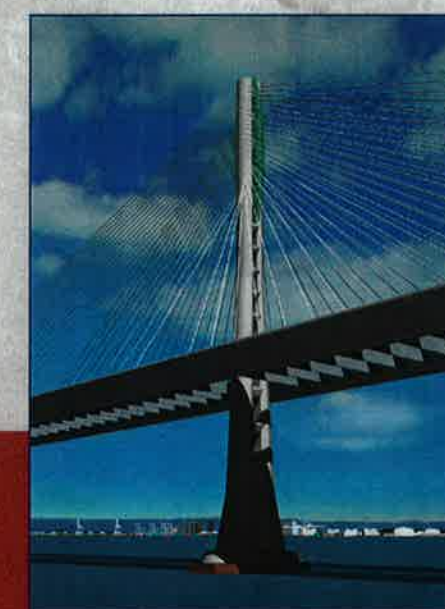


The San Francisco-Oakland Bay Bridge East Span Seismic Safety Project

Supplement to Final 30% Design Report

Prepared for
State of California
Business, Transportation
and Housing Agency



June 22, 1998

Prepared for
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The San Francisco-Oakland Bay Bridge East Span Seismic Safety Project Supplement to Final 30% Design Report

Supplemental Report

This supplement to the 30 percent design report summarizes recommendations made by the Engineering Design Advisory Panel (EDAP) and identifies revisions made since the 30 percent design submittal.

1.0 EDAP Recommendations

At its meetings on April 15 and May 29, 1998, EDAP approved the following four recommendations for MTC's consideration regarding the design of the new eastern span of the San Francisco-Oakland Bay Bridge:

1. The new eastern span should be a single-tower self-anchored suspension bridge.
2. The skyway section of the new eastern span should be constructed of either concrete with a variable depth profile or steel with a uniform depth profile, and the minimum span length should be 160 meters except near the Yerba Buena Island transition and near the Oakland touchdown.
3. The new eastern span should have a single bicycle/pedestrian path on the south side of the eastbound deck, with a width and height (in relation to the deck) adequate to assure the safety and comfort of path users and to protect the views of motorists.

4. The pile caps for the piers supporting the skyway section should be placed above water, but with careful attention to the design.

Tower

EDAP's first recommendation is that the new eastern span should have a single-tower self-anchored suspension long span over the shipping channel adjacent to Yerba Buena Island. Figures 1, 2, and 3 show computer renderings of this bridge. EDAP selected the suspension design instead of a single-tower cable-stayed long span that had also been developed to the 30 percent design stage. Many members of EDAP commented that both the suspension and cable-stayed designs had been



Figure 1. Suspension Bridge—Single Tower (Aerial View)

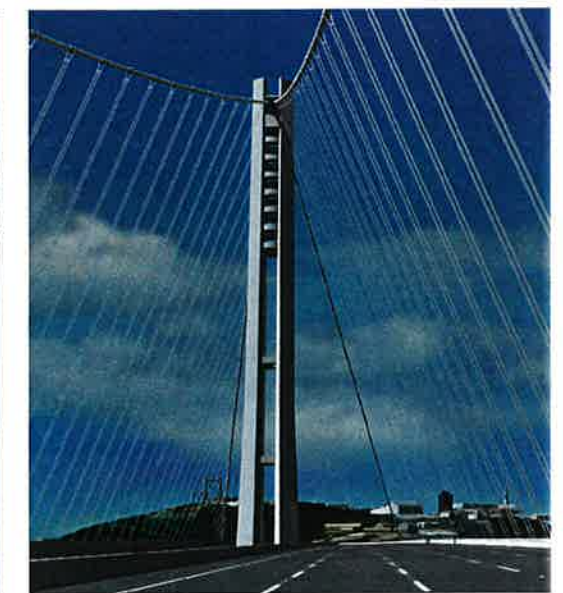
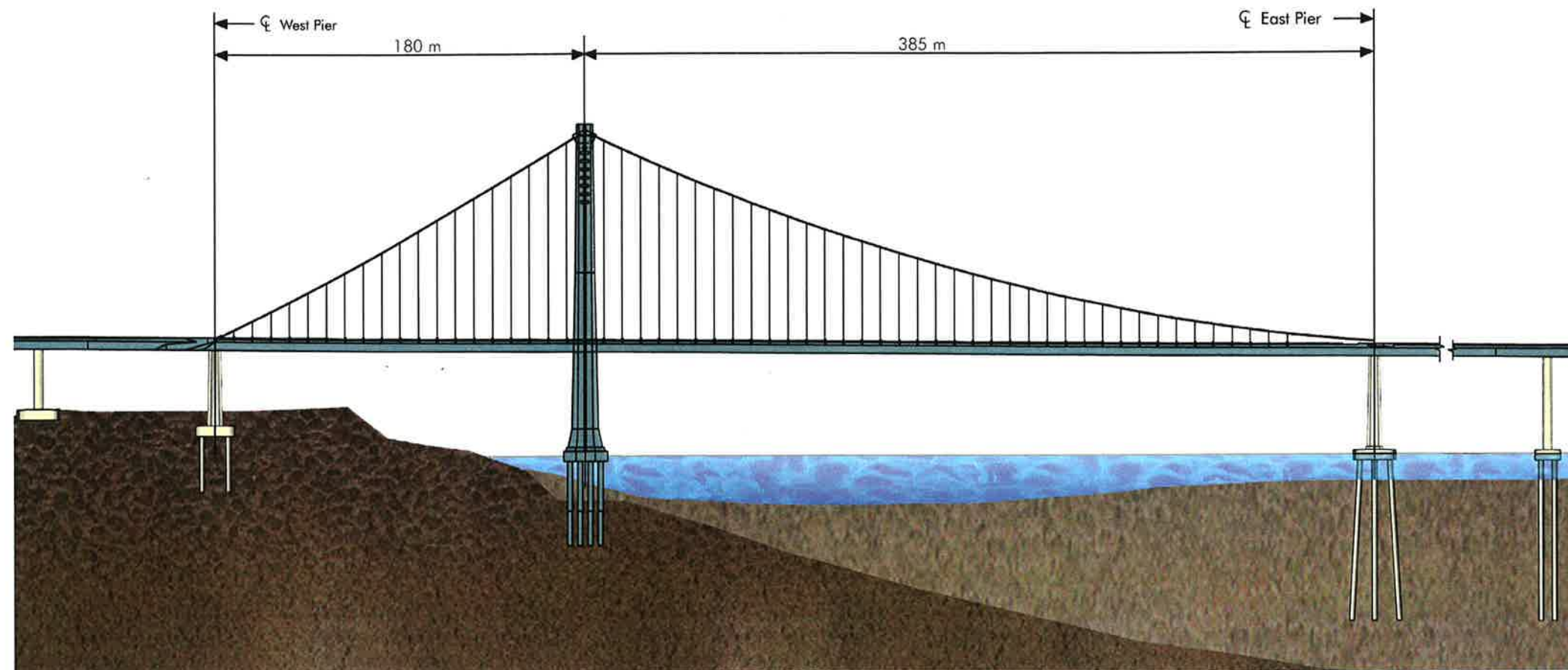


Figure 2. Suspension Bridge—Single Tower (Portal View)



Figure 3. Suspension Bridge—Single Tower (Panoramic View)

Figure 4. Suspension Bridge—Single Tower (Side Elevation)



significantly improved and refined since the design teams began work in January 1998. EDAP's recommendation of the single-tower self-anchored suspension design was based on the following factors:

- The suspension design links the new eastern span to the Bay Area's rich tradition of suspension bridges which include: the Golden Gate Bridge, San Francisco-Oakland Bay Bridge western spans, and new Carquinez Bridge.
- The suspension design is asymmetrical (Fig. 4), with the main span (east of the tower) about twice as long as the back span (west of the tower). This asymmetry is not only visually

appealing, but it shifts the tower west to a better foundation further up the rock shelf near Yerba Buena Island and results in a shipping channel with a horizontal clearance of more than 1,000 feet.

- Both the single-tower and self-anchored features of the new eastern suspension span represent significant innovations in bridge design. For example, the tower is not really a single tower but rather four vertical pylons linked with "sacrificial" fuses (Fig. 5) that are designed to protect the load-bearing pylons during an earthquake.

Skyway

EDAP's second recommendation addresses the appearance and construction material for the skyway portion of the bridge, which extends from the suspended long span to the Oakland shore. EDAP's preference is that the span length (distance between piers) for most of the skyway be at least 160 meters. This recommendation minimizes the number of supporting piers and provides a more graceful profile for the skyway. This span length can be achieved with a haunched (arch-like profile) concrete deck or a uniform depth (level profile) steel deck. Although Caltrans estimates that the steel deck would cost significantly more than the

Figure 5. Suspension Bridge, Single Tower (Section Elevation)

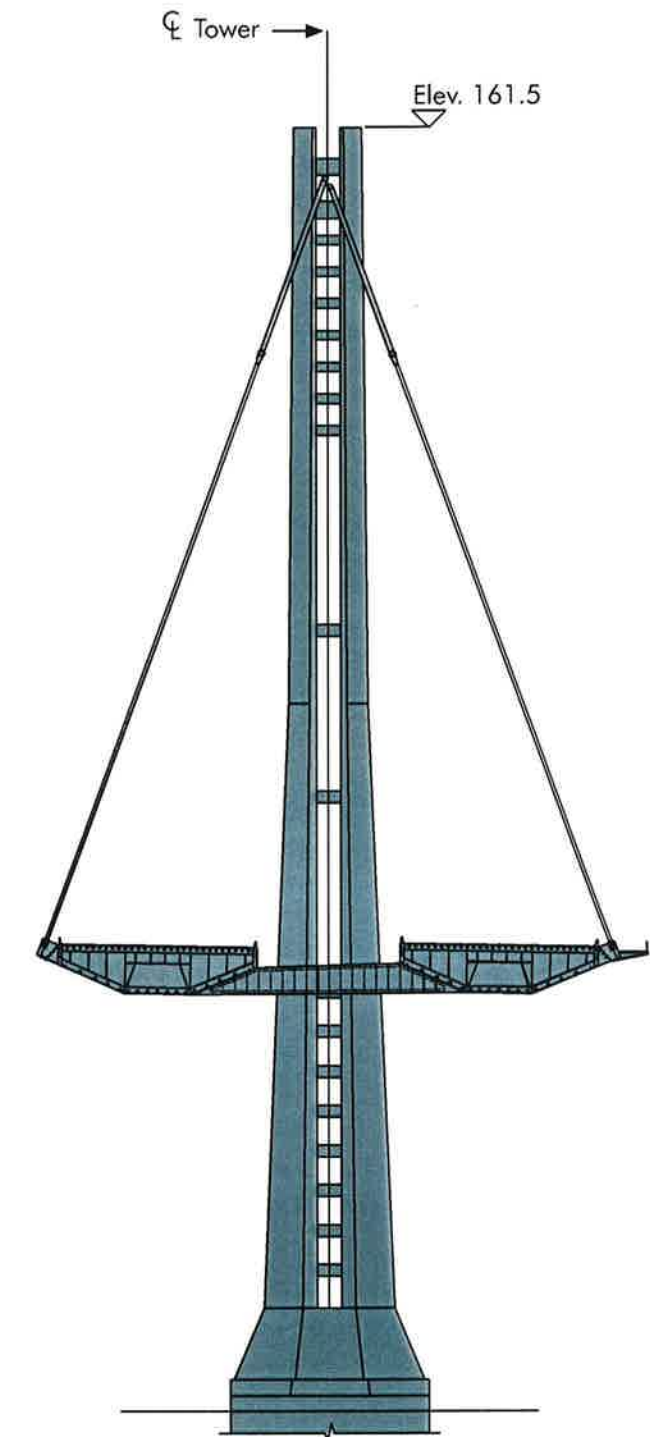




Figure 6. Panoramic View of Skyway with Haunched Concrete Girder



Figure 7. Panoramic View of Skyway with Uniform Depth Steel Girder

concrete deck, EDAP recommended that both decks be designed and bid with the winning low bid determining the construction material to be used. Figures 6 and 7 show panoramic views of the skyway with haunched concrete girders and with constant depth steel girders. Figures 8 and 9 show section elevations of the girders.

Bicycle / Pedestrian Path

EDAP's third recommendation suggests that a single bicycle/pedestrian path be located on the south side of the eastbound span (Fig. 10). In addition to the single bicycle/pedestrian path, the design team developed a proposal for two paths, one each for bicyclists and pedestrians. One path is located on the south side of the bridge, and the other is located on the north side. EDAP rejected the two path option for two reasons: (a) the path on the north

side of the westbound span heading uphill from Oakland to the island could interfere with motorists' views, and (b) for security's sake, it would be better to concentrate (what may be, on many days) a modest number of path users on one facility, instead of spreading them over two. Caltrans' bicycle and pedestrian advisory committee requested that EDAP recommend either two paths each 10 feet wide and 1 foot above deck level, or one path 15 feet wide and also 1 foot above deck level. EDAP agreed to recommend one path, but deferred to further study the exact horizontal and vertical dimensions of the path.

Pile Caps

EDAP's fourth recommendation addresses an earlier recommendation that the Commission approved in July 1997. "For the skyway section, particular

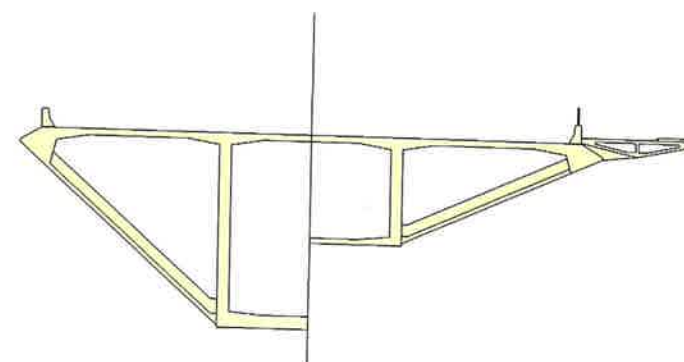


Figure 8. Skyway, Haunched Concrete Girder (Section Elevation)

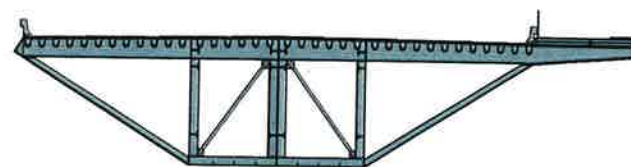


Figure 9. Skyway, Uniform Depth Steel Single Cell Girder with Orthotropic Deck (Section Elevation)

attention should be paid to the design of the supporting pier as it enters the water, including the possibility of submerging the pile cap below water." After further analysis by the design team, EDAP recommends for cost, safety, and other reasons that the pile caps should be placed above water, as is the standard practice in bridge design.

2.0 Design Revisions Since Submittal of 30% Report

Some design revisions have been made since submittal of the 30 percent report on May 29, 1998. These include:

- The alignment of the structure has been adjusted to reflect the longer main span tangent lengths for the recommended suspension span.

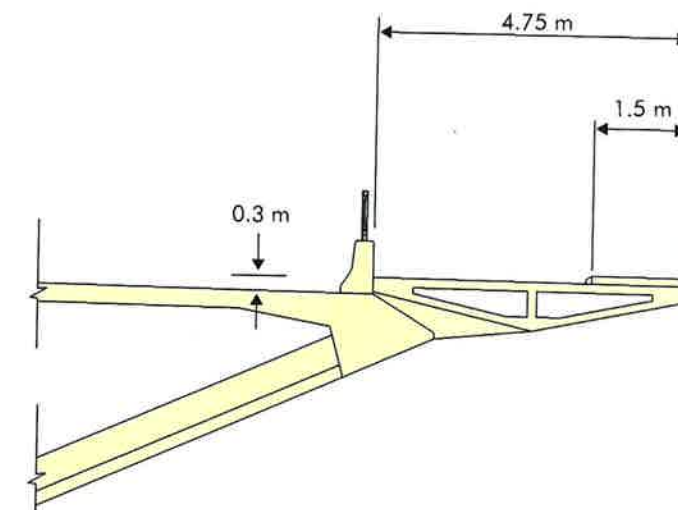


Figure 10. Bicycle / Pedestrian Path

- The span arrangement for the skyway and Oakland Approach Structure has been refined and adjusted to suit the revised alignment.
- The bicycle/pedestrian path width, configuration and construction cost have been revised to reflect recommendations presented by Caltrans' bicycle and pedestrian advisory committee at the May 29, 1998 EDAP meeting.
- The typical cross section of the haunched concrete skyway has been modified to be compatible with the wider bicycle/pedestrian path.
- The construction period has been revised from 30 months to 31 months for the main spans of the single tower suspension structure. This revision does not affect the total time required for bridge completion. Figures 11-13 give revised construction schedules for the Suspension Bridge-Single Tower Alternative.

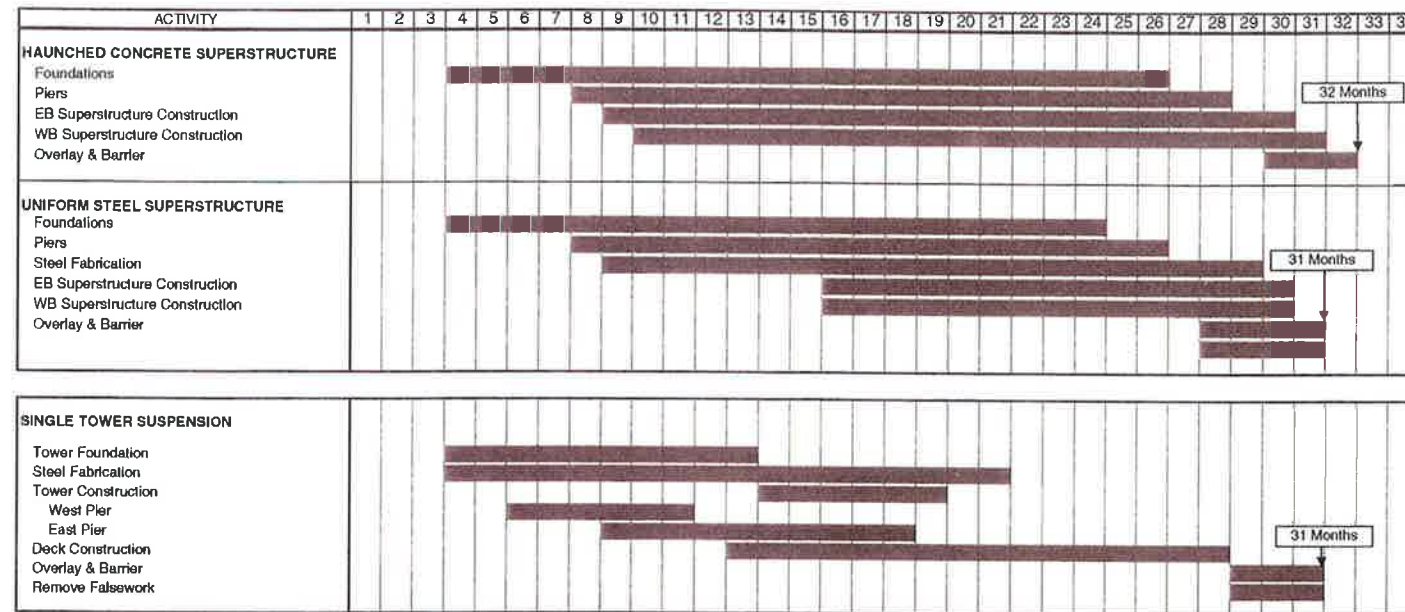


Figure 11.
 Construction Schedule
 Skyway Alternatives

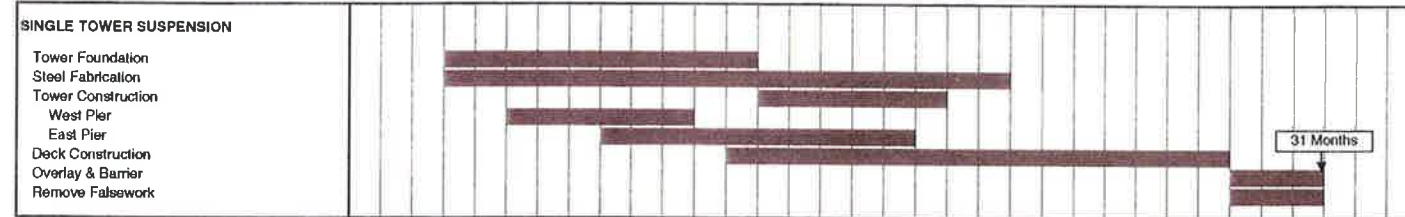
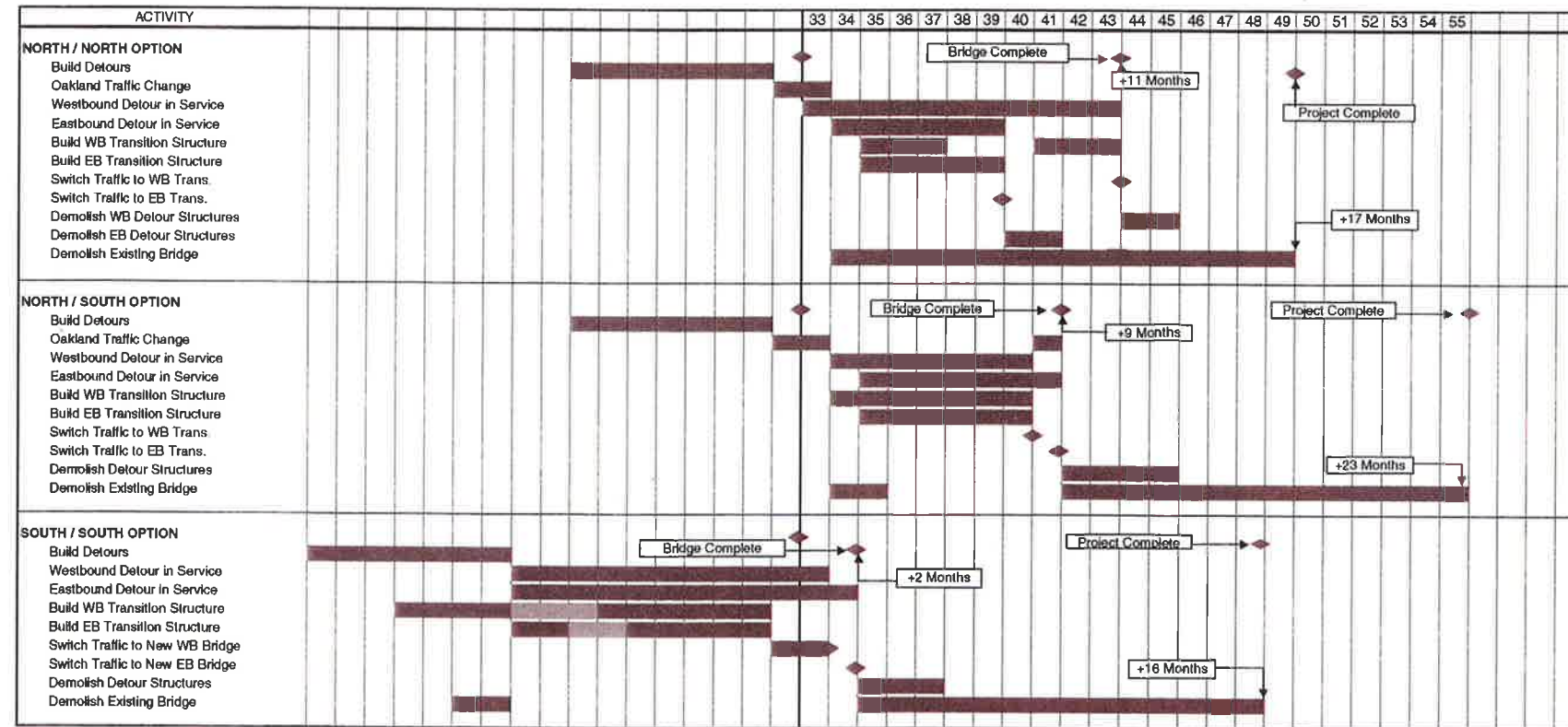


Figure 12.
 Construction Schedule
 Suspension Main Span

Figure 13.
 Construction Schedule
 YBI Detour Alternatives



- Other refinements were made to the construction cost estimates. These include a slight increase in the structural steel quantities for the suspension span tower and superstructure and an increase in the unit cost for piling at the easterly pier for the main span. Tables 1-3 provide revised cost data for the Suspension Bridge-Single Tower Alternative. (See page 6.)

Structural drawings are provided in an appendix to this supplemental report and incorporate these design revisions.

3.0 Skyway Optimization Study

Results of the skyway optimization study presented at the May 29, 1998 EDAP meeting are provided herein for reference purposes.

Selection of an optimum span length is based on the following criteria:

- Cost
- Aesthetics
- Constructibility

Span optimization studies determine a minimum cost configuration. The optimum span length is where the combined cost of the substructure and superstructure is a minimum. Figures 14 and 15 show results of optimization studies for the haunched concrete girder and for the uniform depth steel girder with orthotropic deck. These studies include span lengths between 100 and 220 meters. In addition to dead and live loads, the shape of these curves is influenced by other factors such as earthquake demand and ship collision loads.

Figures 14 and 15 show normalized cost per square meter of deck area versus span length for the skyway substructure, superstructure and their total. The costs have been normalized with respect to the total cost per square meter for the selected span length. The figures show that span lengths in the range of 160 to 200 meters are cost effective for both steel and concrete alternatives. Based on aesthetics and constructibility criteria, the design team has selected 160 meters as the optimum span for both alternatives.

Spans longer than 160 meters would require deeper girders and would complicate the structural/visual transition to the main span. The design team prefers the appearance of a slender deck with a clean transition between the main span and skyway.

Moreover, constructibility studies show that a 160-meter long span can be built efficiently and readily using commonly available equipment employing either balanced cantilever or heavy lift erection procedures.

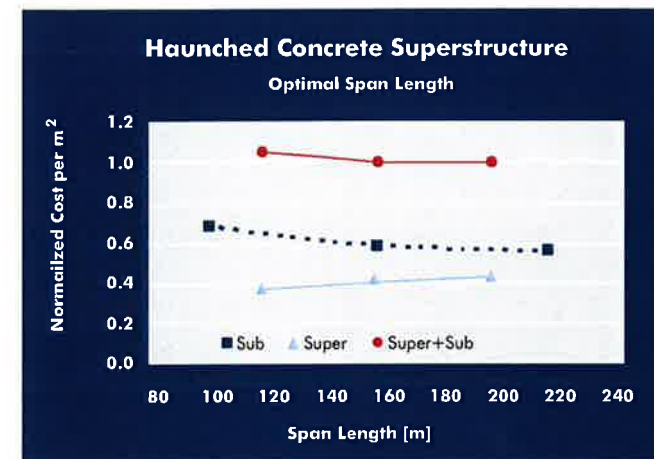


Figure 14. Span Optimization Study—Haunched Concrete Girder

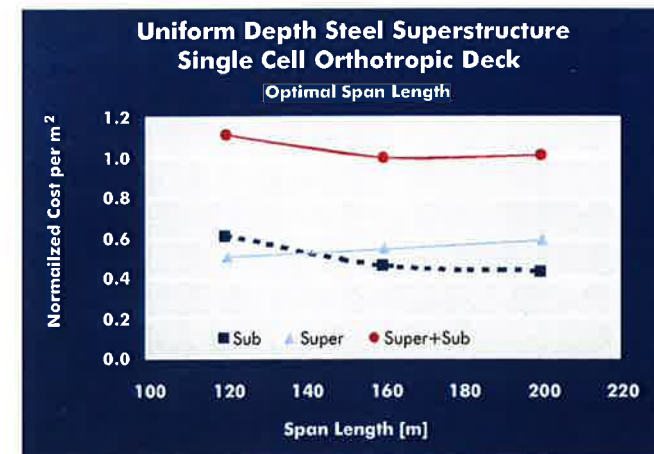


Figure 15. Span Optimization Study—Uniform Depth Steel Girder

Table 1. Cost Estimate Summary Sheet

COST ESTIMATE SUMMARY SHEET		Length	SENATE BILL 60 SKYWAY		CURRENT SKYWAY (Haunched Concrete without Cable Supported Main Span)		SUSPENSION MAIN SPAN STRUCTURE (MAIN SPANS 180m & 385m)			
			Construction Cost	Unit Cost (\$/M ²)	Construction Cost	Unit Cost (\$/M ²)	SINGLE STEEL TOWER			
							Haunched Concrete Skyway		Uniform Depth Steel Skyway	
						Construction Cost	Unit Cost (\$/M ²)	Construction Cost	Unit Cost (\$/M ²)	
A	MAIN SPAN*	625 - 700 m	\$150,493,000	(\$5,016)	\$150,200,000	(\$5,007)	\$300,773,000	(\$8,952)	\$300,773,000	(\$8,952)
B	SKYWAY	2400 - 2331 m	\$577,893,000	(\$5,016)	\$530,600,000	(\$4,606)	\$515,303,668	(\$4,606)	\$571,038,502	(\$5,104)
C	TRANSITION STRUCTURE	407 m	\$64,615,000	(\$3,307)	\$50,500,000	(\$2,628)	\$50,500,000	(\$2,628)	\$55,200,000	(\$2,877)
D	OAKLAND PLAZA	Varies	\$43,095,000	NA	\$29,000,000	(\$1,577)	\$29,000,000	(\$1,577)	\$29,000,000	(\$1,577)
E	YBI DETOUR STRUCTURE	Varies	Included in Transition Structure		\$49,000,000	(\$1,551)	\$49,000,000	(\$1,551)	\$49,000,000	(\$1,551)
F	BRIDGE DEMOLITION	NA	\$46,000,000	NA	\$54,100,000	NA	\$54,100,000	NA	\$54,100,000	NA
G	SUBTOTAL (\$1998)		\$882,100,000		\$863,400,000		\$998,700,000		\$1,059,100,000	
H	ESCALATION TO 2002 @ 3%/YR		\$85,000,000		\$108,364,307		\$125,345,649		\$132,926,381	
I	STRUCTURE SUBTOTAL (\$2002)		\$967,100,000		\$971,800,000		\$1,124,000,000		\$1,192,000,000	
J	ROADWAY CONST COST		\$54,000,000		\$89,500,000		\$89,500,000		\$89,500,000	
K	SUPPORT COSTS		\$96,000,000		\$155,400,000		\$155,400,000		\$155,400,000	
L	CONTRACT 19 EAST RETROFIT		\$5,000,000		\$0		\$0		\$0	
M	TOTAL ESCALATED COST (\$2002)		\$1,122,100,000		\$1,216,700,000		\$1,368,900,000		\$1,436,900,000	
N	GROUND MOTION CONTINGENCY (W/O DEMO)		NA		\$91,090,997		\$106,310,997		\$113,110,997	
O	SUBTOTAL (\$2002)		NA		\$1,307,800,000		\$1,475,200,000		\$1,550,000,000	
P	COMPARATIVE LIFE CYCLE COST AT PV (\$2002) **		NA		\$11,201,893		\$11,534,000		\$15,866,000	
Q	POST BARTHQUAKE RPAIR COST		NA		\$20,133,700		\$27,728,000		\$30,911,000	
R	TOTAL (\$2002)		NA		\$1,339,000,000		\$1,514,000,000		\$1,597,000,000	

** Comparative Life Cycle Costs Include only Maintenance & Repair Items whose costs differ appreciably between Alternate Design Configurations.

