INFORMATION HANDOUT

For Contract No. 11-263304
At 11-Imp-8-R38.8/R39.1

Identified by
Project ID 1100000743

MATERIALS INFORMATION

FOUNDATION REPORT FOR DOGWWOD RD OC

DATED OCTOBER 11, 2012

STRUCTURE SEISMIC DESIGN RECOMMENDATION FOR DOGWOOD RD OC (REPLACE)

DATED OCTOBER 11, 2012

GEOTECHNICAL DESIGN REPORT FOR PERCOLATION TESTS AND A RETAINING WALL

DATED MAY 30, 2012

STRUCTURAL SECTIONS RECOMMENDATIONS

DATED MARCH 3, 2011

CORROSION STUDY

DATED JUNE 25, 2012

HAZARDOUS WASTE REVIEW FOR IMPROVEMENTS FOR INTERSTATE 8/DOGWOOD INTERCHANGE

DATED JANUARY 26, 2012

WATER SOURCE INFORMATION FROM IMPERIAL IRRIGATION DISTRICT

DATED NOVEMBER 26, 2012

State of California — Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: MR. HOWARD NG
Structures Design
Office of Bridge Design-South 2
Bridge Design Branch 20
Diamond Bar, CA

Attention: Edward Mu

Date: October 11, 2012

File: 11-IMP-08-PM R38.7/R39.3
11-263301
Proj. ID: 1100000743
Dogwood Rd. OC (Replace)
Br. #58-0351

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 Dogwood Rd. OC

This report presents the foundation recommendations for the proposed replacement of the Dogwood Road Overcrossing (OC) (Br. No. 58-0351), and supersedes the Preliminary Foundation Report, dated March 1, 2012, and the Structure Preliminary Geotechnical Report, dated September 14, 2011, for this structure. The Office of Geotechnical Design-South 2, Design Branch B completed a foundation investigation in April 2012 pursuant to a request by Structure Design, Office of Bridge Design – South 2 for foundation recommendations for the proposed replacement bridge.

Project Description

The bridge site is located in the Imperial Valley on Interstate 8 in El Centro, Imperial County. The existing bridge is proposed to be replaced with a wider structure to accommodate increased traffic in the area, due to the recent construction of a shopping mall located just to the southeast of the overcrossing. The existing Dogwood Road OC consists of a two-span, cast-in-place, reinforced concrete, box-girder structure, with end-diaphragm abutments that was constructed in 1967. In 1997 a seismic retrofit was completed for the bridge, which involved a column retrofit at the Bent 2 location. The proposed replacement bridge will consist of a two-span, cast-in-place, prestressed concrete structure, with a three column bent, and seat abutments. The bridge is proposed to be 96 ft wide and 200.4 ft long.

Recent subsurface investigations were conducted at the bridge site in April and August 2012. The following foundation recommendations for the Dogwood Road OC are based on information gathered during the 2012 subsurface investigations, as well as a review of "As-built" Log of Test Boring (LOTB) data from a 1964 foundation investigation, 1964 foundation recommendations, a 1965 foundation review, and 1966 pile driving records.

Due to the bridge site being below mean sea level, and to avoid listing negative elevations, Structure Design has indicated that the reference vertical datum for the bridge plans have been

adjusted by adding 328.08 ft (100 meters) to the 1988 North American Vertical Datum (NAVD88). Additionally, District 11 Surveys has stated that "As-built" information which was based on the 1929 NGVD datum was adjusted by adding 500 feet to that datum. With regards to the foundation recommendations provided in this report, all elevations are based on NAVD88 datum plus 328.08 feet.

Geology

The bridge site is located in the Imperial Valley on Interstate 8 in El Centro, Imperial County. The Imperial Valley is generally a flat, featureless, playa floor, which is almost entirely below sea level. It is a faulted basin with bordering mountain slopes, defined by fault planes of members of the San Andreas Fault system. The valley contains an immense sedimentary fill of sand and gravel that accumulated during Cenozoic time. The Imperial Valley has a veneer of highly fertile lakebed sediments which are derived from the ancient Lake Coahuila. The geologic map of California, San Diego – El Centro Sheet (Jenkins, 1962) shows that the bridge site is located on unconsolidated Quaternary lake deposits.

In 1964 a subsurface investigation was performed at the site which consisted of one mud-rotary boring (boring B-3) and three 2.25 inch penetration borings (currently known as dynamic cone penetration borings). The "As-built" Log of Test Borings from the 1964 subsurface investigation described the site as being underlain by scattered small cobbles and gravels just below the ground surface, which were underlain by interbedded layers of clayey silt, fine sand, and silty clay to the maximum depth drilled in that boring (92 ft).

In April 2012, a subsurface investigation was performed at the bridge site which consisted of 2 mud rotary borings (borings RC-12-001 and RC-12-002), five Cone Penetration Tests (CPT), and one Primary Wave/Shear Wave (P-S) Log in Boring RC-12-001. Boring RC-12-001 and two CPT holes were drilled on the west side of Abutment 1 location, boring RC-12-002 and one CPT boring were drilled on the east side of Abutment 3 location, and two CPT holes were drilled on the west side of Abutment 3 location.

In boring RC-12-001 alluvial material consisting of interbedded layers of firm to very stiff fat and lean clay, and loose to dense silt and silty sand were encountered to the maximum depth drilled in that boring (121.5 ft) .

In boring RC-12-002 alluvial material consisting of interbedded layers of stiff to hard fat and lean clay, and medium dense to very dense silt and silty sand, were encountered to the maximum depth of that boring (101.5 ft).

In August 2012 auger boring A-12-003 was drilled to a depth of 40.5 ft, in the northeast quadrant of the interchange, to specifically determine ground water elevation for a proposed detention basin in that area.

For site-specific soil descriptions from the 1964 and 2012 foundation investigations, refer to the LOTB sheets for the proposed replacement.

Ground Water

Ground water was encountered at the site during the 1964 and 2012 subsurface investigations. Table 1, below, presents the measured ground water elevations and date measured.

Table 1: Ground Water Information

Boring	Date	Ground Water Elevation
B-1	1/15/64	281.7 ft
B-2	1/15/64	284.0 ft
B-3	1/21/64	284.0 ft
B-4	1/20/64	286.9 ft
RC-12-002	7/10/12	286.7 ft
A-12-003	9/17/12	282.7 ft

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

Scour Potential

Scour is not considered to be an issue at this site as the bridge does not span any watercourse.

Corrosion

Corrosion test results for soil samples collected from borings RC-12-001 are shown below in Table 2. Due to chloride content being greater than 500 ppm in three of the samples, and sulfate content being greater than 2000 ppm in one of the samples tested, the site is considered to be corrosive based on current Caltrans' standards. Therefore, reinforced concrete (including piles) which is in contact with the native formational material, or fill material composed of the native formational material, requires corrosion mitigation in accordance with *Bridge Design Specifications, Article 8.22.* Additionally, when steel piles are specified, sacrificial corrosion allowance is required per the Department's *Corrosion Guidelines, Section 10.1*, "Corrosion Mitigation Measures for Steel Piles", available at (http://www.dot.ca.gov/hq/esc/ttsb/corrosion/Indes.htm).

Table 2 – Corrosion Test Summary

Location	Minimum Resistivity (Ohm-Cm)	pH	Chloride Content (ppm)	Sulfate Content (ppm)
Boring RC-12-001 Depth: 6.5 - 7.5 ft (Elev. 285.3 – 284.3 ft)	132	6.45	4500	1100
Boring RC-12-001 Depth: 20 - 21 ft (Elev. 271.8 – 270.8 ft)	132	6.77	2000	120
Boring RC-12-001 Depth: 65 – 66 ft (Elev. 226.8 – 225.8 ft)	228	7.73	4900	2800

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 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 September 18, 2012. The nearest fault to the site is the Imperial Fault (Fault ID 201), a right-lateral strike-slip fault, with a maximum credible earthquake Mmax=7.0, located approximately 4.3 miles northeast of the bridge site. P-S log information, gathered in the field, was inconclusive due to squeezing clays during testing; therefore, soil correlations were used for estimating V_{S30}. The average shear wave velocity for the upper 100 feet of the subsurface materials is estimated as V_{S30}=230 m/s. At this site, the probabilistic seismic procedure controls, with a Peak Ground Acceleration (PGA) of 0.70g. Refer to the Final Seismic Design Recommendation for additional information.

Surface Rupture Potential

Surface rupture potential at the bridge site is considered to be low, since no active fault passes near or beneath the bridge site.

Liquefaction Potential/Lateral Spreading

The Seismic Design Recommendations report, dated September 18, 2012, states that due to the site being predominantly underlain by cohesive soils, the liquefaction/lateral spreading potential at the site is considered low. Refer to the Seismic Design Recommendations for additional information.

Foundation Recommendations

The following Foundation Recommendations are for the proposed replacement of Dogwood Road OC (Br. No. 58-0351) as shown on the General Plan dated October 1, 2012. At Abutments 1 and 3, and Bent 2 support locations, driven Class 140 Alternative "V" piles, are recommended to be used for support. Tables 3 and 4, below, show the foundation design information provided by the structure designer.

