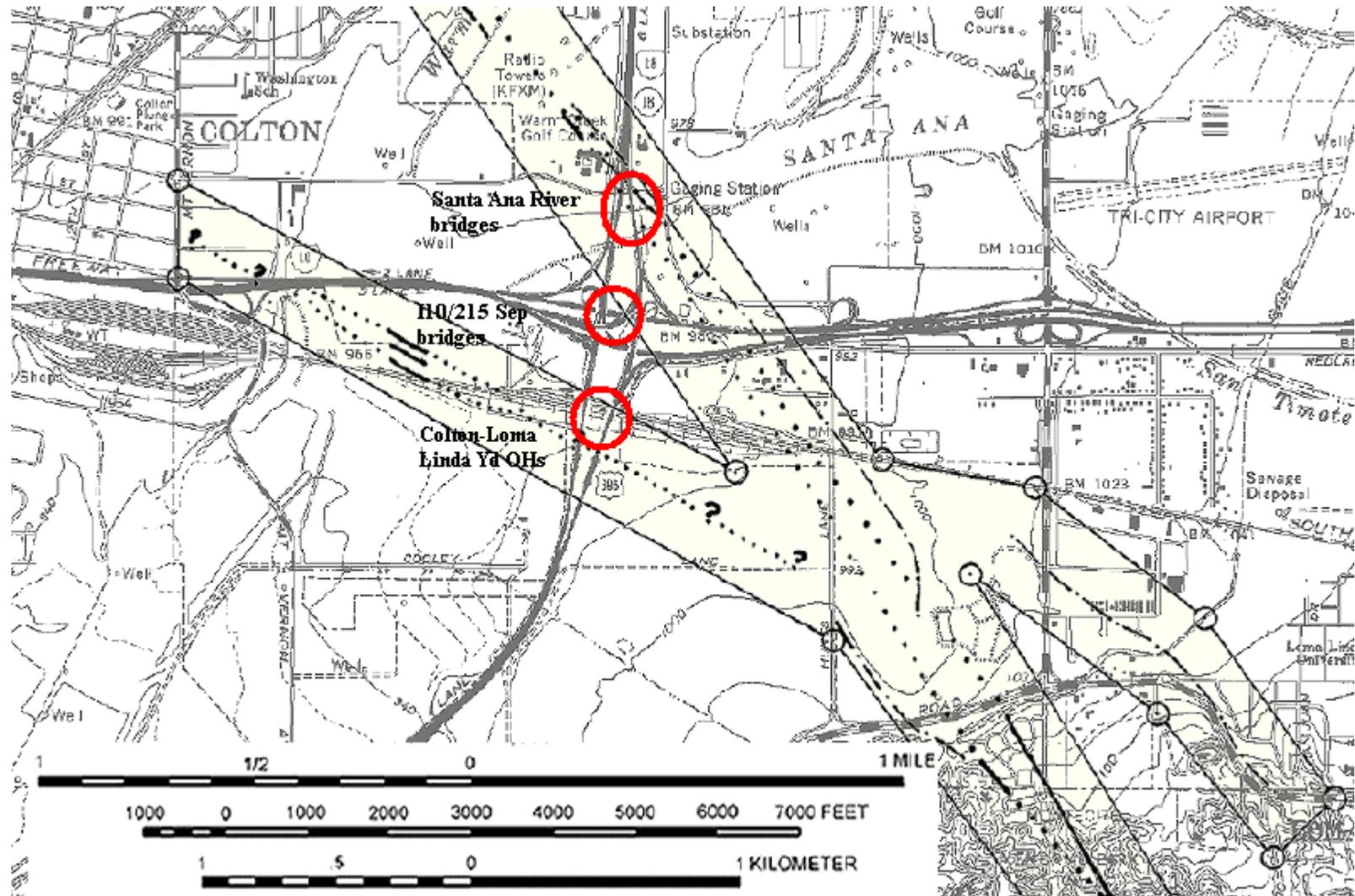


Figure 2. 1977 EFZ Map San Bernardino South quad. Fault through overheads is shown as dotted and queried, meaning the fault is concealed and has additional uncertainty in the mapped location.

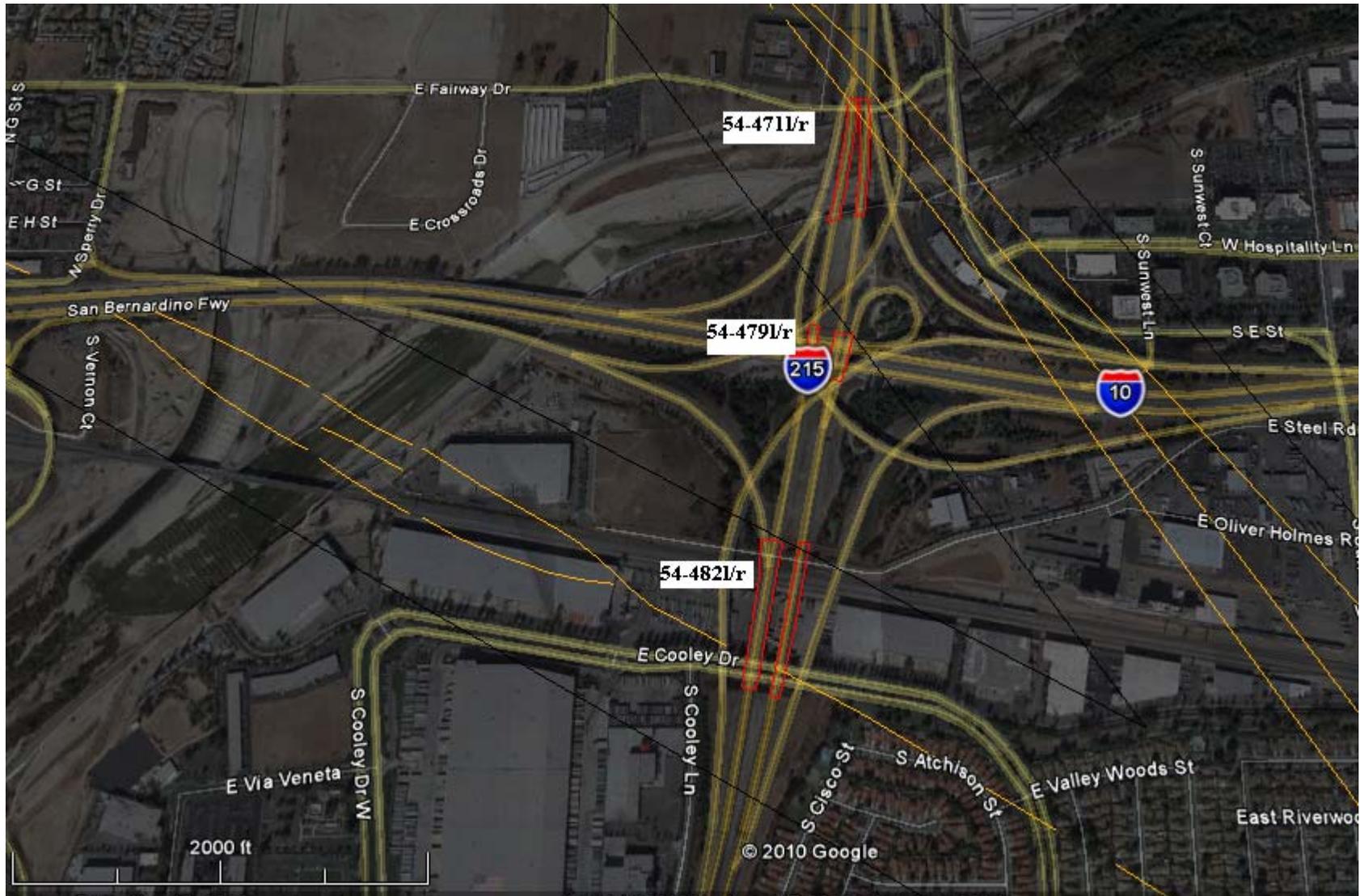


Figure 3. Location of Colton-Loma Linda Yard UPs, I10/215 Separation bridges, and Santa Ana River bridges. AP EFZs are thin black lines subparallel to faults. Fault locations from USGS (2009; original source was CGS, 1977).

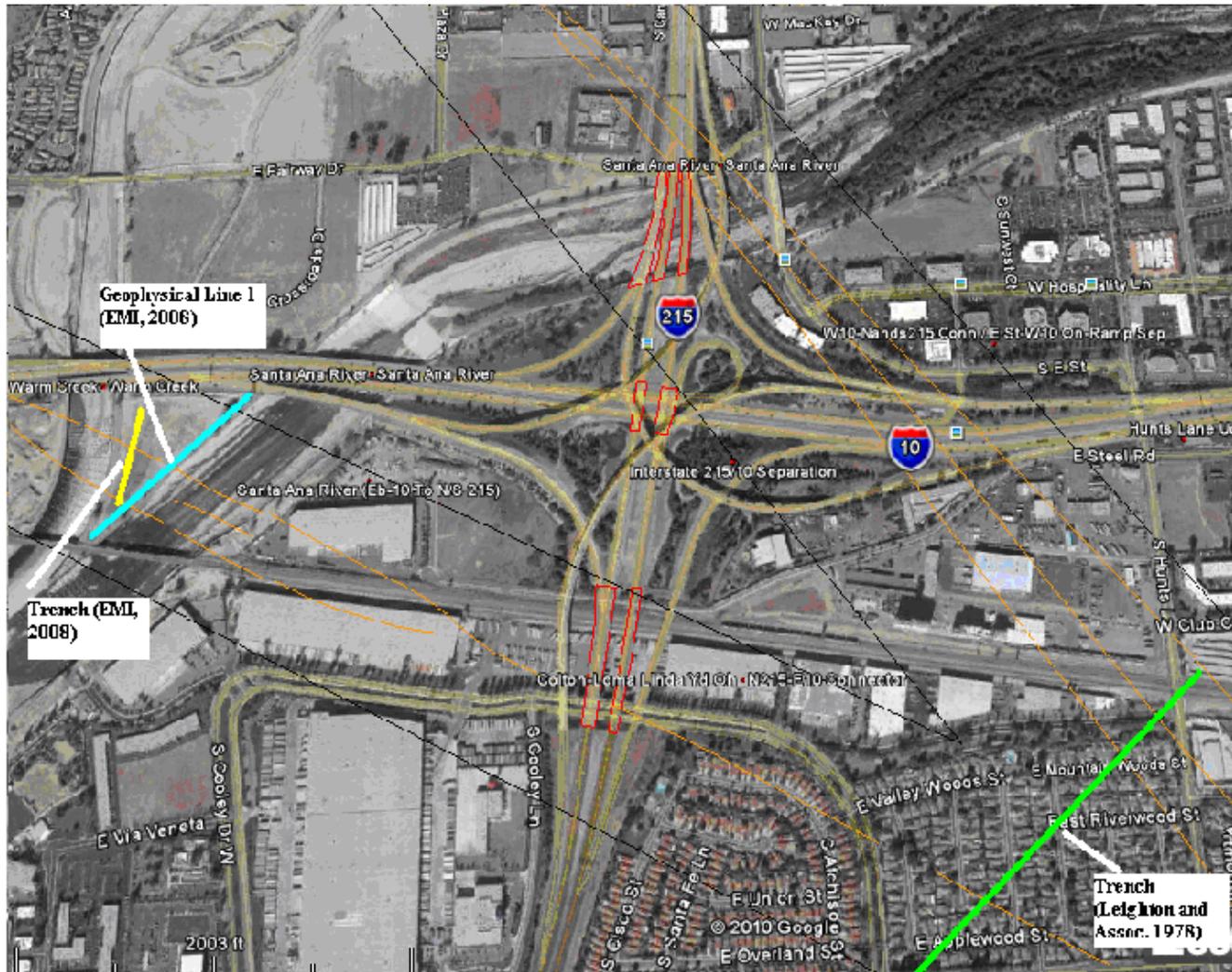


Figure 5. Locations of previous investigations near Colton-Loma Linda Yard OHs..

Memorandum

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To: MR DAN T. ADAMS Division of
Engineering Services Office of Bridge Design
Central Bridge Design Branch 10

Attention: Mr. Larry Wu

Date: October 10, 2011
File: 08-SBd-215-PM 3.72
08-0M9400
Project No. 0800000506
Colton – Loma Linda
Yard OH (Widen)
Br. #54-0482 L/R

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Geotechnical Services
Office of Geotechnical Design – South 2 MS #5
Design Branch B

Subject: Foundation Report for Colton-Loma Linda Yard OH (Widen)

This report presents the foundation recommendations for the proposed center widening for Colton – Loma Linda Yard OH, Left and Right Bridges (#54-0482L/R) and supersedes all previously generated Preliminary Foundation Reports for these structures. The Colton-Loma Linda Yard OH bridge widening is being designed by the Office of Bridge Design Branch 10 which has provided the Office of Geotechnical Design, South-2 the design information used in this report to provide foundation recommendations. With regards to the current foundation recommendations, all elevations referenced within this report and shown on the recent Log of Test Boring (LOTB) sheets are based on the NAVD 88 vertical datum, unless otherwise noted. “As-Built” elevations were converted to the current NAVD 88 datum by adding 2.0 ft (left bridge) and 2.14 ft (right bridge) to the existing NGVD 29 datum (per Office of Bridge Design 10).

Project Description

The existing structure site is located near the Colton area in San Bernardino County where Interstate 215 crosses over the Union Pacific Railroad (just south of I-215/I-10 Separation). At this location, the Colton – Loma Linda Yard OH, right and left bridges presently consist of a divided freeway with four southbound and three northbound lanes. The left and right existing bridges consist of six-span, steel I-girder bridges supported on pile foundations except for the Abutment 7 location of the left bridge which is supported on a spread footing foundation. The left bridge was originally constructed in 1959 and later widened in 1972. Construction of the current right bridge was completed in 1973. In 1996, the right and left bridges were both seismically retrofitted.

The proposed project will consist of a center widening of the present left and right bridges by approximately 17.5 feet. One lane will be added to each bridge, which will accommodate the additional proposed High Occupancy Vehicle (HOV) lanes associated with the 7.5 mile long 215 Gap Closure Project. The proposed bridge widening is shown for each structure on the Colton-Loma Linda OH Right (Widen) General Plan (printed on 4/29/11), and Colton-Loma Linda OH Left (Widen) General Plan (printed on 9/1/11).

Geology

The bridge site is located within the Peninsular Range Geomorphic Providence of California. Base on the Geologic Map of the San Bernardino and Santa Ana 30' x 60' quadrangles (Morton & Miller 2006), the site is underlain by Holocene alluvial-valley deposits.

“As-Built” information shows that a 1957 subsurface investigation was performed at the site which consisted of six rotary borings and five penetration borings. In 1968, an additional subsurface investigation was performed which consisted of three rotary borings and six penetration borings. In general, the “As-Built” LOTBs show the underlying soil materials at the site can be separated into three units. The upper unit consists mainly of loose to medium dense silty sands with scattered layers of sandy silts, gravelly sands, gravel and clayey silts. This upper unit extends from the ground surface (~ Elev. 967 feet) to a depth of about 15 feet (~ Elev. 952 feet). Below this zone, the middle unit consists mainly of medium dense to dense silty sands and sandy silts (with localized very dense zones) and extends to a depth of approximately 35 ft (~ Elev. 932 feet). The lowermost unit consists of dense to very dense gravelly sands and sandy gravels with isolated sandy silt and gravel. This unit extends to the maximum explored depth of the borings, which is approximately 60 feet below the existing ground surface (~Elev. 912 feet).

In 2010 a subsurface investigation was performed at the site which consisted of two mud rotary soil borings; one borehole drilled in the freeway median between left and right bridges, near Abutments 1 and 7. Those borings revealed that 28 feet and 38 feet of embankment fill material is present at Abutments 1 and 7, respectively. The fill embankment material consisted mainly of dense to very dense poorly-graded sands with silt and gravel, with a few layers of silty sand and poorly-graded gravels to approximate Elev. 966.0 feet. Below the fill material, loose silt with sand and poorly-graded sand were encountered to approximate Elev. 957.0 feet. Then, medium dense to very dense silts, well-graded and poorly-graded sand and gravel were encountered to the maximum explored depth of 121.5 ft (Elevation 873.1 feet). Due to an access issue related to obtaining a right-of-entry permit, no borings were drilled at the bent locations for the structures. As a result, “As-Built” borings were used to characterize the subsurface conditions at the bent locations. For more details, please refer to the LOTB sheets.

Ground Water

Ground water was encountered at the site in the 1957, 1968 and 2010 subsurface investigations. Recorded ground water information from the 1957, 1968, and 2010 subsurface investigations is presented in Table 1, below. For borehole specific ground water elevation, refer to the Log of Test Borings.

Table 1 – Ground Water Elevations

Subsurface Investigation	Elevation (ft)
1957	937.6 to 944.8
1966 -1968	919.9 to 941.9
2010	899.2 to 902.3

Ground water levels indicated in this report and shown on the LOTB sheets reflect the measured ground water level in the borehole on the specified date. Ground water surface elevations are subject to seasonal fluctuations and will be encountered at higher or lower elevations depending on seasonal conditions.

Scour Potential

The bridges do not span a waterway, therefore scour is not considered an issue.

Corrosion

Composite soil samples were collected from borings RC-10-01 and RC-10-02 during the 2010 foundation investigation and were tested for corrosive potential by the Office of Testing and Technology Services, Corrosive Technology Branch. Based on the current Caltrans’ Standards, the composite samples are not considered corrosive. For specific test results, please refer to Table 2.

Table 2 – Corrosion Test Summary

Location	pH	Minimum Resistivity (Ohm-Cm)	Sulfate Content (ppm)	Chloride Content (ppm)
Boring RC-10-01 (Elev. 959.6 to 949.6 ft)	7.55	3451	---	---
Boring RC-10-01 (Elev. 939.6 to 938.1 ft)	7.98	2494	---	---
Boring RC-10-01 (Elev. 938.1 to 936.6 ft)	7.96	844	219	11
Boring RC-10-01 (Elev. 936.6 to 919.6 ft)	8.22	1800	---	---
Boring RC-10-01 (Elev. 899.6 to 889.6 ft)	8.52	16450	---	---
Boring RC-10-01 (Elev. 884.6 to 874.6 ft)	8.24	1130	32	7.6
Boring RC-10-02 (Elev. 1002.9 to 967.9 ft)	8.25	9975	---	---
Boring RC-10-02 (Elev. 967.9 to 966.4 ft)	6.65	7355	---	---
Boring RC-10-02 (Elev. 966.4 to 962.9 ft)	7.74	2808	---	---
Boring RC-10-02 (Elev. 962.9 to 961.4 ft)	8.09	2355	---	---
Boring RC-10-02 (Elev. 957.9 to 956.4 ft)	8.53	7889	---	---
Boring RC-10-02 (Elev. 952.9 to 951.4 ft)	8.18	1431	---	---
Boring RC-10-02 (Elev. 951.4 to 916.4 ft)	8.94	10030	---	---
Boring RC-10-02 (Elev. 916.4 to 902.9 ft)	8.70	15470	---	---

Note: Caltrans currently defines a corrosive environment as an area where the soil has either a chloride concentration of 500 ppm or greater, a sulfate concentration of 2000 ppm or greater, or has a pH of 5.5 or less. With the exception of MSE walls, soil and water are not tested for chlorides and sulfates if the minimum resistivity is greater than 1,000 ohm-cm.

Fault and Seismic Data

The structure site is potentially subject to ground motions from nearby earthquake sources and is located between two branches of the San Jacinto Fault Zones. The bridge is situated approximately 0.3 miles (0.4 km) from the San Bernardino section (Fault ID 230, $M_{\max}=7.5$, strike-slip, dip 90°) and is capable of generating a Peak Ground Acceleration (PGA) of 0.5g.

Seismic design recommendations were provided as separate memorandum for the proposed widening of the existing structures. For more information, please refer to the memorandum concerning Seismic Design Recommendations (dated August 17, 2011), by Anhdan Le (916-227-7211) of the Office of Geotechnical Design South 2.

A review of the surface fault rupture hazard was developed for this structure and an estimate of 1 foot of vertical displacement (northeast side down) was estimated. For details, refer to the "Review of Fault Rupture Hazard at 215 Bridges" memorandum developed by Martha Merriam, dated July 10, 2010.

Liquefaction Potential

The Seismic Design Recommendations memorandum, dated August 17, 2011, states that due to the loose to very dense nature of the underlying silty sands and sandy silts and the deep ground water elevation, the potential for soil liquefaction due to strong ground shaking is considered low at the proposed bridge site.

"As-Built" Information

The Colton – Loma Linda Yard OH, right and left bridges presently consist of a divided freeway with four southbound and three northbound lanes. The left bridge is approximately 749 feet long and varies from about 78 feet to 113 feet wide. It consists of a six-span, steel I-girder structure supported on pile foundations at Abutment 1 and Bents 2 through 6 support locations. Abutment 7 is supported on a spread footing. The left bridge was originally constructed in 1959 and later widened in 1973. In 1994, the bridge was seismically retrofitted.

Abutment 1, and Bent 2 through Bent 6, are supported on Raymond Step Taper driven piles, with a design load of 45 Tons. The 1959 "As-Built" LOTB, provided some pile driving information, which included the minimum, average and maximum pile tip elevations for the above mentioned structure support locations. Pile cutoff elevations were estimated from the bottom of pile cap elevations listed on the "As-Built" LOTB. The 1959 "As-Built" LOTB also provided the Abut 7, bottom of footing elevation of 986.5 feet. Table 3, below, provides a summary of the 1959 "As-Built" Data for the Left Bridge.

Table 3 - "As-Built" Pile Data - 1959 Left Bridge (#54-0482L)

Support Location	Foundation Type*	Gross All Bearing Capacity/ Design Load	Pile Cut-Off / Bottom of Footing Elev. (ft)	Max. Pile Tip Elev. (ft)**	Avg. Pile Tip Elev. (ft)**	Min. Pile Tip Elev. (ft)**
Abut 1	Raymond Step Taper	45 Ton	983.8	956.0	953.5	951.5
Bent 2	Raymond Step Taper	45 Ton	960.8	948.5	945.0	940.5
Bent 3	Raymond Step Taper	45 Ton	958.3	946.5	945.5	945.0
Bent 4	Raymond Step Taper	45 Ton	957.3	950.5	945.0	938.0
Bent 5	Raymond Step Taper	45 Ton	957.3	947.0	945.0	942.5
Bent 6	Raymond Step Taper	45 Ton	961.3	947.5	943.5	939.0
Abut 7	Spread Footing	2.0 Tsf	986.5	NA	N/A	N/A

Notes: * Raymond Step Taper piles dimensions consist of a tip = 8 inches; butt = 15.5 inches.
 ** Elevations were scaled from 1959 "As-Built" LOTB and converted to the NAVD 88 datum.
 N/A: Not Applicable.

Construction of the left bridge widening was completed in 1973 and consisted of adding both an inside and outside lane to the existing bridge. All support locations for the widening are supported on 70 ton, 12-inch square, precast/prestressed concrete piles except for the Abutment 7 location, which is supported on a spread footing. The 1973 "As-Built" LOTB, provided partial pile driving information, which included the minimum, average and maximum pile tip elevations for the some of the above mentioned structure support locations. Pile cutoff elevations were estimated from the bottom of pile cap elevations listed on the "As-Built" Foundation Plan. The 1973 "As-Built" plans also provided the Abutment 7, bottom of footing elevations. Table 4, below, provides a summary of the 1973 "As-Built" Data for the Left Bridge.

Table 4 - "As-Built" Pile Data - 1973 Left Bridge (#54-0482L) (Widen)

Support Location	Foundation Type	Gross All. Bearing Capacity/ Design Load	Pile Cut-Off / Bottom of Footing Elev. (ft)	Max. Pile Tip Elev. (ft)	Avg. Pile Tip Elev. (ft)	Min. Pile Tip Elev. (ft)
Abut 1	12" Concrete	70 Ton	983.8 (typical)	Not Available	942.6	Not Available
Bent 2	12" Concrete	70 Ton	960.8 (typical)	Not Available	939.3	Not Available
Bent 3	12" Concrete	70 Ton	958.0 – 957.3	938.5	938.5	938.5
Bent 4	12" Concrete	70 Ton	957.0 – 956.3	938.6	938.6	938.6
Bent 5	12" Concrete	70 Ton	956.3 – 957.3	Not Available	939.0	Not Available
Bent 6	12" Concrete	70 Ton	960.8 – 961.3	Not Available	939.5	Not Available
Abut 7	Spread Footing	2.0 Tsf	986.5	Not Available	Not Available	Not Available

Notes: Elevations were scaled from 1959 "As-Built" LOTB and converted to the NAVD 88 datum.

The Colton – Loma Linda Yard OH Right Bridge was completed in 1973 and allowed the northbound traffic lanes to be re-aligned to its current location. The right bridge is approximately 749 feet long and 59 feet wide, and consists of a six-span, steel I-girder bridge structure supported on pile foundations at all support locations. In 1994, the bridge was seismically retrofitted.

Abutments 1 and 7, and Bents 2 through 6 of the right bridge are supported on driven 70 ton, 12-inch square, precast/prestressed concrete piles. The 1973 “As-Built” LOTB, provided partial pile driving information, which included the minimum, average and maximum pile tip elevations for the some of the above mentioned structure support locations. Pile cutoff elevations were estimated from the bottom of pile cap elevations listed on the “As-Built” Foundation Plan. Table 5, below, provides a summary of the 1973 “As-Built” Data for the right bridge.

Table 5 - “As-Built” Pile Data - 1973 Right Bridge (#54-0482R)

Support Location	Foundation Type	Design Load	Pile Cut-Off Elev. (ft)	Max. Pile Tip Elev. (ft)	Avg. Pile Tip Elev. (ft)	Min. Pile Tip Elev. (ft)
Abut 1	12” Concrete	70 Ton	Not Available	Not Available	940.5	Not Available
Bent 2	12” Concrete	70 Ton	958.6	Not Available	939.9	Not Available
Bent 3	12” Concrete	70 Ton	958.1	Not Available	936.9	Not Available
Bent 4	12” Concrete	70 Ton	958.1	929.4	929.4	929.4
Bent 5	12” Concrete	70 Ton	959.6	Not Available	939.1	Not Available
Bent 6	12” Concrete	70 Ton	960.6	Not Available	939.4	Not Available
Abut 7	12” Concrete	70 Ton	Not Available	944.6	940.6	939.6

Notes: Elevations were scaled from 1959 “As-Built” LOTB and converted to the NAVD 88 datum.

The bridge file also contained a memorandum titled “Field Report of Foundation Conditions” (dated 5/2/73) for the 1973 left and right structures. It indicated that at Bents 3, 5 and 6 jetting was needed to obtain the required pile tip elevation. The 1973 “As-Built” LOTB also indicated that prior to driving piles at the abutment locations, pre-drilling down to the original ground elevation was used to facilitate driving.