INCREMENTAL COST TO ADD BIKEWAY		(Based on 4.75 m Elevated Path along South Side of Structure.)			
BA	STRUCTURE CONST	NA	\$42,600,000	\$42,600,000	\$42,600,000
BB	SUPPORT COSTS	NA	\$1,300,000	\$1,300,000	\$1,300,000
BC	ROADWAY CONST COST	NA	\$500,000	\$500,000	\$500,000
BD	TOTAL COST (\$1998)		NA	\$44,400,000	\$44,400,000
BE	ESCALATION TO 2002 @ 3%/YR	NA	\$5,572,591	\$5,572,591	\$5,572,591
BF	TOTAL ESCALATED COST (\$2002)		NA	\$50,000,000	\$50,000,000
INCREMENTAL COST TO ADD AESTHETIC LIGHTING		(Additional Cost for Upgrading Standard Safety Lighting to Aesthetic Lighting)			
LA	LIGHTING COST	NA	NA	\$12,100,000	\$12,100,000
LB	SUPPORT COSTS	NA	NA	\$757,000	\$757,000
LC	ROADWAY CONST COST	NA	NA	\$550,000	\$550,000
LD	TOTAL COST (\$1998)		NA	NA	\$13,410,000
LE	ESCALATION TO 2002 @ 3%/YR	NA	NA	\$1,683,073	\$1,683,073
LF	TOTAL ESCALATED COST (\$2002)		NA	NA	\$15,100,000

** Comparative Life Cycle Costs Include only Maintenance & Repair Items whose costs differ appreciably between Alternate Design Configurations.

FUTURE LIGHT RAIL: The Cost to include provisions on the structure for Future Light Rail is estimated between \$12,000,000 to \$24,000,000. This cost does not include any Rail Facilities.

Table 2. Main Span Cost

San Francisco - Oakland Bay Bridge East Span		RCVD BY: RAF	IN EST:			
Seismic Safety Project		BR. No.: 34-0006	OUT EST:			
Main Span Segment - Single Steel Tower		CU: 04	DISTRICT: 4			
Extended 385m Suspension Bridge - Steel Deck		EA: 01200K	RTE: 80			
			CO: ALA/SF			
			KP: 0			
LENGTH:	700.0 Meters	NUMBER OF STRUCTURES IN PROJECT:	EST. NO.			
WIDTH:	48.0 Meters	PRICES BY:	COST INDEX:			
AREA =	33600 m sq	QUANTITIES BY:	DATE:			
		QUANTITIES CHECKED BY:	DATE:			
CONTRACT ITEMS	TYPE	UNIT	QUANTITY	PRICE	AMOUNT	
Substructure: West Pier						
1	STRUCTURE EXCAVATION (BRIDGE)	TYPE D	m3	6,000	\$75.00	\$450,000
2	STRUCTURE EXCAVATION (BRIDGE)	TYPE H	m3	2,000	\$192.00	\$384,000
3	STRUCTURE BACKFILL (BRIDGE)		m3	4,000	\$40.00	\$160,000
4	CIDH CONC. PILING 2.5 M		m	80	\$2,200.00	\$176,000
5	CIDH CONC. PILING 2.5 M (W/PERM CASING)		m	126	\$5,100.00	\$642,600
6	STRUCTURAL CONCRETE, BRIDGE FOOTING		m3	3,800	\$250.00	\$950,000
7	STRUCTURAL CONCRETE, BRIDGE		m3	1,570	\$600.00	\$942,000
8	BAR REINFORCING STEEL (BRIDGE)		kg	1,430,000	\$1.20	\$1,716,000
						\$5,420,600
Substructure: Tower Pier						
1	STRUCTURE EXCAVATION (BRIDGE)	TYPE D	m3	30,000	\$52.00	\$1,560,000
2	CIDH CONC. PILING 2.5 M (W/PERM CASING)		m	770	\$7,700.00	\$5,929,000
3	PRESTRESSING, FOOTING		LS	1	\$425,000.00	\$425,000
4	STRUCTURAL CONCRETE, BRIDGE FOOTING		m3	3,590	\$490.00	\$1,759,100
5	STRUCTURAL CONCRETE, BRIDGE		m3	0	\$1,025.00	\$0
6	BAR REINFORCING STEEL		kg	0	\$1.20	\$0
7	BAR REINFORCING STEEL (EPOXY COATED)		kg	1,850,000	\$2.00	\$3,700,000
8	FURNISH STRUCTURAL STEEL		kg	6,305,000	\$3.60	\$22,698,000
9	ERECT STRUCTURAL STEEL		kg	6,305,000	\$0.72	\$4,539,600
10	CLEAN AND PAINT STRUCTURAL STEEL		LS	1	\$1,750,000.00	\$1,750,000
11	MISCELLANEOUS METAL		kg	30,000	\$12.00	\$360,000
						\$42,720,700
Substructure: East Pier						
1	FURNISH CISS PILING 2.5M		m	1,520	\$5,500.00	\$8,360,000
2	DRIVE CISS PILES 2.5M		EA	16	\$68,000.00	\$1,088,000
3	PRESTRESSING, FOOTING		LS	1	\$675,000.00	\$675,000
4	STRUCTURAL CONCRETE, BRIDGE FOOTING		m3	5,340	\$490.00	\$2,616,600
5	STRUCTURAL CONCRETE, BRIDGE		m3	2,050	\$740.00	\$1,517,000
6	BAR REINFORCING STEEL		kg	0	\$1.20	\$0
7	BAR REINFORCING STEEL (EPOXY COATED)		kg	2,580,000	\$2.00	\$5,160,000
						\$19,416,600
Superstructure						
1	MINOR CONCRETE, (COUNTERWEIGHT)		m3	5000	\$160.00	\$800,000
2	FURNISH/INSTALL DECK OVERLAY		m2	35000	\$52.00	\$1,820,000
3	BEARING DEVICES		LS	1	\$250,000.00	\$250,000
4	JOINT SEAL ASSEMBLY		m	100	\$13,000.00	\$1,300,000
5	FURNISH STRUCTURAL STEEL		kg	22,700,000	\$3.54	\$80,358,000
6	ERECT STRUCTURAL STEEL		kg	22,700,000	\$1.31	\$29,737,000
7	FURNISH SUSPENSION CABLE ASSEMBLIES		kg	3,843,000	\$2.20	\$8,454,600
8	ERECT SUSPENSION CABLE ASSEMBLIES		kg	3,843,000	\$3.50	\$13,450,500
9	FURNISH SUSPENDER ASSEMBLIES		kg	272,000	\$4.24	\$1,153,280
10	ERECT SUSPENDER ASSEMBLIES		kg	272,000	\$4.31	\$1,172,320
11	CLEAN & PAINT STRUCTURAL STEEL		LS	1	\$5,750,000.00	\$5,750,000
12	MISCELLANEOUS METAL BRIDGE		kg	5,000	\$6.00	\$30,000
13	BARRIER		m	2,800	\$125.00	\$350,000
						\$144,625,700
Misc.						
1	FENDER SYSTEM		LS	1	\$3,100,000.00	\$3,100,000
2	ELEVATOR (INC. MECH. & ELECT.)		LS	1	\$673,000.00	\$673,000
3	NORTH SLOPE STABILIZATION		LS	1	\$600,000.00	\$600,000
						\$4,373,000
COMMENTS:						
Costs can be reduced if Bolted Connections are used instead of Welds on Steel Towers						
COST PER SQ. METER				\$8.952		
SUBTOTAL					\$216,556,600	\$216,556,600
MOBILIZATION					\$24,061,844	
SUBTOTAL BRIDGE ITEMS					\$240,618,444	
CONTINGENCIES (@ 25%)					\$60,154,611	
BRIDGE TOTAL COST					\$300,773,056	
GRAND TOTAL					\$300,773,056	
FOR BUDGET PURPOSES - SAY					\$300,773,000	

Table 3. Bicycle / Pedestrian Incremental Cost

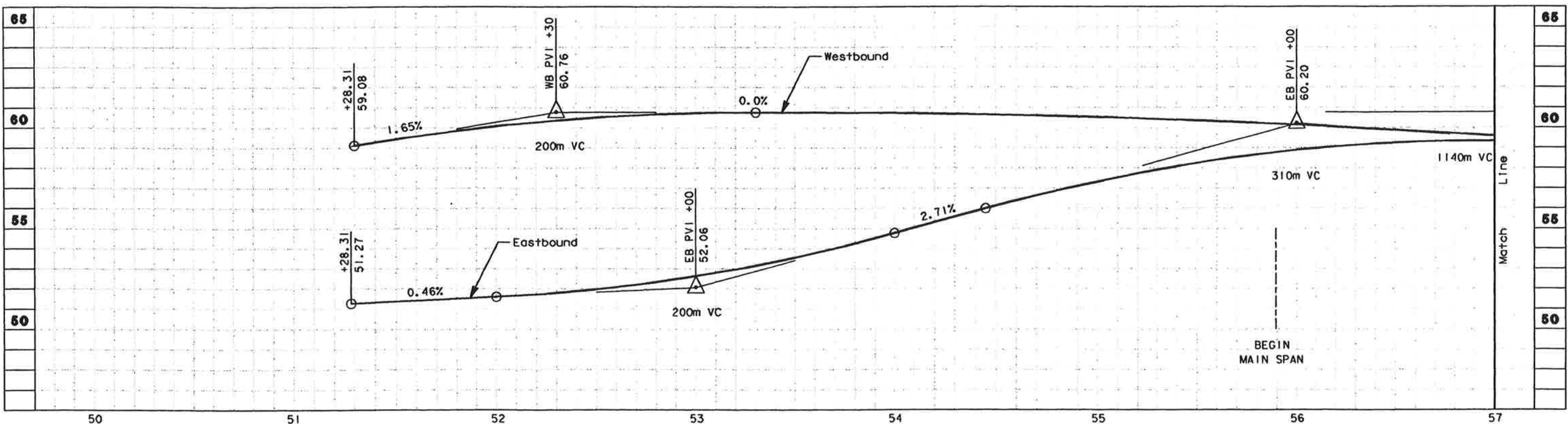
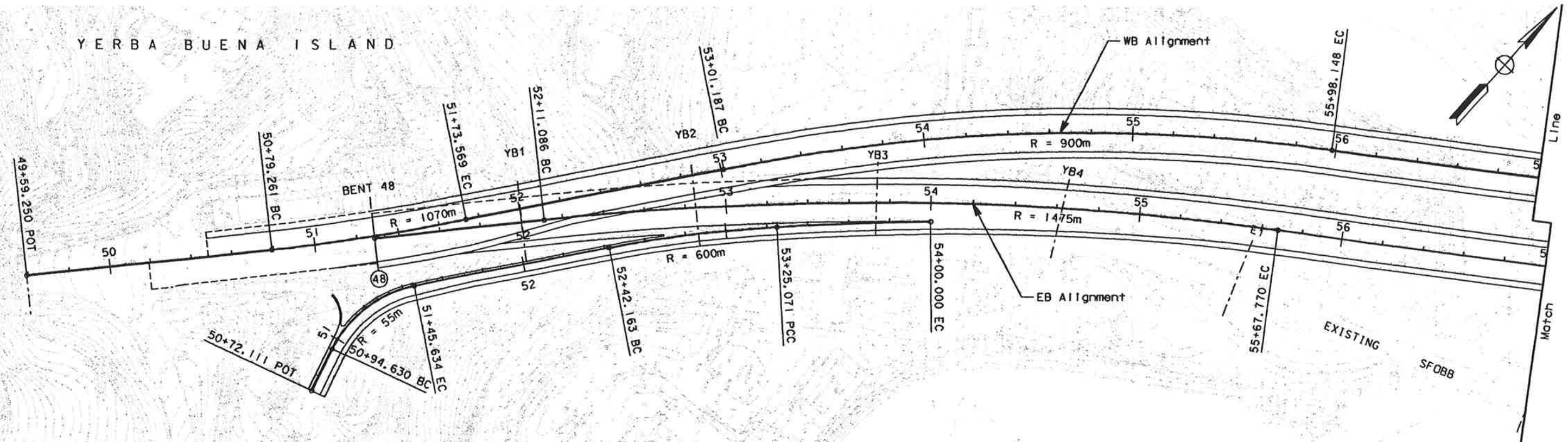
San Francisco - Oakland Bay Bridge East Span Seismic Safety Project					
STRUCTURE:	Bikeway Addition - South (Eastbound) Side		RCVD BY: RAF	IN EST:	
TYPE:	Single Lane - Elevated from Roadway		BR. No.: 34-0006	DISTRICT: 04	
			CU: 04	RTE: 80	
			BA: 01200K	CO: ALA/SF	
				KP:	
LENGTH:	3538.0 m		NUMBER OF STRUCTURES IN PROJECT:	EST. NO.	
WIDTH:	4.8 m		PRICES BY:	COST INDEX:	
AREA =	16805.5 m sq		QUANTITIES BY:	DATE:	
			QUANTITIES CHECKED BY:	DATE:	
CONTRACT ITEMS					
	TYPE	UNIT	QUANTITY	PRICE	AMOUNT
<i>Transition Structure</i> 402.0 m					
1	CIDH PILES	m	684	\$100.00	\$68,400
2	PRESTRESSING STEEL	222700 LS	1	\$935,000	\$935,000
3	STRUCTURAL CONCRETE, BRIDGE	m3	1,530	\$600.00	\$918,000
4	FURNISH/INSTALL DECK OVERLAY	m2	1,900	\$52.00	\$98,800
5	JOINT SEAL ASSEMBLY	m	15	\$13,000.00	\$195,000
6	BAR REINFORCING STEEL (BRIDGE)	kg	184,000	\$1.20	\$220,800
7	MISCELLANEOUS METAL BRIDGE	kg	3,216	\$6.00	\$19,296
8	SEPARATION RAILING	m	402	\$150.00	\$60,300
9	BIKEWAY RAILING	m	402	\$750.00	\$301,500
10	RAMP TRANSITION	30 LS	1	\$150,000.00	\$150,000
				SUBTOTAL	\$2,967,096
				COST/M	\$7,381
<i>Mainspan & Cantilevers (Suspension)</i> 700.0 m					
1	FURNISH/INSTALL DECK OVERLAY	m2	3,330	\$52.00	\$173,160
2	JOINT SEAL ASSEMBLY	m	5	\$13,000.00	\$65,000
3	FURNISH/ERECT STRUCTURAL STEEL	kg	1,210,000	\$4.85	\$5,868,500
4	FURNISH/ERECT CABLE WIRE STEEL	kg	185,000	\$5.70	\$1,054,500
5	FURNISH/ERECT SUSPENDERS	kg	13,000	\$8.55	\$111,150
6	CLEAN & PAINT STRUCTURAL STEEL	LS	1	\$500,000	\$500,000
7	MISCELLANEOUS METAL BRIDGE	kg	5,600	\$6.00	\$33,600
8	SEPARATION RAILING	m	700	\$150.00	\$105,000
9	BIKEWAY RAILING	m	700	\$750.00	\$525,000
				SUBTOTAL	\$8,435,910
				COST/M	\$12,051
<i>Skyway (Assume Haunched Concrete Superstructure)</i> 2331.0 m					
1	FURNISH PILES	m	600	\$5,600	\$3,360,000
2	PRESTRESSING STEEL	687,100 LS	1	\$2,890,000	\$2,890,000
3	STRUCTURAL CONCRETE, BRIDGE	m3	1,400	\$690.00	\$966,000
4	STRUCTURAL CONCRETE, BRIDGE (Lightweight)	m3	4,800	\$980.00	\$4,704,000
5	FURNISH/INSTALL DECK OVERLAY	m2	11,100	\$52.00	\$577,200
6	BAR REINFORCING STEEL (BRIDGE)	kg	47,000	\$1.20	\$56,400
7	JOINT SEAL ASSEMBLY	m	35	\$3,200.00	\$112,000
8	MISCELLANEOUS METAL BRIDGE	kg	18,600	\$6.00	\$111,600
9	SEPARATION RAILING	m	2,331	\$150.00	\$349,650
10	BIKEWAY RAILING	m	2,331	\$750.00	\$1,748,250
				SUBTOTAL	\$14,875,100
				COST/M	\$6,381
<i>Oakland Plaza Structure</i> 105.0 m					
1	FURNISH PILES	m	160	\$160.00	\$25,600
2	DRIVE PILES	BA	10	\$1,700.00	\$17,000
3	PRESTRESSING STEEL	57000 LS	1	\$239,000	\$239,000
4	STRUCTURAL CONCRETE, BRIDGE	m3	270	\$650.00	\$175,500
5	FURNISH/INSTALL DECK OVERLAY	m2	500	\$52.00	\$26,000
6	JOINT SEAL ASSEMBLY	m	5	\$750.00	\$3,750
7	BAR REINFORCING STEEL (BRIDGE)	kg	32,000	\$1.20	\$38,400
8	MISCELLANEOUS METAL BRIDGE	kg	840	\$6.00	\$5,040
9	SEPARATION RAILING	m	105	\$150.00	\$15,750
10	BIKEWAY RAILING	m	105	\$750.00	\$78,750
10	TRANSITION/ROADWAY	40 LS	1	\$200,000.00	\$200,000
				SUBTOTAL	\$824,790
				COST/M	\$7,855
<i>Lighting</i>					
	BIKEWAY LIGHTING	LS	1	\$800,000.00	\$800,000
	BIKEWAY APURTENANCES	LS	1	\$2,750,000.00	\$2,750,000
				SUBTOTAL BRIDGE ITEMS	\$30,652,896
				MOBILIZATION (@ 10%)	\$3,405,877
				SUBTOTAL BRIDGE ITEMS	\$34,058,773
				CONTINGENCIES (@ 25%)	\$8,514,693
				BRIDGE TOTAL COST	\$42,573,467
				GRAND TOTAL	\$42,573,467
				FOR BUDGET PURPOSES - SAY	\$42,600,000
COMMENTS:					
COST PER SQ. METER		\$2,533			

The San Francisco-Oakland Bay Bridge East Span
Seismic Safety Project: Supplement to Final 30% Design Report

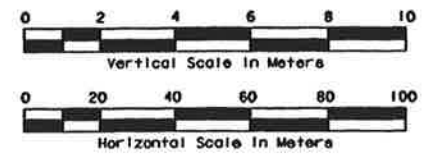
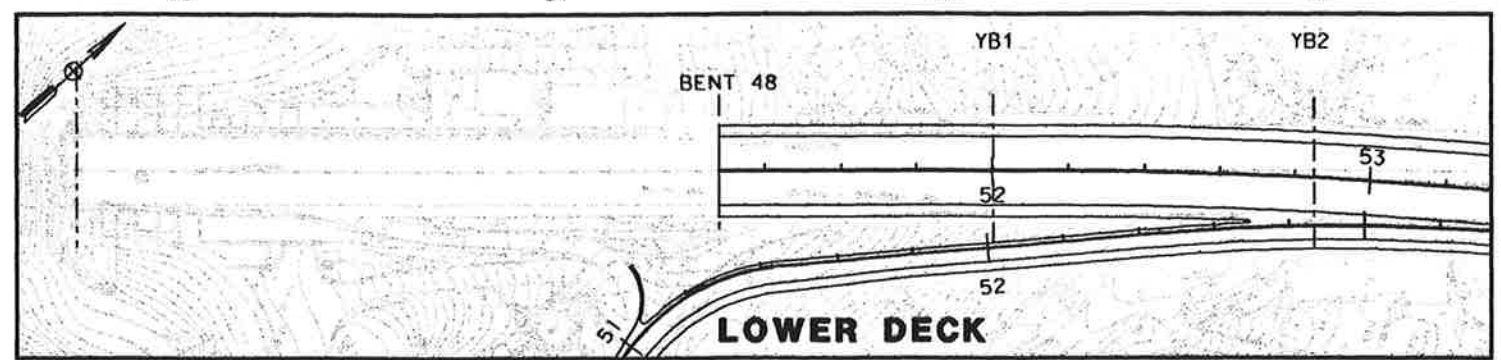
Appendix

Civil and Structural Drawings

YERBA BUENA ISLAND



REV	CK	DATE	REVISIONS



PRELIMINARY
SUBJECT TO REVISION

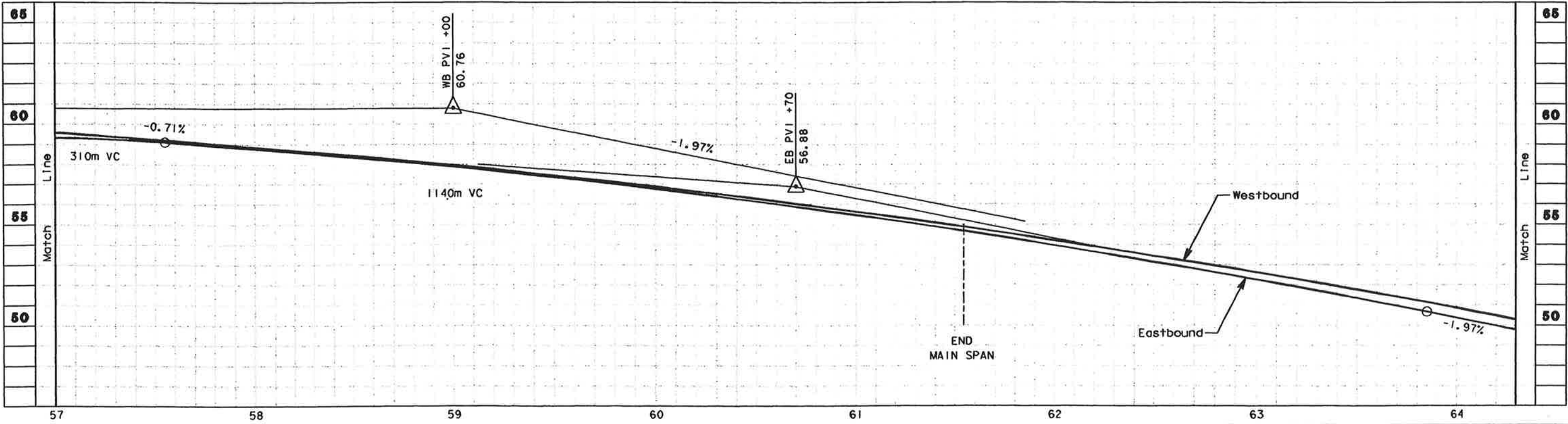
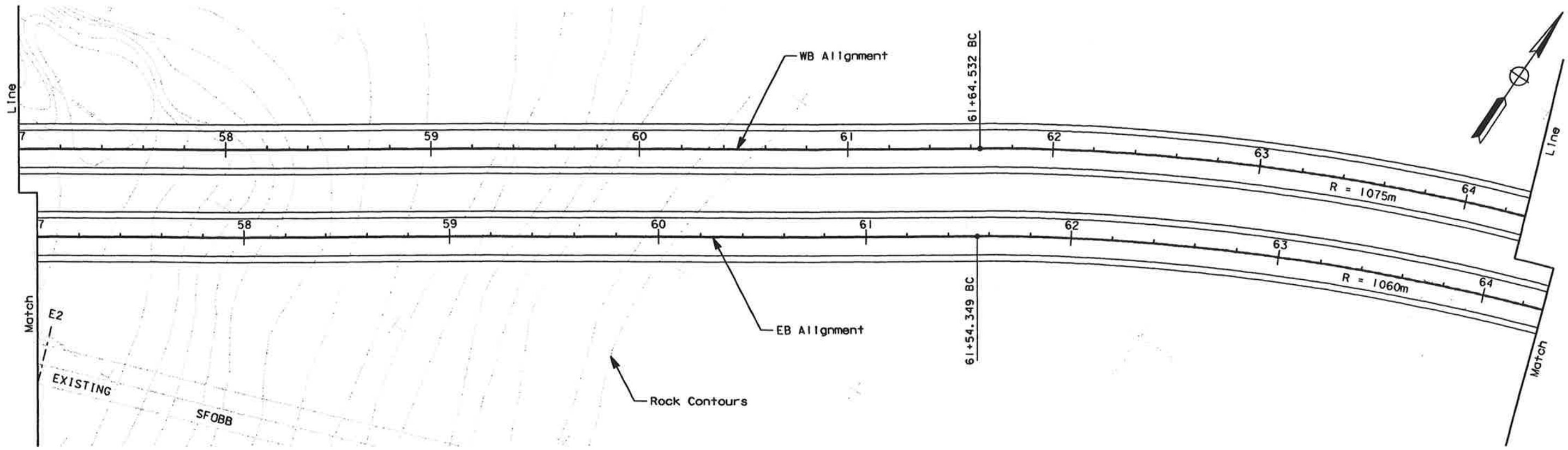


**SAN FRANCISCO - OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT**

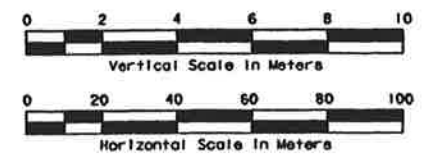
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PLAN AND PROFILE
N6 ALIGNMENT**

Prepared By: E McCarthy	Date: 15 June 98	Revision: 2
Checked By: X	Date: X	Dwg No. N6PP7

DATE PLOTTED -> \$DATE
TIME PLOTTED -> \$TIME



DATE	REVISIONS	REV CK



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SUBJECT TO REVISION

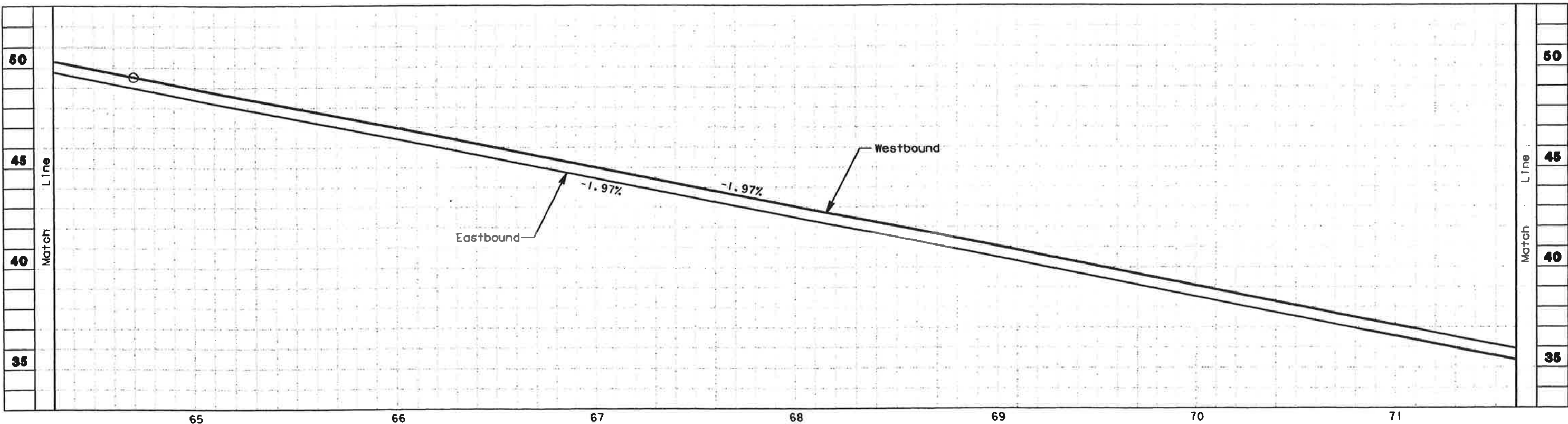
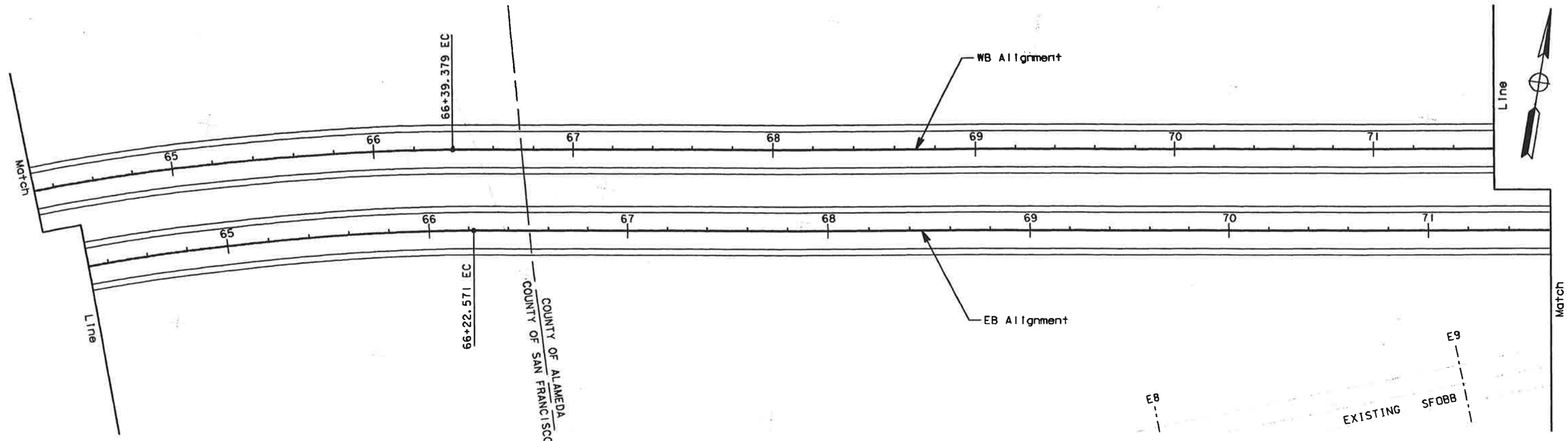