Table 3: General Foundation Information Provided by Structure Designer (Br. No. 58-0351)

Support Location	Design Method	Pile Type	Finished Grade Elevation	Pile Cut-off Elevation	Pile Cap Size (ft)		Permissible Settlement Under Service Load	Number of Piles per Support
					B	L		
Abutment 1	WSD	Class 140 Alt "V" Piles	295.6 ft	289.4 ft	14.0 ft	101.0 ft	1 in	108
Bent 2-Right	LRFD	Class 140 Alt "V" Piles	295.0 ft	288.4 ft	21.0 ft	21.0 ft	1 in	44
Bent 2-Middle	LRFD	Class 140 Alt "V" Piles	295.0 ft	288.4 ft	21.0 ft	21.0 ft	1 in	38
Bent 2- Left	LRFD	Class 140 Alt "V" Piles	295.0 ft	288.4 ft	21.0 ft	21.0 ft	1 in	38
Abutment 3	WSD	Class 140 Alt "V" Piles	295.7 ft	289.4 ft	14.0 ft	101.0 ft	1 in	108

Table 4: Foundation Design Loads Provided by Structure Designer (Br. No. 58-0351)

Support Location	Service 1 Limit State			Strength Limit State (Controlling Group)				Extreme Event Limit State (Controlling Group)			
	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	5167 kips	97 kips	4633 kips	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bent 2 Right	2025 kips	58 kips	1379 kips	3086 kips	95 kips	N/A	N/A	1806 kips	125 kips	N/A	41 kips
Bent 2 Middle	2044 kips	62 kips	1272 kips	3133 kips	97 kips	N/A	N/A	1977 kips	125 kips	N/A	30 kips
Bent 2 Left	2044 kips	62 kips	1272 kips	3133 kips	97 kips	N/A	N/A	1977 kips	125 kips	N/A	30 kips
Abutment 3	5167 kips	97 kips	4633 kips	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

The specified pile tip elevations for Abutments 1 and 3 are shown below in Table 5.

Table 5: Foundation Design Recommendations for Abutments 1 and 3 (Br. No. 58-0351)

Support Location	Pile Type	Cut-Off Elevation	LRFD Service-I Limit State Load per Support		LRFD Service-I Limit State Total Load per Pile (Compression)-	Required Nominal Resistance	Design Tip Elevation	Specified Tip Elevation
			Total	Permanent				
Abutment 1	Class 140 Alt "V" Piles	289.4 ft	5167 kips	4633 kips	97 kips	200 kips	214.3 ft (a)	214.3 ft
Abutment 3	Class 140 Alt "V" Piles	289.4 ft	5167 kips	4633 kips	97 kips	200 kips	204.7 ft (a)	204.7 ft

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

The specified pile tip elevation for Bent 2 is shown below in Table 6.

Table 6: Foundation Design Recommendations for Bent 2 (Br. No. 58-0351)

Support Location	Pile Type	Cut-Off Elevation	Service-I Limit State Load per Support	Total Permissible Support Settlement	Required Nominal Resistance				Design Tip Elevation	Specified Tip Elevation
					Strength Limit		Extreme Event			
					Comp. (φ=0.7)	Tension (φ=0.7)	Comp. (φ=1)	Tension (φ=1)		
Bent 2 Right	Class 140 Alt "V" Piles	288.4 ft	2025 kips	1 in	140 kips	0 kips	130 kips	50 kips	219.3 ft (a-I) 232.8 ft (a-II) 248.8 ft (b-II)	219.3 ft
Bent 2 Middle	Class 140 Alt "V" Piles	288.4 ft	2044 kips	1 in	140 kips	0 kips	130 kips	30 kips	219.3 ft (a-I) 232.8 ft (a-II) 248.8 ft (b-II)	219.3 ft
Bent 2 Left	Class 140 Alt "V" Piles	288.4 ft	2044 kips	1 in	140 kips	0 kips	130 kips	30 kips	219.3 ft (a-I) 232.8 ft (a-II) 248.8 ft (b-II)	219.3 ft

Note: Design tip elevations are controlled by (a-I) Compression (Strength Limit), (a-II) Compression (Extreme Event), (b-II) Tension (Extreme Event)

The Pile Data Table for Abutments 1 and 3, as well as Bent 2, is presented in Table 7, below. The ultimate geotechnical pile capacity of the Alternative "V" piles will meet or exceed the required nominal resistance in compression.

Table 7: Pile Data Table (Br. No. 58-0351)

Support Location	Pile Type	Required Nominal Resistance		Design Tip Elevation	Specified Tip Elevation
		Compression	Tension		
Abutment 1	Class 140 Alt "V" Piles	200 kips	0	214.3 ft (a)	214.3 ft
Bent 2-Right	Class 140 Alt "V" Piles	140 kips	50 kips	219.3 ft (a) 248.8 ft (b)	219.3 ft
Bent 2-Middle	Class 140 Alt "V" Piles	140 kips	30 kips	219.3 ft (a) 248.8 ft (b)	219.3 ft
Bent 2-Left	Class 140 Alt "V" Piles	140 kips	30 kips	219.3 ft (a) 248.8 ft (b)	219.3 ft
Abutment 3	Class 140 Alt "V" Piles	200 kips	0	204.7 ft (a)	204.7 ft

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

Abutments 1 and 3 Right and Left Side Retaining Walls

The Abutments 1 and 3 right and left side retaining wall footings may be supported on spread footings founded on newly-placed structure backfill material compacted to 95% relative compaction. At Abutments 1 and 3 right and left side retaining wall segments closest to the abutments, unsuitable native soils underlie the support footings. Therefore, it is recommended that the native materials be removed and replaced by subexcavating down to the elevations shown in Tables 8 through 11, below, and then brought back up to the bottom of footing elevation with structure backfill compacted to 95% relative compaction. The recommended Factored Gross Nominal Bearing Resistances, bottom of footing elevations, and bottom of subexcavation elevations are listed below in Tables 8 through 11.

Table 8: Abutment 1 Right Side Type 1 Ret. Wall LRFD Spread Footing Recommendations

Wall Location	Wall Segment	Design Height of Wall "H"	Bottom of Footing Elevation	Bottom of Subexcavation Elevation	Loading Type	Effective Footing Width (B') (ft)	Gross Uniform Bearing Stress (q_o) (ksf)	Net Bearing Stress (q'_o) (ksf)	Permissible Net Contact Stress (q_{pn}) (ksf)	Factored Gross Nominal Bearing Resistance (q_R) (ksf)
Abutment 1 Right	Segment 1	8 ft	311.2 ft	N/A	Service	6.2	N/A	1.3	4.5	N/A
					Strength	3.6	2.3	N/A	N/A	4.6
					Extreme I	3.9	2.2	N/A	N/A	10.3
Abutment 1 Right	Segment 2	12 ft	307.2 ft	N/A	Service	6.3	N/A	2.0	4.0	N/A
					Strength	3.2	4.0	N/A	N/A	4.5
					Extreme I	2.8	4.8	N/A	N/A	8.8
Abutment 1 Right	Segment 3	20 ft	298.8 ft	N/A	Service	11.0	N/A	2.4	3.5	N/A
					Strength	7.4	3.8	N/A	N/A	5.3
					Extreme I	4.6	6.4	N/A	N/A	11.5
Abutment 1 Right	Segment 4	28 ft	289.8 ft	284.8 ft	Service	15.5	N/A	3.1	3.2	N/A
					Strength	10.7	4.9	N/A	N/A	6.1
					Extreme I	6.1	8.9	N/A	N/A	14.2

Notes: Wall segment 1 is farthest from the abutment, and Wall segment 4 is nearest to the abutment.

Table 9: Abutment 1 Left Side Type 1 Ret. Wall LRFD Spread Footing Recommendations

Wall Location	Wall Segment	Design Height of Wall "H" (ft)	Bottom of Footing Elevation (ft)	Bottom of Subexcavation Elevation (ft)	Loading Type	Effective Footing Width (B') (ft)	Gross Uniform Bearing Stress (q_o) (ksf)	Net Bearing Stress (q'_o) (ksf)	Permissible Net Contact Stress (q_{pn}) (ksf)	Factored Gross Nominal Bearing Resistance (q_R) (ksf)
Abutment 1 Left	Segment 1	8 ft	311.2 ft	N/A	Service	6.2	N/A	1.3	4.5	N/A
					Strength	3.6	2.3	N/A	N/A	4.6
					Extreme I	3.9	2.2	N/A	N/A	10.3
Abutment 1 Left	Segment 2	12 ft	307.2 ft.	N/A	Service	6.3	N/A	2.0	4.0	N/A
					Strength	3.2	4.0	N/A	N/A	4.5
					Extreme I	2.8	4.8	N/A	N/A	8.8
Abutment 1 Left	Segment 3	20 ft	298.8 ft	N/A	Service	11.0	N/A	2.4	3.5	N/A
					Strength	7.4	3.8	N/A	N/A	5.3
					Extreme I	4.6	6.4	N/A	N/A	11.5
Abutment 1 Left	Segment 4	28 ft	289.8 ft	284.8 ft	Service	15.5	N/A	3.1	3.2	N/A
					Strength	10.7	4.9	N/A	N/A	6.1
					Extreme I	6.1	8.9	N/A	N/A	14.2

Notes: Wall segment 1 is farthest from the abutment, and Wall segment 4 is nearest to the abutment.

Table 10: Abutment 3 Right Side Type 1 Ret. Wall LRFD Spread Footing Recommendations

Wall Location	Wall Segment	Design Height of Wall "H" (ft)	Bottom of Footing Elevation (ft)	Bottom of Subexcavation Elevation (ft)	Loading Type	Effective Footing Width (B') (ft)	Gross Uniform Bearing Stress (q_o) (ksf)	Net Bearing Stress (q'_o) (ksf)	Permissible Net Contact Stress (q_{pn}) (ksf)	Factored Gross Nominal Bearing Resistance (q_R) (ksf)
Abutment 3 Right	Segment 1	28 ft	289.8ft	284.8 ft	Service	15.5	N/A	3.1	3.2	N/A
					Strength	10.7	4.9	N/A	N/A	6.1
					Extreme I	6.1	8.9	N/A	N/A	14.2
Abutment 3 Right	Segment 2	20 ft	298.8 ft.	N/A	Service	11.0	N/A	2.4	3.5	N/A
					Strength	7.4	3.8	N/A	N/A	5.3
					Extreme I	4.6	6.4	N/A	N/A	11.5
Abutment 3 Right	Segment 3	12 ft	307.2 ft	N/A	Service	6.3	N/A	2.0	4.0	N/A
					Strength	3.2	4.0	N/A	N/A	4.5
					Extreme I	2.8	4.8	N/A	N/A	8.8
Abutment 3 Right	Segment 4	8 ft	311.2 ft	N/A	Service	6.2	N/A	1.3	4.5	N/A
					Strength	3.6	2.3	N/A	N/A	4.6
					Extreme I	3.9	2.2	N/A	N/A	10.3

Notes: Wall segment 1 is nearest to the abutment, and Wall segment 4 is farthest from the abutment.