In 1997, as a part of a seismic retrofit project, both the left and right bridges were strengthened with a variety of retrofit strategies, which included adding restrainers, shear keys, column and footing enhancements at various support locations. With regards to footing retrofits, only two supports were fortified at each bridge location. At the existing left bridge, Bents 2 and 6 support locations, 70 ton Alt. “W” piles were installed around the perimeter of the existing pile footing. At the existing right bridge, Bents 5 and 6 support locations, 70 ton Alt. “W” piles were installed around the perimeter of the existing pile footing. The “As-Built” pile data for the retrofit of these bridges is listed below in Tables 6 and 7.

Table 6 - “As-Built” Pile Data - 1997 Left Bridge (#54-0482L) (Retrofit)

Support Location	Pile Type	Design Load	Specified Pile Tip Elev. (ft)
Bent 2	Steel Pipe (Alt “W”)	70 Ton	912.0
Bent 6	Steel Pipe (Alt “W”)	70 Ton	912.0

Table 7 - “As-Built” Pile Data - 1997 Right Bridge (#54-0482R) (Retrofit)

Support Location	Pile Type	Design Load	Specified Pile Tip Elev. (ft)
Bent 5	Steel Pipe (Alt “W”)	70 Ton	911.5
Bent 6	Steel Pipe (Alt “W”)	70 Ton	912.5

Foundation Recommendations

The following recommendations are for the proposed Colton-Loma Linda OH Right Bridge (Widen), as shown on the General Plan (printed on 4/29/11) and Colton-Loma Linda OH Left Bridge (Widen) as shown on the General Plan (printed on 9/1/11).

Tables 8 thru 11 below, show the foundation design data provided by the Office of Bridge Design Branch 10.

Table 8-Left Bridge (#54-0482L) Foundation Design Information Provided by Structures Design

Support Location	Design Method	Pile Type	Finished Grade Elev. (ft)	Pile Cutoff Elev. (ft)	Pile Cap Size (ft)		Permissible Settlement Under Service Load (in)	Number of Piles
					B	L		
Abutment 1	WSD	HP 10x57 “H”-Piles	985.0	983.6	6.0	18.0	1	5
Bent 2	LRFD	HP 14x89 “H”-Piles	966.0	960.6	11.0	18.0	1	16
Bent 3	LRFD	HP 14x89 “H”-Piles	965.0	957.1	11.0	18.0	1	16
Bent 4	LRFD	HP 14x89 “H”-Piles	965.0	956.1	13.0	18.0	1	16
Bent 5	LRFD	HP 14x89 “H”-Piles	965.0	957.1	11.0	18.0	1	16
Bent 6	LRFD	HP 14x89 “H”-Piles	965.0	961.1	11.0	18.0	1	16
Abutment 7	WSD	HP 10x57 “H”-Piles	988.5	986.6	6.0	18.0	1	7

Table 9-Left Bridge (#54-0482L) Foundation Design Loads Information Provided by Structures Design

Support Location	Service-1 Limit State (Kips)		Strength Limit State (Controlling Group) (Kips)				Extreme Event Limit State (Controlling Group) (Kips)				
	Total Loads		Permanent Loads	Compression		Tension		Compression		Tension	
	Per Support	Max Per Pile	Per Support	Per Support	Max Per Pile	Per Support	Max Per Pile	Per Support	Max Per Pile	Per Support	Max Per Pile
Abutment 1	350	125	260	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bent 2	1200	N/A	900	1800	170	N/A	N/A	950	300	0	195
Bent 3	1600	N/A	1200	2300	220	N/A	N/A	1300	320	0	190
Bent 4	1700	N/A	1200	2600	240	N/A	N/A	1350	320	0	180
Bent 5	1600	N/A	1150	2300	230	N/A	N/A	1250	320	0	190
Bent 6	1300	N/A	1000	2000	200	N/A	N/A	1050	320	0	180
Abutment 7	600	130	320	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: N/A: Not Applicable.

Table 10-Right Bridge (#54-0482R) Foundation Design Information Provided by Structures Design

Support Location	Design Method	Pile Type	Finished Grade Elev. (ft)	Pile Cutoff Elev. (ft)	Pile Cap Size (ft)		Permissible Settlement Under Service Load (in)	Number of Piles
					B	L		
Abutment 1	WSD	HP 10x57 "H"-Piles	990.0	981.67	6.5	17.0	1	5
Bent 2	LRFD	HP 14x89 "H"-Piles	967.0	958.89	12.0	12.0	1	16
Bent 2R*(Lt.)	LRFD	HP 14x89 "H"-Piles	967.0	958.89	9.0	15.0	1	6
Bent 2R*(Rt.)	LRFD	HP 14x89 "H"-Piles	967.0	958.89	9.0	15.0	1	6
Bent 3	LRFD	HP 14x89 "H"-Piles	965.0	956.64	10.0	18.0	1	18
Bent 4	LRFD	HP 14x89 "H"-Piles	965.0	958.14	10.0	18.0	1	18
Bent 5	LRFD	HP 14x89 "H"-Piles	966.0	959.47	12.0	18.0	1	24
Bent 6	LRFD	HP 14x89 "H"-Piles	966.0	960.47	12.0	18.0	1	24
Abutment 7	WSD	HP 10x57 "H"-Piles	1000.0	990.01	6.5	17.0	1	7

Notes: Bent 2R* is seismic retrofit for existing Bent 2 footing at right bridge.

Table 11-Right Bridge (#54-0482R) Foundation Design Loads Information Provided by Structures Design

Support Location	Service-1 Limit State (Kips)			Strength Limit State (Controlling Group) (Kips)				Extreme Event Limit State (Controlling Group) (Kips)			
	Total Loads		Permanent Loads	Compression		Tension		Compression		Tension	
	Per Support	Max Per Pile		Per Support	Max Per Pile	Per Support	Max Per Pile	Per Support	Max Per Pile	Per Support	Max Per Pile
Abutment 1	550	135	350	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bent 2	1400	N/A	1100	1600	220	0	60	1000	300	0	180
Bent 2R*(Lt.)	1740	N/A	1050	2850	240	0	30	1220	300	0	195
Bent 2R*(Rt.)	1740	N/A	1050	2850	240	0	30	1220	300	0	195
Bent 3	1600	N/A	1200	2250	140	0	20	1150	320	0	180
Bent 4	1700	N/A	1200	2150	130	0	20	1100	320	0	185
Bent 5	1600	N/A	1150	2200	250	0	70	1600	320	0	170
Bent 6	1400	N/A	1100	2200	250	0	70	1200	300	0	170
Abutment 7	750	130	500	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: Bent 2R* is seismic retrofit for existing Bent 2 footing at right bridge. N/A: Not Applicable.

Abutments 1 and 7 Footing Locations

At Abutments 1 and 7 support locations, HP 10x57 driven steel “H” piles may be used for support. The ultimate geotechnical pile capacity for the “H” piles will meet or exceed the required nominal resistance in compression. The specified pile tip elevations for abutment supports are listed in Tables 12 and 13, below.

Table 12 - Abutment Foundation Design Recommendations-Left Bridge (#54-0482L)

Support Location	Pile Type	Pile Cutoff Elev. (ft)	Service-I Limit State Load per Support (kips)		Service-I Limit State Load per Pile (kips)	Nominal Resistance (kips)	Design Tip Elev. (ft)	Specified Tip Elev. (ft)	Nominal Driving Resistance (kips)
			Total	Permanent					
Abutment 1	HP 10x57 “H”-Piles	983.6	350	260	125	250	927.0(a)	927.0	250
Abutment 7	HP 10x57 “H”-Piles	986.6	600	320	130	260	927.0(a)	927.0	260

Note: Design tip elevations are controlled by (a) Compression.

Table 13 - Abutment Foundation Design Recommendations-Right Bridge (#54-0482R)

Support Location	Pile Type	Pile Cutoff Elev. (ft)	Service-I Limit State Load per Support (kips)		Service-I Limit State Load per Pile (kips)	Nominal Resistance (kips)	Design Tip Elev. (ft)	Specified Tip Elev. (ft)	Nominal Driving Resistance (kips)
			Total	Permanent					
Abutment 1	HP 10x57 "H"-Piles	981.67	550	350	135	270	925.0(a)	925.0	270
Abutment 7	HP 10x57 "H"-Piles	990.01	750	500	130	260	927.0(a)	927.0	260

Note: Design tip elevations are controlled by (a) Compression.

Bent 2 thru 6 Footing Locations

At Bent 2 thru Bent 6 locations, HP 14x89 driven steel "H" piles may be used for support. The ultimate geotechnical pile capacity for the "H" piles will meet or exceed the required nominal resistance in compression and tension. The specified pile tip elevations for bent supports are listed in Tables 14 and 15, below.

Table 14 - Bent Foundation Design Recommendations-Left Bridge (#54-0482L)

Support Location	Pile Type	Pile Cutoff Elev. (ft)	Service-I Limit State Per Support (kips)	Total Permissible Support Settlement (in)	Required Nominal Resistance (kips)				Design Tip Elev. (ft)	Specified Tip Elev. (ft)	Nominal Driving Resist. (kips)
					Strength Limit		Extreme Limit				
					Comp. ($\phi=0.7$)	Tension ($\phi=0.7$)	Comp. ($\phi=1.0$)	Tension ($\phi=1.0$)			
Bent 2	HP 14x89 "H"-Piles	960.6	900	1	250	N/A	300	195	905.0 (a) 907.0 (b)	905.0	300
Bent 3	HP 14x89 "H"-Piles	957.1	1200	1	320	N/A	320	190	911.0 (a) 915.0 (b)	911.0	320
Bent 4	HP 14x89 "H"-Piles	956.1	1200	1	350	N/A	320	180	909.0 (a) 916.0 (b)	909.0	350
Bent 5	HP 14x89 "H"-Piles	957.1	1150	1	330	N/A	320	190	912.0 (a) 917.0 (b)	912.0	330
Bent 6	HP 14x89 "H"-Piles	961.1	1000	1	290	N/A	320	180	912.0 (a) 917.0 (b)	912.0	320

Notes: Design tip elevations are controlled by a) Compression, b) Tension.

Table 15 - Bent Foundation Design Recommendations-Right Bridge (#54-0482R)

Support Location	Pile Type	Pile Cutoff Elev. (ft)	Service-I Limit State Per Support (kips)	Total Permissible Support Settlement (in)	Required Nominal Resistance (kips)				Design Tip Elev. (ft)	Specified Tip Elev. (ft)	Nominal Driving Resist. (kips)
					Strength Limit		Extreme Limit				
					Comp. ($\phi=0.7$)	Tension ($\phi=0.7$)	Comp. ($\phi=1.0$)	Tension ($\phi=1.0$)			
Bent 2	HP 14x89 "H"-Piles	958.89	1100	1	320	90	300	180	903.0 (a) 909.0 (b)	903.0	320
Bent 2R* (Lt.)	HP 14x89 "H"-Piles	958.89	1050	1	350	50	300	195	900.0 (a) 907.0 (b)	900.0	350
Bent 2R* (Rt.)	HP 14x89 "H"-Piles	958.89	1050	1	350	50	300	195	900.0 (a) 907.0 (b)	900.0	350
Bent 3	HP 14x89 "H"-Piles	956.64	1200	1	200	30	320	180	911.0 (a) 916.0 (b)	911.0	320
Bent 4	HP 14x89 "H"-Piles	958.14	1200	1	190	30	320	185	911.0 (a) 915.0 (b)	911.0	320
Bent 5	HP 14x89 "H"-Piles	959.47	1150	1	360	100	320	170	910.0 (a) 917.0 (b)	910.0	360
Bent 6	HP 14x89 "H"-Piles	960.47	1100	1	360	100	300	170	910.0 (a) 917.0 (b)	910.0	360

Notes: Design tip elevations are controlled by a) Compression, b) Tension.
 Bent 2R* is seismic retrofit for existing Bent 2 footing at right bridge.

The pile data tables for Abutments 1 and 7 and Bents 2 thru 6, of the left and right bridges, are presented below in Tables 16 and 17. The ultimate geotechnical pile capacity will meet or exceed the required nominal resistance in compression.

Table 16 – Pile Data Table-Left Bridge (#54-0482L)

Support Location	Pile Type	Required Nominal Resistance (Kips)		Design Tip Elevation (ft)	Specified Tip Elevation (ft)	Nominal Driving Resist. (kips)
		Compression	Tension			
Abutment 1	HP 10x57 "H"-Piles	250	0	927.0 (a)	927.0	250
Bent 2	HP 14x89 "H"-Piles	300	195	905.0 (a) 907.0 (b)	905.0	300
Bent 3	HP 14x89 "H"-Piles	320	190	911.0 (a) 915.0 (b)	911.0	320
Bent 4	HP 14x89 "H"-Piles	350	180	909.0 (a) 916.0 (b)	909.0	350
Bent 5	HP 14x89 "H"-Piles	330	190	912.0 (a) 917.0 (b)	912.0	330
Bent 6	HP 14x89 "H"-Piles	320	180	912.0 (a) 917.0 (b)	912.0	320
Abutment 7	HP 10x57 "H"-Piles	260	0	927.0 (a)	927.0	260

Notes: Design tip elevations are controlled by a) Compression, b) Tension.

Table 17 – Pile Data Table-Right Bridge (#54-0482R)

Support Location	Pile Type	Required Nominal Resistance (Kips)		Design Tip Elevation (ft)	Specified Tip Elevation (ft)	Nominal Driving Resist. (kips)
		Compression	Tension			
Abutment 1	HP 10x57 “H”-Piles	270	0	925.0 (a)	925.0	270
Bent 2	HP 14x89 “H”-Piles	320	180	903.0 (a) 909.0 (b)	903.0	320
Bent 2R* (Lt.)	HP 14x89 “H”-Piles	350	195	900.0 (a) 907.0 (b)	900.0	350
Bent 2R* (Rt.)	HP 14x89 “H”-Piles	350	195	900.0 (a) 907.0 (b)	900.0	350
Bent 3	HP 14x89 “H”-Piles	320	180	911.0 (a) 916.0 (b)	911.0	320
Bent 4	HP 14x89 “H”-Piles	320	185	911.0 (a) 915.0 (b)	911.0	320
Bent 5	HP 14x89 “H”-Piles	360	170	910.0 (a) 917.0 (b)	910.0	360
Bent 6	HP 14x89 “H”-Piles	360	170	910.0 (a) 917.0 (b)	910.0	360
Abutment 7	HP 10x57 “H”-Piles	260	0	927.0 (a)	927.0	260

Notes: Design tip elevations are controlled by a) Compression, b) Tension.
 Bent 2R* is seismic retrofit for existing Bent 2 footing.

General Notes:

- 1) All support locations are to be plotted in plan view on the Log of Test Borings as stated in “Memo to Designers” 4-2. The plotting of support locations should be made prior to requesting a final foundation review.
- 2) When applicable, the structure engineer shall show on the plans, in the pile data table, the design pile tip elevation required to meet the lateral load demands. If the design pile tip elevation required to meet lateral load demand exceeds the specified pile tip elevations given within this report, the Office of Geotechnical Design-South 2, Branch B shall be contacted for further recommendations.

Construction Considerations:

Driven Piles:

- 1) Pile acceptance is to be based on Standard Specifications 49-2.01A(4)(b) “Pile Driving Acceptance Criteria” of the 2010 Standard Specifications.

- 2) At Abutments 1 and 7 locations of the left and right bridges, any pile that achieves 1½ times required nominal resistance in compression, as shown on the contract plans, within 5 feet of the specified pile tip elevation, may be considered satisfactory and cut off with written approval from the engineer.

- 3) At Bents 2 through 6 locations of the left and right bridges, any pile that achieves 1½ times required nominal resistance in compression, as shown on the contract plans, within the zone between the tension and compression specified pile tip elevations, may be considered satisfactory and cut off with written approval from the engineer. One and one half times the nominal resistance in compression for the support locations is presented in Tables 18 and 19, below.

Table 18–Pile Driving Resistance Left Bridge (#54-0482L)

Support Location	1½ Times Required Nominal Resistance
Abutment 1	375 Kips
Bent 2	450 Kips
Bent 3	480 Kips
Bent 4	525 Kips
Bent 5	495 Kips
Bent 6	480 Kips
Abutment 7	390 Kips

Table 19–Pile Driving Resistance Right Bridge (#54-0482R)

Support Location	1½ Times Required Nominal Resistance
Abutment 1	405 Kips
Bent 2	480 Kips
Bent 2R*	525 Kips
Bent 3	480 Kips
Bent 4	480 Kips
Bent 5	540 Kips
Bent 6	540 Kips
Abutment 7	390 Kips

Notes: Bent 2R* is seismic retrofit for existing Bent 2 footing.

- 4) Hard pile driving may be encountered due to dense fill and the presence of cobbles in the existing fill material. All piles at Abutment 1 and Abutment 7 shall be driven in pre-drilled holes in conformance with the provisions in Section 49-2.01C(4), “Predrilled Holes,” of the 2010 Standard Specifications. The corresponding bottom of pre-drilled hole elevations are listed below in Table 20.

Table 20 – Pre-Drilled Hole Elevations at Abutments

Support Location	Bottom of Predrilled Hole Elevation
Abutment 1	966.0 ft
Abutment 7	966.0 ft

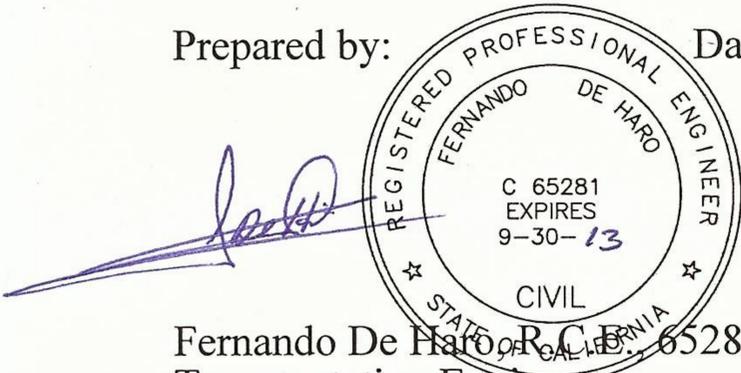
- 5) At the bent locations, the contractor should anticipate hard and erratic driving due to the presence of variable loose to very dense sands and possible small cobbles, described in the geology section and shown on the Log of Test Boring sheets. Field splicing and cutting off of steel piling should be anticipated due to these variations in the subsurface conditions.

The recommendations contained in this report are based on specific project information regarding structure type, support locations, and design loads that have been provided by the Office of Bridge Design Branch 10. If any conceptual changes are made during final project design, the Office of Geotechnical Design-South 2, Design Branch B, should review those changes to determine if these foundation recommendations are still applicable. Any questions regarding the above recommendations should be directed to the attention of Fernando De Haro, (916) 227-4556 or Mark DeSalvatore, (916) 227-5391, at the Office of Geotechnical Design-South 2, Branch B.

Prepared by:

Date:

10/10/2011



Fernando De Haro, R.C.E., 65281
Transportation Engineer
Office of Geotechnical Design-South 2
Design Branch B

- cc: Jim Robinson – District 8 Project Manager
Ben Amiri – District 8 Design Manager
Alex Sanchez – District 8 Project Engineer
R.E. Pending File
John Stayton - Specs & Estimates
Bruce Kean – District 8 (Materials Engineer)
Abbas Abghari – OGDS-2
Mark Desalvatore – OGDS-2 *EN FOR M.D.*
Mark Willian – GS Corporate

M e m o r a n d u m*Flex your power!
Be energy efficient!*

To: MR DAN T. ADAMS
Division of Engineering Services
Office of Bridge Design Central
Bridge Design Branch 10

Date: December 15, 2011
File: 08-SBd-215-PM 3.72
08-0M9401
Project No. 0800000506
Colton-Loma Linda Yard OH
Br. #54-0482 R/L

Attention: Mr. Larry Wu

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES
OFFICE OF GEOTECHNICAL DESIGN – SOUTH 2
DESIGN BRANCH B, MS #5

Subject: Amended Foundation Report for Colton-Loma Linda Yard OH

This report presents amended foundation recommendations for the proposed widening of the Colton-Loma Linda Yard Overhead (Br. No 54-0482 R/L), dated October 10, 2011. The purpose of this amended foundation recommendations is to correct two errors in the construction considerations section of the “original” foundation report. Specifically, Construction Considerations #1 and #4 made reference to erroneous specifications. This amended foundation report provides the correct reference to the project standard specifications. All other foundation recommendations and construction considerations contained in the “original” foundation report (dated 10-10-11) are still applicable.

Corrections to Construction Considerations #1 and #4

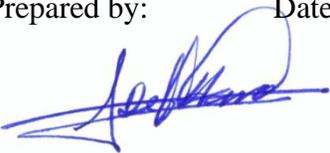
Construction Consideration Number	Construction Activity	Erroneous Specification listed in “original” Foundation Report dated October 10, 2011	Applicable Specification
1	Pile Driving Acceptance Criteria	<i>2010 Standard Specification 49-2.01A(4)(b)</i>	2006 Standard Specification 49-1.08
4	Predrilled Holes	<i>2010 Standard Specification 49-2.01C(4)</i>	2006 Standard Specification 49-1.06

The recommendations contained in this report are based on specific project information regarding structure type, location, and design loads that have been provided by the Bridge Design Central, Branch 10. If any conceptual changes are made during final project design, the Office of Geotechnical Design-South 2, Design Branch B should review those changes to determine if these foundation recommendations are still applicable.

MR DAN T. ADAMS
December 15, 2011
Page 2

Colton – Loma Linda Yard OH
Br. No. 54-482 R/L
08-0M9401

Any questions regarding the above recommendations should be directed to the attention of Fernando De Haro, (916) 227-4556, or Mark DeSalvatore, (916) 227-5391, at the Office of Geotechnical Design-South 2, Branch B.

Prepared by:  Date: 12-15-11

Fernando De Haro, R.C.E # 65281
Transportation Engineer
Office of Geotechnical Design-South 2
Design Branch B



cc: Jim Robinson – District 8 Project Manager
Ben Amiri – District 8 Design Manager
Alex Sanchez – District 8 Project Engineer
Bruce Kean – District 8 Materials Engineer
John Stayton – HQ, Specifications and Estimates
RE Pending File – HQ, Structures Construction
Shira Rajendra – GS Corporate
Abbas Abghari – OGDS2
Angel Perez-Cobo – OGDS2 APC
Mark DeSalvatore – OGDS2

Memorandum

*Flex your power!
Be energy efficient!*

To: MR DAN T. ADAMS
Division of Engineering Services
Office of Bridge Design Central
Bridge Design Branch 10

Date: September 28, 2011

File: 08-SBd-215-PM 4.03
08-0M9401
Project No. 0800000506
I-215/I-10 Separation (Widen)
Br. #54-0479 R/L

Attention: Mr. Larry Wu

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES
OFFICE OF GEOTECHNICAL DESIGN – SOUTH 2
DESIGN BRANCH B, MS #5

Subject: Foundation Report

This report presents the foundation recommendations for the proposed widening of the existing I-215/I-10 Separation, Br. No. 54-0479 R/L. The following foundation recommendations are based on information gathered during the October 2010 subsurface information performed by Office of Geotechnical Design South II, Branch B, as well as “As-built” Log of Test Borings from previous subsurface investigations at the site. With regards to the current foundation recommendations, all elevations referenced within this report and shown on the recent Log of Test Boring sheets are based on the NAVD 88 vertical datum, unless otherwise noted. As-Built information containing elevation data was updated to the NAVD88 datum by adding 2.3 ft to the NGVD29 datum (per Office of Bridge Design – Central). This Foundation Report supercedes all previous foundation reports developed for this project.

Project Description

The existing structure site is located near the Colton area in San Bernardino County where Interstate 215 intersects Interstate 10. At this location, the Interstate 215/10 Separation, Right and Left Bridges presently consist of a divided freeway with three southbound and three northbound lanes. The existing left bridge is approximately 260 feet long and 54 feet wide. The existing right bridge is approximately 260 feet long and varies from about 80 feet to 102 feet wide. The existing right bridge is wider than the left bridge because it provides an additional lane to accommodate a ramp exit to westbound Interstate 10. The two existing bridges consist of two-span, reinforced concrete, I-girder bridges. Both left and right bridges were originally constructed in 1972 which replaced two 1958 bridges. The only evidence in the geotechnical bridge files or BIRIS of the old 1958 bridges in the files are a 1957 foundation report and 1958 As-Built LOTB.

The proposed project will center widen both the left and right bridge by approximately 17 feet and add one lane capacity to each bridge, which will accommodate the additional proposed High Occupancy Vehicles (HOV) lanes associated with the 7.5 mile long 215 Gap Closure

Project. The layout of the proposed the left and right bridge widened structures are shown on the General Plans (dated 4-14-11 & 3-29-11, respectively).

Site Geology

The bridge site is located within the Peninsular Range Geomorphic Providence of California. In general, the site is underlain by very young alluvial-valley deposits from the late Holocene epoch (Morton & Miller 2006).

The subsurface information provided below is based on the 2010, 1966 and the 1956 subsurface investigations available in the geotechnical bridge files and BIRIS. The only information available from the 1958 bridges are the partially legible As-Built LOTB's showing two rotary borings and two penetration borings and the foundation report for the 1958 right bridge. The 1972 As-Built LOTB's are legible and provide information for 6 rotary borings and 5 penetration borings. The 2010 subsurface investigation consisted of one rotary boring (RC-10-1) located in the median between the Abutment 3 of the Left Bridge and the Right Bridge. The 2010 rotary boring was advanced with wireline-punchcore, fully-cased drilling methods with Standard Penetration Tests (SPT) performed every 5 feet. The RC-10-1 boring extended down to a maximum depth of 121.5 ft (Elev. 877.4 ft).

The soil at the site can be generalized and separated for both the right and left bridges due to the close proximity of each structure. At the Abutment 1 locations, the soil at the site can be separated into three units. The upper unit consists of engineered fill which was placed during the 1972 construction of the existing bridge and extends down to the original ground shown on the As-Built plans. Based on the B-1-66, it is anticipated that engineered fill consisting of dense to very dense sand with silt and sand is present at these locations. Below the fill, the middle unit consists primarily of loose to compact (with local dense to very dense layers) sand with scattered layers of silty sand, sandy gravel, gravelly sand, silt, and sandy silt. The middle unit extends to a depth of about 30 feet below the original ground to ~ Elev. 947 ft at Abut 1, ~ Elev. 943 at Bent 2 and ~ Elev. 950 at Abut 3. The lower unit consists of dense to very dense (with local compact/medium dense) sand, gravelly sand, gravel with sand, sand with gravel and cobbles with local stiff, clay and elastic silt layers. The maximum explored depth below the existing ground surface of the borings at the site was approximately 121.5 feet.

The 1972 foundation report for the right bridge indicated that all borings from the 1956 and 1966 subsurface investigations caved between elevation ~ 961 and elevation ~ 951 ft.

Ground Water

During the 1956 subsurface investigation, groundwater was encountered at elevation 944.3 feet at one boring location. During the 1968 subsurface investigation, groundwater was measured in two borings with levels varying from elevation 925.0 feet to elevation 926.1 feet. During the 2010 subsurface investigation, groundwater was encountered at elevation 911.3 ft.

