



ATTACHMENT 4

Structures

	Bridge Name	Bridge Number	Width/Height	Length	Comments
1	Wilson Ave OC	23-0217	46.7 ft	261 ft	2 span
2	Route 37/29 Separation	23-0218	125 ft	921 ft	6 span
3	Broadway OH	23-0219	112 ft	462 ft	3 span
4	Mini Drive UC	23-0220	131 ft	150 ft	1 span
5	N29-E37 Connector	23-0221G	26.5 ft	253 ft	3 span
6	W37-N&S29 Connector	23-0222F	38.3 ft	428 ft	3 span
7	S29-W37 Connector	23-0223F	26.5 ft	1000 ft	9 span
8	Ret. Wall No. 1	23-Wall 1	8 ft	1476 ft	16' Soundwall
9	Ret. Wall No. 2	23-Wall 2	36 ft	602 ft	
10	Ret. Wall No. 3	23-Wall 3	44 ft	40 ft	
11	Ret. Wall No.4	23-Wall 4	22 ft	389 ft	

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Geology

<i>Bridge Name</i>	<i>Upper Layer</i>	<i>Lower Layer</i>	<i>Foundation Types</i>	<i>Comments</i>	<i>Max Eq/Accel</i>	<i>ATC-32 Curve</i>	<i>Max ARS</i>
Wilson Ave OC	18' fill over bay mud	sandy to clayey silt and soft to very stiff silty clay	PC/PS conc piles class 400 or 625 (no CIDH)	possible corrosion waiting periods req'd for fills	Mw=6.5 @ 5.5km 0.5g	Modified Type D	1.25g
Route 37/29 separation and N29-E37 connector (Ramp H)	13' soft to stiff clay and silt	med dense to dense cemented silt	driven steel H piles. 24" min CIDH OK but not preferred	predrilling may be required if PC concrete piles used	Mw=6.5 @ 4.0km 0.5g	Modified Type D	1.25g
Broadway OH and W37-N&S29 connector (Ramp I)	20-40' fill over stiff to hard silty to sandy clay at western portion	same as upper layer grades to weathered siltstone and sandstone in eastern portion	spread footings (1.5 to 2.5tsf) or driven piles (class 400 or 625) or 24" min CIDH piles	possible corrosion don't use spread footings at Abut 4 due to sewer line, use CIDH piles	Mw=6.5 @ 4.0km 0.5g	Modified Type C	1.18g
Mini Drive UC	10' very stiff clayey to gravelly silt	weathered siltstone and shale	spread footings or PC/PS piles (Class 400 or 625) or 24" min CIDH piles	possible corrosion groundwater present	Mw=6.5 @ 4.0km 0.5g	Modified Type C	1.18g
S29-W37 connector (Ramp K)	13' soft to stiff clay and silt	med dense to dense cemented silt	driven steel H piles. 24" min CIDH OK but not preferred	predrilling may be required if PC concrete piles used	Mw=6.5 @ 4.0km 0.5g	Modified Type D	1.25g

Notes:

- Structures Foundations has completed all Preliminary Foundation recommendations for the bridges and the retaining walls. The Preliminary Seismic Design recommendations have been submitted to Design.
- Logs of Test Borings (LOTB) are available for a number of bridge sites as the route has been studied extensively since 1971. Structures Foundations is having a hard time relating the old LOTB to the new alignment, but expects to successfully utilize those borings in lieu of drilling new exploratory holes.
- Environmental permits are required to drill in the wetlands, but impacts on the protected Clapper Rail may delay drilling until August 15, 1999. Drilling to start in June 1999 where permits are not required.
- No liquefaction potential and no scour problems at any site.
- Approach fills may require special treatment (wick drains), surcharge, and long settlement periods. Expect large settlements (3-5 feet).