**SAN FRANCISCO - OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT**

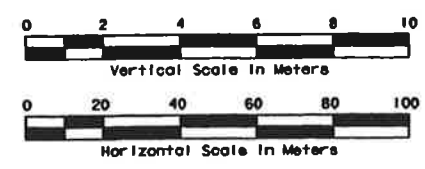
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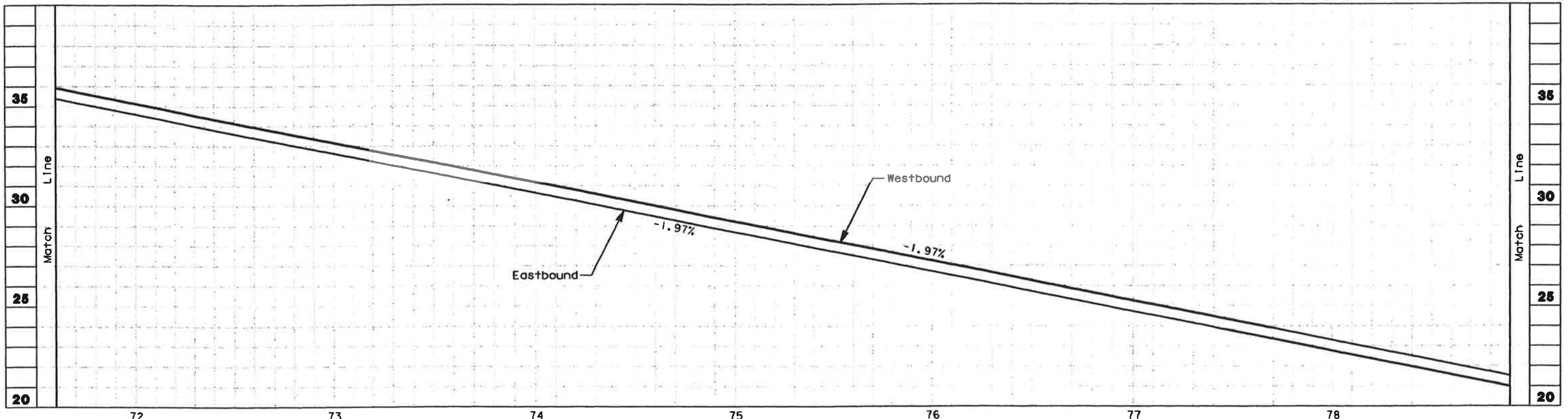
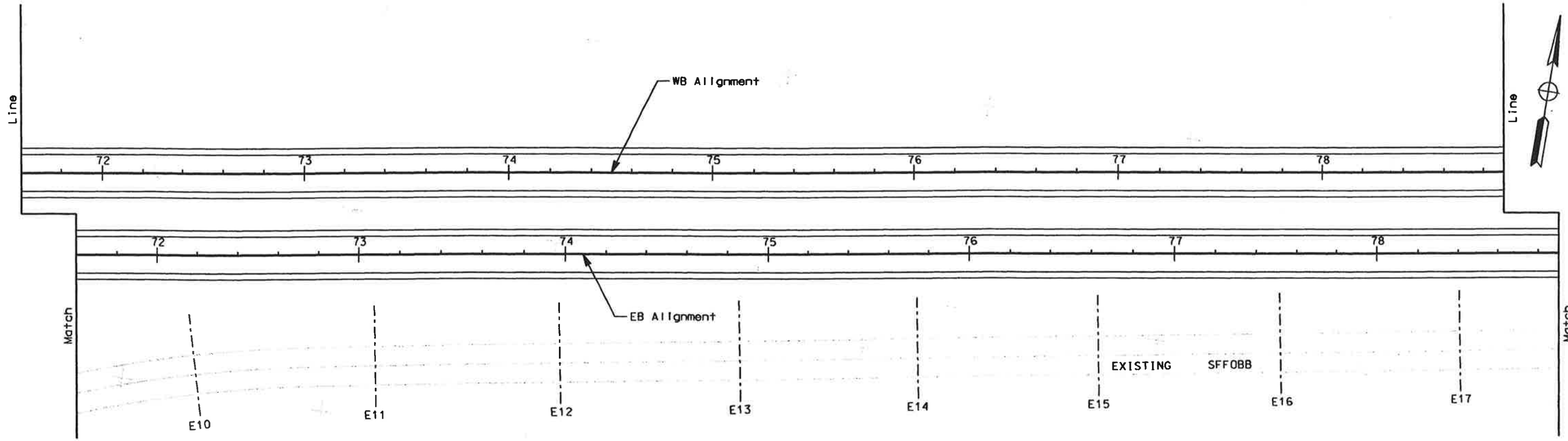


**SAN FRANCISCO - OAKLAND BAY BRIDGE
 EAST SPAN SEISMIC SAFETY PROJECT**

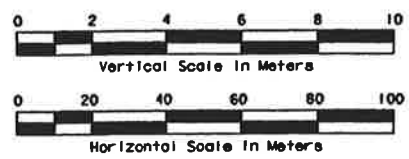
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 N6 ALIGNMENT**

Prepared By: E McCarthy	Date: 15 June 98	Revision: 2
Checked By: X	Date: X	Dwg No. N6PP9

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DATE	REVISIONS	REV CK



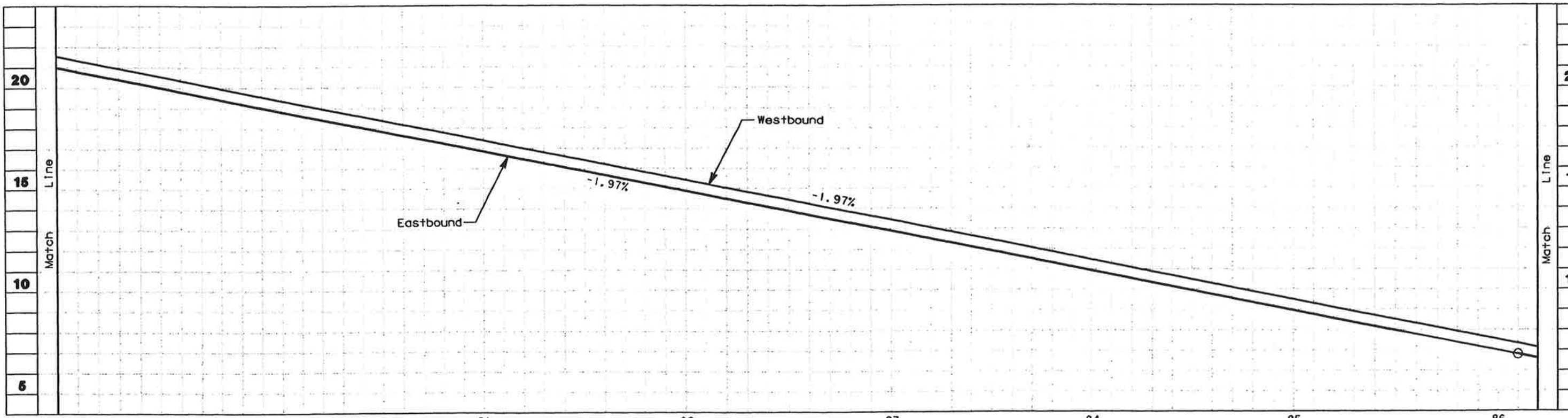
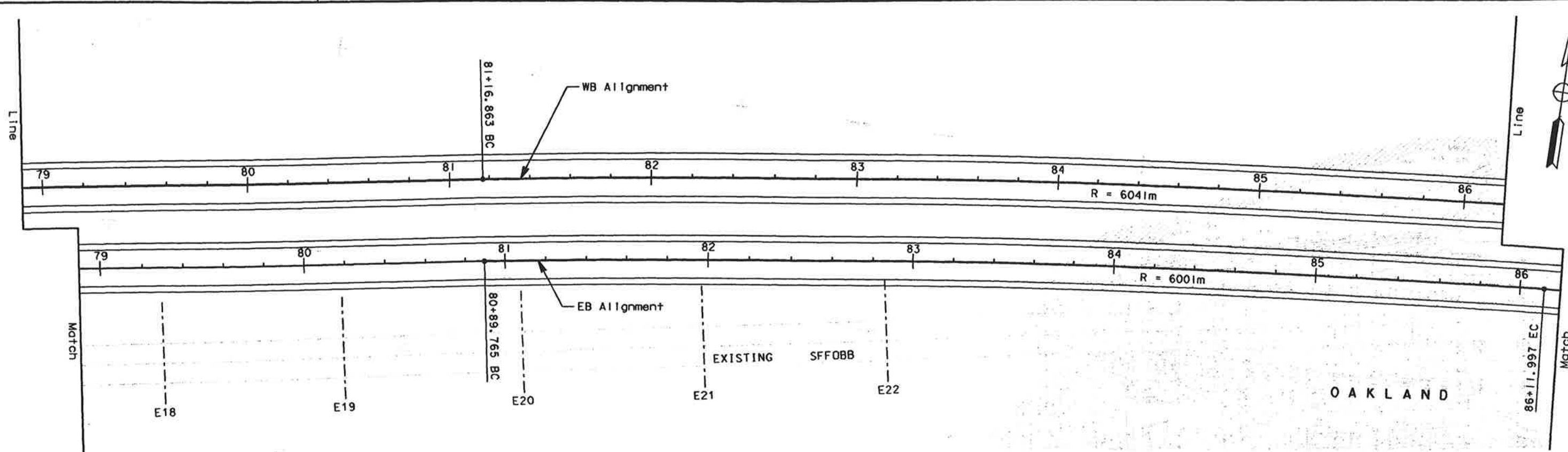
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SUBJECT TO REVISION



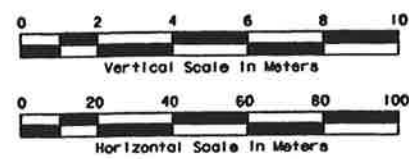
**SAN FRANCISCO - OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT**

**CONCEPTUAL
PLAN AND PROFILE
N6 ALIGNMENT**

Prepared By: E McCarthy	Date: 15 June 98	Revisions: 2
Checked By: X	Date: X	Dwg No. N6PP10



DATE	REVISIONS	REV CK



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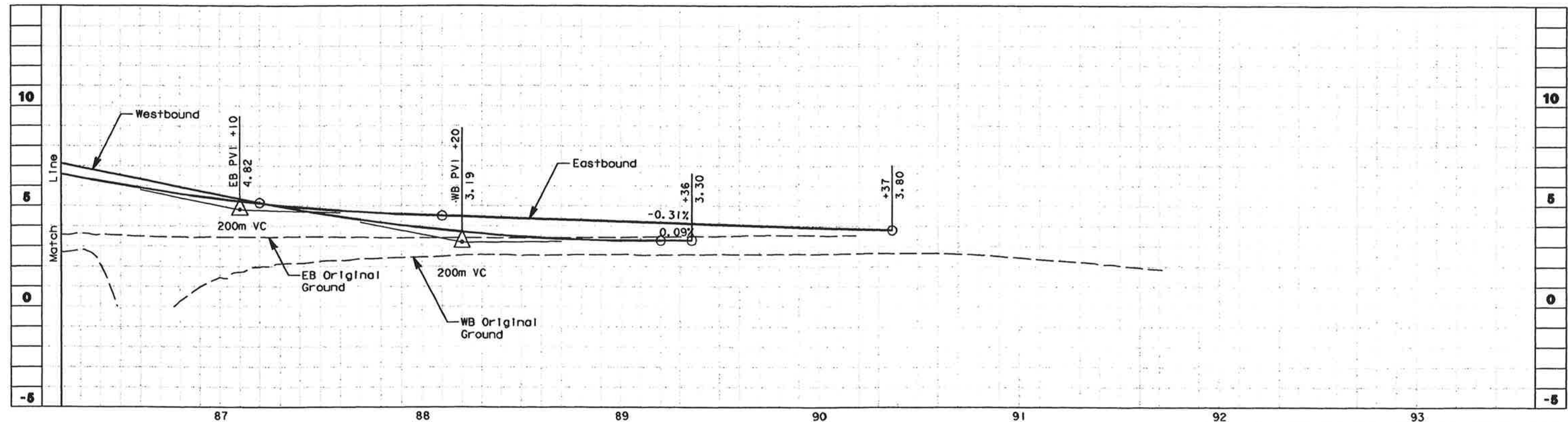
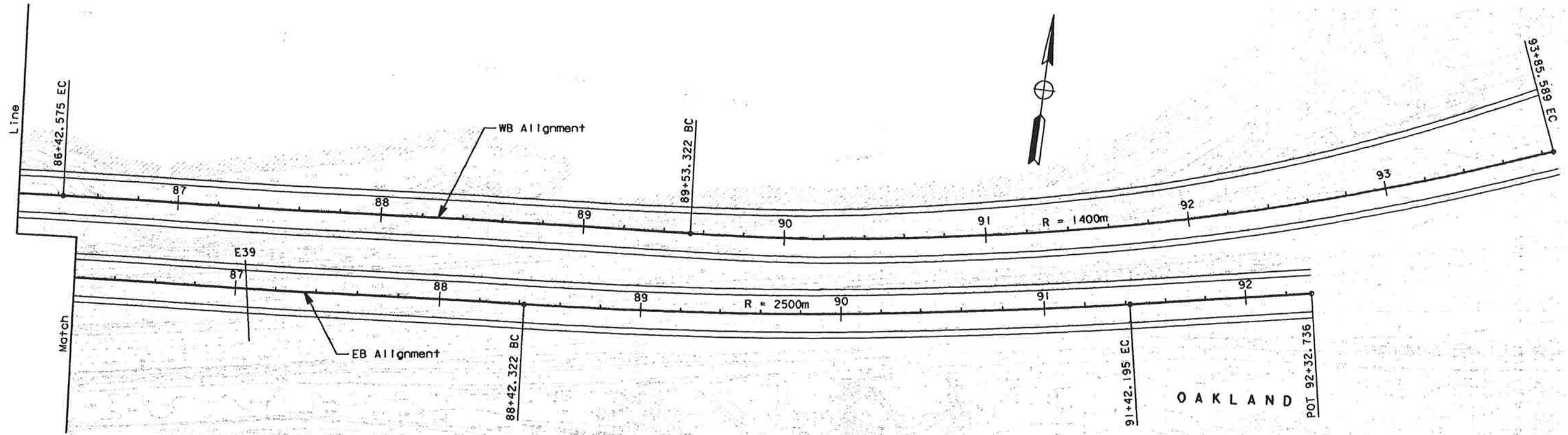


**SAN FRANCISCO - OAKLAND BAY BRIDGE
 EAST SPAN SEISMIC SAFETY PROJECT**

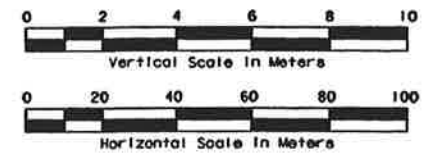
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Prepared By: E McCarthy	Date: 15 June 98	Revision: 2
Checked By: X	Date: X	Dwg No. N6PP11

DATE PLOTTED => 9DATE
 TIME PLOTTED => 8TIME



DATE	REVISIONS	REV CK



PRELIMINARY
SUBJECT TO REVISION



**SAN FRANCISCO - OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT**

**CONCEPTUAL
PLAN AND PROFILE
N6 ALIGNMENT**

Prepared By: E McCarthy	Date: 15 June 98	Revision: 2
Checked By: X	Date: X	Dwg No. N6PP12

DATE PLOTTED -> \$DATE
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INDEX TO PLANS

TITLE

- GENERAL PLAN
- TYPICAL SECTION - SUSPENSION
- TYPICAL SECTION - CONCRETE SKYWAY
- TYPICAL SECTION - STEEL SKYWAY
- STRUCTURE PLAN NO. 1
- STRUCTURE PLAN NO. 2
- STRUCTURE PLAN NO. 3
- STRUCTURE PLAN NO. 4
- STRUCTURE PLAN NO. 5
- STRUCTURE PLAN NO. 6
- STRUCTURE PLAN NO. 7
- STRUCTURE PLAN NO. 8
- FOUNDATION PLAN NO. 1
- FOUNDATION PLAN NO. 2
- FOUNDATION PLAN NO. 3
- FOUNDATION PLAN NO. 4
- FOUNDATION PLAN NO. 5
- FOUNDATION PLAN NO. 6
- FOUNDATION PLAN NO. 7
- TOWER DETAILS NO. 1
- TOWER DETAILS NO. 2
- PIER DETAILS
- ERECTION PROCEDURE NO. 1
- ERECTION PROCEDURE NO. 2
- ERECTION PROCEDURE NO. 3
- ERECTION PROCEDURE NO. 4
- ERECTION PROCEDURE NO. 5
- ERECTION PROCEDURE NO. 6
- TOWER ERECTION



DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04					

REGISTERED ENGINEER - CIVIL

R. Manzanarez

No. _____

Exp. _____

PLANS APPROVAL DATE _____

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T.Y. LIN / MOFFATT & NICHOL
825 BATTERY STREET
SAN FRANCISCO, CA 94111



SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

DESIGN OVERSIGHT	DESIGN BY A. Orsiele	CHECKED	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	PROJECT ENGINEER R. Manzanarez	BRIDGE NO. 34-0006
SIGN OFF DATE	DETAILS BY A. Lee	CHECKED		PROJECT ENGINEER	KILOMETER POST
	QUANTITIES BY	CHECKED			

INDEX TO PLANS										SHEET	OF
REVISION DATES (PRELIMINARY STAGE ONLY)											
6/18/98											



CU 04
EA 012001

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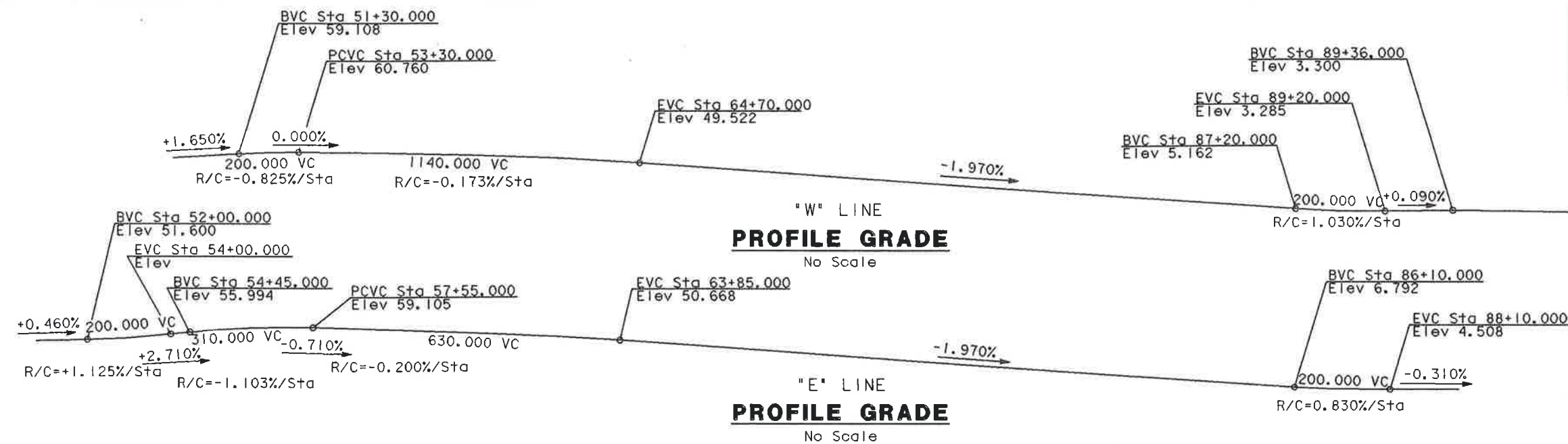
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REGISTERED ENGINEER - CIVIL

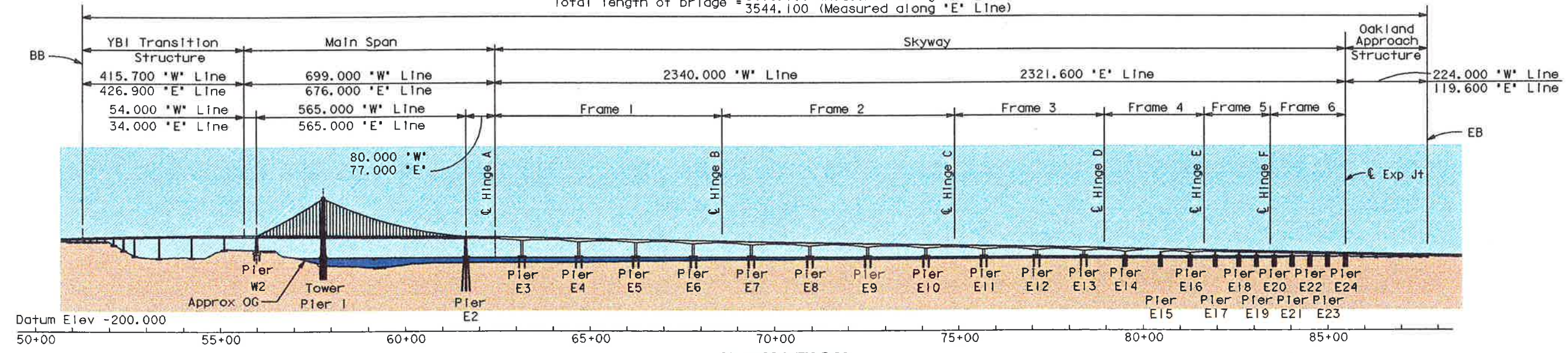
PROFESSIONAL ENGINEER
R. Manzanarez
No. _____
Exp. _____
CIVIL
STATE OF CALIFORNIA

PLANS APPROVAL DATE _____
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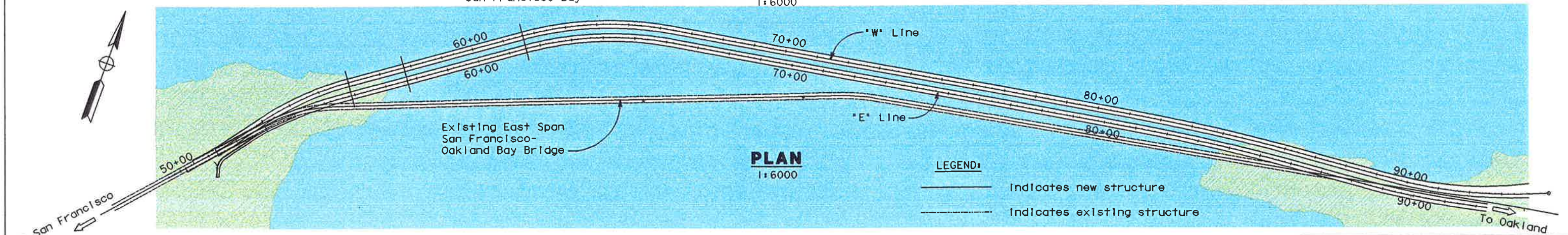
T.Y. LIN / MOFFATT & NICHOL
825 BATTERY STREET
SAN FRANCISCO, CA 94111



Total length of bridge = 3678.700 (Measured along 'W' Line)
= 3544.100 (Measured along 'E' Line)



ELEVATION
I:6000



PLAN
I:6000

LEGEND:
——— Indicates new structure
- - - - Indicates existing structure

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

**SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT**

DESIGN OVERSIGHT	DESIGN BY A.Orslele	CHECKED	LOAD FACTOR DESIGN	LIVE LOADING: HS20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	BRIDGE NO. 34-0006
SIGN OFF DATE	DETAILS BY E. Zharkov	CHECKED	LAYOUT	BY	R. Manzanarez PROJECT ENGINEER	KILOMETER POST
Rev. Date: 5-18-98	QUANTITIES BY	CHECKED	SPECIFICATIONS	BY	CU 04 EA 012001	DISREGARD PRINTS BEARING EARLIER REVISION DATES



GENERAL PLAN	
REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET OF

TIME PLOTTED => \$TIME
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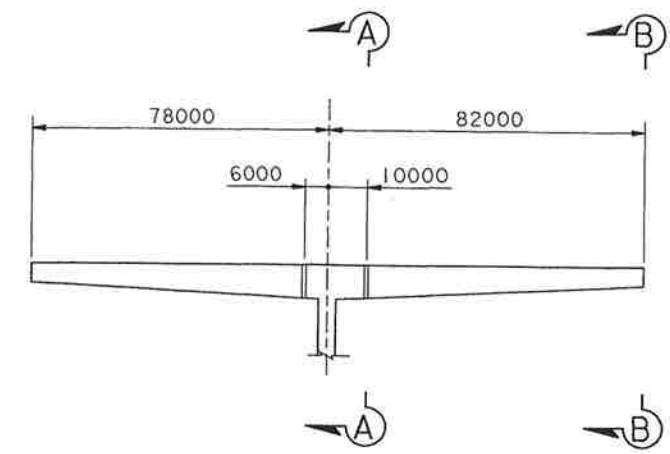
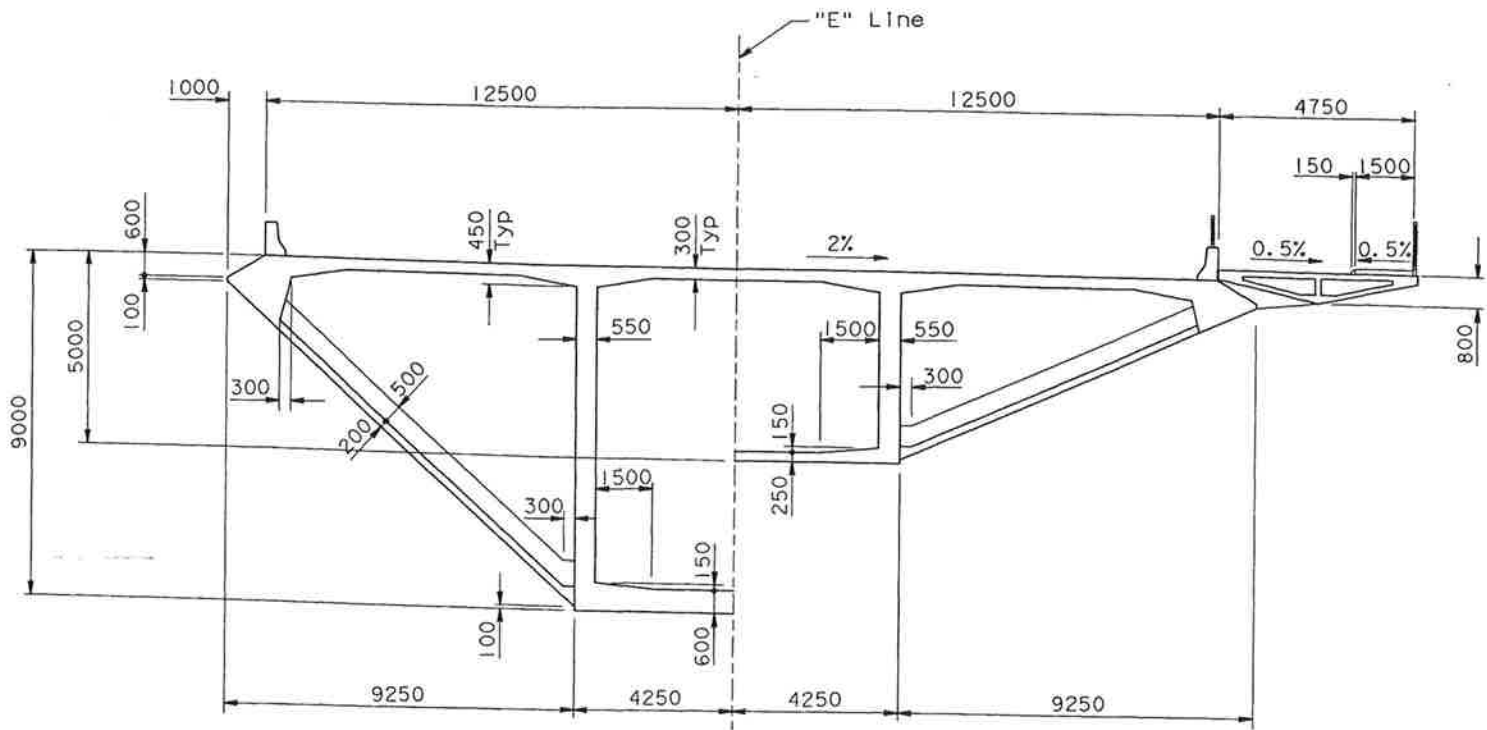
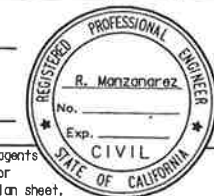
DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
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REGISTERED ENGINEER - CIVIL

PLANS APPROVAL DATE _____

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TYPICAL CANTILEVER SPAN
1:1000

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SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

DESIGN OVERSIGHT _____
SIGN OFF DATE _____
Rev. Date: 5-18-98

DESIGN	BY S. Hunter	CHECKED
DETAILS	BY A. Lee	CHECKED
QUANTITIES	BY	CHECKED

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

R. Manzanarez
PROJECT ENGINEER

BRIDGE NO.	34-0006
KILOMETER POS.	