Corrosion

Composite soil samples collected from four borings during the 2010 foundation investigation were tested for corrosive potential by the Office of Testing and Technology Services, Corrosive Technology Branch (CTB). Based on the current Caltrans Standards, the composite samples are not considered corrosive at this site. For specific test results, please refer to Table 1.

Table 1 – Corrosion Test Summary

Location	SIC Number	Minimum Resistivity (Ohm-Cm)	pH	Chloride Content (ppm)	Sulfate Content (ppm)
Boring RC-10-1 (Elev. 998.9 – 975 ft)	C701527A	4830	7.76	N/A	N/A
Boring RC-10-1 (Elev. 973.9 – 928.9 ft)	C701527B	7130	8.63	N/A	N/A
Boring RC-10-1 (Elev. 928.9 – 898.9 m)	C701527C	18400	8.75	N/A	N/A
Boring RC-10-1 (Elev. 892.4 – 878.9 ft)	C701527D	3910	8.45	N/A	N/A

Note: Caltrans currently defines a corrosive environment as an area where the soil has a minimum resistivity of less than 1000 ohm-cm, and either contains a chloride concentration of 500 ppm or greater, a sulfate concentration of 2000 ppm or greater, or has a pH of 5.5 or less.

Utilities

During the subsurface investigation, it was determined that a 30 inch diameter water line encased in a 42 inch concrete sleeve exists between the footprint of the proposed widening of Abutment 3 Left Bridge and Abutment 3 Right Bridge. If the utility owner determines that the utility line is too close to the proposed pile locations and requests protective measures that include pre-drilling below the specified pre-drilling elevation listed in the construction considerations, then this office should be contacted to provide revised specified pile tip elevations at the affected support location.

Fault Data

The bridge site is located near the northwest trending San Jacinto Fault Zone (Morton & Miller 2006). A review of the surface fault rupture hazard was developed for this structure and determined that surface fault rupture is not an issue because the site is located 900 feet or more from the San Jacinto Fault Zone. For details, refer to the “Review of Fault Rupture Hazard at 215 Bridges” memorandum developed on July 1, 2010 by Martha Merriam.

Seismic Data

The structure site is potentially subject to ground motions from nearby earthquake sources during the design life of the structure. Based on a review of the subsurface conditions and the available groundwater information for the site, the potential for liquefaction at the site is low.

Seismic design recommendations were done as a separate report for this project. For details refer to the Seismic Design Recommendations (dated 8-17-11) or contact Anhdan Le at 916-227-7211.

“As-Built” Information

The original 1958 Left Bridge was constructed and later removed and replaced with the 1972 Left Bridge, which is located at the same general location. The 1958 bridge was supported on pile foundations at the bents and spread footing foundations at the abutments. The 1958 As-Built LOTB provided specified pile tip elevations for the bents and bottom of footing elevation for the abutments. The piles used for the 1958 Left Bridge consisted of Cast-In-Drilled Hole (CIDH) piles (diameter = 15.5 inches) with a design load of 45 Tons (see Table 1).

The original 1958 Right Bridge was constructed and later removed and replaced with the 1972 Right Bridge, which is located approximately 200 feet to the north. The 1958 As-Built LOTB provided two pile driving records for Bent 2 and Bent 3. The piles used for the 1958 Right Bridge consisted of Raymond Step Taper piles (tip = 8 inches; butt = 15.5 inches) with a design load of 45 Tons. These driving records provided the minimum, average and maximum penetration elevations for the above mentioned structure support locations. The 1958 As-Built LOTB also provided the bottom of footing elevations for the abutments. For a summary of the 1958 As-Built Data for both structures, refer to Tables 2 & 3.

Table 2 - “As-Built” Pile Data - 1958 Old Left Bridge (Replaced)

Support Locations	Foundation Type	Gross All. Bearing Capacity/ Design Load	Pile Cut-Off / Bottom of Footing Elev. (ft)	Specified Pile Tip Elev. (ft)
Abut 1	Spread Footing	1.5 Tsf	986.0*	N/A
Bent 2	15½” CIDH Piles	45 Ton	969.0	945.0
Bent 3	15½” CIDH Piles	45 Ton	969.0	945.0
Abut 4	Spread Footing	1.5 Tsf	986.0*	N/A

* Elevations were scaled from the 1958 As-Built LOTB

Table 3 - “As-Built” Pile Data - 1958 Old Right Bridge (Replaced)

Support Location	Foundation Type	Gross All. Bearing Capacity/ Design Load	Pile Cut-Off / Bottom of Footing Elev. (ft)	Min. Penet. Elevation (ft)*	Avg. Pile Tip Elev. (ft)*	Max. Penet. Elevation (ft)*
Abut 1	Spread Footing	1.5 Tsf	989.0	N/A	N/A	N/A
Bent 2	Raymond Step Taper Piles	45 Ton	968.0*	947.2	944.0	942.2
Bent 3	Raymond Step Taper Piles	45 Ton	968.0*	949.0	947.5	945.0
Abut 4	Spread Footing	1.5 Tsf	989.0	N/A	N/A	N/A

* Elevations were scaled from the 1958 As-Built LOTB

The As-built bridge records indicate that the existing 1972 Left and Right Bridges are both supported on 70 ton design load, 12 inch square precast/prestressed (PC/PS) concrete pile foundations at all support locations. These records also provided Average Penetration Pile Tip Elevations for all support locations. Only one graphical pile driving record at Abutment 3, Left Bridge was shown on the 1972 As-Built LOTB. For both structures, the Abutment 1 location consisted of an end diaphragm type abutment supported on a single row of piles and the Abutment 3 location consisted of a seat type abutment supported on two rows of piles. For a summary of the 1972 As-Built Data, refer to Tables 4 & 5.

Table 4 - “As-Built” Pile Data - 1972 Left Bridge (Existing Bridge)

Support Locations	Foundation Type	Design Load	Pile Cut-Off / Bottom of Footing Elev. (ft)	Specified Pile Tip Elev. (ft)	Avg. Penetration Pile Tip Elev. (ft)
Abut 1	12” PC/PS Conc. Piles	70 Ton	985.6 – 984.7*	940.0	939.2
Bent 2	12” PC/PS Conc. Piles	70 Ton	965.5	940.0	939.9
Abut 3	12” PC/PS Conc. Piles	70 Ton	977.2 – 978.0	946.0	945.7

* Elevations were scaled from the 1972 As-Built Abutment Detail Sheets

Table 5 - “As-Built” Pile Data - 1972 Right Bridge (Existing Bridge)

Support Locations	Foundation Type	Design Load	Pile Cut-Off / Bottom of Footing Elev. (ft)	Specified Pile Tip Elev. (ft)	Avg. Penetration Pile Tip Elev. (ft)
Abut 1	12” PC/PS Conc. Piles	70 Ton	979.9 – 978.7*	935.0	934.9
Bent 2	12” PC/PS Conc. Piles	70 Ton	965.5	936.0	935.8
Abut 3	12” PC/PS Conc. Piles	70 Ton	976.6 – 975.1	942.0	942.0

* Elevations were scaled from the 1972 As-Built Abutment Detail Sheets

The bridge file also contained a memorandum titled “Field Report of Foundation Conditions” for the 1972 structures. It indicated that prior to driving piles, pre-drilling down to the original ground elevation to facilitate driving at all abutment pile locations was done. Pre-drilling to facilitate driving was also used at Bent 2 location of the Left Bridge. At Abutment 3, Right Bridge, the piles “drove soft”, so these piles were allowed to set-up several days, which were later re-driven and exceeded the required bearing.

Foundation Recommendations

The following recommendations are for the proposed I-215 / I-10 Separation (Br. No. 54-479 R/L) as shown on the General Plan sheets for each structure (4-14-11 & 3-29-11, respectively). The recommendations are based on a review of previous subsurface investigations, the available As-built information, the 2010 subsurface investigation and foundation design information provided to our office by Structure Design, Branch 10.

Due to variability of soil conditions identified in previous field investigations and variable driving conditions identified in an As-Built driving report, driven pre-cast concrete piles are not recommended. CIDH piles are not recommended due to construction issues associated with potential caving soils and minimum pile size requirements for potential groundwater conditions. Steel H-Piles are recommended at all support locations due to potential variable driving conditions and required penetration to develop the tension demands at the Bent 2 locations.

The information shown in Table 6 & 7 is based on specific foundation design information provided to our office by Structure Design on August 17, 2011. The design is based on working stress design (WSD) at the abutments and Load Resistance Factored Design (LRFD) at the Bent 2 location. Foundation design information and specified pile tip elevations for the abutments and the bent locations are provided in Table 8 & 9, respectively.

Table 6: Foundation and Structure Information Provided by Structure Design

Support Location	Design Method	Pile Type	Finished Grade Elevation (ft)	Pile Cut-off Elevation (ft)	Pile Cap Size (ft)		Permissible Settlement Under Service Load (in)	Number of Piles per Support
					B	L		
Abutment 1 Left Bridge	WSD	HP 10x57 "H"-Piles	990.0	987.9	2.67	17	1.0	4
Bent 2 Left Bridge	LRFD	HP 14x89 "H"-Piles	974.5	967.6	15.0	15.0	1.0	13
Abutment 3 Left Bridge	WSD	HP 10x57 "H"-Piles	984.0	980.6	6.0	17.0	1.0	6
Abutment 1 Right Bridge	WSD	HP 10x57 "H"-Piles	993.0	990.5	2.67	17	1.0	4
Bent 2 Right Bridge	LRFD	HP 14x89 "H"-Piles	974.5	967.6	15.0	15.0	1.0	13
Abutment 3 Right Bridge	WSD	HP 10x57 "H"-Piles	987.0	979.2	6.0	17.0	1.0	6

Table 7: Foundation Design Loads Provided by Structure Design

Support Location	Service 1 Limit State (kips)			Strength Limit State (Controlling Group, kips)				Extreme Limit State (Controlling Group, Kips)			
	Total Loads		Permanent Loads	Compression		Tension		Compression		Tension	
	Per Support	Max Per Pile		Per Support	Max Per Pile	Per Support	Max Per Pile	Per Support	Max Per Pile	Per Support	Max Per Pile
Abutment 1 Left Bridge	560	140	400	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bent 2 Left Bridge	1400	N/A	1250	1900	230	0	0	1250	360	0	185
Abutment 3 Left Bridge	740	140	540	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Abutment 1 Right Bridge	560	140	400	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bent 2 Right Bridge	1400	N/A	1250	1900	230	0	0	1250	360	0	185
Abutment 3 Right Bridge	740	140	540	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 8: Foundation Design Recommendations for Abutments 1 and 3

Location	Pile Type	Cut-Off Elevation (ft)	LRFD Service-I Limit State Load per Support		LRFD Service-I Limit State Total Load per Pile – Compression (kips)	Required Nominal Resistance (kips)	Design Tip Elevation (ft)	Specified Tip Elevation (ft)
			Total (kips)	Permanent (kips)				
Abutment 1 Left Bridge	HP 10x57 “H”-Piles	987.9	560	400	140	280	946.0 (a)	946.0
Abutment 3 Right Bridge	HP 10x57 “H”-Piles	980.6	740	540	140	280	942.0 (a)	942.0
Abutment 1 Left Bridge	HP 10x57 “H”-Piles	990.5	560	400	140	280	946.0 (a)	946.0
Abutment 3 Right Bridge	HP 10x57 “H”-Piles	979.2	740	540	140	280	942.0 (a)	942.0

Note: 1) Design tip elevation is controlled by: (a) Compression

Table 9: Foundation Design Recommendations for Bent 2

Support Location	Pile Type	Cut-Off Elevation (feet)	Service-I Limit State Load per Support (kips)	Total Permissible Support Settlement (in)	Required Nominal Resistance (kips)				Design Tip Elevation (feet)	Specified Tip Elevation (feet)
					Strength Limit		Extreme Event			
					Comp. ($\phi=0.7$)	Tension ($\phi=0.7$)	Comp. ($\phi=1$)	Tension ($\phi=1$)		
Bent 2 Lt. Bridge	HP 14x89 “H”-Piles	967.6	1400	1.0	330	0	360	185	925.0 ft (a-II) 930.0 ft (b-II)	925.0 ft
Bent 2 Rt. Bridge	HP 14x89 “H”-Piles	967.6	1400	1.0	330	0	360	185	925.0 ft (a-II) 930.0 ft (b-II)	925.0 ft

Note: Design tip elevations are controlled by (a-II) Compression (Extreme Event), (b-II) Tension (Extreme Event)

The Pile Data Table for all support locations is presented below in Table 10. The ultimate geotechnical pile capacity for the “H” piles will meet or exceed the required nominal resistance in compression.

Table 10: Pile Data Table for I-215/I-10 Separation

Location	Pile Type	Required Nominal Resistance (kips)		Design Tip Elevation (feet)	Specified Tip Elevation (feet)	Nominal Driving Resistance (kips)
		Compression	Tension			
Abutment 1 Left Bridge	HP 10x57 "H"-Piles	280	0	946.0 (a)	946.0	280
Bent 2 Left Bridge	HP 14x89 "H"-Piles	360	185	925.0 (a) 930.0 (b)	925.0	360
Abutment 3 Left Bridge	HP 10x57 "H"-Piles	280	0	942.0 (a)	942.0	280
Abutment 1 Right Bridge	HP 10x57 "H"-Piles	280	0	946.0 (a)	946.0	280
Bent 2 Right Bridge	HP 14x89 "H"-Piles	360	185	925.0 (a) 930.0 (b)	925.0	360
Abutment 3 Right Bridge	HP 10x57 "H"-Piles	280	0	942.0 (a)	942.0	280

Notes: 1) Design tip elevation is controlled by: (a) Compression (b) Tension

Construction Considerations

- Groundwater was encountered during the 2010 subsurface investigation and previous foundation investigations. Refer to groundwater section of this report and the LOTB's for details regarding the groundwater. Groundwater levels indicated on the LOTB reflect the measured groundwater levels at the time of the subsurface investigation.
- At only the Abutment locations, the support piles shall be driven with lugs installed to aid in achieving the required Nominal Resistance at the specified pile tip elevation. Lug placement, details and installation shall be as specified in the Bridge Construction Records and Procedures Manual, Bridge Construction Memo 130-5.0.
- At Abutments 1 and 3 locations (Left & Right Bridge), pre-drilling through the existing fill material down to the elevation listed in Table 11 will be required prior to driving each "H" pile. All pre-drilling through the existing fill shall be done in accordance with Standard Specification Section 49-1.06 "Pre-drilled Holes".

Table 11: Predrilled Holes for the 215-10 Separation

Location	Bottom of Predrilled Hole Elevation (ft)
Abutment 1 (Left Bridge)	967
Abutment 3 (Left Bridge)	969
Abutment 1 (Right Bridge)	971
Abutment 3 (Right Bridge)	969

- Pile acceptance is to be based on Standard Specifications 49-1.08. The recommended pile foundations are designed utilizing both skin friction and end bearing. .
- At Abutments 1 and 3 support locations, any pile that achieves 1½ times the required nominal resistance in compression, as shown on the contract plans, within 5 feet of the specified pile tip elevation, may be considered satisfactory and cut off with written approval from the engineer. 1½ times the nominal resistance in compression will be 420 kips at Abutments 1 and 3 locations.
- At Bent 2 support locations, any pile that achieves 1½ times the required nominal resistance in compression, as shown on the contract plans, within 5 feet of the specified pile tip elevation, may be considered satisfactory and cut off with written approval from the engineer. 1½ times the nominal resistance in compression will be 540 kips at the Bent 2 locations.

The recommendations contained in this report are based on specific project information regarding structure type, location, and design loads that have been provided by the Bridge Design South 1, Branch 12. If any conceptual changes are made during final project design, the Office of Geotechnical Design-South 2, Design Branch B should review those changes to determine if these foundation recommendations are still applicable. Any questions regarding the above recommendations should be directed to the attention of Hector Valencia, (916) 227-4555, or Mark DeSalvatore, (916) 227-5391, at the Office of Geotechnical Design-South 2, Branch B.

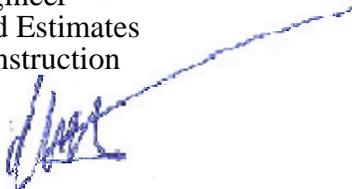
Prepared by: Date: 9-28-11



Hector Valencia, R.C.E # 65257
Engineering Geologist
Office of Geotechnical Design-South 2
Design Branch B



cc: Jim Robninson – District 8 Project Manager
Ben Amiri – District 8 Design Manager
Alex Sanchez – District 8 Project Engineer
Bruce Kean – District 8 Materials Engineer
John Stayton – HQ, Specifications and Estimates
RE Pending File – HQ, Structures Construction
Mark Willian – GS Corporate
Abbas Abghari – OGDS2
Mark DeSalvatore – OGDS2



Memorandum

To: MOHAMMAD RAVANIPOUR, Chief
Bridge Design Branch 19
Division of Engineering Services MS
21073 Pathfinder, Suite # 200
Diamond Bar, CA 91765

Date: October 20, 2010

File: 08-SBD-215-1.78
08-0P5101
Project No. 0800000609

Attention: Bartt Gunter

Newport Ave. OC (Replace)
Bridge No. 54-0529

From: Office of Geotechnical Design South 2
Geotechnical Services - MS 5
Division of Engineering Services

Subject: **Preliminary Seismic Design Recommendations**

Introduction

This memorandum presents preliminary seismic design recommendations for the replacement of the above bridge. Ground motion recommendation is based on the Caltrans 2009 Seismic Design Procedure (SDP) as described in the Seismic Design Criteria Version 1.5 (SDC) Appendix B.

Seismicity

Based on the 2007 Caltrans fault database, the site is located about 1.2 miles (1.9 km) from San Jacinto Fault Zone – San Bernardino Section (Fault ID 229, $M_{max} = 7.5$, strike-slip, dip = 90 deg), which is the controlling fault for the deterministic seismic procedure. The peak horizontal bedrock acceleration (PBA) at the site is estimated as 0.5g for deterministic procedure. A copy of a map showing the location of the bridge and the controlling fault is attached.

Soil Profile

Based on the 1956 As Built log of test borings, the average shear wave velocity for the upper 100 feet of subsurface materials is estimated as $V_{S30} = 270$ m/s

Design Response Spectrum

Based on the 2009 SDP, the design response spectrum is the upper envelope of the deterministic and probabilistic response spectrum, but not to be less than a deterministic response spectrum for a vertical strike-slip fault of $M_{max} = 6.5$ at a distance of 12 km. The deterministic response spectrum is obtained by taking arithmetic average of the median response spectra calculated

Mr. Mohammad Ravanipour
October 20, 2010
Page 2

Newport Ave OC
Bridge No. 54-0529

using the 2008 Campbell-Bozorgnia and 2008 Chiou-Youngs ground motion prediction equations. Probabilistic response spectrum is obtained for 5 percent probability of exceedance in 50 years (about 1000 year return period) from the 2008 USGS Seismic Hazard Map (<http://earthquake.usgs.gov/hazards/products/conterminous/2008/>). Adjustment to account for site condition and near fault effects shall be implemented. For this site the probabilistic procedure controls. A copy of the acceleration response spectrum recommended for preliminary design is attached for your reference.

Liquefaction

From the As Built log of test borings, layers of loose to very dense silty sand and poorly graded sand with gravel and cobbles underlie the site. Ground water surface was encountered at a depth of about 35-ft below the original ground surface during the 1956 subsurface explorations, which were drilled to a depth of about 40-ft. The loose materials extend to a depth of about 10-ft and the potential for soil liquefaction due to strong ground shaking is considered low. This issue will be revisited after the results of subsurface investigations will become available.

Seismic Settlement

Seismic settlement due to strong ground motion is considered less than 1 inch.

Surface Fault Rupture Hazard

The site is not located within the Earthquake Fault Hazard Zone (EFHZ) in California. The potential for surface fault rupture is considered low.

If you have any question please contact Mahmoud Khojasteh at (916) 227-7211.

MAHMOUD KHOJASTEH
Senior Materials and Research Engineer

Attachments:

c: F. De Haro - GDS2
M. DeSalvatore - GDS2
File

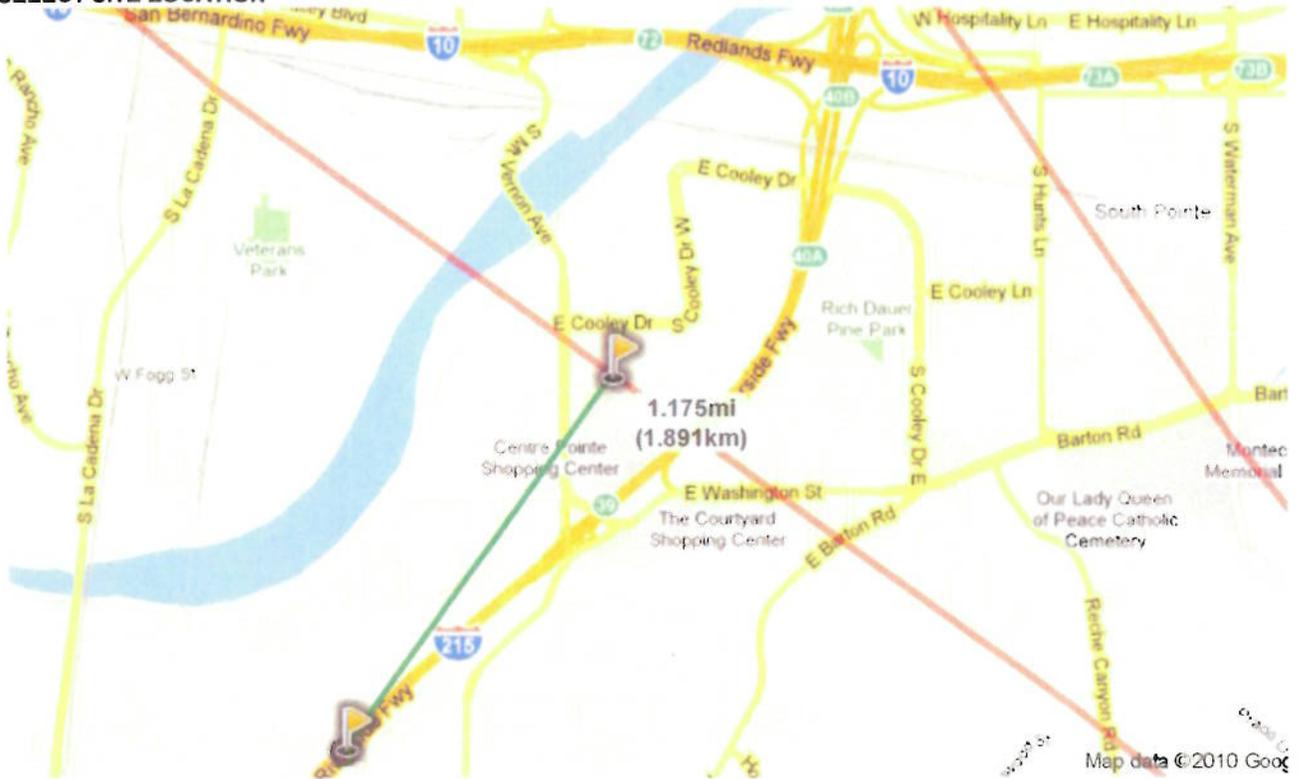


CALIFORNIA DEPARTMENT OF
TRANSPORTATION

Caltrans ARS Online (v1.0.4) Newport Ave OC, Bridge No. 54-0529

This web-based tool calculates both deterministic and probabilistic acceleration response spectra for any location in California based on criteria provided in [Appendix B of Caltrans Seismic Design Criteria](#). [More...](#)

SELECT SITE LOCATION



Latitude:

Longitude:

Vs30:

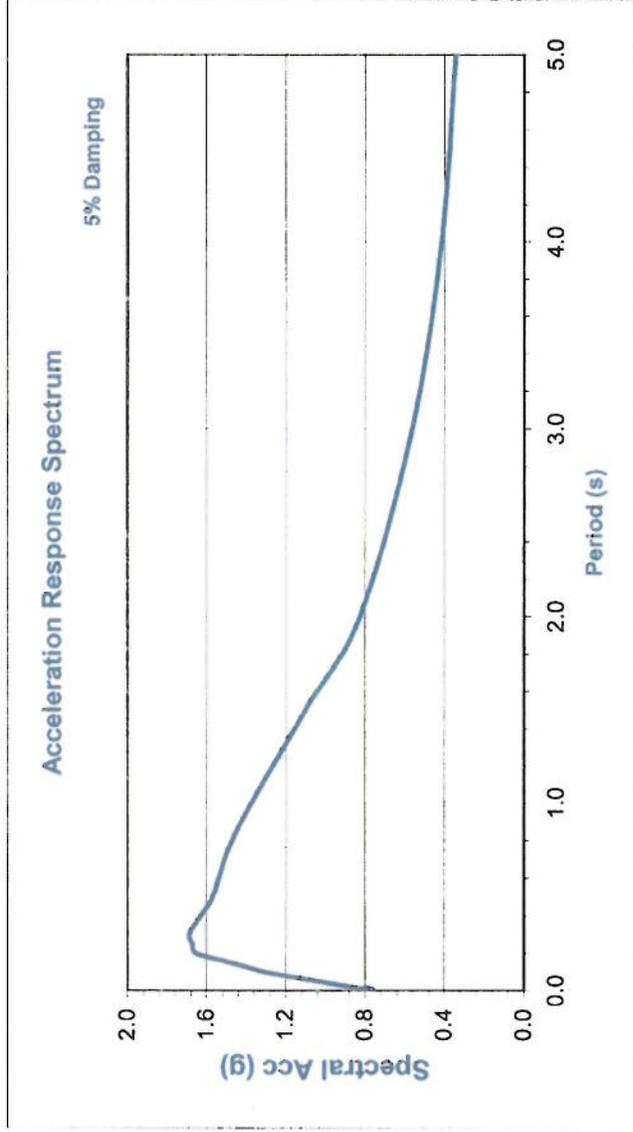
m/s

Newport Ave OC
Bridge No. 54-0529

Latitude 34.0388
 Longitude -117.3193

Control Probabilistic
 USGS 2008 Deagg

Period (s)	Sa(g)
0.010	0.762
0.020	0.873
0.030	0.928
0.050	1.039
0.075	1.177
0.100	1.315
0.120	1.383
0.150	1.486
0.200	1.657
0.250	1.673
0.300	1.690
0.400	1.630
0.500	1.569
0.750	1.493
1.000	1.375
1.500	1.101
2.000	0.828
3.000	0.564
4.000	0.414
5.000	0.343



Deterministic Procedure Data

Fault	San Jacinto Fault zone (San Bernardino Section)	R_{rup}	1.89	km
Fault ID	229	R_{jb}	1.89	km
Style	Strike slip	R_x	1.89	km
Mmax	7.5	V_{s30}	270	m/s
Dip	90	Z_{1.0}	0	m
Z_{TOR}	0	Z_{2.5}	0.00	km
		PBA	0.5	g

Notes

ARS curve was modified for Near Fault Directivity Effect (SDC Ver 1.4 Section 6.1.2.1)

Preliminary
Design Response Spectrum

Memorandum

*Flex your power!
Be energy efficient!*

To: MR. DAN T. ADAMS
BRIDGE DESIGN BRANCH 10
DEVISION OF ENGINEERING SERVICES

Date: August 17, 2011

File:08-SBD-215-PM 4.21
08-0M9400

Attention: Mr. Larry Wu

Santa Ana River Bridge
Bridge No. 54-0471 R/L

From: Office of Geotechnical Design South 2
Geotechnical Services – MS 5
Division of Engineering Services

Subject: **Seismic Design Recommendations**

Introduction

This memorandum presents seismic design recommendations for the widening of the referenced structure. Ground motion recommendation is based on the Caltrans 2009 Seismic Design Procedure (SDP) as described in the Seismic Design Criteria (SDC) version 1.5 Appendix B.