Table 11: Abutment 3 Left Side Type 1 Ret. Wall LRFD Spread Footing Recommendations

Wall Location	Wall Segment	Design Height of Wall "H" (ft)	Bottom of Footing Elevation (ft)	Bottom of Subexcavation Elevation (ft)	Loading Type	Effective Footing Width (B') (ft)	Gross Uniform Bearing Stress (q_o) (ksf)	Net Bearing Stress (q'_o) (ksf)	Permissible Net Contact Stress (q_{pn}) (ksf)	Factored Gross Nominal Bearing Resistance (q_R) (ksf)
Abutment 3 Left	Segment 1	28	289.8ft	284.8	Service	15.5	N/A	3.1	3.2	N/A
					Strength	10.7	4.9	N/A	N/A	6.1
					Extreme I	6.1	8.9	N/A	N/A	14.2
Abutment 3 Left	Segment 2	20	298.8 ft.	N/A	Service	11.0	N/A	2.4	3.5	N/A
					Strength	7.4	3.8	N/A	N/A	5.3
					Extreme I	4.6	6.4	N/A	N/A	11.5
Abutment 3 Left	Segment 3	12	307.2 ft	N/A	Service	6.3	N/A	2.0	4.0	N/A
					Strength	3.2	4.0	N/A	N/A	4.5
					Extreme I	2.8	4.8	N/A	N/A	8.8
Abutment 3 Left	Segment 4	8	311.2 ft	N/A	Service	6.2	N/A	1.3	4.5	N/A
					Strength	3.6	2.3	N/A	N/A	4.6
					Extreme I	3.9	2.2	N/A	N/A	10.3

Notes: Wall segment 1 is nearest to the abutment, and Wall segment 4 is farthest from the abutment.

The recommended Factored Gross Nominal Bearing Resistances provided in Tables 8 through 11, above, are based upon the following design criteria:

1) The final designed spread footings have an effective width (B') such that the Gross Uniform Bearing Stress (q_o) is less than the recommended design values for the Factored Gross Nominal Bearing Resistances (q_R) for Strength and Extreme Limit States.

2) All retaining walls are Standard Type 1 retaining walls as shown in the "Standard Plans (2010)" on Revised Standard Plan RSP sheet B3-1A for Loading Case 1.

3) All spread footings shall be constructed at or below the recommended bottom of footing elevations as shown in Tables 8 through 11, above. Where subexcavation is required, in Tables 8 through 11, above, if the bottom of footing elevation is lowered, then the bottom of subexcavation elevation is to be lowered accordingly, to maintain the 5 ft thick layer of structure backfill below the footing.

4) At locations where newly-placed engineered fill is to be placed beneath the proposed retaining wall footings, the newly-placed fill is to be compacted to 95% relative compaction. The limits of 95% relative compaction of engineered fill are to conform to the limits specified for relative compaction of embankments under retaining wall footings without piles, as defined in section 19-5.03B of the Standard Specifications.

5) All proposed retaining wall spread footings, which will be constructed on the embankment slope, are to be positioned such that they have a minimum horizontal footing embedment of 4 feet, measured from the top of footing to the face of the finished slope. The finished slope is not to exceed a 2:1 (horizontal to vertical) ratio.

If any of the above vertical embedment depths are reduced, the loading case changed, or wall heights increased, the Office of Geotechnical Design-South 2, Branch B is to be contacted for reevaluation.

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 demands 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.

3) Structures Design, Office of Bridge Design – South 2 has indicated that during demolition of the existing bridge, at Abutments 1 and 3, and Bent 2 support locations, the existing piles are proposed to be cut off below the ground surface, and abandoned in place. Abutments 1 and 3, of the existing bridge, are end-diaphragm abutments supported on a single row of 6 vertical piles, with a center-to-center spacing of 6 feet. For the replacement bridge, at the center sections of Abutments 1 and 3 supports, the front row battered piles will need to be spaced so that they line up between the abandoned existing piles.

Construction Considerations:

1) After the engineered approach fills at the Abutments 1 and 3 locations have been constructed to final grade, the contractor is to allow a 90-day settlement waiting period prior to excavating for the pile cap and retaining wall footings.

Driven Piles

1) At Abutments 1 and 3, and Bent 2 support locations, the calculated geotechnical capacity of the Alt "V" piles is based on both skin-friction and end-bearing.

2) Pile acceptance is to be based on Standard Specifications 49-2.01A(4)(b) "Pile Driving Acceptance Criteria". At Abutments 1 and 3, and 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 300 kips at Abutments 1 and 3 location, and 210 kips at Bent 2 location.

Retaining Wall Spread Footings

1) At Abutments 1 and 3, right and left side retaining wall segments closest to the abutments, unsuitable native soils underlie the support footings. Therefore, the native materials below the proposed bottom of footing elevations shall be removed and replaced by subexcavating down to the elevations shown in Tables 8 through 11, above, and then brought back up to the bottom of footing elevation with structure backfill compacted to 95% relative compaction. The limits of the subexcavation and replacement with 95% compacted structure backfill material shall be established by a vertical plane extending down from lines 3.0 feet outside the bottom edges of the footing, on the three sides not in contact with the abutment footing.

2) At Abutments 1 and 3, right and left side retaining walls, concrete for the proposed retaining wall support footings shall be placed neat against undisturbed structure backfill on the bottom of the footing excavation. Should the bottom of the footing excavation be disturbed, then the disturbed soils shall be recompacted to 95% relative compaction prior to placement of concrete for the retaining wall support footings.

3) Due to the anticipation that ground water will be encountered during subexcavation below the footings at the Abutments 1 and 3 right and left retaining wall segments closest to the abutments, structure excavation Type "D" should be shown on the contract plans. The contractor will need to control the ground water to prevent flooding of the excavations.

This Foundation Report is based on specific project information regarding structure type and location that have been provided by the Office of Bridge Design-South 2. 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 this report is still applicable. Any questions regarding the above report should be directed to the attention of Erich Neupert, (916) 227-4565, David Liao, (916) 227-5756, or Mark DeSalvatore, (916) 227-5391 at the Office of Geotechnical Design-South 2, Branch B.

Prepared by: Date: 10/11/12

Erich Neupert

Erich Neupert, P.G., 8137
Engineering Geologist
Office of Geotechnical Design-South 2
Design Branch B

Prepared by: Date: 10/11/12

D. Te-Ming Liao R.C.E., 59838
Transportation Engineer-Civil
Office of Geotechnical Design-South 2
Design Branch B

cc: R.E. Pending File
John Stayton - Specs & Estimates
Sam Amen – District 11 (Project Manager)
Solomon Tadesse-Dist. 11 Project Engineer
Art Padilla – District 11 (Materials Engineer)
Mark DeSalvatore – OGDS-2 R.V. for Mark DeSalvatore
Abbas Abghari – OGDS-2
Shira Rajendra – GS Corporate

State of California

Business, Transportation and Housing Agency

Flex your power!
Be energy efficient!

Memorandum

To: MR. HOWARD NG, CHIEF
BRIDGE DESIGN BRANCH 20
OFFICE OF BRIDGE DESIGN SOUTH 2
DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES

Date: October 11, 2012

File: 11-SD-8-PM R38.7-R39.3
Project No. 1100000743
EA No. 11-26330
Dogwood Road O.C.
(Replace)
Bridge No. 58-0351

Attn.: Mr. Edward Mu

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES - MS #5
OFFICE OF GEOTECHNICAL DESIGN SOUTH-2

Subject: **Structure Seismic Design Recommendations for Dogwood Road O.C. (Replace)-**

Introduction

This memorandum presents seismic design recommendations for the Dogwood Road O.C. (Replace) bridge. Ground motion recommendations are based on the Caltrans 2009 Seismic Design Procedure (SDP) as described in the Seismic Design Criteria Version 1.6 (SDC) Appendix B, the Acceleration Response Spectrum (ARS) Online Tool v2.0, USGS 2008 Interactive Deaggregations (Beta) and 2012 subsurface geotechnical investigations and 1965 as-built Logs of Test Borings (LOTBs).

Seismicity

Based on the 2010 Caltrans faults database / Caltrans ARS Online (v2.0) Tool, the site is located about 4.3 miles (6.9 km) from the Imperial fault zone. This strike-slip fault (Fault ID 201, MMax = 7.0, right lateral strike-slip, dip = 90 degrees, northeast, Bottom and Top of Rupture Plane approximately 9.3 and 0 miles, respectively) is the controlling fault for the deterministic seismic design procedure. A map showing the location of the bridge and the controlling fault is attached.

Soil Profile

The Office of Geotechnical Design South-2, Branch B, conducted a subsurface geotechnical investigation consisting of two 4-inch diameter mud rotary wash boring (RC-12-001 and RC-12-002), which were drilled on April 17 through April 24, 2012. The maximum depths of the investigations were advanced to approximately 121.5 feet below the existing ground surface.

In 1964, one 3-inch rotary sample boring and three penetration borings were performed prior to the construction of the original bridge. The rotary boring was drilled to depths approximately 90 feet (elevations 200 feet) with split spoon sampling carried out to refusal. The penetration borings were advanced to depths approximately ranging from 36 to 66 feet (elevation 254 to 224 feet) below the existing natural grade.

