DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	501	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

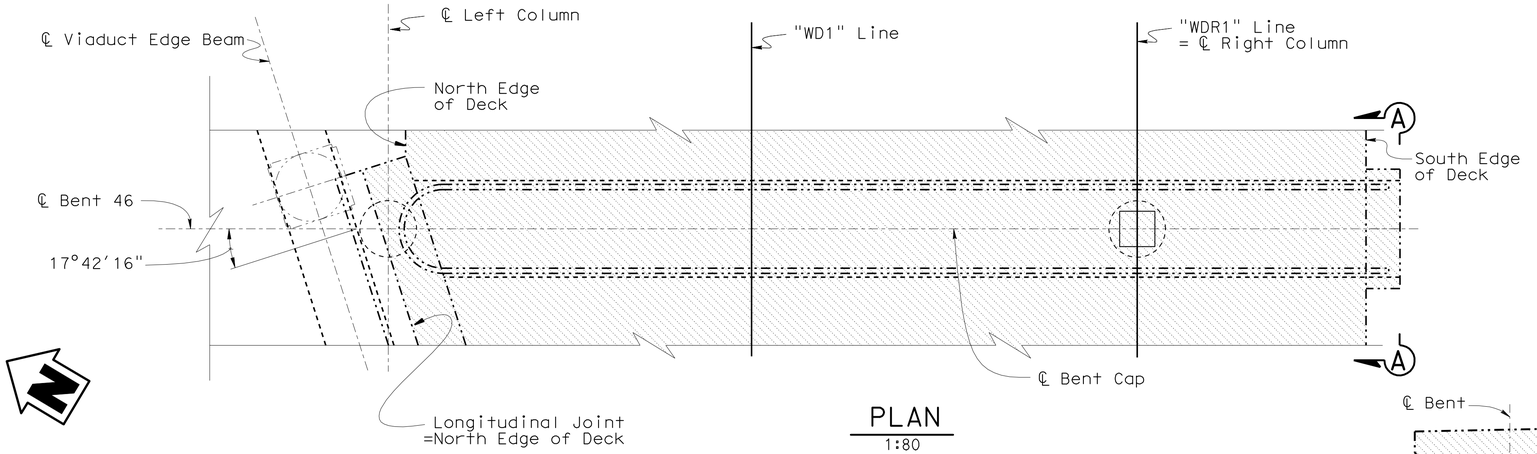
2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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.

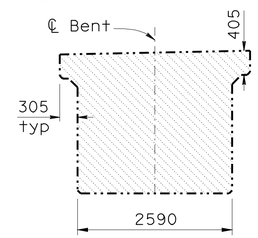
LEGEND:

Indicates bridge removal

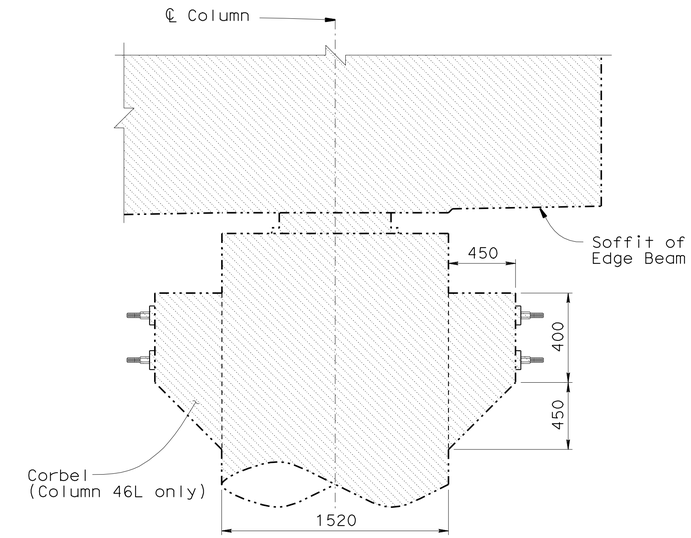


PLAN
1:80

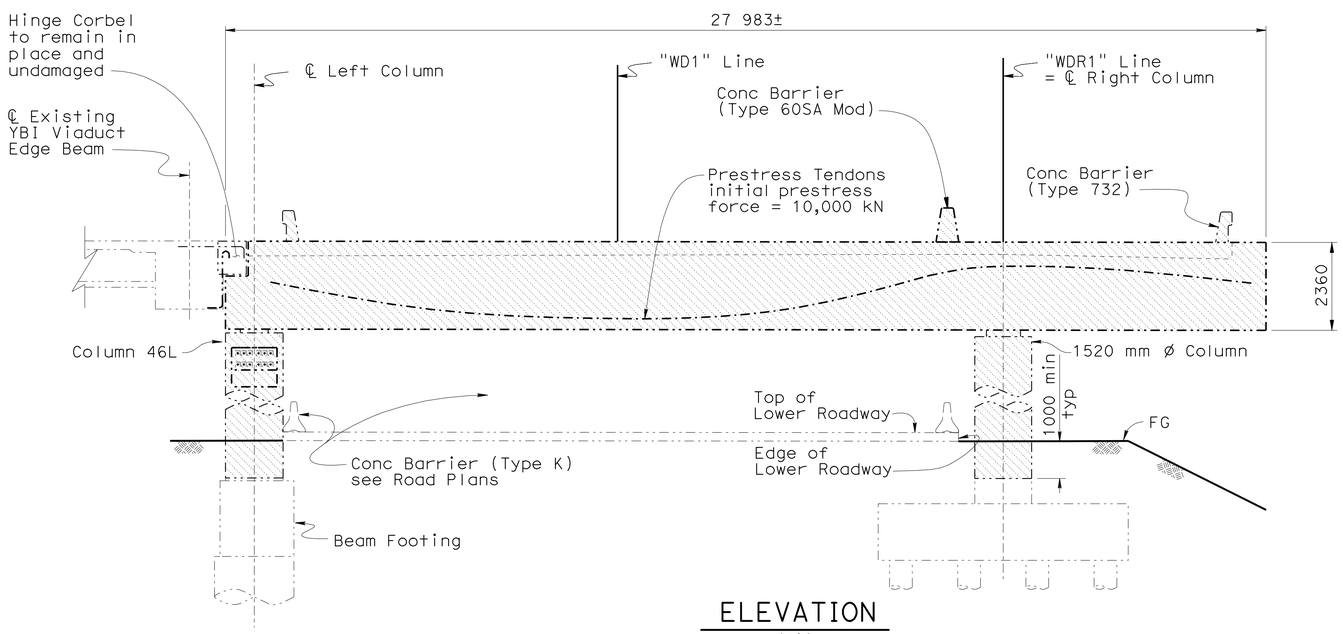
Note: Concrete Barriers not shown for clarity.



SECTION A-A
1:50

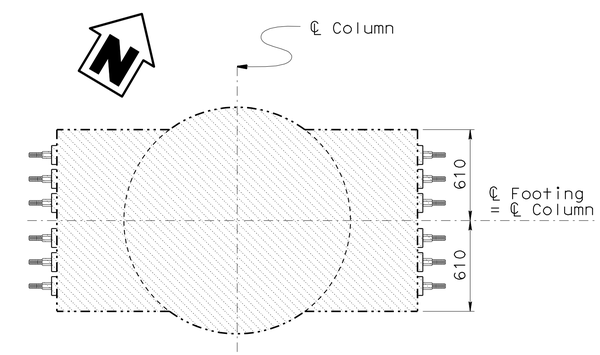


ELEVATION



ELEVATION
1:80

STA "WDR1" 51+08.141



PLAN

COLUMN 46L CORBEL
1:20

NOTE:
THE CONTRACTOR SHALL VERIFY ALL
RELATED AS-BUILT FIELD DIMENSIONS.

Caltrans Metric

	BY	CHECKED
DESIGN	Pyo Hong	M. J. Cullen
DETAILS	G. M. Souza/S. Jiang	M. J. Cullen
QUANTITIES	Pyo Hong	M. J. Cullen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

WEST TIE-IN PHASE 3
WEST TIE-IN (DEMOLITION)
FRAME 1 BENT 46 DEMOLITION DETAILS

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 06-30-10 07-23-10 09-08-10 09-15-10 03-22-11

SHEET 10 OF 16

FILE => 34-0006-48-10-g-frame01-bent_46-demo-det.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s121614 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 11:52

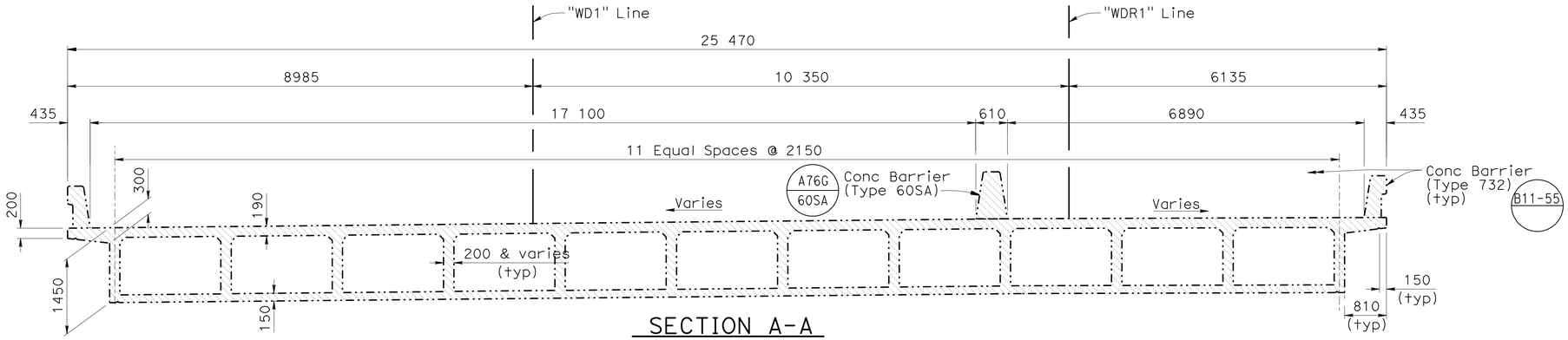
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	502	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

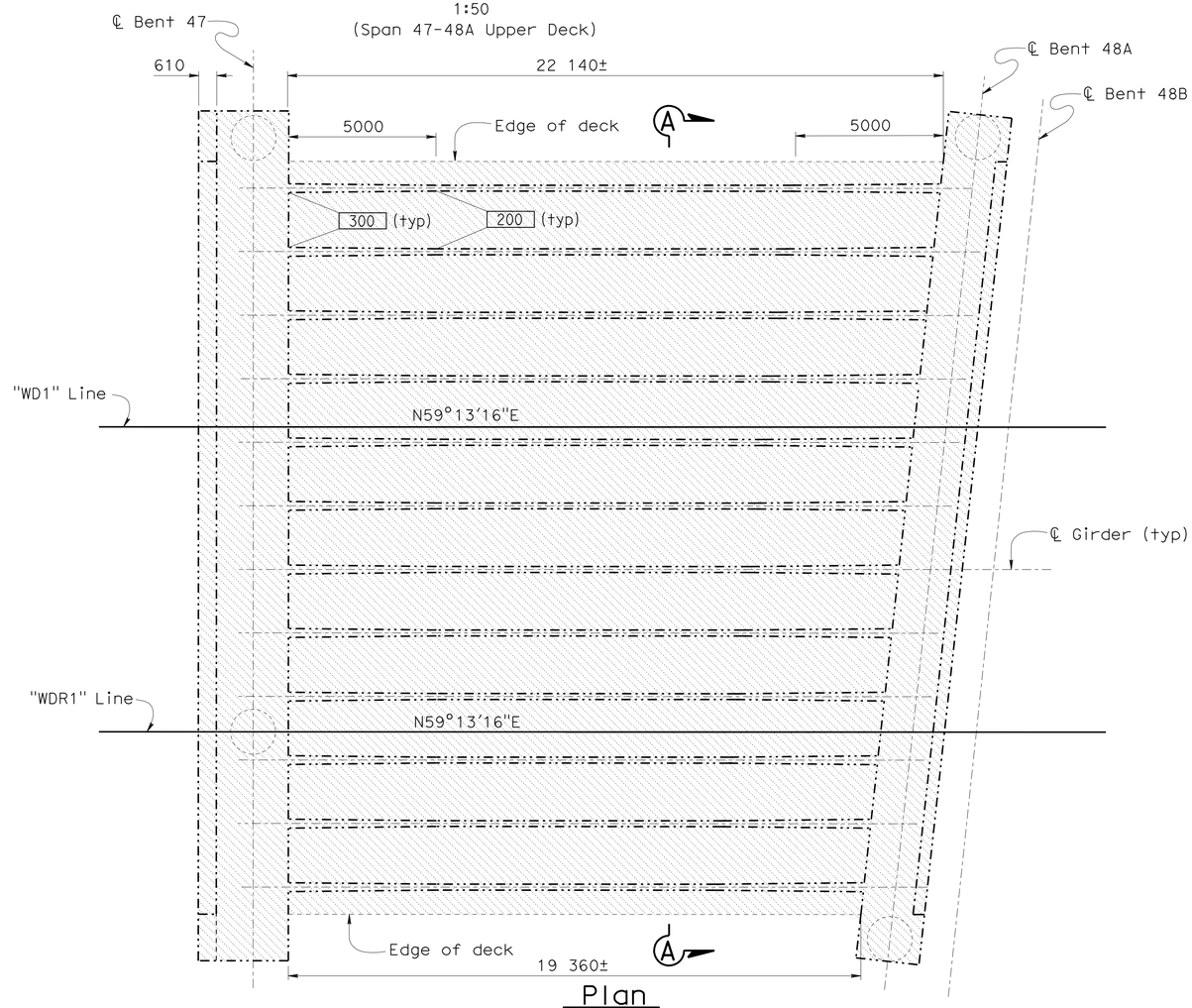
REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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.



SECTION A-A

1:50
(Span 47-48A Upper Deck)



Plan

1:100

NOTE:
THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

LEGEND:

Indicates bridge removal

WEST TIE-IN PHASE 3

WEST TIE-IN (DEMOLITION)

FRAME 2 DEMOLITION LIMITS

Caltrans Metric

	BY	CHECKED
DESIGN	Pyo Hong	M. J. Cullen
DETAILS	G. M. Souza	M. J. Cullen
QUANTITIES	Pyo Hong	M. J. Cullen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 06-30-10 07-23-10 09-08-10 09-15-10

SHEET 11 OF 16

FILE => 34-0006-49-11-g-frame02_demo-limits.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s121614 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 11:52

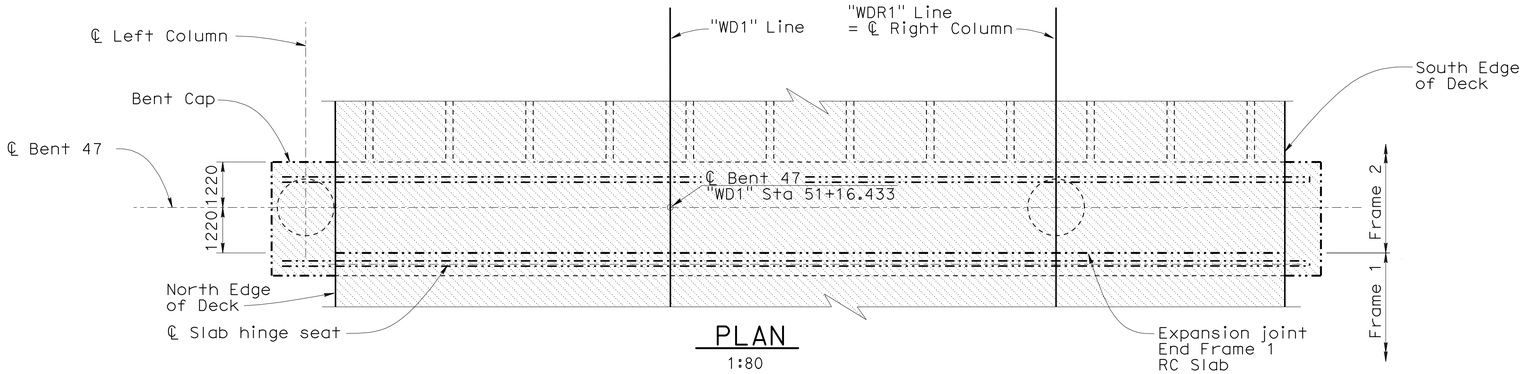
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	503	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

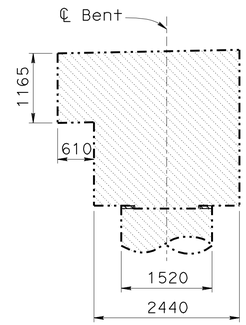
2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

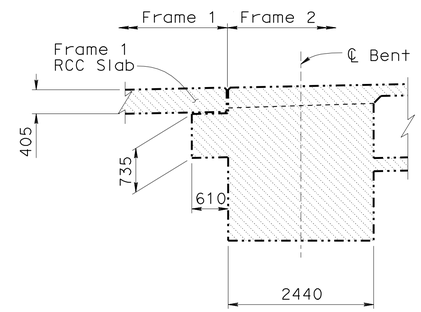
The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.



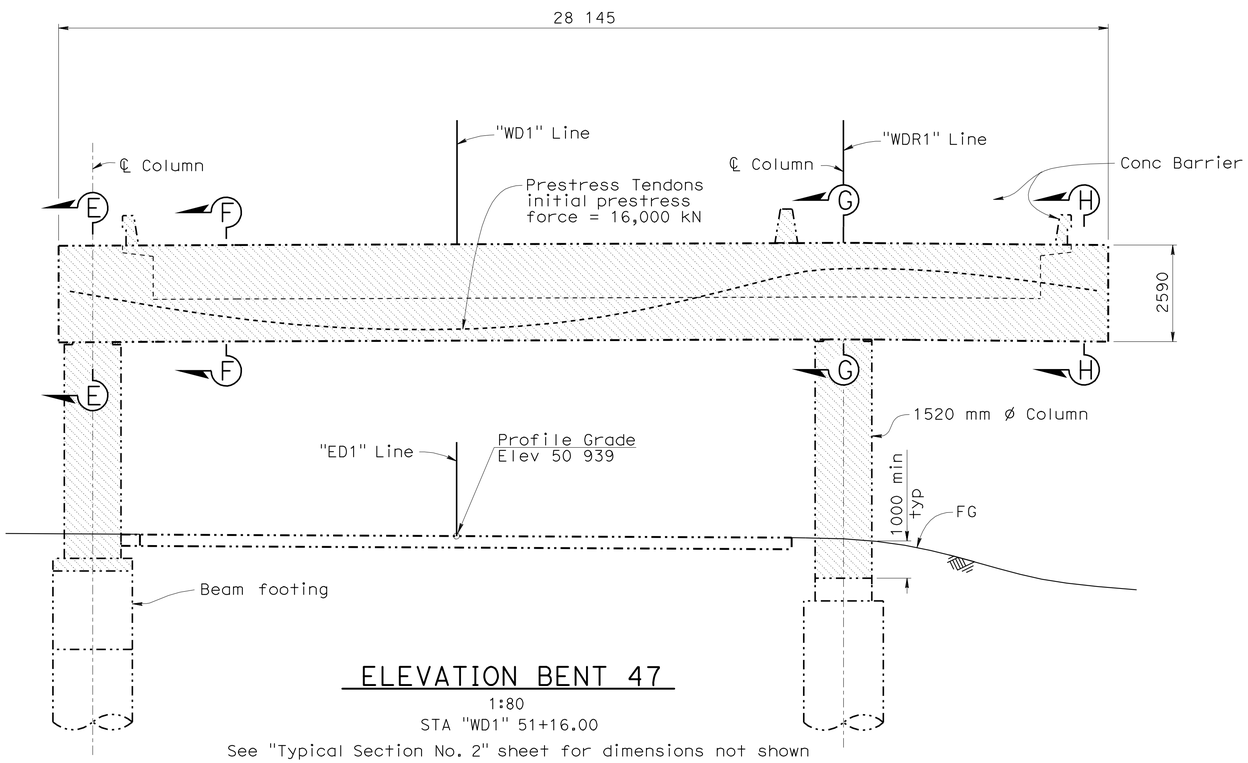
PLAN
1:80
Note: Concrete Barriers not shown for clarity



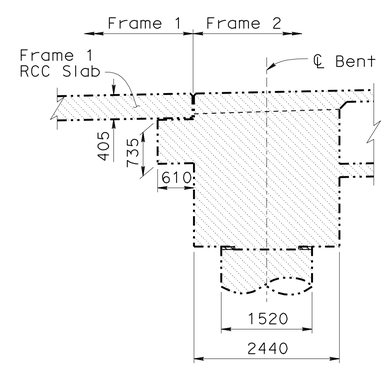
SECTION E-E
1:50



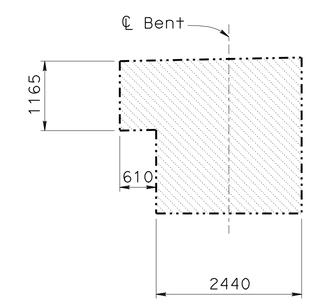
SECTION F-F
1:50



ELEVATION BENT 47
1:80
STA "WD1" 51+16.00
See "Typical Section No. 2" sheet for dimensions not shown



SECTION G-G
1:50



SECTION H-H
1:50

LEGEND:

Indicates bridge removal

NOTE:
THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

Caltrans Metric

	BY	CHECKED
DESIGN	Pyo Hong	M. J. Cullen
DETAILS	G. M. Souza/S. Jiang	M. J. Cullen
QUANTITIES	Pyo Hong	M. J. Cullen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

WEST TIE-IN PHASE 3
WEST TIE-IN (DEMOLITION)
FRAME 2 BENT 47 DEMOLITION DETAILS

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 06-30-10 07-23-10 09-08-10 03-22-11 05-26-11 11-08-11

SHEET 12 OF 16

FILE => 34-0006-51-13-g-frame02-bent_47-demo-det.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s12614 DATE PLOTTED => 27-FEB-2012 TIME PLOTTED => 08:55

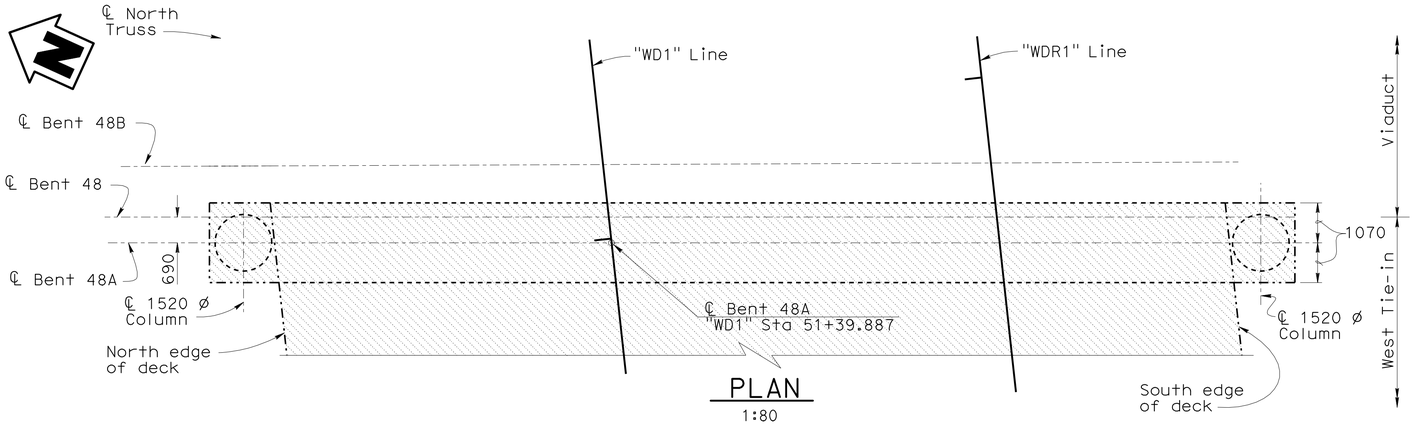
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	504	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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.

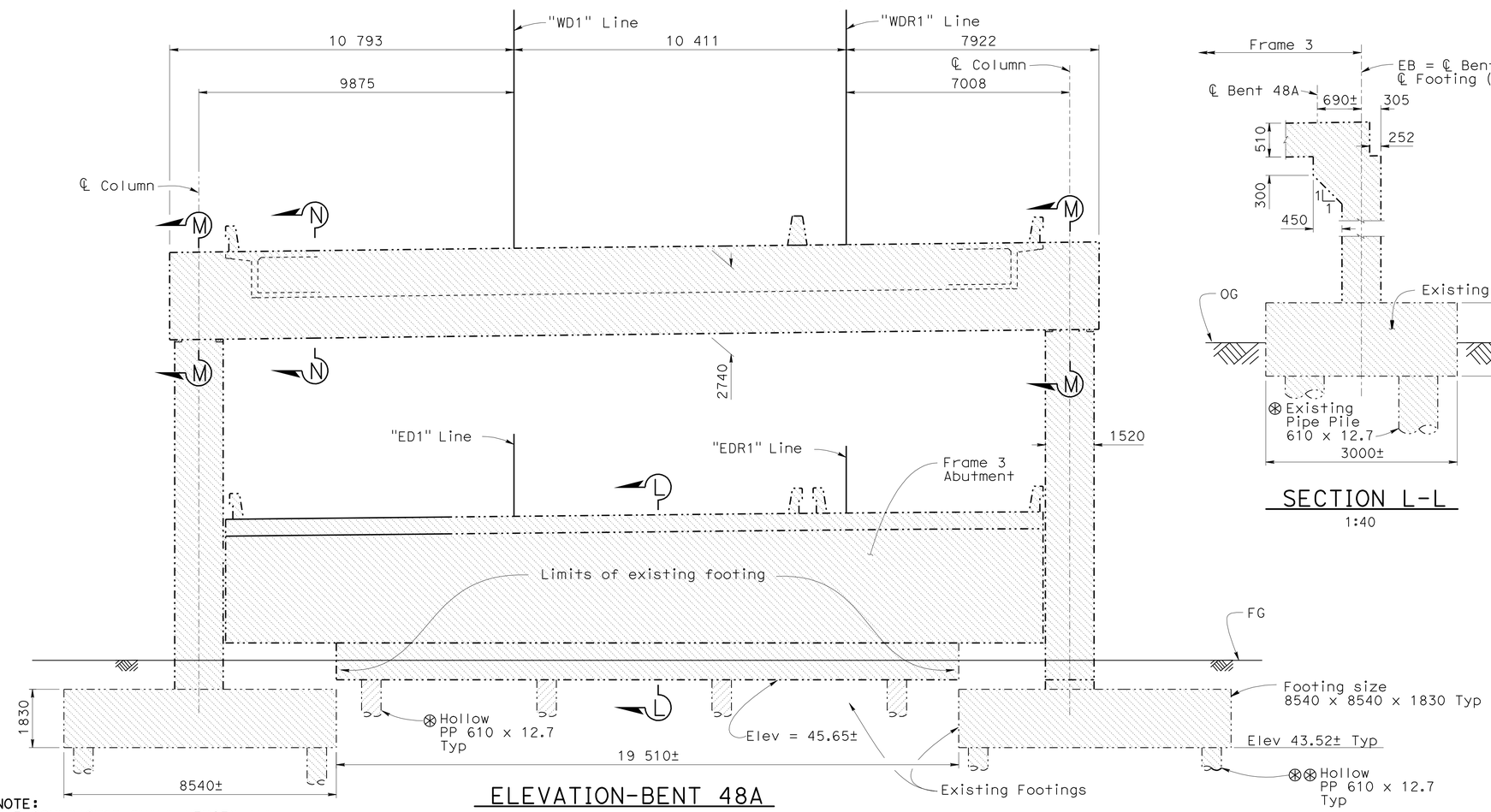


PLAN
1:80

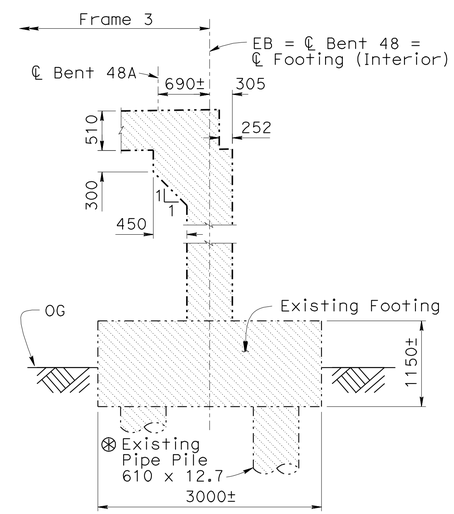
Note: Concrete Barriers not shown for clarity.

LEGEND:

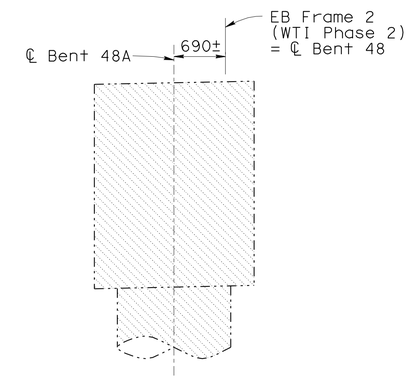
Indicates bridge removal



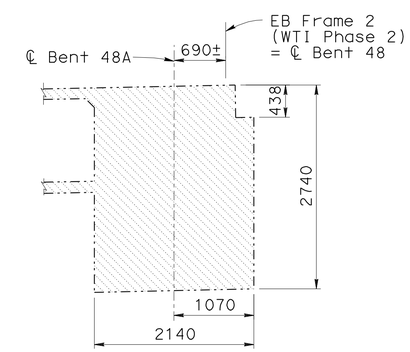
ELEVATION-BENT 48A
1:80
STA "WD1" 51+39.887



SECTION L-L
1:40



SECTION M-M
1:40



SECTION N-N
1:40

⊗ Remove upper footing pipe piles (PP 610 x 12.7). Existing tip elevation = 36.4 m ±. Backfill hole with lean concrete (1 sack mix). Total 20 piles.

⊗⊗ Remove lower footing pipe piles (PP 610 x 12.7) to elevation 42.0 m. Total 20 piles.

NOTE:
THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

WEST TIE-IN PHASE 3
WEST TIE-IN (DEMOLITION)
FRAME 2 BENT 48A DEMOLITION DETAILS

Caltrans Metric

	BY	CHECKED
DESIGN	Pyo Hong	M. J. Cullen
DETAILS	G. M. Souza/S. Jiang	M. J. Cullen
QUANTITIES	Pyo Hong	M. J. Cullen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 06-30-10 07-26-10 09-08-10 02-22-11 03-30-11

SHEET 13 OF 16

FILE => 34-0006-50-12-g-frame02-bent-48a-demo-det.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s121614 DATE PLOTTED => 27-FEB-2012 TIME PLOTTED => 08:55

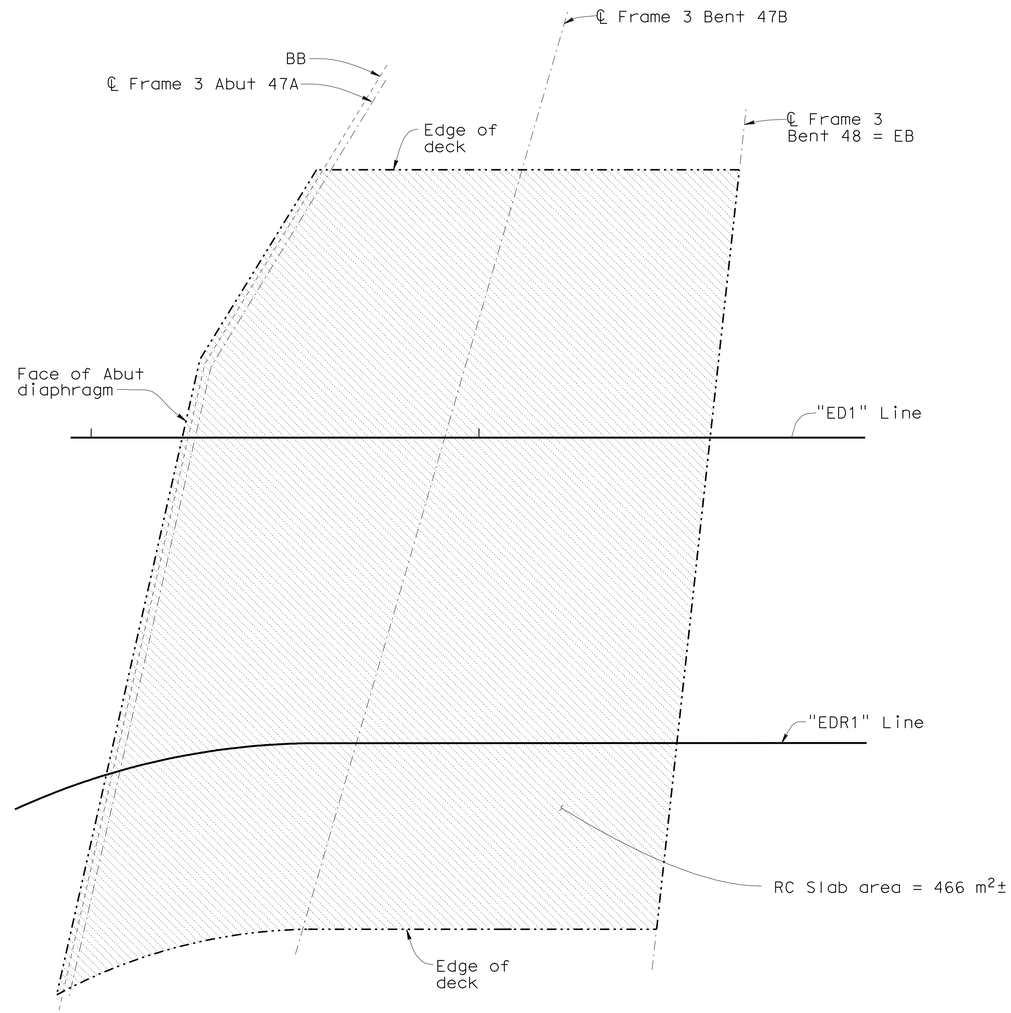
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	505	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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.



For Bent 48 Details, see "Frame 2 Bent 48A Demolition Details" sheet

FRAME 3 PLAN

1:100

LEGEND:

Indicates bridge removal

NOTE:
THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

Caltrans Metric

	BY	CHECKED
DESIGN	Pyo Hong	M. J. Cullen
DETAILS	G. M. Souza	M. J. Cullen
QUANTITIES	Pyo Hong	M. J. Cullen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

WEST TIE-IN PHASE 3
WEST TIE-IN (DEMOLITION)
FRAME 3 DEMOLITION LIMITS

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 06-30-10 | 07-14-10 | 07-23-10 | 09-02-10 | 09-15-10

SHEET 14 OF 16

FILE => 34-0006-52-14-g-frame03-demo_limits.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s126614 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 11:53

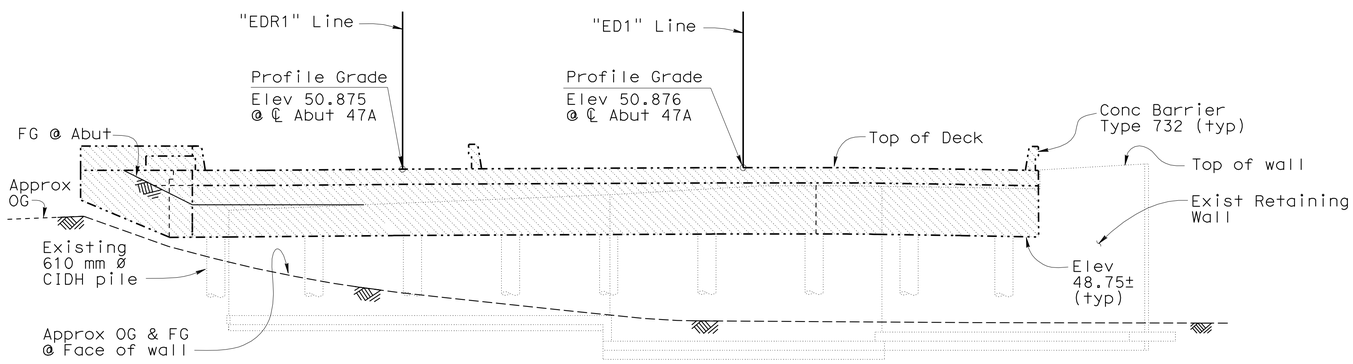
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	506	821

REGISTERED CIVIL ENGINEER — DATE 11-09-11

2-21-12
PLANS APPROVAL DATE

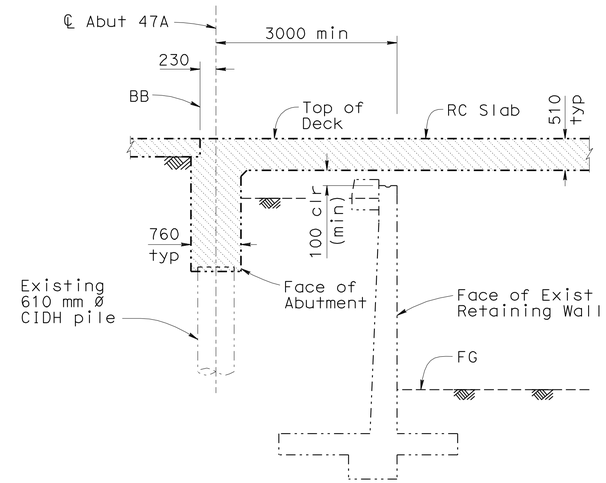
REGISTERED PROFESSIONAL ENGINEER — M. J. CULLEN — No. C 40620 — Exp. 03-31-13 — CIVIL — STATE OF CALIFORNIA

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.