Seismicity

Based on the 2007 Caltrans fault database, the site is located between two branches of San Jacinto fault zones. The San Bernardino section (Fault ID 230, $M_{\max}=7.5$, strike-slip, dip=90 deg) is about 0.2 miles (0.3 km) from the site and is the controlling fault for deterministic seismic procedure. The peak horizontal bedrock acceleration (PBA) at the site is estimated as 0.5g. A copy of a map showing the location of the bridge and the controlling fault is attached.

Soil Profile

From the 1954 and 1968 As-Built and 2010 log of test borings, layers of sand, silty sand and sandy silt with gravel underlie the site. Using correlation of shear wave velocity with SPT blow counts, the average shear wave velocity for the upper 100 feet of the subsurface materials is estimated as $V_{S30}=290$ m/s.

Design Response Spectrum

Based on the 2009 SDP, the design response spectrum is the upper envelope of deterministic and probabilistic response spectra, but not to be less than a deterministic response spectrum for a vertical strike-slip fault of $M_{\max}=6.5$ at a distance of 12 km. The deterministic response spectrum is obtained by taking average of the median response spectra calculated using the 2008 Campbell-Bozorgnia and 2008 Chiou-Youngs ground motion prediction equations. Probabilistic response spectrum is obtained for 5% probability of exceedance in 50 years (about 1000 year return period) from the 2008 USGS Seismic Hazard Map (<http://earthquake.usgs.gov/hazards/products/conterminous/2008/>). Adjustment to account for

Dan T. Adams
August 17, 2011
Page 2 of 2

site condition and near fault effects shall be implemented. For this site the probabilistic procedure controls. The PGA value from probabilistic approach is about 0.85g. A copy of the acceleration response spectrum recommended for design is attached for your reference.

Liquefaction

From the 1954 and 1968 As-Built and 2010 log of test borings, layers of sand, silty sand and sandy silt with gravel underlie the site. During the 1954 and 1968 subsurface explorations, ground water surface was encountered at elevations varying from 936 to 955 feet. During 2010 subsurface explorations, the ground water surface was encountered at elevations varying from 919 to 941 feet.

Layers of loose to medium dense sand and silty sand were generally located in the upper 20 feet below the ground surface. Considering the groundwater surface and soil profiles at the site, it can be concluded that the potential for soil liquefaction due to strong ground shaking is low.

Seismic Settlement

Seismic settlement due to strong ground motion is estimated about 2 inches.

Subsurface Fault Rupture Hazard

The site falls within the Earthquake Fault Hazard Zone (EFHZ) in California. Engineer geologist Martha Merriam with Caltrans has recommended that about 8 feet horizontal and 1 foot vertical displacements be considered in the design of the above bridges. For details, please see the enclosed memo issued by Martha Merriam on July 1, 2010.

If you have any question, please contact AnhDan Le (916) 227-7211 or Angel Perez-Cobo (916) 227-7167, Office of Geotechnical Design South-2.

Prepared by:

Date: 08/17/11

Supervised by:

Date:

AnhDan Q Le, Ph.D, G.E.
Transportation Engineer
Geotechnical Design South-2

Angel Perez-Cobo, P.E.
Senior Transportation Engineer
Geotechnical Design South-2

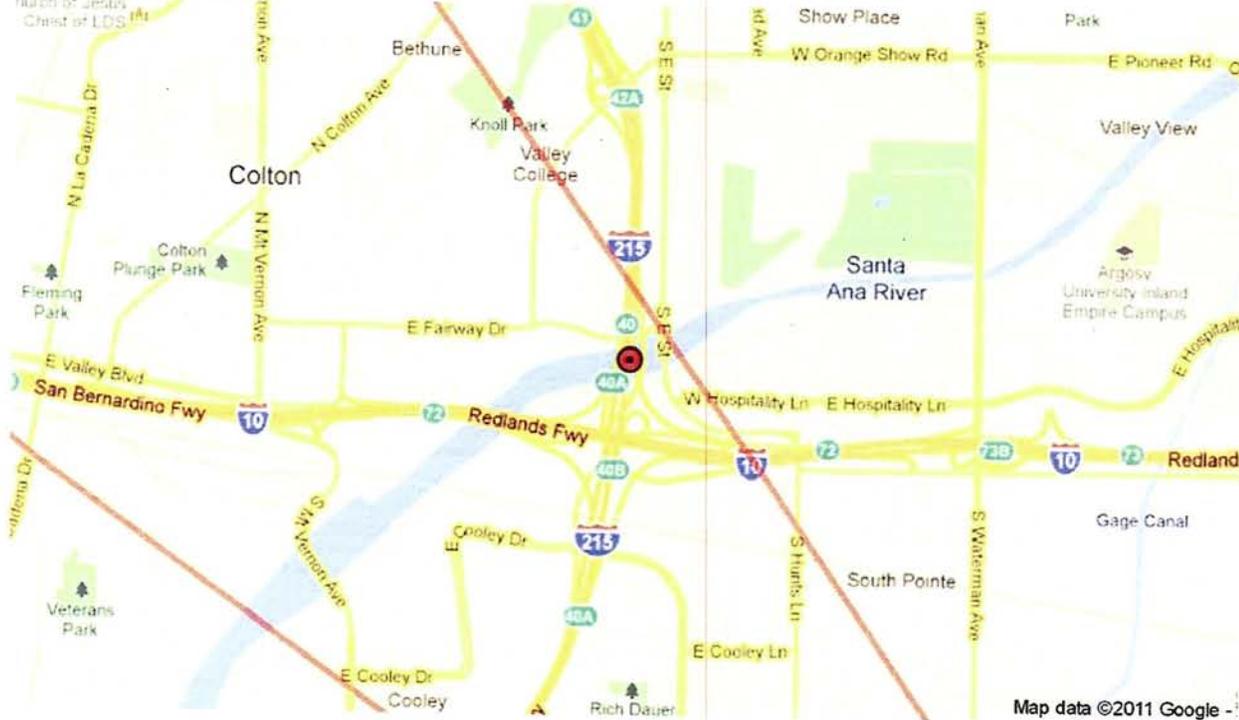
cc: H. Valencia - GDS2
M. DeSalvatore - GDS2
File

CALIFORNIA DEPARTMENT OF TRANSPORTATION

Caltrans ARS Online (v1.0.4)

This web-based tool calculates both deterministic and probabilistic acceleration response spectra for any location in California based on criteria provided in *Appendix B of Caltrans Seismic Design Criteria*. More...

SELECT SITE LOCATION



Latitude:

Longitude:

Vs30: m/s

Santa Ana River Bridge

Bridge No. 54-0471 L/R

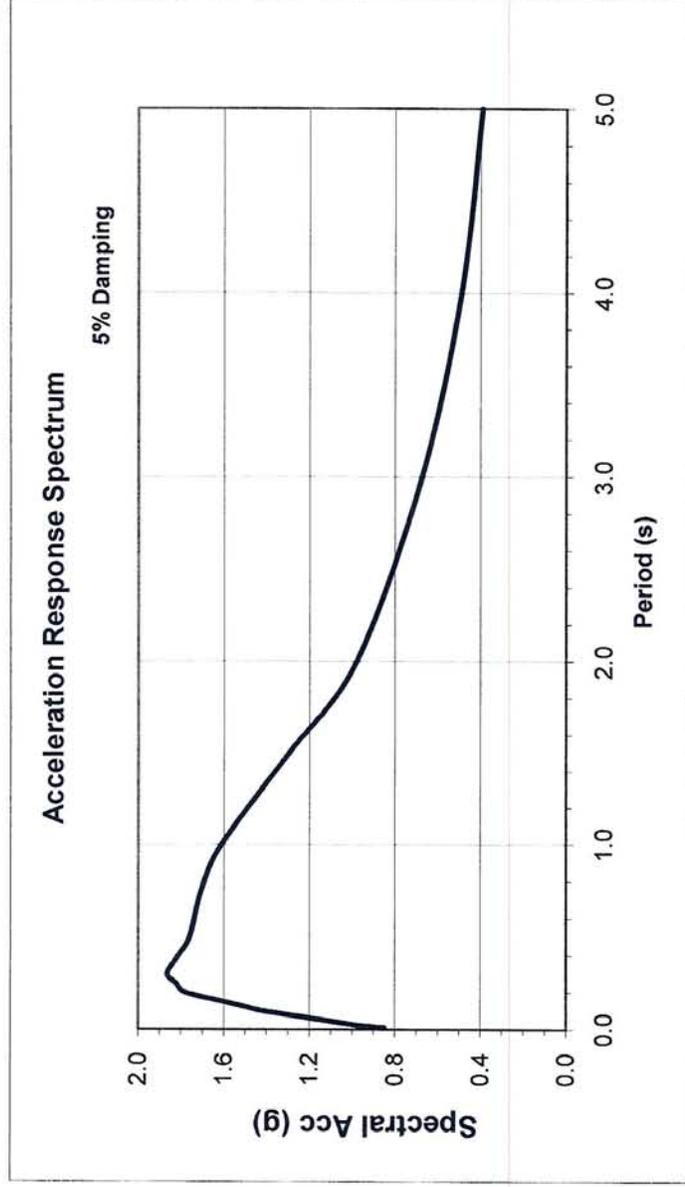
Latitude 34.0637

Longitude -117.2959

Control Probabilistic

USGS 2008 Deagg

Period (s)	ARS
0.010	0.850
0.020	0.964
0.030	1.021
0.050	1.136
0.075	1.279
0.100	1.422
0.120	1.494
0.150	1.602
0.200	1.783
0.250	1.824
0.300	1.864
0.400	1.812
0.500	1.760
0.750	1.706
1.000	1.611
1.500	1.296
2.000	0.980
3.000	0.674
4.000	0.490
5.000	0.392



Deterministic Procedure Data

Fault	San Jacinto Fault Zone (San Bernardino Valley Section)	R_{rup}	0.30	km
Fault ID	230	R_{jb}	0.30	km
Style	Strike-Slip	R_x	0.30	km
Mmax	7.5	V_{S30}	290	m/s
Dip	90	Z_{1.0}	0	m
Z_{TOR}	0	Z_{2.5}	0.00	km
		PBA	0.53	g

Notes

ARS curve was modified for Near Fault Directivity Effect (SDC Ver. 1.5 Section 6.1.2.1)

Memorandum

*Flex your power!
Be energy efficient!*

To: MR. DAN T. ADAMS
BRIDGE DESIGN BRANCH 10
DEVISION OF ENGINEERING SERVICES

Date: August 17, 2011

File:08-SBD-215-PM 4.03
08-0M9400

Attention: Mr. Larry Wu

I-215/10 Separation
Bridge No. 54-0479 R/L

From: Office of Geotechnical Design South 2
Geotechnical Services – MS 5
Division of Engineering Services

Subject: **Seismic Design Recommendations**

Introduction

This memorandum presents preliminary seismic design recommendations for the widening of the referenced structure. Ground motion recommendation is based on the Caltrans 2009 Seismic Design Procedure (SDP) as described in the Seismic Design Criteria (SDC) version 1.5 Appendix B.

Seismicity

Based on the 2007 Caltrans fault database, the site is located between two branches of San Jacinto fault zones. The San Bernardino section (Fault ID 230, $M_{\max}=7.5$, strike-slip, dip=90 deg) is about 0.3 miles (0.4 km) from the site and is the controlling fault for deterministic seismic procedure. The peak horizontal bedrock acceleration (PBA) at the site is estimated as 0.5g. A copy of a map showing the location of the bridge and the controlling fault is attached.

Soil Profile

From the 1966 As-Built and 2010 log of test borings, layers of medium dense to dense silty sand (SM), sand (SP) with some gravel and cobbles underlie the site. The average shear wave velocity for the upper 100 feet of the subsurface materials is estimated as $V_{S30}=280$ m/s.

Design Response Spectrum

Based on the 2009 SDP, the design response spectrum is the upper envelope of deterministic and probabilistic response spectra, but not to be less than a deterministic response spectrum for a vertical strike-slip fault of $M_{\max}=6.5$ at a distance of 12 km. The deterministic response spectrum is obtained by taking average of the median response spectra calculated using the 2008 Campbell-Bozorgnia and 2008 Chiou-Youngs ground motion prediction equations. Probabilistic response spectrum is obtained for 5% probability of exceedance in 50 years (about 1000 year return period) from the 2008 USGS Seismic Hazard Map (<http://earthquake.usgs.gov/hazards/products/conterminous/2008/>). Adjustment to account for

Dan T. Adams
August 17, 2011
Page 2 of 2

site condition and near fault effects shall be implemented. For this site the probabilistic procedure controls. The PGA value from probabilistic approach is about 0.83g. A copy of the acceleration response spectrum recommended for design is attached for your reference.

Liquefaction

From the 1966 As-Built and 2010 log of test borings, layers of loose to very dense sand, silty sand and sandy silt with gravel were encountered at the site. These layers have been reported within elevations about 970 to 950 feet. These layers when saturated have the potential for soil liquefaction due to strong ground shaking.

Ground water surface was encountered during the 1968 and 2010 subsurface explorations at elevation about 923 feet and 911 feet, respectively. Ground water surface up to elevation of about 935 feet has been measured in boreholes of bridges in vicinity.

Based on the above information, the potential for soil liquefaction due to strong ground shaking is considered low.

Seismic Settlement

Seismic settlement due to strong ground motion is estimated about 1 inch.

Subsurface Fault Rupture Hazard

The site is not located within the Earthquake Fault Hazard Zone (EFHZ) in California. The potential for surface fault rupture hazard is considered low.

If you have any question, please contact AnhDan Le (916) 227-7211 or Angel Perez-Cobo (916) 227-7167, Office of Geotechnical Design South-2.

Prepared by:

Date: 08/17/11

Supervised by:

Date:

8/17/11

AnhDan Q Le, Ph.D., G.E.
Transportation Engineer
Geotechnical Design South-2



Angel Perez-Cobo, P.E.
Senior Transportation Engineer
Geotechnical Design South-2

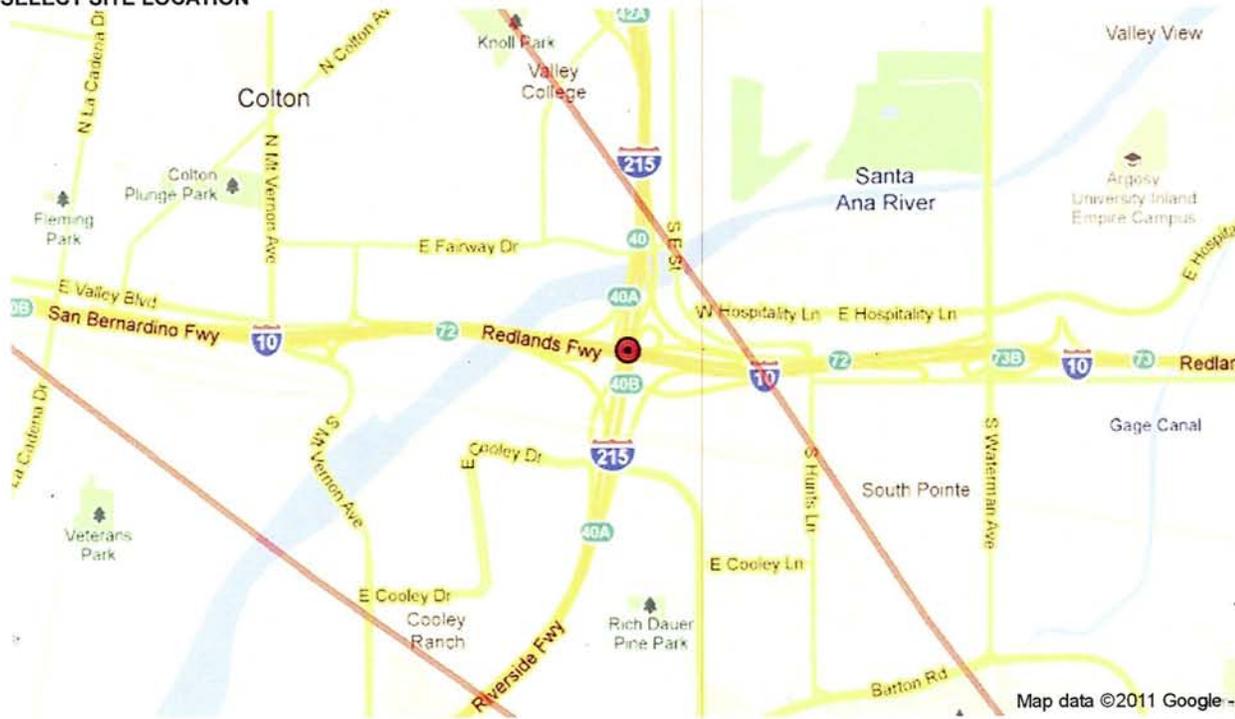
cc: H. Valencia - GDS2
M. DeSalvatore - GDS2
File

CALIFORNIA DEPARTMENT OF TRANSPORTATION

Caltrans ARS Online (v2.0)

This web-based tool calculates both deterministic and probabilistic acceleration response spectra for any location in California based on criteria provided in *Appendix B of Caltrans Seismic Design Criteria*. More...

SELECT SITE LOCATION



Latitude: Longitude: Vs30: m/s

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I-215/10 Separation

Bridge No. 54-0479 L/R

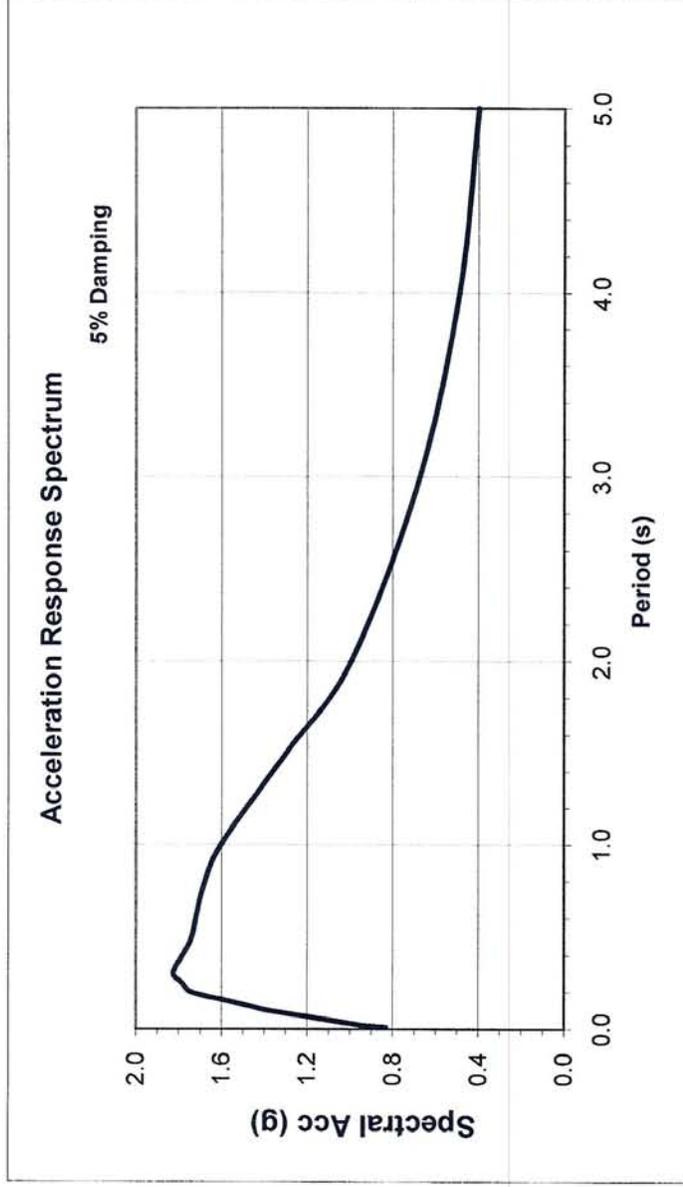
Latitude 34.0641

Longitude -117.2965

Control Probabilistic

USGS 2008 Deagg

Period (s)	ARS
0.010	0.832
0.020	0.942
0.030	0.997
0.050	1.107
0.075	1.245
0.100	1.383
0.120	1.455
0.150	1.563
0.200	1.743
0.250	1.784
0.300	1.825
0.400	1.782
0.500	1.739
0.750	1.690
1.000	1.602
1.500	1.299
2.000	0.995
3.000	0.674
4.000	0.490
5.000	0.399



Deterministic Procedure Data

Fault	San Jacinto Fault Zone (San Bernardino Valley Section)	R_{rup}	0.40	km
Fault ID	230	R_{jb}	0.40	km
Style	Strike-Slip	R_x	0.40	km
Mmax	7.5	V_{S30}	280	m/s
Dip	90 deg	Z_{1.0}	0	m
Z_{TOR}	0 km	Z_{2.5}	0.00	km
		PBA	0.53	g

Notes

ARS curve was modified for Near Fault Directivity Effect (SDC Ver. 1.5 Section 6.1.2.1)

Preliminary

Design Response Spectrum

Memorandum

*Flex your power!
Be energy efficient!*

To: MR. DAN T. ADAMS
BRIDGE DESIGN BRANCH 10
DEVISION OF ENGINEERING SERVICES

Date: August 17, 2011

File:08-SBD-215-PM 3.72
08-0M9400

Attention: Mr. Larry Wu

Colton-Loma Linda Yard OH
Bridge No. 54-0482 R/L

From: Office of Geotechnical Design South 2
Geotechnical Services – MS 5
Division of Engineering Services

Subject: **Seismic Design Recommendations**

Introduction

This memorandum presents seismic design recommendations for the widening of the referenced structure. Ground motion recommendation is based on the Caltrans 2009 Seismic Design Procedure (SDP) as described in the Seismic Design Criteria (SDC) version 1.5 Appendix B.

Seismicity

Based on the 2007 Caltrans fault database, the site is located between two branches of San Jacinto fault zones. The San Bernardino section (Fault ID 230, $M_{\max}=7.5$, strike-slip, dip=90 deg) is about 0.3 miles (0.4 km) from the site and is the controlling fault for deterministic seismic procedure. The peak horizontal bedrock acceleration (PBA) at the site is estimated as 0.5g. A copy of a map showing the location of the bridge and the controlling fault is attached.

Soil Profile

From the 1966 As-Built and 2010 log of test borings, layers of sand, silty sand and sandy silt with cobbles and gravels underlie the site. Using correlation of shear wave velocity with SPT blow counts, the average shear wave velocity for the upper 100 feet of the subsurface materials is estimated as $V_{S30}=260$ m/s.

Design Response Spectrum

Based on the 2009 SDP, the design response spectrum is the upper envelope of deterministic and probabilistic response spectra, but not to be less than a deterministic response spectrum for a vertical strike-slip fault of $M_{\max}=6.5$ at a distance of 12 km. The deterministic response spectrum is obtained by taking average of the median response spectra calculated using the 2008 Campbell-Bozorgnia and 2008 Chiou-Youngs ground motion prediction equations. Probabilistic response spectrum is obtained for 5% probability of exceedance in 50 years (about 1000 year return period) from the 2008 USGS Seismic Hazard Map (<http://earthquake.usgs.gov/hazards/products/conterminous/2008/>). Adjustment to account for

Dan T. Adams
August 17, 2011
Page 2 of 2

site condition and near fault effects shall be implemented. For this site the probabilistic procedure controls. The PGA value from probabilistic approach is about 0.78g. A copy of the acceleration response spectrum recommended for design is attached for your reference.

Liquefaction

From the 1966 As-Built and 2010 log of test borings, layers of loose to very dense sand, silty sand and sandy silt with gravel underlie the site. Ground water surface was encountered at elevations varying from 917 feet to 940 feet during the 1966 and 1957 subsurface explorations. Ground water surface was encountered at elevations varying from 899 feet to 902 feet during the 2010 subsurface explorations.

Considering the groundwater surface elevations and soil profiles at the site, it can be concluded that the potential for soil liquefaction due to strong ground shaking is low.

Seismic Settlement

Seismic settlement due to strong ground motion is estimated about 2 inches.

Subsurface Fault Rupture Hazard

The site falls within the Earthquake Fault Hazard Zone (EFHZ) in California. Based on the study reported by engineer geologist Martha Merriam, about a foot of vertical offset (northeast side down) should be expected anywhere beneath the bridges. For details, please see the enclosed memo issued by Martha Merriam on July 1, 2010.

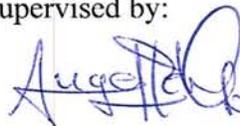
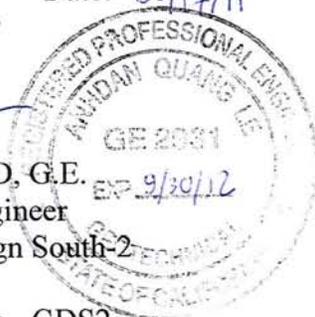
If you have any question, please contact AnhDan Le (916) 227-7211 or Angel Perez-Cobo (916) 227-7167, Office of Geotechnical Design South-2.