The Dogwood Road OC site is located in the Imperial Valley on Interstate 8 in El Centro, Imperial County. The Imperial Valley contains an immense sedimentary fill of clayey silts, sands and gravels accumulated below sea level during Cenozoic time.

The vast sedimentary fill contains interbedded layers with variable thicknesses of soft to hard fat/lean clay and loose to very dense layer of clayey silt, silt, sandy silt and poorly graded sands to the bottom of both 2012 and 1964 subsurface geotechnical investigations. Bedrock was not encountered during both (2012 and 1964) investigations.

Groundwater was encountered during the 2012 as well as 1964 subsurface geotechnical investigations at depths of 5.5 and 3.2 to 9.6 feet (286.7 and elevation 286.9 to 281.7 feet) from the original ground surface, respectively. The groundwater elevations may fluctuate due to seasonal conditions, from artesian pressure during construction, etc.

It must be noted, that due to the bridge site being below sea level, the elevations have been adjusted by adding 328.08 feet (100-meter) to the actual (referenced 1988 National Geodetic Vertical Datum, NGVD) elevation.

Based on 2012 subsurface geotechnical data and 1964 Log of Test Borings for the Dogwood Road OC, the average shear wave velocity for the upper 100 feet of subsurface materials is estimated as V_{S30} = 230 m/s. using the shear wave velocity correlation with Standard Penetration Test (SPT) by Sykora (1987) after Sykora and Stokoe (1983).

Design Response Spectrum

Based on the 2009 SDP, the design response spectrum is the upper envelope of the deterministic and probabilistic response, but is not less than a minimum deterministic response spectrum resulting from a Mmax = 6.5 earthquake on a vertical strike-slip fault at a distance of 7.5 miles (12 km).

The deterministic response spectrum is obtained by taking the arithmetic average of the median response spectrum calculated using the 2008 Campbell-Bozorgnia and 2008 Chiou-Youngs ground motion prediction equations. The probabilistic response spectrum is obtained for 5 percent probability of exceedance in 50 years (corresponding to approximately a 975 year return period) using the 2008 USGS Seismic Hazard Map. Adjustments to account for site conditions and fault effects were implemented.

For this site the probabilistic response spectrum controls. The 2008 USGS Deaggregations (Beta) tool was utilized to calculate the 5% in 50 years probabilistic spectrum, because V_{s30} is 230 m/sec. (Caltrans 2009 SDP). As well as the calculated spectrum was adjusted for near field effect. The corresponding peak horizontal ground acceleration at proposed site is 0.70g. The recommended acceleration response spectrum is attached.

Liquefaction Potential Evaluation

Per 2012 and 1964 geotechnical subsurface investigations, this site consists of subsurface material with higher shear wave velocity (V_{S30} > 230 m/s), very high peak ground acceleration and predominately sufficient enough fine or cohesive soils to prevent soil liquefaction along the bridge alignment. Although, our liquefaction studies found that there may be some local liquefaction potential in all of the borings close to abutments and bent; the adverse liquefaction effect(s) to the structure are negligible. It should be mentioned that liquefiable soils are located at different depths (not as a uniformed layer), along the bridge alignment.

Seismic Settlement

Seismic settlement due to strong ground motion and the corresponding peak horizontal ground acceleration (0.70g) are considered negligible.

Surface Fault Rupture Hazard

The site is not located within an Alquist Priolo Fault Hazard Zone and is more than 4.3 miles (6.9 km) from the nearest Imperial fault which extends to the ground surface, the Imperial fault zone. Potential for surface rupture is low, and no further work or design for surface rupture is required.

The seismic design recommendations contained in this report are based on specific project information that was provided by the Office of Bridge Design South-2. If any conceptual changes are made during final project design, the Office of Geotechnical Design South-2 should review those changes to determine whether the seismic design recommendations provided in this report are still applicable. Any questions regarding the above recommendations should be directed to the attention of Asef Wardak (916) 227-1219 or Angel Perez-Cobo (916) 227-7167, Office of Geotechnical Design South-2.

Prepared by: Date: Oct. 11, 2012

Asef Wardak
Transportation Engineer
Office of Geotechnical Design South-2

Attachments:

Figure 1. Nearby Major Faults with Reference to the Project Site
Figure 2. Recommended Acceleration Response Spectrum (ARS) Curve

cc: R.E. Pending File
Specs & Estimates – John Stayton (Electronic File)
District 11 Project Manager – Sam Amen (Electronic File)
District 11 Project Engineer – Solomon Tadesse (Electronic File)
District 11 Materials Engineer – Art Padilla (Electronic File)
HQ Geotechnical Design South-2 – Abbas Abghari – OGDS-2 (Electronic File)
HQ GS Corporate – Shira Rajendra – (Electronic File)
HQ Geotechnical Design South-2 – Mark Desalvatore – GDS-2 (Electronic File)
HQ Geotechnical Design South-2 – Erich Neupert – GDS-2 (Electronic File)
HQ Geotechnical Design South-2 – Angel Perez-Cobo (Electronic File) APC
File

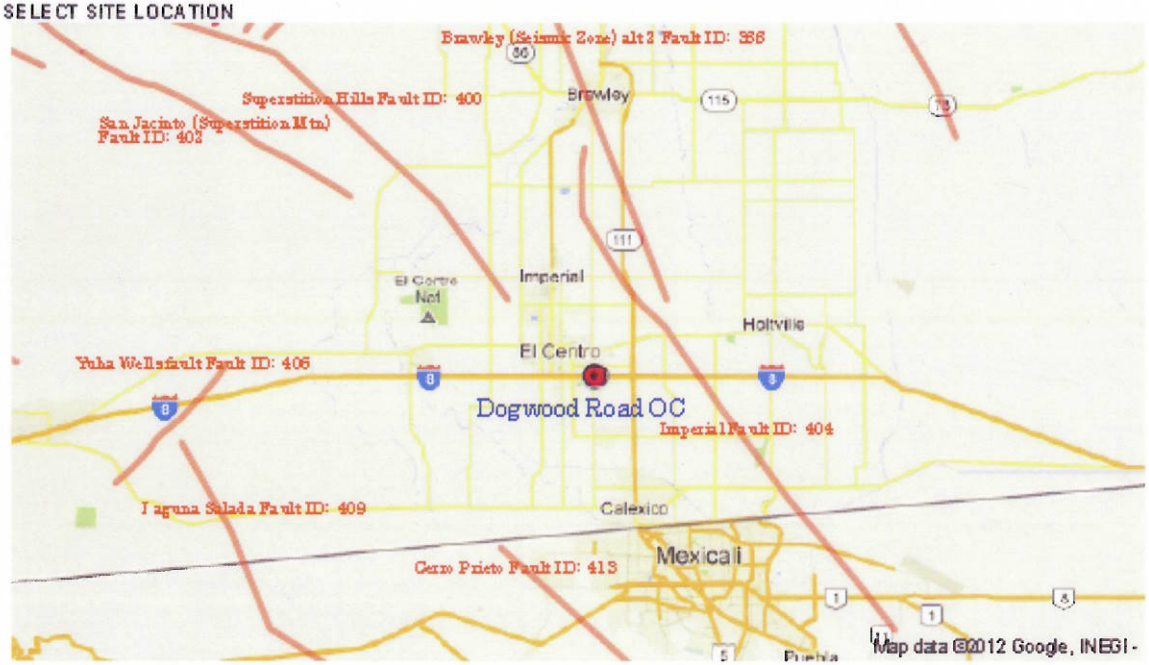
ARS Online

CALIFORNIA DEPARTMENT OF
TRANSPORTATION

Caltrans ARS Online (v2.0)

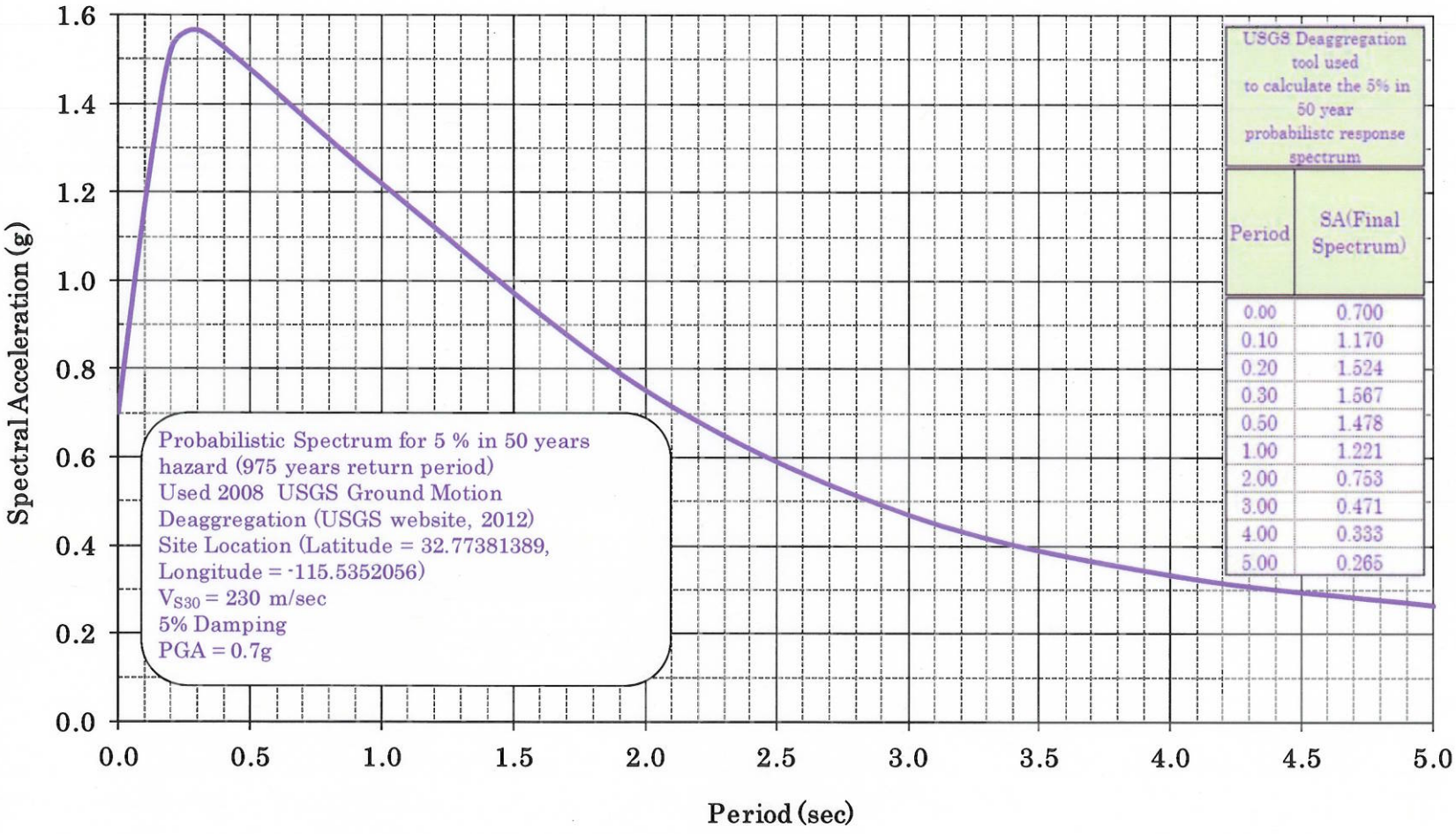
This web-based tool calculates both deterministic and probabilistic acceleration response spectra for any location in California based on criteria provided in *Appendix B of Caltrans Seismic Design Criteria*. More...