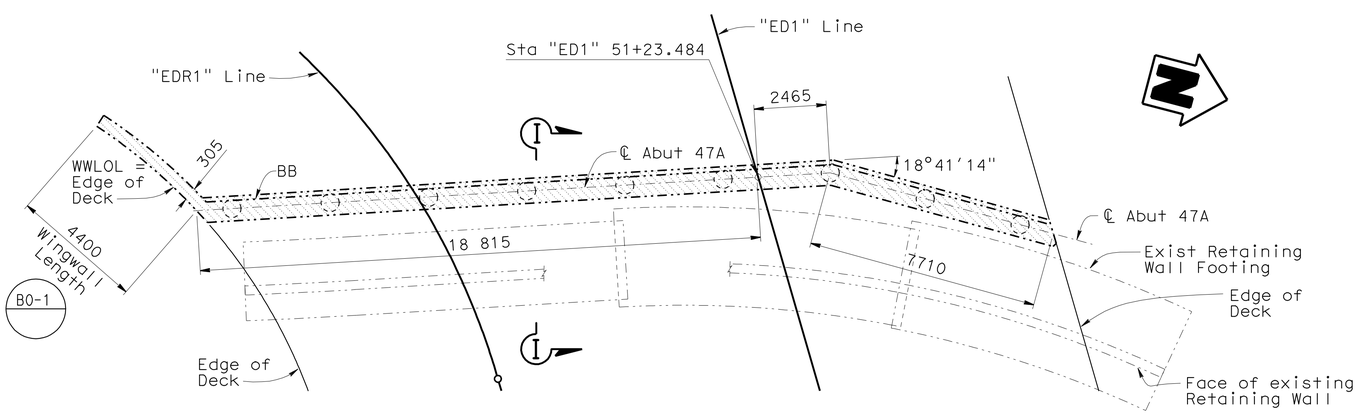
ELEVATION-ABUTMENT 47A

1:100
(Looking Backstation)



SECTION I-I

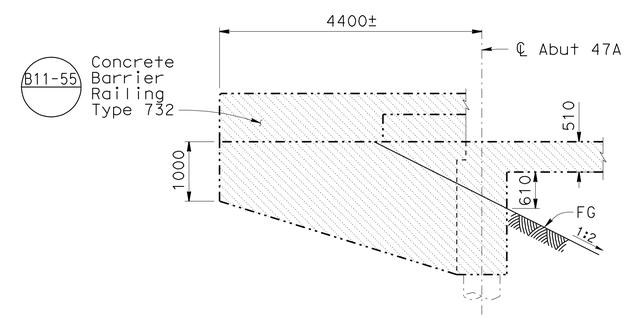
1:50



(RC Slab not shown for clarity)

PLAN

1:100



WINGWALL ELEVATION B0-1

1:50

LEGEND:

Indicates bridge removal

NOTE:
THE CONTRACTOR SHALL VERIFY ALL
RELATED AS-BUILT FIELD DIMENSIONS.

Caltrans Metric

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

	BY	CHECKED
DESIGN	Pyo Hong	M. J. Cullen
DETAILS	G. M. Souza/S. Jiang	M. J. Cullen
QUANTITIES	Pyo Hong	M. J. Cullen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

CU 04251
EA 0120T1

BRIDGE NO. 34-0006
KILOMETER POST NA

WEST TIE-IN PHASE 3
WEST TIE-IN (DEMOLITION)
FRAME 3 DEMOLITION DETAILS NO. 1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 06-30-10 | 07-23-10 | 09-08-10 | 09-16-10 | 03-02-11 | 05-06-11 | 11-08-11

SHEET 15 OF 16

FILE => 34-0006-53-15-g-frame03-demo-det01.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s12614 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 11:53

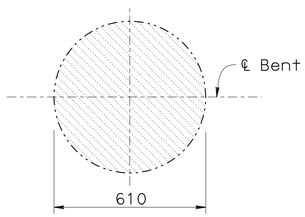
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	507	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

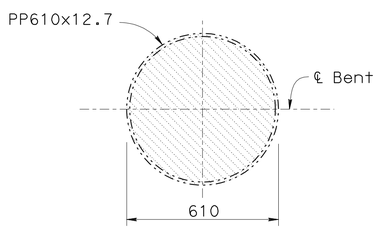
2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

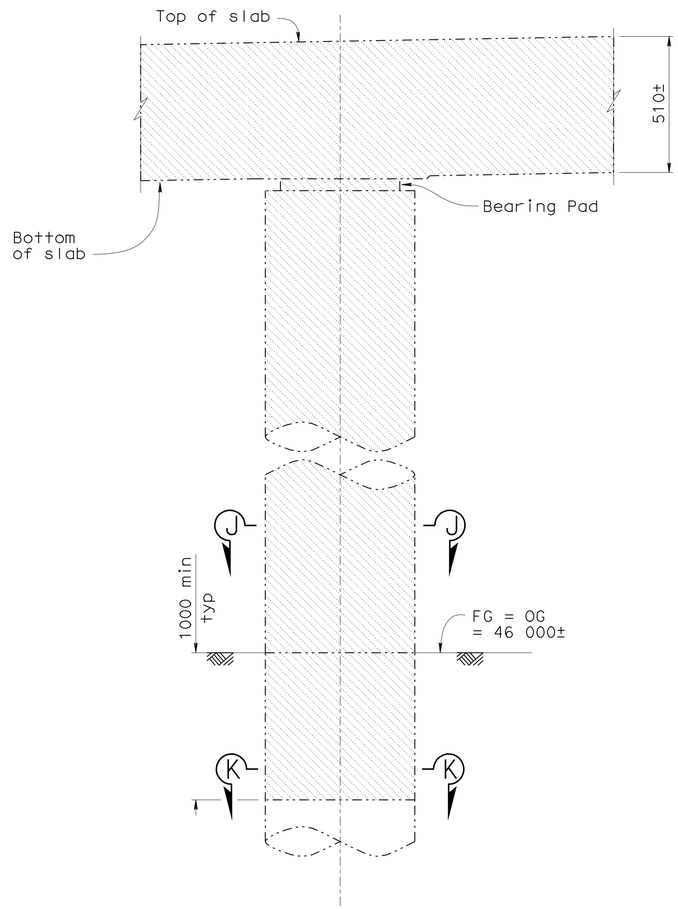
The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.



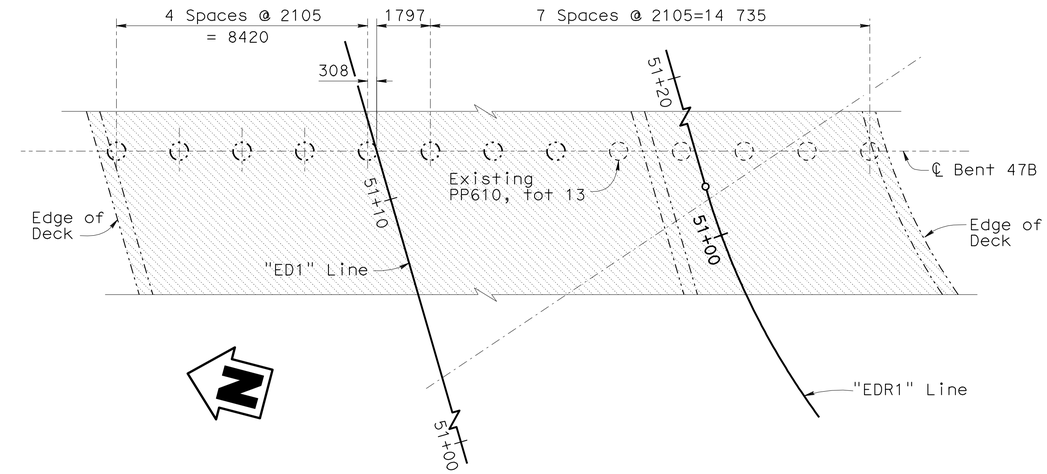
SECTION J-J
no scale



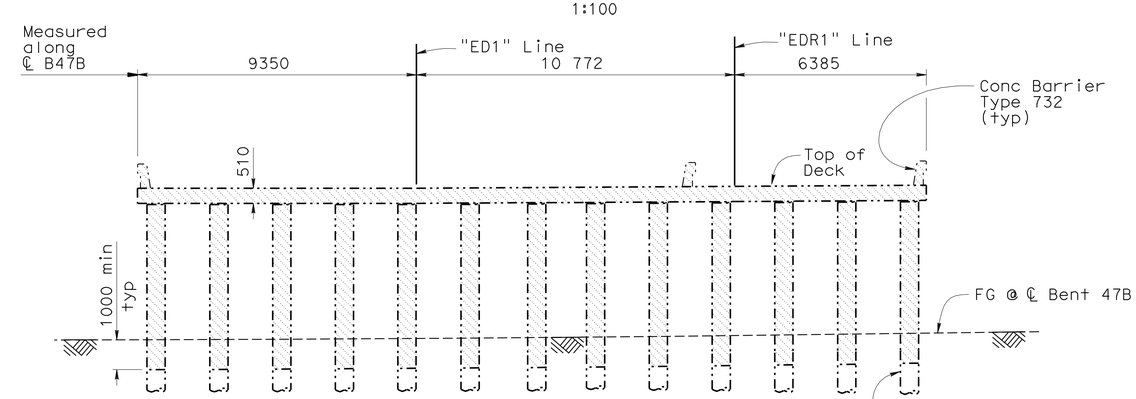
SECTION K-K
no scale



ELEVATION
no scale



PLAN-BENT 47B
1:100



STA "ED1" 51+31.852
ELEVATION-BENT 47B
1:100

LEGEND:

Indicates bridge removal

NOTE:
THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

CISS PIPE PILE & EXTENSION
no scale

DESIGN	BY Pyo Hong	CHECKED M. J. Cullen	
DETAILS	BY G. M. Souza/S. Jiang	CHECKED M. J. Cullen	
QUANTITIES	BY Pyo Hong	CHECKED M. J. Cullen	

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

WEST TIE-IN PHASE 3
WEST TIE-IN (DEMOLITION)
FRAME 3 DEMOLITION DETAILS NO. 2

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 06-30-10 07-23-10 09-08-10 09-16-10 03-02-11 05-26-11 11-08-11

SHEET 16 OF 16

FILE => 34-0006-54-16-g-frame03-demo-det02.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s121614 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 11:53

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	508	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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.

INDEX TO PLANS

SHEET NO.	TITLE
1.	General Plan
2.	Foundation Plan
3.	Deck Contours (East Bound)
4.	Deck Contours (West Bound)
5.	Span Layout No. 1
6.	Span Layout No. 2
7.	Span Layout No. 3
8.	Span Layout No. 4
9.	Span Layout No. 5
10.	Typical Section
11.	Span Details No. 1
12.	Span Details No. 2
13.	Bent Details No. 1
14.	Bent Details No. 2
15.	Bent Details No. 3
16.	Erection Tower Details (Type A)
17.	Erection Tower Details (Type B)

LEGEND:

Indicates bridge removal

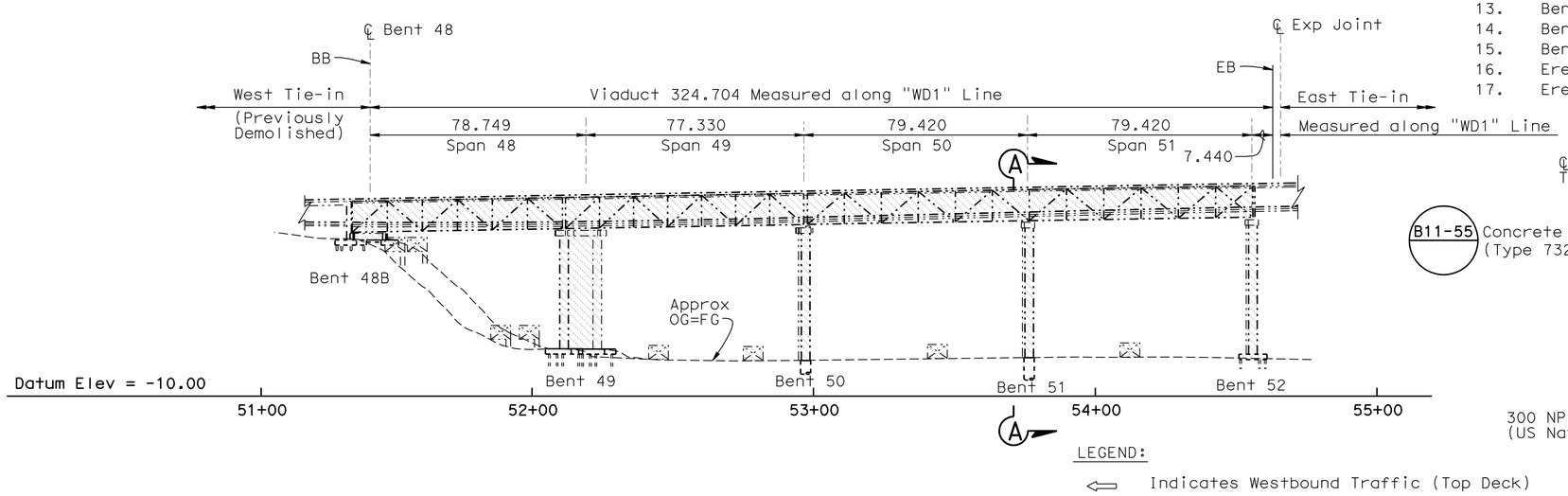
Indicates Erection Tower Foundation to be removed Total 8 locations

NOTE:

(1) All Utilities shall be relocated prior to demolition, see "Road Plans".

QUANTITIES

BRIDGE REMOVAL (PORTION), LOCATION C LUMP SUM



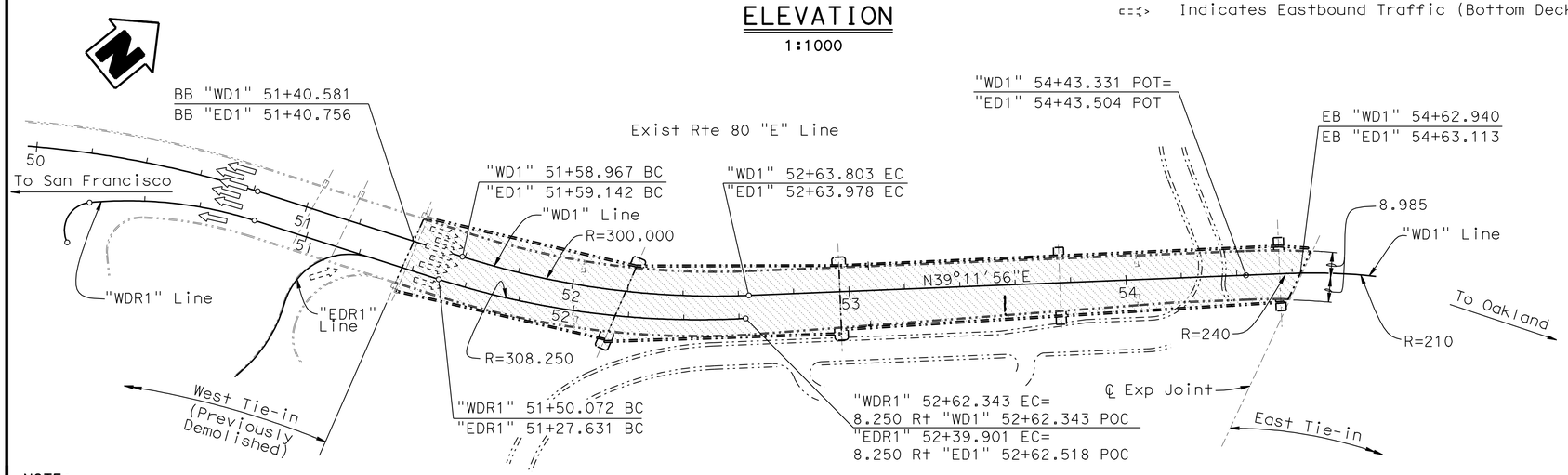
LEGEND:

Indicates Westbound Traffic (Top Deck)

Indicates Eastbound Traffic (Bottom Deck)

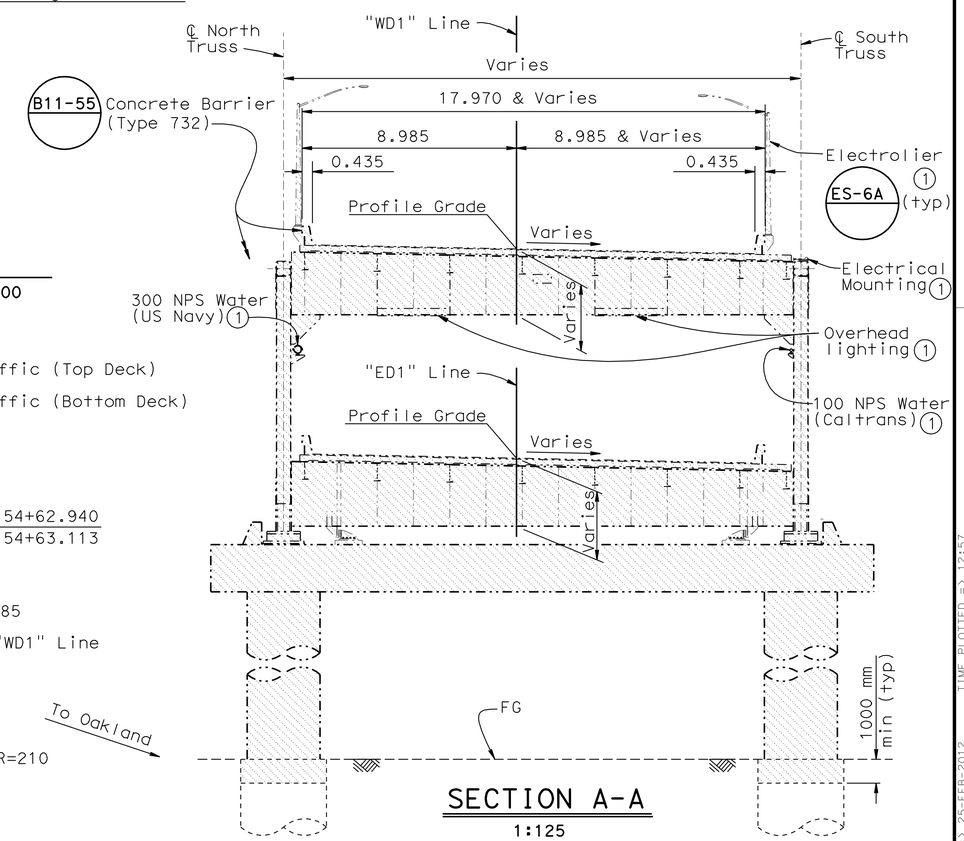
ELEVATION

1:1000



PLAN

1:1000



SECTION A-A

1:125

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

DESIGN	BY Pyo Hong	CHECKED M. J. Cullen	LOAD & RESISTANCE FACTOR DESIGN	LIVE LOADING: HL93 W/"LOW-BOY"; PERMIT DESIGN VEHICLE	
DETAILS	BY C. M. Souza/T. Cotton	CHECKED M. J. Cullen	LAYOUT	BY Pyo Hong	CHECKED M. J. Cullen
QUANTITIES	BY Pyo Hong	CHECKED M. J. Cullen	SPECIFICATIONS	BY S. Margaris	PLANS AND SPECS COMPARED M. J. Cullen

DESIGN ENGINEER

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

SOUTH, SOUTH DETOUR VIADUCT DEMOLITION

GENERAL PLAN

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 09-23-10 10-01-10 10-14-10 10-21-10 11-05-10 01-05-11 01-24-11 01-26-11 10-25-11 11-08-11

SHEET 1 OF 17

FILE => 34-0006-55-01-a-gp-truss.dgn

STRUCTURES DESIGN GENERAL PLAN SHEET (METRIC) (REV.07-24-06)

USERNAME => s114926 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 12:57

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	509	821

Caltrans Metric

REGISTERED CIVIL ENGINEER — DATE 11-09-11

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — M. J. CULLEN — No. C 40620 — Exp. 03-31-13 — CIVIL — STATE OF CALIFORNIA

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"WD1" Line

R = 300.000
Δ = 20°01'20"
T = 52.958
L = 104.836

R = 210.000
Δ = 30°19'52.27"
T = 56.920
L = 111.170

"ED1" Line

R = 300.000
Δ = 20°01'20"
T = 52.958
L = 104.836

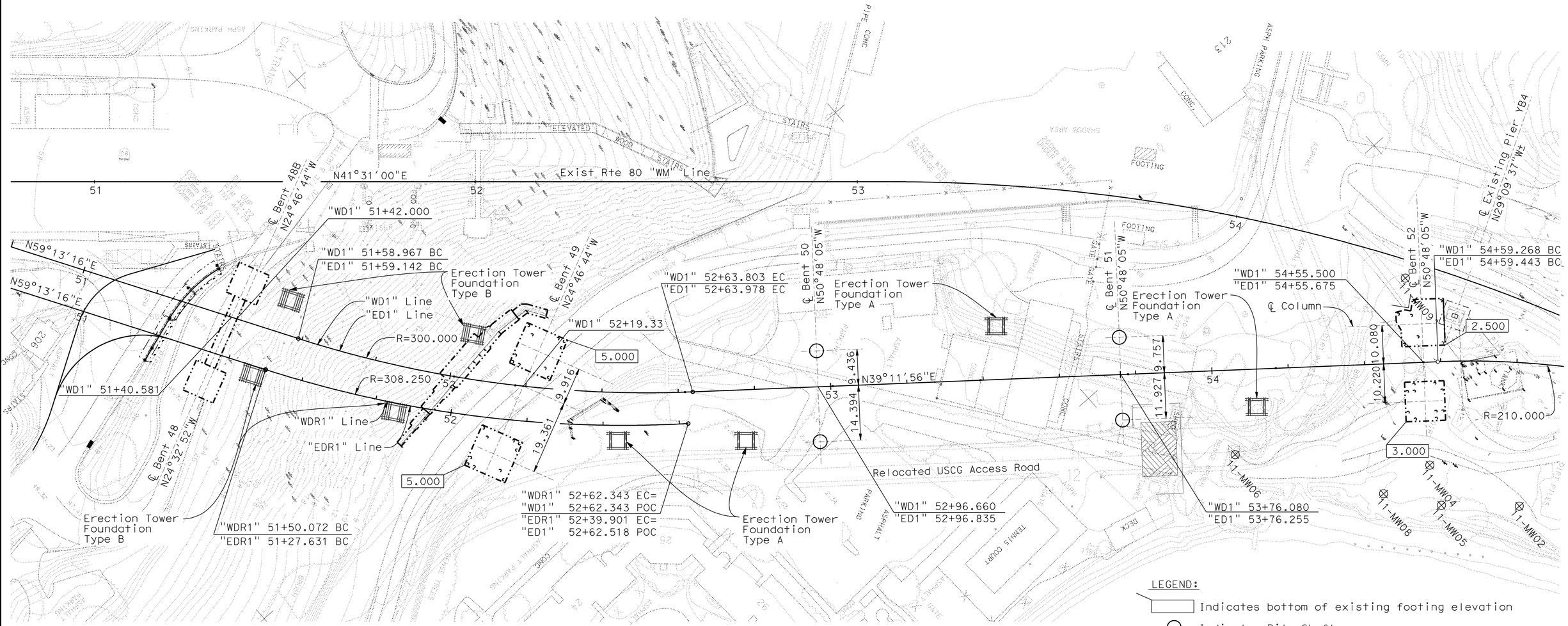
R = 210.000
Δ = 30°19'52.27"
T = 56.920
L = 111.170

"WDR1" Line

R = 308.250
Δ = 20°52'06"
T = 56.764
L = 112.271

"EDR1" Line

R = 308.250
Δ = 20°52'06"
T = 56.764
L = 112.271



PLAN
1:500

LEGEND:

- Indicates bottom of existing footing elevation
- Indicates Pile Shaft
- Indicates Vertical Pile (Not all piles shown)
- Indicates existing well
- Indicates existing footing
- Indicates Erection Tower Foundation, to be removed. Total 8 locations.

Benchmark

Elevation is based on 1929 National Geodetic Vertical Datum (NGVD).

NOTE:
ALL DIMENSIONS ELEVATIONS AND FALSEWORK FOUNDATION LOCATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

Mark Fraites 07/26/04

PRELIMINARY INVESTIGATION SECTION					
SCALE 1:100	VERT.DATUM NGVD29	PHOTOGRAMMETRY AS OF: N/A			
	HORZ.DATUM NAD83	SURVEYED	BY N/A	DRAFTED	BY
ALIGNMENT TIES DIST.TRAVERSE SHEET		FIELD CHECKED	BY N/A	CHECKED	BY N/A

	BY	CHECKED
DESIGN	B. Pentorali	M. J. Cullen
DETAILS	T. Cotton	M. J. Cullen
QUANTITIES	P. Hong	M. J. Cullen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

SOUTH, SOUTH DETOUR VIADUCT DEMOLITION
FOUNDATION PLAN

STRUCTURES FOUNDATION PLAN SHEET (METRIC) (REV. 4/20/00)

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 07-26-06 10-01-10 10-19-10 10-27-10 01-05-11 08-04-11 10-25-11

SHEET 2 OF 17

FILE => 34-0006-56-02-b-fp-truss.dgn

USERNAME => s114926 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 12:57

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	510	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

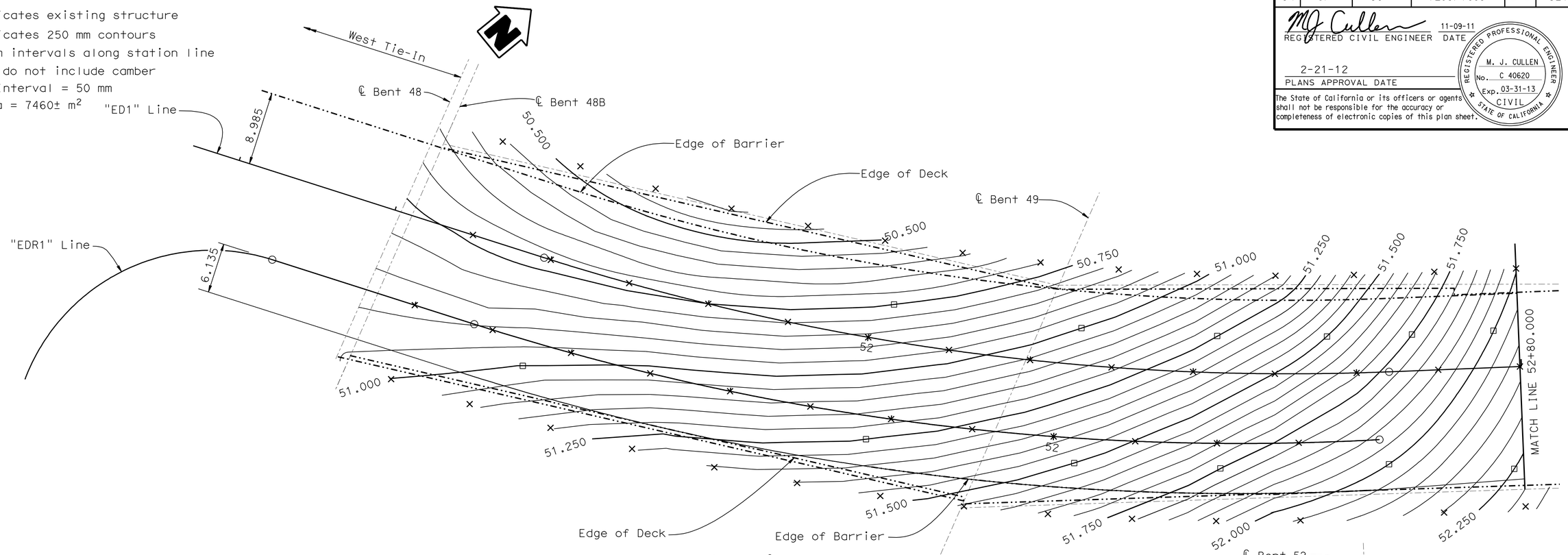
2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

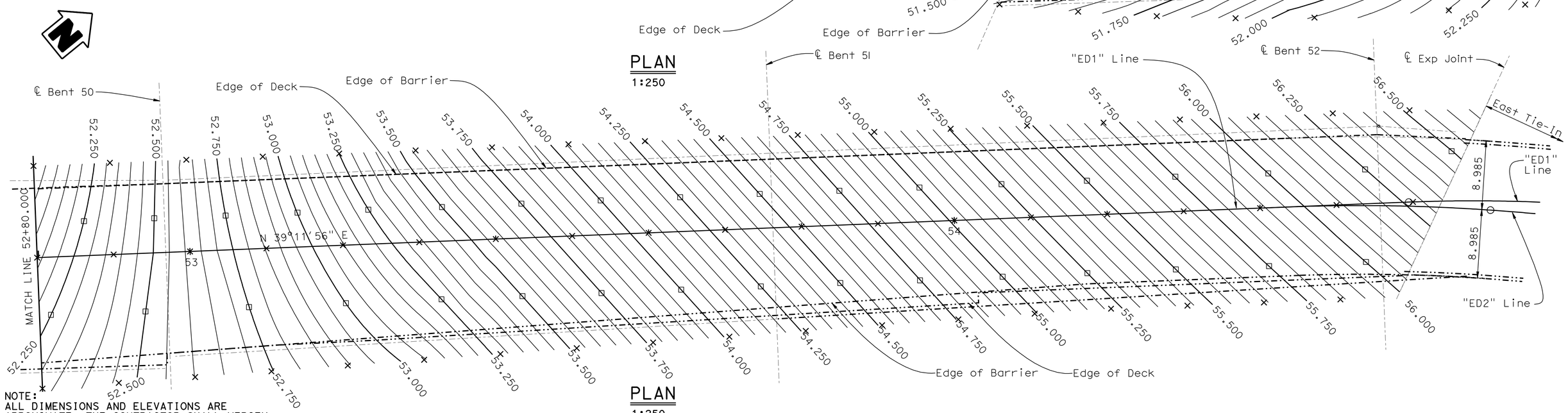
The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

NOTES:

-·-·- Indicates existing structure
□ - Indicates 250 mm contours
× = 10 m intervals along station line
Contours do not include camber
Contour Interval = 50 mm
Deck area = 7460± m^2



PLAN
1:250



PLAN
1:250

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

METERS UNLESS OTHERWISE SHOWN

Caltrans Metric

	BY	CHECKED
DESIGN	P. Hong	M. J. Cullen
DETAILS	G. M. Souza	M. J. Cullen
QUANTITIES	P. Hong	M. J. Cullen

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

CU 04251
EA 0120T1

BRIDGE NO. 34-0006
KILOMETER POST NA

SOUTH, SOUTH DETOUR VIADUCT DEMOLITION

DECK CONTOURS-EASTBOUND

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 11-05-10 01-13-11

SHEET 3 OF 17

FILE => 34-0006-57-03-b-dc01_truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s114926 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 12:57

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	511	821

REGISTERED CIVIL ENGINEER — DATE 11-09-11

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — M. J. CULLEN — No. C 40620 — Exp. 03-31-13 — CIVIL — STATE OF CALIFORNIA

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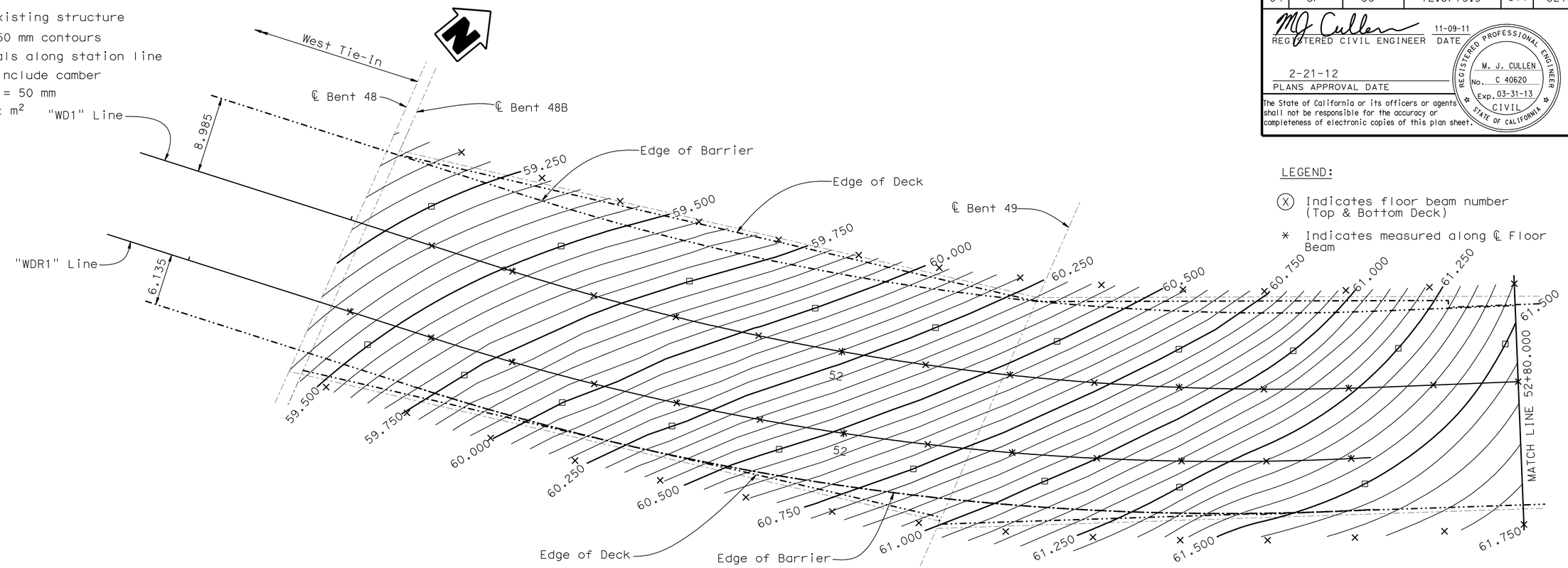
NOTES:

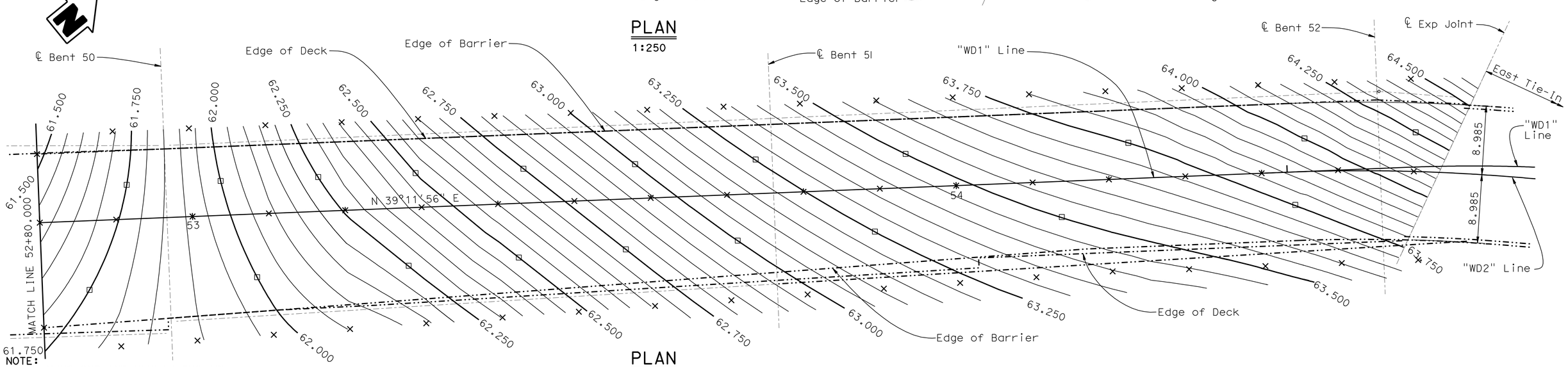
-·-·- Indicates existing structure
□ - Indicates 250 mm contours
× = 10 m intervals along station line
Contours do not include camber
Contour Interval = 50 mm
Deck area = 7460± m²