Prepared by:

Date: 08/17/11

Supervised by:

Date:



8/17/11

AnhDan Q Le, Ph.D., G.E.
Transportation Engineer
Geotechnical Design South-2

Angel Perez-Cobo, P.E.
Senior Transportation Engineer
Geotechnical Design South-2

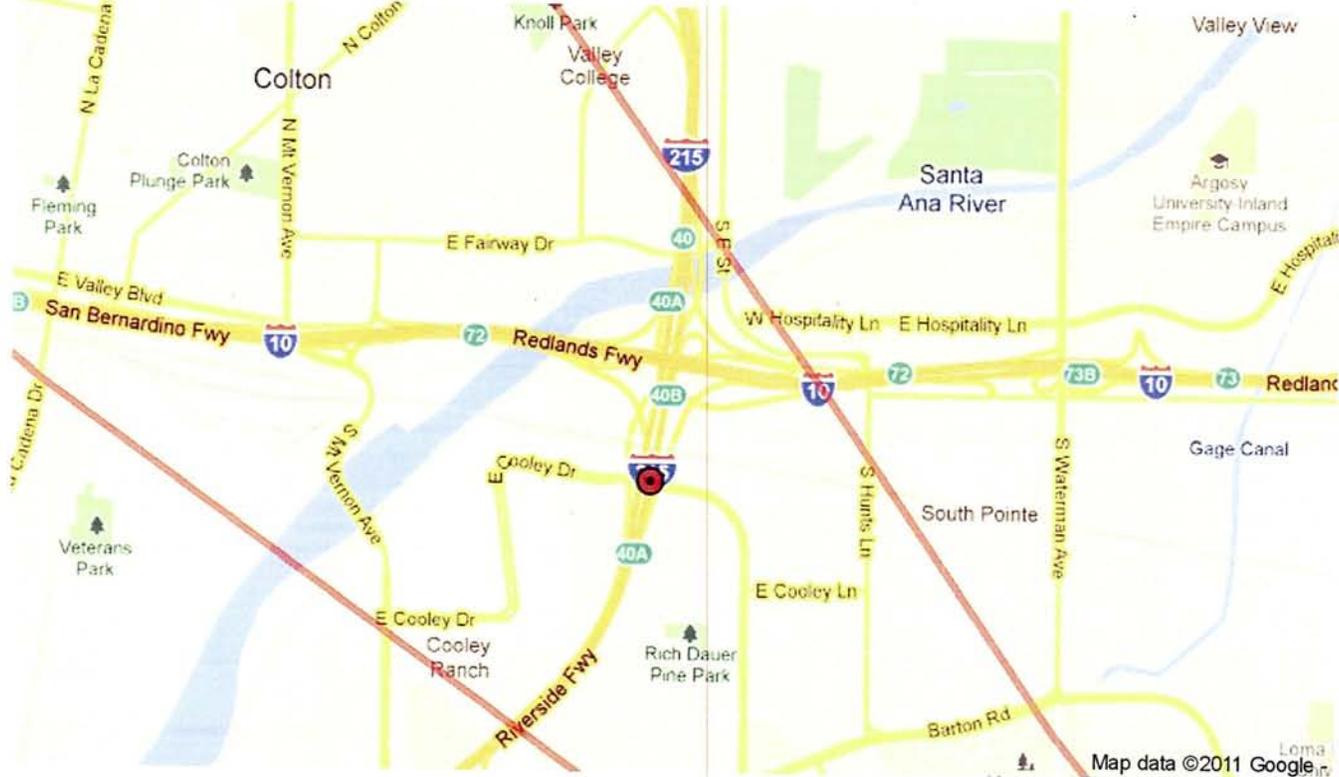
cc: H. Valencia - GDS2
M. DeSalvatore - GDS2
File

CALIFORNIA DEPARTMENT OF TRANSPORTATION

Caltrans ARS Online (v1.0.4)

This web-based tool calculates both deterministic and probabilistic acceleration response spectra for any location in California based on criteria provided in *Appendix B of Caltrans Seismic Design Criteria*. More...

SELECT SITE LOCATION



Latitude:

Longitude:

Vs30: m/s

Colton-Loma Linda Yard OH

Bridge No. 54-0482R/L

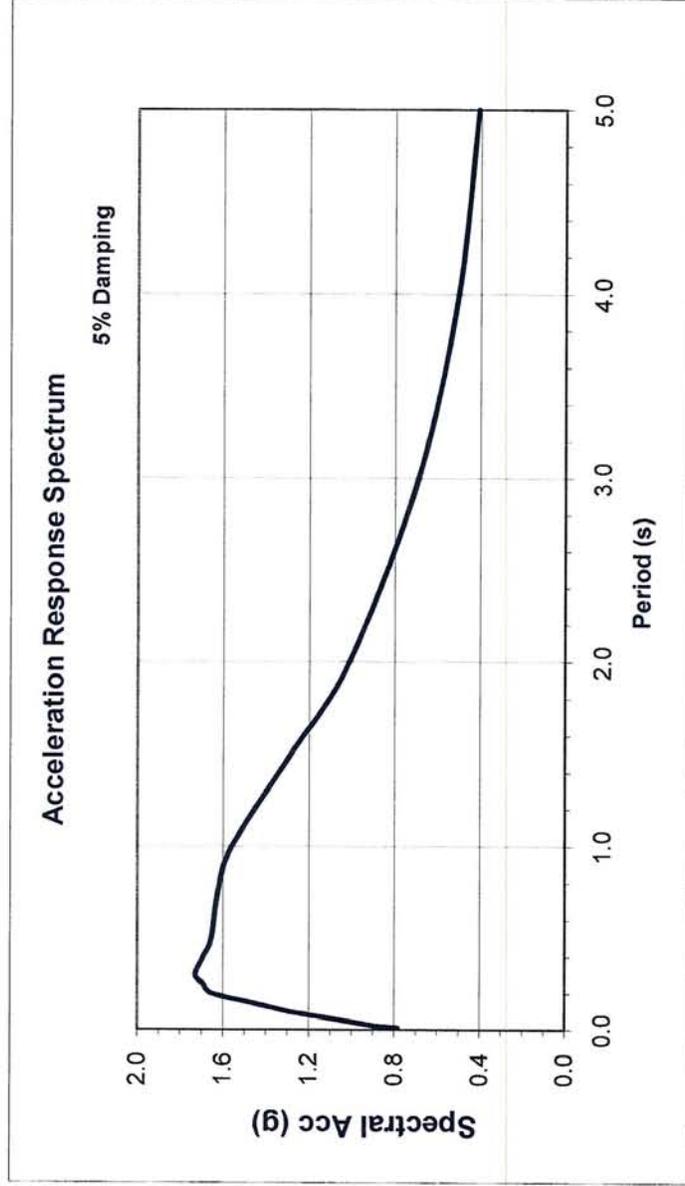
Latitude 34.0609

Longitude -117.2973

Control Probabilistic

USGS 2008 Deagg

Period (s)	ARS
0.010	0.784
0.020	0.887
0.030	0.938
0.050	1.040
0.075	1.168
0.100	1.296
0.120	1.368
0.150	1.476
0.200	1.657
0.250	1.693
0.300	1.730
0.400	1.692
0.500	1.655
0.750	1.625
1.000	1.560
1.500	1.287
2.000	1.014
3.000	0.693
4.000	0.505
5.000	0.411



Deterministic Procedure Data

Fault	San Jacinto Fault Zone (San Bernardino Valley Section)	R_{rup}	0.40	km
Fault ID	230	R_{jb}	0.40	km
Style	Strike-Slip	R_x	0.40	km
Mmax	7.5	V_{S30}	260	m/s
Dip	90	Z_{1.0}	0	m
Z_{TOR}	0	Z_{2.5}	0.00	km
		PBA	0.53	g

Notes

ARS curve was modified for Near Fault Directivity Effect (SDC Ver. 1.5 Section 6.1.2.1)

Memorandum

*Flex your power!
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To: MR. DAN T. ADAMS
BRIDGE DESIGN BRANCH 10
DEVISION OF ENGINEERING SERVICES

Attention: Mr. Larry Wu

From: Office of Geotechnical Design South 2, Branch A
Geotechnical Services – MS 5
Division of Engineering Services

Subject: **Final Seismic Design Recommendations**

Date: August 17, 2011

File: 08-SBD-215-PM 0.6
EA 08-0M9400
Project #0800000506
Highgrove UP
(Replace & Shoofly)
Bridge No. 54-0518 R/L

Introduction

This memorandum presents final seismic design recommendations for the above bridges (Replace & Shoofly). Ground motion recommendation is based on the procedure of Seismic Design for Railway Structures written in American Railway Engineering and Maintenance-of-Way Association (AREMA) Guideline Chapter 9.

Seismicity

Based on the 2007 Caltrans fault database, the site is located about 2.4 miles (3.8 km) from San Jacinto Fault Zone (Fault ID 229, $M_{\max}=7.5$, strike-slip, dip=90 deg), which is the controlling fault for deterministic seismic procedure. The San Jacinto fault is located northeast of the bridge site. The peak horizontal bedrock acceleration (PBA) at the site is estimated as 0.4g. A copy of a map showing the location of the bridge and the controlling fault is attached.

Soil Profile

From the 1957 As-Built and 2010 log of test borings, layers of loose to very dense fine sand, silty sand with gravel and sandy silt underlie the site. The average shear wave velocity for the upper 100 feet of the subsurface materials is estimated as $V_{S30}=300$ m/s.

Design Response Spectrum

Following Figures 9-1-2 and 9-1-3 in AREMA Chapter 9 (Seismic Design for Railway Structures), we obtained: $A_{100}=0.33g$; $A_{475}=0.58$ g and $A_{2400}=0.91$ g.

The following Structure Importance Classification Factors (AREMA 9-1.3.2.2) can be used at this location:

Immediate Safety = 4 (>10 passenger trains)

Immediate Value = 4 (over 50 MGT, no good detour)
 Replacement Value = 4 for Truss Structure (Permanent)
 = 3 for Shoofly

Using these numbers and applying weighting factors, the final importance classification factor for each limit state are calculated as following:

	For Truss Structure (permanent)	For Shoofly
Serviceability	4	4
Ultimate	4	3.9
Survivability	4	3.2

After having the importance classification factor, the return period for each limit state are calculated.

Ground Motion Level	Return Period (years)	
	For Truss Structure (permanent)	For Shoofly*
1	100	100
2	500	492.5
3	2400	2120

*these return periods were estimated for Shoofly as if it is a permanent structure.

Since there is no specific criterion to be followed when determining return period for temporary structure (Shoofly) in AREMA, we decide to use Caltrans standards for temporary structure (MTD 20-12): Site seismicity shall be based on a probabilistic ground motion with a 10% probability of exceedence in 10 years. It means that the return period of temporary Shoofly is 95 years. The final return periods that should be used in design are following:

Ground Motion Level	Return Period (years)	
	For Truss Structure (permanent)	For Shoofly
1	100	95
2	500	95
3	2400	95

Using these return period values together with site coefficient, critical damping, etc., and following the procedures in AREMA Section 9 -1.3.2.3, the ARS curves for the permanent truss structure have been plotted for three limit states: serviceability, ultimate and survivability. One ARS curve is also presented for the temporary shoofly structure estimated at return period of 95

Dan Adams
August 17, 2011
Page 3 of 6

years. A copy of these acceleration response spectra recommended for final design is attached for your reference.

Liquefaction

From the 1957 As-Built and 2010 log of test borings, layers of loose to very dense fine sand, silty sand with gravel and sandy silt underlie the site. Ground water surface was encountered during the 1957 subsurface explorations at El. 896 (about 39 feet below the existing ground surface). Ground water surface was not encountered during 2010 subsurface explorations.

Based on the results of soil profiles obtained during 1957 and 2010 geotechnical explorations, it can be concluded that the potential for soil liquefaction due to strong ground shaking is low.

Seismic Settlement

Seismic settlement due to strong ground motion is estimated about 2 inches.

Subsurface Fault Rupture Hazard

The site is not located within the Earthquake Fault Hazard Zone (EFHZ) in California. The potential for surface fault rupture hazard is considered low.

If you have any question, please contact AnhDan Le (916) 227-7211 or Angel Perez-Cobo (916) 227-7167, Office of Geotechnical Design South-2.

Prepared by:

AnhDan Q Le, Ph.D., G.E.
Transportation Engineer
Geotechnical Design South-2



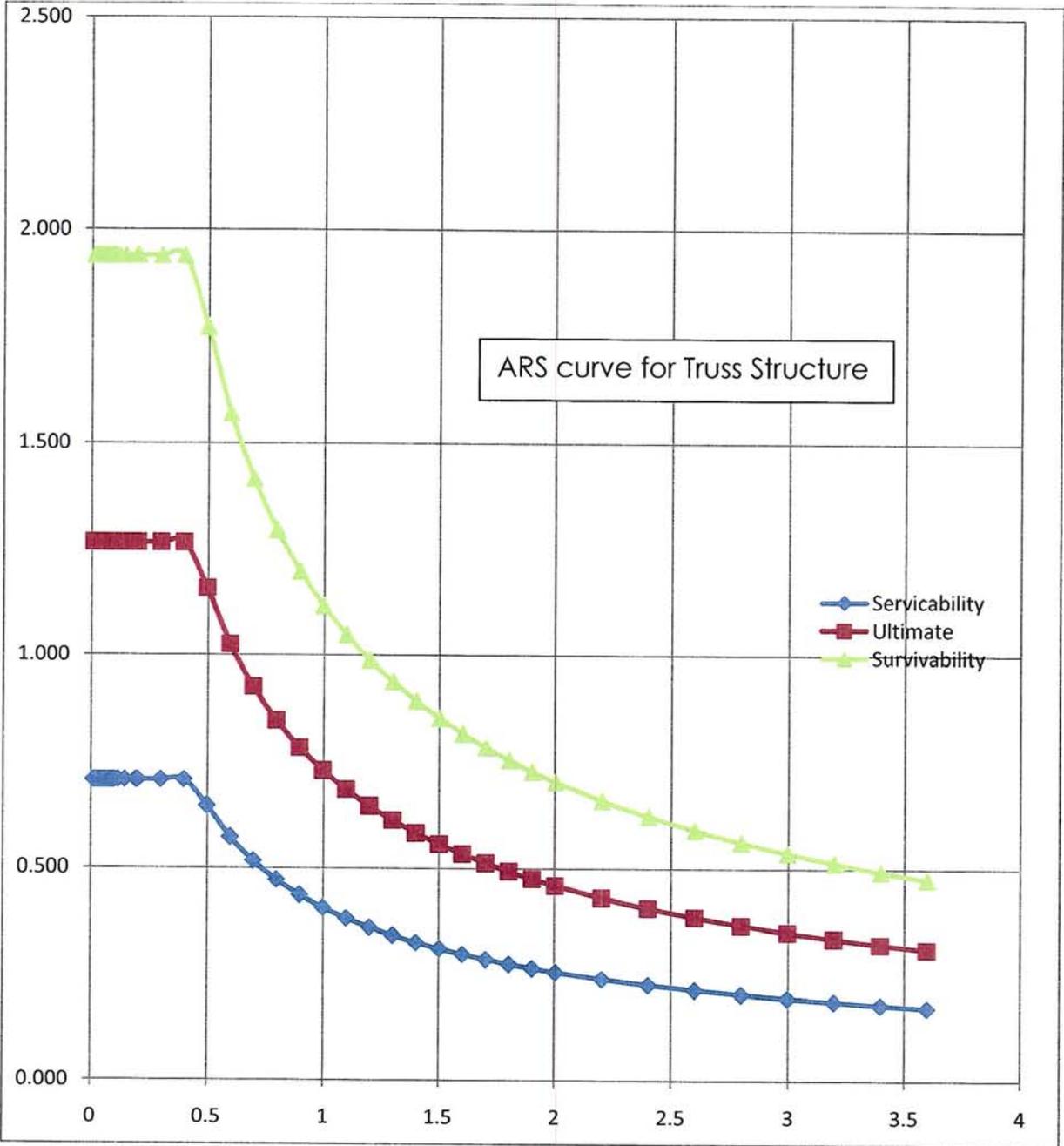
Supervised by:

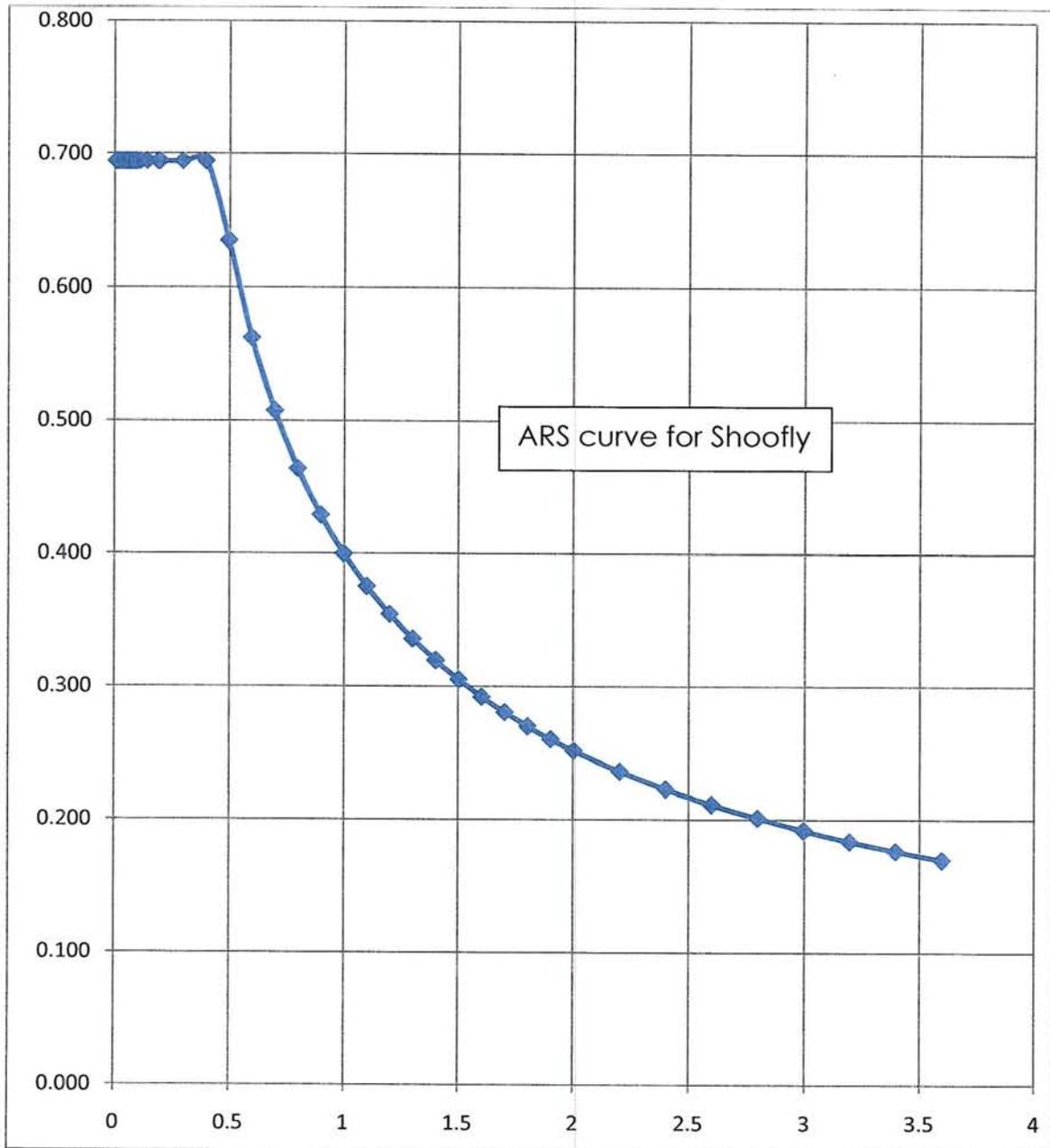
Angel Perez-Cobo, P.E.
Senior Transportation Engineer
Geotechnical Design South-2

Date:

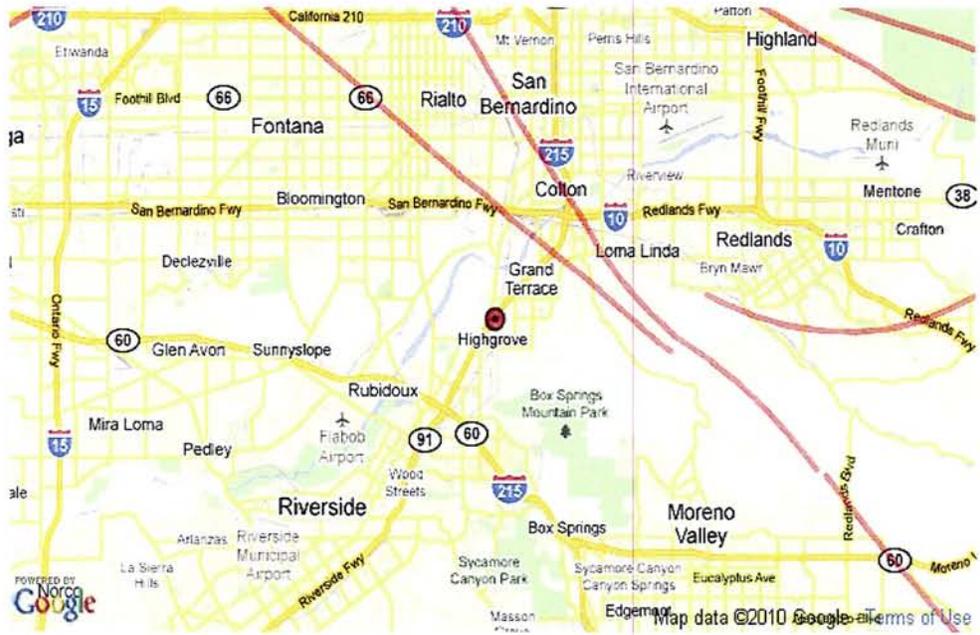
8/17/11

cc: H. Valencia - GDS2
M. DeSalvatore - GDS2
File





SELECT SITE LOCATION



M e m o r a n d u m*Flex your power!
Be energy efficient!***To:** BEN AMIRI - 08
Design I**Date:** March 12, 2012**File:** 08-0M9401

08-SBd-215-PM 0/5.2

08-RIV-215- PM 485/570

Bi-County Gap Closure

Attn: Justine Niu**From:** DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Geotechnical Services MS 5
Office of Geotechnical Design – South 2, Branch C**Subject:** Revised Geotechnical Design Report for Retaining Walls and Soundwalls**INTRODUCTION**

As requested by your Office on July 12, 2010, and later submitted information, our Office of Geotechnical Design South 2 (OGDS2) has prepared this Revised Geotechnical Design Report (GDR). The revision recommends Retaining Wall #40 to be a Caltrans Standard Type 1 Retaining Wall instead of the originally proposed Soil Nail Wall due to construction constraints. This report supersedes the previous GDR, dated February 16, 2011, and provides geotechnical information and recommendations for approximately 30,000 linear feet of retaining walls, 15,000 linear feet of soundwalls, to be constructed along the northbound and southbound shoulders of the I-215 in San Bernardino and Riverside Counties as part of the Bi-County Gap Closure Project. The retaining walls will provide needed space for proposed High Occupancy Vehicle lanes (HOV) in the existing medians and help manage traffic noise. Our scope of services performed for this study consisted of a review of pertinent geotechnical and geological literature, a review of existing Caltrans records relating to existing structures, and performing a subsurface investigation.

Existing Facilities

The segments of the I-215 within the project limits are approximately 7.5 miles long with 3 lanes in each direction, with auxiliary lanes at the freeway interchanges. The original freeway was constructed in the 1950s and was widened in the 1970s. There are several bridges constructed within the subjected project limits including but not limited to: the Santa Ana River Bridge, Route 215/10 Separation, Colton-Loma Linda Yard Overhead, and the Grand Terrance Underpass. Several reinforced concrete drainage structures cross the 215 beneath the freeway and several concrete lined open channels parallel the freeway along the Caltrans right-of-way. There are also several existing concrete retaining walls within the project limits, many of which will be removed and replaced.

Proposed Improvements

This project includes construction of approximately 7.5 miles of HOV lanes in the existing median, outside lane widening and median barrier replacement. Outside lane widening will be

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accomplished with proposed retaining wall structures. Currently there are seventeen proposed soundwalls and thirty-three proposed retaining walls. In addition, special wall foundations are needed at eight locations in order to span several large box culverts and open channels. Table 1 below contains the pertinent information for the proposed improvement within the scope of this GDR as received from your Office.

Table 1: Proposed Improvements

Wall Type and Number	Approximate Location. (Stations)	Wall and Foundation Type	On Cut or Fill	Max RW Height (ft)	Appr. RW Length (ft)	Appr. SW Length (ft)
In Riverside County						
SWB #469	SB 469 to 484	CIDH Piles				1512
SWRW & SWB #485	SB 485 to 495	Type 5 RW or CIDH' piles	Fill	6-8	770	1013
SWB #501	SB 502 to 511	CIDH Piles				886
RW 510	NB 511 to 513	Type 5 RW	Fill	4	202	
SWRW #511	SB 511 to 529	Type 5 RW	Fill	4-6	1441	1441
SWRW #516	NB 517 to 520	Type 5 RW	Fill	4	254	
SWB #529	N/A	CIDH Piles				961
SWRW & SWB #537	SB 537 to 543	Type 5 RW, or CIDH piles	Fill	4	337	168
RW #538	NB 539 to 544	Type 5 RW	Fill	4	397	
SWRW & RW #543	SB 543 to 549	Type 7 RW, or CIDH piles	Cut	4-6	583	314
SWB & SWRW #544	NB 545 to 551	Type 7 RW1 or CIDH piles	Cut	4-10	373	127
SWB # 556	NB 555 to 568	CIDH piles				1288
RW # 563	SB 563 to 569	Type 5 RW	Fill	4-6	554	
In San Bernardino County						
RW #10	NB 10 to 13	Type 5	Fill	4	350	
RW #35	SB 35 to 40	Type 1 & Type 5	Fill	4-8	500	
RW #36	NB 35 to 40	Type 1	Cut	12-16	522	
RW # 40	NB 43 to 55	Type 1	Cut	12-22	1193	
RW # 41	SB 40 to 42	Type 1	Cut	12	165	
RW # 43	SB 42 to 58	Type 1	Cut	4-18	1735	
RW # 54	NB 53 to 58	Type 1	Cut	4-14	491	
RW # 58	NB 59 to 64	Type 1	Fill	4-6	450	
RW # 61	SB 60 to 75	Type 7	Cut	4-10	1443	
RW # 68	NB 66 to 77	Type 1 & Type 7	Cut	4-18	1108	
RW # 73	SB 74 to 77	Type 1	Cut	4	340	

Wall Type and Number	Approximate Location. (Stations)	Wall and Foundation Type	On Cut or Fill	Max RW Height (ft)	Appr. RW Length (ft)	Appr. SW Length (ft)
RW # 79	SB 79 to 86	Type 1	Cut	6	700	
RW # 80	NB 80 to 84	Type 1	Cut	6	368	
SWRW & SWB #82	NB 81 to 95	Type 7 RW or CIDH Piles	Cut	6-12	1448	
SW & SWB #87	SB 86 to 93	CIDH Piles	Cut			684
SWRW & SWB #91	SB 92 to 97	Type 1 RW or CIHD piles	Fill	4-8	340	502
SWRW & SWB #94	NB 94 to 103	Type 1 RW or CIDH	Cut	6-14	665	815
SWRW & RW #97	SB 97 to 103	Type 1 RW	Cut	6-14	532	532
RW #103	SB 103 to 122	Soil Nail	Cut	12-20	1849	
RW #104	NB 104 to 125	Soil Nail	Cut	8-22	2100	
RW #121	SB 122 to 141	Type 1 RW & Type 5 RW	Fill	8-24	1927	
RW #124	NB 125 to 142	Type 1 RW & Type 5 RW	Fill	6-26	1683	520
RW #175	SB 175 to 200	Type 1 RW	Fill	6-10	2550	
RW #242	NB 242 to 250	Type 1 RW & Type 5 RW	Fill	6	800	
RW #256	NB 259 to 262	Type 1 RW	Fill	6	240	
RW #266	NB 268 to 272	Type 1 RW	Fill	6-8	400	

NOTES: SW = Soundwall, SWB = Soundwall on Barrier, RW = Retaining Wall,
 SWRW = Soundwall on Retaining Wall

SUBSURFACE INVESTIGATION AND TESTING

Our office visited the project areas and conducted a site investigation in order to explore the subsurface soil conditions and to obtain soil samples for laboratory testing. The subsurface exploration utilized a B-47 trailer mounted drill rig, a horizontal drill rig, and a Cone Penetrometer Testing (CPT) rig. The CPT rig was utilized to advance 16 soundings through the asphalt-paved and non-paved shoulders along the NB and SB 215 freeway to characterize the foundational material. Twelve vertical auger holes were advanced with the B-47 rig. Five horizontal augered boreholes were advanced into the slope at the proposed soil nail Wall #104 to evaluate the potential of bore holes caving during construction.