TYPICAL SECTION-CONCRETE SKYWAY



CU 04
EA 012001

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET	OF
6/18/98		

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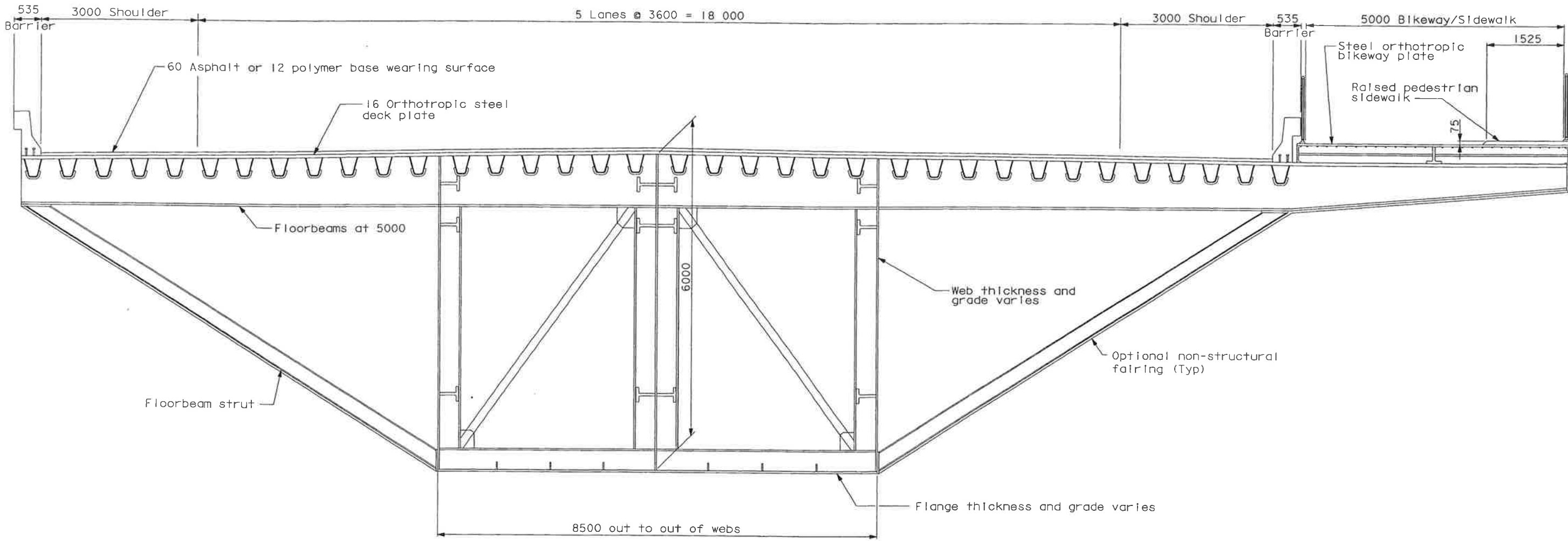


DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04					

REGISTERED ENGINEER - CIVIL
 R. Manzanarez
 No. _____
 Exp. _____
 CIVIL
 STATE OF CALIFORNIA

PLANS APPROVAL DATE _____
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 825 BATTERY STREET
 SAN FRANCISCO, CA 94111



SINGLE ORTHOTROPIC BOX GIRDER

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

DESIGN OVERSIGHT _____
 SIGN OFF DATE _____

DESIGN	BY P. Blasko	CHECKED _____
DETAILS	BY E. Selbert	CHECKED _____
QUANTITIES	BY _____	CHECKED _____

PREPARED FOR THE STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

R. Manzanarez
 PROJECT ENGINEER
 BRIDGE NO. 34-0006
 KILOMETER POS _____

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

TYPICAL SECTION-STEEL SKYWAY

Rev. Date: 5-18-98
 P:\BAY BRIDGE\HCS\skyf2.dgn



CU 04
 EA 012001
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DISREGARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET _____ OF _____
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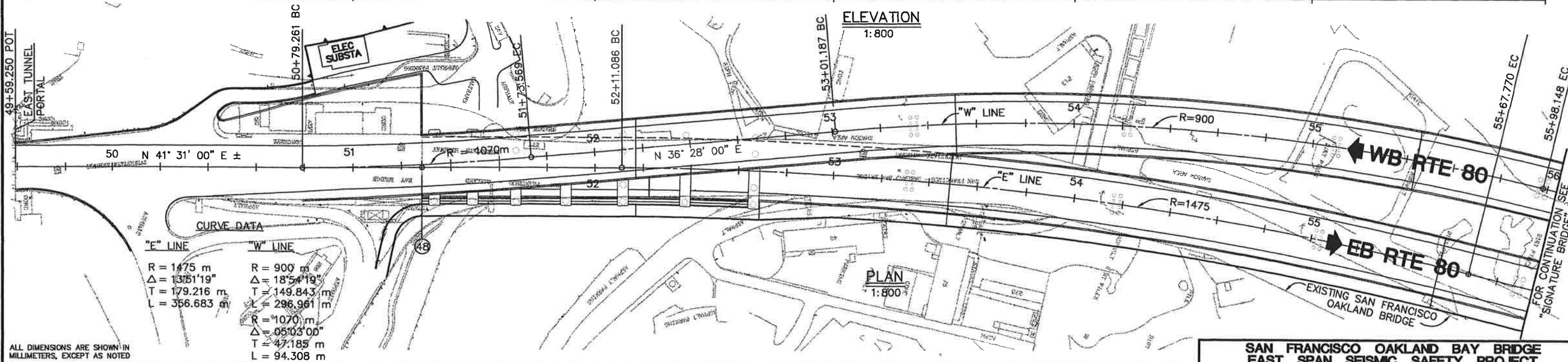
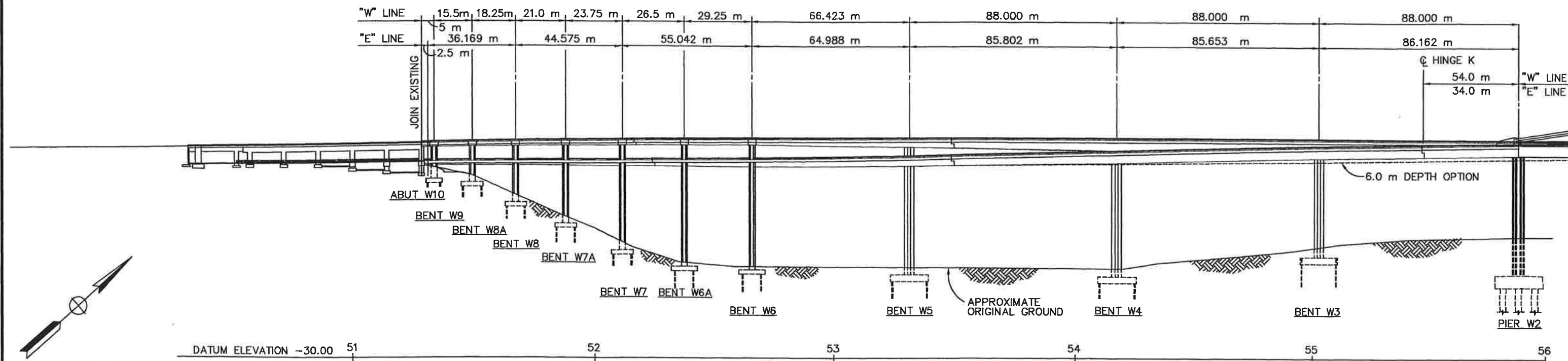
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

T. Y. LIN INTERNATIONAL
MOFFATT & NICHOL ENGINEERS
A JOINT VENTURE
SAN FRANCISCO, CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
A.L. ELY
No. 18880
Exp. 6-30-01
CIVIL
STATE OF CALIFORNIA

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DESIGN			BY			CHECKED			BRIDGE NO.		
DESIGN									34-0006		
DETAILS									POST KM		
QUANTITIES									STRUCTURE PLAN NO. 1		
PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION									CU 04		
PROJECT ENGINEER									EA 012001		
ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS									DISREGARD PRINTS BEARING EARLIER REVISION DATES		
0 20 40 60 80 100									REVISION DATES (PRELIMINARY STAGE ONLY)		
18 JUNE, 1998									SHEET OF		



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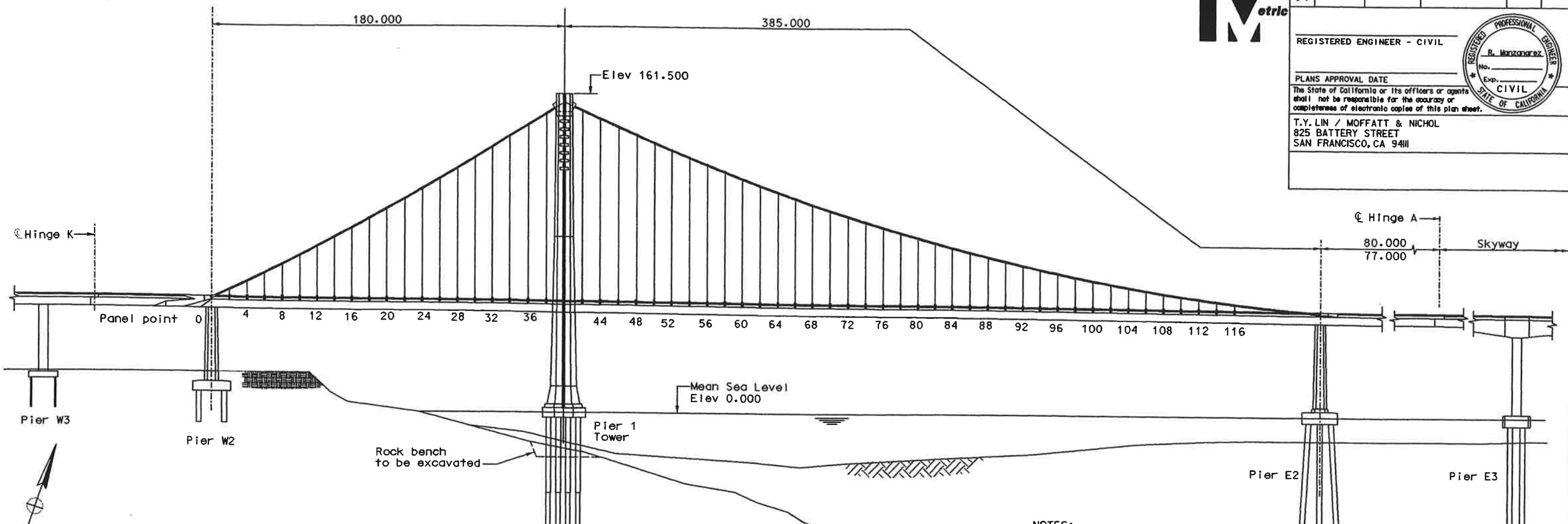
REGISTERED ENGINEER - CIVIL

R. Manzanarez

PLANS APPROVAL DATE

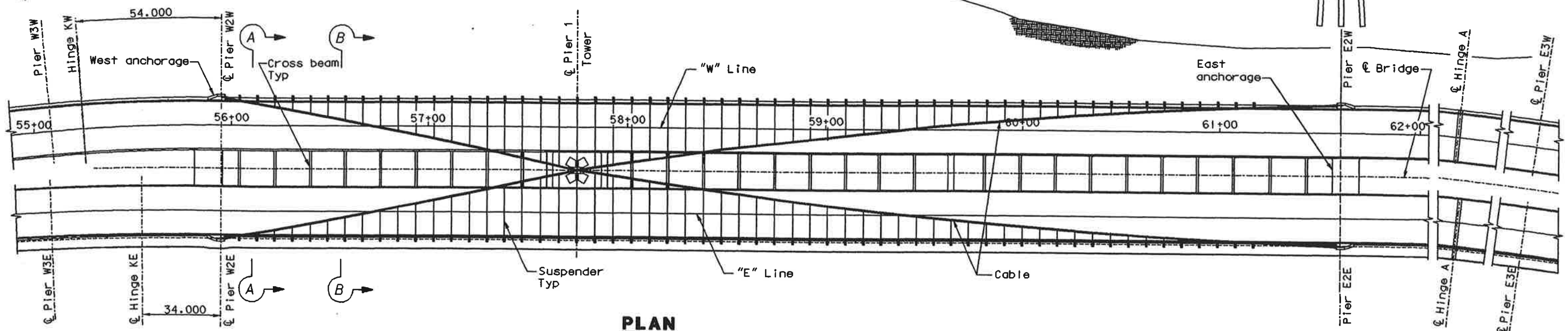
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825 BATTERY STREET
SAN FRANCISCO, CA 94111



ELEVATION
1:1000

NOTES:
1. For Section A-A & B-B see "Typical Sections" sheet.



PLAN
1:1000

DESIGN OVERSIGHT
SIGN OFF DATE

DESIGN	BY	CHECKED
DETAILS	BY	CHECKED
QUANTITIES	BY	CHECKED

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

R. Manzanarez
PROJECT ENGINEER

BRIDGE NO.
34-0006
KILOMETER POST

**SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT**

STRUCTURE PLAN NO.2

Rev. Date: 5-18-98
P:\BAY BRIDGE\HCS\sup1801.dgn



CU 04
EA 012001
FILE => #REQUEST

DISREGARD PRINTS BEARING
EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET	OF

DATE PLOTTED => #DATE
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TIME PLOTTED => #TIME



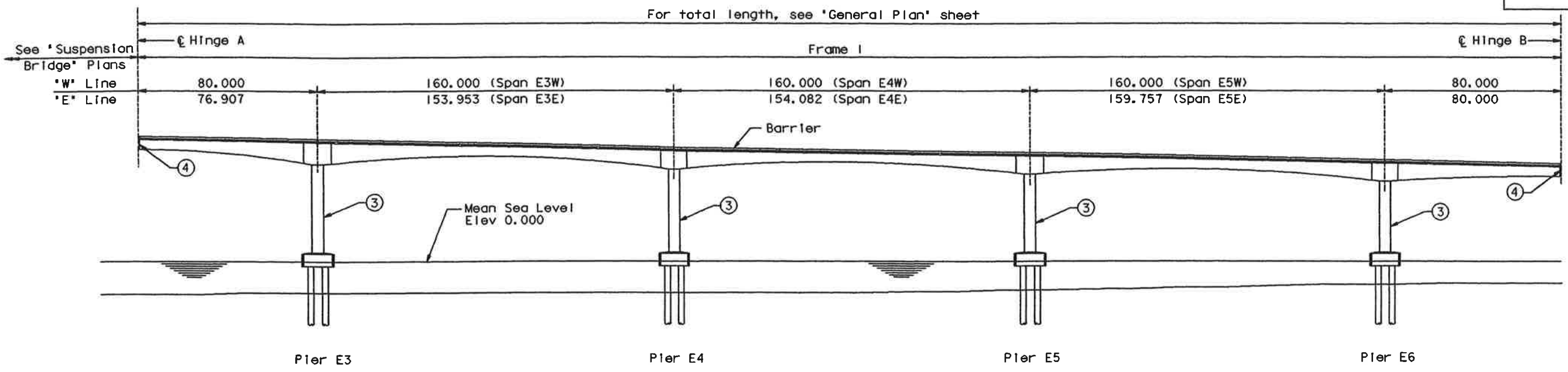
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04					

REGISTERED ENGINEER - CIVIL

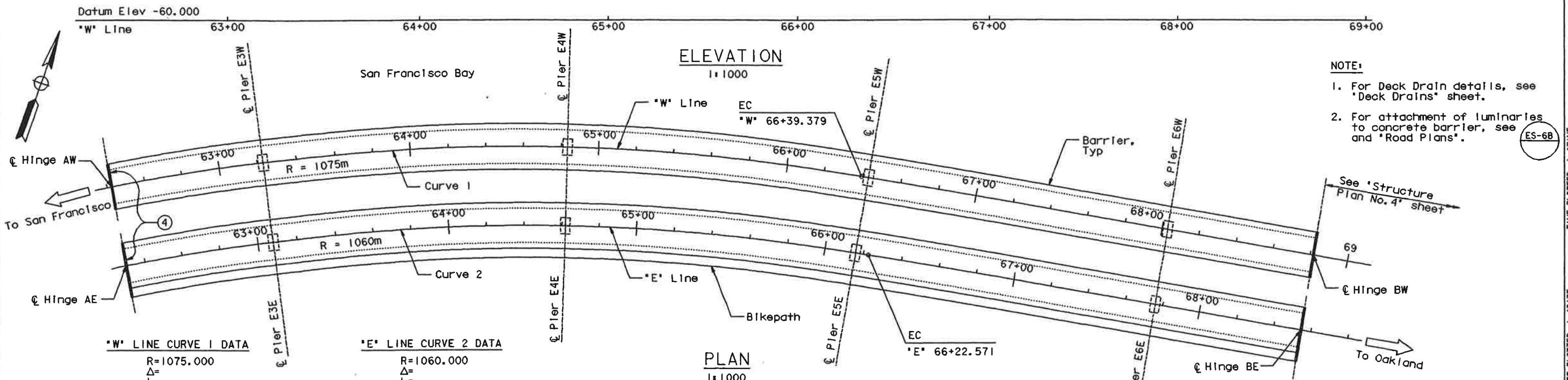
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825 BATTERY STREET
SAN FRANCISCO, CA 94111



- LEGEND:**
- ① Paint "Bridge No."
 - ② Paint "Bridge name" and year constructed.
 - ③ Paint Pier number
 - ④ Paint "Hinge"



- NOTE:**
1. For Deck Drain details, see 'Deck Drains' sheet.
 2. For attachment of luminaries to concrete barrier, see and 'Road Plans'.

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Δ=
L=
T=

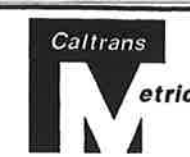
'E' LINE CURVE 2 DATA

R=1060.000
Δ=
L=
T=

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SAN FRANCISCO OAKLAND BAY BRIDGE EAST SPAN SEISMIC SAFETY PROJECT

DESIGN OVERSIGHT	DESIGN BY S. Hunter	CHECKED	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION R. Manzanarez PROJECT ENGINEER	BRIDGE NO. 34-0006	STRUCTURE PLAN NO.3
SIGN OFF DATE	DETAILS BY A. Sanchez	CHECKED		KILOMETER POST	
Rev. Date: 5-18-98	QUANTITIES BY	CHECKED		CU 04 EA 012001	
ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS			FILE => #REQUEST	DISREGARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES (PRELIMINARY STAGE ONLY)



DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04					

REGISTERED ENGINEER - CIVIL
R. Manzanarez
No. _____
Exp. _____
PLANS APPROVAL DATE _____
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T.Y. LIN / MOFFATT & NICHOL 825 BATTERY STREET SAN FRANCISCO, CA 94111

LEGEND:

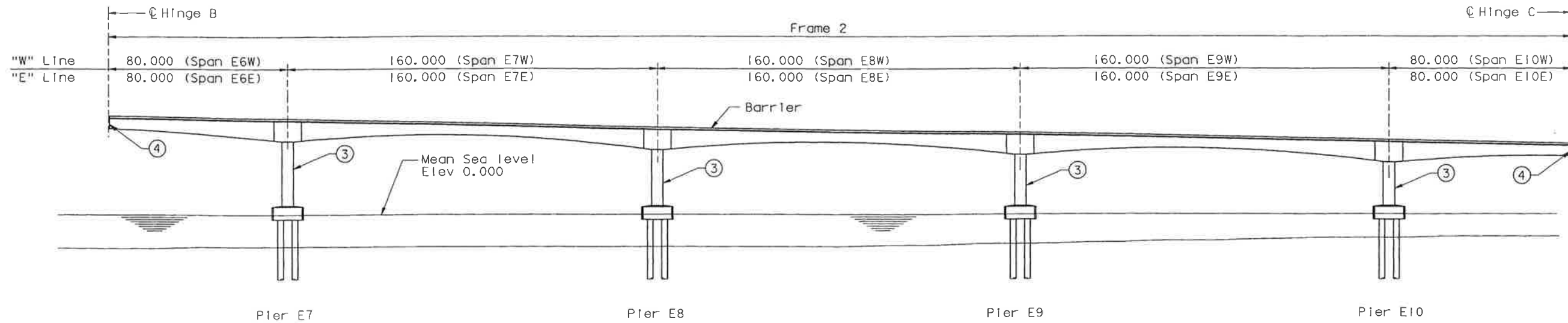
- ① Paint "Bridge No. _____"
- ② Paint "Bridge name _____" and year constructed.
- ③ Paint Pier number
- ④ Paint "Hinge _____"

NOTE:

- 1. For Deck Drain details, see "Deck Drains" sheet.
- 2. For attachment of luminaries to concrete barrier, see and "Road Plans".

ES-6B

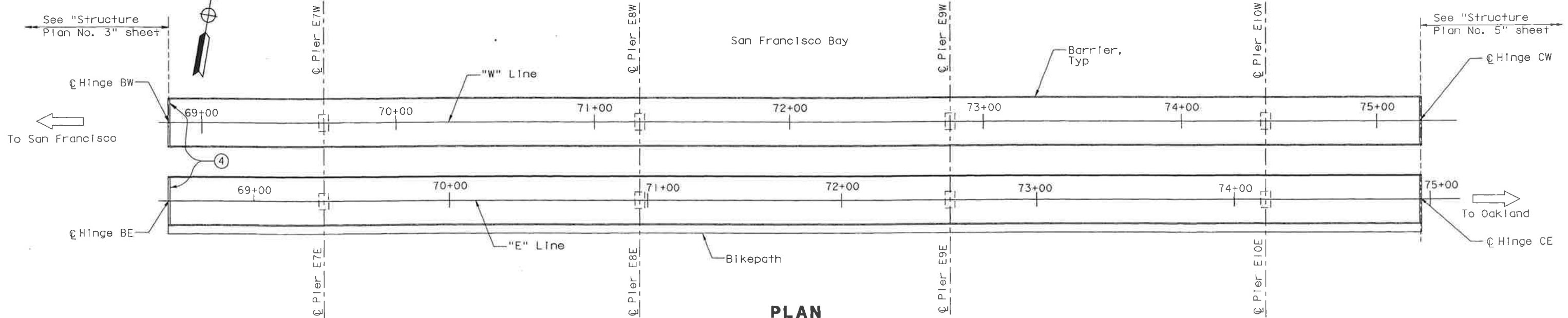
For total length, see "General Plan" sheet



Datum Elev -60.000
"W" Line

ELEVATION

1:1000



PLAN

1:1000

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

DESIGN OVERSIGHT	DESIGN BY S. Hunter	CHECKED	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	BRIDGE NO. 34-0006	STRUCTURE PLAN NO. 4
SIGN OFF DATE	DETAILS BY A. Sanchez	CHECKED	R. Manzanarez PROJECT ENGINEER	KILOMETER POS	
Rev. Date: 5-18-98	QUANTITIES BY	CHECKED	CU 04 EA 012001	DISREGARD PRINTS BEARING EARLIER REVISION DATES	

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS

FILE -> d:\nbox brl\dae\hcs\asp102.dgn

DATE PLOTTED -> 18 JUN 98 USERNAME -> FJUNG



DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04					

REGISTERED ENGINEER - CIVIL
 R. Manzanarez
 No. _____
 Exp. _____
 CIVIL
 STATE OF CALIFORNIA

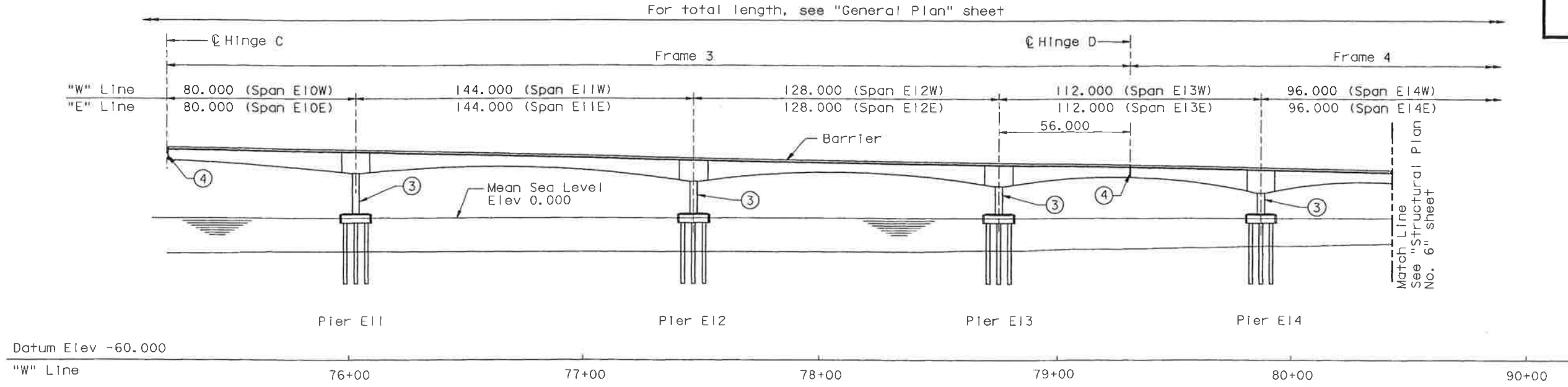
PLANS APPROVAL DATE _____

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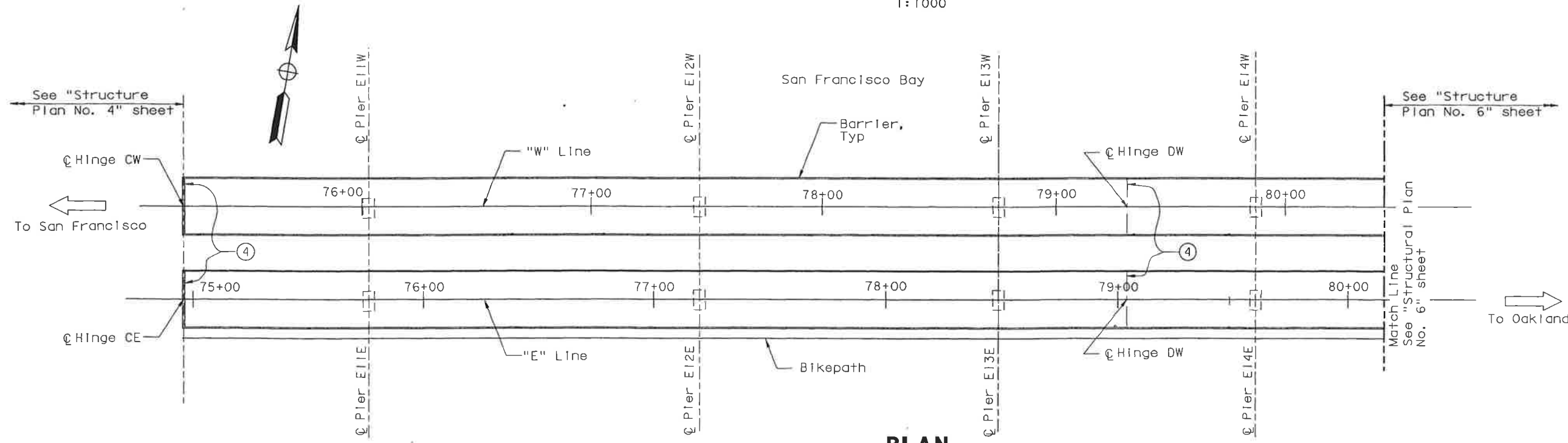
T.Y. LIN / MOFFATT & NICHOL
 825 BATTERY STREET
 SAN FRANCISCO, CA 94111

- LEGEND:**
- ① Paint "Bridge No. _____"
 - ② Paint "Bridge name _____ and year constructed."
 - ③ Paint Pier number
 - ④ Paint "Hinge _____"

- NOTE:**
1. For Deck Drain details, see "Deck Drains" sheet.
 2. For attachment of luminaires to concrete barrier, see and "Road Plans".



ELEVATION
1:1000



PLAN
1:1000

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DESIGN OVERSIGHT		DESIGN BY S. Hunter	CHECKED	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION		BRIDGE NO. 34-0006	SAN FRANCISCO OAKLAND BAY BRIDGE EAST SPAN SEISMIC SAFETY PROJECT
SIGN OFF DATE		DETAILS BY A. Sanchez	CHECKED	PROJECT ENGINEER R. Manzanarez		KILOMETER POST	
Rev. Date: 5-18-98		QUANTITIES BY	CHECKED	CU 04 EA 012001		STRUCTURE PLAN NO. 5	
ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS		0 10 20 30 40 50 60 70 80 90 100		DISREGARD PRINTS BEARING EARLIER REVISION DATES		REVISION DATES (PRELIMINARY STAGE ONLY)	

DATE PLOTTED => 18 JUN 98 TIME PLOTTED => 18:06:06 USERNAME => FHUNG



DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04					

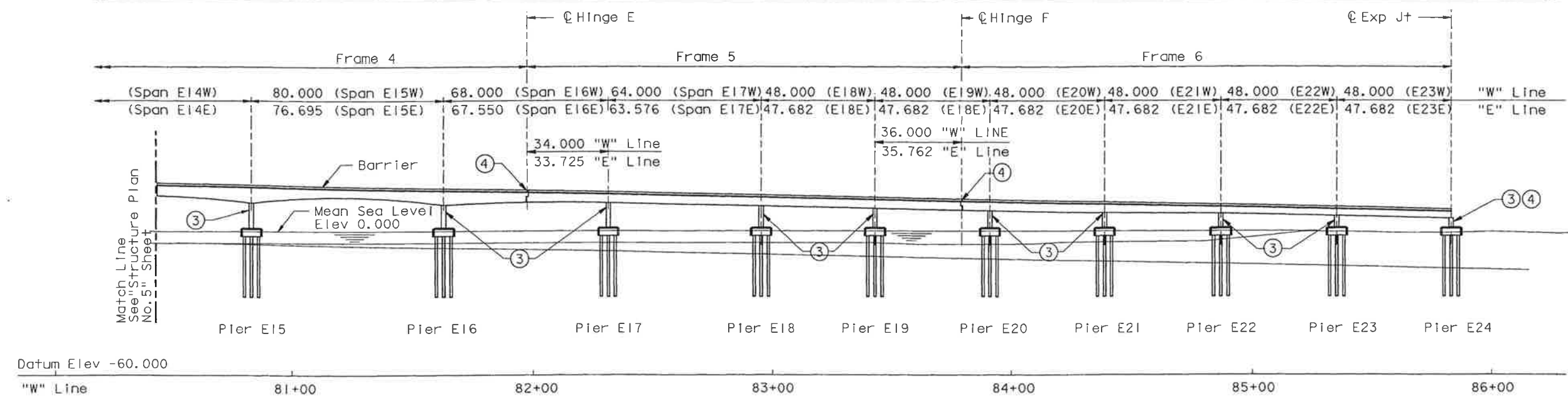


REGISTERED ENGINEER - CIVIL

PLANS APPROVAL DATE
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T.Y. LIN / MOFFATT & NICHOL
 825 BATTERY STREET
 SAN FRANCISCO, CA 94111

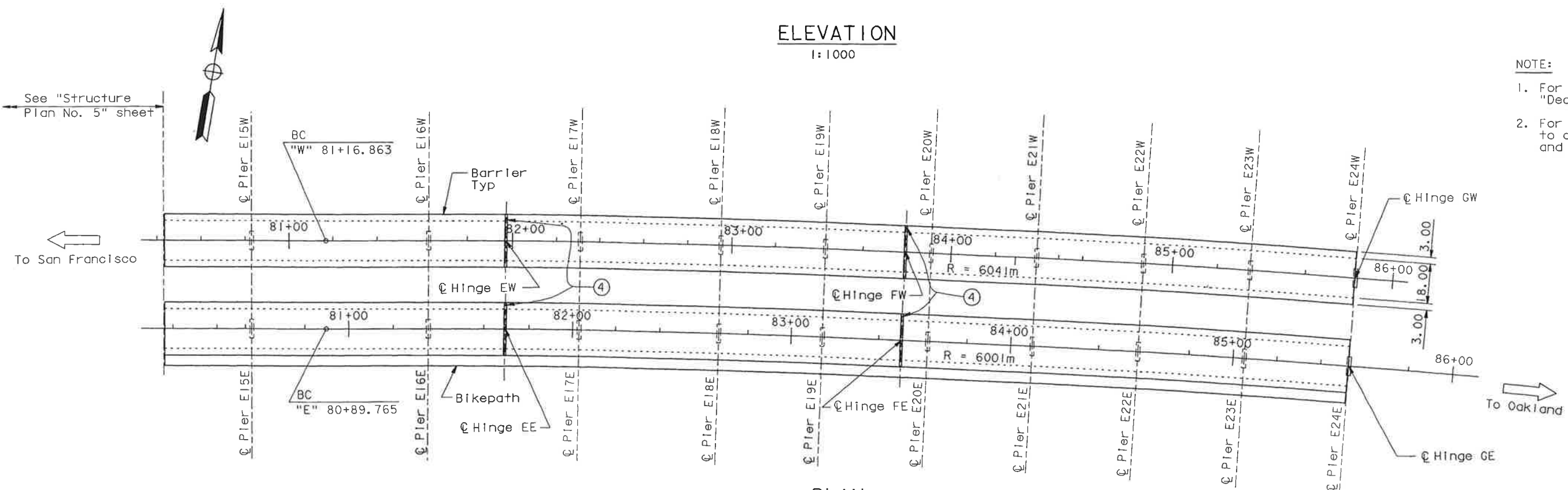
For total length, see "General Plan" sheet



ELEVATION
1:1000

- LEGEND:**
- ① Paint "Bridge No."
 - ② Paint "Bridge name" and year constructed.
 - ③ Paint Pier number
 - ④ Paint "Hinge"

- NOTE:**
1. For Deck Drain details, see "Deck Drains" sheet.
 2. For attachment of luminaries to concrete barrier, see and "Road Plans".