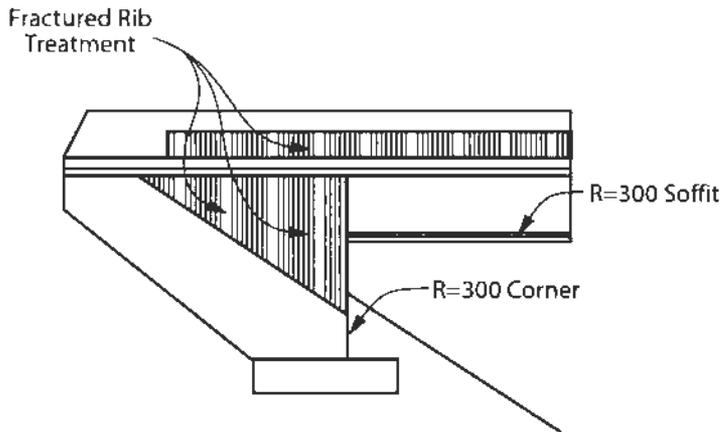
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Aesthetics

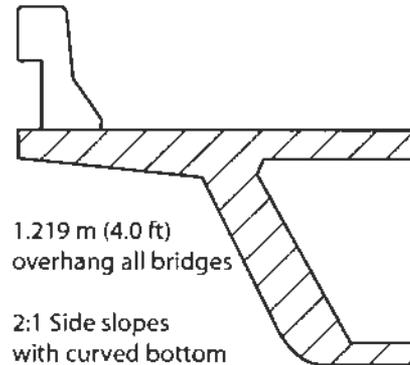
The Final Environmental Report/Statement dated May 1998 stated in Section 4.7.1 that "Certain aesthetic elements utilized in the structure at Fairgrounds Drive Undercrossing will be incorporated into proposed structures to provide visual consistency of the portion of the Route 37 corridor between the I-80/Rt 37 Interchange and the north end of the Napa River Bridge."

Proposed treatments for CIP/PS Box Girders are shown below. Ramp K will utilize round columns with architectural treatment. Bent cap at Ramp K shall be tapered in elevation and in plan, and will have architectural treatment. Wingwall layout line shall be placed at edge of deck without offset. Cost estimates include \$356,000 for aesthetic treatment.

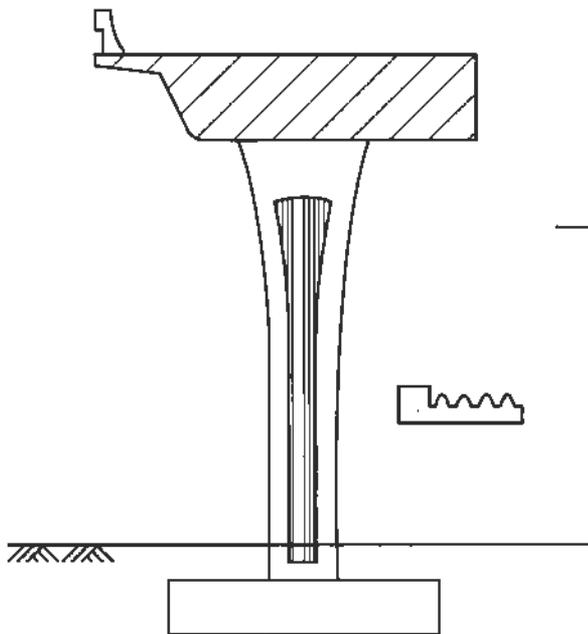
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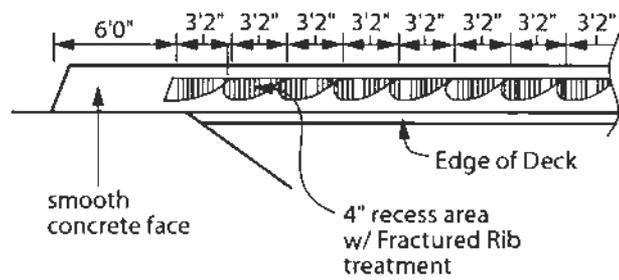
Abutment