LEGEND:

(X) Indicates floor beam number (Top & Bottom Deck)
* Indicates measured along ℄ Floor Beam



PLAN
1:250



PLAN
1:250

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

METERS UNLESS OTHERWISE SHOWN

Caltrans Metric

	BY	CHECKED
DESIGN	P. Hong	M. J. Cullen
DETAILS	G. M. Souza	M. J. Cullen
QUANTITIES	P. Hong	M. J. Cullen

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

CU 04251
EA 0120T1

BRIDGE NO. 34-0006
KILOMETER POST NA

SOUTH, SOUTH DETOUR VIADUCT DEMOLITION

DECK CONTOURS-WESTBOUND

DISREGARD PRINTS BEARING EARLIER REVISION DATES — 11-06-10 01-13-11

SHEET 4 OF 17

FILE => 34-0006-58-04-b-dc02_truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s114926 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 12:57

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	512	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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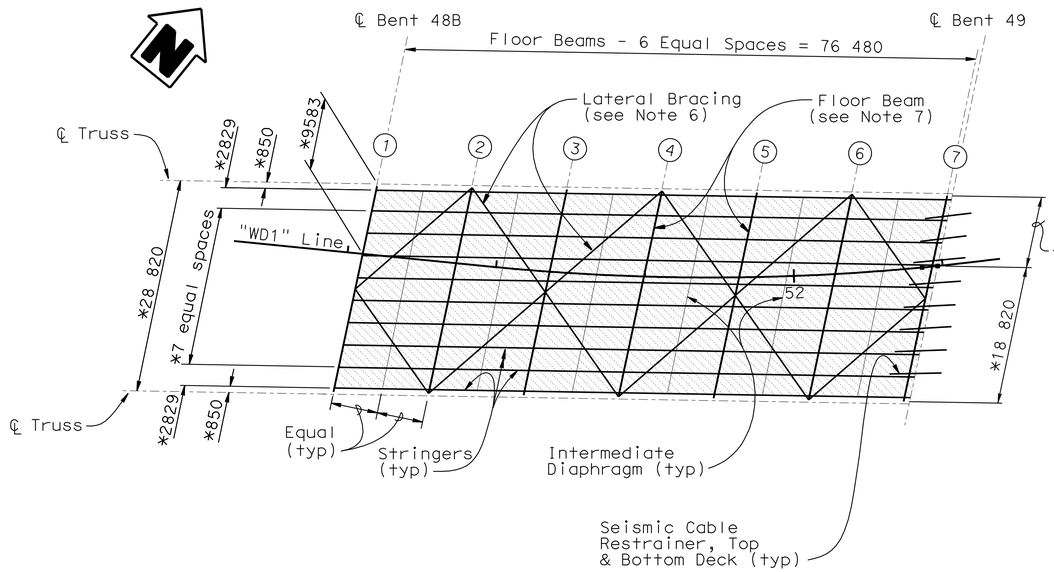
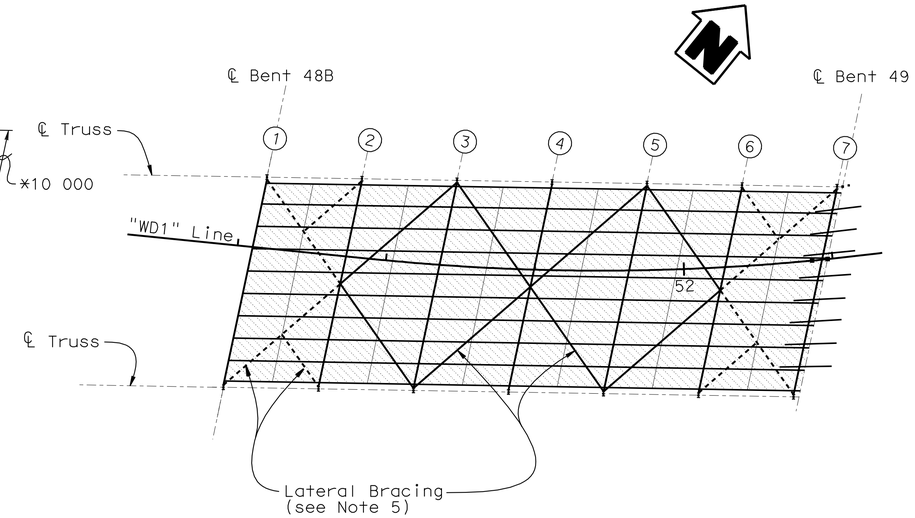


PLAN-TOP FRAMING & LATERAL BRACING

1:400



PLAN-BOTTOM FRAMING & LATERAL BRACING

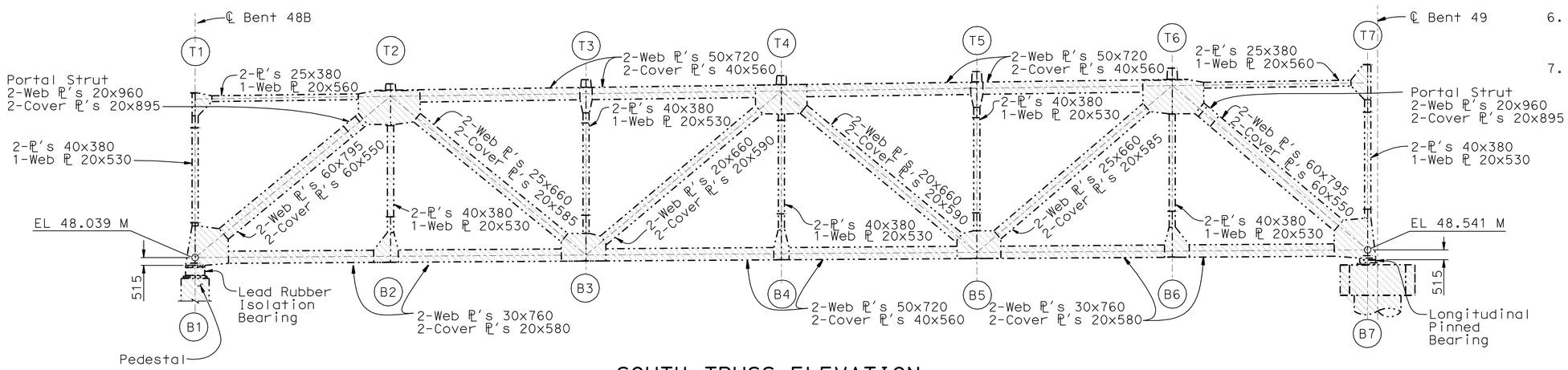
1:400

LEGEND:

- (X) Indicates existing floor beam number (Top & Bottom Deck)
- * Indicates measured along ℄ Floor Beam
- —— Indicates existing Lateral Bracing with 10 mm flange ℙ
- ---- Indicates existing Lateral Bracing with 16 mm flange ℙ
- Indicates bridge removal
- ---- Indicates Existing Structure

Notes:

1. All stringers are W760x134.
2. All intermediate diaphragms are C380x50.4
3. All bearings are pinned transversely, except at Bent 48B.
4. All bolts are ASTM A490 25 mm ø HS bolts in oversized holes, unless otherwise noted.
5. All Bottom Lateral bracing consists of a 10 x 280 web plate and a 10 x 330 or a 16 x 330 flange plate (see Legend)
6. All Top Lateral bracing consists of a 10 x 280 web plate and a 10 x 330 flange plate (see Legend)
7. For Floor Beam details, see "Span Details" sheet



SOUTH TRUSS ELEVATION

1:100

(North Truss Similar)

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

Caltrans Metric

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

	BY	CHECKED
DESIGN	P. Hong	M. J. Cullen
DETAILS	G. M. Souza/T. C.	M. J. Cullen
QUANTITIES	P. Hong	M. J. Cullen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

CU 04251
EA 0120T1

BRIDGE NO. 34-0006
KILOMETER POST NA

SOUTH, SOUTH DETOUR VIADUCT DEMOLITION

SPAN LAYOUT NO. 1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 09-24-10 10-01-10 10-18-10 10-21-10 11-08-10 01-05-11 05-25-11

SHEET 5 OF 17

FILE => 34-0006-59-05-b-spanlyt01_truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s114926 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:08

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	513	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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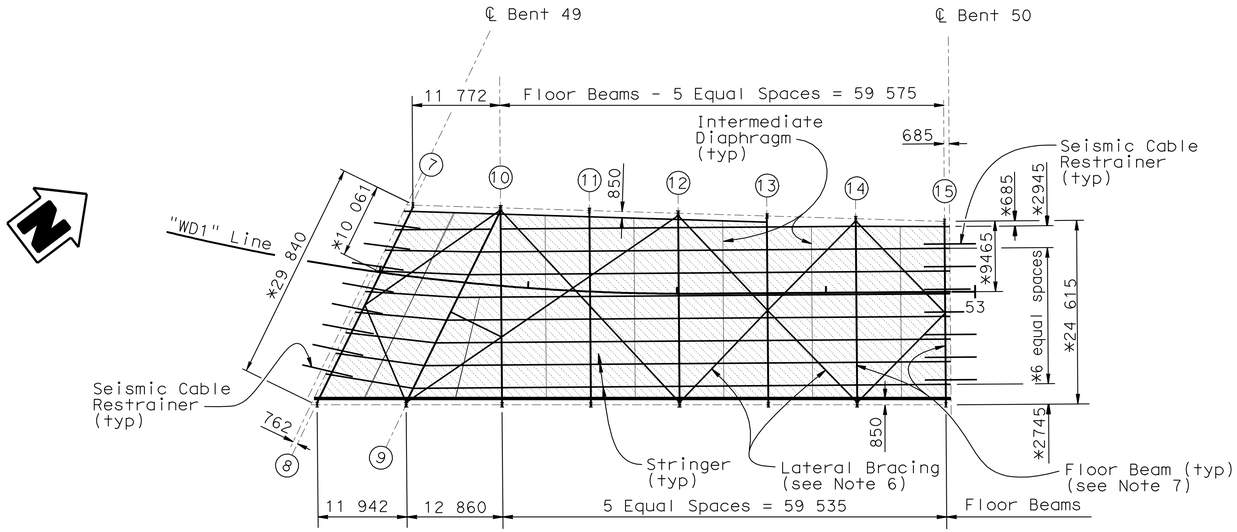


PLAN-TOP LATERAL BRACING

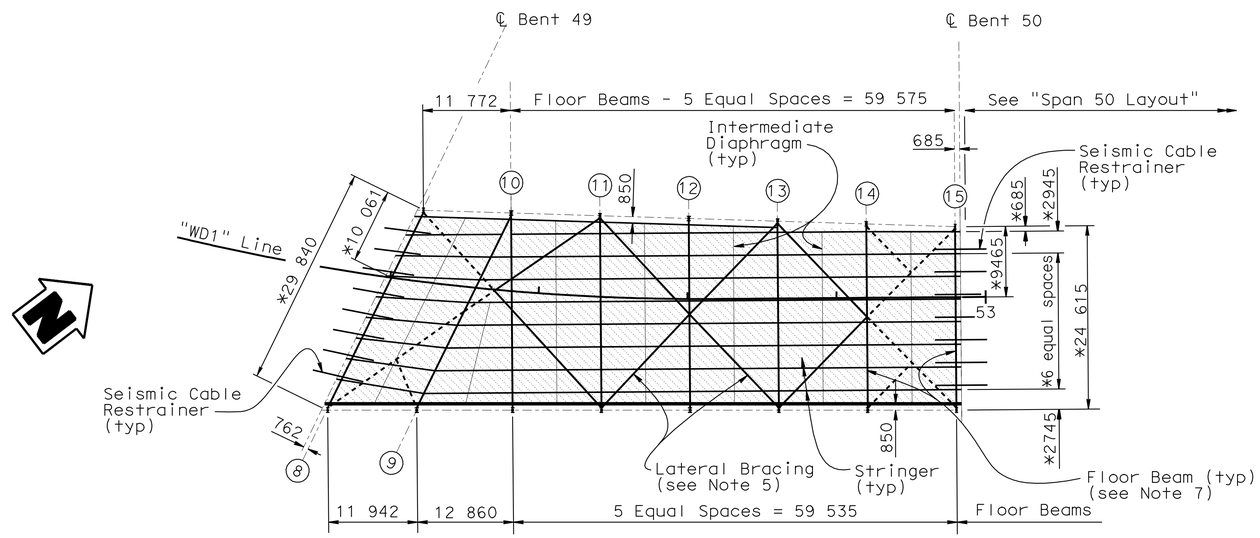
1:400

LEGEND:

- (X) Indicates existing floor beam number (Top & Bottom Deck)
- * Indicates measured along ℄ Floor Beam
- —— Indicates existing Lateral Bracing with 10 mm flange ℙ
- ---- Indicates existing Lateral Bracing with 16 mm flange ℙ
- Indicates bridge removal

NOTE:

For Notes, see "Span Layout No. 1" sheet



PLAN-BOTTOM LATERAL BRACING

1:400

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

Caltrans Metric

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

	BY	CHECKED
DESIGN	P. Hong	M. J. Cullen
DETAILS	G. M. Souza	M. J. Cullen
QUANTITIES	P. Hong	M. J. Cullen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

CU 04251
EA 0120T1

BRIDGE NO. 34-0006
KILOMETER POST NA

SOUTH, SOUTH DETOUR VIADUCT DEMOLITION

SPAN LAYOUT NO. 2

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 09-24-10 09-24-10 10-04-10 10-14-10 11-06-10 01-06-11 05-25-11

SHEET 6 OF 17

FILE => 34-0006-60-06-b-spanlyt02_truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s114926 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 12:58

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	514	821

REGISTERED CIVIL ENGINEER — DATE 11-09-11

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — M. J. CULLEN — No. C 40620 — Exp. 03-31-13 — CIVIL — STATE OF CALIFORNIA

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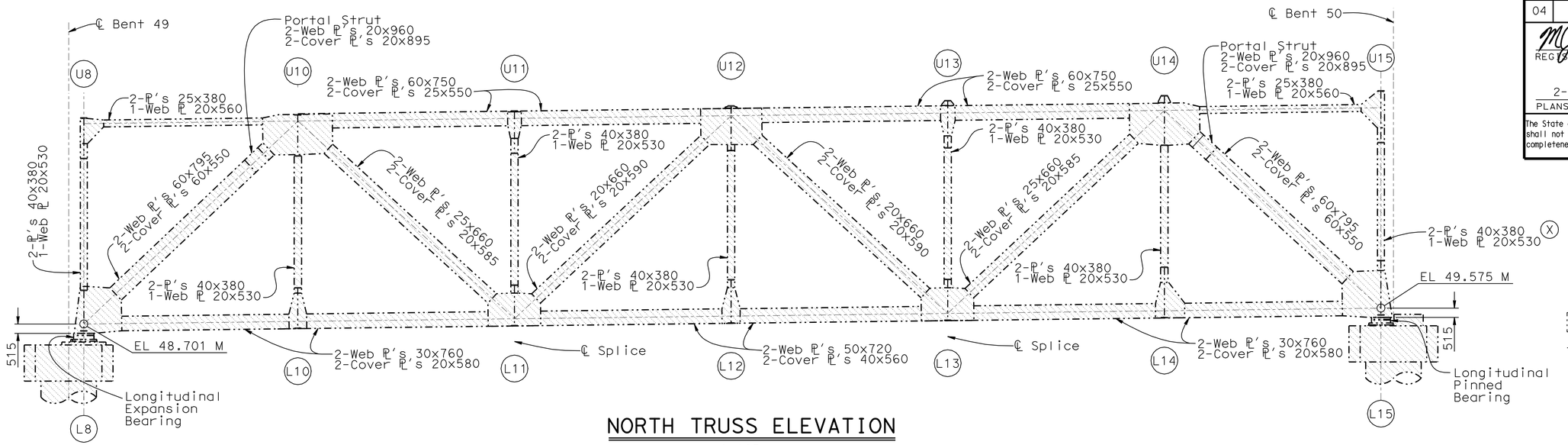


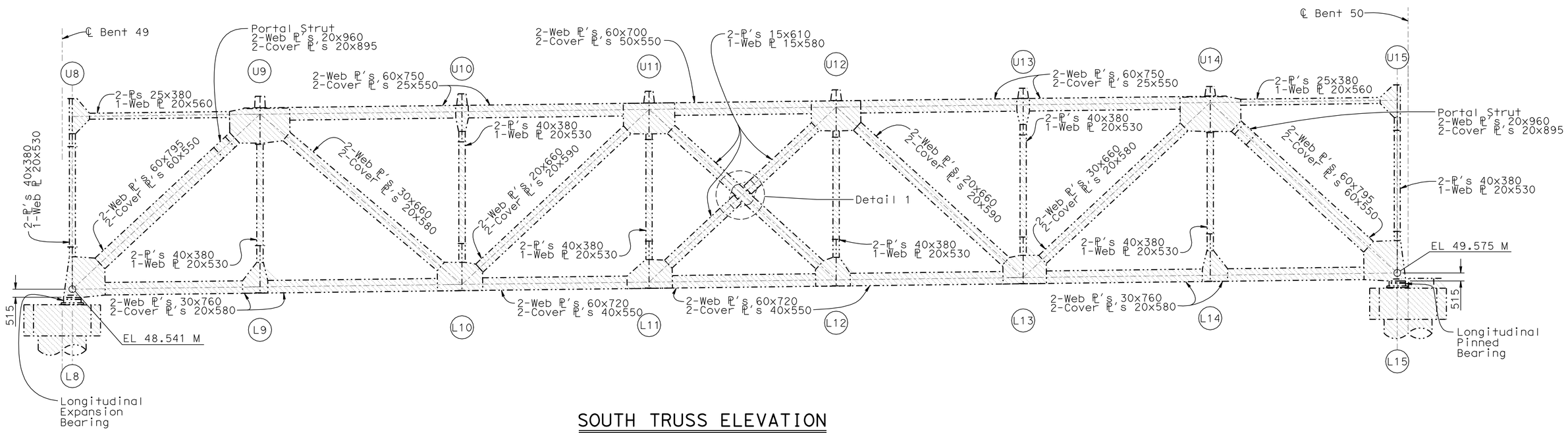
NORTH TRUSS ELEVATION

1:125

LEGEND:

Indicates bridge removal

Indicates Existing Structure



SOUTH TRUSS ELEVATION

1:125

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

NOTE: For DETAIL 1, see "Span Layout No. 6" sheet

Caltrans Metric

	BY	CHECKED
DESIGN	P. Hong	M. J. Cullen
DETAILS	G. M. Souza	M. J. Cullen
QUANTITIES	P. Hong	M. J. Cullen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

SOUTH, SOUTH DETOUR VIADUCT DEMOLITION

SPAN LAYOUT NO. 3

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES → 09-29-10 10-18-10 11-08-10 01-05-11

REVISION DATES

SHEET 7 OF 17

FILE => 34-0006-61-07-b-spanlyt03_truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s114926 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 12:58

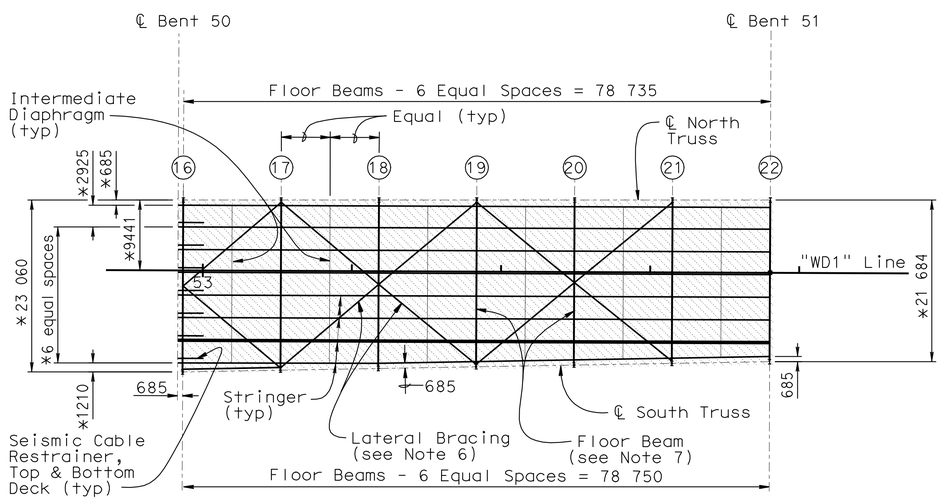
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	515	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

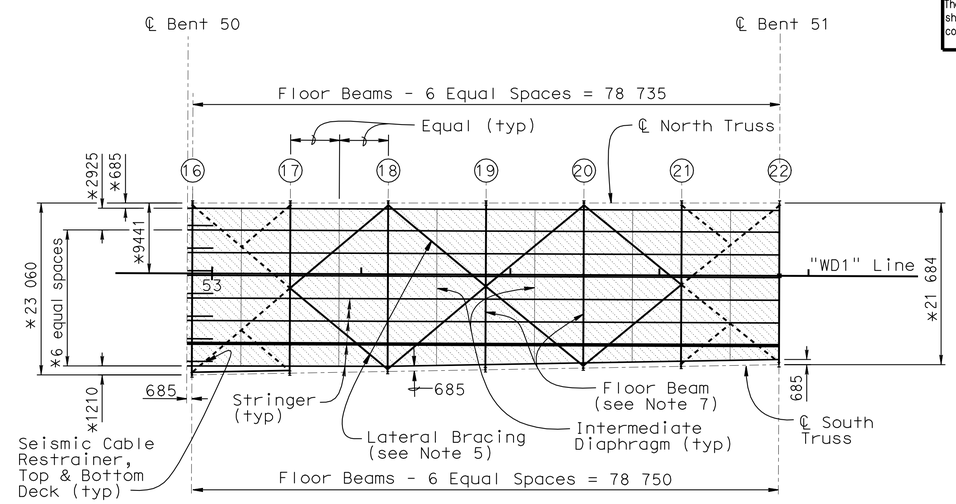
REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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.



PLAN-TOP FRAMING & LATERAL BRACING

1:400



PLAN-BOTTOM FRAMING & LATERAL BRACING

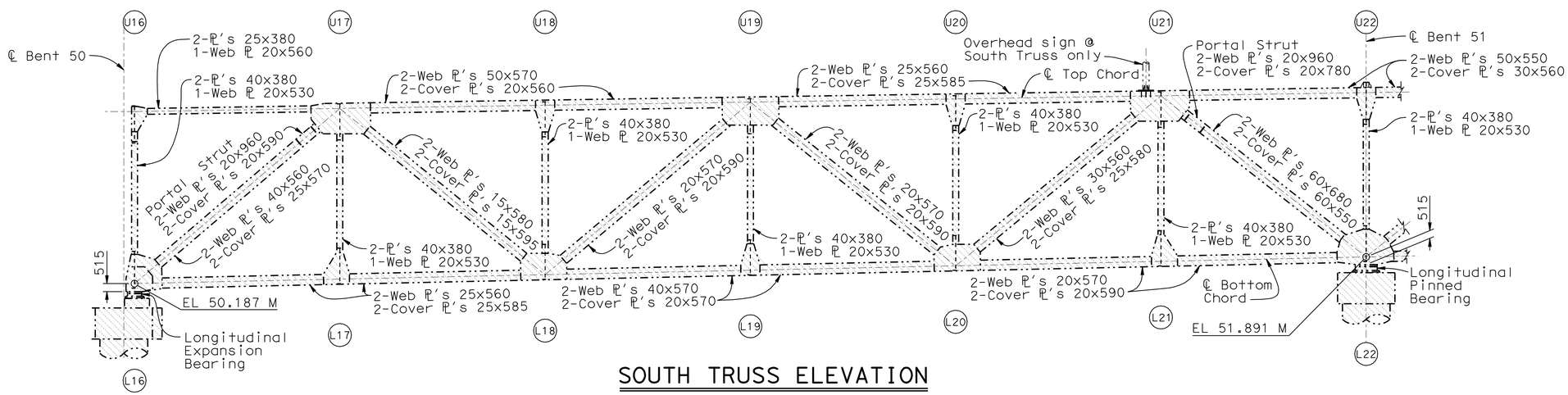
1:400

LEGEND:

- (X) Indicates existing floor beam number (Top & Bottom Deck)
- * Indicates measured along ℄ Floor Beam
- Indicates existing Lateral Bracing with 10 mm flange ℙ
- Indicates existing Lateral Bracing with 16 mm flange ℙ
- Indicates bridge removal
- Indicates Existing Structure

NOTE:

For Notes, see "Span Layout No. 1" sheet



SOUTH TRUSS ELEVATION

1:100
(North Truss Similar)

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

Caltrans Metric

	BY	CHECKED
DESIGN	P. Hong	M. J. Cullen
DETAILS	G. M. Souza/T.C.	M. J. Cullen
QUANTITIES	P. Hong	M. J. Cullen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

SOUTH, SOUTH DETOUR VIADUCT DEMOLITION

SPAN LAYOUT NO. 4

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 09-24-10 10-01-10 10-19-10 10-22-10 11-09-10 01-06-11 05-25-11

SHEET 8 OF 17

FILE => 34-0006-62-08-b-spanlyt04_truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s114926 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 12:58

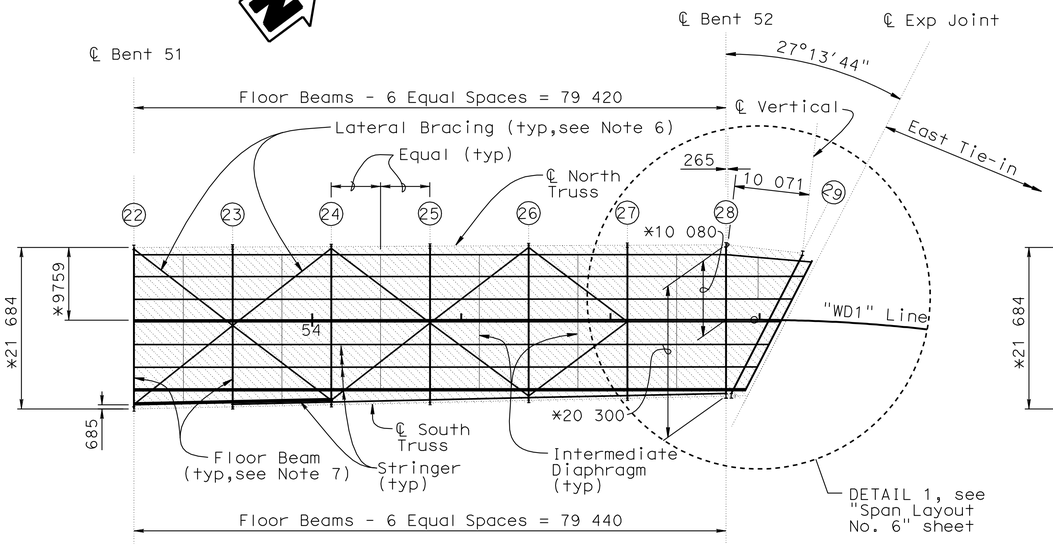
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	516	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

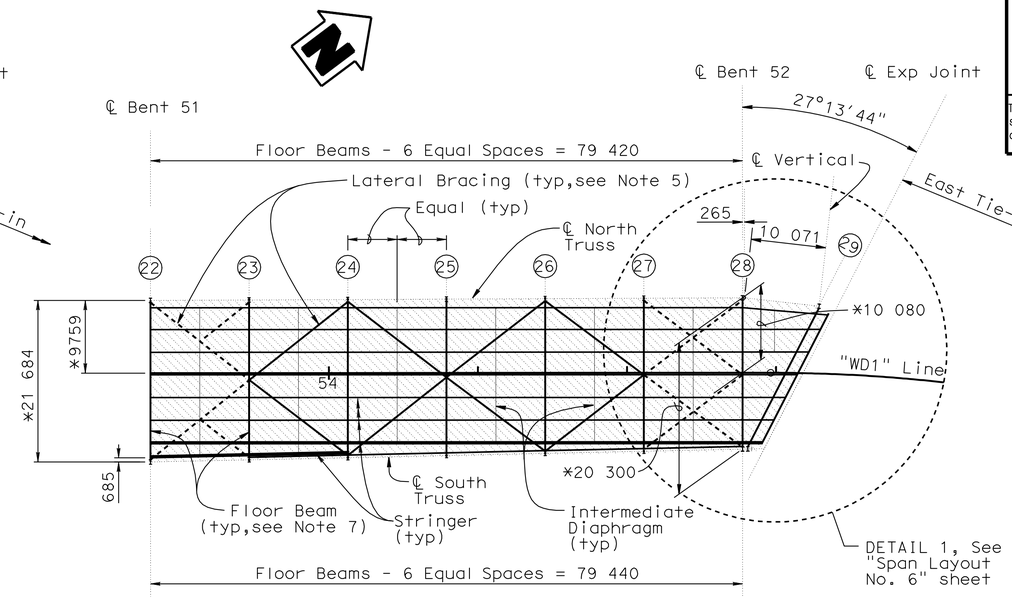
REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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.



PLAN-TOP FRAMING & LATERAL BRACING

1:400



PLAN-BOTTOM FRAMING & LATERAL BRACING

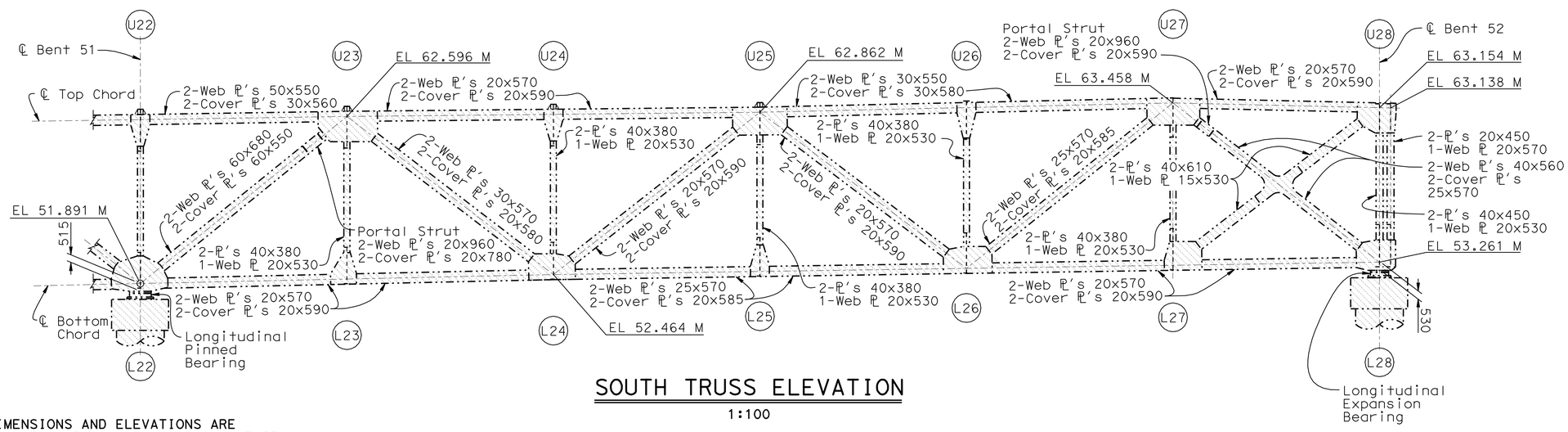
1:400

LEGEND:

- (X) Indicates existing floor beam number (Top & Bottom Deck)
- * Indicates measured along ℄ Floor Beam
- —— Indicates existing Lateral Bracing with 10 mm flange ℙ
- ---- Indicates existing Lateral Bracing with 16 mm flange ℙ
- Indicates bridge removal
- ---- Indicates Existing Structure

NOTE:

For Notes, see "Span Layout No. 1" sheet



SOUTH TRUSS ELEVATION

1:100

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

Caltrans Metric

	BY	CHECKED
DESIGN	P. Hong	M. J. Cullen
DETAILS	G. M. Souza	M. J. Cullen
QUANTITIES	P. Hong	M. J. Cullen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

SOUTH, SOUTH DETOUR VIADUCT DEMOLITION

SPAN LAYOUT NO. 5

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 09-29-10 10-01-10 10-19-10 10-22-10 11-09-10 01-06-11 05-25-11

SHEET 9 OF 17

FILE => 34-0006-63-09-b-spanlyt05_truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s114926 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 12:58

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	517	821

REGISTERED CIVIL ENGINEER — DATE 11-09-11

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — M. J. CULLEN — No. C 40620 — Exp. 03-31-13 — CIVIL — STATE OF CALIFORNIA

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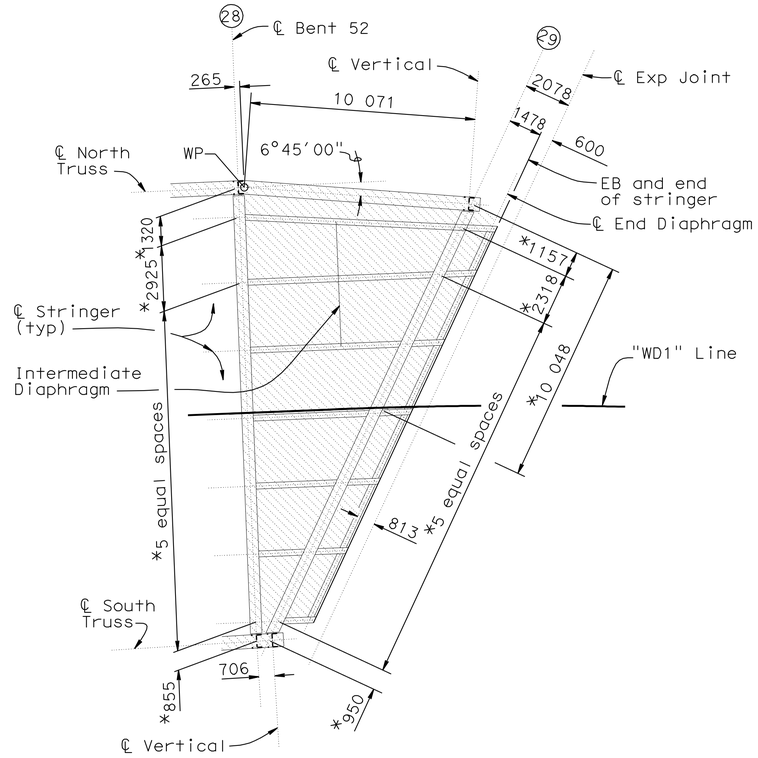
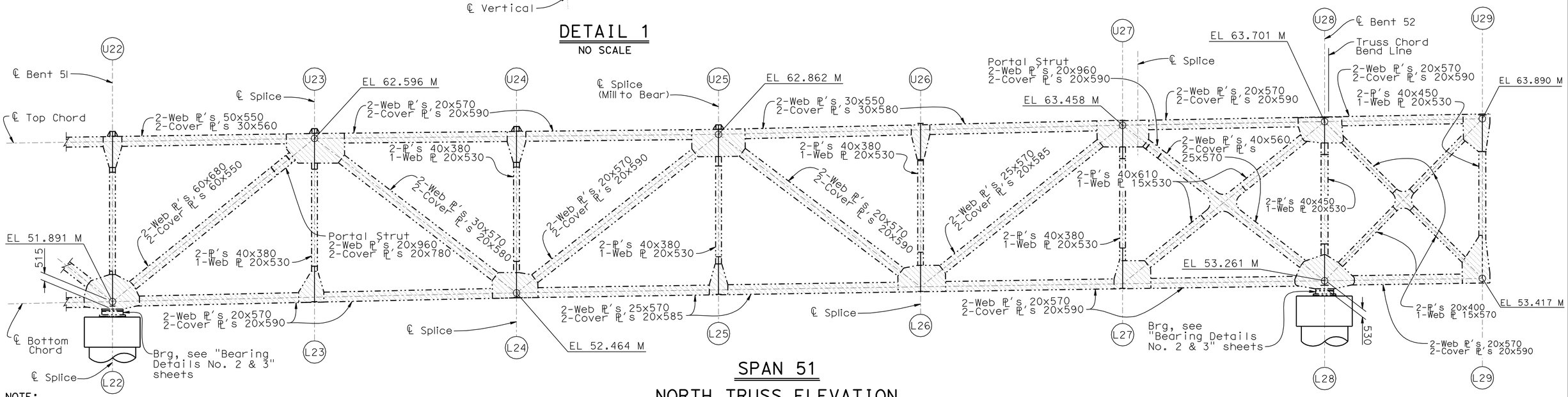


DETAIL 1

NO SCALE

LEGEND:

- (X) Indicates existing floor beam number (Top & Bottom Deck)
- * Indicates measured along ℄ Floor Beam
- —— Indicates existing Lateral Bracing with 10 mm flange ℙ
- ---- Indicates existing Lateral Bracing with 16 mm flange ℙ
- Indicates bridge removal
- ···— Indicates Existing Structure



SPAN 51

NORTH TRUSS ELEVATION

1:125

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

Caltrans Metric

	BY	CHECKED
DESIGN	P. Hong	M. J. Cullen
DETAILS	G. M. Souza/T.C.	M. J. Cullen
QUANTITIES	P. Hong	M. J. Cullen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

SOUTH, SOUTH DETOUR VIADUCT DEMOLITION

SPAN LAYOUT NO. 6

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES → 01-05-11

REVISION DATES

SHEET 10 OF 17

FILE => 34-0006-64-10-b-spanlyt06_truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s114326 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 12:58

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	518	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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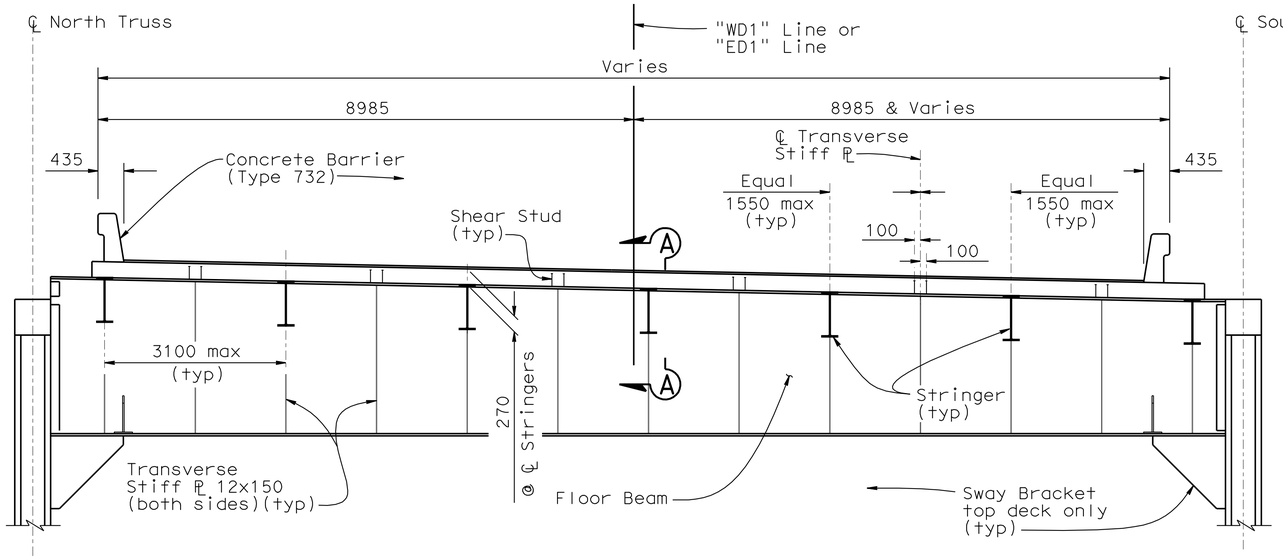


Note: Top Deck shown, Bottom Deck similar. Floor Beam Length varies, see "Floor Beam Detail" on "Details No. 2" sheet.