PLAN
1:1000

"W" LINE CURVE 3 DATA	"E" LINE CURVE 4 DATA
R=6041.000	R=6001.000
Δ=	Δ=
L=	L=
T=	T=

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

**SAN FRANCISCO OAKLAND BAY BRIDGE
 EAST SPAN SEISMIC SAFETY PROJECT**

DESIGN OVERSIGHT	DESIGN BY S. Hunter	CHECKED	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	BRIDGE NO. 34-0006
SIGN OFF DATE	DETAILS BY A. Sanchez	CHECKED		PROJECT ENGINEER R. Manzanarez
Rev. Date: 5-18-98	QUANTITIES BY	CHECKED		KILOMETER POS
ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS			CU 04 EA 012001	DISREGARD PRINTS BEARING EARLIER REVISION DATES

STRUCTURE PLAN NO. 6

DATE PLOTTED => 15 JUN 98 USERNAME => AL08



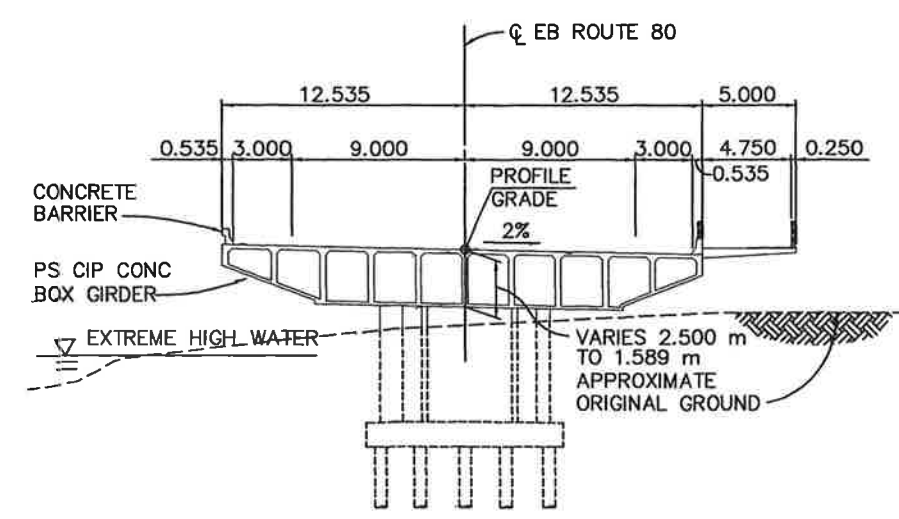
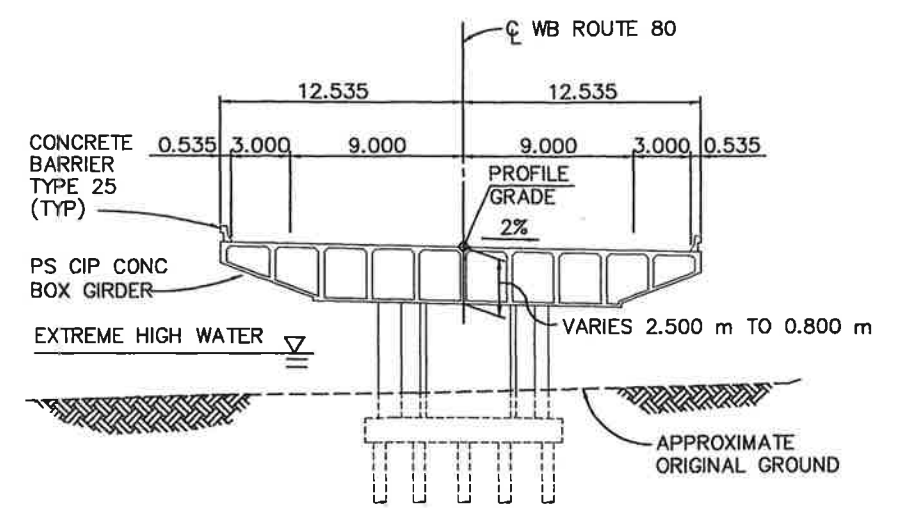
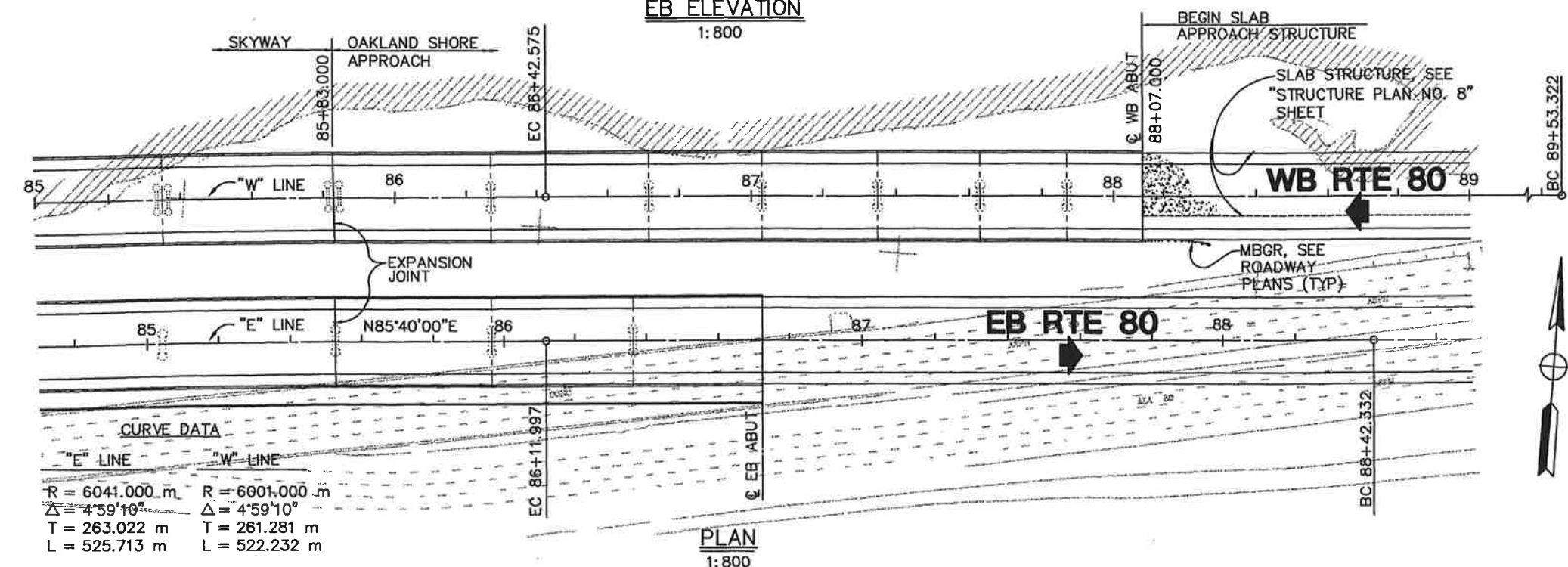
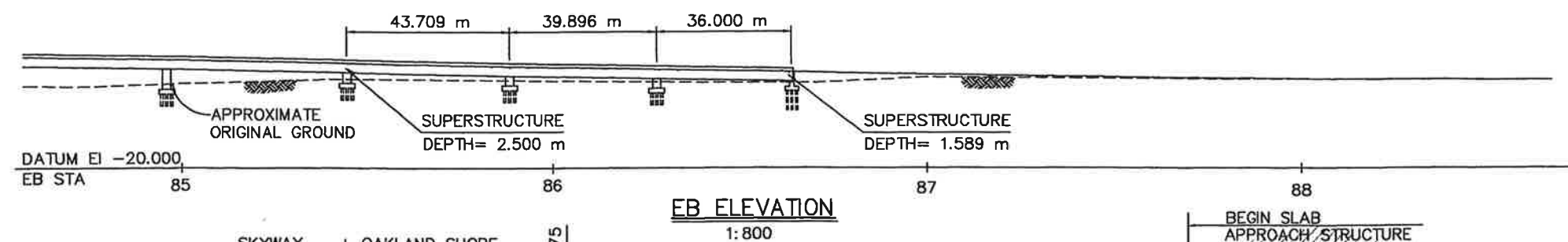
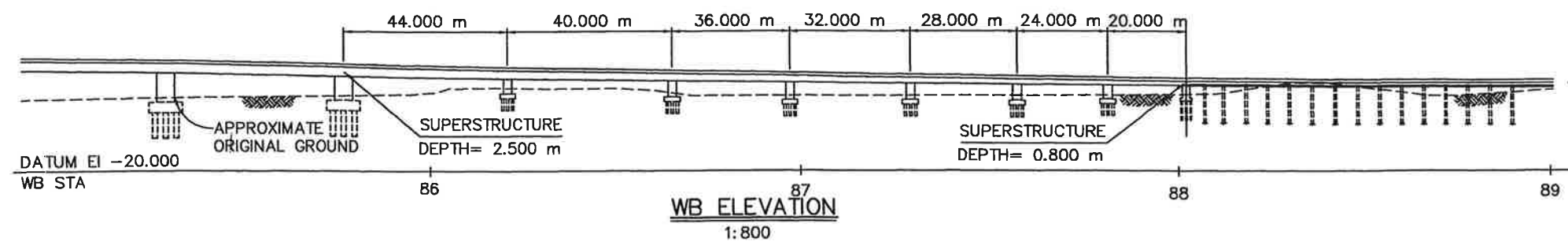
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04					

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

T. Y. LIN INTERNATIONAL
MOFFATT & NICHOL ENGINEERS
A JOINT VENTURE
SAN FRANCISCO, CALIFORNIA

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DESIGN		BY	CHECKED	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	BRIDGE NO.	34-0006	
DETAILS		BY	CHECKED		PROJECT ENGINEER	POST KM	
QUANTITIES		BY	CHECKED				
ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS				0 20 40 60 80 100	CU 04 EA 012001	DISREGARD PRINTS BEARING EARLIER REVISION DATES	
SAN FRANCISCO OAKLAND BAY BRIDGE EAST SPAN SEISMIC SAFETY PROJECT						STRUCTURE PLAN NO. 7	
REVISION DATES (PRELIMINARY STAGE ONLY)						SHEET OF	



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04					

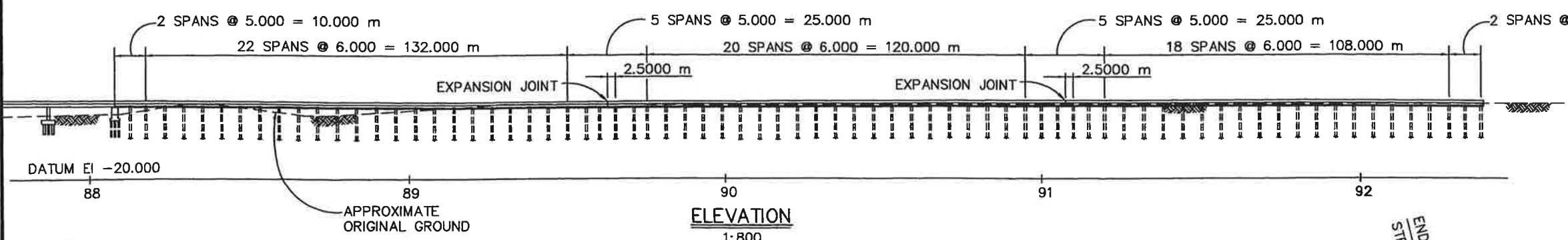
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

T. Y. LIN INTERNATIONAL
MOFFATT & NICHOL ENGINEERS
A JOINT VENTURE
SAN FRANCISCO, CALIFORNIA

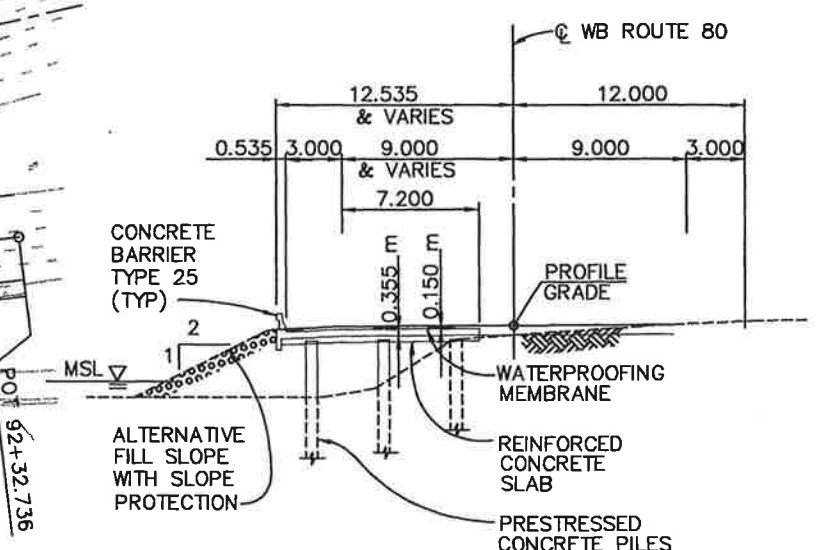
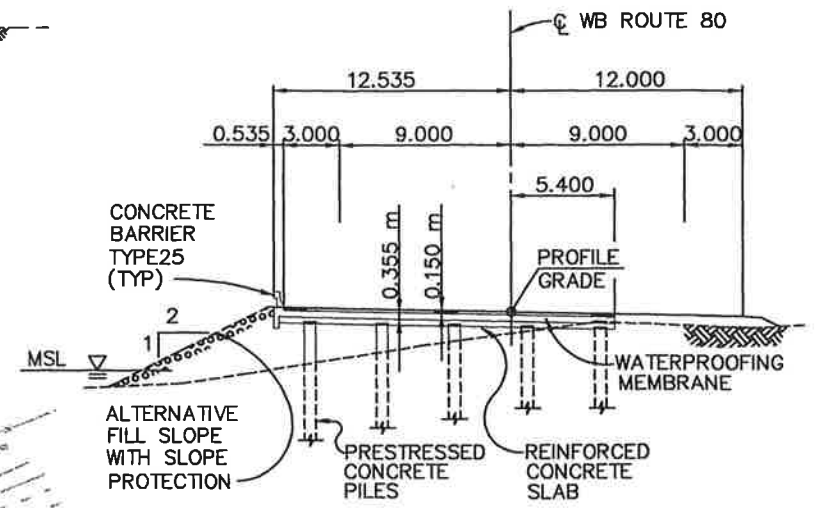
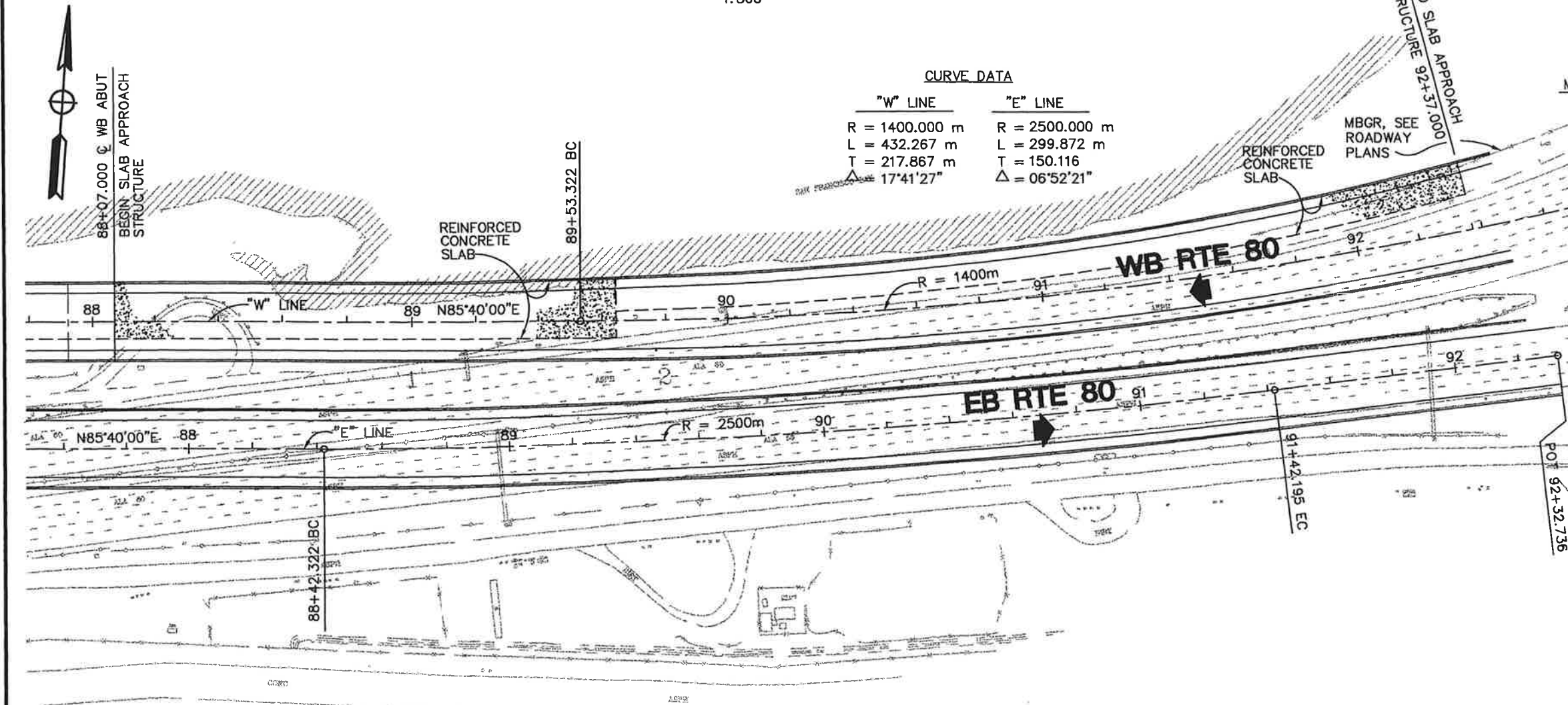
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REGISTERED PROFESSIONAL ENGINEER
A.L. ELY
No. 18880
Exp. 6-30-01
CIVIL
STATE OF CALIFORNIA



CURVE DATA

"W" LINE	"E" LINE
R = 1400.000 m	R = 2500.000 m
L = 432.267 m	L = 299.872 m
T = 217.867 m	T = 150.116 m
Δ = 17°41'27"	Δ = 06°52'21"



TYPICAL SECTIONS
1:200

ALL DIMENSIONS ARE SHOWN IN MILLIMETERS, EXCEPT AS NOTED

DESIGN	BY	CHECKED	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	BRIDGE NO. 34-0006
DETAILS	BY	CHECKED	PROJECT ENGINEER	POST KM
QUANTITIES	BY	CHECKED		

SAN FRANCISCO OAKLAND BAY BRIDGE EAST SPAN SEISMIC SAFETY PROJECT	
STRUCTURE PLAN NO. 8	
REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET OF



CU 04
EA 012001

DISREGARD PRINTS BEARING EARLIER REVISION DATES

LAST REV: 19 JUNE, 1998



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04					

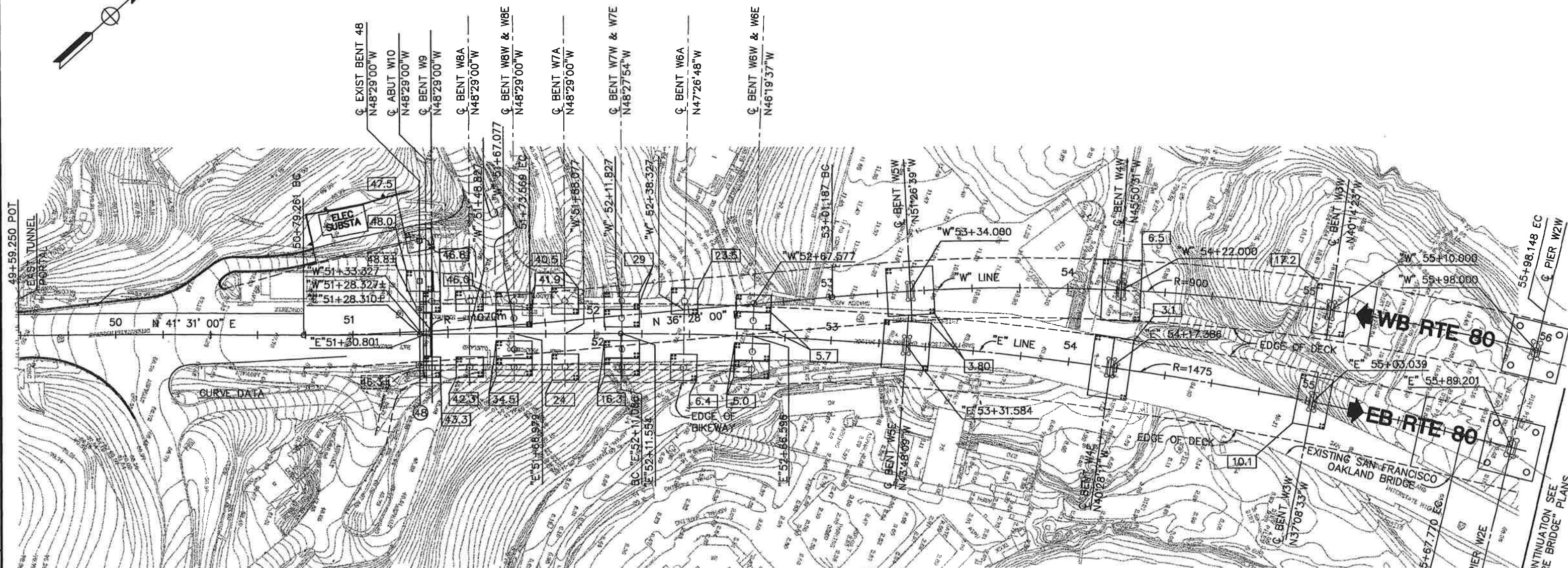
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

T. Y. LIN INTERNATIONAL
MOFFATT & NICHOL ENGINEERS
A JOINT VENTURE
SAN FRANCISCO, CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
A.L. ELY
No. 18880
Exp. 6-30-01
CIVIL
STATE OF CALIFORNIA

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Q EB RTE 80	Q WB RTE 80
R = 1475 m	R = 900 m
Δ = 13°51'19"	Δ = 18°54'19"
T = 179.216 m	T = 149.843 m
L = 356.683 m	L = 296.961 m
	R = 1070 m
	Δ = 05°03'00"
	T = 47.185 m
	L = 94.308 m

PLAN
1:800

- NOTES:
- INDICATES PILES - ALL PILES NOT SHOWN
 - + INDICATES ROCK ANCHORS - ALL ROCK ANCHORS NOT SHOWN
 - DENOTES BOTTOM OF NEW FOUNDATION
 - DENOTES BOTTOM OF EXISTING FOUNDATION

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DESIGN CHECKED	PHOTOGRAMMETRY AS OF:	DRAWN	BY	DESIGN	BY	CHECKED
BY DATE	SURVEYED	TRACED	BY	DETAILS	BY	CHECKED
BY DATE	FIELD CHECKED	CHECKED	BY	QUANTITIES	BY	CHECKED

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PROJECT ENGINEER	BRIDGE NO. 34-0006
	KILOMETER POST

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

FOUNDATION PLAN NO. 1



CU 04
EA 012001

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET	OF

FOR CONTINUATION SEE "SIGNATURE BRIDGE" PLANS

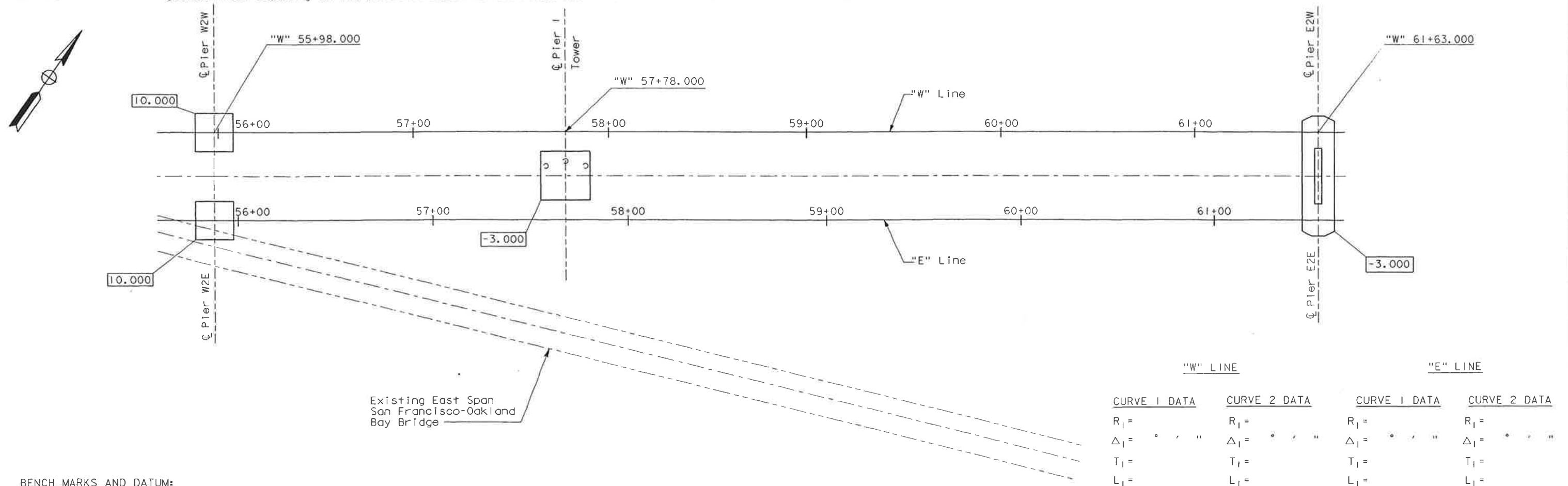


DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04					

REGISTERED ENGINEER - CIVIL
PLANS APPROVAL DATE
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T.Y. LIN / MOFFATT & NICHOL 825 BATTERY STREET SAN FRANCISCO, CA 94111
WEIDLINGER ASSOCIATES, INC. 375 HUDSON STREET, NEW YORK, NY 10014

Location	Pile type	Design Loadings (Service Load) (MN)		Nominal Resistance (MN)		Cut-off Elev (m)	Permanent casing Tip Elev (m)	Design Tip Elev (m)	Specified Tip Elev (m)
		Compression	Tension	Compression	Tension				
W2W	PP 2500 x 76, Type 2					14.00			-20.00
W2W	PP 2500 x 76, Type 3					14.00			-15.00
W2E	CIDH 2500					14.00			-6.00
Tower	PP 2500 x 48, Type 1					1.00			-58.00
Piers E2W, E2E	PP 2500 x 48, Type 4					1.00			-92.00

- Design tip elevation is controlled by the following demands: (1) Compression; (2) Tension; (3) Lateral Loads
- The required ultimate geotechnical capacity of the piles is equal to 1.0 times the nominal resistance values shown above.



PLAN
1:1000

BENCH MARKS AND DATUM:

- LEGEND:**
- (○) Indicates pile
 - Indicates bottom of footing elevation

- NOTES:**
- For footing layout, see "Footing Layout" sheets.
 - Not all piles shown.

30% UNCHECKED

DESIGN OVERSIGHT		DESIGN BY G. Baker	CHECKED	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	BRIDGE NO. 34-0006	SAN FRANCISCO OAKLAND BAY BRIDGE EAST SPAN SEISMIC SAFETY PROJECT	
SIGN OFF DATE		DETAILS BY J. J. & E. A.	CHECKED		R. Manzanarez PROJECT ENGINEER		POST MILE
P: \BAY BRIDGE\WA1\REV\EW\FINAL2\sutowfnd.dgn		QUANTITIES BY	CHECKED		EA 012001		REVISION DATES (PRELIMINARY STAGE ONLY)

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS: 0 10 20 30 40 50

DISREGARD PRINTS BEARING EARLIER REVISION DATES: 6/16/98

SHEET 003 OF

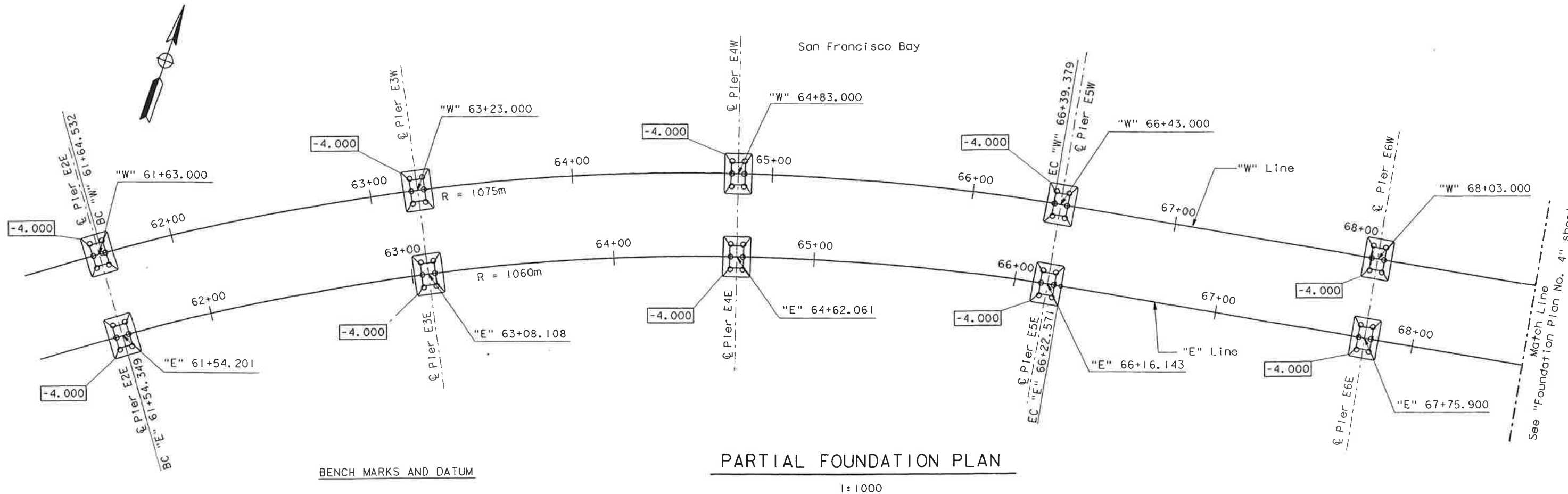


DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04					

REGISTERED ENGINEER - CIVIL	
PLANS APPROVAL DATE	
The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.	
T.Y. LIN / MOFFATT & NICHOL 825 BATTERY STREET SAN FRANCISCO, CA 94111	

Location	Pile type	PILE DATA							
		Design Loadings (Service Load) (MN)		Nominal Resistance (MN)		Cut-off Elev (m)	Permanent casing Tip Elev (m)	Design Tip Elev (m)	Specified Tip Elev (m)
		Compression	Tension	Compression	Tension				
Piers E3W-E3E	PP2500x70/60/40					-0.25			-76.00
Piers E4W-E4E	PP2500x70/60/40					-0.25			-79.00
Piers E5W-E5E	PP2500x70/60/40					-0.25			-88.00
Piers E6W-E6E	PP2500x70/60/40					-0.25			-95.00
Piers E7W-E10E	PP2500x70/60/40					-0.25			-98.00
Piers E11W-E14E	PP1500x60/50/40					0.50			-98.00
Piers E15W-E22E	PP1000x35/25					0.00			-98.00

- Design tip elevation is controlled by the following demands: (1) Compression; (2) Tension; (3) Lateral Loads
- The required ultimate geotechnical capacity of the piles is equal to 1.0 times the nominal resistance values shown above.