SELECT SITE LOCATION



Latitude: 32.77381389 Longitude: -115.5352056 V_{S30}: 230 m/s Calculate

Figure 1. Nearby Major Faults with Reference to the Project Site



USGS Deaggregation tool used to calculate the 5% in 50 year probabilistc response spectrum

Period	SA(Final Spectrum)
0.00	0.700
0.10	1.170
0.20	1.524
0.30	1.567
0.50	1.478
1.00	1.221
2.00	0.753
3.00	0.471
4.00	0.333
5.00	0.265

Figure 2. Recommended Acceleration Response Spectrum for Dogwood Road OC (Bridge No. 58-0351)

State of California | Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: Kazim Mamdani - 11
Design

Attn: Solomon Tadesse

Date: May 30, 2012
File: 11-IMP-08-PM 38.9
1100000743
Dogwood Road

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
Geotechnical Services MS 5
Office of Geotechnical Design – South 2, Branch C

Subject: Geotechnical Design Report for Percolation Tests and a Retaining Wall

Introduction

Per your request dated March 16, 2012, we are providing test results for 7 percolation tests and recommendations for a retaining wall located near the intersection of Dogwood Road and SR 8 in Imperial County, California. It is our understanding that the percolation tests were requested to design proposed detention basins to mitigate the runoff from the new road surface of the proposed Dogwood Road Bridge replacement project. The recommendations provided in this report are based on the As-built LOTBs, the subsurface investigation for the proposed Dogwood bridge replacement, and percolation testing conducted between April 16 and April 19, 2012. Due to the fact the proposed retaining wall will be founded on fill material, drilling was not required for the design of the retaining wall foundation. For more information please refer to the PFR for the Dogwood Rd. OC dated September 14, 2011 or the LOTBs for the final Foundation Report for the Dogwood Rd. Bridge Replacement when available from this office.

Geology

The project site is located in the Imperial Valley on Interstate 8 in El Centro, Imperial County. The Imperial Valley is generally a flat, featureless playa floor which is almost entirely below sea level. It is a faulted basin with bordering mountain slopes, defined by fault planes of members of the San Andres Fault system. The valley contains an immense sedimentary fill of sands and gravels that accumulated during the Cenozoic time. Most of these sediments are only partially consolidated into sandstones and conglomerates. The Imperial Valley has a veneer of highly fertile lakebed sediments which are derived from the ancient Lake Coahuila. The geologic map of California, San Diego – El Centro (Jenkins, 1962) shows that the bridge site is located on Quanternary lake deposits.

The As-Built Log of Test Borings, from the 1964 subsurface investigation for the Dogwood Road OC, shows the site is underlain by clayey silt, fine sand and silty clay to the maximum depth drilled of 92 feet below ground surface. During our subsurface investigation of April 2012 the soils encountered included stiff to very dense layered clay, silts and find sands to a depth of 100 feet below existing grade of SR8.

Test Method

Tests were designed by CT 749 (1986) method for 12-inch diameter test hole. Test pits were excavated by hand, shovel, pry bar, hand auger, and 12" gas auger. The test pit dimensions were 12" wide by 18" deep. Test pits were filled with water and allowed to "pre-soak" overnight or for a minimum of 12 hours. Percolation testing in all of the 7 test pits proceeded for 5 hours each. Because of the homogeneity of the site soils and the number of locations, only one percolation test pit was tested per location. The test pit locations were labeled A thru G as shown on the provided Attachment #1 - Percolation Testing Locations. The percolation test results for each test pit were averaged and are provided in Table 1 below.

Test Results

Table 1
Percolation Test Results

Area	Soil encountered	Percolation rate Minutes/inch
A	Stiff to hard Clay	60
B	Stiff to hard Clay	240
C	Stiff to hard Clay	480
D	Stiff to hard Clay	240
E	Very dense silty sand with fine gravel	30
F	Very dense silty sand with fine gravel	40
G	Very dense silty sand with fine gravel	240

Please see the Attachment 1 – "Percolation Testing Locations" for testing location map.

Selection of Soil Strength and Design Parameters for Retaining Wall

Based on the Request and Typical Cross Sections provided to this Office, the proposed Retaining Wall W1 shall be founded on future proposed fill. Retaining Wall W1 is proposed between stations 36+77 and 40+01.37 as referenced from the "D" line. During our design, we assumed that the existing or proposed foundation material shall be founded on recompacted fill materials to not less than 95% relative compaction, over the existing still or dense ground materials, thereby providing the following soil parameters; 34° for the angle of internal friction, zero (0) cohesion and a moist unit weight of 125 lb/ft^3.

Retaining Wall Foundation Recommendations

Based on the above soil parameters, loading cases, and the footing dimensions for a Caltrans Standard Type 1 Retaining Walls, we concur with the design of your proposed Standard Type1 Retaining walls in accordance with the Caltrans 2010 Standard Plans Sheet B3-1.

Assuming the retaining wall will be founded on future fill materials, this office recommends the removal of unsuitable materials on the existing ground, scarify the surface, moisture conditioned,

and compacted prior to placing new fill materials, as stated in Section 19.5 of the Standard Specifications.

In case the retaining wall will be founded below the existing surface, the subbase materials under the footing should be overexcavated to one foot below the bottom of footing elevation. The bottom of the overexcavated area should be scarified; moisture conditioned; and recompacted to 95% relative compaction before replacing the removed soil under the footing. The materials under the footing should be free of unsuitable materials or clay.

Corrosion

During the subsurface investigation for the proposed Dogwood Rd. bridge, soil samples tested positive for corrosion. The in-situ material is considered corrosive to foundation materials. Please see the Bridge Foundation Report for more corrosion information.

Groundwater

Groundwater was not measured in the test holes. As-built Log of Test Borings drilled in October 1965 shows the groundwater elevation around the bridge to be between 4 to 9 feet below the surface. Drilling done during April 11 2012 for the Dogwood Road bridge replacement indicate that the groundwater elevation is approximately 20 feet below the surface of the Dogwood Road centerline.

Construction Considerations

From the cross sections and our site investigation, it appears any proposed temporary excavation cut of 1:1 (H: V) should remain stable during footing construction, although contractor shall be responsible for shoring design as deemed necessary. Groundwater is not anticipated to be encountered during construction of the basins or retaining wall.

If you have any questions or comments, please call Brian Gutierrez at (916) 227-1222