Typical Section



**Typical column at
CIP/PS box girder**



Bridge Railing



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Falsework

Bridge Name	Vehicular Traffic		Pedestrian Traffic		Railroad	Temporary Traffic
	Location	Temporary Opening (meters)	Location	Temporary Opening (meters)	Temporary Opening (meters)	Lane reduction needed for footing excavation
Wilson Ave OC	Route 37	4.6 x 12.0	NA	NA	NA	yes at Route 37
Route 37/29 separation	Route 29 Access Rd	4.6 x 12.0 4.6 x 6.0	NA	NA	NA	yes at route 29
Broadway OH	Broadway Street	4.6 x 12.0	West Side Broadway Street	3.6 x 2.4	6.4 x 7.32	No
Mini Drive UC	Mini Drive	4.6 x 12.0	East Side Mini Drive	3.6 x 2.4	NA	No
N29-E37 connector (Ramp H)	Access Road	4.6 x 6.0	NA	NA	NA	No
W37-N&S 29 connector (Ramp I)	Broadway Street	4.6 x 12.0	West Side Broadway Street	3.6 x 2.4	6.4 x 7.32	No
S29-W37 connector (Ramp K)	NA	NA	NA	NA	NA	No

Falsework openings will have Type K railings adjacent to traffic and Crash Cushions adjacent to end of railings, when required. District has reviewed and approved falsework openings. No falsework is to be permitted in Chabot Creek.

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Clearances for Construction Operations

Note - Dimensions are between traffic faces of temporary railing				Column/Footing		Falsework at Bents	
Bridge Name	Location	Column Size	Footing Size	Work Space Req'd	Duration	Work Space Req'd	Duration
Wilson Ave OC (Alt #1)	Median of Route 37	1.22m	3.7x3.7x1.37m	9.1 m centered on column	6 weeks	5.8 m centered on column	10 weeks
Wilson Ave OC (Alt #2)	Median of Route 37	2.13m	5.2x5.2x1.37m	9.1 m centered on column	4 weeks	6.7 m centered on column	10 weeks
Route 37/29 Separation	Median of Route 29	3.05m	7.3x7.3x1.45m	11.5 m centered on column	6 weeks	7.6 m centered on column	16 weeks
Route 37/29 Separation	Shoulder of Route 29	3.05m	7.3x7.3x1.45m	6.5 m From CL of Column	6 weeks	3.8 m From CL of Column	16 weeks
Broadway OH	East Shoulder of Broadway St	1.68m	4.9x4.9x1.22m	5.9 m From CL of Column	6 weeks	3.1 m From CL of Column	10 weeks
Mini Drive UC	No Impact on Traffic						
N29-E37 Connector (Ramp H)	No Impact on Traffic						
W37-N&S 29 Connector (Ramp I)	East Shoulder of Broadway St	1.68m	7.3x4.9x1.53m	5.5 m From CL of Column	4 weeks	3.1 m From CL of Column	10 weeks
S29-W37 Connector (Ramp K)	No Impact on Traffic						

Intermittent Lane Closures will be required during falsework erection and removal, loading of excavated material, and delivery of materials.

Hydraulics/Hydrology

1. Structures Hydraulics has reviewed the project for its impact on Chabot Creek and has found no hydrology or hydraulic problems associated with the project .
2. District 04 Environmental Section has requested that columns not be placed within Chabot Creek as Fish and Game and the Corps of Engineers would strongly discourage such columns. Columns in the creek would also increase the mitigation required for fresh water and would pose an impact to the wetlands mitigation.
3. District 04 Hydraulics has provided design rainfall intensity.



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Construction Impacts

1. The EIR stipulates that construction activities, other than pouring concrete and road paving, shall not commence until September 1 and shall be completed prior to February 1 of each year within 700 feet from any suitable clapper rail breeding habitat. Chuck Morton, District 04 Environmental Planning Section indicates that the revised work dates, when construction noise is above 86 dba, is August 15 to January 1 for construction within 700 feet of clapper rail nests. The black rail and the harvest mouse are also protected species within the project site.
2. Chuck Morton, District 04 Environmental Planning Section, states that the only allowable time period for excavation in Chabot Creek is during May to August.

Corrosion

Soil and water at the site may be corrosive. Corrosion potential and recommendations for mitigation will be addressed in final foundation recommendations for elements in contact with soil.

Special requirements are required for elements in Marine Atmosphere, but the determination of whether the project site is considered within a Marine Atmosphere is unclear. ESC Corrosion Technology is currently researching the area and will make recommendations on whether the project site should be considered within the Marine Atmosphere. Marine Atmosphere includes both the atmosphere over land within 1000 feet of ocean or tidal water, and the atmosphere above the splash zone. Tidal water for this application is any body of water having a chloride content of 500 ppm or greater.