LEGEND:

- Indicates piles
- Indicates bottom of footing elevation

Existing East Span
San Francisco-Oakland
Bay Bridge

NOTES:

- For Footing Layout, see "Footing Layout" sheet.
- For Pile Details, see "Pile Details" sheet.
- Similar layout for other skyway alternatives.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

DESIGN OVERSIGHT	SCALE:	VERT. DATUM	HORZ. DATUM	DESIGN BY S. Abbas	CHECKED	BRIDGE NO. 34-0006
SIGN OFF DATE	PHOTOGRAMMETRY AS OF:	ALIGNMENT TIES	DETAILS BY A. Lishansky	CHECKED	PROJECT ENGINEER R. Manzanarez	KILOMETER POST
Rev. Dater 5-18-98	SURVEYED BY	DRAFTED BY	QUANTITIES BY	CHECKED	DEPARTMENT OF TRANSPORTATION	FOUNDATION PLAN NO. 3
pl\bay br\ldg\hcs\crp01.dgn	FIELD CHECKED BY	CHECKED BY			CU 04 EA 012001	REVISION DATES (PRELIMINARY STAGE ONLY)



DISREGARD PRINTS BEARING EARLIER REVISION DATES

USERNAME => ALISHANSKY DATE PLOTTED => 18 JUN 98 TIME PLOTTED => 14:51:37



DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04					

REGISTERED ENGINEER - CIVIL

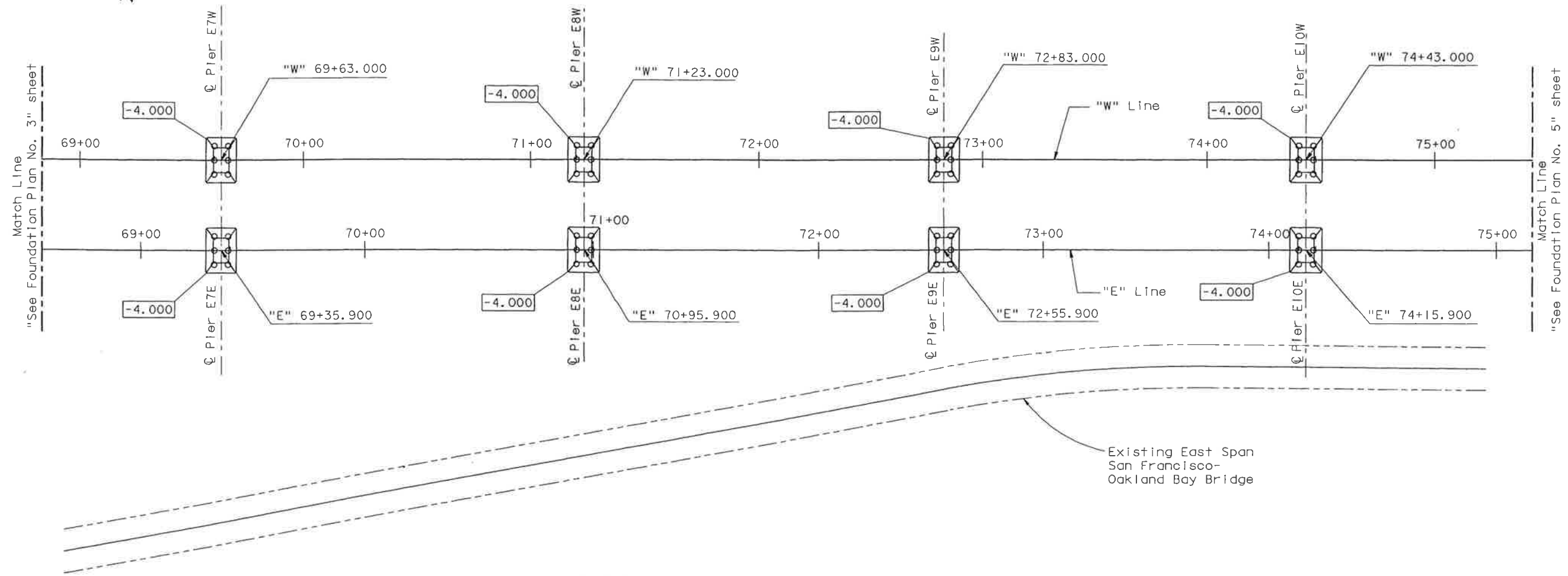
PLANS APPROVAL DATE

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T.Y. LIN / MOFFATT & NICHOL
825 BATTERY STREET
SAN FRANCISCO, CA 94111



San Francisco Bay



PARTIAL FOUNDATION PLAN
1:1000

- LEGEND:**
- Indicates piles
 - Indicates bottom of footing elevation

- NOTES:**
- For Bench Marks and Datum, see "Foundation Plan No. 1" sheet.
 - Similar layout for other skyway alternatives.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DESIGN OVERSIGHT	SCALE:	VERT. DATUM	HORZ. DATUM	DESIGN BY J. Tognoli	CHECKED	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	BRIDGE NO. 34-0006
	PHOTOGRAMMETRY AS OF:	ALIGNMENT TIES	DETAILS BY A. Sanchez	CHECKED	PROJECT ENGINEER R. Manzanarez		KILOMETER POST
SIGN OFF DATE	SURVEYED BY	DRAFTED BY	QUANTITIES BY	CHECKED			
	FIELD CHECKED BY	CHECKED BY				CU 04 EA 012001	DISREGARD PRINTS BEARING EARLIER REVISION DATES

SAN FRANCISCO OAKLAND BAY BRIDGE EAST SPAN SEISMIC SAFETY PROJECT	
FOUNDATION PLAN NO. 4	
REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET OF



Rev. Date: 5-18-98
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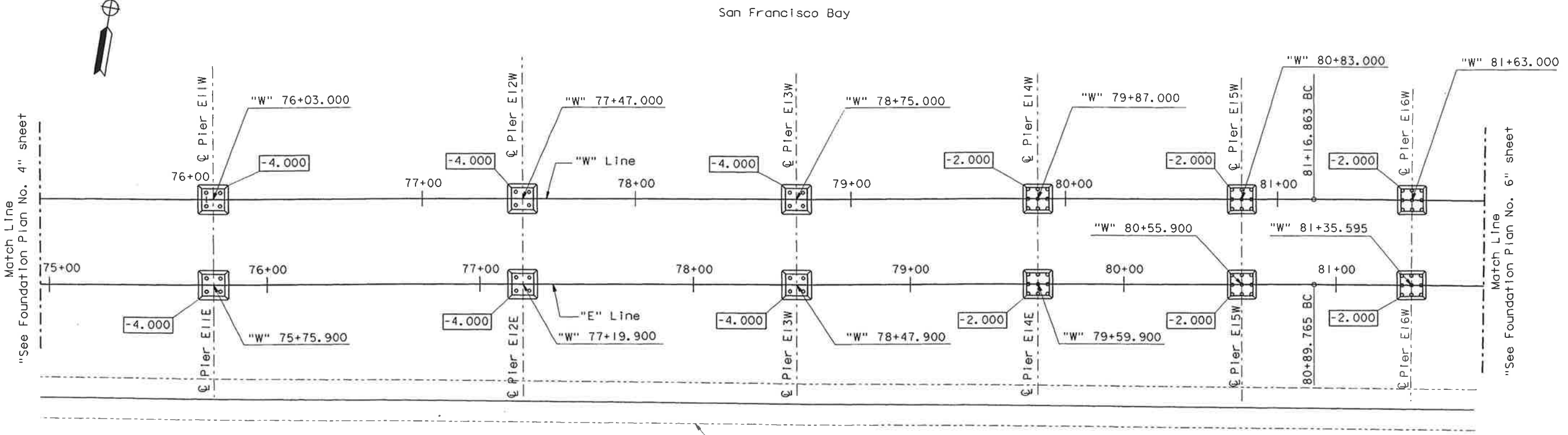
DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04					

REGISTERED ENGINEER - CIVIL

PLANS APPROVAL DATE

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T.Y. LIN / MOFFATT & NICHOL
825 BATTERY STREET
SAN FRANCISCO, CA 94111



PARTIAL FOUNDATION PLAN
1:1000

NOTES:

1. For Bench Marks and Datum, see "Foundation Plan No. 1" sheet.
2. Similar layout for other skyway alternatives.

LEGEND:

- Indicates piles
- Indicates bottom of footing elevation

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

**SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT**

DESIGN OVERSIGHT	SCALE:	VERT. DATUM	HORZ. DATUM	DESIGN BY M. Char	CHECKED	BRIDGE NO. 34-0006
SIGN OFF DATE	PHOTOGRAMMETRY AS OF:	ALIGNMENT TIES	DETAILS BY A. Lishansky	CHECKED	PROJECT ENGINEER R. Manzanarez	KILOMETER POST
Rev. Date: 5-18-98 pl\bay bridge\hcs\cfp03.dgn	SURVEYED BY	DRAFTED BY	QUANTITIES BY	CHECKED	DEPARTMENT OF TRANSPORTATION	FOUNDATION PLAN NO. 5
	FIELD CHECKED BY	CHECKED BY			CU 04 EA 012001	REVISION DATES (PRELIMINARY STAGE ONLY)



USERNAME: alishansky DATE PLOTTED: 18 JUN 98 TIME PLOTTED: 15:22:51



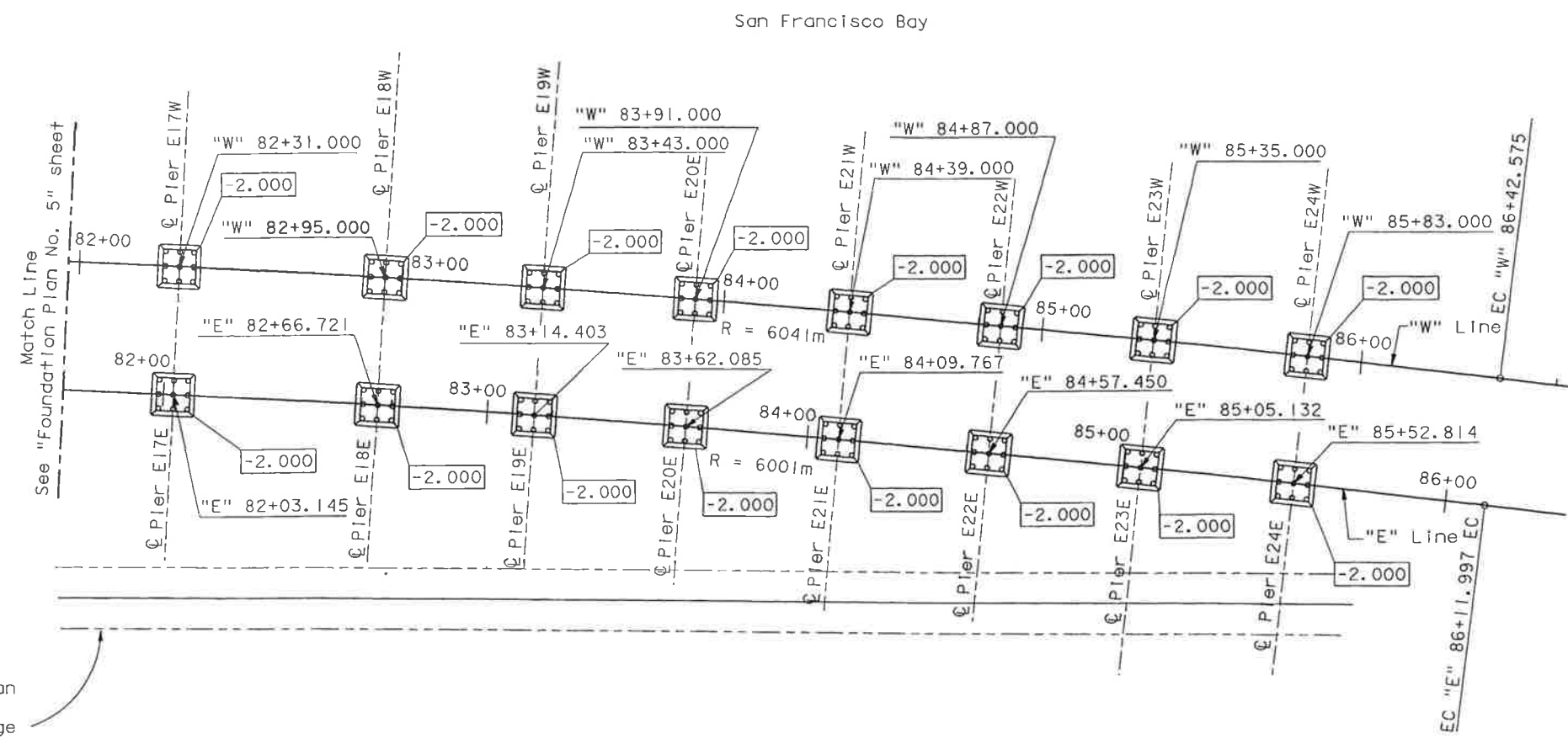
DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04					

REGISTERED ENGINEER - CIVIL

PLANS APPROVAL DATE

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T.Y. LIN / MOFFATT & NICHOL
825 BATTERY STREET
SAN FRANCISCO, CA 94111



PARTIAL FOUNDATION PLAN
1:1000

- LEGEND:
- Indicates piles
 - Indicates bottom of footing elevation

- NOTES:
- For Bench Marks and Datum, see "Foundation Plan No. 1" sheet.
 - Similar layout for other skyway alternatives.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DESIGN OVERSIGHT	SCALE:	VERT. DATUM	HORZ. DATUM	DESIGN BY M. Char	CHECKED	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	BRIDGE NO. 34-0006
SIGN OFF DATE	PHOTOGRAMMETRY AS OF:	ALIGNMENT TIES	DETAILS BY A. Lishansky	CHECKED	PROJECT ENGINEER R. Manzanarez		KILOMETER POST
	SURVEYED BY	DRAFTED BY	QUANTITIES BY	CHECKED			
	FIELD CHECKED BY	CHECKED BY					FOUNDATION PLAN NO. 6



Rev. Date: 5-18-96	ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS	CU 04 EA 012001	DISREGARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET OF
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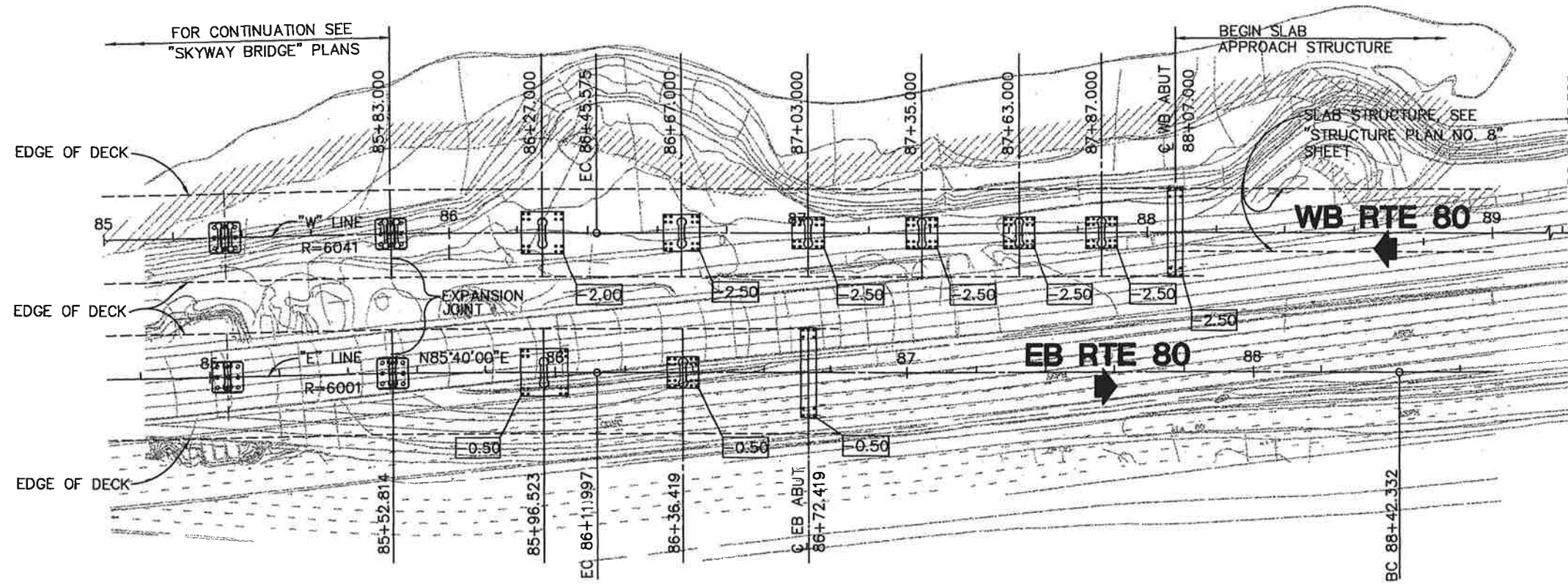
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04					

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

T. Y. LIN INTERNATIONAL
MOFFATT & NICHOL ENGINEERS
A JOINT VENTURE
SAN FRANCISCO, CALIFORNIA

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PLAN
1:800

CURVE DATA

"E" LINE	"W" LINE
R = 6001.000 m	R = 6041.000 m
Δ = 4°59'10"	Δ = 4°59'10"
L = 522.23 m	L = 525.71 m

- NOTES:
- # INDICATES PILES - ALL PILES NOT SHOWN
 - DENOTES BOTTOM OF NEW FOUNDATION

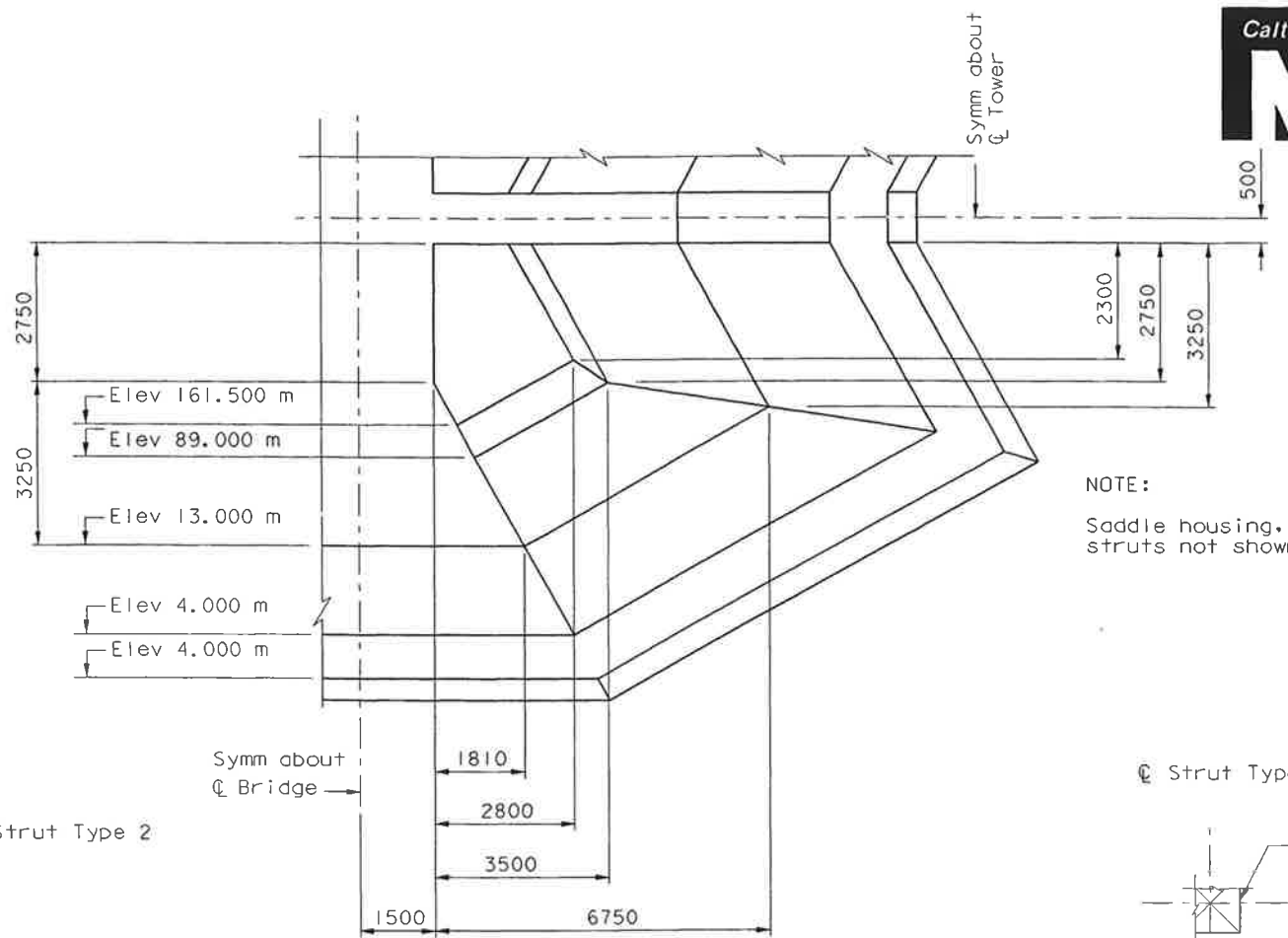
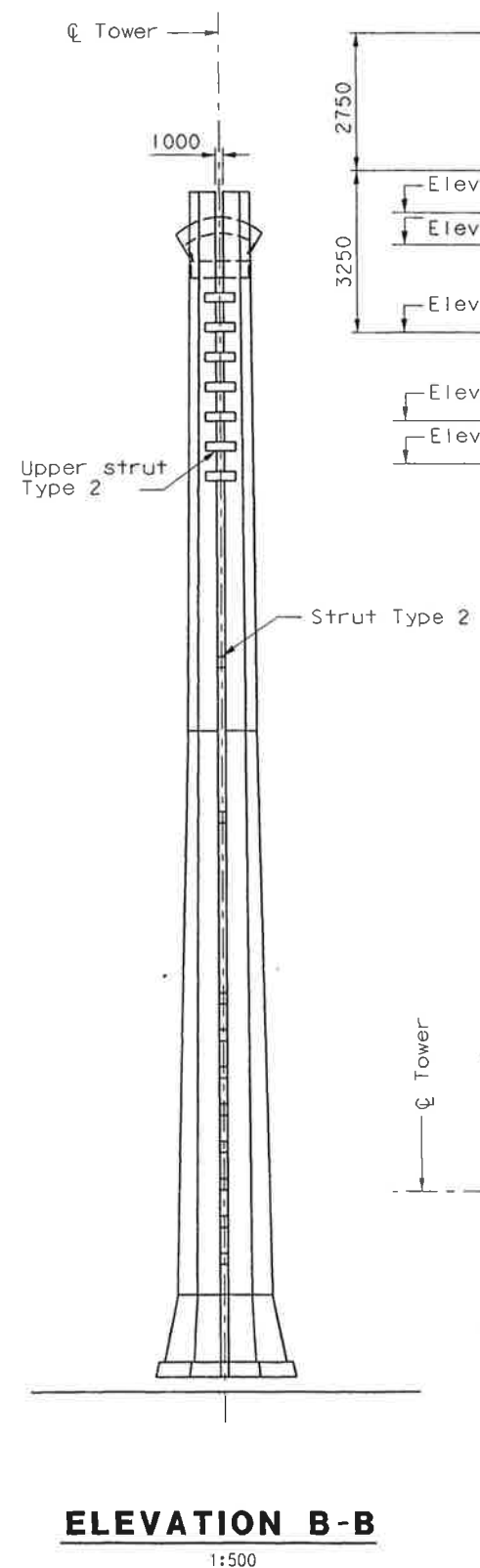
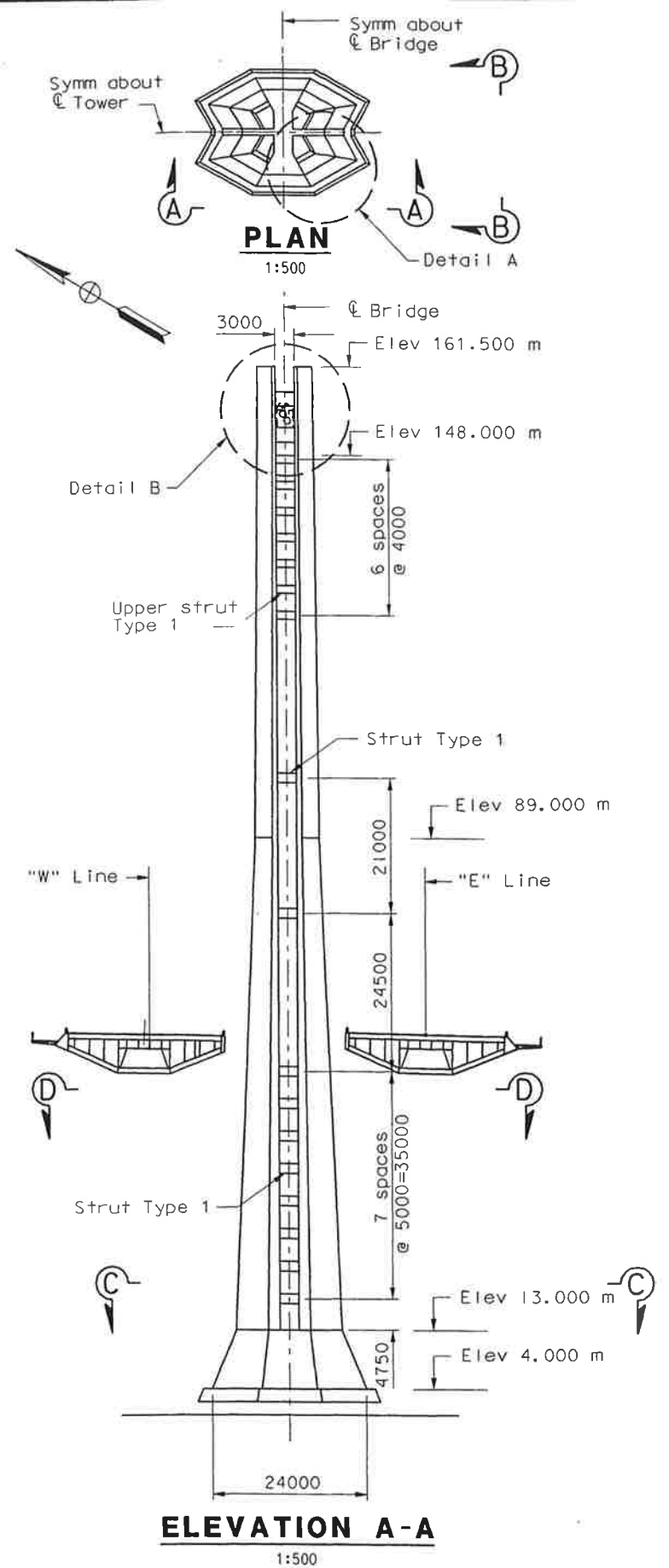


ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

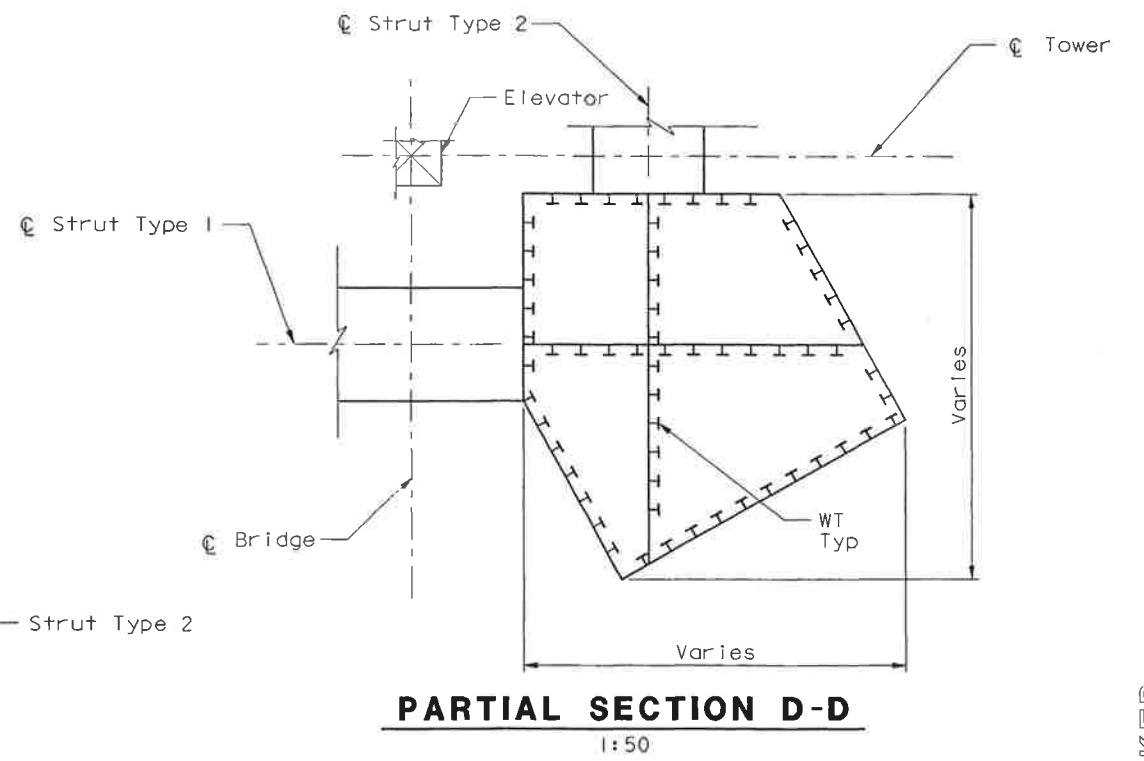
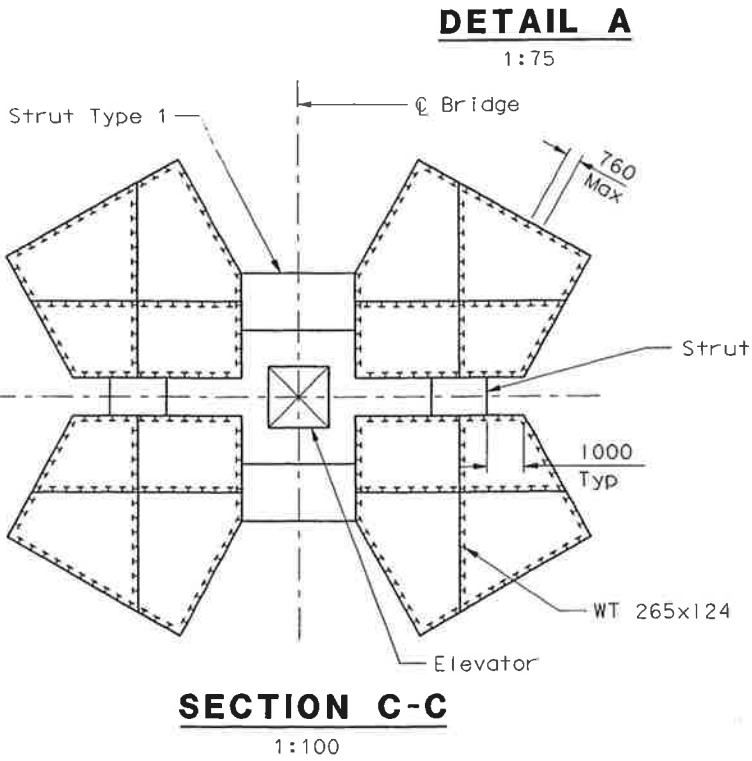
PHOTOGRAMMETRY AS OF:				DESIGN				PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION				BRIDGE NO. 34-0006		SAN FRANCISCO OAKLAND BAY BRIDGE EAST SPAN SEISMIC SAFETY PROJECT			
SURVEYED BY				DETAILS BY				PROJECT ENGINEER				KILOMETER POST		FOUNDATION PLAN NO. 7			
FIELD CHECKED BY				QUANTITIES BY				CU 04 EA 012001				DISREGARD PRINTS BEARING EARLIER REVISION DATES		REVISION DATES (PRELIMINARY STAGE ONLY)			
DRAWN BY				CHECKED BY				ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS				SHEET		OF			

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
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REGISTERED ENGINEER - CIVIL	
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NOTE:
Saddle housing, grillage and struts not shown for clarity.