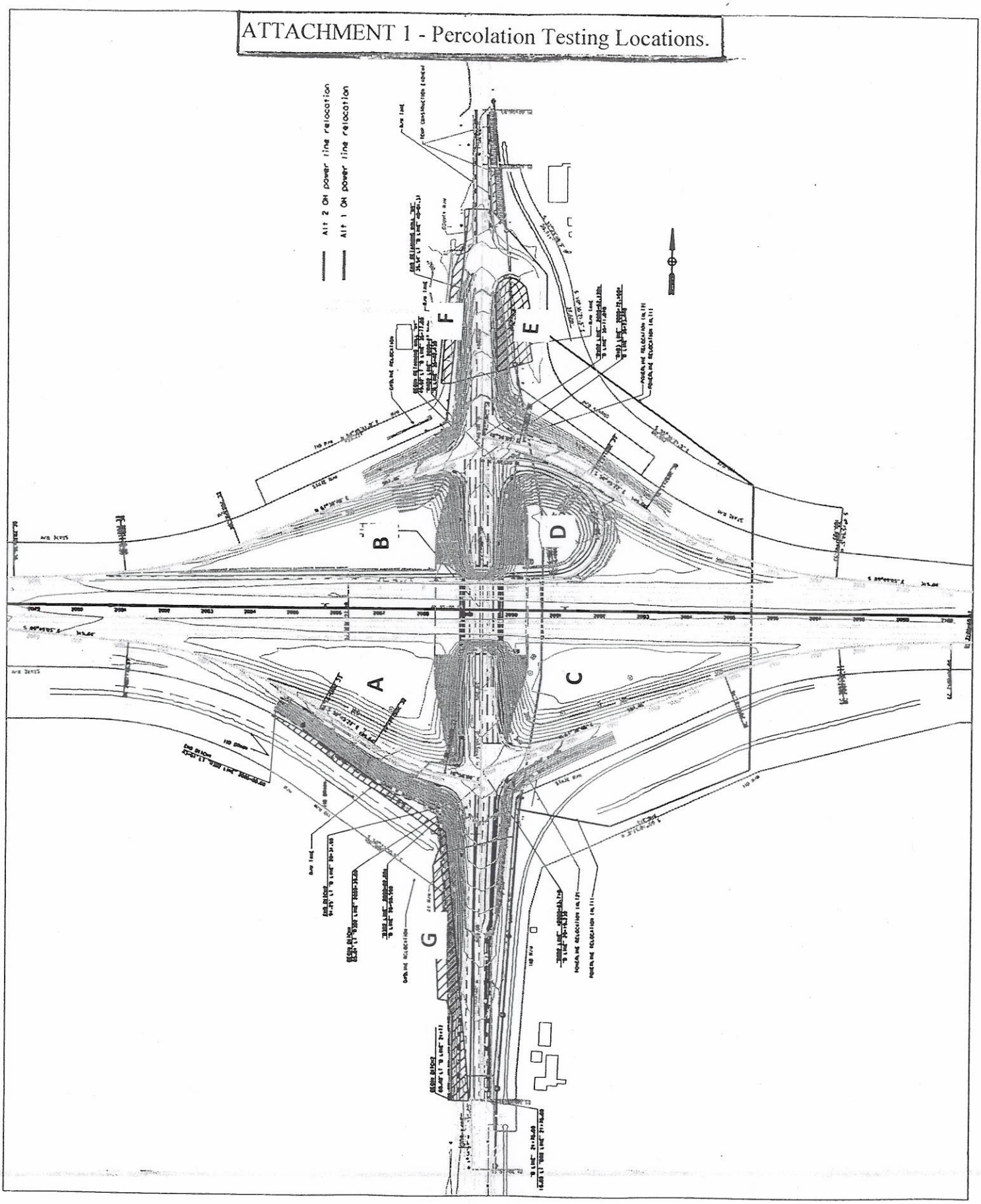
Prepared by: Date: 5/30/12

BRIAN GUTIERREZ, P.E.
Office of Geotechnical Design–South 2
Branch C

ATTACHMENT 1 - Percolation Testing Locations

cc A. Abghari – GDS2
S. Wei – GDS2
GS Corporate

ATTACHMENT 1 - Percolation Testing Locations.



State of California

Business, Transportation and Housing Agency

Memorandum

To : KAZIM MAMDANI (MS 333)
Project Manager
Project Development

Date: March 3, 2011

File: 11-IMP-8
PM R38.7/R39.3
EA 263300
EFIS 1100000743

From : **DEPARTMENT OF TRANSPORTATION - DISTRICT 11**
PAVEMENT ENGINEERING SECTION

Subject: **STRUCTURAL SECTIONS RECOMMENDATIONS**

The following structural section recommendations for the IMP-8 / Dogwood Road Interchange reconstruction are submitted for the PSR. Calculations were based on a Traffic Index furnished by the designer and a minimum design R-value (Rv) of 10. The Rv was determined from previous projects in the area.

Per Highway Design Manual, 613.5(2)a, Special design consideration should be given to new or reconstructed shoulders. At a minimum, new or reconstructed shoulders shall be engineered using the same structural section (TI) as the adjacent traffic lane when the shoulder width is 5 feet or less.

Per Highway Design Manual, 626.1(3), due to the projected truck traffic PCC pavement will be placed at the ramp termini of both the WB and EB off-ramps and designed according to HDM Table 623.1G.

Ramp Traveled Ways
TI = 12, Rv = 10

Alternate 1	Alternate 2
0.60' HMA-C	0.60' HMA-C
2.25' AB – Class 2	1.40' AB – Class 2
	0.95' AS – Class 4

Ramp Shoulders (widths greater than 5 feet)
TI = 7.5, Rv = 10

Alternate 1	Alternate 2
0.35' HMA-C	0.35' HMA-C
1.35' AB – Class 2	0.90' AB – Class 2
	0.50' AS – Class 4

Off-Ramp Termini

0.85 JPCP
0.25' HMA-A
0.60 AB – Class 2

Dogwood Road (north of I-8)
TI = 12, Rv = 10

Alternate 1	Alternate 2
0.60' HMA-C	0.60' HMA-C
2.25' AB – Class 2	1.40' AB – Class 2
	0.95' AS – Class 4

Dogwood Road (south of I-8)
TI = 12.5, Rv = 10

Alternate 1	Alternate 2
0.65' HMA-C	0.65' HMA-C
2.35' AB – Class 2	1.40' AB – Class 2
	1.00' AS – Class 4

Design Notes:

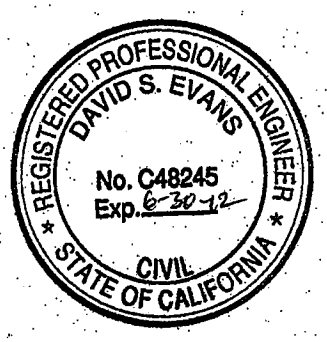
1) The grade of the asphalt binder for this project shall be PG 70-10.

2) The aggregate gradation for the HMA-C shall be ¾" maximum.

3) The structural section layer thicknesses are the minimum required by the Highway Design Manual. They may be increased so that the designer may facilitate design or construction.

If you have questions with regards to this memorandum, please contact me at 858-467-4056 or FAX at 858-467-4063.

David Evans
District Pavement Engineer
District 11 Materials Lab



cc: A Padilla (DME)
M Peinado (MS 330)
8.263300.ss1.doc

State of California

Business, Transportation and Housing Agency

Memorandum

To : SOLOMON TADESSE
Project Engineer
Design (MS 333)

Date: June 25, 2012
File: 11-IMP-8
PM R38.7/R39.3
EA 11-263300

From : DEPARTMENT OF TRANSPORTATION - DISTRICT 11
MATERIALS ENGINEERING BRANCH

Subject: **CORROSION STUDY**

In response to your request we are submitting material recommendations for drainage systems within the above referenced project.

The environment is rated as very corrosive to metal pipe and only mildly corrosive to reinforced concrete pipe.

Design values for analysis are as follows:

1. pH = 7.9
2. Minimum Resistivity = 180 Ohms.cm
3. Sulfites = 4700 mg/kg
4. Chlorides = 3300 mg/kg
5. Non-abrasive flow conditions

Recommendations for existing culverts

In accordance with CTM 643, the condition of existing drainage facilities determines design over actual corrosion testing. Therefore, any modifications to existing systems should be compatible with the "as-builts".

Recommendations for New Culverts

Aluminum or Aluminized pipe is not acceptable. Design values allow the use of 0.052" (18 gauge) or thicker Polymerized or Polymeric coated Corrugated Steel Pipe (CSP) but it is the district policy not to use metal culverts in this section of the Imperial Valley.

Plastic Pipe can be used but must incorporate the minimum and maximum fill height requirements. Corrugated Polyvinyl Chloride or Corrugated Type-C or S High Density Polyethylene Pipe is acceptable. Consideration for end treatments of plastic pipe must be made to avoid UV exposure.

Use of reinforced concrete pipe (RCP) and or reinforced concrete box (RCB), must incorporate type IP (MS) modified cement, type II modified cement with mineral admixture or Type V cement with mineral admixture as set forth in section 90-1.01 of the Standard Specifications. Concrete pipe shall contain 5.5 sac (564#) with a minimum 1" cover to steel and a maximum water/cement ratio of 0.40.

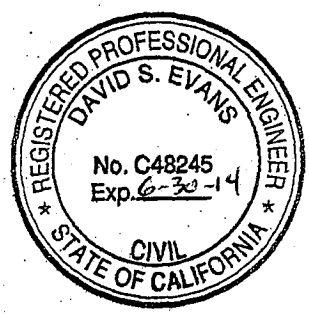
If you have any questions or comments concerning this report, you can contact J. Scandore at 858-467-4069.

Prepared by:

John L. Scandore
M&R Eng. Assoc.

Reviewed By:

David Evans
Assoc.TE (CT/Reg.)



Cc: A Padilla (63)
File 8-263300

State of California

Business, Transportation and Housing Agency

Memorandum

To: **Russell Simpson**
Environmental Planner
Environmental Analysis

Date: January 26, 2012
File: 11-IMP-8
PM: R38.7/R39.3
EA: 263300
PI: 1100000743

From: **Diane Vermeulen**
Environmental Engineering

Subject: Hazardous Waste Review for Improvements for Interstate 8/Dogwood Interchange, in Imperial County, California

A review of the potential for encountering hazardous waste materials/issues for the above referenced project has been completed. The project includes upgrading the bridge from 2 lanes to 6 lanes, and adding a loop ramp in the NE quadrant of the interchange. Hazardous waste issues include aerially deposited lead, paint stripe removal, treated wood Waste (TWW), from the existing metal beam guard rail and existing signs, and asbestos shims under the bridge rails.

An ADL study has been conducted by Kleinfelder West, Inc., called "Aerially Deposited Lead Survey Report, Imp 8 & Dogwood Interchange R38.87/R39.5, El Centro, CA" and dated January 20, 2012. It has been determined that the soil has non-hazardous levels of lead. The SSP 7-1.02K(6)(j)(iii), which requires a Lead Compliance Plan to be written for earth material containing lead, will be used for worker safety. The soil will be classified as Type X which doesn't have any restrictions.