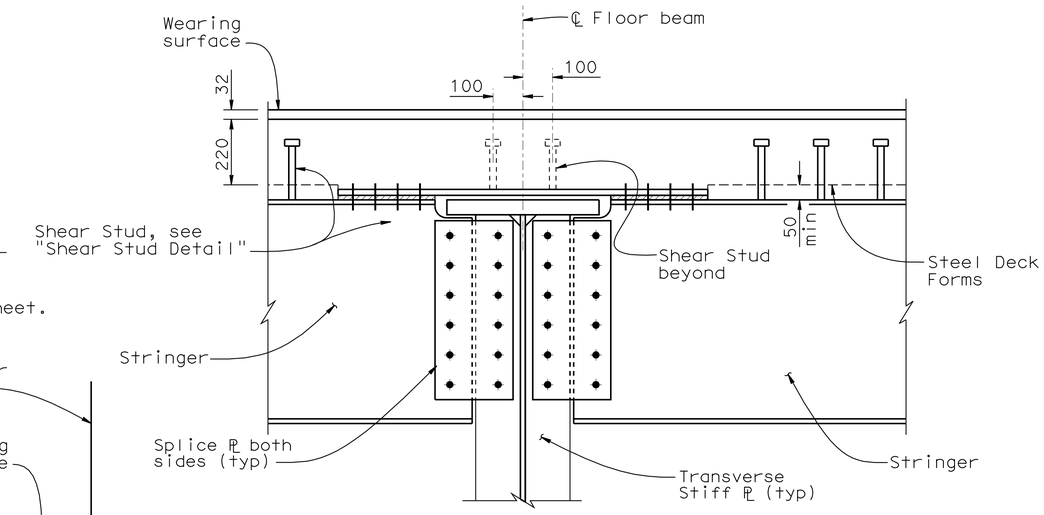
* Not hatched for clarity

TYPICAL SECTION

1:20

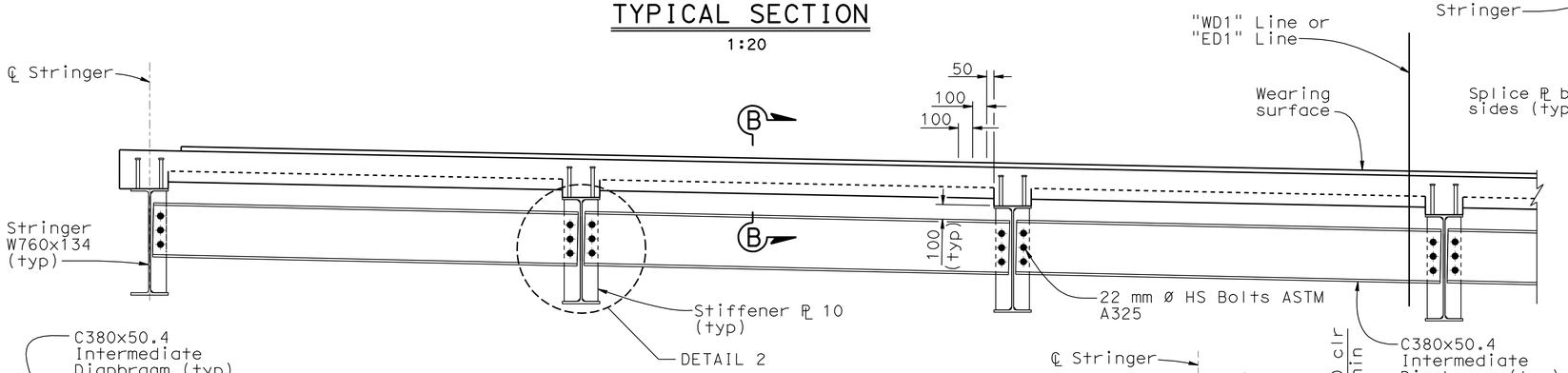
Note:

All drawings are of existing structures and are shown with solid line style for clarity



SECTION A-A

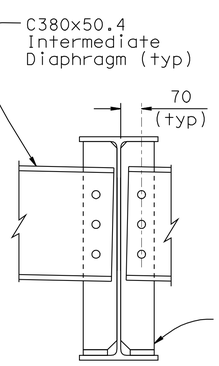
1:10



* Not hatched for clarity

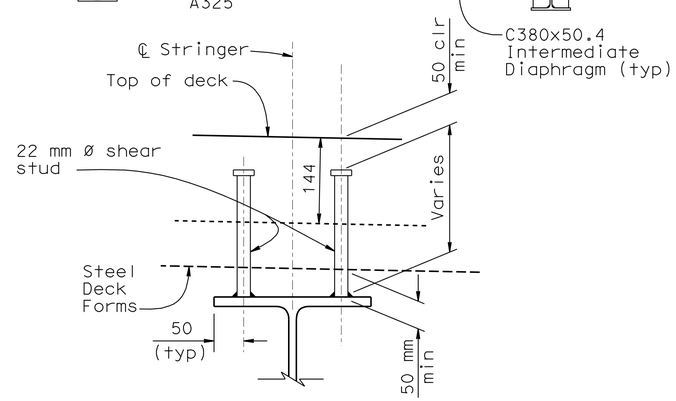
PART TYPICAL SECTION

1:20



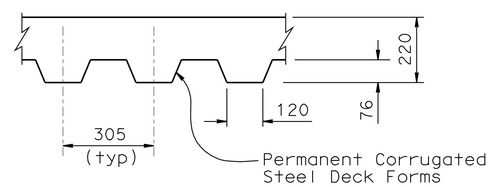
DETAIL 2

1:10



SHEAR STUD DETAIL

1:5



SECTION B-B

1:10

Notes:

1. Deck concrete is light weight (18.8 kN/m or 120 pcf) with f'c = 28 MPa.
2. Wearing surface 575 N/m (12 lb/ft) assumed.
3. Steel formwork with sound proofing material at 240 N/m (5 lb/ft) assumed.

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

	BY	CHECKED
DESIGN	P. Hong	M. J. Cullen
DETAILS	G. M. Souza	M. J. Cullen
QUANTITIES	P. Hong	M. J. Cullen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

SOUTH, SOUTH DETOUR VIADUCT DEMOLITION

TYPICAL SECTION

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 10-04-10 11-09-10 01-06-11 01-24-11 05-26-11

SHEET 11 OF 17

FILE => 34-0006-65-11-c-typ-sec_truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s128843 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:06

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	519	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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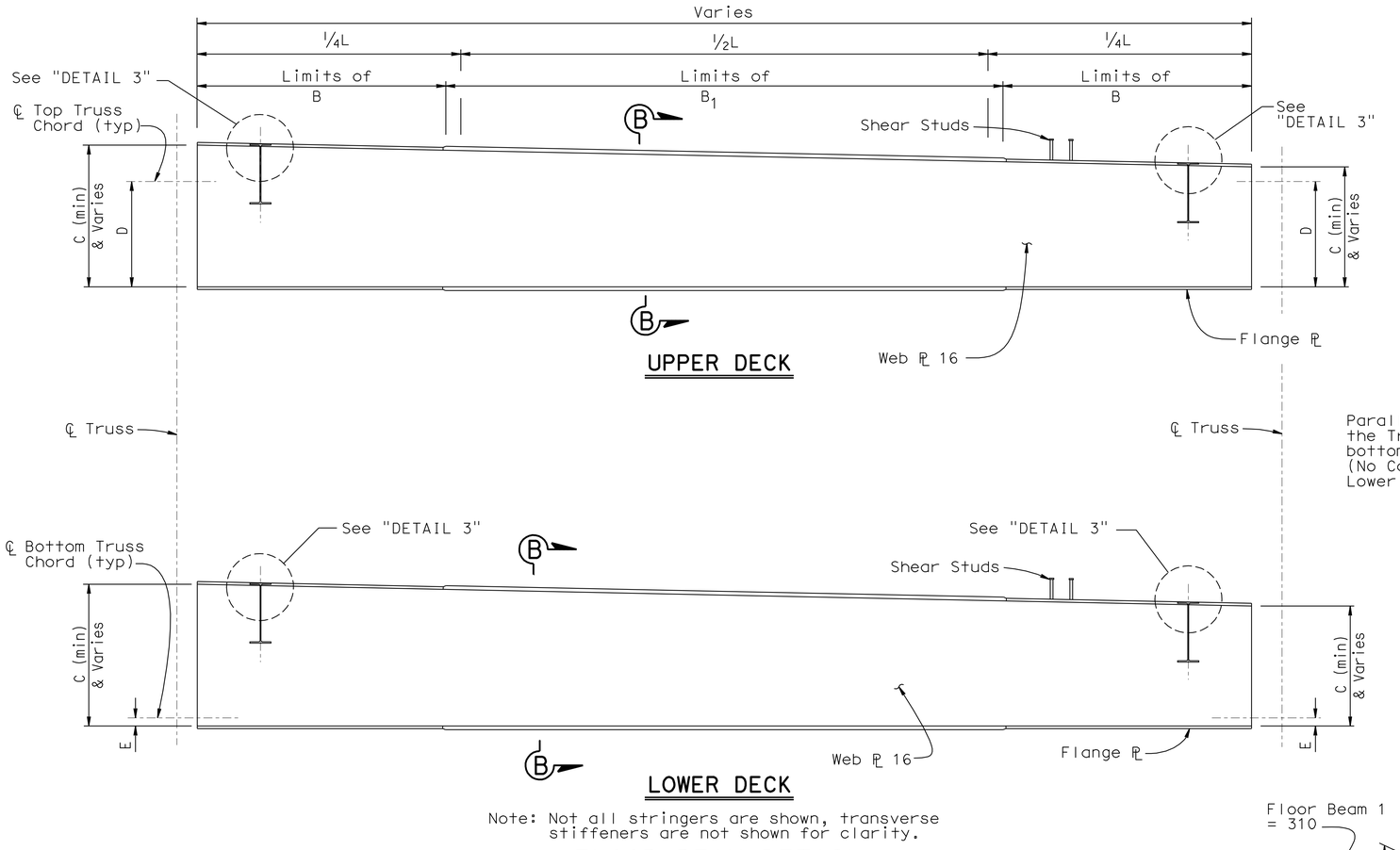
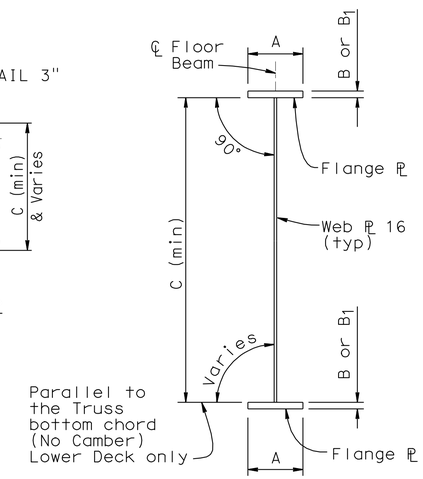


Note: Not all stringers are shown, transverse stiffeners are not shown for clarity.

FLOOR BEAM DETAIL

No Scale



SECTION B-B

No Scale

FLOOR BEAM DIMENSIONS

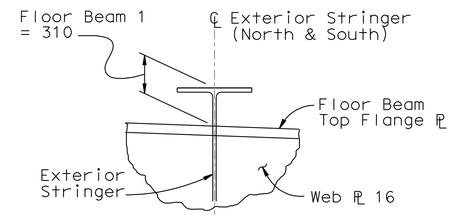
FLOOR BEAM	A	B	B_1	C (min)	D	E
1	610	60	60	1900	1900	340
2 THRU 9 Upper and Lower Deck	610	35	50	2200	1900	365
10 THRU 15 Upper and Lower Deck	510	33	50	2200	1900	367
16 THRU 20 Upper and Lower Deck	510	30	46	2200	2000	275
21 THRU 25 Upper and Lower Deck	510	28	44	2200	2000	277
26 & 27 Upper Deck	510	42	50	1750	2000	N/A
28 Upper Deck North	510	42	50	1650	1970	N/A
28 Upper Deck South	510	42	50	1650	1395	N/A
26 THRU 28 Lower Deck	510	25	42	2200	N/A	280
29 Upper Deck North	510	50	50	1650	2160	N/A
29 Upper Deck South	510	50	50	1650	1407	N/A
29 Lower Deck	510	25	42	2200	N/A	255

LEGEND

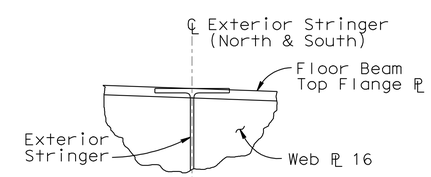
(X) Indicates floor beam number (Upper & Lower Deck)

Note:

All drawings are of existing structures and are shown with solid line style for clarity



FLOOR BEAM 1



FLOOR BEAMS 2-29

DETAIL 3

No Scale

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

Caltrans Metric

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

	BY	CHECKED
DESIGN	P. Hong	M. J. Cullen
DETAILS	G. M. Souza	M. J. Cullen
QUANTITIES	P. Hong	M. J. Cullen

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN
DESIGN BRANCH 5

CU 04251
EA 0120T1

BRIDGE NO. 34-0006
KILOMETER POST NA

SOUTH, SOUTH DETOUR VIADUCT DEMOLITION

SPAN DETAILS

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 09-29-10 10-04-10 10-19-10 01-06-11 05-26-11

SHEET 12 OF 17

FILE => 34-0006-66-12-c-spandet_truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s128843 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:06

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	520	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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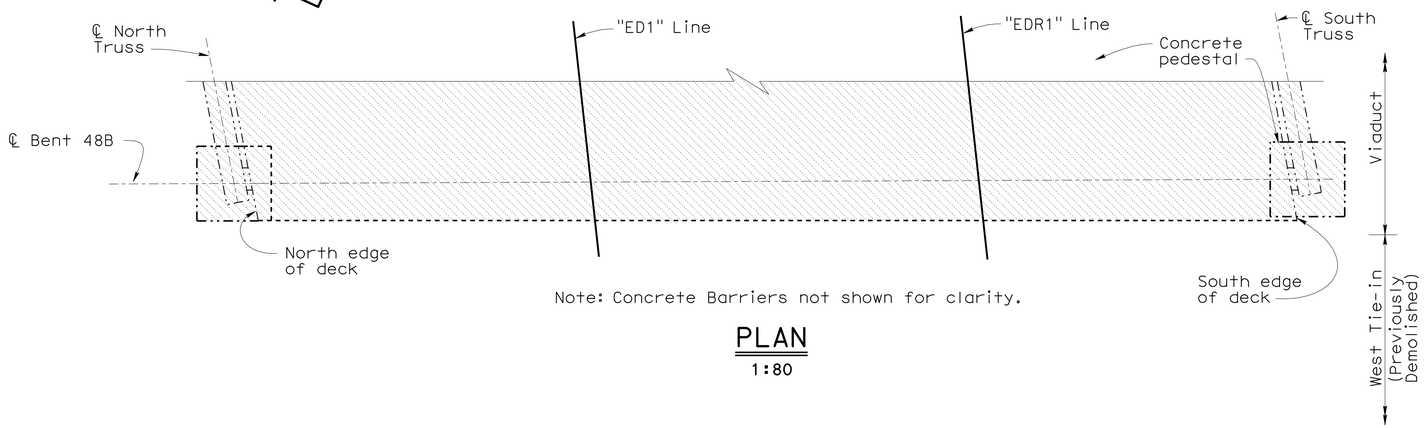
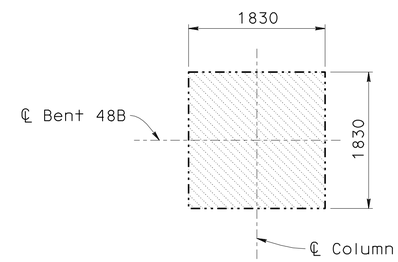
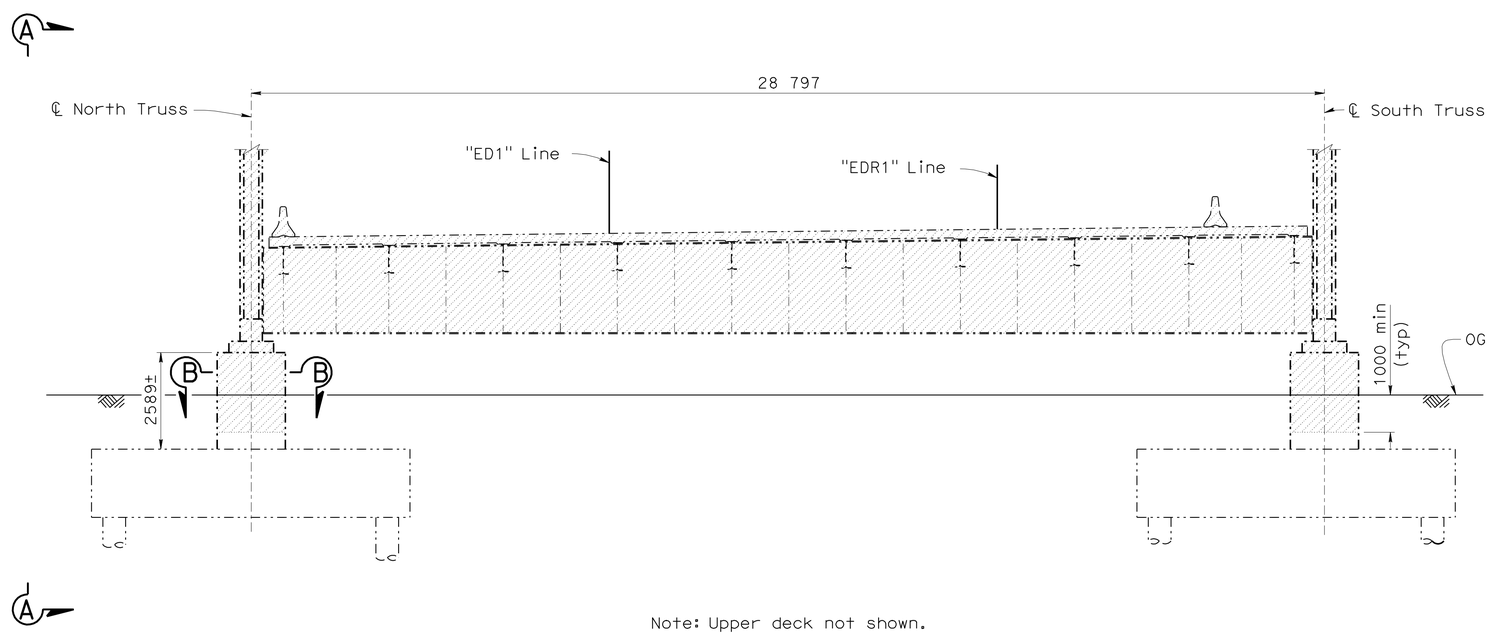


Note: Concrete Barriers not shown for clarity.

PLAN
1:80

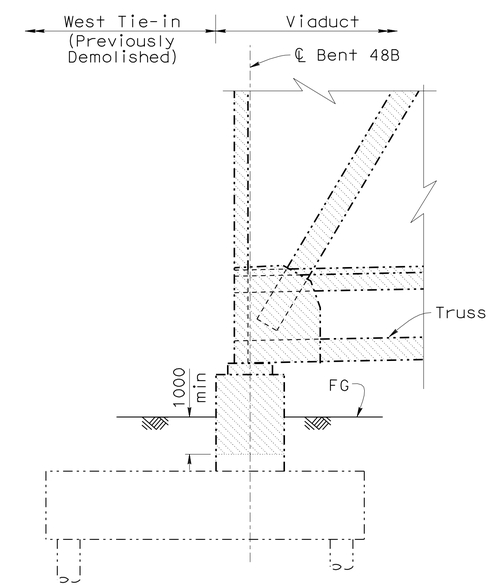


SECTION B-B
1:40



Note: Upper deck not shown.

ELEVATION-BENT 48B
1:80
STA "WD1" 51+42.00



VIEW A-A
1:80

LEGEND:

Indicates Existing Structure

Indicates bridge removal (Viaduct)

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

	BY	CHECKED
DESIGN	P. Hong	M. J. Cullen
DETAILS	G. M. Souza	M. J. Cullen
QUANTITIES	P. Hong	M. J. Cullen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

SOUTH, SOUTH DETOUR VIADUCT DEMOLITION
BENT DETAILS NO. 1

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 10-25-10 01-06-11 01-12-11 01-28-11 05-26-11 11-08-11

SHEET 13 OF 17

FILE => 34-0006-67-13-c-bnt-det01_truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s128843 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:06

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	521	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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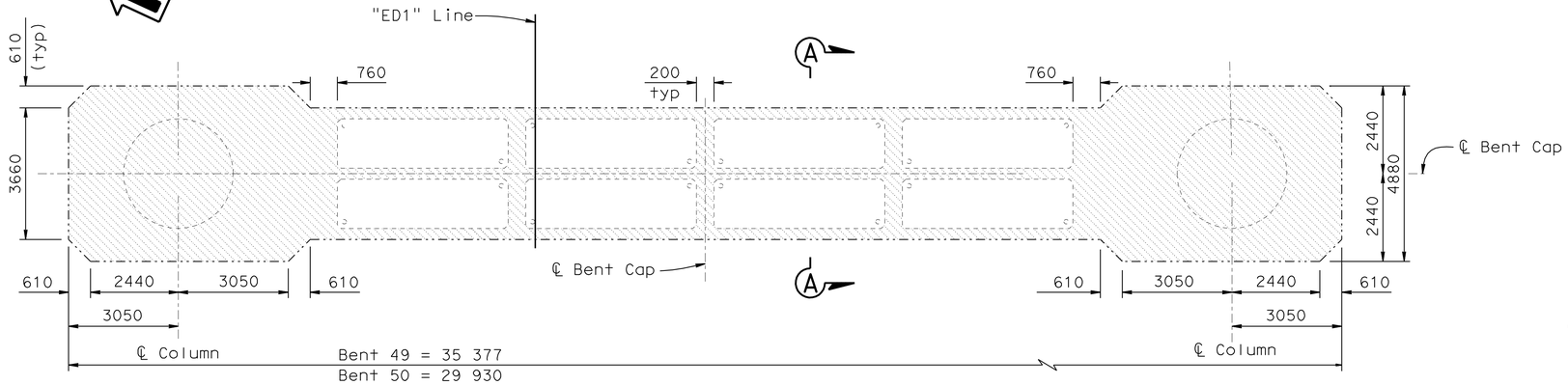
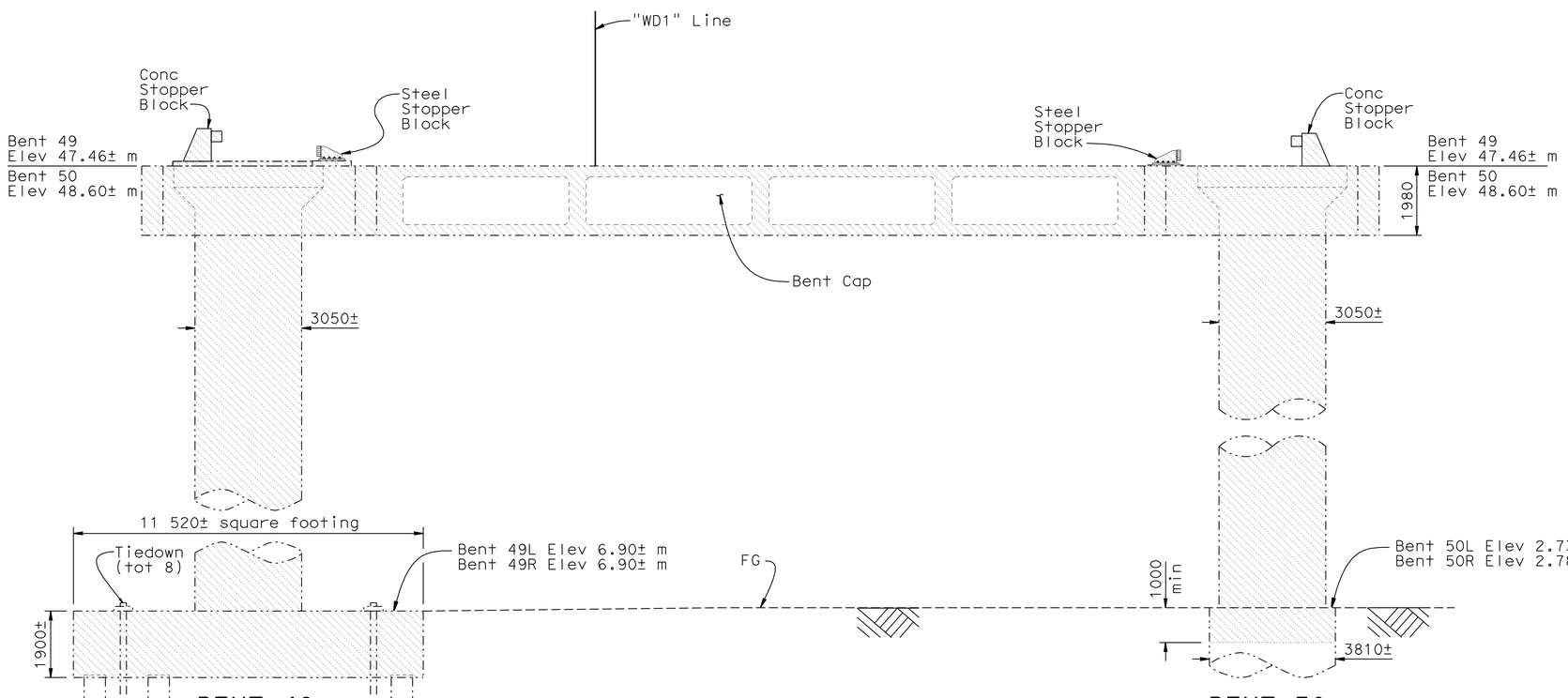
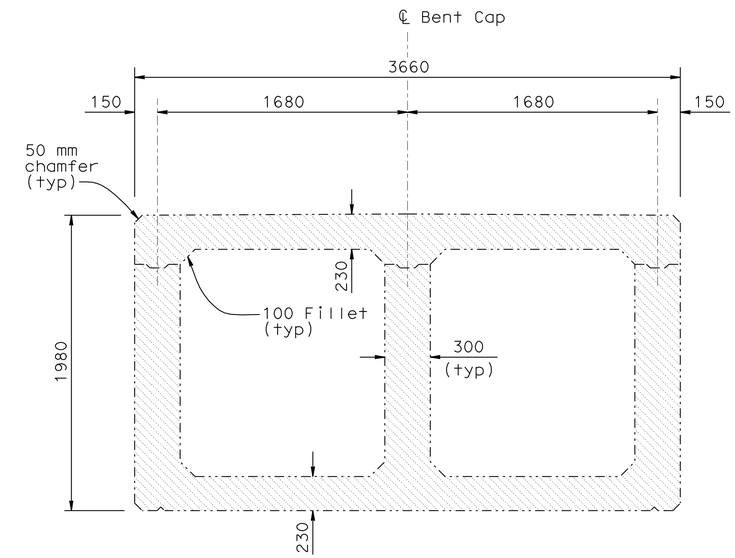


PLAN
1:80



ELEVATION
1:80

STA: "WD1" 52+19.33 Truss not shown



SECTION A-A
1:20

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

LEGEND:

-·-·-·- Indicates Existing Structure

Indicates bridge removal

	BY	CHECKED
DESIGN	P. Hong	M. J. Cullen
DETAILS	G. M. Souza/T.C.	M. J. Cullen
QUANTITIES	P. Hong	M. J. Cullen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

SOUTH, SOUTH DETOUR VIADUCT DEMOLITION
BENT DETAILS NO. 2

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 10-04-10 10-18-10 10-22-10 01-06-11 01-12-11 01-24-11 01-25-11 11-08-11

SHEET 14 OF 17

FILE => 34-0006-68-14-c-bnt-det02_truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s128843 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:06

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	522	821

REGISTERED CIVIL ENGINEER — DATE 11-09-11

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — M. J. CULLEN — No. C 40620 — Exp. 03-31-13 — CIVIL — STATE OF CALIFORNIA

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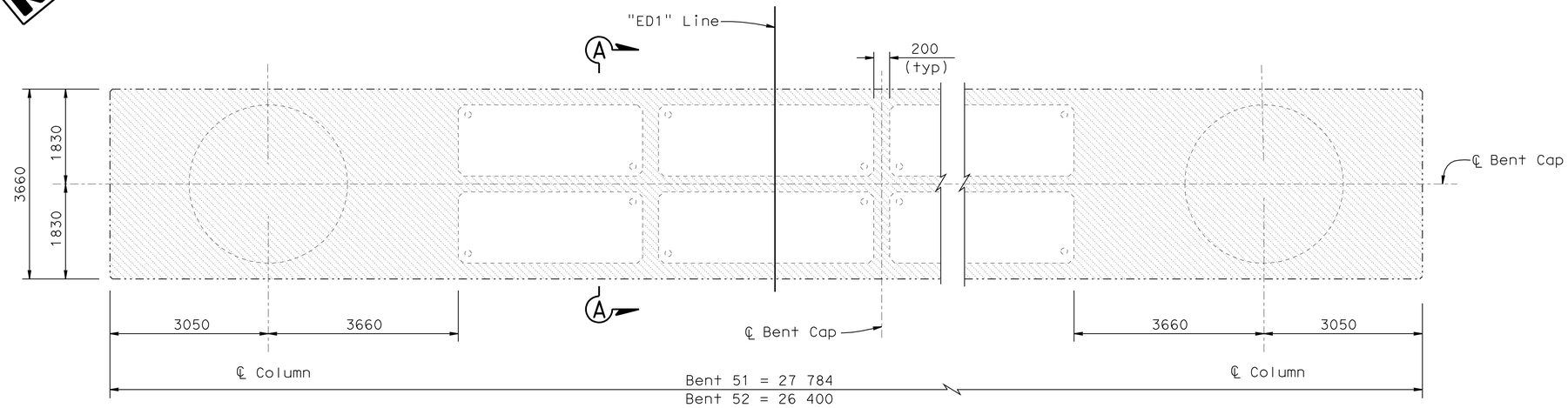
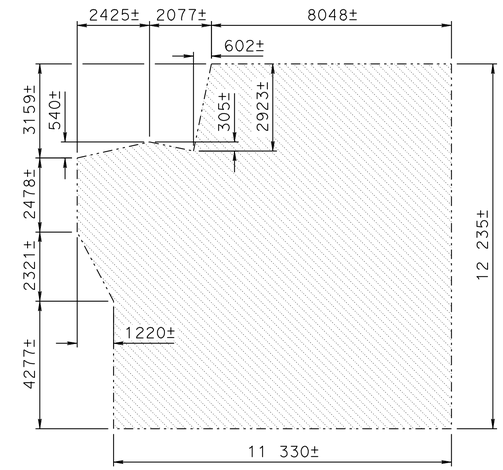
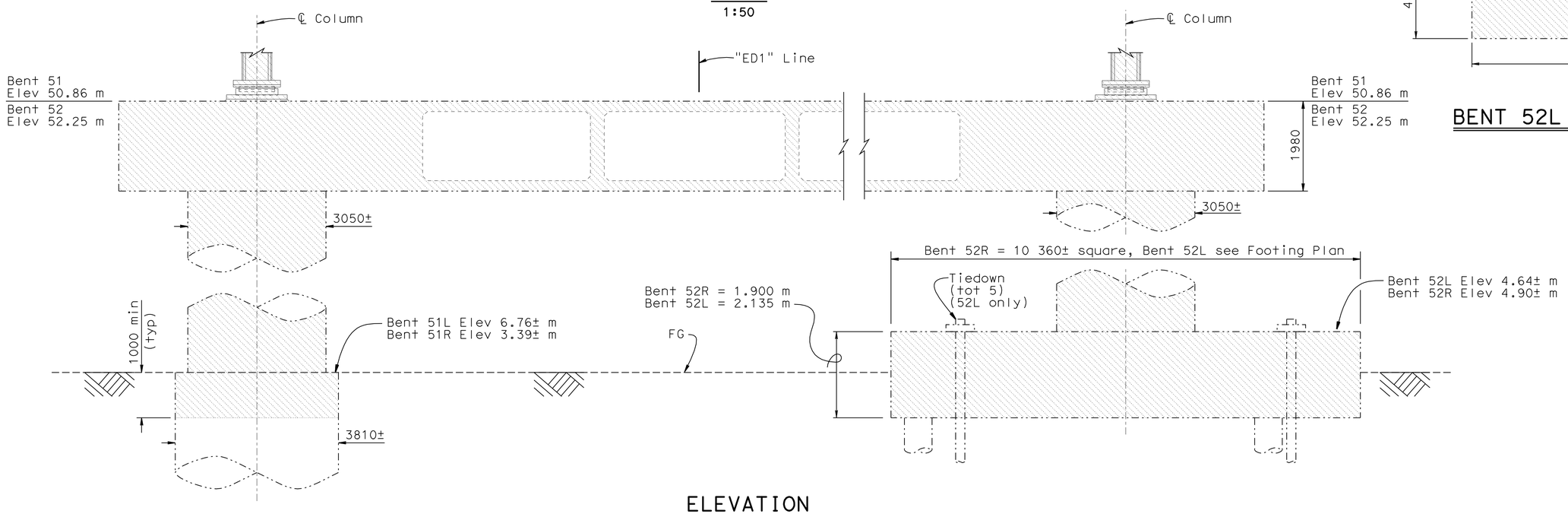


Note: For Section A-A, see "Bent Details No 2" sheet

PLAN
1:50



BENT 52L FOOTING PLAN
1:100



ELEVATION
1:50

BENTS 51 & 52

BENT 51
Bent 51L shown, Bent 51R similar

BENT 52
Bent 52R shown, Bent 52L similar

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

LEGEND:
- Indicates Existing Structure
- Indicates bridge removal

	BY	CHECKED
DESIGN	P. Hong	M. J. Cullen
DETAILS	G. M. Souza	M. J. Cullen
QUANTITIES	P. Hong	M. J. Cullen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

SOUTH, SOUTH DETOUR VIADUCT DEMOLITION
BENT DETAILS NO. 3

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 09-06-06 10-06-06 10-27-06 01-06-11 01-12-11 01-26-11 05-26-11 11-08-11

SHEET 15 OF 17

FILE => 34-0006-69-15-d-bnt-det03_truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s128843 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:06

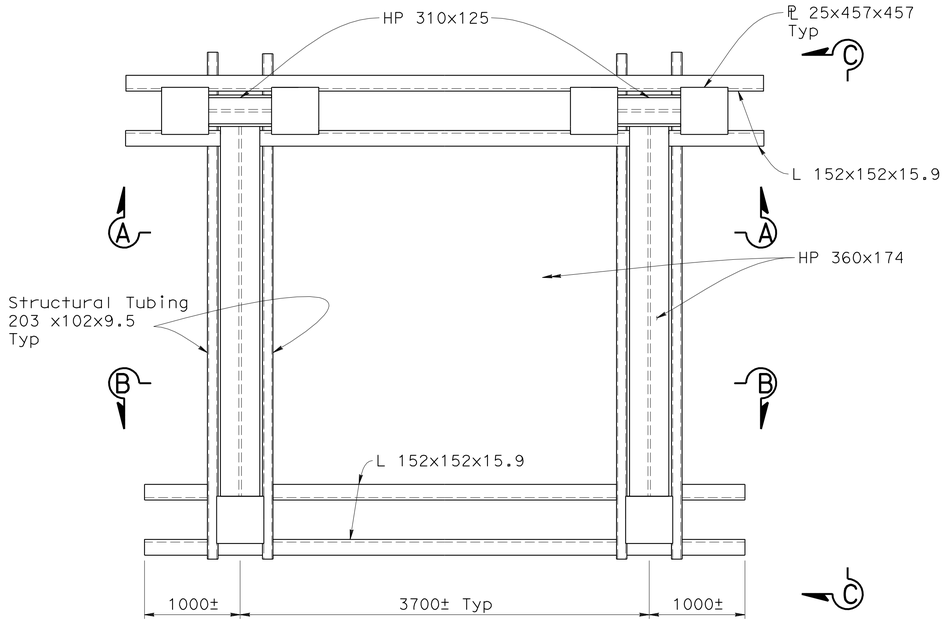
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	523	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

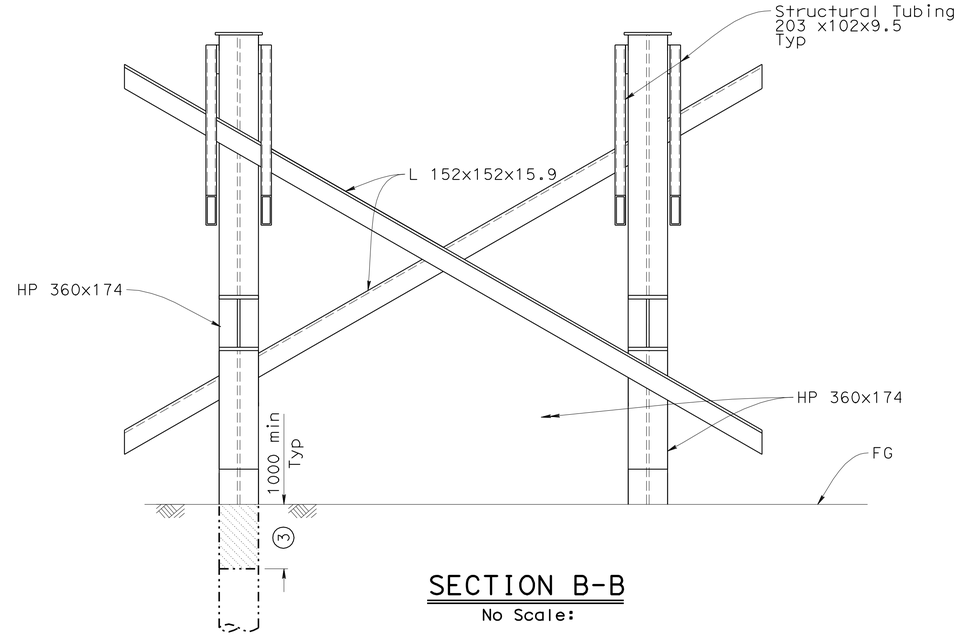
2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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.