Permits and Agreements

California Endangered Species Act	California Dept Fish and Game
BCDC	Regional Water Quality Control Board
National Pollutant Discharge Elimination System	US Army Corps of Engineers
State Reclamation Board Permit	Federal Endangered Species Act
Union Pacific Railroad	City of Vallejo



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Caltrans Efforts

1. The Final Project Report was completed November 17, 1997.
2. The Final Environmental Report/Statement was completed May 1998.
3. A Draft Value Analysis Study was completed on July 10, 1997.
4. District 04 requested an Advanced Planning Study on October 24, 1998, but it was quickly followed by a Bridge Site Submittal on November 2, 1998. Consequently the Advanced Planning Study was shelved in favor of completing the General Plans.
5. District 04 submitted a Bridge Site Data submittal for Non-Standard Retaining Walls on January 14, 1999.
6. Preliminary Investigations started their work in mid February 1999 and expect to complete their work by the end of April 1999.
7. District still needs to provide final R/W drawings, final topographic maps and mapping for 54" sewer line at Broadway and 42" sewer at Retaining Wall No. 1.

Hazardous Materials

Hazardous materials have not been identified at the site. No provisions have been included in the estimate to account for disposal of hazardous materials.

General

1. Route 37 is in the State SHELL route system. There are no special construction loadings.
2. There are no restrictions for contractor storage facilities.

Project Milestones

Structures Design has not yet committed to completion dates as we were waiting for the General Plan Estimates to be completed before scheduling the work. The dates proposed by District 04 are:

Project EA	Structures P&Q Date	Structures PS&E Date
04-0T1411	10/29/2000	11/24/2000
04-0T1421	9/15/2000	11/10/2000



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Route 37/29 Separation (#23-0218)

<i>Structure Type</i>	<i>CP/PS Box Girder</i>
Spans	44.347, 58.420, 39.308, 38.605, 48.807, 51.353 m (145.5, 191.7, 129.0, 129.0, 126.7, 160.1, 168.5 ft)
Structure Depth	2.525 meters (8.25 feet). Depth/Span Ratio = 0.43
Abutment 1	High cantilever seat type abutment required as wetlands mitigation prohibits abutment approach fill. 100 ton driven piles. Battered piles at toe. Roadway fill slope set to start at face of abutment. 1:1.5 Abutment Fill slope set to provide for future 3.6 m lane on Route 29.
Abutment 7	Short seat type abutment on 100 ton driven piles. Battered piles at toe. Fill Slopes = 1.0:1.5 Toe of fill set at edge of access road.
Bents	6.0 ft diameter Type 2R flared six column bents with pinned base and 100 ton driven piles. Outrigger bents with 10 ft diameter circular columns with fixed base, pinned top and 70 ton driven piles used where required to produce equal spans. No columns permitted in Chabot Creek. Columns set to provide minimum 3.6 m clearance from edge of shoulder on Route 29 to provide for future widening.
Construction Sequence	Construct approach fills with surcharge and wick drains. Surcharge fill allowed to temporarily spill into wetlands. Settlement period required. Construct bridge with falsework over existing two lane Route 29, Chabot Creek and Access Road. Detour required for construction of column foundation in median of Route 29.
Vertical Clearance	5.625 m (18.46 ft) provided vs. 5.0 m (16.73 ft) minimum required
Temporary Vertical Clearance	4.71 m (15.46 ft) provided vs. 4.60 m (15.09 ft) minimum required
Barriers	Type 732 at edge of deck and Type 60 at median
Slope Paving	None
Approaches	PCC pavement on approaches. Structure Approach Slab Type N(9S)
Deck Protection	The proposed structure is located in Environmental Area No. 1. No special deck protection is required.
Drains	None on the structure
Temperature Range	35° F to 100° F
Joints	Type B joints at abutment. MR = 50 mm (2 inch)
Utilities	None. Provide one future utility opening. District will advise on necessity for irrigation supply lines and control conduit.
Future Widening	None



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Broadway Overhead (#23-0219)