The paint stripe, both yellow and white and pavement markings, were removed in 1998; therefore there are non-hazardous lead levels present in the existing paint stripe. Special Provision (SSP) 15-2.02c(2), which is attached, will be used to remove all the pavement marking and the paint stripe. Non-hazardous concentrations of lead chromate are present in the paint material. A Lead Compliance Plan shall describe proper handling methods of the paint material and shall provide information regarding limiting worker and public exposure to lead.

Treated wood waste (TWW) is wood that has been treated with a chemical preservative, such as the wood posts from the guardrails and signs to be removed. The TWW must not be relinquished to the contractor. It must be reused on the job or disposed of at a solid waste landfill facility permitted to accept such wastes. Management of treated wood waste needs to follow Title 22 CA Code of Regulations, Division 4.5, Chapter 34. The Treated Wood Waste SSP 14-11.09 will need to be used.

An Asbestos Survey has been completed by Kleinfelder West, Inc. called "Limited Asbestos Survey Report Dogwood Road Overcrossing IMP 8 Dogwood Interchange Realignment Project " and dated January 18, 2012. The report identifies asbestos shims under the bridge rails that will need to be disposed of according to all federal, state and local regulations. I have attached the Headquarters approved nssp for this task.

Encountering any other hazardous waste issues/materials is not anticipated for the project. If you have questions call me at (619) 688-3148.

Diane Vermeulen, PE
Environmental Engineering

cc: Jayne Dowda

Replace section 7-1.02K(6)(j)(iii) with:

7-1.02K(6)(j)(iii) Earth Material Containing Lead

Section 7-1.02K(6)(j)(iii) includes specifications for handling, removing, and disposing of earth material containing lead.

Submit a lead compliance plan.

Lead is present in earth material on the job site. The average lead concentrations are below 1,000 mg/kg total lead and below 5 mg/L soluble lead. Earth material on the job site:

1. Is not a hazardous waste
2. Does not require disposal at a permitted landfill or solid waste disposal facility

Lead is typically found within the top 2 feet of material in unpaved areas of the highway. Reuse all excavated earth material on the right-of-way. Haul and place surplus excavated material on the right-of-way at any available safe location.

Lead has been detected in earth material to a depth of 1' in unpaved areas of the highway. Levels of lead found on the job site range from less than 3.9 to 90.8 mg/kg total lead with an average concentration of 13.7 mg/kg total lead as analyzed by EPA test method 6010 or EPA test method 7000 series and based upon a 95 percent upper confidence limit. Levels of lead found within the project limits have a predicted average soluble concentration of 0.7 mg/L as analyzed by the California Waste Extraction Test and based upon a 95 percent upper confidence limit.

Handle earth material containing lead under all applicable laws, rules, and regulations, including those of the following agencies:

1. Cal/OSHA
2. CA RWQCB, Region 9—San Diego Regional Water Control Board
3. CA Department of Toxic Substances Control

If earth material is disposed of:

1. Disclose the lead concentration of the earth material to the receiving property owner when obtaining authorization for disposal on the property
2. Obtain the receiving property owner's acknowledgment of lead concentration disclosure in the written authorization for disposal
3. You are responsible for any additional sampling and analysis required by the receiving property owner

If you choose to dispose of earth material at a commercial landfill:

1. Transport it to a Class III or Class II landfill appropriately permitted to receive the material
2. You are responsible for identifying the appropriately permitted landfill to receive the earth material and for all associated trucking and disposal costs, including any additional sampling and analysis required by the receiving landfill

Replace section 15-2.02C(2) with:

15-2.02C(2) Remove Traffic Stripes and Pavement Markings Containing Lead

Residue from removing traffic stripes and pavement markings contains lead from the paint or thermoplastic. The average lead concentrations are less than 1,000 mg/kg total lead and 5 mg/L soluble lead. This residue:

1. Is a nonhazardous waste
2. Does not contain heavy metals in concentrations that exceed thresholds established by the Health and Safety Code and 22 CA Code of Regs
3. Is not regulated under the Federal Resource Conservation and Recovery Act (RCRA), 42 USC § 6901 et seq.

Submit a lead compliance plan under section 7-1.02K(6)(j)(ii).
Payment for a lead compliance plan is not included in the payment for existing facilities work.
Payment for handling, removal, and disposal of pavement residue that is a nonhazardous waste is included in the payment for the type of removal work involved.

Replace section 14-11.09 with:

14-11.09 TREATED WOOD WASTE

14-11.09A General

14-11.09A(1) Summary

Section 14-11.09 includes specifications for handling, storing, transporting, and disposing of treated wood waste (TWW).
Wood removed from metal beam guard rail is TWW. Manage TWW under 22 CA Code of Regs, Div. 4.5, Chp. 34.

14-11.09A(2) Submittals

For disposal of TWW, submit as an informational submittal a copy of each completed shipping record and weight receipt within 5 business days.

14-11.09B Materials

Not Used

14-11.09C Construction

14-11.09C(1) General

14-11.09C(2) Training

Provide training to personnel who handle TWW or may come in contact with TWW. Training must include:

1. All applicable requirements of 8 CA Code of Regs
2. Procedures for identifying and segregating TWW
3. Safe handling practices
4. Requirements of 22 CA Code of Regs, Div. 4.5, Chp. 34
5. Proper disposal methods

Maintain records of personnel training for 3 years.

14-11.09C(3) Storage

Store TWW before disposal using the following methods:

1. Elevate on blocks above a foreseeable run-on elevation and protect from precipitation for no more than 90 days.
2. Place on a containment surface or pad protected from run-on and precipitation for no more than 180 days.
3. Place in water-resistant containers designed for shipping or solid waste collection for no more than 1 year.
4. Place in a storage building as defined in 22 CA Code of Regs, Div. 4.5, Chp. 34, § 67386.6(a)(2)(C).

Prevent unauthorized access to TWW using a secured enclosure such as a locked chain link fenced area or a lockable shipping container located within the job site.

Resize and segregate TWW at a location where debris from the operation including sawdust and chips can be contained. Collect and manage the debris as TWW.
Provide water-resistant labels that comply with 22 CA Code of Regs, Div. 4.5, Chp. 34, §67386.5, to clearly mark and identify TWW and accumulation areas. Labels must include:

1. Caltrans, District number, Construction, Construction Contract number
2. District office address
3. Engineer's name, address, and telephone number
4. Contractor's contact name, address and telephone number
5. Date placed in storage

14-11.09C(4) Transporting and Disposal

Before transporting TWW, obtain an agreement from the receiving facility that the TWW will be accepted. Protect shipments of TWW from loss and exposure to precipitation. For projects with 10,000 pounds or more of TWW, request a US EPA Generator Identification Number from the Engineer at least 5 business days before the first shipment. Each shipment must be accompanied by a shipping record such as a bill of lading or invoice that includes:

1. Caltrans with district number
2. Construction Contract number
3. District office address
4. Engineer's name, address, and telephone number
5. Contractor's contact name and telephone number
6. Receiving facility name and address
7. Waste description: Treated Wood Waste with preservative type if known or unknown/mixture
8. Project location
9. Estimated quantity of shipment by weight or volume
10. Date of transport
11. Date of receipt by the receiving TWW facility
12. Weight of shipment as measured by the receiving TWW facility
13. For projects with 10,000 pounds or more of TWW include the USA EPA Generator Identification Number.

The shipping record must be at least a 4-part carbon or carbonless 8 1/2 by 11-inch form to allow retention of copies by the Engineer, transporter, and disposal facility.
Dispose of TWW at an approved TWW facility. A list of currently approved TWW facilities is available at:
http://www.dtsc.cs.gov/HazardousWaste/upload/TWW_Confirmed_Landfill_List.pdf.
Dispose of TWW within:

1. 90 days of generation if stored on blocks
2. 180 days of generation if stored on a containment surface or pad
3. 1 year of generation if stored in a water-resistant container, or within 90 days after the container is full, whichever is shorter
4. 1 year of generation if storing in a storage building as defined in 22 CA Code of Regs, Div. 4.5, Chp. 34, § 67386.6(a)(2)(C)

14-11.09D Payment

Not Used

10-1.__ REMOVAL OF ASBESTOS CONTAINING MATERIALS Asbestos containing materials (ACM), as defined in section 1529, "Asbestos," of the Construction Safety Orders, Title 8, of the California Code of Regulations arepresent in the structure proposed for demolition or renovation.

In compliance with Standard Specifications Section 14-9.01, the Contractor must notify the San Diego Air Pollution Control District (SDAPCD) as required by the National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 CFR Part 61, Subpart M, California Health and Safety Code section 39658(b)(1), and the California Air Resources Board regulations. Provide a copy of the notification form and attachments to the Engineer prior to submittal. Notification must take place a minimum of 10 days prior to starting demolition or renovation activities. Contractor must contact the AQMD for confirmation. Notify other local permitting agencies and utility companies prior to demolition or alteration.

Send Copy to :
San Diego Air Pollution Control District
Attention: Compliance – Asbestos Program
10124 Old Grove Road
San Diego, California 92131

Friable ACM is defined under the Asbestos Hazard Emergency Response Act (AHERA) as "any material containing more than 1 percent (%) asbestos by area that hand pressure can crumble, pulverize or reduce to powder when dry". The term non- friable implies that the asbestos fibers are tightly bound into the matrix of the material and should not become an airborne hazard as long as the material remains intact and undamaged, and is not sawed, sanded, drilled or otherwise abraded during removal.

Codes, which govern removal and disposal of materials containing asbestos include, but are not limited to, the following:

1. California Health and Safety Code, Division 20, Chapter 6.5, Hazardous Waste Control.
2. California Code of Regulations, Title 8, General Industry Safety Order 5208 Asbestos.
3. California Code of Regulations, Title 8, Sections 1529 and 341
4. California Code of Regulations, Title 22, Division 4.5
5. Occupational Safety and Health Administration, Part 26 (amended), of Title 29 of the Code of Federal Regulations.
6. Code of Federal Regulations (CFR), Title 40, Part 61, subpart M.