Sampling was accomplished with the B-47 drill rig performing Standard Penetration Testing (SPT) every 5 feet or where needed. Blow counts from the SPT sampler were recorded in the LOTBs. Soil samples collected from the 2 inch-diameter SPT spoon sampler were packaged in

zip-lock bags and bulk bag samples were collected from auger cuttings. Samples for testing were delivered to the Sacramento Laboratory. Groundwater was not encountered during our subsurface investigation during the month of November 2010. Log of Test Borings will be provided when they are completed. Table 2 below contains information regarding subsurface investigation locations and material encountered.

Table 2: Subsurface investigation locations

Location (Appr. Station)	Boring Type and ID	Depth (ft)	N60	Material encountered
SB 201	CPT #100	20	8-15	Loose silty Sand
SB 196	CPT #95	30	21-30	Silt and Clay
SB 191	CPT #90	30	6-15	Silt and Clay
SB 185	CPT #85	30	11 -30	Medium dense silty Sand
SB 178	CPT #80	40	15 -25	Medium dense silty Sand
SB 177	CPT #75	35	15-30	Medium dense silty Sand
SB 175	CPT #175	6	50+	Dense Sand
SB 119+60	Horizontal	40	NA	Silty Sand w/trace fine Gravel
SB 117+50	Horizontal	40	NA	Silty Sand w/trace fine Gravel
SB 114+00	Horizontal	40	NA	Silty Sand w/trace fine Gravel
SB 104 +50	Horizontal	40	NA	Granite, friable, moderately hard to hard.
SB 106+50	Horizontal	40	NA	Silty Sand w/trace fine to coarse Gravel
NB 122+10	Auger	80	42	Dense silty Sand
NB 118+00	Auger	70	42	Hard sandy lean Clay
NB 115+10	Auger	60	40	Dense silty Sand
NB 112+60	Auger	60	40	Dense sand
NB 109+80	Auger	50	20 30	Very stiff sandy Silt
NB 106+75	Auger	40	20-30	Very stiff to hard sandy Silt
SB 103	R-10-02	60	4-30	Loose to medium dense Sand
NB 103	R-10-01	60	5-15	Loose to med. dense silty Sand
SB 93+60	Auger	36	10 - 51	Medium dense clayey Silt
SB 93+50	CPT# 92	25	30 - 40	Dense Sand and Gravels
SB 86+40	CPT #86	25	30 - 50	Dense Sand and Gravels
SB 88+20	CPT #88	25	50 +	Very dense Sand
NB 98+20	Auger A10-98	20	44	Dense silty Sand
NB 95+10	Auger A10-95	20	24	Medium dense silty Sand
NB 52+75	Auger A10-052	20	72	Very hard silty Clay
NB 50+10	Auger A10-050	20	27	Dense silty Sand
NB 45+20	Auger A10-045	15	56	Very hard silty Clay
NB 41+10	Auger A10-041	20	1-11	Loose Sand
NB 258+25	CPT # 258	22	10 - 50	Medium dense Sands
NB 543+10	CPT #545	9	30 - 50	Dense sandy Silt
SB 540+20	CPT #540	28	12 -30	Medium dense silty Sand

SB 526+00	CPT #425	17	10 - 30	Medium dense Sand
NB 518+10	CPT #520N	17	15 - 40	Medium dense silty Sand
SB 521+20	CPT #520	13	20 - 50	Dense silty Sand
SB 516+80	CPT #518	12	50 +	Dense Sand
SB 512+10	CPT #513	15	10 - 30	Medium dense silty Sand with gravels
NB 510+10	CPT #512	15	15 - 30	Medium dense silty Sand

Laboratory Testing

Laboratory tests performed on the collected samples included: Mechanical Analysis (California Test Method 202), Plasticity Indexing (CTM 204) and Corrosion (CTM 643).

In-Situ testing

In-situ testing for this report included Standard Penetration Tests (SPT), which were, performed at all vertical boring locations. Cone Penetration Testing was conducted with in the area of the proposed retaining walls and soundwalls.

Project Site Seismicity

The controlling fault for the site is the Heledale Fault, which is a 56-mile long right-lateral fault. The Heledale Fault is capable of a Maximum Credible Earthquake (MCE) of 7.25 and is located about 11 miles northeast of the site according to seismic design recommendations. The peak horizontal bedrock acceleration at the site, based on Caltrans California Hazard Map, is estimated to be 0.4g

SOUNDWALL RECOMMENDATIONS

There are several types of sound wall foundations proposed for this project including Caltrans standard soundwalls on retaining wall (Types 1, 5 and 7), standard soundwall on barriers and standard soundwalls on Cast in Drilled Holes (CIDH) piles.

Our Office concurs with the proposed standard design as proposed. However, at some locations, special design soundwall foundations are recommended for spanning utilities, as listed in the Table 3 below. This section describes the methodology used for design of the proposed sound walls, including the selection of soil strength parameters, the proposed slope of the finished ground and the wall geometry.

Related standards used for the design of these soundwalls:

- Standard Plan numbers B15-1 through B15-15
- Bridge standard Detail Sheets XS14-010 through XS14-410-2e
- Bridge memos to designers 22-1
- Standard Specifications, 2006 sections 6-3.01, 19-5.03 and 19-5.04

The following soundwall recommendations, as listed in Table 3 below, were derived from following the design procedures as listed in the Caltrans Geotechnical Manual for Soundwall Design.

Table 3: Soundwall Foundation Recommendations

Wall No.	Location	Foundation Type	Wall Height (ft)	Case	Friction Angle (degree)
#469	SB 469 to 484	CIDH	12 -16	II	30
#485		Type 5 RW	12 -16	I	34
#485		CIDH	12 -16	II	30
#501	SB 502 to 511	CIDH	12 -16	II	30
#511	SB 511 to 529	Type 5 RW	12 -16	I	34
#529	SB 537 to 543	CIDH	12 -16	II	30
#537	SB 537 to ?	Type 5 RW	12 -16	I	34
#537	SB ? to 543	CIDH	12 -16	II	30
#543	SB 549	Type 7 RW	12 -16	I	34
#544	NB 545 to 549+50	Type 7 RW	12 -16	I	34
#544	NB 549+50 to 551	CIDH	12 -16	II	30
#563	NB 568+50 to 576	CIDH	12 -16	I	34
#563	563 to 568+50	Type 5 RW	12 -16	I	34
#82	NB 81to ?	Type 7 RW	12 -16	II	34
#82	NB ? to 95	CIDH	12 -16	II	30
#87	SB 86 to ?	CIDH	12 -16	II	30
#87	SB ? to 93	CIDH	12 -16	II	30
#91	SB 92	Type 1RW	12 -16	I	34
#91	SB 92	CIDH	12 -16	II	30
#94	NB 94	Type 1 RW	12 -16	I & II	30
#94	NB 94	CIDH	14	II	30
#97	SB 97	Typ1 RW	14	II	34

Notes: SD = Special Design grade beam to span utility

RETAINING WALL RECOMMENDATIONS

There are several types of retaining wall foundations proposed for this project including Caltrans Standard Retaining Wall Types 1, 5 and 7, and Standard Retaining Walls with Barriers. In addition, there are two soil nail walls proposed, #103 and #104.

Our Office concurs with the proposed Caltrans Standard Retaining Wall designs from geotechnical point of view. The geotechnical recommendations for the two soil nail walls are described in later Sections of this report.

This section describes the methodology used for design of the proposed standard retaining walls including the selection of soil strength parameters, the proposed slope and of finished ground wall geometry.

Related standards used for the design of these retaining walls:

- Standard Plan numbers B3-1 through B3-11
- Bridge standard Detail Sheets XS14-010 through XS14-410-2e
- Bridge memos to designers 22-1
- Standard Specifications, 2006 sections 6-3.01, 19-5.03 and 19-5.04
- Spec for grade beam to bridge utility crossings

The following retaining wall recommendations, as listed below in Table 4, are derived from following the design procedures as listed in the Caltrans Geotechnical Manual for Retaining Wall Design and the most recent information provided to our Office. Please note that the following listed retaining wall locations are described in approximate stations, with the best understanding to our Office.

Table 4: Retaining Wall Foundation Recommendations

Wall No.	Approximate Location (Stations)	Wall Type	Approximate Wall Height (ft)	Case and Notes	Friction Angle (degrees)
#510	NB 511 to 513	Type 5	4	I	34
#516	NB 517 to 520	Type 5	4	I	34
#538	NB 544 to 539	Type 5	4	I	34
#543	SB 546	Type 7	4-6	I	34
#10	NB 9 to 13	Type 5	4	I	34
#35	SB 35 to 40	Type 1	4-8	I	34
#35	SB 35 to 40	Type 5	4-8	I	34
#36	NB 35 to 39	Type 1	12 to 16	II	34
#40	NB 43 to 53	Type 1	12 to 22	II	34
#41	SB 40 to 41	Type 1	12	I	34
#43	SB 42 to 60	Type 1	4 to 18	II	34
#54	NB 52 to 57	Type 1	4 to 14	II	
#58	NB 59 to 63	Type 1	4-6	I	34
#61	SB 60 to 74	Type 7	4-10	I	34
#68	NB 66 to 77	Type 1	4-18	II	34
#68	NB 66 to 77	Type 7	4-18	II	34
#73	SB 74 to 77	Type 1	4	II	34
#79	SB 79 to 86	Type 1	6	I	34
#80	NB 80 to 84	Type 1	6	II and III	34
#97	SB 97	Type 1	12	I	34
#103	SB 103 to 122	Soil nail	12-20	II	32
#104	NB 104 to 125	Soil nail	8 to 22	II	32

Wall No.	Approximate Location (Stations)	Wall Type	Approximate Wall Height (ft)	Case and Notes	Friction Angle (degrees)
#121	SB 122 to 141	Type 1	8-24	I	34
#121	SB 122	Type 5	8-24	I	34
#124	NB 124 to 142	Type 1	6 to 26	I	34
#124	NB 124 to 142	Type 5	6 to 26	I	34
#175	SB 175 to 200	Type 1	6 to 10	I	34
#242	NB 242 to 250	Type 1	6	I	34
#242	NB 242 to 250	Type 5	6	I	34
#256	NB 257 to 262	Type 1	6	I	34
#266	NB 267 to	Type 1	6-8	I	34

Between the proposed site of retaining Wall #40 and the existing BNSF Railroad Overhead, there is a creek which flows beneath the 215 at approximately station 41 and flows along the southbound shoulder. Aerial photographs and existing LOTBs indicate this area was part of an alluvial creek bed. During our subsurface investigation very loose sands were encountered at this location and therefore special considerations will be required when designing foundations at this location. At this time this office is uncertain what type of wall will be required at this location, although it is our understanding that a Special Design Wall on piles will be required at the location if the wall will span the culvert. The BNSF RR Overhead at station 40 will be replaced at it is not clear at this time if the wall at the culvert crossing will be part of this GDR or if they will be bridge wing walls and included in the FR for the bridge.

Special Design Retaining walls to span over utilities

According to information we have received from your Office, there are twelve locations along the 215 freeway, where large pipe or box culverts cross beneath the LOL of proposed retaining and or soundwalls. Special designed walls on piles and grade beams may be required to cross over the utilities at the 12 locations listed below in Table 5. The geotechnical recommendations required for specially designed walls will be provided in a separate GDR when all design parameters are provided to our Office.

Table 5: Potential Special Design Wall Locations

Wall No.	Station	Utility	Wall No.	Station	Utility
42	SB 40	Double 6'x 6' RCB	175	SB 174	14'x 13" RCB
41	NB 41	Double 6'x 6' RCB	175	SB 187	8'x 4' RCB
58	NB 62	60" RCP	511	SB 520+50	8'x 6' RCB
61	SB 64	60" RCP	537	SB 538	8'x 6' RCB
92	SB 94	54" RCP	538	SN 540	8'x 6' RCB
94	NB 95	54" RCP	538	NB 541	4'x 4' RCB

SOIL NAIL WALL RECOMMENDATIONS

Based on information from the District, the design length of Retaining Wall #103 and #104 is approximately 2100 feet long from station 103+00 to 124+00, with the wall heights ranging from approximately 6 feet to 22 feet. The proposed finished slope in front of the walls will be 3:1 H: V in order to leave space for an additional future widening. The finished slope above this wall will typically continue from the top of wall at a slope of approximately 2:1 H: V or flatter, to the hinge point at the top of slope.

As requested by District, this office analyzed both options for a Standard Type 1 Retaining Wall and a soil nail wall for Walls #40, #103 and #104. Considering the required temporary shoring for constructing Type-1 walls, soil nail walls are considered to be a better option at proposed wall locations #103 and #104, although permanent subsurface easements may be required for soil nails that may extend beyond the current Caltrans Right of Way. At the proposed location of Wall #40, a Standard Type1 Retaining is recommended due to the potential of nails extending past the Caltrans right of way.

Both soil nail walls are to be designed such that a future widening can be accomplished by adding addition soil nail walls below the currently proposed walls. Between stations 121+80 and 134+80, there is a trapezoidal concrete lined culvert at the slope bench which runs parallel to and with in the Caltrans R/W. Between station 137+00 and 144+45, the existing Caltrans R/W runs along the slope hinge, several large utility towers supporting high-voltage lines that cross the freeway to the Southern Californian Edison Electrical sub station. There is a mass of granite that daylight along the freeway cut between stations 109 +00and 116+00 on the Southbound 215.

At the proposed base of Retaining Wall 103 lies a lenticular Box Springs granitoid crops between Stations 109+00 to 116+00. This body daylights 15 to 20 feet above the roadway and extends into the slope roughly horizontal. The material is composed of dark granites and quartz dikes in moderately fractured, highly weathered state. The material is friable. A boring, 0-10-004, was advanced 45 degrees into the slope and ended about 30 feet below the foundation of the wall. The material was still highly weathered and friable.

Selection of Soil Strength and Design Parameters

The SPT data from the subsurface investigation for Wall #104 averaged 41 blows per foot near the proposed soil nail area. The only subsurface investigation for wall #103 was five horizontal borings atop the cut slope and one mud rotary boring at Newport Ave Bridge. Due to the fact walls #103 and #104 will be placed on either side of a large cut, we assumed similar soil conditions exist for design of both walls. In general, soil samples from the site were classified as medium dense to very dense silty SAND (SM). From the in-situ and Laboratory test results, we estimated the general soil parameters to be of an internal friction angle of 32 degrees, cohesion of 0 psf and a moist unit weight of 125 lb/ft³.

Wall Design and Analysis

The above soil strength parameters slope and wall geometry were inputted into the limit equilibrium computer program. SNAIL program (Ver. 3.09), created by Caltrans, to determine possible combinations of nail lengths, spacing and the associated Fact of Safety (FOS) for material estimating. This analysis report includes internal and external slope stability analysis. Static and seismic cases are separately studied. The pseudo-static analysis assumes a horizontal acceleration of 0.20g. The factors of safety used for the design of the three soil nail walls was as follows: 1.66 for Static(Global), and 1.20 for Pseudo_Static(0.2g). Ground water is not considered for this case. The soil nail walls are designed generally in accordance with the guidelines recommended by FHWA Manual for Design & Construction Monitoring of Soil Nail Walls, Edition 1996. The recommended design data are presented below in Tables 6, 7 and 8.

Table 6: General information for Soil Nail Walls

Wall no.	Start Station	End Station	Height Range (feet)	No. of Nail Layers	Soil Nail Length (feet)
103	103+22	125+39	10 to 20	4	30
104	104+39	158+58	10 to 22	5	30

Table 7: General information for Soil Nail Walls

Wall No.	Vertical Nail Spacing for Top Row Only (ft)	Vertical Nail Spacing (ft)	Horizontal Nail Spacing (ft)	Punching Shear (kips)	Yield Stress (ksi)
103	2	5	5	40	60
104	2	4	5	40	60

Recommendations

The soil nail design pullout resistance is required to be 3,300 lb/ft. Contractor will select drilled hole diameter as soil nail size to meet the design capacity. Loose and/or caving sands may be encountered in the top 5 feet of slope during wall construction; the first row of nails may require a short section of casing. The top row of nails should be placed a maximum of 2 feet below the top of the wall. All construction operations should comply with the special specifications provisions, Section 10.1, based on the following recommended Wall Zones.

Wall Zones

Soil Nail Walls #103 and #104 will each be separated into four zones for soil nail testing and temporary open cut duration purposes. Each wall is divided into two sections, each section is divided in two zones, one section for the top 5 feet of the wall and one section for the area of the wall from 5 feet below the top to the bottom of the walls. Zones are listed below in Table 8.

Table 8: Wall Soil Zones

Wall No.	Divided Zones	Start Station	End Station	Nail length (ft)	Ultimate Bond Strength (psi)
103	Zone 1 (Top 5 ft)	104+00	112+00	20.0	10.0
	Zone 2 (5 ft below)				
	Zone 3 (Top 5 ft)	112+00	125+00	30.0	10.0
	Zone 4 (5 ft below)				
104	Zone 1 (Top 5 ft)	103+60	109+50	16.0	10.0
	Zone 2 (5 ft below)				
	Zone 3 (Top 5 ft)	109+50	124+58	30.0	10.0
	Zone 4 (5 ft below)				

Test Nails

The Contractor will perform verification testing and proof testing as specified in the Construction Specifications. A minimum of eight percent (8%) of the total number of nails shall be proof tested.

Corrosion

Materials Engineering and Testing Services Technology Branch has performing corrosion tests on soil samples from the soil nail wall field investigation. Test results indicate the soils at the Soil Nail wall sites are not considered corrosive. Normal design techniques and construction materials can be used for the soil nail walls. Further testing of other soil samples is ongoing, we do not anticipate encountering corrosive soils, and we shall provide testing results as they become available.

Construction Considerations

No groundwater was encountered during our subsurface investigations, and groundwater should not be encountered during construction, although the many culverts and creeks may contribute water during construction.

From the provided typical cross sections for standard retaining walls and our site investigation, it appears 5 foot vertical temporary excavation cuts should remain stable during footing construction, although the contractor shall be responsible for shoring design as deemed necessary. If temporary shoring is required, medium dense to very dense sands with gravels should be anticipated for temporary shoring construction.

During soil nail construction, compressed air should not be introduced into the soil nail wall boreholes, as the air will dry out the sands and cause them to slough and cave. There could be potential layers of loose sands, which may be encountered during construction. Holes drilled in loose sands may require casing near the surface. All holes drilled for soil nails should be grouted the same day they are drilled; no holes shall be left open overnight. The five horizontal borings

Ben Amiri
March 12, 2012
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into the cut slope at the proposed location of soil nail wall 103, remained open and clear for twenty four hours indicating the holes drilling for soil nails should remain open during construction. The gravels encountered did not cause problems during our horizontal drilling operation and the gravels are not are anticipated to cause refusal or caving problems during soil nail construction.

Regarding the granitoid outcrops between Stations 109+00 to 116+00 of soil nail wall #103, it appears the proposed nails of the wall will be placed above the granite, and the footing of the wall will be placed approximately on top of the granite. The granite material appears to be friable, and ripping should be moderate to hard, with no blasting anticipated.

If you require further information, please contact Brian Gutierrez at (916) 227-1222 or Shawn Wei at (916) 227-5252.

Prepared by:

Date:

Brian Gutierrez 3/12/12

BRIAN GUTIERREZ, P.E.
Branch C
Office of Geotechnical Design- South 2



cc: AAbghari - GDS2
SWei - GDS2
GS Corporate

M e m o r a n d u m*Flex your power!
Be energy efficient!*

To: MR. BEN AMIRI
Office Chief
District 8
Design I, MS 1164

Date: September 15, 2011

File: 08-SBd-215-PM 0.0/5.7
08-0M9401
0800000506
Bi-County HOV Gap Closure

Attn: Justine Niu

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Geotechnical Services
Office of Geotechnical Design – South 2

Subject: Geotechnical Design Recommendations For Retaining Walls 28, 29 and 31

This Geotechnical Design Recommendations memorandum presents the geotechnical information and recommendations for the three proposed retaining walls (Retaining Walls 28, 29, and 31) near the Iowa Avenue Overcrossing (Br. 54-0527). The proposed retaining walls are to facilitate the widening of the I-215 freeway and the off-ramps at the Iowa Avenue Overcrossing. These proposed retaining walls are part of the Bi-County Gap Closure Project. This project will include widening of the existing roadway and bridges to accommodate approximately 7.5 miles of HOV lanes to complete the gap in the regional HOV network on State Route 91 and Interstate 215 in Riverside and San Bernardino Counties. In preparation of this report the following documents are reviewed:

- Retaining Wall Plans, prepared by District 8, Design I, dated July 2, 2011
- Field investigation results of three exploratory test borings (August 2011).
- Geotechnical Design Report for 17 Overhead Sign Foundation prepared by Geotechnical Design- South 2, dated July 5, 2011
- As-Built Log-of-Test-Borings prepared by the Division of Highways, dated April 16, 1956
- Foundation Report prepared by the Division of Highways, dated June 4, 1956

Subsurface Investigation

In August of 2011, our office conducted a subsurface investigation where three exploratory soil boring were drilled. A soil boring was conducted at each of the retaining wall locations. These locations of the soil borings will be shown in the final Log of Test Borings (LOTB) when completed.

Each borehole was situated within 50 feet of the proposed location for walls. A truck mounted CS-2000 drill rig with hollow-stem augers was used for this subsurface exploration. The soil borings were drilled to a depth of 31.5 feet below the existing ground surface. Standard Penetration Tests (SPT) was performed at 5 feet interval. Bulk soil samples and relatively undisturbed soil samples were retrieved from the SPT tubes for field observations and laboratory testing as needed.

Subsurface Conditions

The following subsurface information for the proposed retaining walls are based on the recent field investigations and the existing As-Built Log of Test Borings from the Iowa Avenue Overcrossing.

The subsurface materials encountered at the project site (Retaining Walls 28, 29, and 31) consist of inter-bedded layers of medium dense to very dense sandy SILT, silty SAND, and SAND with silt, with the exception of some loose material encountered at the ground surface. The maximum depth explored during this investigation was to the approximate depth of 31.5 feet below the ground surface.

Groundwater

Groundwater was not encountered at the project site during the subsurface investigation. However, groundwater elevations may fluctuate throughout the year due to seasonal precipitation.

Corrosion

Due to the granular nature of the soil and soil samples tested from nearby structures, corrosive soil conditions should not be anticipated. However, soil samples were collected at each retaining wall location and will be tested by the Corrosion Laboratory. If the soil is corrosive, the test results will be submitted to your office.

Seismic Data and Liquefaction Potential

The controlling fault for this project site is the San Jacinto Fault, which is a right-lateral strike slip fault which crosses Route 215, just north of Interstate 10. This fault is capable of a Maximum Credible Earthquake (MCE) of 7.25 according to the 1996 Caltrans California Seismic Hazard Map (CCHM). Based on the CCHM, the peak bedrock acceleration (PBA) at the site is estimated to be 0.6g. The bedrock is estimated to be greater than 150 feet below the ground surface. The liquefaction potential for soil is considered to be low.

Retaining Wall Recommendations

The following retaining wall recommendations are based on the existing geotechnical data from the references listed above. The retaining walls are identified as noted in the General Plan sheets. The locations of the proposed retaining walls are summarized in Table 1 below.

Table 1
Summary of Proposed Retaining Wall Locations

Wall ID	Wall Beginning Station	Wall Ending Station
Retaining Wall 28	28+74.71	30+87.70
Retaining Wall 29	27+62.72	28+85.52
Retaining Wall 31	30+75.00	32+10.00

- **Retaining Wall 28**

Retaining Wall 28 will be a combination of a Caltrans Standard Type 1 Retaining Wall and a tie back wall for the construction of the freeway widening at the Iowa Avenue Southbound Exit Ramp from Stations 28+74.71 to 30+87.70. The tie back portion of the retaining wall is located near the abutment of the bridge at stations 29+38.87 to 29+98.54.

For the Type 1 Portion of the wall which ranges from 8 to 20 feet in height, it is recommended that the existing soil/foundation material beneath the wall footings should be scarified, moisture conditioned, sub-excavated and re-compacted to 95% relative compaction as stated in Section 19.5 of the Standard Specifications. After re-compaction is complete at the footing elevations, the allowable soil bearing capacity will equal 4.3 kips/ft². Proper drainage facilities should be installed to insure no hydrostatic pressure building up behind the wall.

For the tie back portion of the wall, temporary shoring may be required for cuts exceeding 5 feet in height vertically. Proper drainage facilities should be installed to insure no hydrostatic pressure building up behind the wall. The soil parameters for design purposes for this tie back wall are as follows:

Unit Weight = 124 lb/ft³

Internal Friction Angle of Soil = 34°

Coefficient of Active Earth Pressure (K_a) = 0.33

Inclination = 15°

Transfer Load = 5.3 kips/ft (ultimate)

Minimum Un-bonded Length for Tie Backs= 13 feet

- **Retaining Wall 29**

This wall is proposed to be a special design Type 1 Retaining Wall, with design heights of 6 to 10 feet, from Stations 27+62.72 to 28+85.52. Due to the existing loose to medium dense surficial soils and that As-Built Log of Test Borings show a natural drainage course along the walls layout line, it is recommended that the existing soil/foundation material beneath the wall footings should be sub-excavated and re-compacted. The sub-excavations should extend to a depth of approximately 2.0 feet below the bottom of footing elevations. The sub-excavated areas shall then be backfilled with native material compacted to 95% relative compaction as stated in Section 19.5 of the Standard Specifications. The limits of the sub-excavated and backfilled area shall include the full footing footprints and extend a minimum of 1 foot in front of the footings footprint. After the sub-excavation and re-compaction is complete at the footing elevations, the allowable soil bearing capacity will equal 2.5 kips/ft². A unit weight of 120 lb/ft³ and a 32° internal friction angle of the soil can be used for the wall design. Proper drainage facilities should be installed to insure no hydrostatic pressure building up behind the wall.

- **Retaining Wall 31**

Retaining Wall 31 will be a combination of a Caltrans Standard Type 1 Retaining Wall and a tie back wall for the construction of the freeway widening at the Iowa Avenue Southbound Exit Ramp from Stations 30+75.00 to 32+10.00. The tie back portion of the retaining wall is located near the abutment of the bridge at stations 31+06.05 to 31+65.74.