Structure Type	CP/PS Box Girder
Spans	45.4 m , 45.0 m and 50.4 m (149.0 ft, 147.6 ft and 165.4 ft)
Structure Depth	2.000 meters (6.56 feet). Depth/Span Ratio = 0.040.
Abutments	Short seat type abutments on 70 ton driven piles. Predrill through abutments. Fill Slopes = 1.0:1.5. Toe of fills set to provide 3.0 m clear to R/W fences. Revised memo from District would allow 1.5 m clearance to R/W fences. Must avoid 54" Sewer Line at Abut 4 (needs to be located).
Bent	5.5 ft diameter Type 2R flared four column bent. Pinned base. 70 ton driven piles. Footing excavation will not impact railroad.
Vertical Clearance	7.52 m (24.67 ft) provided at railroad vs. 7.01 m (23.0 ft) minimum required 8.80 m (28.87 ft) provided at Broadway Street vs. 5.10 m (16.73 ft) minimum required
Horizontal Clearance	12.85 m (42.17 ft) provided between centerline railroad and face of column vs. 25.0 ft required
Temporary Vertical Clearance	6.91 m (22.67 ft) provided at railroad vs. 7.01 m (23.0 ft) minimum required 8.80 m (28.87 ft) provided at Broadway Street vs. 4.6 m (15.09 ft) minimum required
Barriers	Type 732 at edge of deck and Type 60 at median
Slope Paving	None
Approaches	PCC pavement on approaches. Structure Approach Slab Type N(9S)
Deck Protection	The proposed structure is located in Environmental Area No. 1. No special deck protection is required.
Drains	At right edge of deck at Abutment No. 1.
Temperature Range	35° F to 100° F
Joints	Joint Seal Assembly at abutments. MR=64 mm (2.5 inch)
Utilities	None. No future utility opening. District will advise on necessity for irrigation supply lines and control conduit.
Safety Fence	None
Future Widening	None



Bridge Name	Bridge No.	Type	Cost	Area m ²	Cost/m ²	Cost/sf
Wilson Ave OC Alt #1	23-0217	CIP/PS Piles	\$1,174,000	1,134	\$1,035	\$96
Wilson Ave OC Alt #2	23-0217	CIP/PS Piles	\$1,182,000	1,282	\$922	\$86
Route 37/29 Separation	23-0218	CIP/PS Piles	\$11,640,000	10,547	\$1,104	\$103
Broadway OH	23-0219	CIP/PS Piles	\$3,973,000	4,652	\$854	\$79
Mini Drive UC	23-0220	CIP/PS Spread	\$1,490,000	1,786	\$834	\$78
N29-E37 Connector (Ramp H)	23-0221G	CIP/PS Piles	\$646,000	623	\$1,037	\$96
W37-N&S 29 Connector (Ramp I)	23-0222 F	CIP/PS Piles	\$1,389,000	1,524	\$911	\$85
S29-W37 Connector (Ramp K) Alt #1	23-0223F	Bathtub	\$3,162,000	2,461	\$1,285	\$119
S29-W37 Connector (Ramp K) Alt #2	23-0223F	Bulb Tee	\$2,898,000	2,461	\$1,178	\$109
S29-W37 Connector (Ramp K) Alt #3	23-0223F	Steel	\$3,009,000	2,461	\$1,223	\$114
Subtotal Bridges			\$23,210,000	22,727	\$1,021	\$95
Retaining Wall No. 1	23-WALL1	Type 5SWB	\$1,734,000	842	\$2,059	\$191
Retaining Wall No. 2 Alt #1	23-WALL2	Type 1 Piles	\$2,706,000	1,691	\$1,600	\$149
Retaining Wall No. 2 Alt #2	23-WALL2	MSE	\$1,276,000	1,691	\$755	\$70
Retaining Wall No. 3	23-WALL3	Type 1 Piles	\$349,000	159	\$2,195	\$204
Retaining Wall No. 4 Alt #1	23-WALL4	Type 1 Spread	\$351,000	575	\$610	\$57
Retaining Wall No. 4 Alt #2	23-WALL4	Type 5 Spread	\$125,000	211	\$592	\$55
Subtotal Retaining Walls			\$3,484,000	2,903	1,200	\$111
Total Bridges and Retaining Walls			\$26,694,000			

Grey Filled Cells represent selected alternative in totals

Structure Costs