PLAN
No Scale:

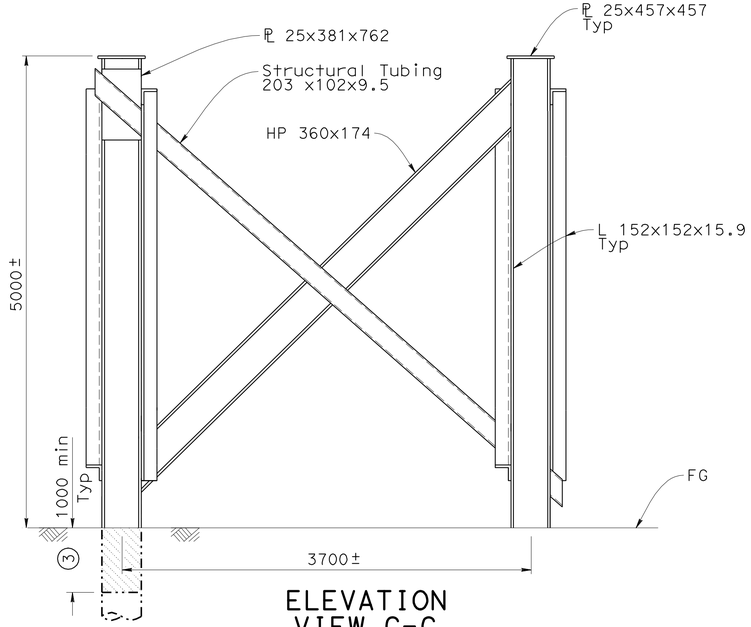


SECTION B-B
No Scale:

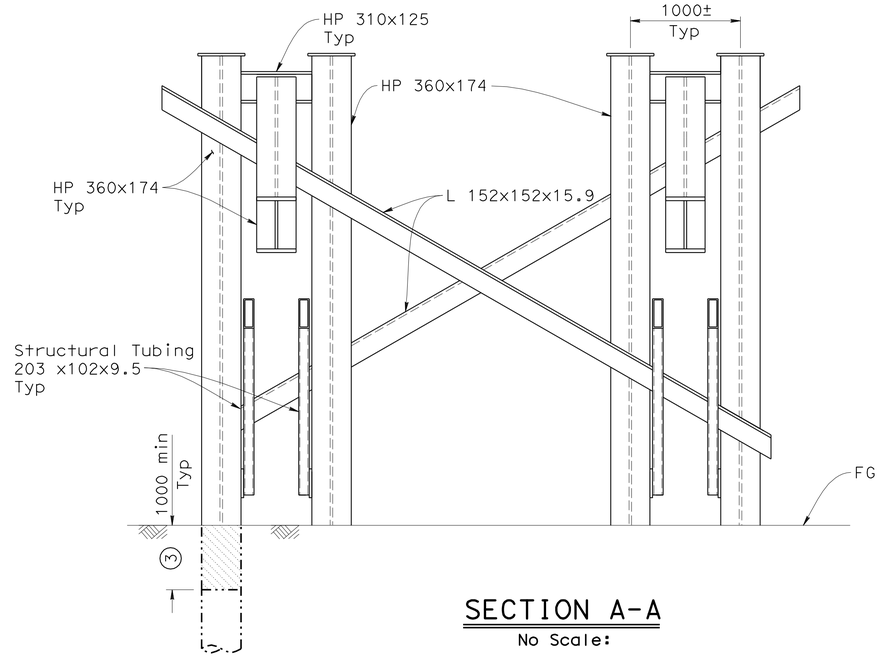
Note:

1. Falsework Foundation member size, dimensions and configurations are approximate and vary at each location. The contractor shall verify all field dimensions.
2. Total four locations, for locations see "Foundation Plan".
3. All members shall be removed to 1000 mm below FG.

Indicates partial removal.



ELEVATION
VIEW C-C
No Scale:



SECTION A-A
No Scale:

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

	BY	CHECKED
DESIGN	B. Pentorali	M. J. Cullen
DETAILS	T. Cotton	M. J. Cullen
QUANTITIES	P. Hong	M. J. Cullen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

SOUTH, SOUTH DETOUR VIADUCT DEMOLITION
ERECTION TOWER FOUNDATION DETAILS (TYPE A)

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 08-05-11 10-05-11 10-17-11 11-08-11

SHEET 16 OF 17

FILE => 34-0006-70-16-d-bnt-det04_truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s128843 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:06

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	524	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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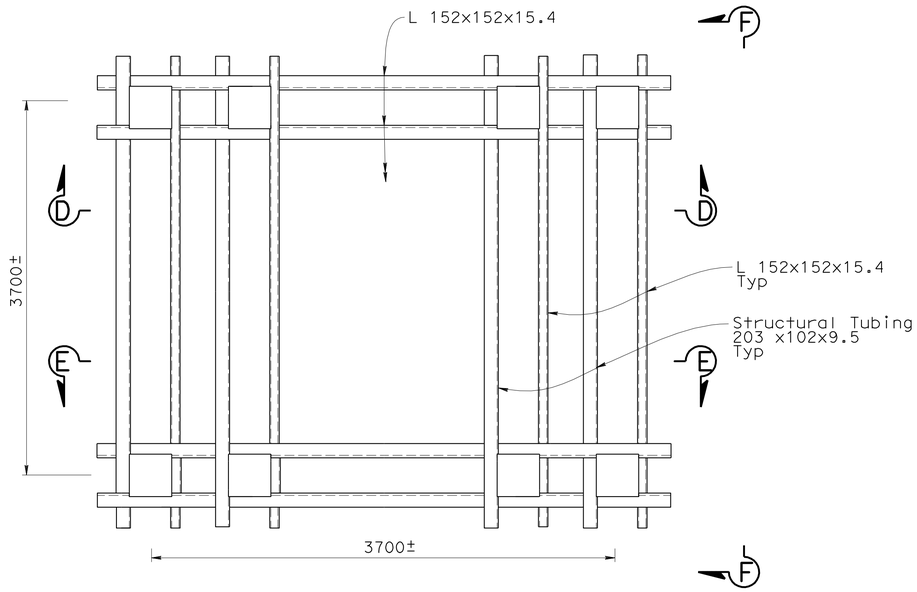
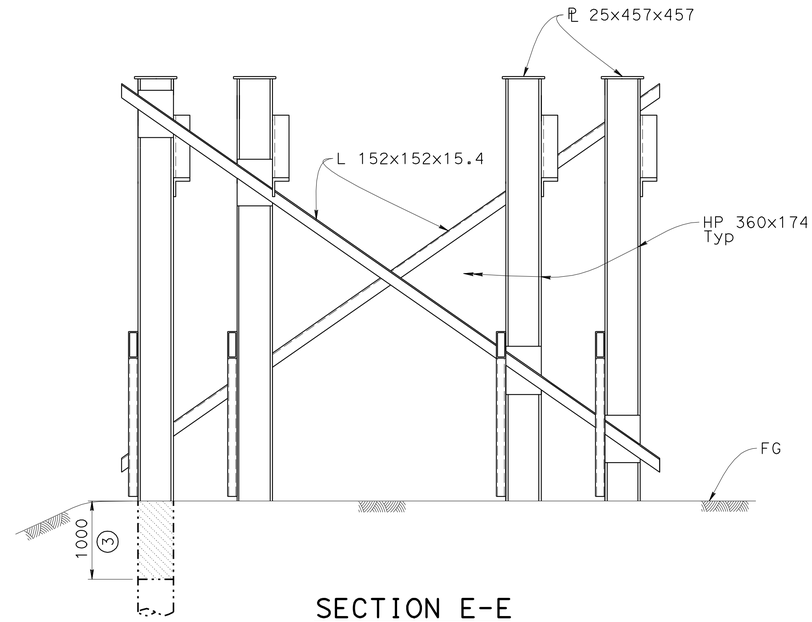
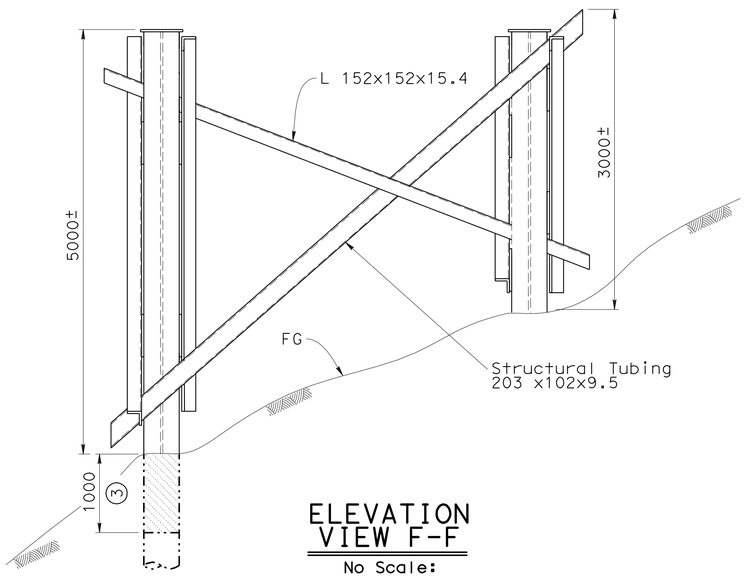


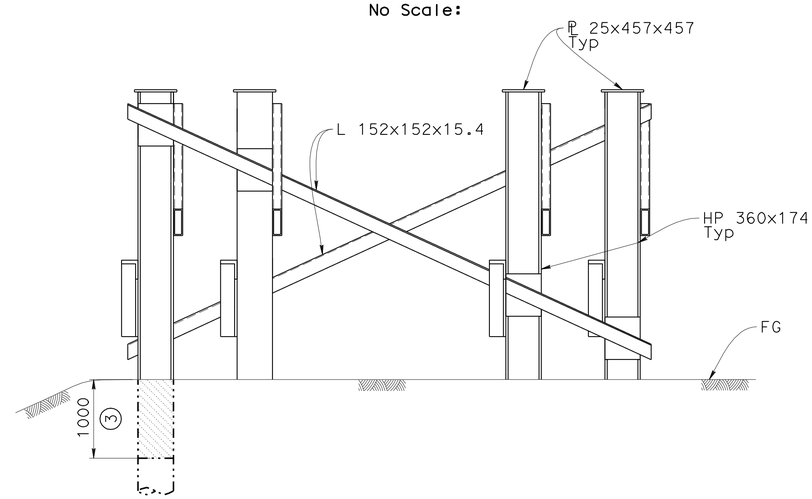
PLAN
No Scale:



SECTION E-E
No Scale:



ELEVATION VIEW F-F
No Scale:



SECTION D-D
No Scale:

Note:

1. Falsework Foundation member size, dimensions and configurations are approximate and vary at each location. The contractor shall verify all field dimensions.
2. Total four locations, for locations see "Foundation Plan".
3. All members shall be removed to 1000 mm below FG.

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

Caltrans Metric

	BY	CHECKED
DESIGN	B. Pentorali	M. J. Cullen
DETAILS	T. Cotton	M. J. Cullen
QUANTITIES	P. Hong	M. J. Cullen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

SOUTH, SOUTH DETOUR VIADUCT DEMOLITION
ERECTION TOWER FOUNDATION DETAILS (TYPE B)

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES 08-05-11 10-05-11 11-08-11

REVISION DATES

SHEET 17 OF 17

FILE => 34-0006-71-17-d-bnt-det05_truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s128843 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:07

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	525	821

REGISTERED CIVIL ENGINEER — DATE 11-09-11

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — M. J. CULLEN — No. C 40620 — Exp. 03-31-13 — CIVIL — STATE OF CALIFORNIA

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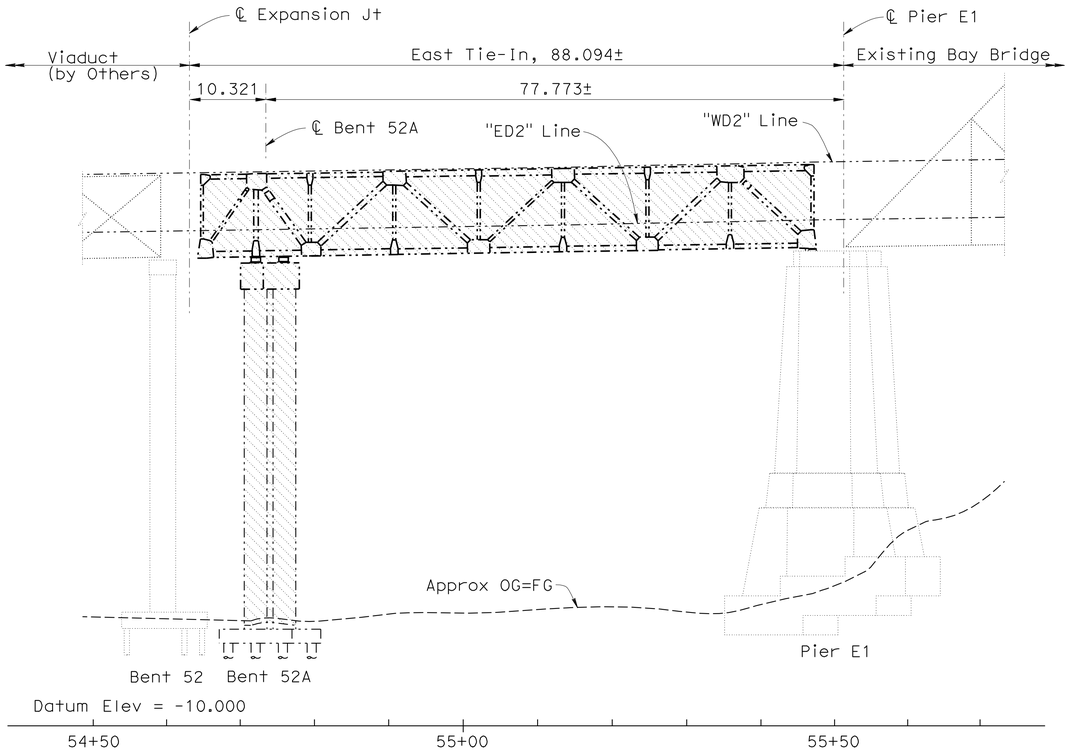


PROJECTED ELEVATION

1:400

Note: Longitudinal dimensions measured along "WD2" or "ED2" line.

QUANTITIES

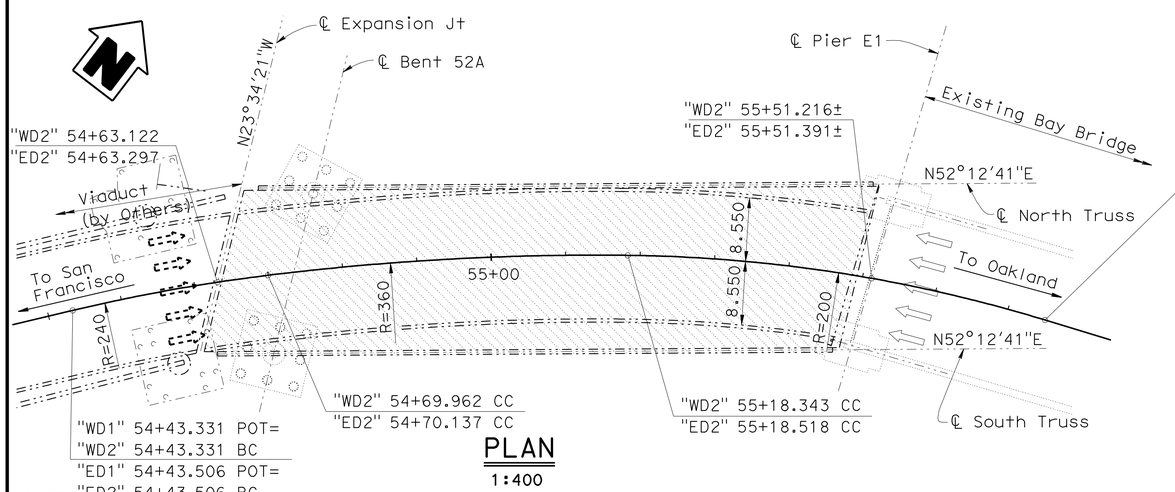
BRIDGE REMOVAL (PORTION), LOCATION D	LUMP SUM

INDEX TO PLANS

SHEET NO.	TITLE
1.	General Plan
2.	Foundation Plan
3.	Deck Contours (East Bound)
4.	Deck Contours (West Bound)
5.	Span Layout No. 1
6.	Span Layout No. 2
7.	Span Layout No. 3
8.	Span Layout No. 4
9.	Span Layout No. 5
10.	Typical Section
11.	Span Details No. 1
12.	Span Details No. 2
13.	Bent Details No. 1
14.	Bent Details No. 2
15.	Bent Details No. 3

LEGEND:

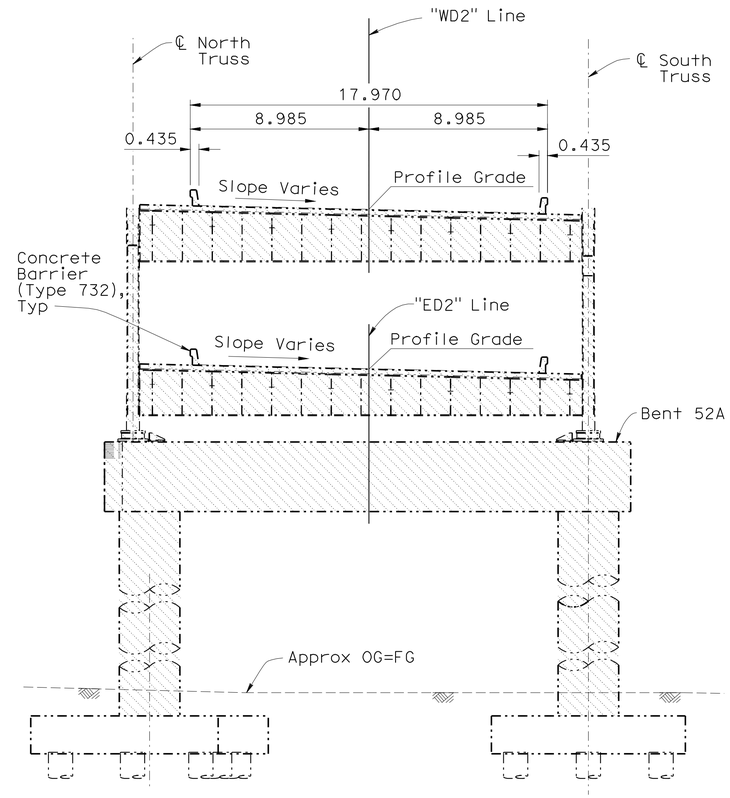
- Indicates Existing Structure
- Indicates Bridge Removal
- Indicates Westbound Traffic
- Indicates Eastbound Traffic



PLAN

1:400

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.



TYPICAL SECTION

1:150

Note: Dimensions measured perpendicular to "WD2" or "ED2" line.

All dimensions are approximate.

DESIGN	BY M. J. Cullen	CHECKED Pyo Hong	LOAD & RESISTANCE FACTOR DESIGN	LIVE LOADING: HL93 W/"LOW-BOY"; PERMIT DESIGN VEHICLE	
DETAILS	BY G. M. Souza/T. Cotton	CHECKED M. J. Cullen	LAYOUT	BY M. J. Cullen	CHECKED Pyo Hong
QUANTITIES	BY M. J. Cullen	CHECKED Pyo Hong	SPECIFICATIONS	BY S. Margaris	PLANS AND SPECS COMPARED M. J. Cullen

DESIGN ENGINEER

Caltrans Metric

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN
DESIGN BRANCH 5

CU 04251
EA 0120T1

BRIDGE NO. 34-0006
KILOMETER POST NA

EAST TIE-IN (DEMOLITION)

GENERAL PLAN

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 09-23-10, 10-01-10, 10-18-10, 10-27-10, 11-05-10, 12-23-10, 01-18-11, 01-28-11

SHEET 1 OF 10

FILE => 34-0006-72-01-a-gp-truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s128843 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:07

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	526	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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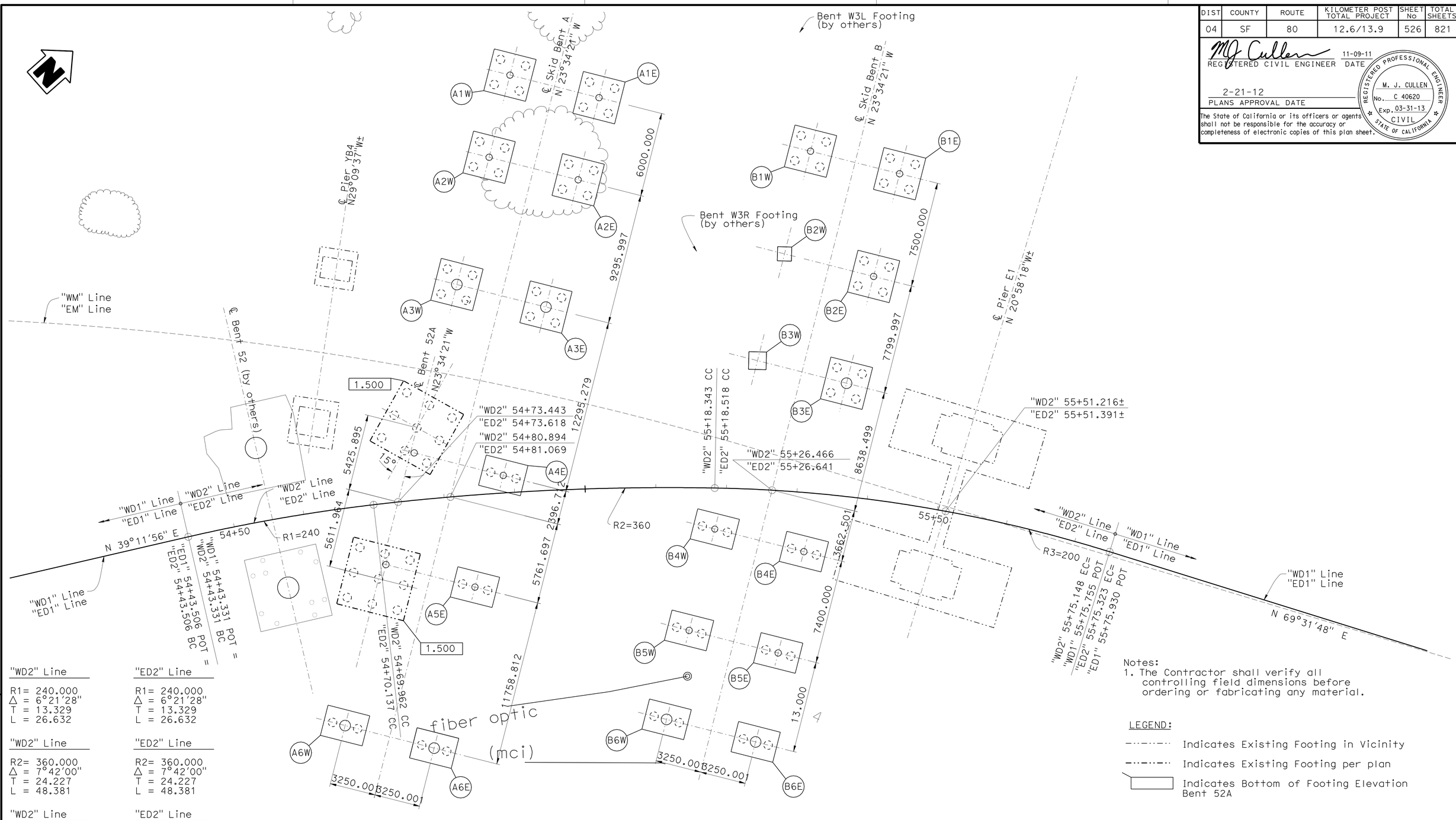

"WD2" Line	"ED2" Line
R1= 240.000	R1= 240.000
Δ = 6°21'28"	Δ = 6°21'28"
T = 13.329	T = 13.329
L = 26.632	L = 26.632
"WD2" Line	**"ED2" Line**
R2= 360.000	R2= 360.000
Δ = 7°42'00"	Δ = 7°42'00"
T = 24.227	T = 24.227
L = 48.381	L = 48.381
"WD2" Line	**"ED2" Line**
R3= 200.000	R3= 200.000
Δ = 16°16'24"	Δ = 16°16'24"
T = 28.595	T = 28.595
L = 56.805	L = 56.805

NOTE:

Benchmark:
Elevation is based on 1929 National Geodetic Vertical Datum (NGVD).

PLAN
1:250

Notes:
1. The Contractor shall verify all controlling field dimensions before ordering or fabricating any material.

LEGEND:

Indicates Existing Footing in Vicinity

Indicates Existing Footing per plan

Indicates Bottom of Footing Elevation Bent 52A

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

Mark Freitas 07/26/04

Caltrans Metric

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

	BY	CHECKED
DESIGN	M. J. Cullen	Pyo Hong
DETAILS	G. M. Souza/T. Cotton	M. J. Cullen
QUANTITIES	M. J. Cullen	Pyo Hong

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN
DESIGN BRANCH 5

CU 04251
EA 0120T1

BRIDGE NO. 34-0006
KILOMETER POST NA

EAST TIE-IN (DEMOLITION)
FOUNDATION PLAN

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 01-26-06 10-01-10 10-14-10 10-27-10 12-23-10 01-18-11 01-26-11 11-08-11

SHEET 2 OF 10

FILE => 34-0006-73-02-b-fdpl-truss.dgn

USERNAME => s128843 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:07

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	527	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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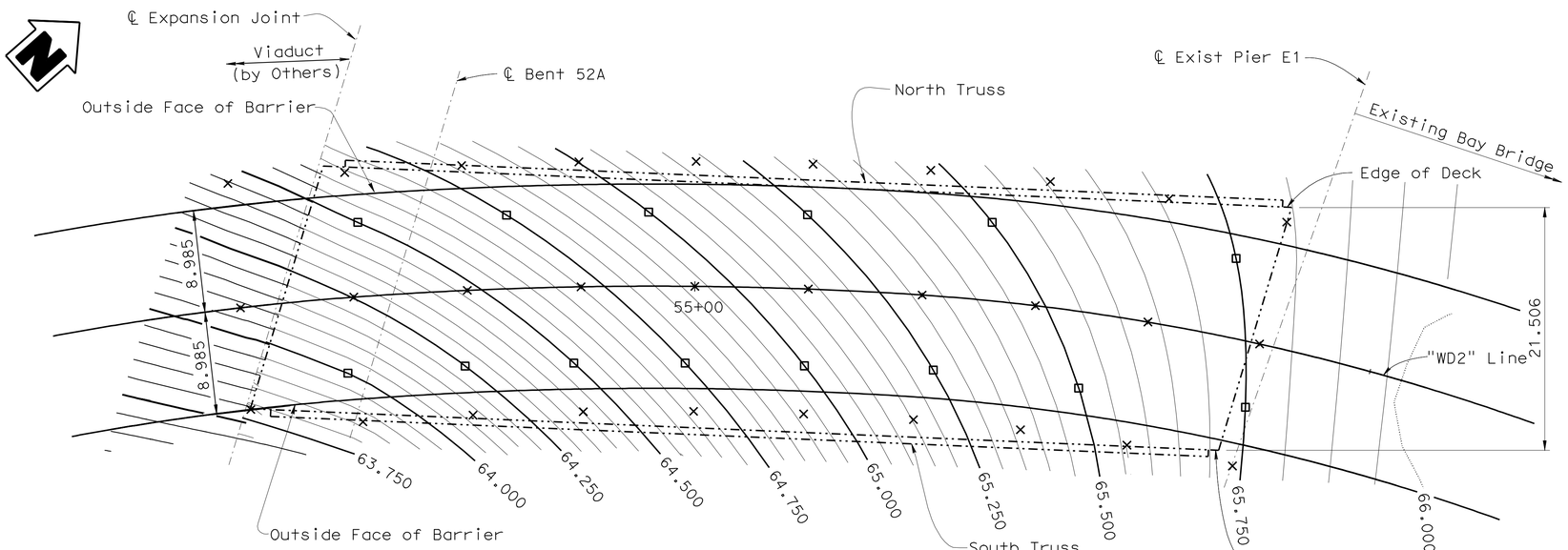
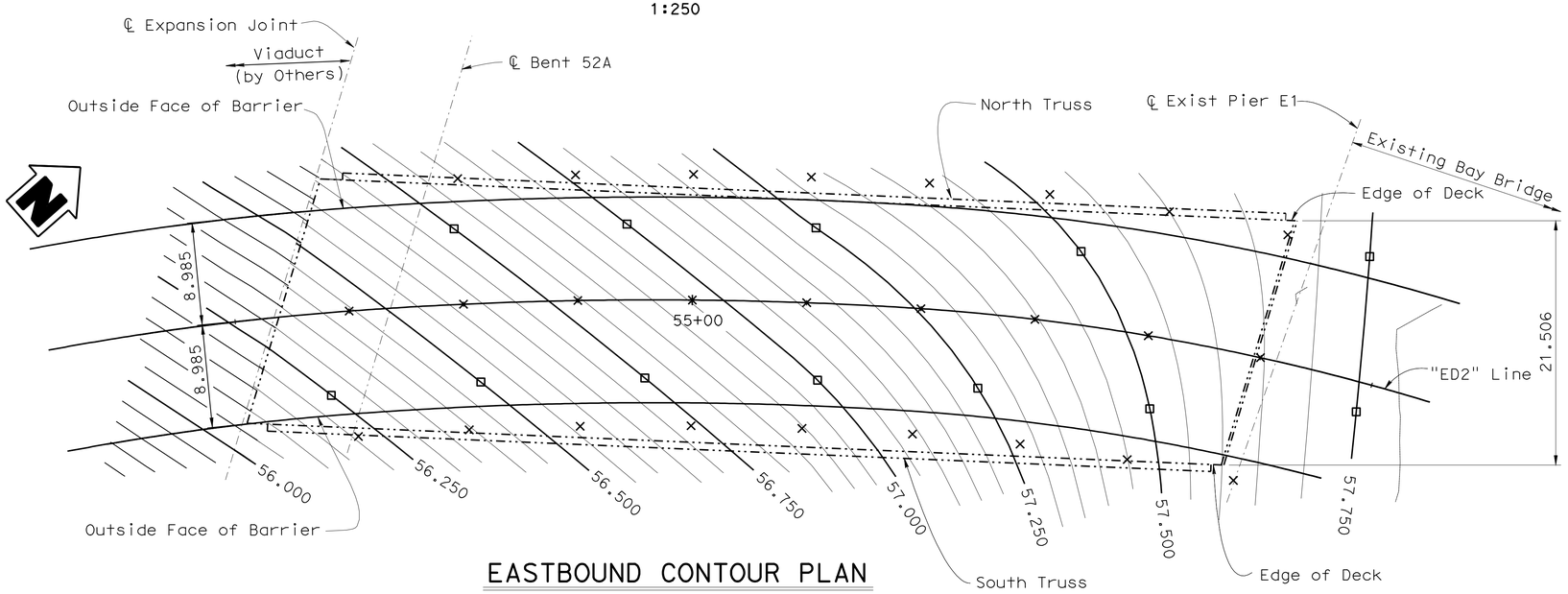


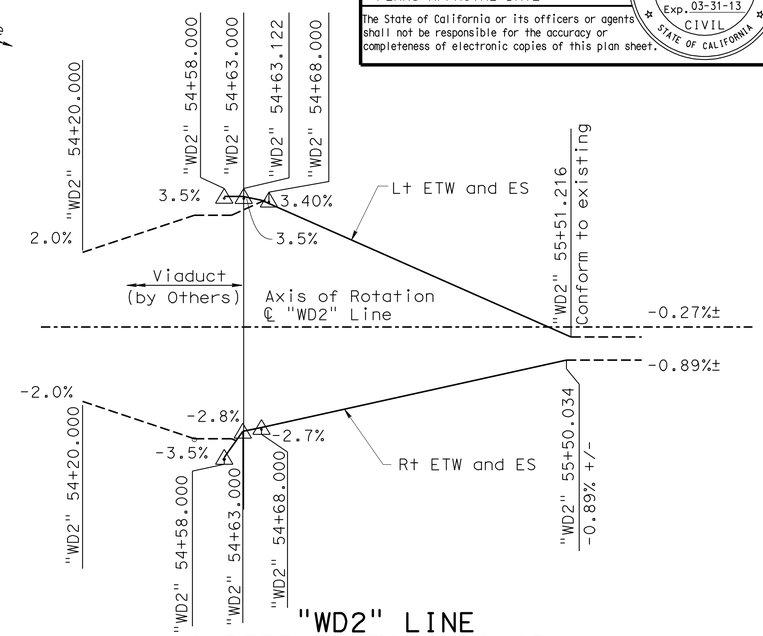
WESTBOUND CONTOUR PLAN

1:250



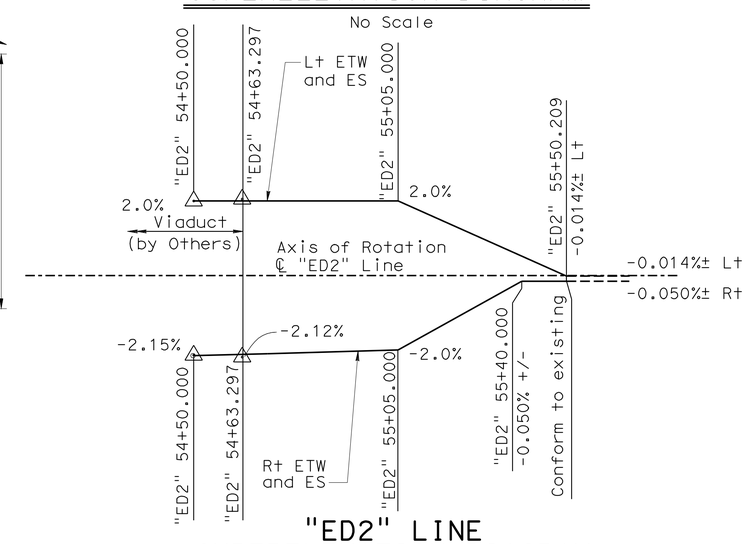
EASTBOUND CONTOUR PLAN

1:250



"WD2" LINE SUPERELEVATION DIAGRAM

No Scale



"ED2" LINE SUPERELEVATION DIAGRAM

No Scale

LEGEND:

- □ - Indicates 250 mm contours
- × = 10 m intervals along station line
- —··—·· Indicates existing structure

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

Notes:

1. Contours do not include camber.
2. Contour interval is 50 mm.
3. Contours are shown for top of wearing surface (overlay) elevation. Elevation of concrete is 32 mm lower than shown.