For the Type 1 Portion of the wall which ranges from 8 to 18 feet in height, it is recommended that the existing soil/foundation material beneath the wall footings should be sub-excavated and re-compacted. The sub-excavations should extend to a depth of approximately 1.0 feet below the bottom of footing elevations. The sub-excavated areas shall then be backfilled with native material compacted to 95% relative compaction as stated in Section 19.5 of the Standard Specifications. The limits of the sub-excavated and backfilled area shall include the full footing footprints and extend a minimum of 1 foot in front of the footings footprint. After the sub-excavation and re-compaction is complete at the footing elevations, the allowable soil bearing capacity will equal 4.0 kips/ft². Proper drainage facilities should be installed to insure no hydrostatic pressure building up behind the wall.

For the tie back portion of the wall, temporary shoring may be required for cuts exceeding 5 feet in height vertically. Proper drainage facilities should be installed to insure no hydrostatic pressure building up behind the wall. The inclination of the tie back can be raised or lowered to avoid any damage to the existing culvert behind the retaining wall. The soil parameters for design purposes for this tie back wall are as follows:

Unit Weight = 124 lb/ft³
Internal Friction Angle of Soil = 34°
Coefficient of Active Earth Pressure (K_a) = 0.33
Inclination = 8° to 25°
Transfer Load = 5.3 kips/ft (ultimate)
Minimum Un-bonded Length for Top and Middle Row Tie Backs= 15 feet
Minimum Un-bonded Length for Bottom Row Tie Backs= 12 feet

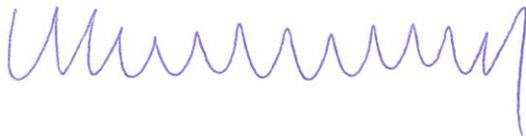
Construction Considerations

Although loose and caving soil conditions were not encountered in the areas of the tie back walls during our site investigation, these conditions may be present during construction.

The recommendations provided in this report are based on specific project information regarding structure types and locations that have been provided by District Design I. If any conceptual changes are made to project design, the Office of Geotechnical Design-South 2 should review those changes to determine if these recommendations are still applicable.

If you require further information, please contact Mark Wilson at (916) 227-1257 or Shawn Wei at (916) 227-5252.

Prepared by: Date: 9-15-11



MARK WILSON
Engineering Geologist
Branch C
Office of Geotechnical Design- South 2



cc: A. Abghari
S. Wei
GS Corporate



State of California – Department of Transportation
Division of Engineering Services
Structure Design Services

FINAL HYDRAULIC REPORT

Santa Ana River
Bridge No. 54-0471R/L
8 - SBd - 215
EA 08-0M9401
Project # 0800000506

Prepared by:

Anthony Nedwick, PE
Structure Hydraulics and Hydrology
August 10, 2011

General:

It is proposed to construct an HOV lane in each direction on I-215. The scope of work includes the widening the existing Right and Left mainline bridges, extending them on the median side of both structures. Both structures will also be linked on the northern side of the channel.

Both existing structures can be described as continuous 12 span RC T-beam girders with RC open end diaphragm abutments and piers walls at Piers 2 through 9, on concrete footings, all founded on steel "H" piles.

Based on General Plan No.1 (revision date of 6-03-11) and General Plan No. 2 (revision date of 6-09-11), the proposed widening will be a CIP Box Girder structure on pierwall and footing extensions, all founded on steel "HP" piles. For the purposes of this report, the pier wall and footing dimensions are assumed to be similar to the existing structure.

Based on the As-Built plans, Bridge No. 54-0471L has 1.0 foot wide pierwalls on 2.5 foot wide footings. The footings are 2.0 feet thick and have a bottom of footing elevation of 257.57 foot, NAVD 88 (255.0 per the As-builts, assumed to use the NGVD 29 datum). Bridge No. 54-0471R

It is important to note that the box culvert catchers that were part of the 2005 earthquake retrofit were structurally-based but do provide benefits in the reduction of scour. This report assumes that the box culvert catchers will not be extended beyond their current dimensions, but will remain in place.

Due to the widened portion of 54-0471R being solely on the downstream side of the structure, there will be negligible scour occurring at this structure. It is advised to extend the reinforced concrete channel lining from the downstream end of the box culvert inlet to the downstream end of the new, extended pierwalls. This slab should also incorporate a cutoff wall on the downstream edge. The concrete nosing should be replaced between the culvert walls and the pierwalls, but there is no reason to extend the nosing along the new pierwall sections. Hydraulically, there is no reason to retain the rounded form of the nosing on the downstream side of 54-0471R.

For Bridge No. 54-0471L, the reinforced concrete channel lining should also be extended. The existing concrete channel lining extends upstream from the concrete nosing 17 feet at Piers 3 through 6, and 22 feet at Piers 7 through 9. The new channel lining should extend upstream from the upstream end of the new pierwall and should utilize a cutoff wall along the upstream end at a minimum. There is no need to extend the concrete nosing to the front of the new pierwall, but it should be transitioned back from the culvert wall to the pierwall.

Based on the retention and extension of the channel lining slabs and the concrete pierwall nosings, there will be no scour anticipated at Piers 3 through 9. Pier 2, which was not previously retrofitted with either channel lining slab or additional nosing, will still be subject to potential pier scour effects.

This report is based on the plans and information provided by Structure Design, as well as various other sources including survey data and Foundation Plans prepared by Preliminary Investigations; previous Caltrans reports; the preliminary Structure Hydraulic Report for the project prepared by AECOM/LAN with associated aerial mapping survey prepared by Associated Engineers, Inc; FEMA Flood Insurance Studies; USGS data for the watershed; Army Corps studies for the Main Stem of the Santa Ana River.

Datum:

The vertical datum used for this project is NAVD 1988. Datum transformation information between NGVD 1929 and NAVD 1988 was determined using the VERTCON Orthometric Height Conversion provided by the National Geodetic Survey, National Oceanic and Atmospheric Administration (www.ngs.noaa.gov) website. According to the NGS information, values for the NAVD 1988 datum are 2.57 feet higher than for the NGVD 1929 datum at the project site. FEMA Flood insurance Study for San Bernardino County also notes a datum conversion factor of 2.57 feet for the Santa Ana River.

All elevations indicated in this report are based on Vertical Datum NAVD 1988, except as noted.

Basin:

The Santa Ana River Basin covers about 505 mi² at the site draining areas of central San Bernardino County. There are several reservoirs upstream of the project site, including Big Bear Lake and Seven Oaks Reservoir. Seven Oaks' primary purpose is for flood control. A large portion of the watershed is undeveloped and drains portions of the San Bernardino Mountains and San Jacinto Mountains.

Discharge:

At the project site, the 100-year flow rate is approximately 70,000 cfs. This flow rate is based on several different sources, including the Army Corps of Engineers' Santa Ana River Mainstem Project report as well as the August 28, 2008 FEMA Flood Insurance Study. Table 11 Floodway Data of the FEMA study indicates a 100-year flow (Base Flood) of 70,000 cfs. A 50-year flow rate of 47,000 cfs was extrapolated from the 100-year rate and other regional data.

Hydraulic Analysis:

The channel was evaluated using data and channel cross-sections from previous Bridge Inspection Reports for the existing structure as well as other hydraulic reports and studies for the area. The channel has an average slope of approximately 0.5% in the reach studied.

The channel hydraulics were modeled using the Army Corps of Engineers HEC-RAS modeling program, version 4.1.0, utilizing survey data prepared by Associated Engineers, Inc. HEC-RAS was used to determine the water surface elevations and velocities throughout the project reach. Manning's roughness coefficients varied and were estimated using USGS guides as well as data and photos gathered during site investigations. Manning's coefficients were estimated at 0.035 in the main channel and 0.040 in the overbank and floodplain areas.

For Bridge Number 54-0471L, based on the 100-year event, a water surface elevation of 973.3 feet was calculated just upstream from the structure. Since the proposed widening is only proposed for the median, it was determined that the water surface elevation upstream of the Right structure was too conservative for the project. Therefore, the water surface elevation for Bridge Number 54-0471R was based on the water surface elevation at the downstream side of the structure, an elevation of 973.3 feet. Due to the nature and location of the widening, extending the current pierwalls and footings in the median, there was no appreciable difference in water surface elevations or velocities between the existing and proposed conditions.

However, the Lowest Soffit Elevation for either structure is approximately 991 feet, which provides in excess of 17 feet of freeboard over the 100-year flow of 70,000 cfs.

For the 100-year flows, average velocity upstream and beneath the structures was calculated at approximately 11 fps for the 100-year event.

Streambed:

The natural channel bed material consists of mostly alluvium ranging from course to fine sand with smaller amounts of silt and some layers of gravel and small cobbles. This material is considered to be scourable.

Scour Analysis:

Scour was estimated utilizing the methods set forth in the FHWA HEC-18, "Evaluating Scour at Bridges." All scour elevations are based on the 100-year discharge.

The Santa Ana River is considered to be an active, meandering channel. Therefore, channel migration within the main channel beneath the structure is anticipated and has been included for Local Pier Scour consideration. Local Pier Scour elevations at Pier 2 are based off the minimum channel invert of 957.5 feet and assume lateral migration of the thalweg. Scour depths also take into account the size and proximity

of the footing. Local Pier Scour for the 1-foot wide pier wall and 2.5 foot wide footing at Pier 2 for Bridge No. 54-0471L is anticipated at 7.2 feet depth, to an elevation of 950.3 feet. There is no scour anticipated at the downstream end of Pier 2 for Bridge No. 54-0471R.

Contraction Scour and Abutment Scour were calculated using the Hydraulic Design function within HEC-RAS. Contraction Scour was calculated at 2.3 feet, while Abutment Scour was determined to be negligible for the project site.

Summary & Recommendations:

Below is a summary of key design parameters based on the hydrology and hydraulic analysis performed for this structure.

All elevations given are referenced to the data provided by Structures Design and Preliminary Investigations-North, using the NAVD 88 vertical datum.

Hydrologic Summary for		
Santa Ana River, Median area for 54-0471R & 54-0471L		
Drainage Area: 505 mi ²		
Frequency	Design Flood	Base Flood
	50-year	100-year
Discharge	47,000 cfs	70,000 cfs
Water Surface Elevation at Bridge	970.4 ft	973.3 ft
Flood plain data are based upon information available when the plans were prepared and are shown to meet federal requirements. The accuracy of said information is not warranted by the State and interested or affected parties should make their own investigation.		
Minimum Required Soffit Elevation	973.3 ft	
Local Scour Depth, Pier 2, Left Bridge*	7.2 ft	
Local Scour Elevation, Pier 2, Left Bridge*	950.3 ft	

Long Term Scour Depths, Santa Ana River, 54-0471R & 54-0471L		
Support	Degradation Scour Depth	Contraction Scour Depth
Pier 2*	0.0 ft	2.3 ft

Scour Data (Elevation and Depth), Santa Ana River, 54-0471R & 54-0471L		
Support	Long Term Scour Elevation	Short Term (Local) Scour Depth
Pier 2*	955.2 ft	7.2 ft

* All supports except Pier 2 are protected by RC channel lining or are out of the flow.

This report has been prepared under my direction as the professional engineer in responsible charge of the work, in accordance with the provisions of the Professional Engineers Act of the State of California.

Memorandum

*Flex your power!
Be energy efficient!*

To: MR DAN T. ADAMS
Division of Engineering Services
Office of Bridge Design Central
Bridge Design Branch 10

Attention: Mr. Larry Wu

Date: January 26, 2011

File: 08-SBd-215-PM 0.6
08-0M9401
Project No. 0800000506
- Highgrove UP (Shoofly)
Viaduct
Br. No. 54-1306S

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES
OFFICE OF GEOTECHNICAL DESIGN – SOUTH 2
DESIGN BRANCH B, MS #5

Subject: Foundation Report for Highgrove UP (Shoofly) Viaduct

This report presents the foundation recommendations for the proposed Highgrove Underpass (UP) Shoofly Viaduct – Br. No. 54-1306S, which is associated with the Highgrove Underpass #1, #2, #3 (Br. No.'s 54-1304, 1305, & 1303, respectively) and the Highgrove Underpass Shoofly - Br. No. 54-1306. A separate foundation report (dated 12-22-11) for the other associated Highgrove UP structures was completed prior to this report. The Office of Geotechnical Design South 2 completed a foundation investigation pursuant to a request by Structure Design (Office of Bridge Design Central, Branch 10) for foundation recommendations for the proposed Highgrove UP Shoofly Viaduct.

The following foundation recommendations are based on information gathered during the recent 2011 subsurface information performed by Office of Geotechnical Design South II, Branch B, as well as “As-Built” plans, which included the “As-Built” Log of Test Borings (LOTB) from the original 1957 subsurface investigation for the existing Highgrove UP (Br. No. 54-0518) located approximately 500 feet to the north. Additional information available in the Geotechnical Services Archive included a foundation report (dated 7-3-57) for that structure. With regards to the current foundation recommendations, all elevations referenced within this report and shown on the recent Log of Test Boring sheets are based on the NAVD88 vertical datum, unless otherwise noted. The “As-Built” elevation information contained in this report was updated to the NAVD88 vertical datum by adding 2.5 ft (per Office of Bridge Design – Central) to any elevations based on the NGVD29 datum.

Project Description

The proposed Highgrove UP Shoofly Viaduct is a temporary structure that is necessary to maintain BNSF railroad operations from being interrupted during the demolition of the existing Highgrove UP and construction of the replacement Highgrove UP #1, #2, & #3 structures.

Currently, there is no existing bridge structure at the site, therefore, there is no “As-Built” information available for this specific location. The proposed structure site is situated between an existing canal and two BNSF railroad tracks (as shown on the foundation plan 12-30-11).

The proposed Highgrove UP Shoofly Viaduct consists of a two span, reinforced concrete bridge and will be approximately 50 ft in length and 14 ft wide, as shown on the Shoofly Viaduct, General Plan (dated 9-22-11). Additional retaining wall structures adjacent to the proposed structure are also shown on the General Plan

Site Geology

This bridge site is located within the Peninsular Range Geomorphic Providence of California. Geologic maps of the area identify that the site is underlain by very old alluvium-fan deposits which were deposited during the middle-early Pleistocene (Morton & Miller 2003).

The 1957 subsurface investigation, for the design of the existing Highgrove UP (constructed in 1959), consisted of one rotary boring and 12 dynamic cone penetration borings/soundings, which are shown on the “As-Built” LOTB. A summary of the 1957 subsurface investigation is given in the Highgrove UP (#1, #2, & #3) foundation report dated 12-22-11. For specific details regarding the 1957 foundation investigation, refer to the As-Built LOTB’s.

The 2011 foundation investigation consisted of 6 borings drilled for the new proposed 5 bridge structures associated with the replacement of the existing Highgrove UP. The 2011 borings were advanced with wireline-punchcore, fully-cased drilling methods and hollow flight augers with Standard Penetration Tests (SPT) performed every 5 ft. The borings extended down to a maximum depth of 160.8 ft.

Due to permit restrictions from BNSF Railroad, no drilling equipment could access the proposed site. As a result, no borings were drilled at the proposed structure site. Consequently, borings had to be drilled near the proposed structure (within 200 ft) but not at any of the support locations.

The following section will summarize only 3 of 6 borings because of the close proximity to the Highgrove UP Shoofly Viaduct. The 2011 rotary and auger borings located near the structure site (RW-11-001, RW-11-004, and A-11-006) were primarily drilled into native alluvium-fan deposits. For the purposes of discussion, the soil materials encountered at the site can be separated into two units. The upper unit consists of primarily of sand with local lenses of silt and clay down to maximum depth 35 feet (elev. 904 feet). This unit varied in apparent density from medium dense to dense (with local very dense zones) for cohesionless soil and varied in consistency from very stiff to hard for cohesive soil. Below this zone, the lower unit consists primarily of sand with silt and clay lenses. This unit varied in apparent density from dense to very dense for cohesionless soil and varied in consistency from very stiff to hard for cohesive soil. This unit extends to the maximum explored depth of 61.5 ft (Elev. 870.4 ft).

For details regarding the information mentioned above and the other borings associated with this project, please refer to the 2011 LOTB and the “As-Built” LOTB.

Groundwater

During the 1957 subsurface investigation, groundwater was measured in one boring at elevation 898.6 feet (as shown on the “As-Built” LOTB). Additional groundwater information was obtained from the State Water Resources Control Board (SWRCB) website, which includes five borings monitored between 2002 to 2009 for a nearby Shell Gas Station located at 2718 South Iowa Avenue, Colton, CA, 92324 (approximately 1200 ft southwest of the bridge site). The website lists quarterly groundwater measurements for each boring at varying and sporadic depths over the span of nearly seven years. The groundwater data shows a minimum depth of approximately 80 feet and a maximum depth of approximately 105 feet. For detailed groundwater information, refer to the SWRCB website (<http://geotracker.waterboards.ca.gov/>).

During the 2011 foundation investigation, attempts to measure groundwater at two boring locations were conducted between June 2011 and November 2011. Boring RW-11-002 showed no evidence of groundwater down to the maximum explored depth of 120.5 feet (Elev. 817.7 ft). In Boring RW-11-005, groundwater was encountered at a depth of 111.4 feet (Elev. 807.2 ft). A summary of the groundwater information is listed below in Table 1.

Table 1: Summary of Groundwater Information

Location	Boring #	Year Measured	Elevation (feet)
Existing Highgrove UP, Bent 2	B-3	1957	898.6
Shell Gas Station – 2718 S. Iowa Ave, Colton*	MW-1 to MW-6	2002 - 2009	~ 837 to 812 **
Near Proposed Highgrove UP Shoofly – Bent 3	RW-11-005	2011	807.2

*Detailed groundwater information is available for each boring at SWRCB (<http://geotracker.waterboards.ca.gov/>).

** An estimated top of ground elevation of ~ 917 feet was estimated for boring MW-1 to MW-6.

Scour Potential

The canal shown on the plans is contained by a concrete channel lining leading into a proposed culvert. As a result, scour is not anticipated to be an issue at this site.

Corrosion

Soil samples were collected from 3 borings during the 2011 foundation investigation and tested for corrosive potential by the Office of Testing and Technology Services, Corrosive Technology Branch (CTB).

Caltrans currently defines a corrosive environment as an area where the soil has a minimum resistivity of less than 1000 ohm-cm, and either contains a chloride concentration of 500 ppm or greater, a sulfate concentration of 2000 ppm or greater, or has a pH of 5.5 or less. Based on the current Caltrans Standards, the soil samples are not considered corrosive at this site. For specific test results, please refer to Table 2.

Table 2 – Corrosion Test Summary

Boring Number	Sample Depth (feet)	SIC Number	Minimum Resistivity (Ohm-Cm)	pH	Chloride Content (ppm)	Sulfate Content (ppm)
Boring RW-11-02	5.0 - 6.5	C701529A	1075	7.78	11	528
Boring RW-11-02	20 - 21.5	C701529B	1583	8.08	N/A	N/A
Boring RW-11-02	35 - 36.5	C701529C	1338	7.50	N/A	N/A
Boring RW-11-02	60 - 61.5	C701529D	5601	7.92	N/A	N/A
Boring RW-11-02	100 - 100.7	C701529E	8307	6.26	N/A	N/A
Boring RW-11-03	5 - 6.5	C701529F	3451	8.23	N/A	N/A
Boring RW-11-03	15 - 16.5	C701529G	1285	8.05	N/A	N/A
Boring RW-11-03	35 - 36.5	C701529H	1914	7.62	N/A	N/A
Boring RW-11-03	55 - 56.5	C701529I	7396	7.50	N/A	N/A
Boring RW-11-04	5 - 6.5	C701529J	2646	6.93	N/A	N/A
Boring RW-11-04	10 - 11.5	C701529K	1002	7.02	28	97
Boring RW-11-04	25 - 26.5	C701529L	2789	7.96	N/A	N/A
Boring RW-11-04	50 - 51.5	C701529M	3630	7.69	N/A	N/A

Seismic Data

The site is potentially subject to ground motions from nearby earthquake sources during the design life of the structure. Seismic design recommendations and fault information were provided as a separate memorandum for the proposed widening of the existing structures. For more information, please refer to the Seismic Design Recommendations (dated August 17, 2011) or contact Anhdan Le at 916-227-7211.

“As-Built” Information

Currently, there is no existing bridge structure at the site, therefore, there is no “As-Built” information. There is also no available “As-Built” information for the existing culvert located approximately 100 feet south of the site.

Foundation Recommendations

The following recommendations are for the proposed Highgrove Underpass Shoofly Viaduct, as shown on the General Plan (provided on 1-24-12). Due to permit restrictions from BNSF Railroad, no drilling equipment could access the proposed site. As a result, no borings were drilled at the proposed support locations. Consequently, conservative soil strength parameters from nearby borings were used to develop soil profiles for the design of the structure foundations. The following foundation recommendations are based on a review of recent subsurface investigations and the design information and plans available at the time this report was completed.

The information shown in Tables 3 & 4 is based on specific foundation design information provided to our office by Structure Design, Branch 10 for the proposed Highgrove UP Shoofly Viaduct (received on 1-19-12). The design of the proposed structures is based on working stress design (WSD) with considerations given to Chapter 8 (Parts 3 & 4) of the American Railway Engineering and Maintenance-of-Way Association (AREMA). Foundation design information and specified pile tip elevations for the all proposed structures are provided in Tables 5 & 6.

- *Highgrove UP Shoofly Viaduct*

At this site, driven steel H-piles (HP 10x42) are recommended at the Abutment 1, Abutment 1 Wingwalls, Abutment 3 and Abutment 3 Wingwall locations. At the Bent 2 location, a single Cast-In-Drilled-Hole (CIDH) pile is recommended. Spread footing foundations are recommended at the proposed Sidewall Retaining Wall location (located between Abutment 1 & 3).

Table 3: Foundation and Structure Information Provided by Structure Design for Shoofly Viaduct

Support Location	Design Method	Pile Type	Bottom of Pile Cap / Bottom of Footing Elevation (ft)	Pile Cut-off /Bottom of Footing Elevation (ft)	Pile Cap Size (ft)		Permissible Settlement Under Service Load (in)	Number of Piles per Support
					B	L		
Abutment 1	WSD	HP 10x42 "H"- Piles	928.70	929.12	9.5	16.0	1	10
Abutment 1 Wingwall (H = 10 ft)	WSD	HP 10x42 "H"- Piles	928.70	929.12	9.0	33.0	1	16
Abutment 1 Wingwall (H = 8 ft)	WSD	HP 10x42 "H"- Piles	930.70	931.12	8.0	19.0	1	8
Abutment 1 Wingwall (H = 6 ft)	WSD	HP 10x42 "H"- Piles	932.70	933.12	6.0	24.0	1	8
Abutment 1 Wingwall (H = 4 ft)	WSD	HP 10x42 "H"- Piles	934.70	935.12	5.0	12.0	1	4
Bent 2	WSD	42-inch CIDH	N/A	930.50	N/A	N/A	1	1
Abutment 3	WSD	HP 10x42 "H"- Piles	928.70	929.12	9.5	16.0	1	10
Abutment 3 Wingwall	WSD	HP 10x42 "H"- Piles	928.70	929.12	7.5	9.5	1	4
Sidewall Retaining Wall	WSD	Spread Footing	930.70	N/A	10.5	39.0	1	N/A

Table 4: Foundation Design Loads Provided by Structure Design for Shoofly Viaduct

Support Location	Design Method	Pile Type	Design Loading (kips / ksf)					
			Primary Load Combination			Secondary Load Combination		
			Compression or q (max)	Tension	Shear	Compression	Tension	Shear
Abutment 1	WSD	HP 10x42 "H"- Piles	70 kips	0	10 kips	95 kips	0	17 kips
Abutment 1 Wingwall (H = 10 ft)	WSD	HP 10x42 "H"- Piles	70 kips	0	11 kips	63 kips	0	0
Abutment 1 Wingwall (H = 8 ft)	WSD	HP 10x42 "H"- Piles	62 kips	0	12 kips	55 kips	0	0
Abutment 1 Wingwall (H = 6 ft)	WSD	HP 10x42 "H"- Piles	66 kips	0	10 kips	55 kips	0	0
Abutment 1 Wingwall (H = 4 ft)	WSD	HP 10x42 "H"- Piles	48 kips	0	7 kips	35 kips	0	0
Bent 2	WSD	42-inch CIDH	700 kips	0	0	700 kips	0	70 kips
Abutment 3	WSD	HP 10x42 "H"- Piles	70 kips	0	10 kips	100 kips	0	17 kips
Abutment 3 Wingwall	WSD	HP 10x42 "H"- Piles	36 kips	0	5 kips	35	0	0
Sidewall Retaining Wall	WSD	Spread Footing	2.75 ksf	N/A	N/A	1.4 ksf	N/A	N/A

- Notes:
1. Primary Load Combination requires a minimum factor of safety of 2 when determining the required nominal resistance or ultimate geotechnical capacity (per. AREMA 8-4.4.2b).
 2. When pile foundations are designed using Secondary Load Combinations, the allowable resistance may be increased by 25% (per. AREMA 8-4.4.2b). This equates to a minimum factor of safety of 1.6 when determining the required nominal resistance or ultimate geotechnical ultimate capacity.
 3. q (max) is the maximum contact toe pressure for the spread footing.

Table 5: Spread Footing Data for Retaining Wall - Shoofly Viaduct (Bridge No. 54-1306S)

Support Location	Minimum Footing Width, (B)	Bottom of Footing Elevation	Effective Footing Dimension used for WSD	Bearing Stress provided by Structure Design for WSD	Bearing Pressures To Be Used For WSD ¹
			Effective Footing Width, (B')	Gross Uniform Bearing Stress (q _{g,u})	Gross Allowable Soil Bearing Pressure (q _{all})
Sidewall Retaining Wall	10.5 ft	930.7 ft	8.8 ft	2.2 ksf	2.2 ksf

- Notes: 1) For Working Stress Design: The Gross Uniform Bearing Stress (q_{g,u}) equals the total vertical load divided by the effective footing area (A' = B' x L'). The Gross Allowable Soil Bearing Pressure (q_{all}) will meet or exceed the Gross Uniform Bearing Stress (q_{g,u}). The Ultimate Soil Bearing Capacity, (q_{ult}), will equal or exceed 3 times the specified Gross Allowable Soil Bearing Pressure, (q_{all}).

The recommended Allowable Gross Bearing Capacities to be used for design, provided in Table 5, above, are based on the following design criteria:

- 1) The spread footing shall have minimum width (B) as shown in Table 5.
- 2) The spread footing is to be constructed at or below the recommended bottom of footing elevations shown in Table 5.

If any of the above loading conditions are changed, minimum footing widths or embedment depths are reduced, or bottom of footing elevations raised, the Office of Geotechnical Design-South 2, Branch B, is to be contacted for reevaluation.