All dimensions are in millimeters unless otherwise shown

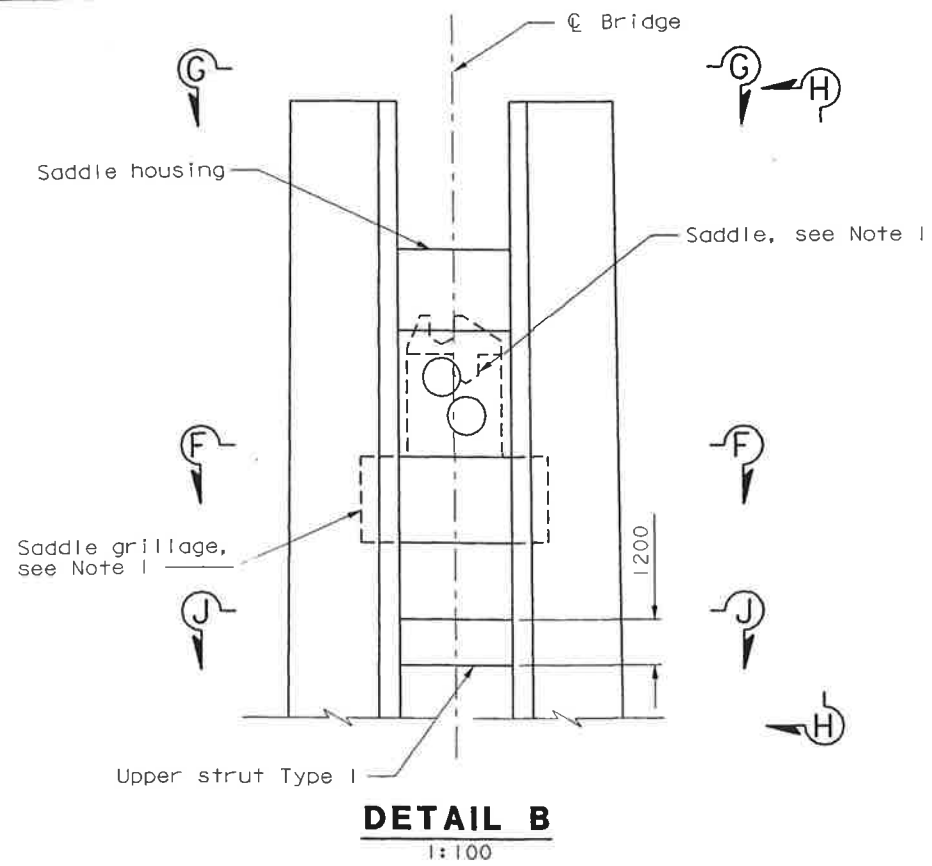
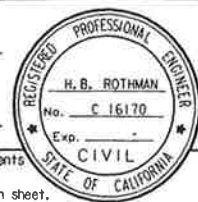
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	DETAILS	BY E. Zharkov	CHECKED		PROJECT ENGINEER	POST MILE	
	QUANTITIES	BY	CHECKED				
SIGN OFF DATE					TOWER DETAILS NO. 1		
P:\BAY BRIDGE\W1\REVIEW\FINAL2\stow801.dgn				ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 	CU 04 EA 012001	DISREGARD PRINTS BEARING EARLIER REVISION DATES 	

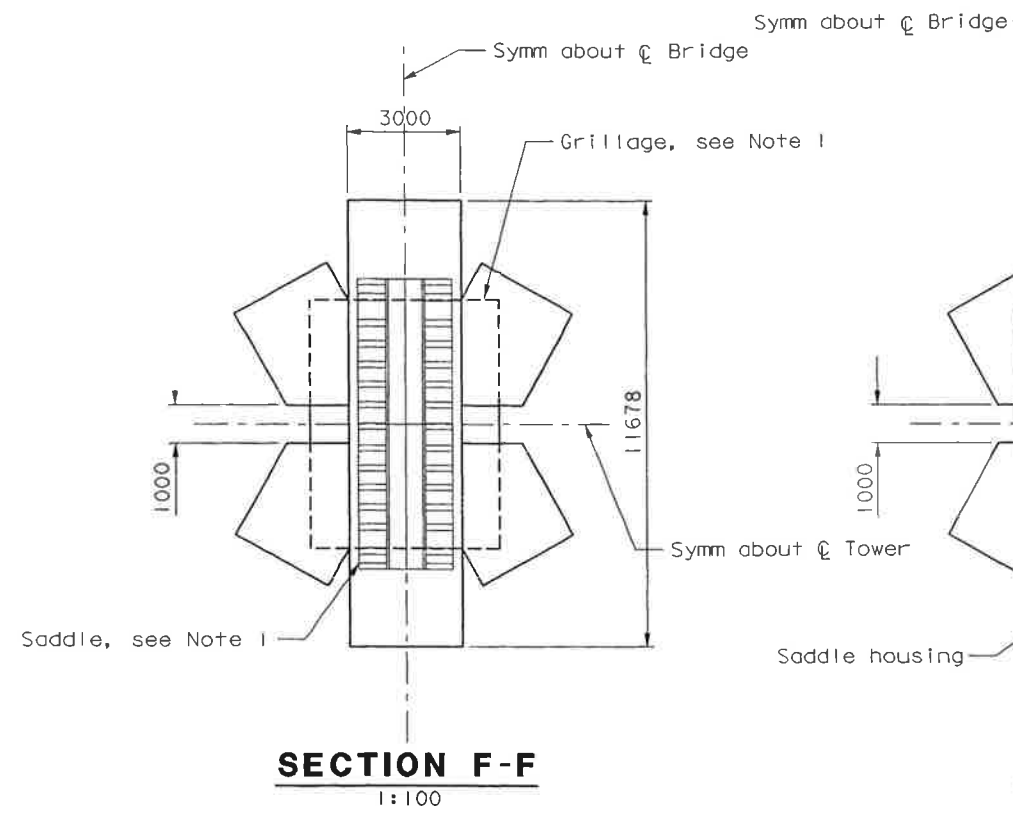


DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
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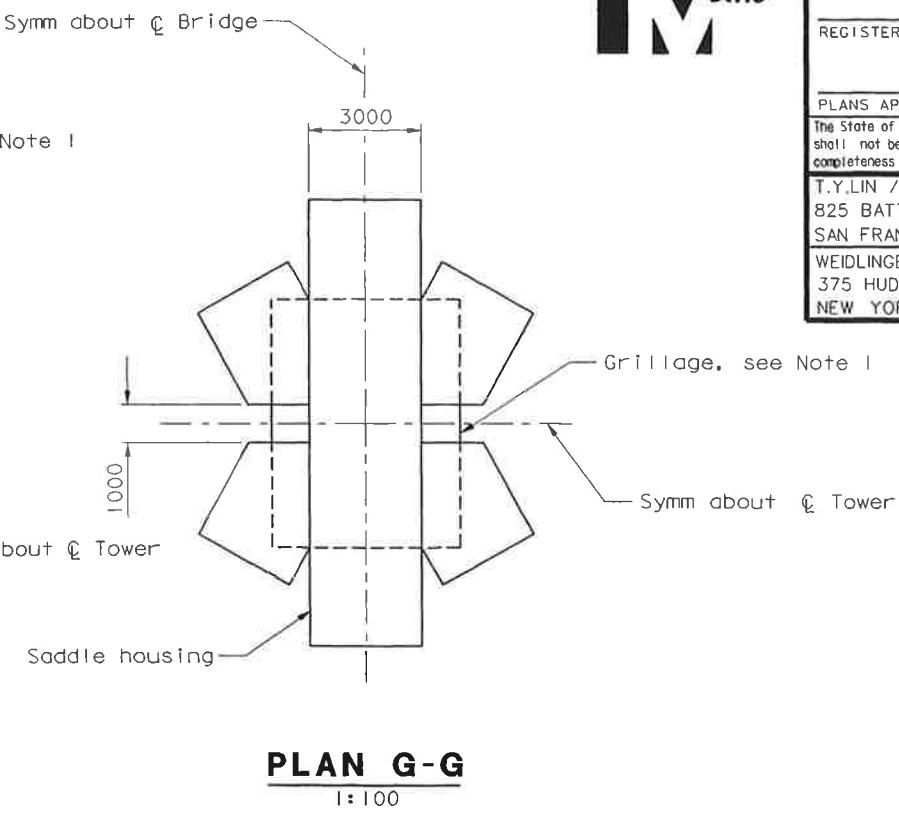
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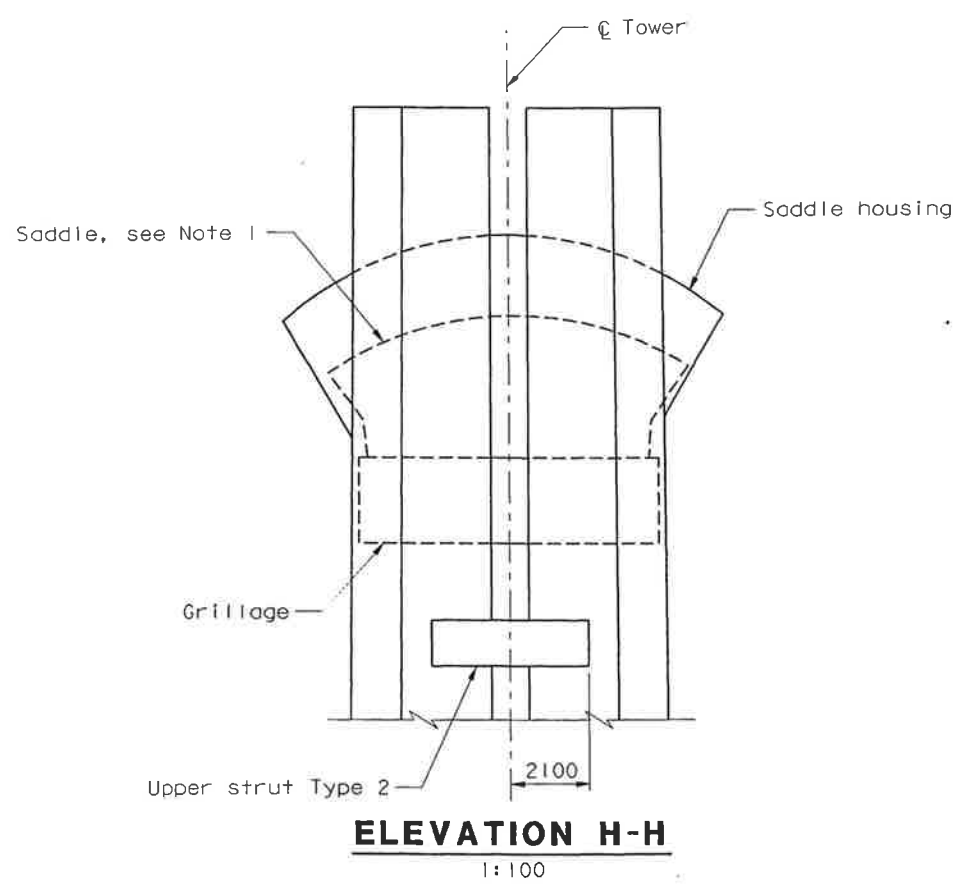
DETAIL B
1:100



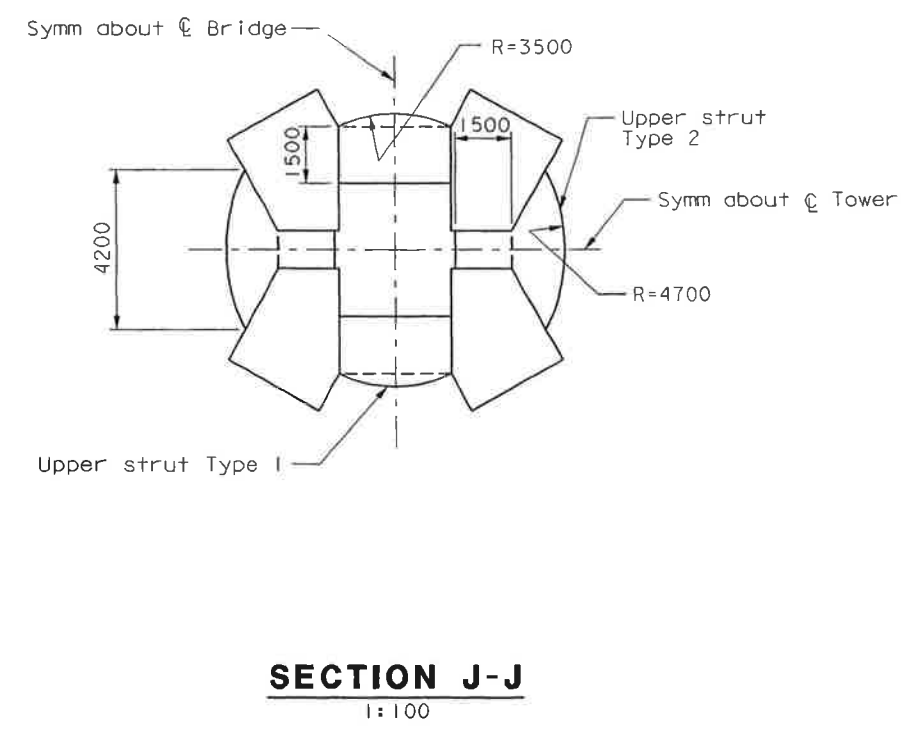
SECTION F-F
1:100



PLAN G-G
1:100



ELEVATION H-H
1:100



SECTION J-J
1:100

NOTES:

- For Saddle and Grillage details see "Splay Saddle Details No. 1" and "Splay Saddle Details No. 2" sheets.

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**SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT**

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	DETAILS	BY E. Zharkov	CHECKED		PROJECT ENGINEER	POST MILE	
	QUANTITIES	BY	CHECKED				

TOWER DETAILS NO.2

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ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS

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REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET	OF



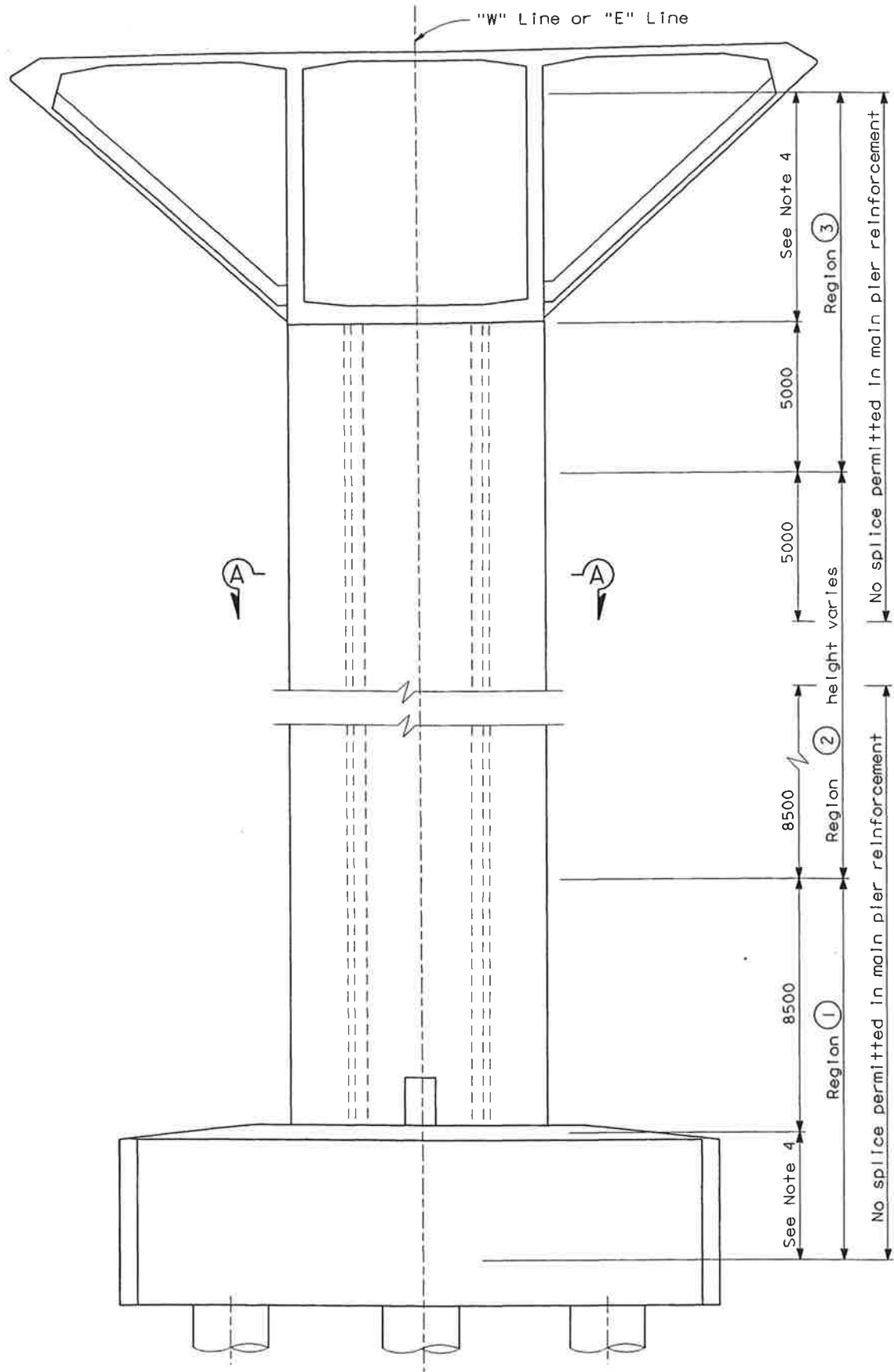
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REGISTERED ENGINEER - CIVIL

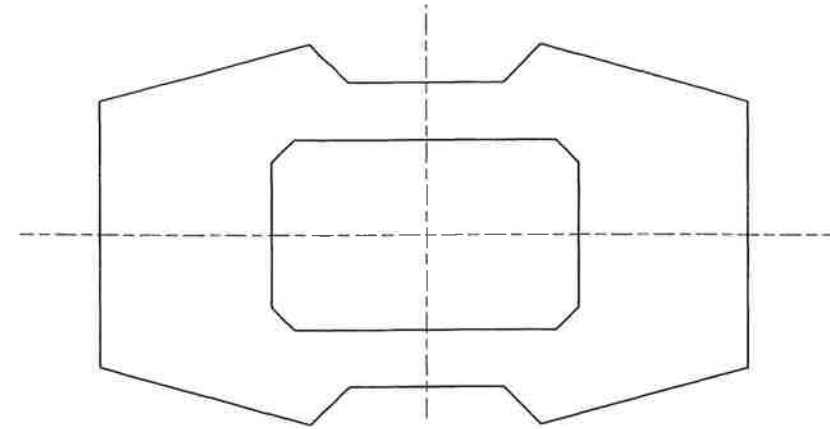
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825 BATTERY STREET
SAN FRANCISCO, CA 94111



ELEVATION (Piers E3W and E3E shown. Piers E4W thru E10E similar.)
1:100



SECTION A-A
1:50

NOTES:

1. For "Bar Spiral Splice & Spiral Anchor and Hoop Detail", in Regions ① & ③, see "Pier Details" sheet.
2. For development of main pier reinforcement see "Footing Details No. xxx" & "Pier Table Details No. xxx" sheets.
3. Epoxy coat all reinforcement below elevation XXX m.

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

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SIGN OFF DATE	DETAILS BY A. Lee	CHECKED		PROJECT ENGINEER R. Manzanarez
	QUANTITIES BY	CHECKED		KILOMETER POS.

PIER DETAILS	
REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET OF

Rev. Date: 5-10-98
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ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS

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6/11/98

DATE PLOTTED => 17 JUN 98 USERNAME => AL88



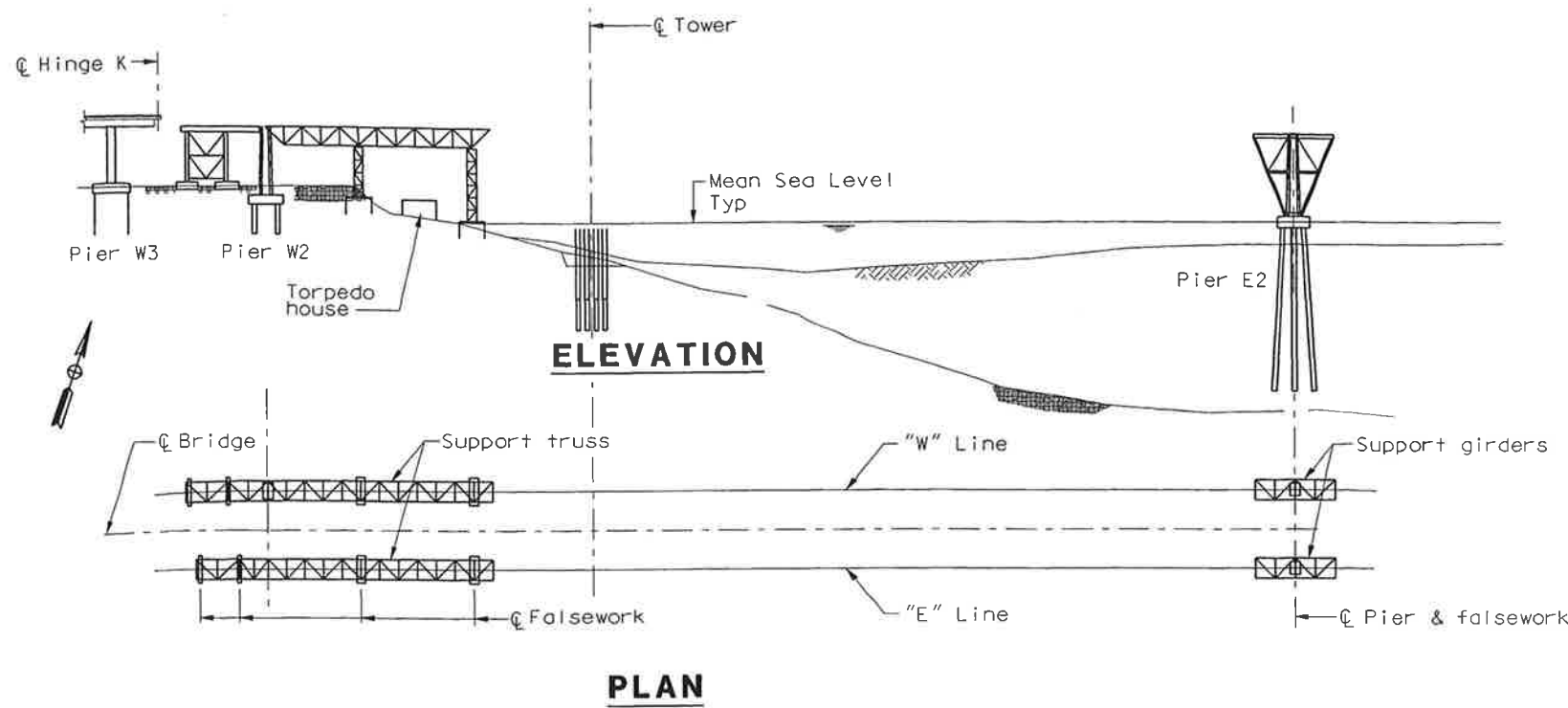
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04					

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No. C 16170
Exp. _____
CIVIL
STATE OF CALIFORNIA

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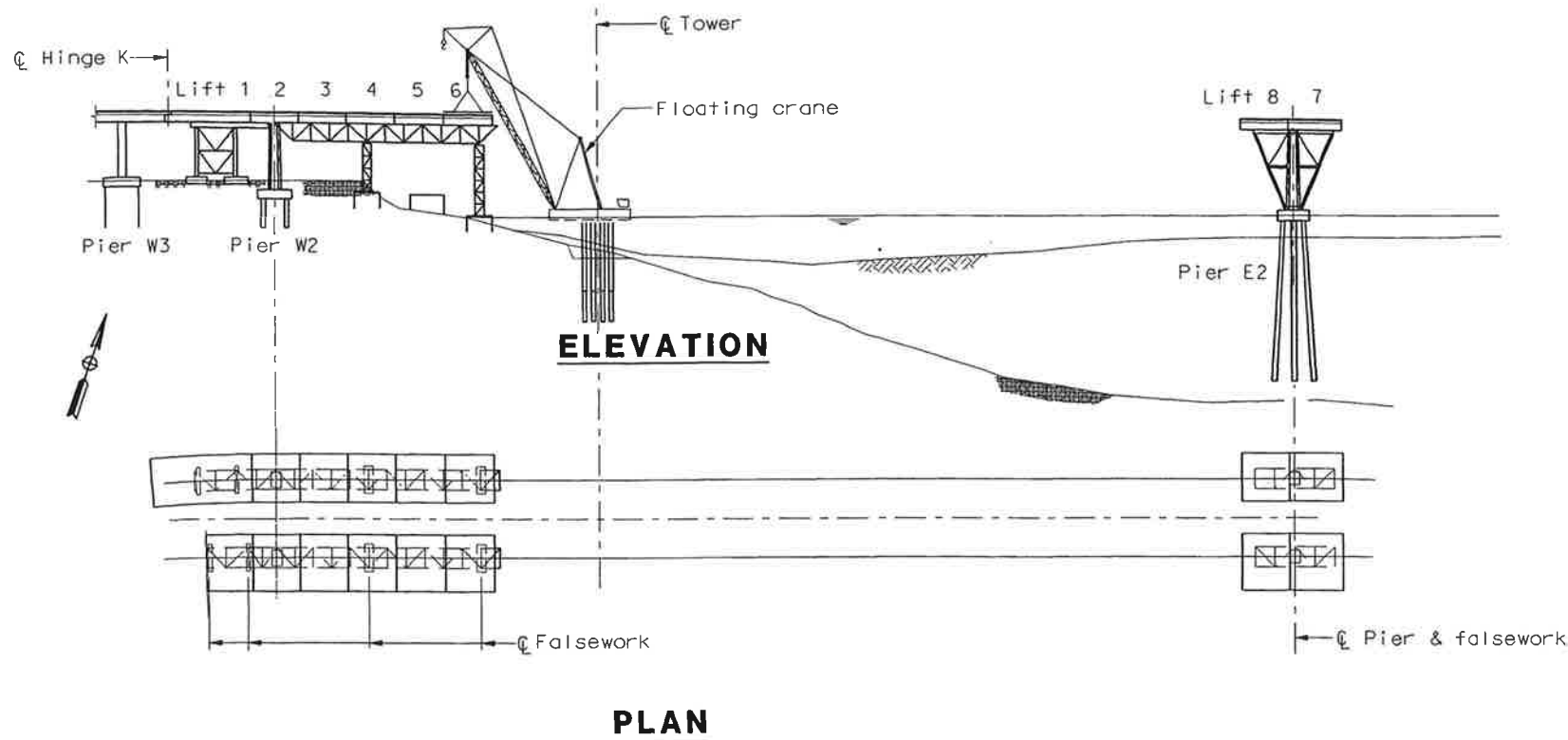
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 375 HUDSON STREET,
 NEW YORK, NY 10014



Step 1

- West span:
Erect falsework and trestle.
- East span:
Erect falsework at Pier E2.



Step 2

- West span:
With floating crane, lift six (6) deck sections for each roadway on trestle, roll each deck west, align and make up splices.
- East span:
With floating crane, lift two (2) deck sections for each roadway, onto falsework, align and make up splices.

NOTES:

1. Erection procedure continued on "Erection Procedure No.2" sheet.

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DESIGN OVERSIGHT	
SIGN OFF DATE	

DESIGN	BY G. Baker	CHECKED
DETAILS	BY E. Zharkov	CHECKED
QUANTITIES	BY	CHECKED

**PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION**

R. Manzanarez
PROJECT ENGINEER

BRIDGE NO.	34-0006
POST MILE	

**SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT**

ERECTION PROCEDURE NO.1

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ORIGINAL SCALE IN MILLIMETERS
FOR REDUCED PLANS

CU 04
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DISREGARD PRINTS BEARING
EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)										SHEET	OF



DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04					

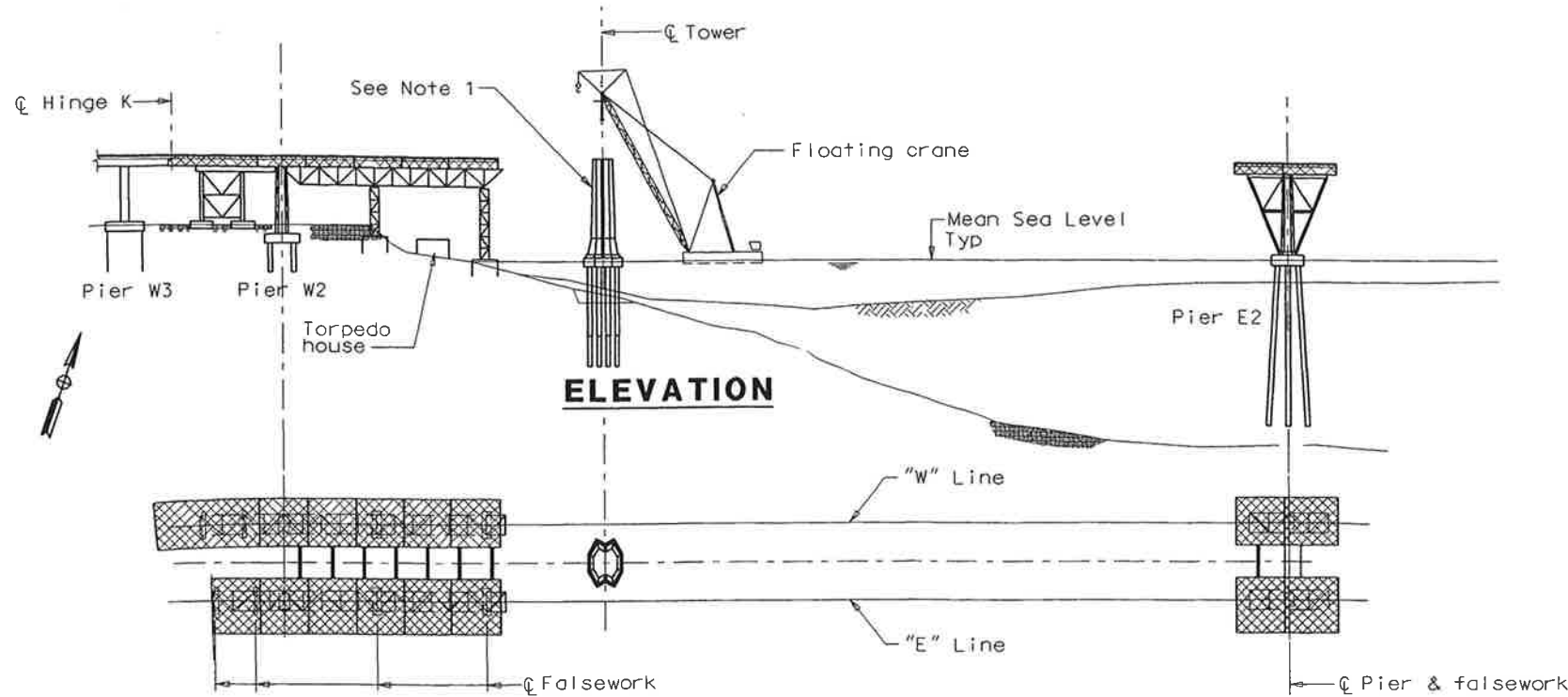
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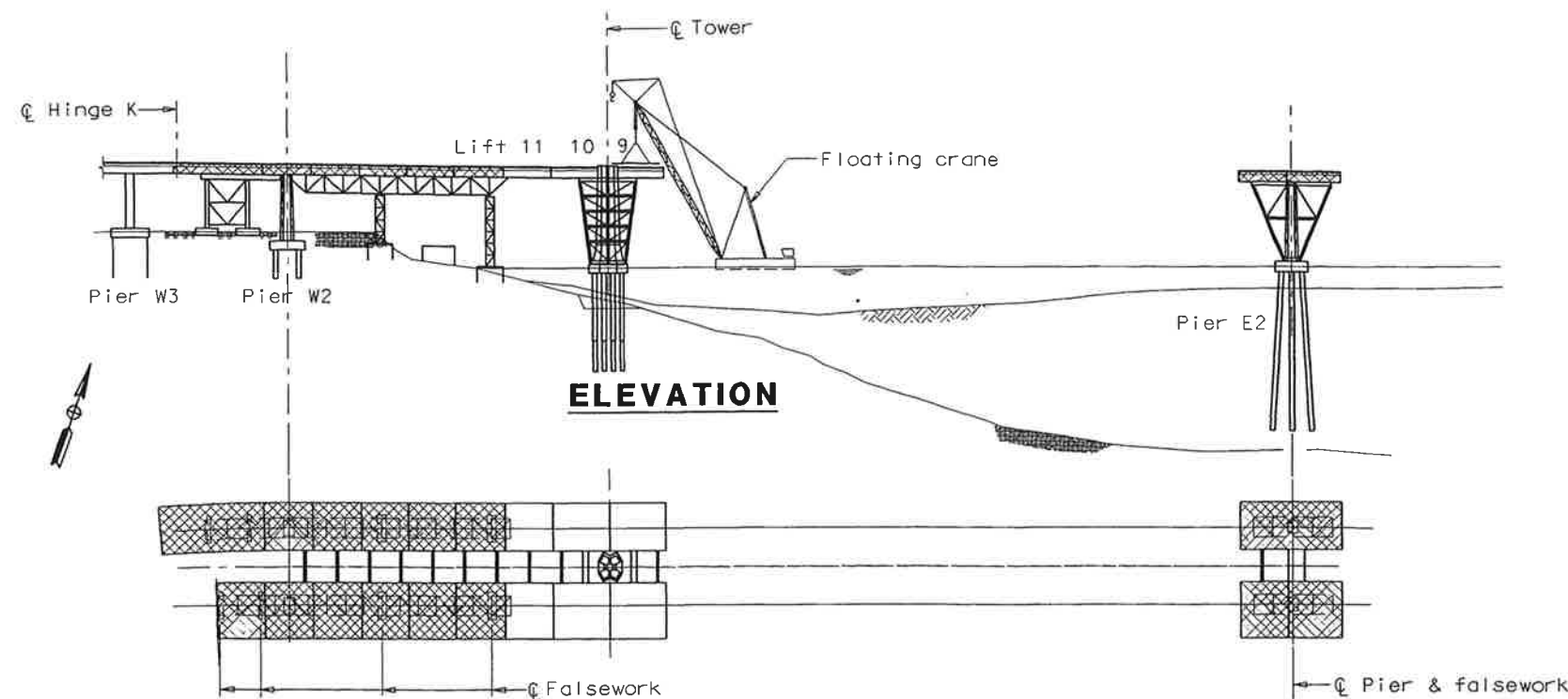
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NOTES:

1. With floating crane, erect tower to roadway and make up all splices.
See Step 1 of tower erection procedure.

PLAN



Step 3

1. With floating crane, erect inclined falsework, lift two (2) deck sections for each roadway and make up splices (Lift 9 and 10).
2. With floating crane, erect one (1) deck section for each roadway (Lift 11).
3. Jack deck sections positioned over the inclined falsework to the west, to close the west span. Make up splices.