Caltrans Metric

	BY	CHECKED
DESIGN	M. J. Cullen	Pyo Hong
DETAILS	G. M. Souza/T. Cotton	M. J. Cullen
QUANTITIES	M. J. Cullen	Pyo Hong

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

EAST TIE-IN (DEMOLITION)

DECK CONTOURS

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 4/16/01 11/8/01 12/20/10 01/28/11 05-26-11

SHEET 3 OF 10

FILE => 34-0006-74-03-b-dc01-truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s128843 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:07

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	528	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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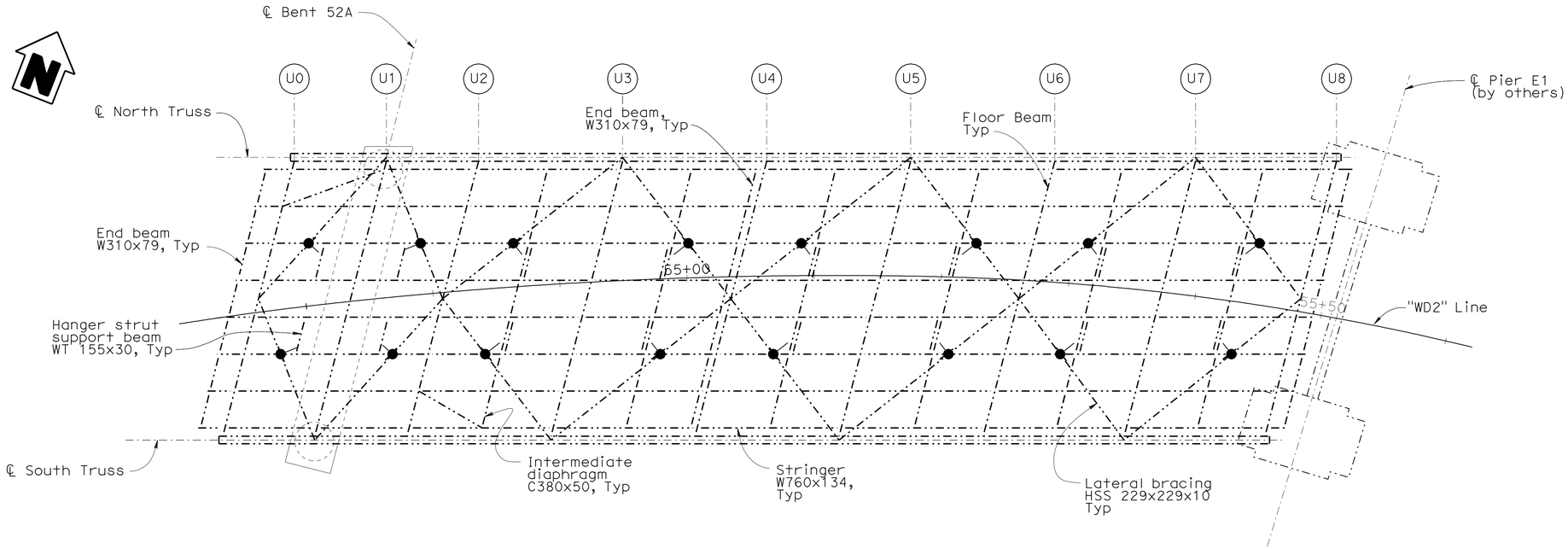
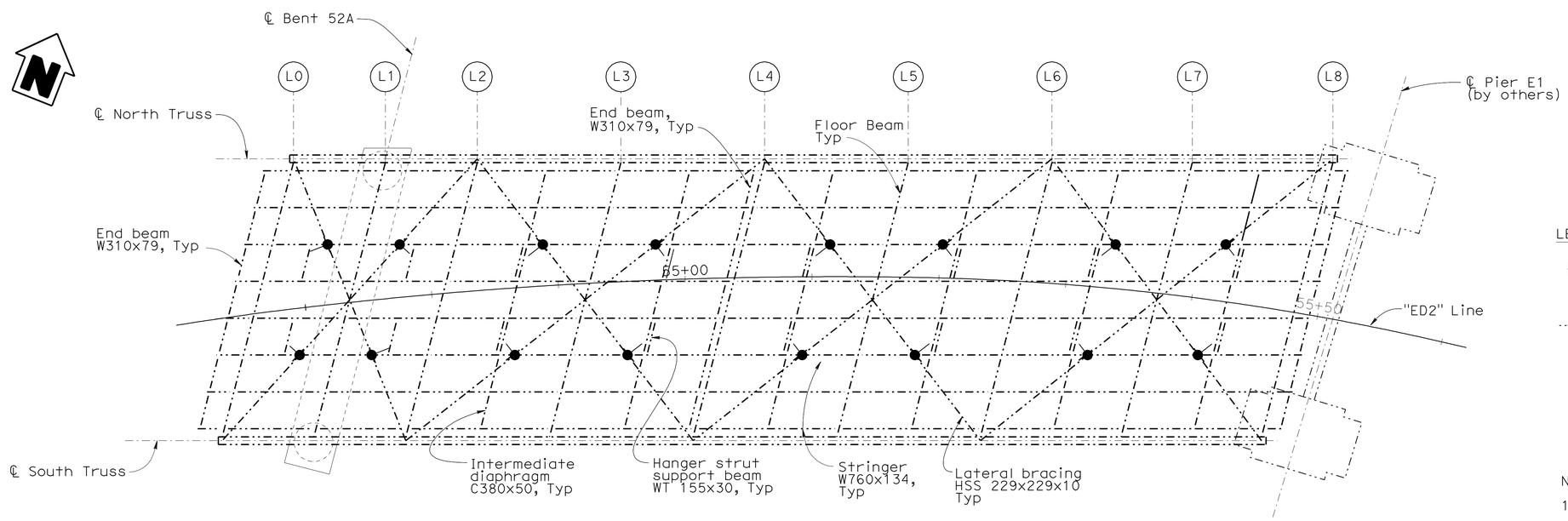


UPPER DECK PLAN

1:200



LOWER DECK PLAN

1:200

LEGEND:

- (X) Indicates floor beam number (Upper & Lower Deck)
- ● Indicates Hanger Strut Location
- ··-··- Indicates existing structure

Notes:

1. For floor beam type and details, see "Typical Section" sheet and "Floor Beam Details" sheets.
2. Not hatched for clarity

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

Caltrans Metric

	BY	CHECKED
DESIGN	M. J. Cullen	Pyo Hong
DETAILS	C. M. Souza/T. Cotton	M. J. Cullen
QUANTITIES	M. J. Cullen	Pyo Hong

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

EAST TIE-IN (DEMOLITION)

FRAMING PLAN

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 4/16/01 11/6/01 12/29/10 01/18/11 01/28/11 05-26-11

SHEET 4 OF 10

FILE => 34-0006-75-04-b-fmgpn-truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s128843 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:07

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	529	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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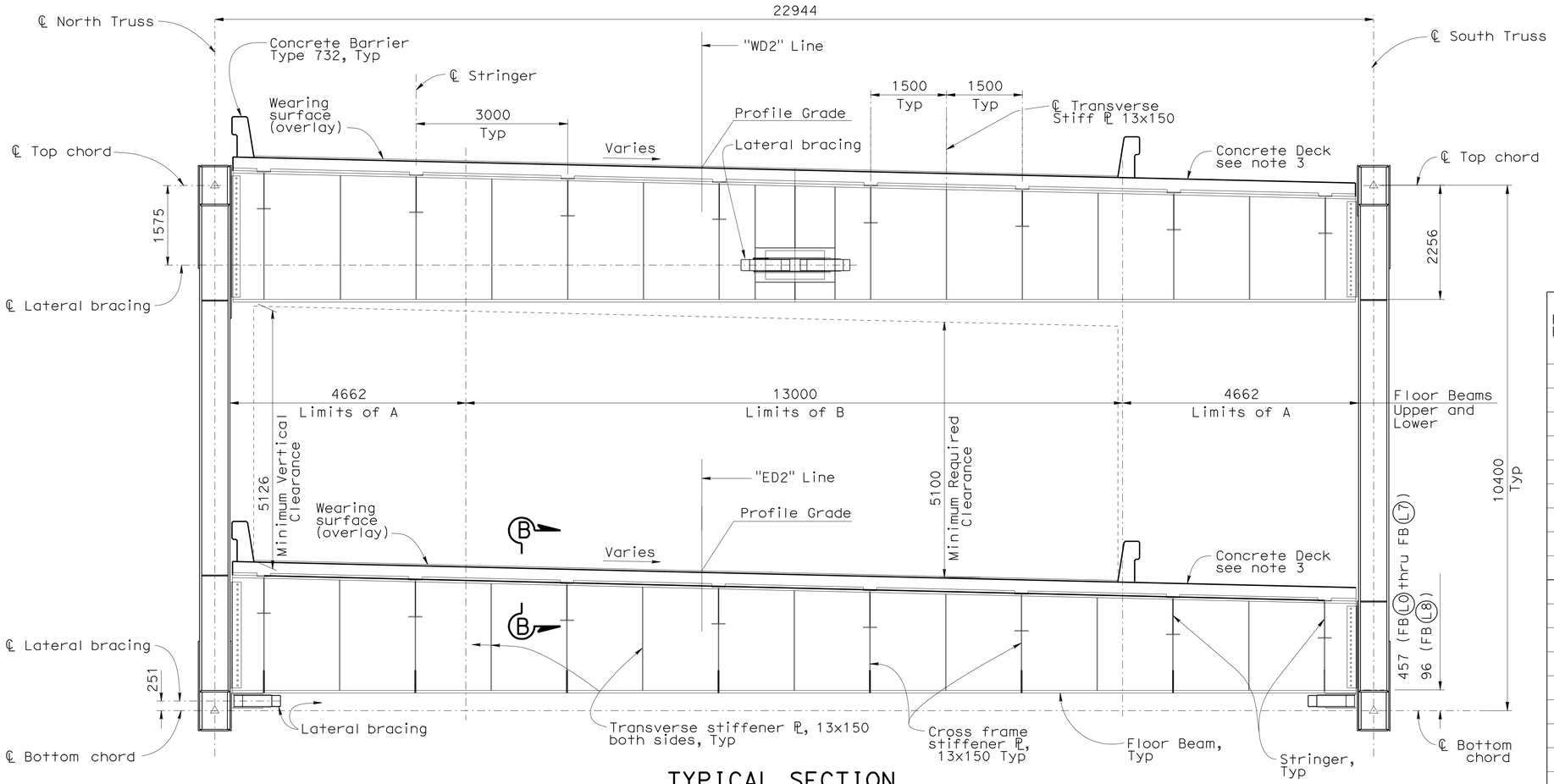


TYPICAL SECTION

1:50

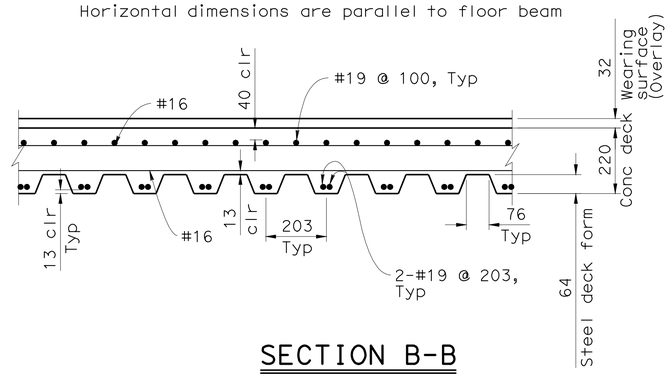
Section along Floor Beam U4 and L4 shown
Horizontal dimensions are parallel to floor beam

Floor Beam Dimensions (mm)

Floor Beam No.	Web d N. end	Web d S. end	Web t_w	A Flanges b_f	A Flanges t_f	B Flanges Top b_f	B Flanges Top t_f	B Flanges Bottom b_f	B Flanges Bottom t_f
U0	2410	1600	16	400	51	400	51	500	51
U1	2404	1648	2-19	664	51	664	51	664	51
U2	2415	1701	16	400	51	400	51	500	51
U3	2453	1821	16	400	51	400	51	500	51
U4	2505	1961	16	400	51	400	51	500	51
U5	2557	2110	16	400	51	400	51	500	51
U6	2573	2239	16	400	51	400	51	500	51
U7	2550	2333	16	400	51	400	51	500	51
U8	2481	2385	2-19	664	51	664	51	664	51
L0	2123	1553	16	400	51	400	51	500	51
L1	2130	1569	2-16	664	51	664	51	664	51
L2	2141	1582	16	400	51	400	51	500	51
L3	2159	1613	16	400	51	400	51	500	51
L4	2169	1647	16	400	51	400	51	500	51
L5	2138	1725	16	400	51	400	51	500	51
L6	2099	1830	16	400	51	400	51	500	51
L7	2050	1924	16	400	51	400	51	500	51
L8	2342	2310	2-25	1000	51	1000	51	1000	51

Notes:

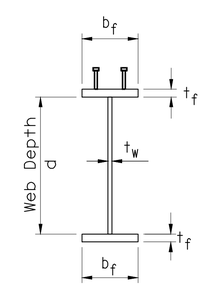
1. All dimensions are measured along the centerline of the floor beam unless noted otherwise.
2. Not hatched for clarity.
3. Light Weight Concrete (17.3 $^{KN}/_{m^3}$, 110 pcf)
4. All drawings are of existing structures and are shown with solid line style for clarity



SECTION B-B

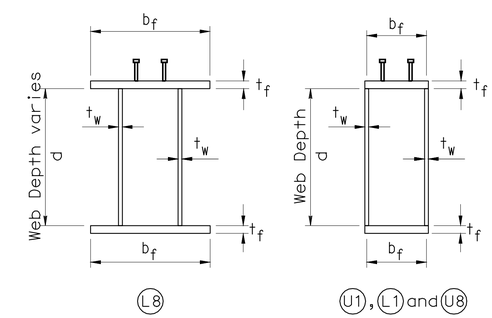
1:10

Shown parallel to Floor Beams



TYPICAL FLOOR BEAM SECTION

No Scale



BOX FLOOR BEAM SECTION

No Scale

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

Caltrans Metric

	BY	CHECKED
DESIGN	M. J. Cullen	Pyo Hong
DETAILS	G. M. Souza/T. Cotton	M. J. Cullen
QUANTITIES	M. J. Cullen	Pyo Hong

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

EAST TIE-IN (DEMOLITION)

TYPICAL SECTION

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES → 4/18/01 11/8/01 12/28/10 01/18/11 01/24/11

REVISION DATES

SHEET 5 OF 10

FILE => 34-0006-76-05-c-typ-sec-truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s128843 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:07

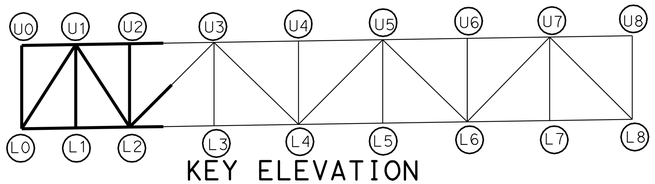
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	530	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

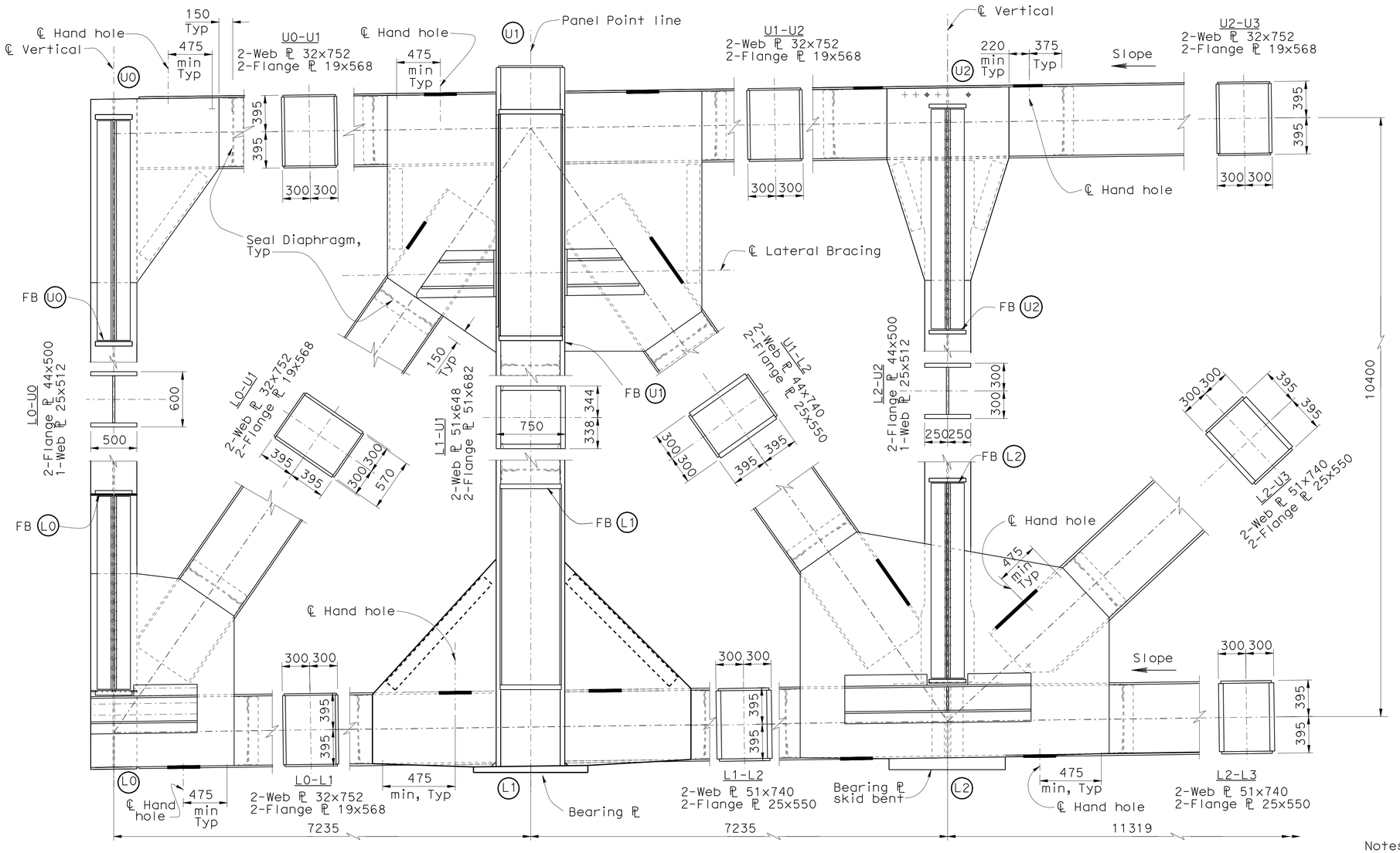
2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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.



KEY ELEVATION



NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

INSIDE ELEVATION NORTH TRUSS

(Not hatched for clarity)

Scale 1:25

Notes:

1. Elevation of North Truss shown, elevation of South Truss similar.
2. All drawings are of existing structures and are shown with solid line style for clarity

	BY	CHECKED
DESIGN	M. J. Cullen	Pyo Hong
DETAILS	G. M. Souza/T. Cotton	M. J. Cullen
QUANTITIES	M. J. Cullen	Pyo Hong

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

CU 04251
EA 0120T1

BRIDGE NO. 34-0006
KILOMETER POST NA

EAST TIE-IN (DEMOLITION)

TRUSS LAYOUT NO. 1

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

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: 4/16/01 11/8/01 01/04/11 01-18-11 01-28-11 05-26-11

SHEET 6 OF 10

FILE => 34-0006-77-06-b-trslyt01-truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s128843 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:07

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	531	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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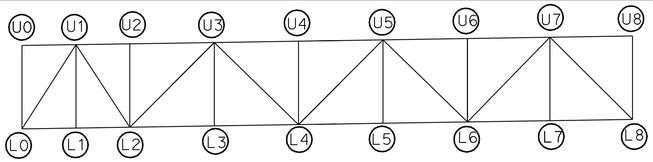
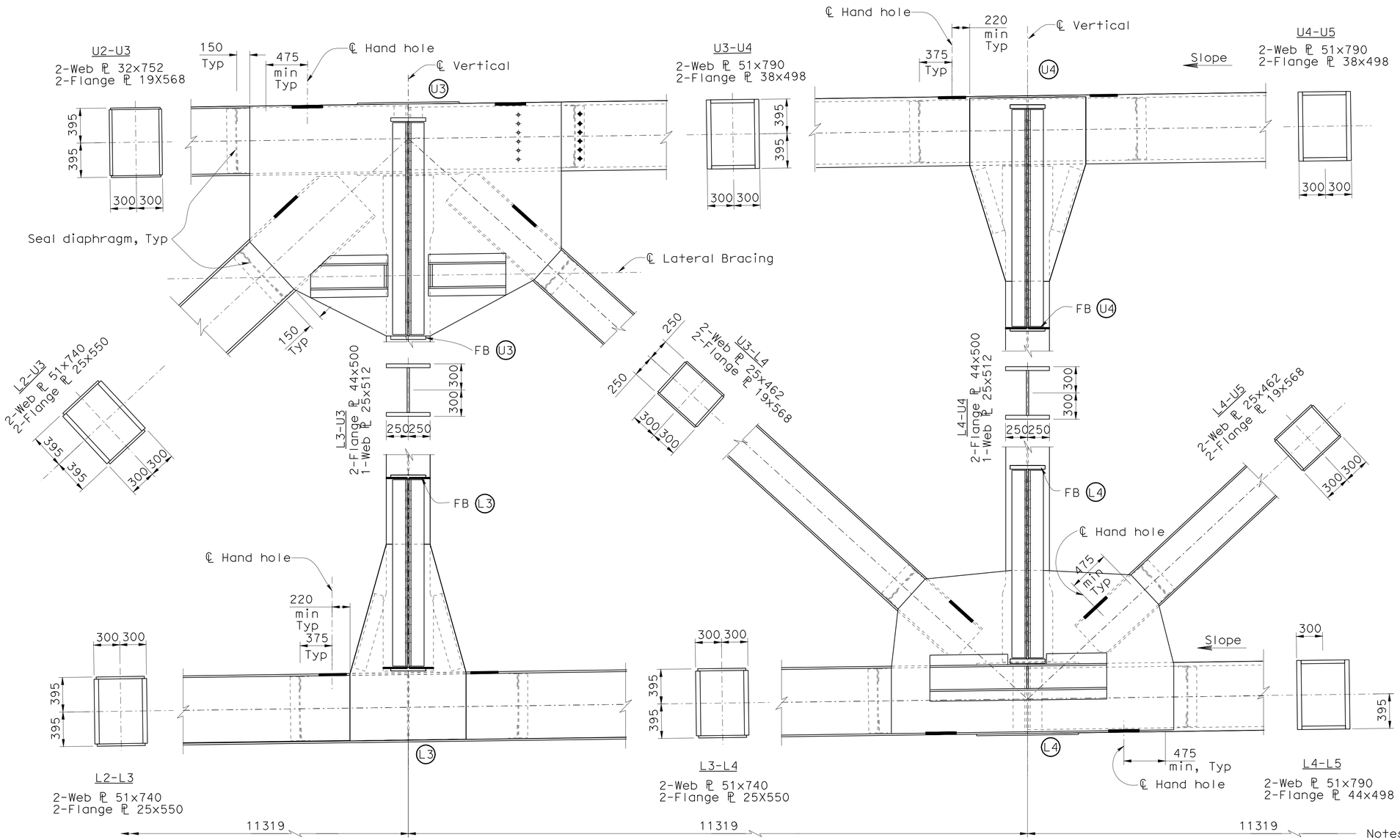


KEY ELEVATION



NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

INSIDE ELEVATION NORTH TRUSS (Not hatched for clarity)

Scale 1:25

Notes:

1. Elevation of North Truss shown, elevation of South Truss similar.
2. All drawings are of existing structures and are shown with solid line style for clarity

Caltrans Metric

	BY	CHECKED
DESIGN	M. J. Cullen	Pyo Hong
DETAILS	G. M. Souza/T. Cotton	M. J. Cullen
QUANTITIES	M. J. Cullen	Pyo Hong

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

EAST TIE-IN (DEMOLITION)

TRUSS LAYOUT NO. 2

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 4/16/07 11/26/07 01/04/11 01/26/11 01/28/11 05-26-11

SHEET 7 OF 10

FILE => 34-0006-78-07-b-trslyt02-truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s128843 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:07

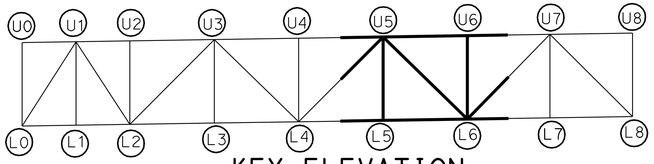
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	532	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

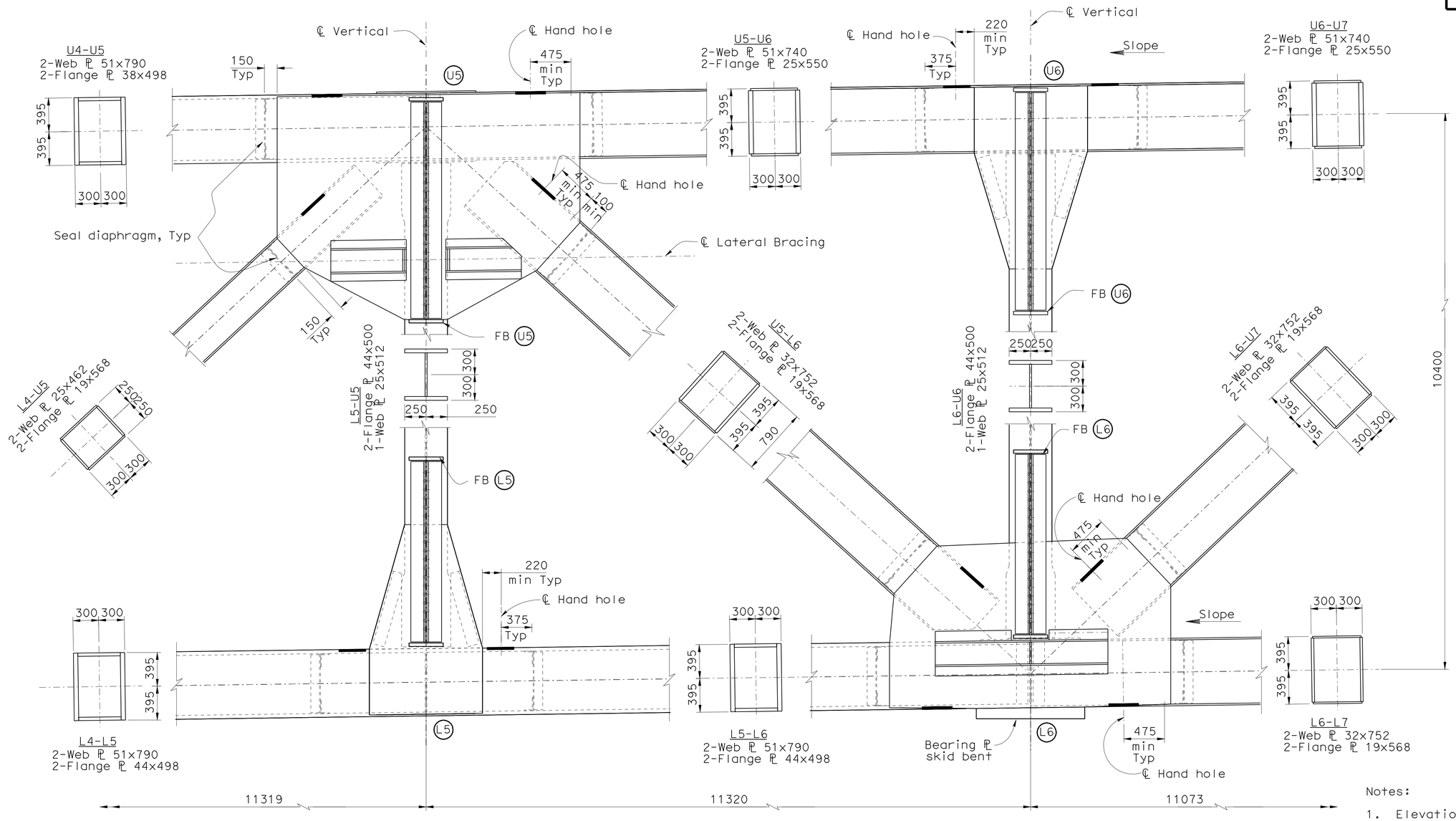
2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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.