ASBESTOS SURVEY

Asbestos was detected in the rail shims of all six structures of asbestos containing materials and presumed asbestos containing materials from survey report includes:

Structure	Description	Asbestos	Approx. Amount	Category
Dogwood Avenue UC	Rail Shims	Assumed Asbestos	5 ft^2	Non-friable

All other suspected areas have tested negative for asbestos-containing material. Portions of the survey report are included in the "Information Handout." The complete report entitled "LIMITED ASBESTOS SURVEY REPORT DOGWOOD ROAD OVERCROSSING IMP 8 DOGWOOD INTERCHANGE REALIGNMENT PROJECT EL CENTRO, CALIFORNIA" dated January 18, 2012, is available for inspection at the Department of Transportation, located at _ 4050 Taylor Street, San Diego, CA 92110..

SUBMITTALS

Submit an Asbestos Compliance Plan (ACP). ACP must comply with section 7-1.01A, "Labor Code Requirements" of the Standard Specifications and "Asbestos Compliance Plan," of these special provisions.

ASBESTOS COMPLIANCE PLAN

Prepare an Asbestos Compliance Plan (ACP) to prevent or minimize exposure to asbestos. Attention is directed to Title 8, California Code of Regulations, Construction Safety Orders, section 5192 (b) and section 1529, "Asbestos", Occupational Safety and Health Guidance Manual published by the National Institute of Occupational Safety and Health (NIOSH) and the USEPA for elements of the ACP. The ACP must contain as a minimum but not be limited to: identification of key personnel for the project, job hazard analysis for work assignments, summary of risk assessment, personal protective equipment, delineation of work zones on-site, decontamination procedures, general safe work practices, security measures, emergency response plans and worker training. The ACP must be authorized in writing by an industrial hygienist certified in the practice of industrial hygiene by the American Board of Industrial Hygiene before submission to the Engineer for review and acceptance. Submit the ACP to the Engineer at least 15 days prior to beginning work in areas containing or suspected to contain asbestos.

TRAINING

Prior to performing work in areas containing or suspected to contain asbestos, personnel who have no prior training or are not current in their training status, including State personnel, must complete a safety training program provided by the Contractor, which meets the requirement of Title 8, California Code of Regulations, Section 1529. Provide a written certification of completion of safety training to the Engineer for trained personnel prior to performing work in areas containing or suspected to contain asbestos.

EQUIPMENT AND MEDICAL SURVEILLANCE

Provide personnel protective equipment, training, and medical surveillance required by the Contractor's Asbestos Compliance Plan to State personnel. The number of State personnel will be 1.

REMOVAL

Prepare a work plan for the removal, storage, transportation and disposal of ACM. Removal and management of ACM will be performed by a contractor registered pursuant to Section 6501.5 of the Labor Code and certified pursuant to Section 7058.6 of the Business and Professions Code. Asbestos removal must conform to Cal/OSHA requirements in Title 8 Sections 1529 and 341. Remove all friable material in a manner that conforms to OSHA work practice requirements.

Remove and handle all non-friable ACM to prevent breakage. Non-friable ACM such as asbestos cement pipe must be disposed of to a landfill facility permitted to take ACM. The removal of ACM encased in concrete or other similar structural material is not required prior to demolition, but such material must be adequately wetted whenever exposed during demolition. Packaging, storage, transporting, and disposing of ACM, must conform to Title 22, Division 4.5, Chapters 11, 12 and 13 of the California Code of Regulations. No visible dust must be generated when handling, removing, transporting, and disposing of ACM.

Asbestos removal procedures include, but are not limited to:

1. Installing asbestos warning signs at perimeters of abatement work areas.
2. Wetting asbestos materials with sprayers.
3. Containing large volumes of asbestos materials in disposal bins for temporary storage until removed from the site.
4. Providing manifests for the Engineer to sign for disposal of friable ACM waste or a waste shipment record for disposal of non-friable ACM waste.
5. Providing transporters registered to transport hazardous waste in the State of California in accordance with the provisions of Chapter 6.5, Division 20 of the Health and Safety Code and Title 22 of the California Code of Regulations, Division 4.5.
6. Disposing of asbestos materials at a permitted disposal facility, which accepts such materials.
7. Working in accordance with Federal, State, and Local requirements for asbestos work.

Mark all vehicles used to transport ACM as specified below, or an equivalent warning:

DANGER

ASBESTOS

CANCER AND LUNG DISEASE HAZARD

AUTHORIZED PERSONNEL ONLY

Handling

Comply with CCR Title 22, Division 4.5, Chapter 12, Article 3 requirements for the packaging and labeling of removed ACM, and place such removed material in approved plastic containers (double ply plastic bags) with caution labels affixed to bags. Such caution labels must have conspicuous, legible lettering, which spells out the following, or equivalent warning:

DANGER

CONTAINS ASBESTOS FIBERS

AVOID CREATING DUST

CANCER AND LUNG DISEASE HAZARD

At the option of the Contractor, the removed materials containing asbestos may be placed directly into a covered roll off or drop box, which must have the same caution label, affixed on all sides.

Transporting

Haulers of friable asbestos containing material will have current registration with the State Department of Toxic Substances Control (DTSC), and must have a U.S. Environmental

Protection Agency Identification Number (U.S. EPA I.D. Number). A valid registration issued by DTSC is required for all vehicles used to transport hazardous waste material. Non-friable ACM is not hazardous waste and can be transported with a waste shipment record (WSR) or comparable shipping document.

Disposal

The Engineer will obtain the required EPA generator identification numbers, and will sign the hazardous waste manifests for disposal of friable asbestos containing material. The Contractor must dispose of friable and non-friable waste containing asbestos at a disposal facility permitted to accept such material and that meets all the requirements specified by Federal, State, and Local regulations. Notify the proper authorities at the disposal site in advance of delivery of asbestos containing material to the disposal site. Conduct additional sampling deemed necessary by the owner of the disposal facility for acceptance of the material at your expense.

MEASUREMENT AND PAYMENT

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in preparing the Asbestos Compliance Plan, including paying the Certified Industrial Hygienist, and for providing personal protective equipment, training, medical surveillance, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer will be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

Full compensation for preparation of a Removal Work Plan and for the removal, transportation, and disposal of asbestos-containing material is included in the contract items of work involved and no additional compensation will be allowed therefor.

IID

www.iid.com

A century of service.

November 26, 2012

Mr. Kazim Mamdani
Caltrans District 11 – Design
4050 Taylor Street
M.S. 120
San Diego, CA. 92110

Dear Mr. Mamdani:

Subject: Water Construction Availability for the Dogwood Road Interchange Reconstruction Project

This letter is to confirm that water will be available for the construction of the Dogwood Road Interchange Reconstruction Project. Per your letter dated November 6, 2012, an estimated amount of 1.5 million gallons at an approximate rate of 5 cubic feet per second will be required for the construction of the project beginning January 2014 and lasting approximately one year.

The procedure for obtaining water is as follows:

1. The applicant will need to complete an application for temporary water use at the Southend Division office. The temporary water use permit will not be issued until the application is approved and signed by the Assistant Manager.

   Southend Division Office
   2151 Adams Avenue
   El Centro, CA 92243
   (760) 482-9800

2. The application must state the intended locations from where water will be drawn. Please note that due to possible limited capacities and outages water availability cannot be guaranteed at all locations at all times. It will be necessary to plan for multiple locations. Additionally, it is important to note that outages frequently affect entire canal systems, as opposed to individual canals. Coordination with the Southend Division Office will be warranted.

COPY

3. Caltrans will be responsible for pump installation.

4. Meters must be installed on the pumps to allow IID staff to obtain readings and charge accordingly.

5. Caltrans will be charged at the industrial water rate (Schedule No.7).

6. The pumps and all appurtenances must not block access to any IID facility (you must provide enough clearance for IID vehicles to drive through or around).

7. Additionally, IID encroachment permits will be required for all proposed pumps and appurtenances that will encroach upon existing and proposed IID rights-of-way. A copy of the encroachment permit application is included in the attached IID Water Department Developer Project Guide accessed at:

   http://www.iid.com/Modules/ShowDocument.aspx?documentid=2328

Please contact IID's Real Estate Section at (760) 339-9239 for additional information regarding encroachment permits.

Once all permits are approved, IID will guarantee that the contractors will have sufficient water for the construction of the Dogwood Road Interchange Reconstruction Project. Please contact Mr. Henry Dollente, Assistant Manager, Southend Division at (760) 339-9239 if you have any questions.

Sincerely,

Ismael Gomez, P.E.
Assistant Manager
Chief Civil Engineer
Water Department

OA:sm

Attachments

cc: Shane Ferber, Asst. Supervisor, Real Estate
Henry Dollente, Asst. Mgr., Southend Water
Francisco Pena, Superintendent, Construction Resources
Olivia Alcaraz, Engineer, Water Engineering

DEPARTMENT OF TRANSPORTATION
DISTRICT 11
4050 TAYLOR STREET, M.S. 120
SAN DIEGO, CA 92110
PHONE (619) 688-6668
FAX (619) 688-3122
TTY 711
www.dot.ca.gov

Flex your power!
Be energy efficient!

November 6, 2012

Ms. Olivia Alcaraz
Engineering Services
Imperial Irrigation District
333 East Barioni Blvd.
Imperial, CA 92251

Subject: Construction water availability for Dogwood Road Interchange Reconstruction Project

Dear Ms Alcaraz:

This letter is to inquire the availability of construction water for the project mentioned above. Construction of the project is expected to begin January 2014 and will last for one year. The estimated water demand is about 1.5 million gallons at an approximate rate of 5 cubic feet per second (cfs).

Sincerely,

K. A. Hamdani

Kazim Mamdani
Design Manager