Table 6: Pile Data Table for Shoofly Viaduct (Br. No. 54-1306S)

Location	Pile Type	Required Nominal Resistance (kips)		Design Tip Elevation (feet)	Specified Tip Elevation (feet)
		Compression	Tension		
Abutment 1	HP 10x42 "H"-Piles	160 *	0	881 (a)	881
Abutment 1 Wingwall (H = 10ft)	HP 10x42 "H"-Piles	140	0	883 (a)	883
Abutment 1 Wingwall (H = 8 ft)	HP 10x42 "H"-Piles	130	0	886 (a)	886
Abutment 1 Wingwall (H = 6 ft)	HP 10x42 "H"-Piles	140	0	885 (a)	885
Abutment 1 Wingwall (H = 4 ft)	HP 10x42 "H"-Piles	100	0	890 (a)	890
Bent 2	42-in CIDH	1400	0	869 (a)	869
Abutment 3	HP 10x42 "H"-Piles	160 *	0	881 (a)	881
Abutment 3 Wingwall	HP 10x42 "H"-Piles	80	0	895 (a)	895

Notes: 1) Design tip elevation is controlled by: (a) Compression
 2) Required nominal resistance with an "*" indicates that the Secondary Load Combination controlled.

General Notes

1. The structure engineer shall show on the plans, in the pile data table, the minimum pile design tip elevation required to meet the lateral load demands. If the specified pile tip elevation required to meet lateral load demands exceed the specified pile tip elevation given within this report, the Office of Geotechnical Design South 2, Branch B should be contacted for further recommendations.
2. The District engineer shall specify in the special provisions the requirements of Tunnel Safety Orders, for the CIDH shaft work that meets the definition of a tunnel or shaft as described in the Highway Design Manual, Section 110.12 "Tunnel Safety Orders."

3. The presence of live railroad traffic just west of the site and the presence of numerous overhead and underground utility lines may limit access for driving battered and vertical piles. Considerations should be given to these potential obstructions when contemplating the design of the proposed structure foundations.

Construction Considerations

- *Spread Footing (Sidewall Retaining Wall between Abutment 1 & Abutment 3):*

1. At the Retaining Wall location (between Abutment 1 and Abutment 3), concrete for the proposed support footing shall be placed neat against the undisturbed native soils on the bottom of the footing excavation. Should the bottom of the footing excavation be disturbed, then the disturbed native soils shall be re-compacted to 95% relative compaction prior to placement of concrete for the structure support footings.
2. At the Sidewall Retaining Wall location, the support footing excavation is to be inspected and approved by a representative of the Office of Geotechnical Design South 2, Branch B. The inspections are to be made after the excavation has been completed to the specified bottom of footing of elevation listed above in Table 2 and prior to placing any steel rebar in the excavations. The contractor is to allow five (5) working days for the inspection of the excavation to be completed. The structures representative is to provide the Office of Geotechnical Design South 2, Branch B a one-week notification prior to beginning the five-day contractor waiting period.

- *Driven Piles (Abut 1, Abut 1 Wingwalls, Abut 3 & Abut 3 Wingwall Locations):*

3. The calculated geotechnical capacity of the “H” piles is based on both skin-friction and end-bearing at Abutments 1 and 3 locations.
4. Prior to driving each pile at Abutment 1, Abutment 1 Wingwall, Abutment 3 and Abutment 3 Wingwall locations of the Shoofly Viaduct, “drilling to assist driving” will be required. Bottom of drill to assist elevations shall be below the invert elevations of the adjacent existing concrete lined channel in order to avoid any possible damage to the existing structure. All “drilling to assist driving” shall be done in accordance with Standard Specification Section 49-1.05 “Driving Equipment” and shall not extend below the recommended depth listed in Table 7. For details regarding the subsurface conditions at these locations, please refer to the Log of Test Borings.

Table 7: Drill To Assist Driving – Bottom of Hole Elev.

Support Location	Bottom of Drill To Assist Elevation (ft)
Abutment 1	923
Abutment 1 Wingwalls (H=10', H=8', H=6', H=4')	923
Abutment 3	923
Abutment 3 Wingwall	923

5. Pile acceptance is to be based on Standard Specifications 49-1.08, "Pile Driving Acceptance Criteria." Any driven pile that achieves 1½ times the required nominal resistance in compression, as shown on Table 6, within 5 ft of the specified pile tip elevation, may be considered satisfactory and cut off with written approval from the engineer (e.g. 1½ times the nominal resistance in compression will be 320 kips at Abut 1).

- *CIDH Piles:*

6. During 2011 field investigation, groundwater was encountered at levels approximately 62 ft below the CIDH tip, therefore, it is anticipated that groundwater will not be encountered during the excavation of the CIDH shaft for the Highgrove UP Shoofly Viaduct. A summary of groundwater information available for this site is summarized in the groundwater section and listed in Table 1 of this report.
7. Due to the close proximity to the existing canal and the unknown condition of the canal concrete liner for being water tight, the CIDH pile was designed assuming that possible water infiltration could occur during construction and that slurry displacement methods would be used.
8. Due to the anticipation that concrete placement for the CIDH pile will require slurry displacement methods, the calculated geotechnical capacity of all CIDH piles is based on skin friction only and no end-bearing was considered. For the 42-inch CIDH pile, the skin friction zones used to calculate geotechnical capacity of the CIDH pile are from approximately two diameter below the pile cut-off elevation down to within one pile diameter from the design tip elevation for compression.

Table 8 - CIDH Pile Skin Friction Zone for Highgrove UP Shoofly Viaduct

Structure	Support Location	Pile Type	Skin Friction Zone - Start Elevation	Skin Friction Zone - End Elevation
Highgrove UP Shoofly Viaduct	Bent 2	42-inch CIDH	923.5	872.5

9. The contractor should anticipate having to use slurry displacement methods to construct the CIDH piles. Allowable slurries shall consist of mineral or synthetic slurry only. Use of water shall not be allowed.
10. Caving conditions may be encountered during CIDH pile construction due to the medium dense granular soil zones described in the geology section of this report and shown on the LOTB's. Temporary casing may be necessary to control caving during construction. All temporary casing is to be removed during concrete placement.

11. If the contractor chooses to use slurry to aid in the construction of CIDH piles, care should be exercised while advancing the drilled hole for the piles. Due to the non-cohesive nature of granular soils, rapid insertion and removal of the drilling tools during the drilling process can cause excessive scouring and caving of the walls of the drilled shaft.

The recommendations contained in this report are based on specific project information regarding structure type, location, and design loads that have been provided by the Bridge Design Central, Branch 10. If any conceptual changes are made during final project design, the Office of Geotechnical Design-South 2, Design Branch B should review those changes to determine if these foundation recommendations are still applicable. Any questions regarding the above recommendations should be directed to the attention of Hector Valencia, (916) 227-4555, or Mark DeSalvatore, (916) 227-5391, at the Office of Geotechnical Design-South 2, Branch B.

Prepared by: Date: 1-26-12



Hector Valencia, P.E. Civil # 65257
Engineering Geologist
Office of Geotechnical Design-South 2
Design Branch B



cc: Jim Robninson – District 8 Project Manager
Ben Amiri – District 8 Design Manager
Alex Sanchez – District 8 Project Engineer
Bruce Kean – District 8 Materials Engineer
John Stayton – HQ, Specifications and Estimates
RE Pending File – HQ, Structures Construction
Shira Rajendra – GS Corporate
Abbas Abghari – OGDS2
Mark DeSalvatore – OGDS2



San Bernardino County Flood Control District

825 East Third Street, Room 108
San Bernardino, CA 92415-0835
(909) 387-7995 - FAX (909) 387-1858



Inspection Phone:
(909) 387-8009

Inspection office shall be notified two working days prior to commencing permitted use. FAILURE TO OBTAIN INSPECTION SHALL BE CAUSE TO VOID THIS PERMIT.

PERMIT

Permit Issued: March 30, 2012 **Permit Expires:** March 30, 2013 **File:** 2-701/2.04
Permit No: P-22011071

Permittee: State of California-Department of Transportation 464 West 4 th Street San Bernardino, CA 92401	Filing Fee: NO FEE Review Fee: NO FEE Inspection Fee Deposit: \$5,000.00 TOTAL: \$5,000.00
Contact/Phone: Alex Sanchez 909-383-4205 Project Engineer	

Permit Activity: 1) Widen the I-215 bridge crossing the Santa Ana River by constructing bridge footings and piling foundations within the river, 2) extend the existing bridge piers and box culvert catchers between the piers by approximately 19-feet, and 3) construct a temporary access road into the river

Facility: Santa Ana River
Location: I-215 Freeway
City/Community: City of Colton

- The proposed permit activity shall be in accordance with the Plans (Exhibit "A"), and the Special, Standard and General Provisions, all of which are attached and made a part of this permit.
- AT LEAST 48 HOURS NOTICE SHALL BE GIVEN TO THE DISTRICT BEFORE STARTING ANY WORK UNDER THIS PERMIT.** Contact the District's inspector at (909) 387-8009; failure of notification is cause for revocation of this permit.
- This permit, or a certified copy thereof, shall be kept at the job site throughout the period of operations within District right-of-way and shall be shown to any District Representative or any law enforcement officer upon demand. Exercise of this permit shall indicate acceptance of and agreement to comply with all provisions included herein. Violation of any provision shall be cause for immediate revocation of permit.

PERMITTEE'S ACCEPTANCE:

Signature by the Permittee or Permittee's Authorized Agent of this Permit shall indicate acceptance of all of the provisions of the permit.

 _____ 3-26-12 _____
Permittee's Signature Date

Alex Sanchez

PRINT Project Engineer

TITLE Transp. Engr. CT

cc: Fish and Game
FC Operations Supt
Inspector

DISTRICT APPROVAL:

 _____ 3/29/2012 _____
Date

GRANVILLE M. "BOW" BOWMAN
Flood Control Engineer

SPECIAL PROVISIONS

1. As a condition of approval of the proposed activity allowed by this permit, the San Bernardino County Flood Control District (District) has been required to submit plans to the U.S. Army Corps of Engineers (Corps) for review, and obtain the Corps' Section 408 permit for this project. The Corps' Section 408 permit (EE2012-18) authorizing the District to allow this activity is attached to this permit as Exhibit "B", and incorporated herein by this reference. Should conditions of the Corps' Section 408 permit and the District's permit be in conflict, the conditions set forth in the Corps' Section 408 permit shall govern.
2. All conditions placed on the District by the Corps' Section 408 permit are hereby transferred to the Permittee. Prior to signing off the District's permit, all conditions of the Corps' Section 408 permit shall be fully complied with.

STANDARD PROVISIONS

1. **The term of this permit is for one year.** The District will coordinate an extension(s) to the permit term upon receipt of a completed **Flood Control Permit Amendment Application** at least thirty days prior to the expiration date.
2. No revisions to the approved plans shall be made during construction without review, written approval and/or permit amendment from the District.
3. No floatable materials or stockpiling shall be maintained in District right-of-way, and equipment shall be kept out of District right-of-way except when in use during working hours.
4. The existing access gates shall be locked after hours and on weekends by interlocking Permittee's lock with the District's lock to allow District access.
5. The proposed activity within District right-of-way shall be in compliance with all City ordinances for noise and operating hours.
6. The exact location of any above ground structure shall be field coordinated with the District's inspector prior to installation.
7. All applicable fees required for this permit shall be in accordance with the District's current Schedule of Fees Ordinance in effect at the time of District inspection.
8. This permit shall become effective upon the "Permit Issued" date shown on Page 1 of this permit. All permit provisions and all applicable fees (i.e. inspection fees, monthly land use fees, etc.) for the permit shall commence or become enforceable upon the Permit Issued date, regardless of the Permittee's actual commencement of activity within District right-of-way. Signature by the Permittee or Permittee's Authorized Agent on Page 1 of this permit shall indicate the Permittee's agreement to assume all responsibility and to adhere to the permit terms and fees from the date of permit issuance.

9. An access gate with locks shall be installed, if needed, to control public access during the evenings and on weekends. The Permittee shall ensure that the gate remains locked at all times except when authorized access is required.
10. All existing asphalt or concrete surfacing removed during the construction of the permitted activities shall be sawcut at the removal limits. Any settlement in the future shall be maintained by the Permittee.
11. Backfill in all areas having flood control facilities shall be similar to the existing material and shall not contain organic material, broken concrete or pavement, or other material unsuitable for compaction. Backfill two feet deep under concreted rock slope protection and two feet behind concrete structures shall be compacted to at least 95% of maximum dry density as determined by ASTM D-1557. All other backfill shall be compacted to at least ninety percent (90%) relative density as determined by ASTM test Method D-1557, Method C and certified evidence thereof submitted. Compaction tests shall be performed at locations specified and to the satisfaction of the District.
12. All construction and material testing for facilities constructed within District right-of-way will be performed by the Permittee and/or Permittee's authorized agent and certified evidence thereof shall be furnished to the District at the Permittee's expense.
13. The Permittee will submit "Record Drawings", stamped and signed by a Registered Engineer in the State of California, at the time of the final inspection.
14. No more than one-third (1/3) of any flood control facility may be obstructed during the period October 15 to April 15, nor more than two-thirds (2/3) of any facility may be obstructed during the remaining period. The term "obstruction" shall include all temporary or permanent structures, falsework, excavated material, and equipment connected with the construction. For the purpose of computing the area of an obstruction, dimensions shall be taken normal to the channel flow of the actual physical outline of the obstruction.
15. The inspection fee for this permit shall be based on the District's Schedule of Fees Ordinance in effect at the time of District inspection. The District's current Schedule of Fees is Ordinance No. FCD 11-01 (copy attached). Upon completion of the permitted activity, the District will compile all District costs as outlined on the appropriate Schedule of Fees. In the event that the costs exceed \$5,000, the Permittee will be billed for the overage and hereby agrees to pay such amount to the District. In the event that the costs are less than \$5,000, the excess will be refunded to the Permittee.
16. All structural concrete shall be 660-A-4000 in all inverts and 660-B-4000 for all walls, including wingwalls and headwalls. All concrete shall conform to Section 201-1 of the Standard Specification for Public Works Construction, latest edition, unless otherwise specified in this permit.
17. Concrete for rock structures, bottom controls, and splash pads shall be 560-B or C-3250. All concrete shall conform to Section 201-1 of the Standard Specifications for Public Works Construction, latest edition, unless otherwise specified in this permit.

18. Concrete mix designs shall be submitted to the District for review and approval at least 72 hours prior to concrete placement within District right-of-way.
19. All reinforcing steel shall conform to the requirements of ASTM A-615 and shall be Grade 60.
20. No shotcrete or gunite concrete placement will be allowed within existing or future District right-of-way. All concrete structures shall be cast-in-place.
21. Construction plans shall be submitted for District review for all proposed utilities crossing District right-of-way and attached to the bridge crossing.
22. The temporary detour road in the creek shall be so constructed as to wash out during any appreciable flows.
23. The Permittee shall be responsible to retrieve any construction materials that are displaced during any flows within the river.
24. Stop signs shall be placed at all exits to the property.
25. All loads and vehicles accessing the permit site shall comply with applicable State Motor Vehicle requirements.
26. All loads, haul roads and stockpiles shall be watered down to preclude dust at all times, including periods of inactivity. Loads shall maintain a minimum of 6-inches of freeboard or shall be covered prior to leaving the job site.
27. Any spillage on public streets shall be required to be cleaned up by sweeping.
28. Stockpiled material within District right-of-way shall:
 - Be a minimum of 500-feet from any residence. The actual location shall be approved by the District.
 - Be limited to an amount of material that can be hauled off in five calendar days.
 - Encroach no closer than 25-feet to the dry toe of any dike. This 25-foot strip may be used as a haul road but shall not be otherwise occupied or obstructed.
29. Should maintenance activities be required at anytime, the Permittee shall coordinate the permit activity with the District's Flood Control Operations Division.

GENERAL PROVISIONS

1. Exercise of this permit, by Permittee or Permittee's authorized agent, shall indicate acceptance of all of the provisions of this permit. Permittee shall make all contractors doing work on this project familiar with all of the requirements of this permit. Violation of any provisions of this permit shall be cause for immediate revocation of the permit.
2. **INSURANCE** - This permit shall not become valid until the Certificate of Insurance has been completed by your contractor's insurance company and approved by the Flood Control District. If the permit activity is to be completed by Permittee's forces, the Certificate of Insurance shall be completed by Permittee's insurance company and approved by the Flood Control District.

3. The Permittee shall indemnify and hold the District and all officers, employees and agents of said public body free and harmless from any and every claim, demand or action for damages, or injury to any person or persons or property of any kind whatsoever, and any cost or expense in connection therewith, and agrees to defend the Flood Control District, the County of San Bernardino, and all officers, employees and agents of said public body against any claims or demands which may arise out of or result from Permittee's construction, operation, use or activities on District right-of-way.
4. A copy of this permit will be sent to the State Department of Fish and Game, who may require a permit for this type of activity. It is the responsibility of the Permittee to obtain any required permits and approvals prior to starting any activity authorized in the permit. State Department of Fish and Game may be contacted at the address below.

Department of Fish and Game
Region 6, -Environmental Services
4665 Lampson Avenue, Suite J
Los Alamitos, CA 90720
(562) 430-7212

A completely executed copy of the State Department of Fish and Game permit shall be kept at the permit site at all times while work is being performed. Permittee shall make all contractors doing work on this project familiar with all of the requirements of the State Department of Fish and Game permit.

5. Prior to beginning any activity authorized in this permit, the Permittee and/or Permittee's authorized agent, shall notify Underground Service Alert (USA) at 1-800-422-4133 at least 48 hours in advance to coordinate the permit activity on District right-of-way.
6. In accepting this permit, the Permittee agrees to replace any existing improvements which may include but not be limited to access road pavement, irrigation pipelines, chain link fencing and landscaping with acceptable products, installed to size, line and grade as the existing products removed and as approved by the District.
7. Work done in the absence of prescribed inspection may be required to be removed and replaced under the proper inspection, the entire cost of removal and replacement, including the cost of all materials used in the work thus removed, shall be borne by the Permittee, regardless of whether the work removed is found to be defective or not. Work covered up without the authority of the District, shall upon order of the District, be uncovered to the extent required, and the Permittee shall bear the entire cost of performing all the work and furnishing all the equipment and materials necessary for the removal and subsequent replacement of the covering, as directed by the District.
8. Should installation or maintenance activities be required during the period October 15 to April 15, work shall be undertaken within a 5-day clear weather forecast. Permittee shall maintain and provide for a flood watch when storm conditions threaten, and have personnel and equipment available on a 24-hour schedule and provide the District with the names and after-hours phone numbers of responsible supervisory personnel.
9. Any survey monuments which will be disturbed or destroyed shall be located, referenced and a corner record filed with the County Surveyor prior to the start of construction. The monuments shall be reset in a surface of the new construction, with a suitable monument box placed thereon, or set with permanent witness monuments. A corner record shall be filed with the County Surveyor for reset of monuments and evidence submitted prior to finalizing the permit. All work shall be performed under the direction of a licensed land surveyor or registered civil engineer at the expense of the Permittee.
10. Access to the District's levees, channels and patrol roads shall remain open and free to vehicular traffic at all times. Alternate access to the facilities shall be provided when existing access is severed or impaired. Permittee must prevent the public or unauthorized persons from entering the construction area or the District's right-of-way.
11. The Permittee shall perform, at Permittee's own expense, all construction surveying and engineering necessary to control construction to limits defined in the Plans and Exhibit "A". The construction surveying and engineering will be performed to the District's satisfaction.
12. Permittee shall, at all times, exercise proper dust control and dust abatement.

13. At any time during the life of this permit, the District may revise, modify or add provisions to this permit as may be required to meet the flood control, water conservation and safety responsibilities of the District.
14. The location of any temporary construction roadways or ramps which the Permittee may wish to build within District right-of-way shall be subject to the approval of the District. Roads shall be constructed so as to wash out during any appreciable flows.
15. This permit is valid only to the extent of the Flood Control District's jurisdiction. Permits or other approvals required by other cognizant agencies or underlying fee owners of District easement lands shall be the responsibility of the Permittee. Nothing contained in this permit shall be construed as a relinquishment of any rights now held by the Flood Control District.
16. If the Permittee should refuse or neglect to comply with the provisions of the permit, or the orders of the District, the District may have such provisions or orders carried out by others at the expense of the Permittee.
17. If the Permittee fails to comply with any obligation contained herein, Permittee shall be liable to the District for any administrative expenses and attorney's fees incurred in obtaining compliance with this permit and any such expenses and fees incurred in processing any action for damages or for any other remedies permitted by law.
18. No part of the activities authorized under this permit shall be accepted in phases. All work within District right-of-way must be completed prior to District acceptance of improvements within District right-of-way.
19. At the completion of the construction activities, the area shall be cleaned, graded and dressed to the satisfaction of the District. A joint inspection (Permittee/District) shall be made to determine if the work has been completed in accordance with permit requirements.
20. This permit is valid only for the purpose specified herein. All proposed changes shall be submitted, in writing, for District review and approval.
21. Activities under this Permit are subject to any instructions of the Flood Control Engineer or his representative. ALL INSTRUCTIONS MUST BE STRICTLY OBSERVED.
22. District activities shall take precedence at all times and, when any work or activity must be performed to carry out the functions and purposes of the District, Permittee must allow same to be done without interference.
23. Any damage caused to District facilities or structures by reason of the exercise of the Permit shall be repaired at the cost of the Permittee to the satisfaction of the District. Permittee will be billed for the actual cost to the District should Permittee neglect to make such repairs promptly.
24. Any District right-of-way monuments that are removed, disturbed, or destroyed as a result of activity under permit will be replaced by the District. Permittee will be billed and agrees to immediately pay all costs of such replacement.
25. Unless otherwise specified herein, this permit is subject to all prior permits, agreements, easements, privileges or other rights, whether recorded or unrecorded, in the area specified in this permit. Permittee shall make his own arrangements with holders of such prior rights.
26. The permitted activities shall be in accordance with:
 - a. The San Bernardino County Department of Public Works, Transportation and Flood Control Standard Specifications, available at the Department of Public Works, 825 E. Third Street, San Bernardino, California; and
 - b. all applicable provisions of the "Construction and Safety Orders" issued by the State Division of Industrial Safety and "Manual of Accident Prevention in Construction" issued by the Associated General Contractors, Inc.
27. All work associated with the activities authorized under this permit shall conform with all Cal-OSHA requirements. Prior to any shoring activity, the Permittee or Permittee's authorized agent shall submit shoring plans, signed and approved by a registered engineer, and copies of required permits.

28. It shall be the responsibility of the Permittee and/or the Permittee's authorized agent to insure that all personnel performing work authorized under this permit are adequately trained and have appropriate safety gear and equipment before entering any confined space.
29. The Permittee shall comply with the District's Stormwater Ordinance 3588 and all applicable National Pollutant Discharge Elimination System (NPDES) requirements to reduce or eliminate pollution of stormwater discharges into waters of the United States. In this regard, the Permittee shall utilize best management practices in the operation and storage of equipment, machinery, fuels, etc., to prevent any pollutants from being discharged into any storm drain and/or channel systems. In addition, pollutants (including sediment) generated as a result of the activity authorized by this permit shall not be discharged into the drainage system.
30. Should future activities of the Corps of Engineers and/or the District so require, the Permittee shall, at Permittee's expense, relocate all or any part of the subject works as so required.
31. The District will consider time extensions to the permit upon receipt of a written request from the Permittee thirty days prior to expiration.
32. The area disturbed by permitted activities shall be kept to minimum and shall be limited to that area actually being worked.
33. No nuisance shall be allowed on any of the premises and the Permittee shall exercise diligence in precluding any dumping operations in the area by patrolling or installing barriers to deter unauthorized access when the premises are not supervised.
34. Any unauthorized structure or portions thereof placed on District right-of-way or which affect District structures, must be removed by Permittee without cost to the District.
35. Violation of any provision contained therein, without written consent of the District, shall be cause for immediate revocation of this permit after written notice to the Permittee of any violation not remedied within thirty days following said written notice.
36. Upon cancellation or revocation of this permit, for any cause whatsoever, Permittee shall immediately cease all activities authorized hereunder, shall restore District right-of-way, structures and facilities to the satisfaction of the District, and shall vacate the District's premises. Should Permittee neglect to restore the premises, structures and facilities to a condition satisfactory to the District, the District will perform such work and Permittee agrees to reimburse the District for all actual costs of work performed.
37. If the permit term is extended, an annual inspection fee shall be due each year on the anniversary date of the permit. The annual inspection fee shall be based on the District's current Schedule of Fees Ordinance in effect on the anniversary date of the permit.
38. It is expressly understood that the area involved under this permit is subject to inundation from storm, flood and/or conservation flows at any time, and that the District shall not, in any way, be obligated to afford protection against said flows, or to assume any cost for damages. The District reserves the right to divert any storm or flood flows upon any land under this permit any time, and no diversion of such shall be made by the Permittee without the consent of the District.
39. All concrete shall conform to Section 201-1 of the Standard Specification for Public Works Construction, latest edition, unless otherwise specified in this permit. Curing compound shall conform to the provisions of Section 201-4.1 of the Standard Specifications for Public Works Construction, latest edition, Type 1-clear or translucent with red fugitive dye.
40. If applicable, the Permittee shall provide a wheel shaker or other approved device at the entrance of the job site to minimize debris track out on public streets.
41. The Permittee shall comply with all provisions of Rule 403-Fugitive Dust of South Coast Air Quality Management District.

42. The permit activities allowed under this permit may require the Permittee to use a pre-emergent within District right-of-way in order to control the growth of weeds. The District currently uses the following pre-emergent for this purpose: Landmark XP @ 9 oz/acre, Milestone VM @ 7 oz/acre, Reign (Aid in Suspension) @ 1 pt/acre. The necessity to use this or a similar type of pre-emergent shall be at the discretion of the District's inspector, and the type and method of use of the pre-emergent shall be submitted by the Permittee for review and approval by the District's inspector prior to use. Please contact Emilio Lopez, Supervising Agricultural Standards Officer for the San Bernardino County Agriculture Department at (909) 387-2131 with any questions or concerns regarding the proper application of the required pre-emergent.
43. The District's Schedule of Fees Ordinance is subject to change by the County Board of Supervisors. The Board typically considers changes in the Schedule of Fees Ordinance to take effect at the beginning of each fiscal year (July 1). Should the borrow fee rate be adjusted at any time during the life of this permit in accordance with changes to the Schedule of Fees Ordinance, the Permittee shall have the right to continue soil removal based on the new rate or request cancellation of their permit prior to the effective date of the new rate. Upon cancellation, the Permittee shall be responsible for restoring the work area to the satisfaction of the District prior to vacating District right-of-way. The District shall not be responsible for any impact to contractual obligations the Permittee may have with any clients as a result of revisions to the District's Schedule of Fees Ordinance.
44. The Permittee is hereby advised that the District's inspector shall make routine, periodic visits to the construction site commencing upon the date of permit issuance. Such site inspections shall be performed to ensure that permit activities have not been initiated without proper notification to the District. As such, the District shall have its inspector charge the appropriate time for such site visits, whether work is being performed or not, and inspection fees for the permit may be assessed accordingly based on the time necessary to conduct the necessary site visits.

Revised 08/2011