KEY ELEVATION



NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

INSIDE ELEVATION NORTH TRUSS

(Not hatched for clarity)

Scale 1:25

Notes:

1. Elevation of North Truss shown, elevation of South Truss similar.
2. All drawings are of existing structures and are shown with solid line style for clarity

Caltrans Metric

	BY	CHECKED
DESIGN	M. J. Cullen	Pyo Hong
DETAILS	G. M. Souza/T. Cotton	M. J. Cullen
QUANTITIES	M. J. Cullen	Pyo Hong

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

EAST TIE-IN (DEMOLITION)

TRUSS LAYOUT NO. 3

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 4/16/07 11/28/07 01/04/11 01/28/11 01/28/11 05-26-11

SHEET 8 OF 10

FILE => 34-0006-79-08-b-trsly+03-truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s128843 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:08

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	533	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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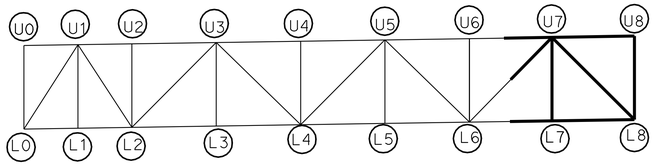

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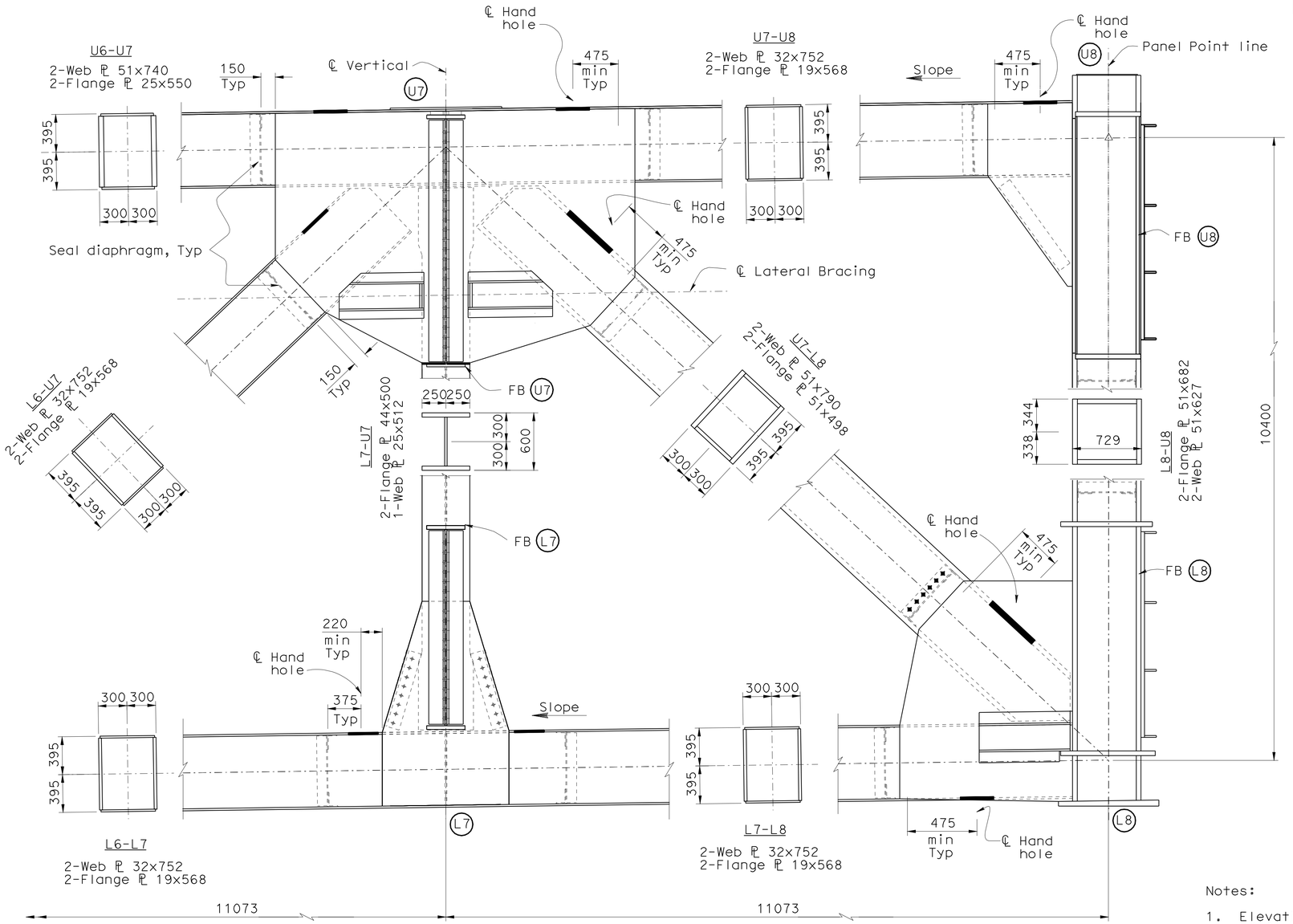

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

INSIDE ELEVATION NORTH TRUSS (Not hatched for clarity)

Scale 1:25

Notes:

1. Elevation of North Truss shown, elevation of South Truss similar.
2. All drawings are of existing structures and are shown with solid line style for clarity

	BY	CHECKED
DESIGN	M. J. Cullen	Pyo Hong
DETAILS	G. M. Souza/T. Cotton	M. J. Cullen
QUANTITIES	M. J. Cullen	Pyo Hong

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

BRIDGE NO. 34-0006
KILOMETER POST NA

EAST TIE-IN (DEMOLITION)
TRUSS LAYOUT NO. 4

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04251
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 4/16/07 11/6/07 01/04/11 01/18/11 01/28/11 05-26-11

SHEET 9 OF 10

FILE => 34-0006-80-09-b-trslyt04-truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s128843 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:08

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	SF	80	12.6/13.9	534	821

REGISTERED CIVIL ENGINEER 11-09-11 DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER M. J. CULLEN No. C 40620 Exp. 03-31-13 CIVIL STATE OF CALIFORNIA

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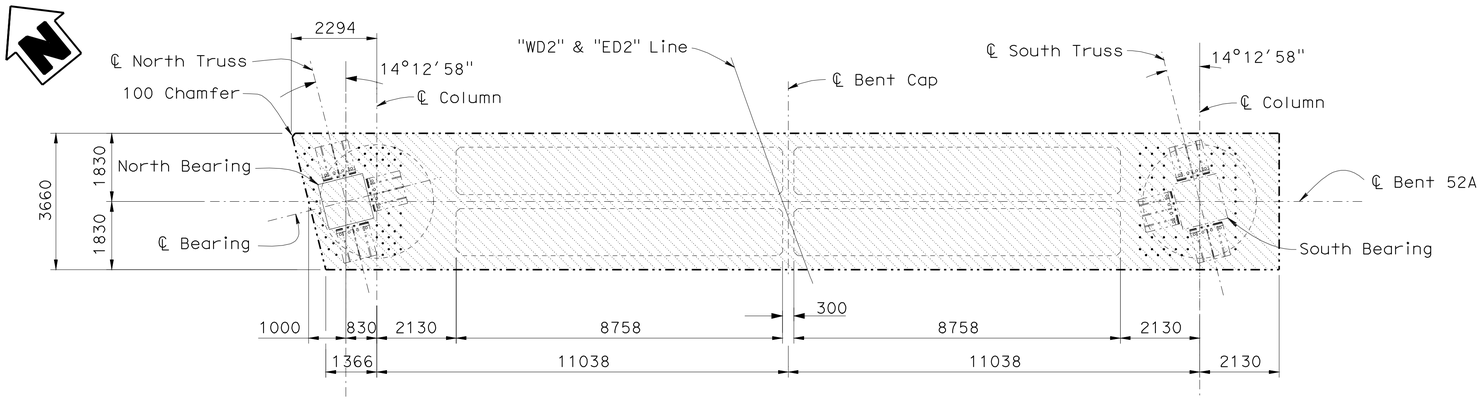
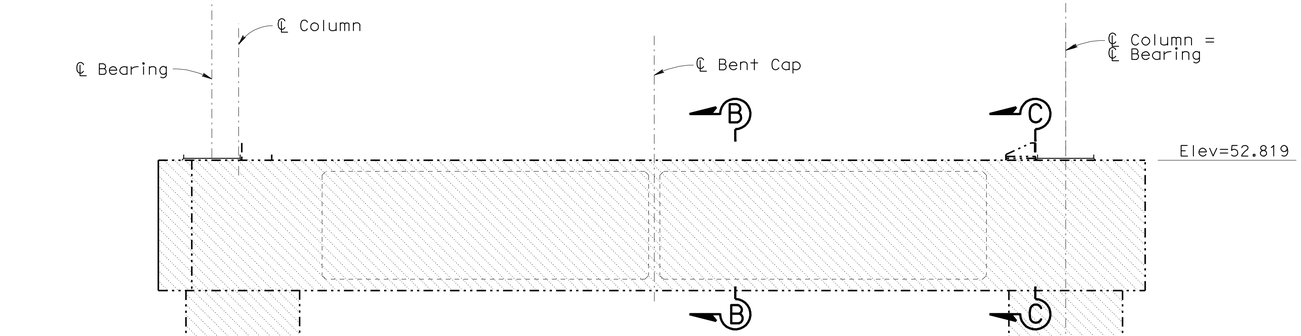
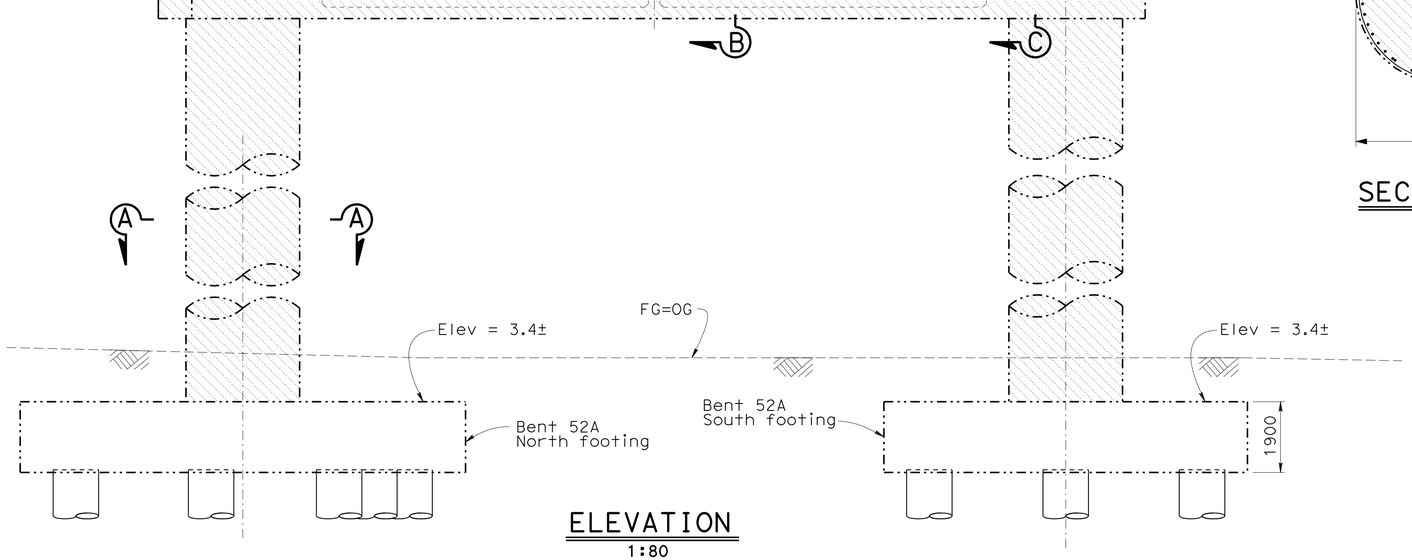
LEGEND:

Indicates Bridge Removal



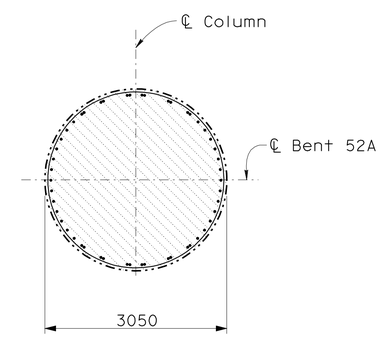
PLAN
1:80



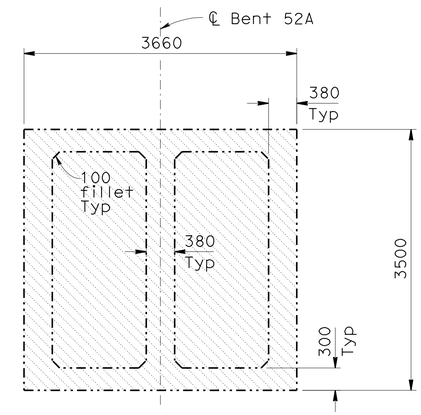


ELEVATION
1:80

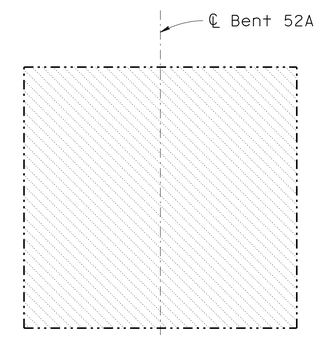
STA: "WD2" 54+73.443
Anchor Rod not shown for clarity



SECTION A-A
1:50



SECTION B-B
1:40



SECTION C-C
1:40

NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APROXIMATE, THE CONTRACTOR SHALL VERIFY ALL RELATED AS-BUILT FIELD DIMENSIONS.

Caltrans Metric

	BY	CHECKED
DESIGN	M. J. Cullen	Pyo Hong
DETAILS	G. M. Souza/T. Cotton	M. J. Cullen
QUANTITIES	M. J. Cullen	Pyo Hong

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 5

CU 04251
EA 0120T1

BRIDGE NO. 34-0006
KILOMETER POST NA

EAST TIE-IN (DEMOLITION)

BENT 52A LAYOUT

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

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: 4/16/01 11/28/01 01/03/11 01/13/11 01/24/11 01/28/11 05-26-11

SHEET 10 OF 10

FILE => 34-0006-81-10-c-bntla-truss.dgn

STRUCTURES DESIGN DETAIL SHEET (METRIC) (REV.03-17-04)

USERNAME => s128843 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:08

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SF	80	12.6/13.9	535	821

Wenyi Long 11-07-11
REGISTERED CIVIL ENGINEER DATE

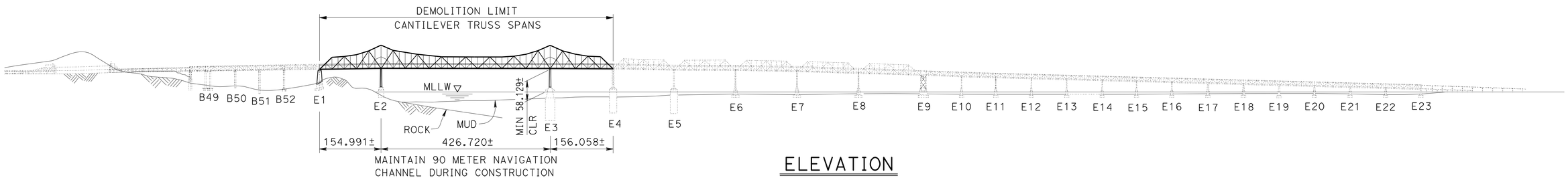
2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
WENYI LONG
No. C57430
Exp. 12-31-13
CIVIL
STATE OF CALIFORNIA

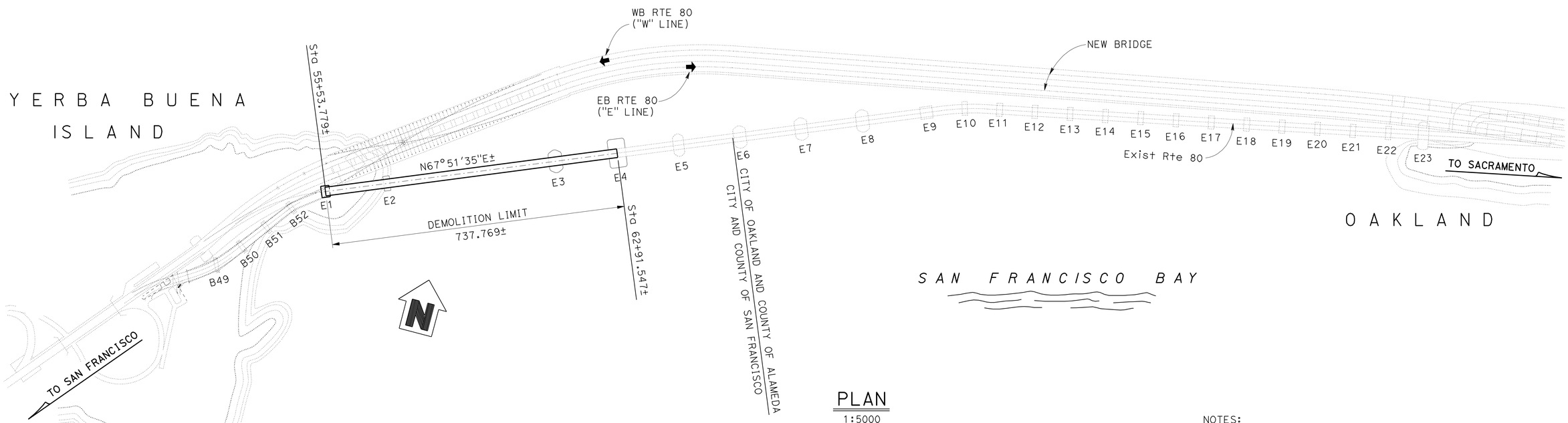
The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

QUANTITIES

ESTABLISH MARINE ACCESS	LUMP SUM
BRIDGE REMOVAL (PORTION), LOCATION G	LUMP SUM
WORK AREA MONITORING	LUMP SUM



ELEVATION
1:5000



PLAN
1:5000

NOTES:
1. For "GENERAL DEMOLITION NOTES", see "INDEX TO PLANS".
2. For "UTILITIES", see "ROADWAY PLANS".

NOTE:
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

EXISTING CANTILEVER TRUSS DEMOLITION
GENERAL PLAN

	BY	CHECKED
DESIGN	W. Long	J. Shen
DETAILS	C. Cancino	J. Shen
QUANTITIES	L. Wang	J. Shen

LOAD & RESISTANCE FACTOR DESIGN — LIVE LOADING: HS20-44 WITH MODIFIED LANE LOAD FOR LONG SPAN BRIDGES
LAYOUT — BY W. Long — CHECKED J. Shen
SPECIFICATIONS — BY S. Margaris — PLANS AND SPECS COMPARED W. Long

WENYI LONG
DESIGN ENGINEER

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TOLL BRIDGE DESIGN

BRIDGE NO. 33-0025
KILOMETER POST 13.2/13.9

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04
EA 0120T1
CONTRACT NO.: 04-0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES
REVISION DATES 10-28-11
SHEET 1 OF 87

USERNAME => s128843 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:10

STRUCTURES DESIGN GENERAL PLAN SHEET (X) (REV.09-01-10)

FILE => 33-0025-a-gp.dgn

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SF	80	12.6/13.9	536	821

Caltrans Metric

Wenyi Long 11-07-11
REGISTERED CIVIL ENGINEER DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER WENYI LONG No. C57430 Exp. 12-31-13 CIVIL STATE OF CALIFORNIA

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GENERAL DEMOLITION NOTES

1. Design Specifications:

   Caltrans Bridge Design Specifications, 2004;
   AISC Manual of Steel Construction, 1989.

2. Wind Load:

   Windward pressure = 1.86 KN/m^2 or 5% of dead load, whichever is greater
   Leeward pressure = 0.93 KN/m^2 or 2.5% of dead load, whichever is greater

3. Existing Structural Steel (MPa):

Steel Type	Nickel	Carbon		Silicon	Heat Treated
		Medium	Mild		
Fy	379	255	207	310	345
$F_{allowable}$	234	152	124	193	234

   Where the material is not otherwise specifically designated on as-built plans, Medium Carbon Steel was used.

4. Existing Rivets (MPa):

   Sizes (Dia): 19 mm, 22 mm, 25 mm, 29 mm, 32 mm, 34 mm
   Shear Connection:
   - Carbon Steel Rivet Allowable = 103
   - Manganese Steel Rivet Allowable = 138

   Bearing Connection:
   - Carbon Steel Rivet Allowable = 207
   - Manganese Steel Rivet Allowable:
     - For Carbon Steel = 207
     - For Silicon Steel = 262
     - For Nickel Steel = 310

5. Datum:

   Elevation based on 1929 NGVD Datum.
   Mean Lower Low Water (MLLW) is at Elevation 0.00.
   All Elevations shown in Meters.

APPROXIMATE TIDAL SUMMARY	
TIDE LEVEL	ELEVATION (m) (NGVD)
Highest Observed Water Level (EHW)	2.61
Mean Higher High Water (MHHW)	1.87
Mean Sea Level (MSL)	0.87
Mean Lower Low Water (MLLW)	0
Lowest Observed Water Level (ELW)	-0.61

   Contractor shall verify tidal elevations prior to beginning work

6. Coordinates, distances, and bearings are based on 1933 as-built plans.

7. Depending on demolition sequence and equipment used, existing structure members and connections may require strengthening and / or supplemental bracing.

STANDARD PLANS DATED JULY 2004

A10A ACRONYMS AND ABBREVIATIONS (A-L)
A10B ACRONYMS AND ABBREVIATIONS (M-Z)

INDEX TO PLANS

SHEET NO.	TITLE
1	GENERAL PLAN
2	INDEX TO PLANS
3	DEMOLITION LIMITS PLAN
4	TRUSS MEMBER MATERIALS
5	FOUNDATION PLAN
6	TYPICAL SECTION
7	PIER E1
8	PIER E2
9	PIER E3
10	LOG OF TEST BORINGS 1
11	LOG OF TEST BORINGS 2
12	LOG OF TEST BORINGS 3
13	LOG OF TEST BORINGS 4
14	LOG OF TEST BORINGS 5
15	LOG OF TEST BORINGS 6
16	LOG OF TEST BORINGS 7
17	LOG OF TEST BORINGS 8
18	LOG OF TEST BORINGS 9
19	LOG OF TEST BORINGS 10
20	LOG OF TEST BORINGS 11
21	LOG OF TEST BORINGS 12
22	LOG OF TEST BORINGS 13
23	LOG OF TEST BORINGS 14
24	LOG OF TEST BORINGS 15
25	LOG OF TEST BORINGS 16
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27	LOG OF TEST BORINGS 18
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42	LOG OF TEST BORINGS 33
43	LOG OF TEST BORINGS 34
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45	LOG OF TEST BORINGS 36
46	LOG OF TEST BORINGS 37
47	LOG OF TEST BORINGS 38
48	LOG OF TEST BORINGS 1 OF 47
49	LOG OF TEST BORINGS 2 OF 47
50	LOG OF TEST BORINGS 3 OF 47
51	LOG OF TEST BORINGS 4 OF 47
52	LOG OF TEST BORINGS 5 OF 47
53	LOG OF TEST BORINGS 6 OF 47
54	LOG OF TEST BORINGS 7 OF 47
55	LOG OF TEST BORINGS 8 OF 47
56	LOG OF TEST BORINGS 9 OF 47
57	LOG OF TEST BORINGS 10 OF 47
58	LOG OF TEST BORINGS 11 OF 47
59	LOG OF TEST BORINGS 12 OF 47
60	LOG OF TEST BORINGS 13 OF 47
61	LOG OF TEST BORINGS 14 OF 47
62	LOG OF TEST BORINGS 15 OF 47
63	LOG OF TEST BORINGS 1 OF 25
64	LOG OF TEST BORINGS 2 OF 25
65	LOG OF TEST BORINGS 3 OF 25
66	LOG OF TEST BORINGS 4 OF 25
67	LOG OF TEST BORINGS 5 OF 25
68	LOG OF TEST BORINGS 6 OF 25
69	LOG OF TEST BORINGS 7 OF 25
70	LOG OF TEST BORINGS 8 OF 25
71	LOG OF TEST BORINGS 9 OF 25
72	LOG OF TEST BORINGS 10 OF 25
73	LOG OF TEST BORINGS 11 OF 25
74	LOG OF TEST BORINGS 12 OF 25
75	LOG OF TEST BORINGS 13 OF 25
76	LOG OF TEST BORINGS 14 OF 25
77	LOG OF TEST BORINGS 15 OF 25
78	LOG OF TEST BORINGS 16 OF 25
79	LOG OF TEST BORINGS 17 OF 25
80	LOG OF TEST BORINGS 18 OF 25
81	LOG OF TEST BORINGS 19 OF 25
82	LOG OF TEST BORINGS 20 OF 25
83	LOG OF TEST BORINGS 21 OF 25
84	LOG OF TEST BORINGS 22 OF 25
85	LOG OF TEST BORINGS 23 OF 25
86	LOG OF TEST BORINGS 24 OF 25
87	LOG OF TEST BORINGS 25 OF 25

CANTILEVER TRUSS REMOVAL SEQUENCE:

1. Remove upper and lower decks before removing any steel truss member. Decks consist of concrete slab and overlay, curbs and barriers.
   a. For each deck the removal shall begin at the center of span E2-E3 and proceed toward pier E1 and pier E4.
   b. Remove upper deck before removing lower deck.

   For concrete slabs, curbs and barriers on decks, see "TYPICAL SECTION" sheet.
2. Remove suspended span. The entire suspended span may be removed as one piece or may be removed member by member beginning from the center of span E2-E3.
3. Remove cantilever arms.
4. Remove anchor arms.

NOTE:
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

	BY	CHECKED
DESIGN	W. Long	J. Shen
DETAILS	C. Cancino	J. Shen
QUANTITIES	L. Wang	J. Shen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TOLL BRIDGE DESIGN

BRIDGE NO. 33-0025
KILOMETER POST 13.2/13.9

EXISTING CANTILEVER TRUSS DEMOLITION
INDEX TO PLANS

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES → 10-26-11 02/13/12

SHEET 2 OF 87

STRUCTURES DESIGN DETAIL SHEET (X) (REV. 09-01-10)

FILE => 33-0025-b-index.dgn

USERNAME => s119571 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:46

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SF	80	12.6/13.9	537	821

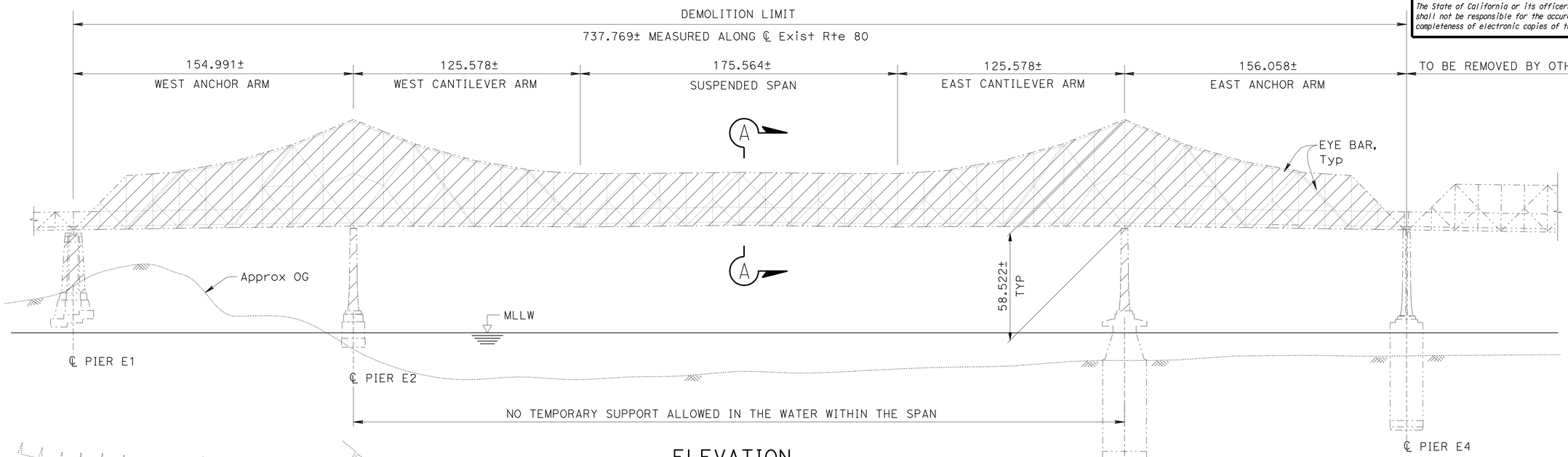
Caltrans Metric

Wenyi Long 11-07-11
REGISTERED CIVIL ENGINEER DATE

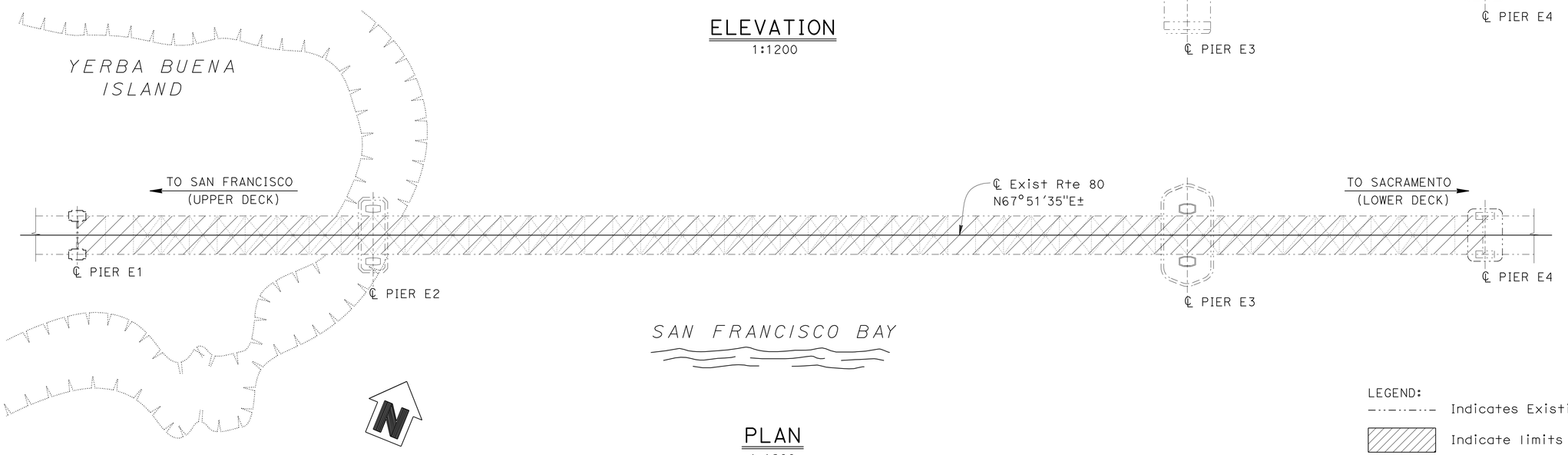
2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
WENYI LONG
No. C57430
Exp. 12-31-13
CIVIL
STATE OF CALIFORNIA

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.



ELEVATION
1:1200



PLAN
1:1200

LEGEND:

-·-·-·-·- Indicates Existing

▨ Indicate limits of demolition

NOTE:
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

NOTE:
For "SECTION A-A", see "TYPICAL SECTION" sheet

	BY	CHECKED
DESIGN	W. Long	J. Shen
DETAILS	C. Cancino	J. Shen
QUANTITIES	L. Wang	J. Shen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TOLL BRIDGE DESIGN

BRIDGE NO. 33-0025
KILOMETER POST 13.2/13.9

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

EXISTING CANTILEVER TRUSS DEMOLITION
DEMOLITION LIMITS PLAN

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 10-28-11 02/13/12

SHEET 3 OF 87

STRUCTURES DESIGN DETAIL SHEET X() (REV. 09-01-10)

FILE => 33-0025-c-demolimit.dgn

USERNAME => s119571 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:46

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SF	80	12.6/13.9	538	821

Caltrans Metric

Wenyi Long 11-07-11
REGISTERED CIVIL ENGINEER DATE

2-21-12
PLANS APPROVAL DATE

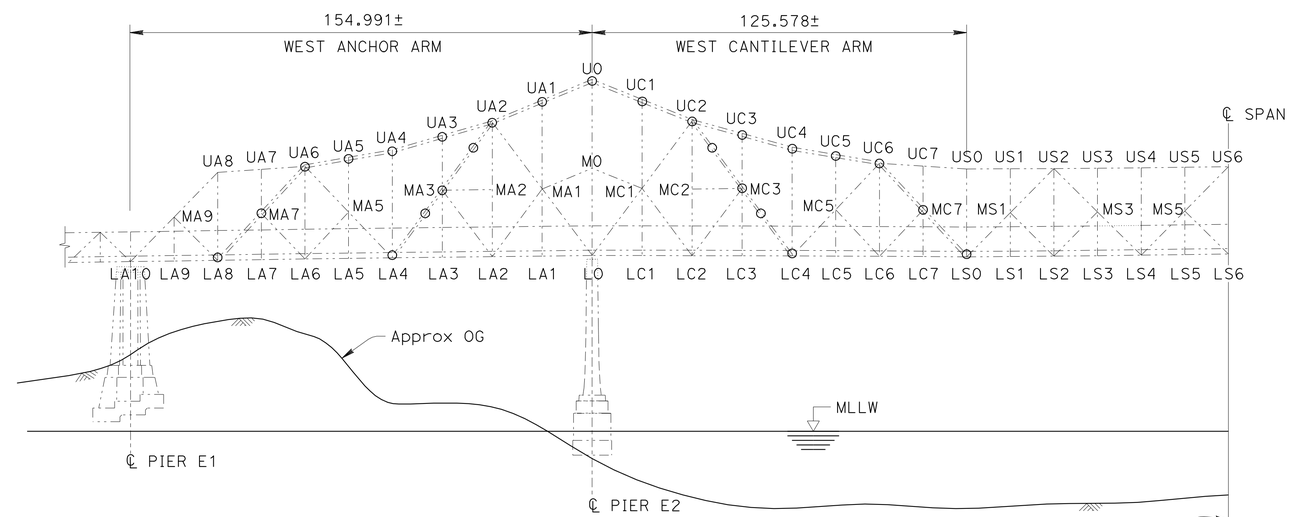
REGISTERED PROFESSIONAL ENGINEER WENYI LONG No. C57430 Exp. 12-31-13 CIVIL STATE OF CALIFORNIA

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.

TRUSS MEMBER MATERIALS

ANCHOR ARM		CANTILEVER ARM		SUSPENDED SPAN		FLOOR & LATERAL	
MEMBER	MATERIAL	MEMBER	MATERIAL	MEMBER	MATERIAL	MEMBER	MATERIAL
LO-LA2	N	LO-LC2	N	LSO-LS2	N	FLOOR BEAM & STRINGERS	S
LA2-LA4	N	LC2-LC4	N	LS2-LS4	N		
LA4-LA6	S	LC4-LC6	S	LS4-LS6	H.T.		
LA6-LA8	S	LC6-LC7	S			BOTTOM LATERAL	S
LA8-LA10	S	LC7-LSO	S			OTHERS	C
UO-UA2	H.T.	UO-UC2	H.T.	USO-US2	S		
UA2-UA4	H.T.	UC2-UC4	H.T.	US2-US6	N		
UA4-UA6	H.T.	UC4-UC6	H.T.				
UA6-UA8	S	UC6-USO	S				
LO-MA1	S	LO-MC1	S	LSO-MS1	N		
MA1-UA2	S	MC1-UC2	S	MS1-US2	N		
UA2-MA3	H.T.	UC2-MC3	H.T.	US2-MS3	S		
MA3-LA4	H.T.	MC3-LC4	H.T.	MS3-LS4	S		
LA4-MA5	S	LC4-MC5	S	LS4-MS5	S		
MA5-UA6	S	MC5-UC6	S	MS5-US6	S		
UA6-MA7	H.T.	UC6-MC7	H.T.				
MA7-LA8	H.T.	MC7-LSO	H.T.				
UA8-MA9	S						
MA9-LA10	S						
UA2-LA2	S	UC2-LC2	S	USO-LSO	C		
UA4-LA4	S	UC4-LC4	S	US2-LS2	S		
UA6-LA6	S	UC6-LC6	S	US4-LS4	C		
UA8-LA8	S			US6-LS6	S		
UA1-MA1	S	UC1-MC1	C	US1-MS1	C		
UA3-MA3	C	UC3-MC3	C	US3-MS3	C		
UA5-MA5	C	UC5-MC5	C	US5-MS5	C		
UA7-MA7	C	UC7-MC7	C				
MA1-LA1	S	MC1-LC1	S	MS1-LS1	S		
MA3-LA3	S	MC3-LC3	S	MS3-LS3	S		
MA5-LA5	S	MC5-LC5	S	MS5-LS5	S		
MA7-LA7	S	MC7-LC7	S				
MA9-LA9	S						
		UO-MO	N				
MA10-LA10	C	MO-LO	N				
MA1-LA2	S	MC1-LC2	C	MS1-LS2	C		
MA3-LA2	C	MC3-LC2	C	MS3-LS2	C		
MA5-LA6	S	MC5-LC6	C	MS5-LS6	C		
MA7-LA6	C	MC7-LC6	C				
MA9-LA8	C						
MA1-MO	C	MO-MC1	C				
MA3-MA2	C	MC2-MC3	C				

NOTE:
N: Nickel Steel
C: Carbon Steel
S: Silicon Steel
H.T.: Heat Treated Carbon Steel (eye-bars)



PART ELEVATION

1:1000

NOTE:
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

	BY	CHECKED
DESIGN	W. Long	L. Wang
DETAILS	C. Cancino	L. Wang
QUANTITIES	L. Wang	J. Shen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TOLL BRIDGE DESIGN

BRIDGE NO. 33-0025
KILOMETER POST 13.2/13.9

EXISTING CANTILEVER TRUSS DEMOLITION

TRUSS MEMBER MATERIALS

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES 10-28-11

REVISION DATES

SHEET 4 OF 87

STRUCTURES DESIGN DETAIL SHEET X() (REV. 09-01-10)

FILE => 33-0025-c-trussmember.dgn

USERNAME => s119571 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:46

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SF	80	12.6/13.9	539	821

Caltrans Metric

Wenyi Long 11-07-11
REGISTERED CIVIL ENGINEER DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
WENYI LONG
No. C57430
Exp. 12-31-13
CIVIL
STATE OF CALIFORNIA

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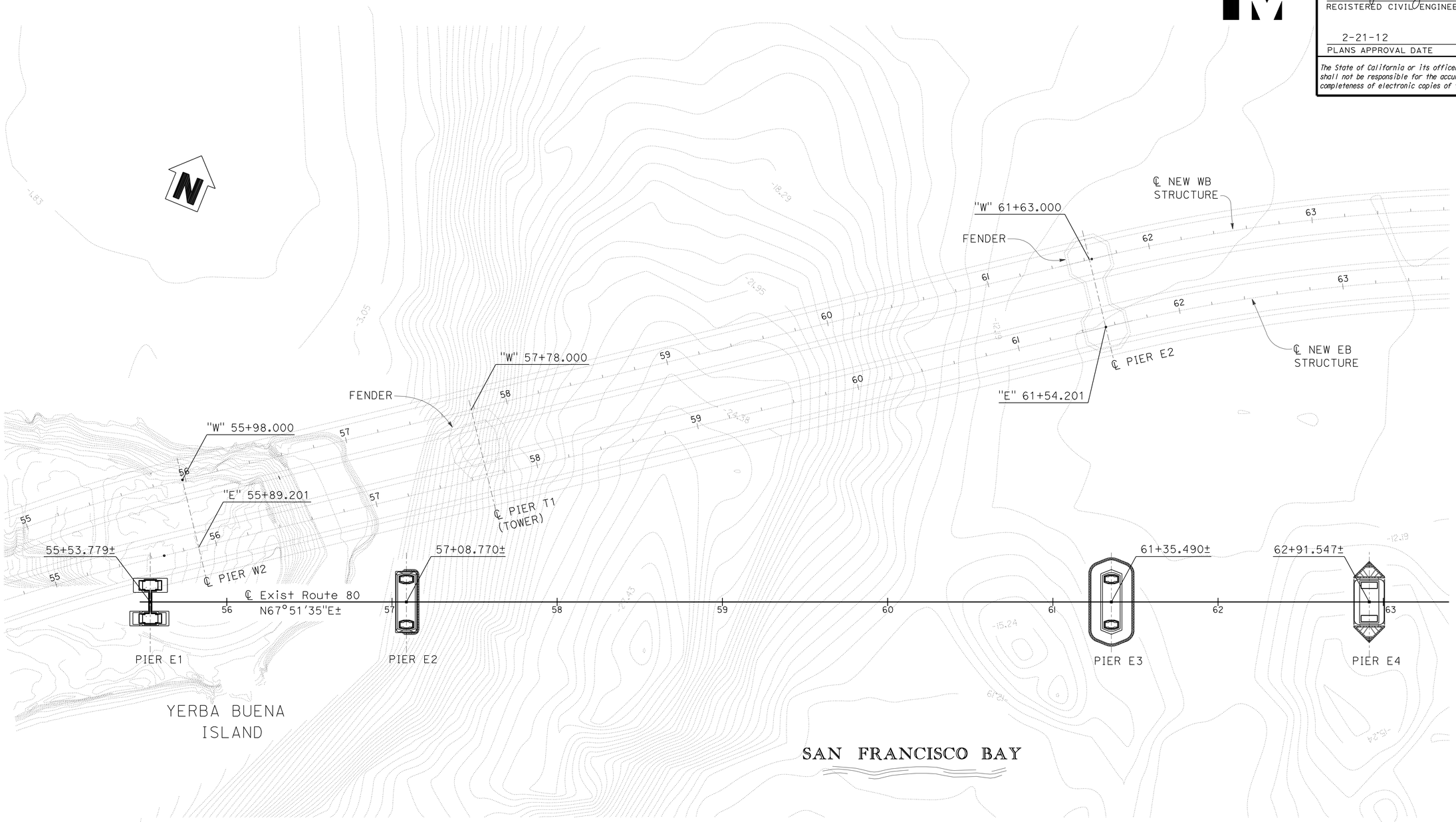

PLAN
1:1200

NOTES:
1. Provide and maintain a 90 meter navigation channel between pier E2 and E3 during construction.
2. Mudline contours are according to soundings taken during January, 1998.