NOTES:

1. Erection procedure continued on "Erection Procedure No.3" sheet.

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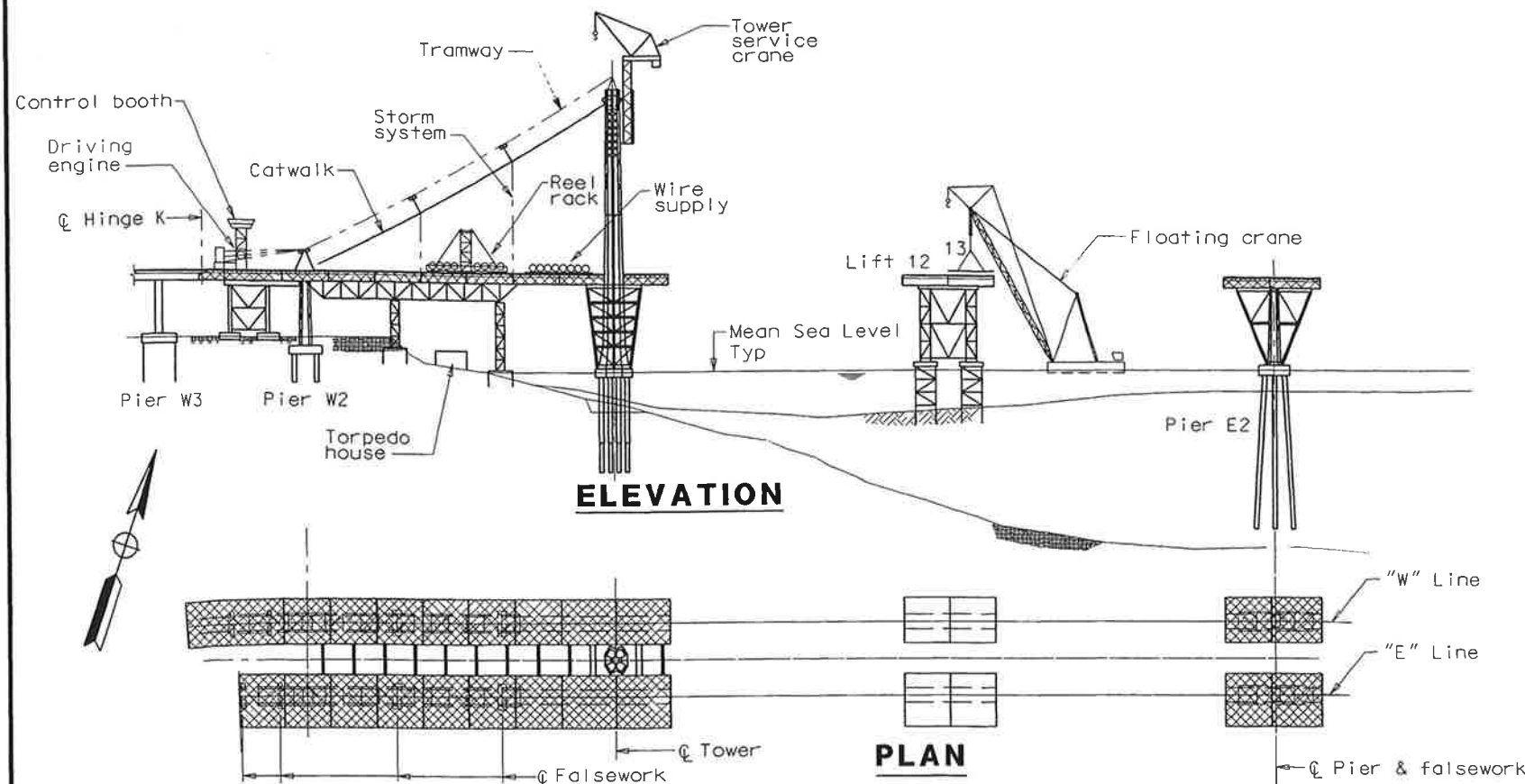
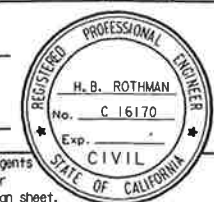
**SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT**

DESIGN OVERSIGHT	DESIGN BY G. Baker	CHECKED	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	BRIDGE NO.	ERECTION PROCEDURE NO. 2
SIGN OFF DATE	DETAILS BY E. Zharkov	CHECKED		34-0006	
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ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS			CU 04 EA 012001	DISREGARD PRINTS BEARING EARLIER REVISION DATES	



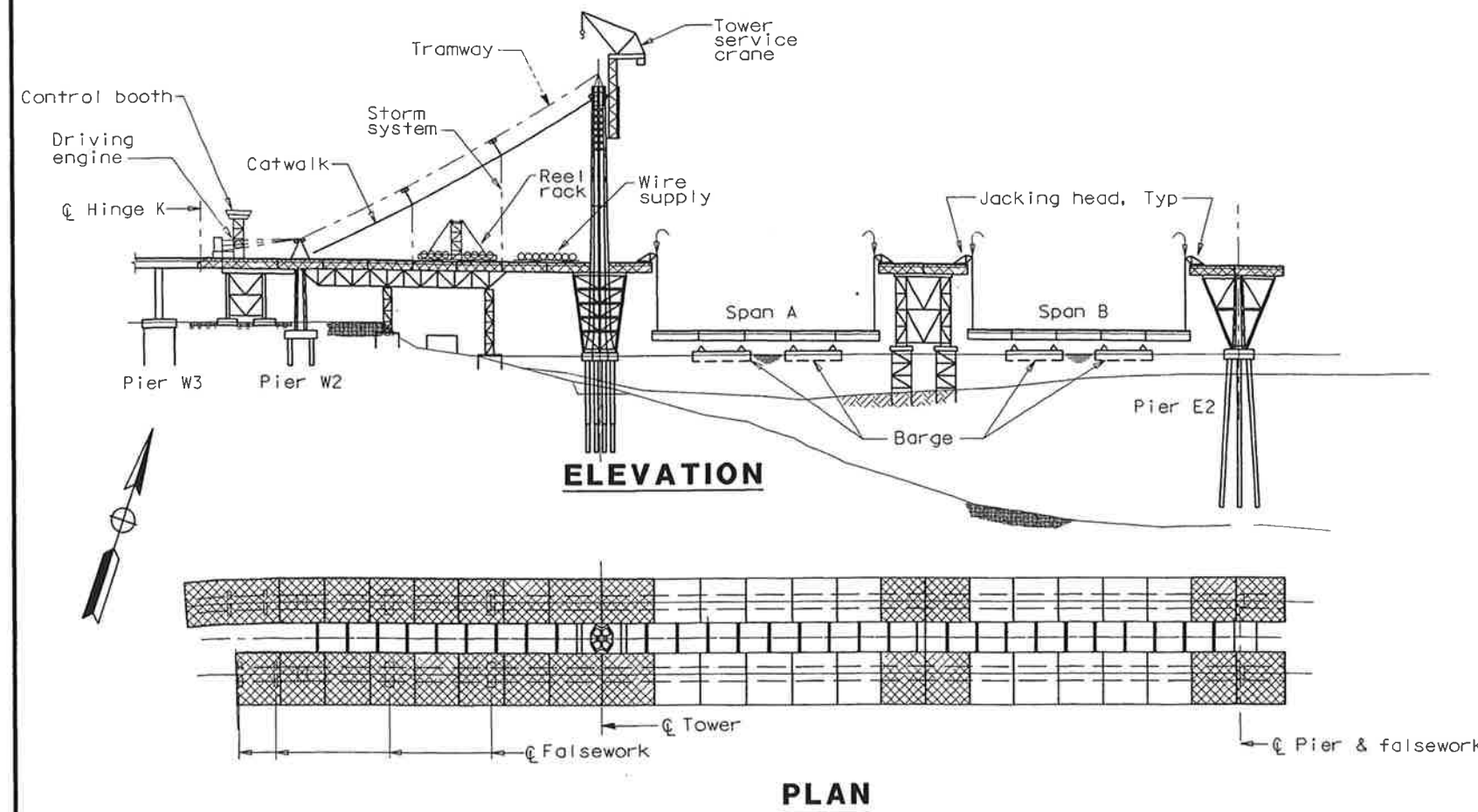
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
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Step 4

1. With floating crane, drive piles, erect pile bracing, grillages, jacking arrangement and falsework bent.
2. With floating crane, erect two (2) deck sections, for each roadway (Lift 12 and 13). Make up splices.
3. Erect catwalk, storm system and tramway in the west span. Place spinning machinery control booth, driving engine, reel rack and wire supply on the deck of the west span.



Step 5

1. Position jacking equipment on top of deck sections.
2. Load Span A and Span B previously assembled in yard onto barge, seafasten and float into position.
3. Cut seafastening, connect jacking strands to deck sections.
4. Lift Span A by jacking, jack deck sections on top of falsework west, to close span, make up splices.
5. Same procedure for Span B.

NOTES:

1. Erection procedure continued on "Erection Procedure No. 4" sheet.

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SAN FRANCISCO OAKLAND BAY BRIDGE EAST SPAN SEISMIC SAFETY PROJECT

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SIGN OFF DATE	DETAILS BY E. Zharkov	CHECKED	R. Manzanarez PROJECT ENGINEER	POST MILE	
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ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50

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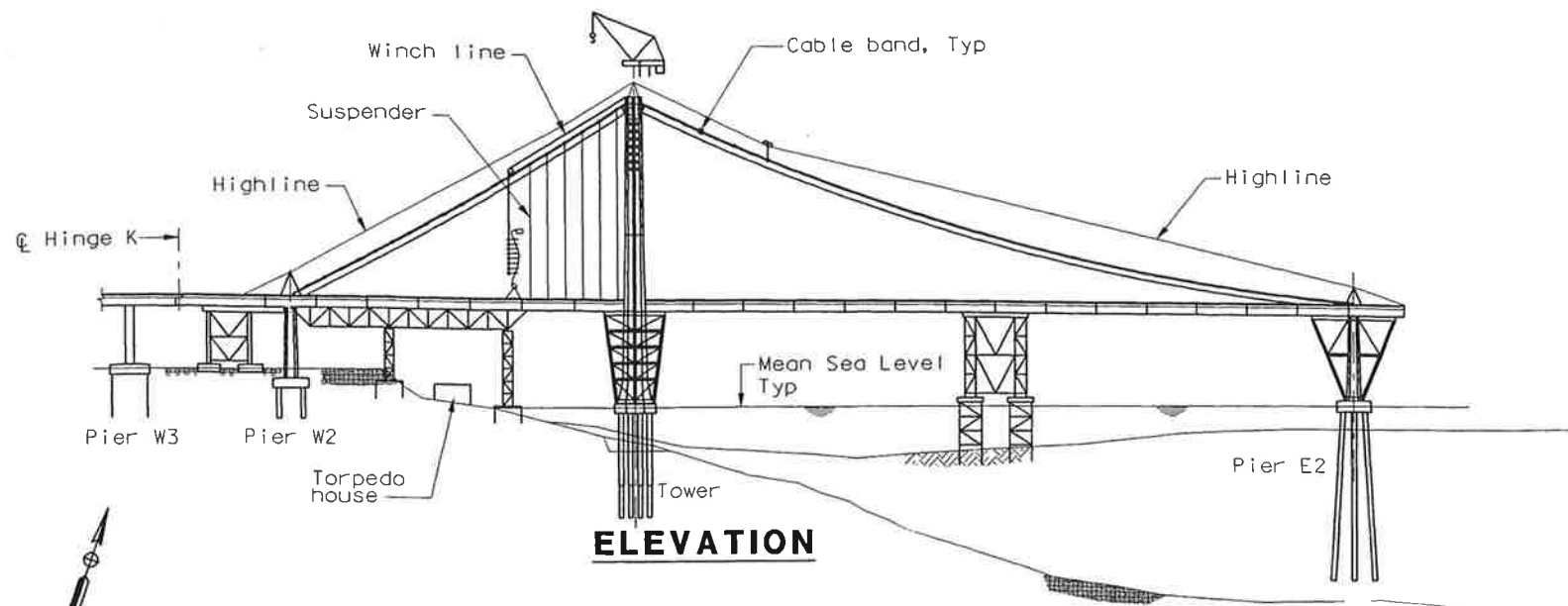
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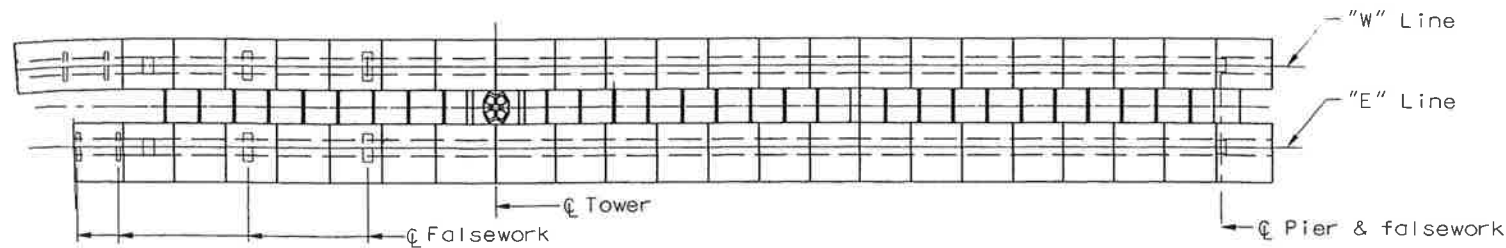
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04					

REGISTERED ENGINEER - CIVIL
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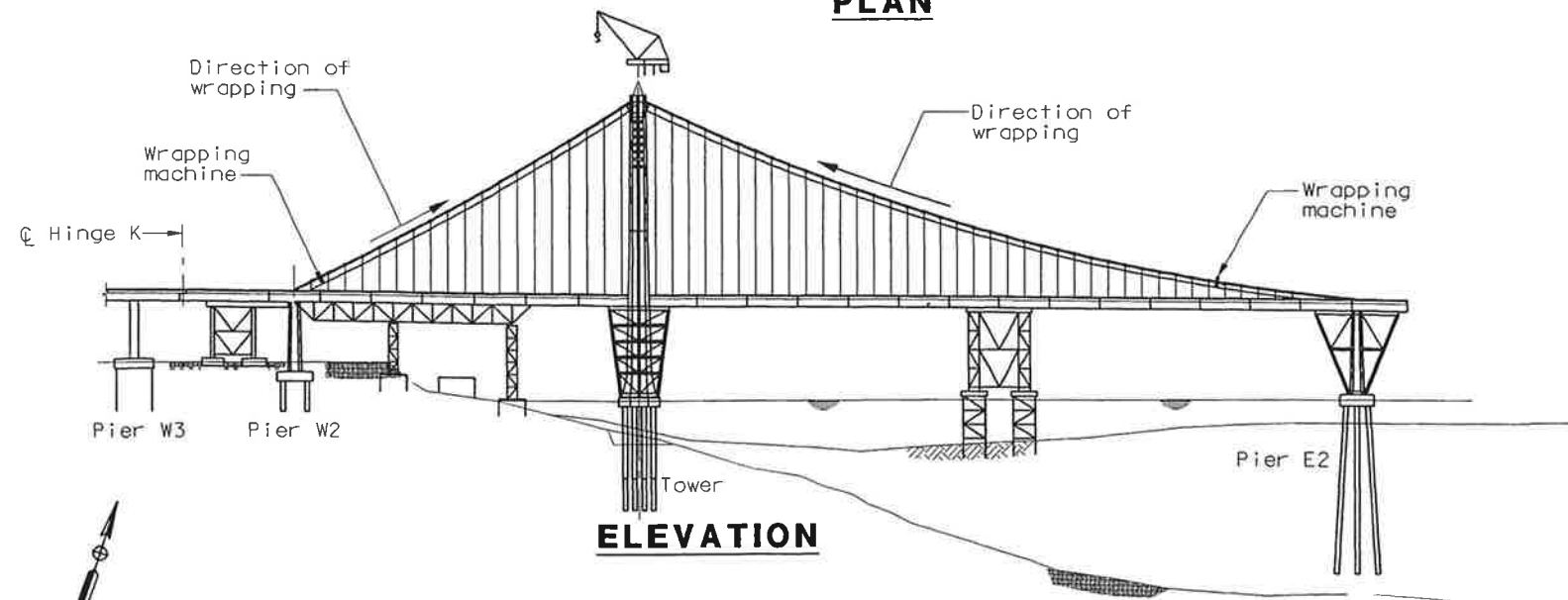
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375 HUDSON STREET,
NEW YORK, NY 10014



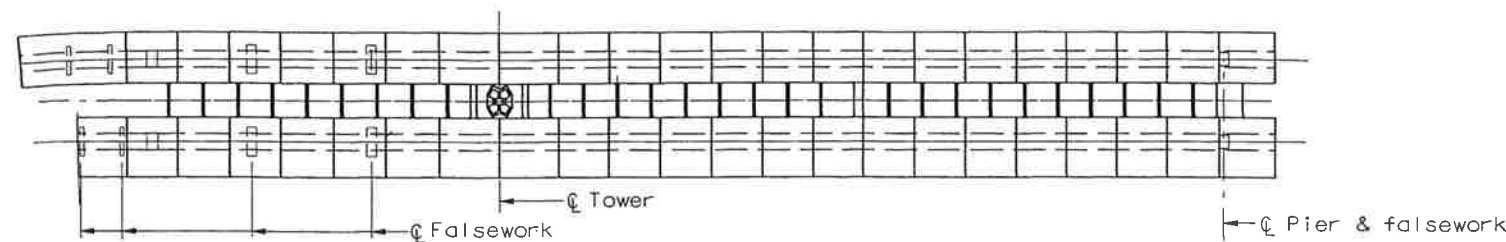
ELEVATION



PLAN



ELEVATION



PLAN

Step 8

1. Secure catwalk to cable.
2. Remove storm system and cross bridge.
3. Erect cable bands and suspenders at each cable and in each span.

Step 9

1. Connect suspenders to deck structure.
2. Jack down falsework and transfer load to suspenders.
3. Place wrapping machine on each cable and in each span.
4. Erect post and hand rail on top of cable.
5. Remove highline.
6. Wrap uphill.
7. Remove catwalk and tower service crane.
8. Remove falsework.

NOTES:

1. Erection procedure continued on "Erection Procedure No. 6" sheet.

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DESIGN OVERSIGHT	DESIGN	BY G. Baker	CHECKED	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	BRIDGE NO.	34-0006	SAN FRANCISCO OAKLAND BAY BRIDGE EAST SPAN SEISMIC SAFETY PROJECT
	DETAILS	BY E. Zharkov	CHECKED		PROJECT ENGINEER	R. Manzanarez	
SIGN OFF DATE	QUANTITIES	BY	CHECKED	CU 04 EA 012001	ERECTION PROCEDURE NO. 5		
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DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
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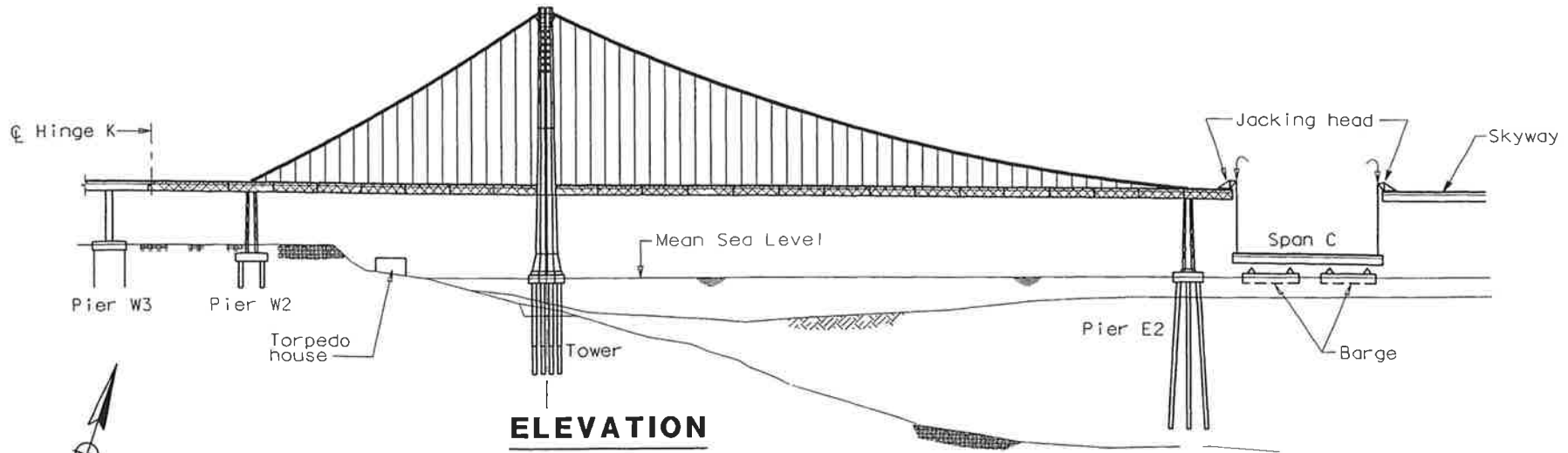
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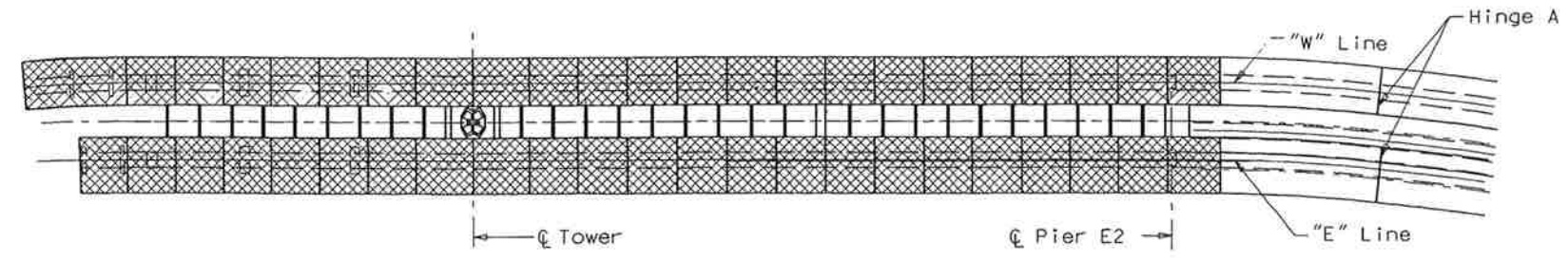
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Step 10

1. Position jacking equipment on top of deck structure.
2. Load out Span C onto barges, seafasten and float into position.
3. Cut seafastening and connect jacking strands.
4. Lift Span C by jacking.
5. Connect to Skyway.
6. Remove all equipment.



ELEVATION

PLAN

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SIGN OFF DATE		DETAILS BY E. Zharkov	CHECKED		PROJECT ENGINEER R. Manzanarez		
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ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS				0 10 20 30 40 50	CU 04	REVISION DATES (PRELIMINARY STAGE ONLY)	
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NEW YORK, NY 10014

Step 1

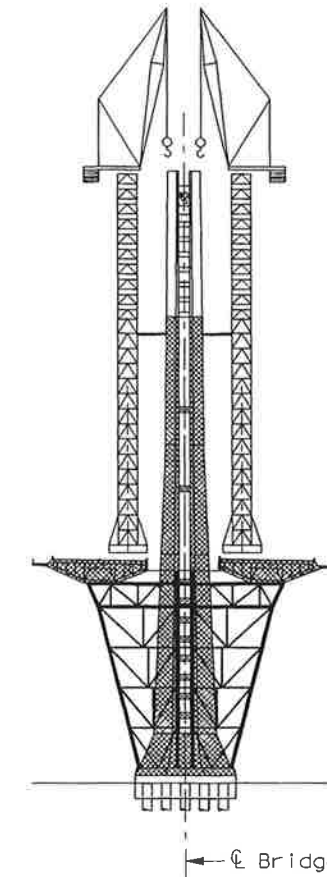
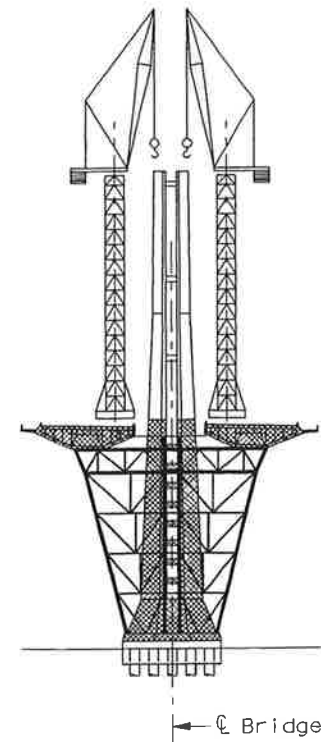
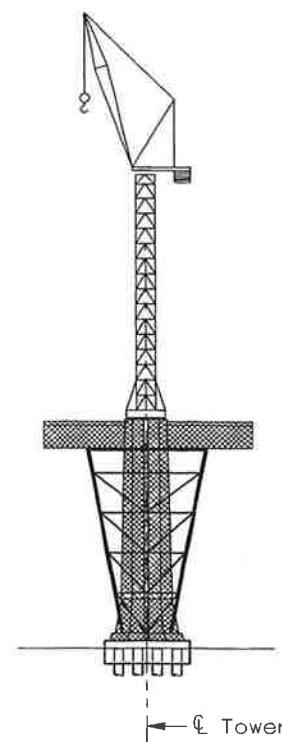
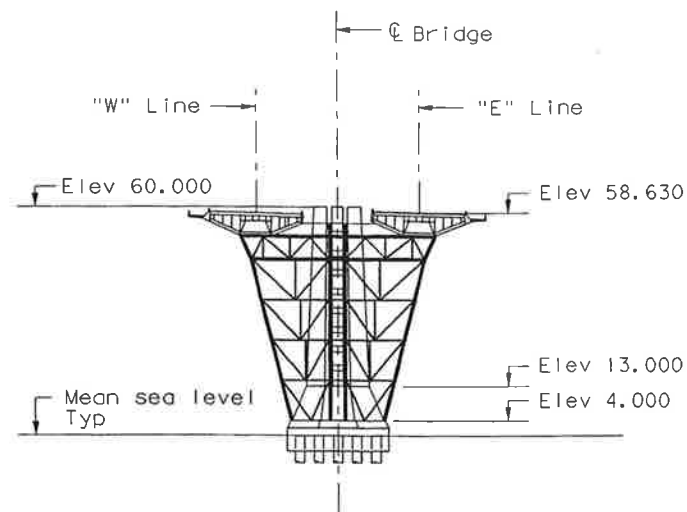
1. With Floating crane, place four (4) Base plates.
2. Erect four (4) Tower legs to Elev 60.000.
3. Erect falsework.
4. Place four (4) Roadway sections with Floating crane on top of falsework and secure.

Step 2

1. Position two (2) Tower cranes, one (1) on each roadway.
2. Erect four (4) Tower legs.

Step 3

1. Elevate Tower crane and tie into Tower.
2. Erect four (4) Tower legs.
3. Erect Saddle.
4. Dismantle one (1) Tower crane.
5. Tie second Tower crane to Tower.
6. Crane will serve as Tower service Crane during construction.



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SIGN OFF DATE		DETAILS BY E. Zharkov	CHECKED		PROJECT ENGINEER R. Manzanarez		POST MILE
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ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS				0 10 20 30 40 50	DISREGARD PRINTS BEARING EARLIER REVISION DATES		
REVISION DATES (PRELIMINARY STAGE ONLY)						SHEET OF	