NOTE:
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

EXISTING CANTILEVER TRUSS DEMOLITION
FOUNDATION PLAN

PRELIMINARY INVESTIGATION SECTION

SCALE X	Vert. DATUM X	PHOTOGRAMMETRY AS OF: X		
	Horiz. DATUM X	SURVEYED	BY X	CHECKED BY X
ALIGNMENT TIES X		DRAFTED	BY X	CHECKED BY X

DESIGN	BY W. Long	CHECKED J. Shen
DETAILS	BY C. Cancino	CHECKED J. Shen
QUANTITIES	BY L. Wang	CHECKED J. Shen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TOLL BRIDGE DESIGN

BRIDGE No. 33-0025
KILOMETER POST 13.2/13.9

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04
EA 0120T1

CONTRACT No.: 04-0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 10-28-11

SHEET 5 OF 87

STRUCTURES FOUNDATION PLAN SHEET (X) (REV. 09-01-10)

FILE => 33-0025-d-fp1.dgn

USERNAME => s113571 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED =>

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SF	80	12.6/13.9	540	821

Caltrans Metric

Wenyi Long 11-07-11
REGISTERED CIVIL ENGINEER DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
WENYI LONG
No. C57430
Exp. 12-31-13
CIVIL
STATE OF CALIFORNIA

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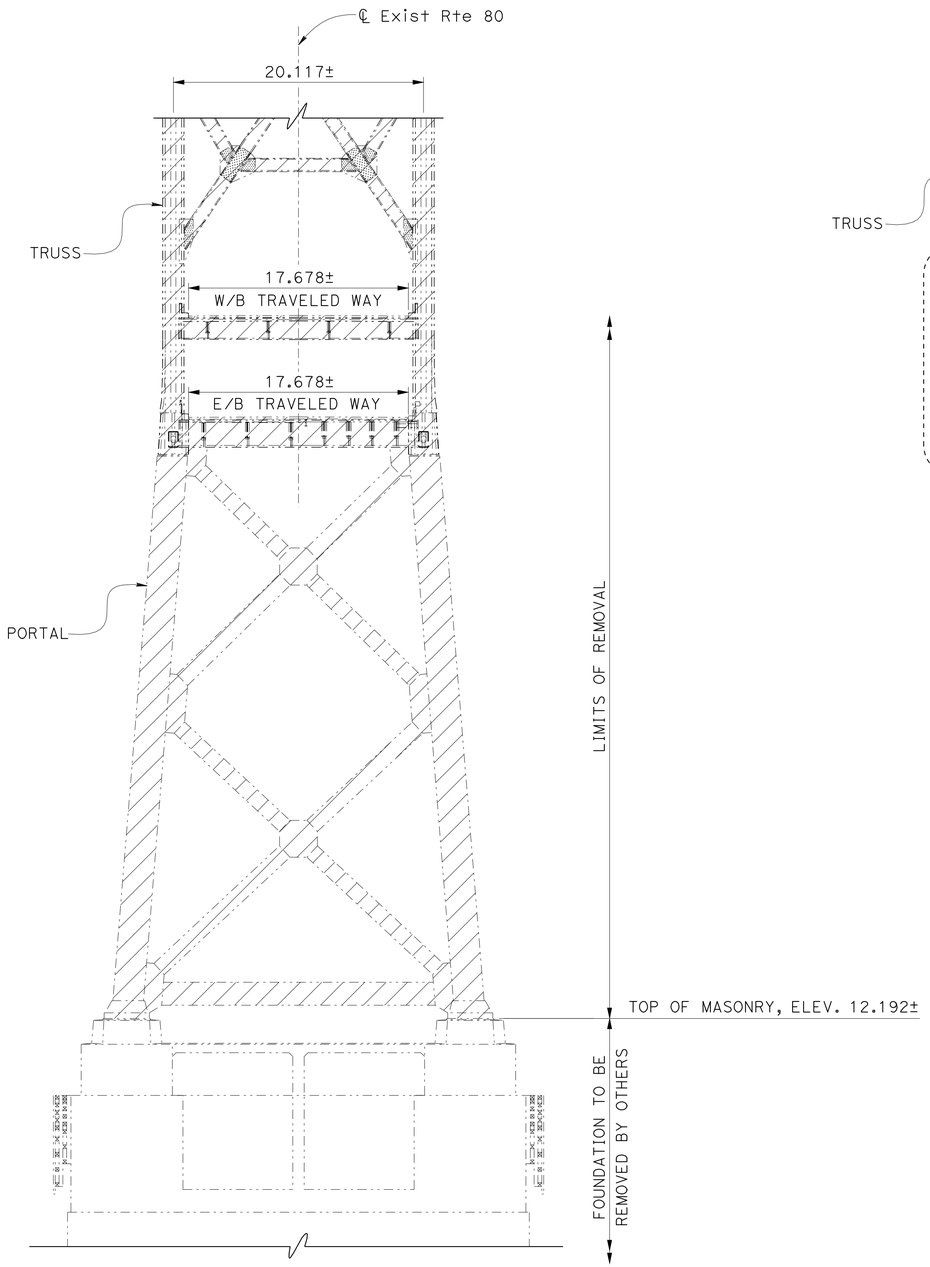
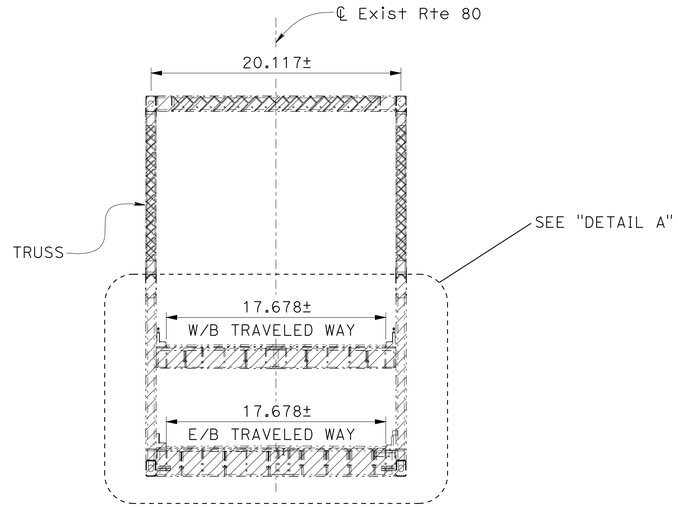
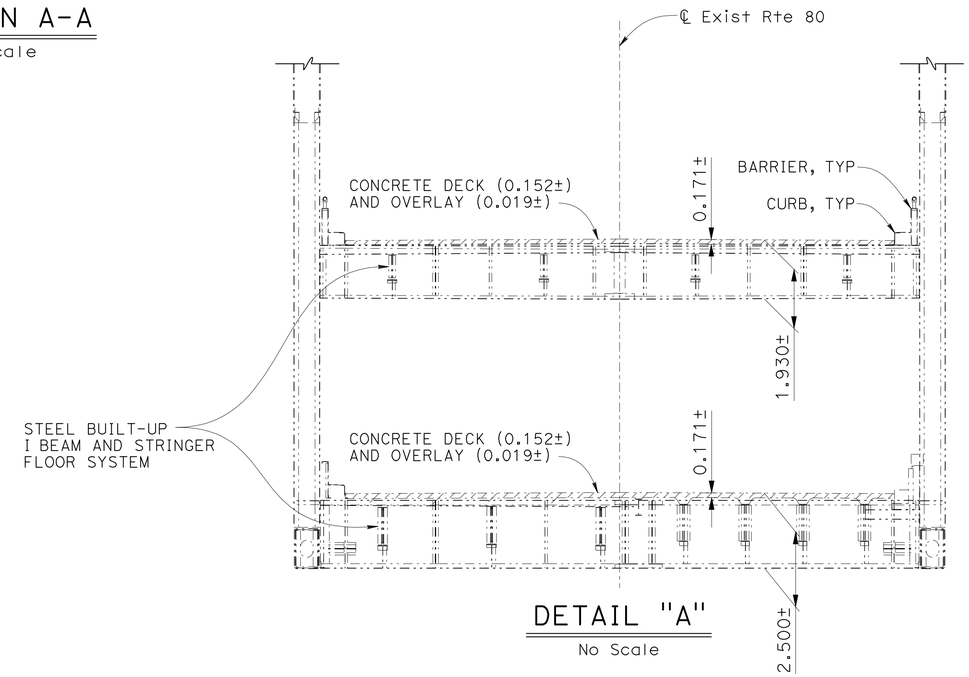


TYPICAL SECTION
PIER E2 AND PIER E3
No Scale



SECTION A-A
No Scale



DETAIL "A"
No Scale

LEGEND:
-·-·-·-·- Indicates Existing
Indicates Removal

NOTE:
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

	BY	CHECKED
DESIGN	W. Long	J. Shen
DETAILS	C. Cancino	J. Shen
QUANTITIES	L. Wang	J. Shen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TOLL BRIDGE DESIGN

BRIDGE NO. 33-0025
KILOMETER POST 13.2/13.9

EXISTING CANTILEVER TRUSS DEMOLITION
TYPICAL SECTION

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 10-25-11 02/13/12

SHEET 6 OF 87

STRUCTURES DESIGN DETAIL SHEET (X) (REV. 09-01-10)

FILE => 33-0025-e-typsect.dgn

USERNAME => s119571 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:46

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SF	80	12.6/13.9	541	821

Caltrans Metric

Wenyi Long 11-07-11
REGISTERED CIVIL ENGINEER DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER WENYI LONG No. C57430 Exp. 12-31-13 CIVIL STATE OF CALIFORNIA

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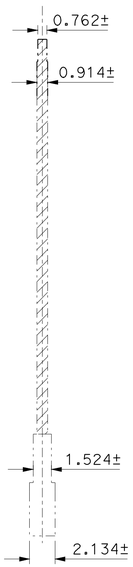
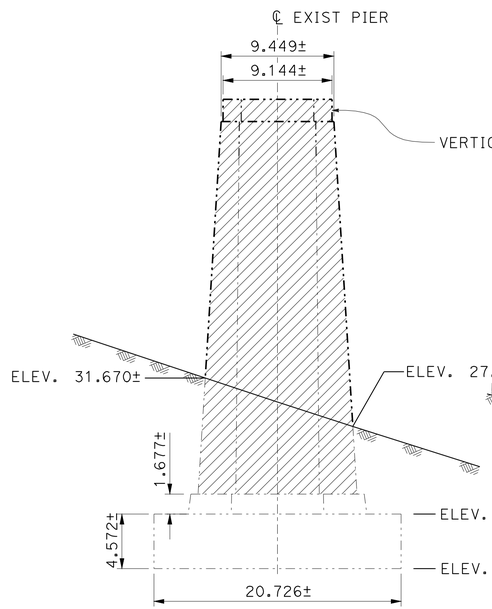
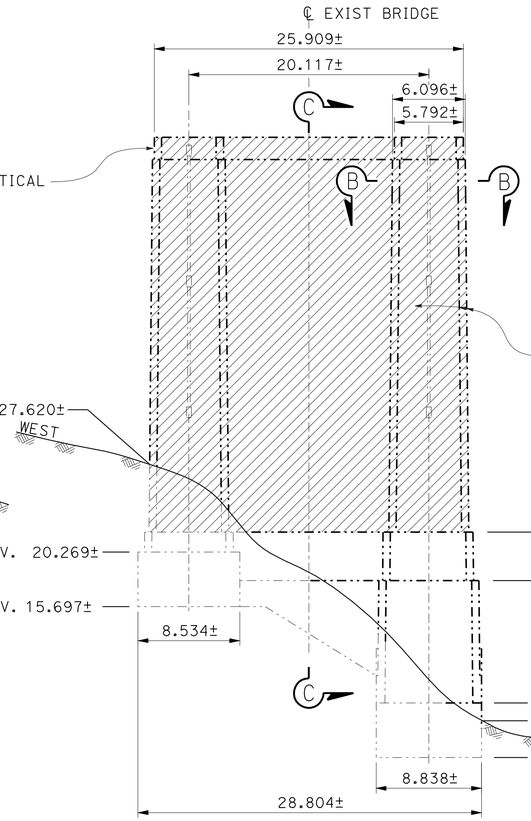
LEGEND:
Indicates Existing
Indicates Removal



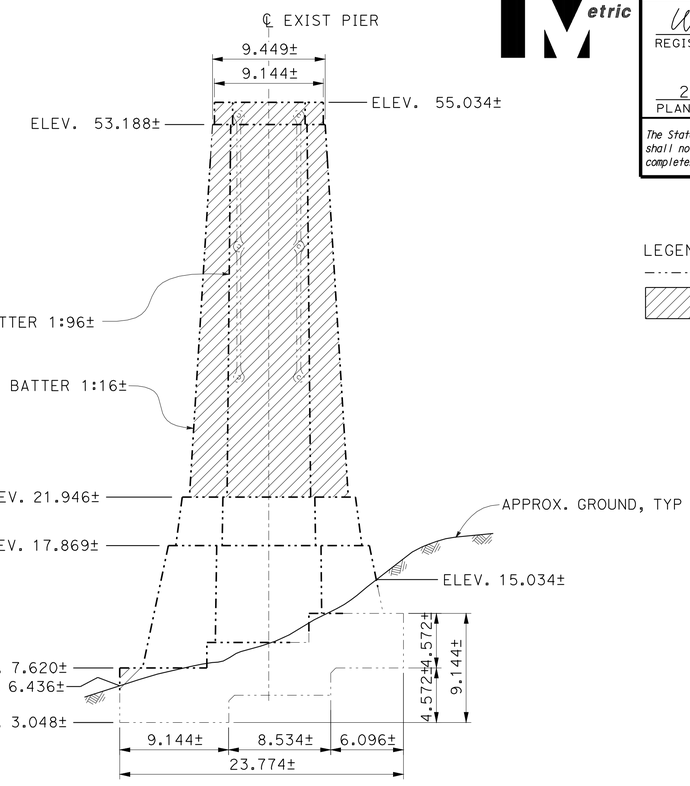
SECTION C-C
1:250



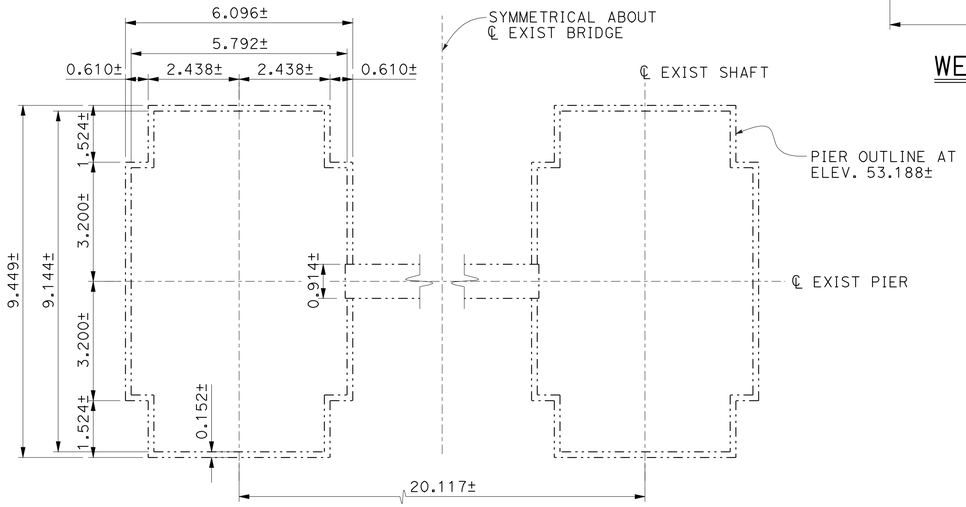
NORTH ELEVATION
1:250



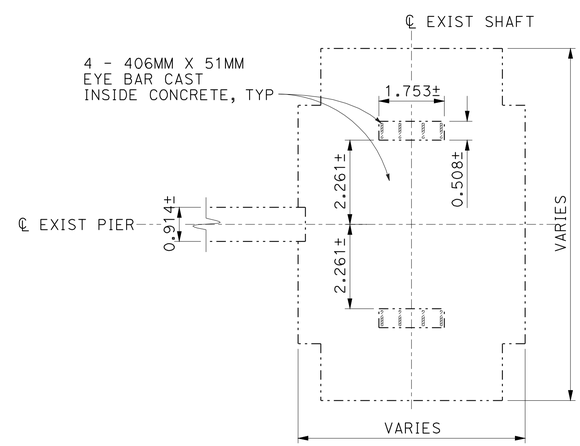
WEST ELEVATION
1:250



SOUTH ELEVATION
1:250



PLAN - TOP OF PIER
1:80



SECTION B-B
1:80

NOTE:
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

	BY	CHECKED
DESIGN	W. Long	J. Shen
DETAILS	C. Cancino	J. Shen
QUANTITIES	L. Wang	J. Shen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TOLL BRIDGE DESIGN

BRIDGE NO. 33-0025
KILOMETER POST 13.2/13.9

EXISTING CANTILEVER TRUSS DEMOLITION
PIER E1

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES
REVISION DATES 10-26-11 02/13/12
SHEET 7 OF 87

STRUCTURES DESIGN DETAIL SHEET (X) (REV. 09-01-10)

FILE => 33-0025-f-pe1.dgn

USERNAME => s119571 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:46

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SF	80	12.6/13.9	542	821

Caltrans Metric

Wenyi Long 11-07-11
REGISTERED CIVIL ENGINEER DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
WENYI LONG
No. C57430
Exp. 12-31-13
CIVIL
STATE OF CALIFORNIA

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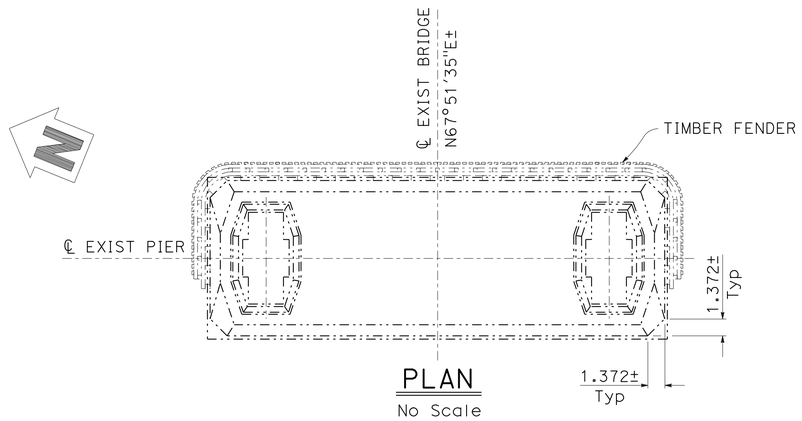
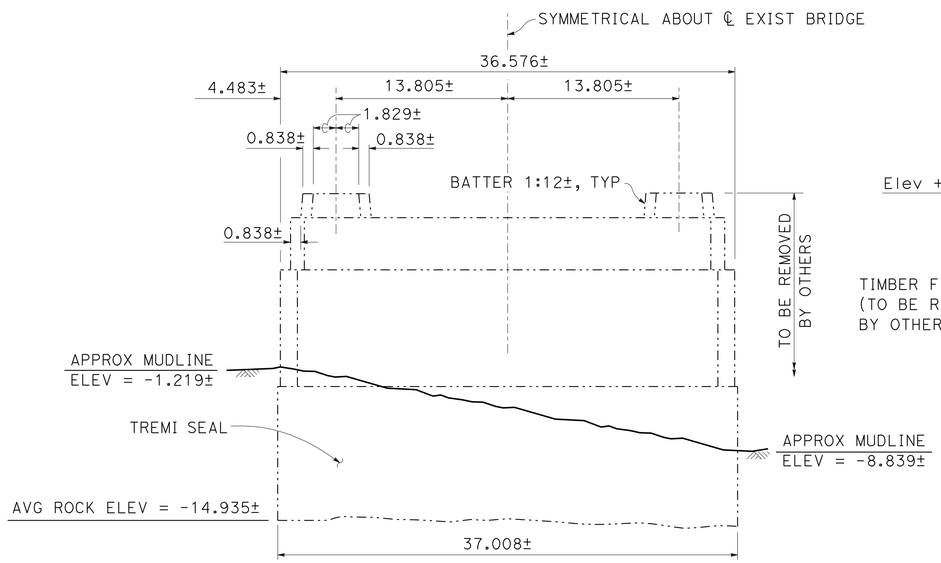
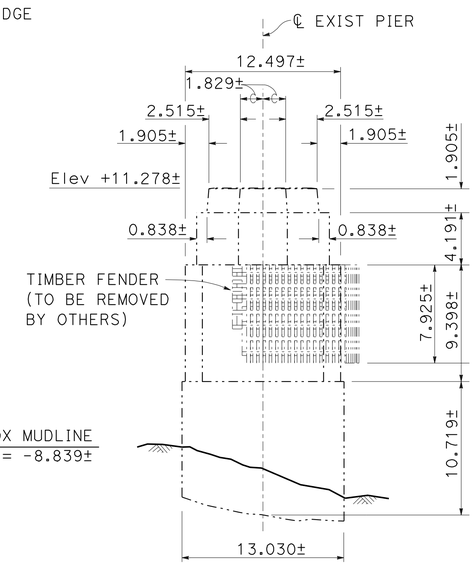


PLAN
No Scale



ELEVATION
No Scale



SIDE ELEVATION
No Scale

LEGEND:
-·-·-·-·- Indicates Existing

NOTES:
1. This sheet is for information only.
2. Mudline elevations are according to soundings taken during January, 1998.
3. The marine foundation will be removed by others.

NOTE:
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

	BY	CHECKED
DESIGN	W. Long	J. Shen
DETAILS	C. Cancino	J. Shen
QUANTITIES	L. Wang	J. Shen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TOLL BRIDGE DESIGN

BRIDGE NO. 33-0025
KILOMETER POST 13.2/13.9

EXISTING CANTILEVER TRUSS DEMOLITION
PIER E2

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 10-28-11

SHEET 8 OF 87

STRUCTURES DESIGN DETAIL SHEET (X) (REV. 09-01-10)

FILE => 33-0025-f-pe2.dgn

USERNAME => s121614 DATE PLOTTED => 27-FEB-2012 TIME PLOTTED => 09:01

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SF	80	12.6/13.9	543	821

Caltrans Metric

Wenyi Long 11-07-11
REGISTERED CIVIL ENGINEER DATE

2-21-12
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
WENYI LONG
No. C57430
Exp. 12-31-13
CIVIL
STATE OF CALIFORNIA

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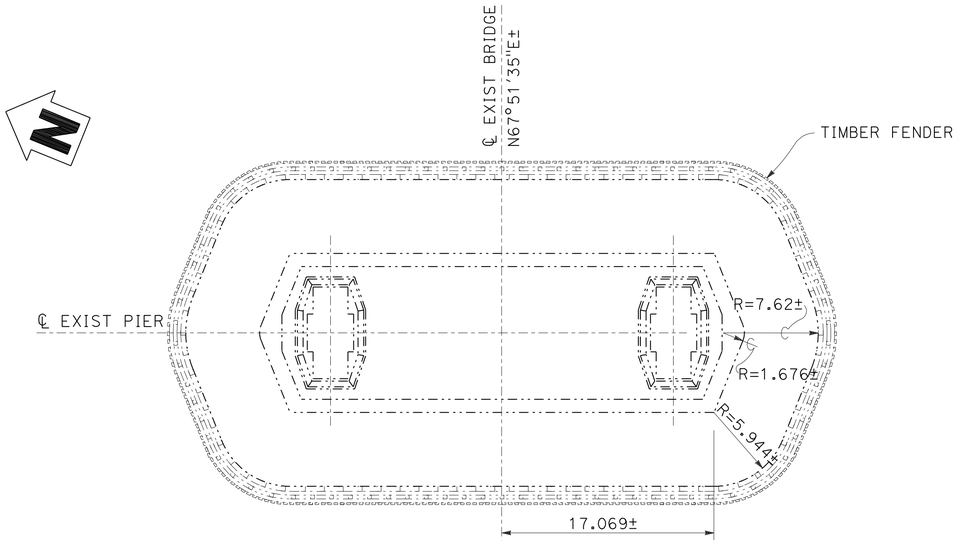
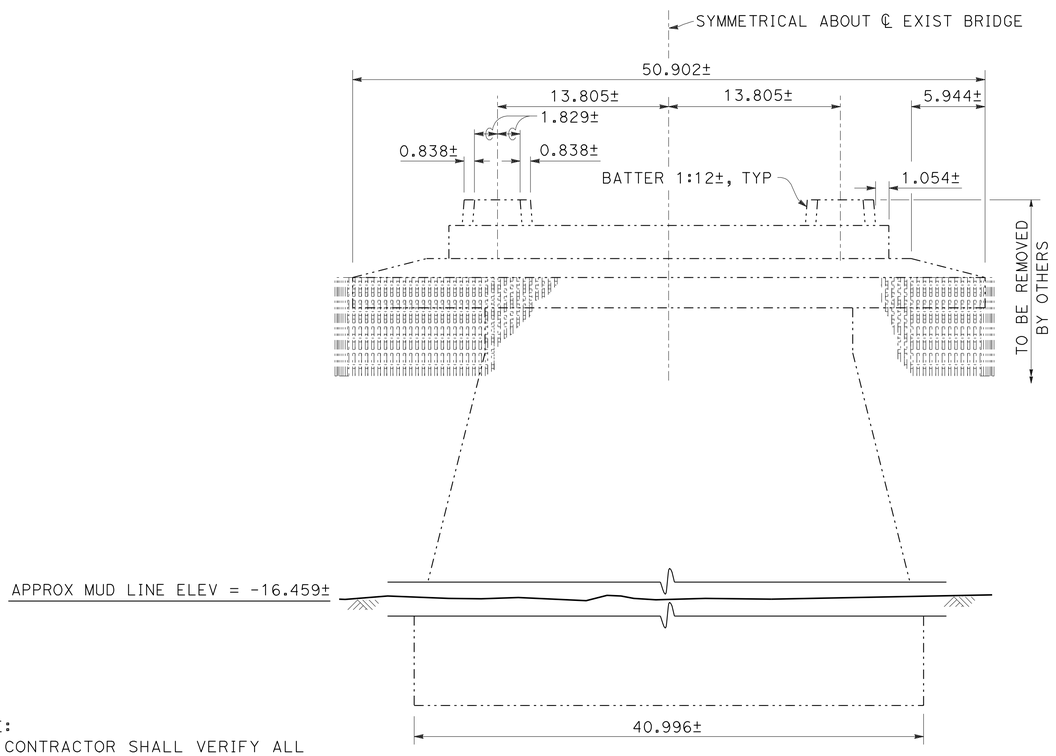


PLAN
No Scale



ELEVATION
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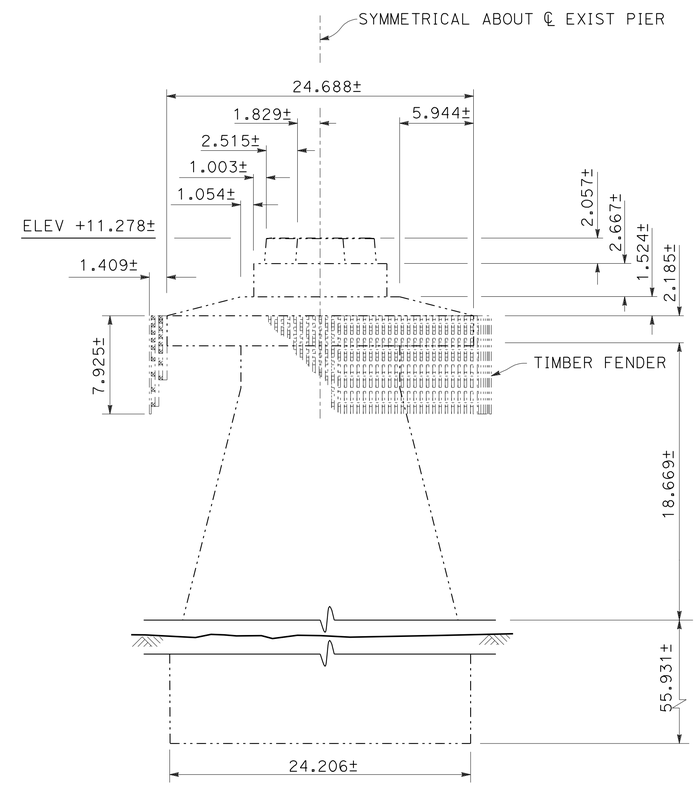

END ELEVATION
No Scale

LEGEND:
-·-·-·-·- Indicates Existing

NOTES:
1. This sheet is for information only.
2. Mudline elevations are according to soundings taken during January, 1998.
3. The marine foundation will be removed by others.

NOTE:
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

	BY	CHECKED
DESIGN	W. Long	J. Shen
DETAILS	C. Cancino	J. Shen
QUANTITIES	L. Wang	J. Shen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TOLL BRIDGE DESIGN

BRIDGE NO. 33-0025
KILOMETER POST 13.2/13.9

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

EXISTING CANTILEVER TRUSS DEMOLITION
PIER E3

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 04
EA 0120T1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 10-28-11

SHEET 9 OF 87

USERNAME => s119571 DATE PLOTTED => 25-FEB-2012 TIME PLOTTED => 13:47

STRUCTURES DESIGN DETAIL SHEET (X) (REV. 09-01-10)

FILE => 33-0025-f-pe3.dgn

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1167	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER MIKE KAPUSKAR No. GE 2564 Exp. 12-31-06 GEOTECHNICAL STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 646,
Oakland, CA 94621
(510) 562-8833, FAX (510) 562-8858

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Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
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- Poorly graded SAND (SP)
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- SAND with clay (SP-SC)
- Clayey SAND (SC)
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- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- PAVEMENT

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 76mm-OD, 60mm-ID Modified California Liner
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- 63.5mm-OD, 54mm-ID Offshore Liner
- Rock Core (Inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

STANDARD PENETRATION TEST (SPT) AND MODIFIED CALIFORNIA (MC) LINER SAMPLERS

Samplers were driven with a 63.5 kg hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ TOTAL UNIT WEIGHT (kN/m³)
- ○ THEORETICAL TOTAL UNIT WEIGHT (kN/m³)

PLASTIC LIMIT + LIQUID LIMIT +

- ⊗ EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- ROCK QUALITY DESIGNATION (RQD)
- ROCK RECOVERY PERCENT
- ROCK CORING RATE

STRENGTH TESTS

- POCKET PENETROMETER
- TORVANE
- REMOTE VANE
- MINIATURE VANE (⊗ RESIDUAL VANE)
- UNCONSOLIDATED UNDRAINED TRIAXIAL
- SWEDISH FALL CONE
- UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- UNCONFINED COMPRESSION (ROCK)
- \+ Soil: Strength Exceeds Capacity of Measuring Device Rock: Sample broke along discontinuity; Intact sample would have greater strength
- FRACTURE DENSITY (ROCK)

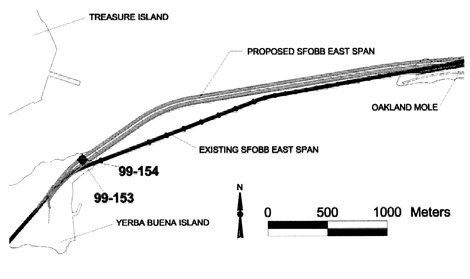
STRENGTH OF COHESIVE SOILS

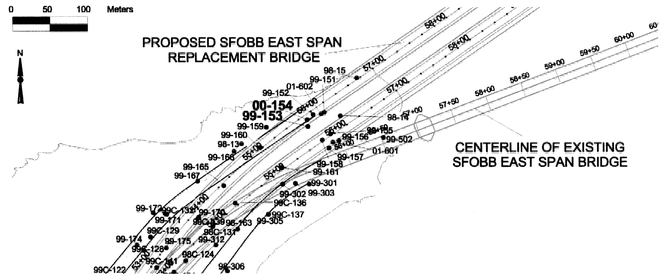
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

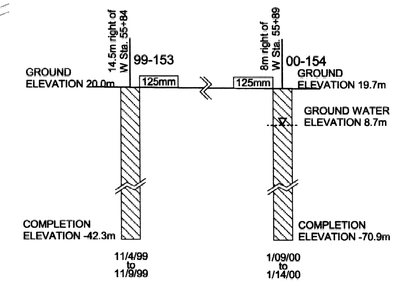
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







BORING 99-153

COORDINATES: E1836216 N647489
CA State Plane Zone 3, NAD83, Meters
GROUND ELEVATION: 20.0m (MSL)
START DATE: 11/4/99

STATION: 14.5m right of W Sta. 55+84
COMPLETION ELEVATION: -42.3m (MSL)
END DATE: 11/9/99

BLOW COUNT	MATERIAL DESCRIPTION	STRATUM NO.
	GROUND ELEVATION: 20.0m (MSL) (0.0m)	
94-44, 100-93, 100-88, 100-16, 100-63, 100-33, 97-45, 90-31	FRANCISCAN FORMATION (JKf) SANDSTONE (Graywacke) (Rx), dark yellowish brown, moderately weathered, moderately soft to moderately hard, fine to medium grained, moderately fractured -slightly weathered below 7.5m (10.5m)	I
100-93, 100-97, 100-92, 100-88, 100-75, 100-99, 100-97	SANDSTONE (Graywacke) (Rx), dark yellowish brown, fresh, very hard, fine to medium grained, slightly fractured -claystone with interbedded sandstone, 11.3m to 11.4m -fractures dipping 30 degrees, at 11.4m (21.9m)	II
100-99, 100-75, 100-97, 100-97, 100-92, 100-99	CLAYSTONE (Rx), black, fresh, hard, laminated, slightly fractured, with minor sandstone and siltstone interbeds (24.1m)	III
100-99, 100-99	SILTSTONE (Rx), dark gray, fresh, very hard, slightly fractured (26.5m)	IV
99-100, 100-99, 100-99, 100-99

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- PAVEMENT

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
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- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

STANDARD PENETRATION TEST (SPT) AND MODIFIED CALIFORNIA (MC) LINER SAMPLERS

Samplers were driven with a 63.5 kg hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ TOTAL UNIT WEIGHT (kN/m^3)
- ○ THEORETICAL TOTAL UNIT WEIGHT (kN/m^3)
- PLASTIC LIMIT + LIQUID LIMIT +
- ⊗ EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- •••• ROCK QUALITY DESIGNATION (RQD)
- —— ROCK RECOVERY PERCENT
- —— ROCK CORING RATE

STRENGTH TESTS

- ⊕ POCKET PENETROMETER
- ◆ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (⊕ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
- ⊠ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- ● POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ◐ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- + Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- —— FRACTURE DENSITY (ROCK)

STRENGTH OF COHESIVE SOILS

Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
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Stiff	50 to 100
Very Stiff	100 to 200
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DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
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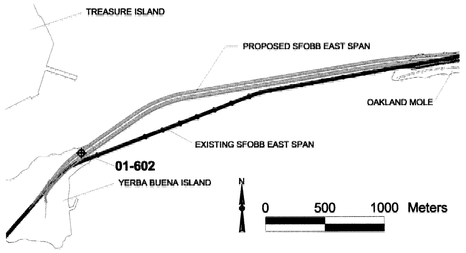
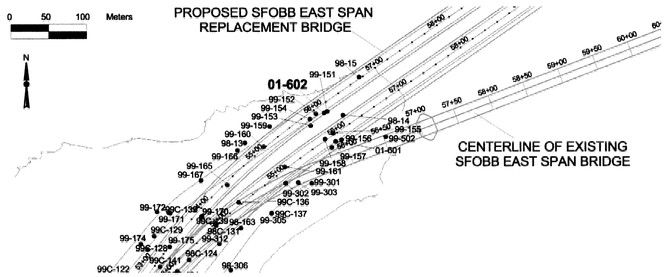
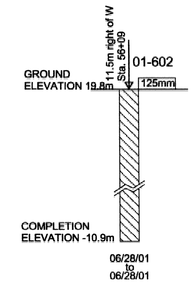
*Estimated from sampler driving record and CPT tip resistance.







DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1163	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER MIKE KAPUSKAR No. GE 2564 Exp. 12-31-06 GEOTECHNICAL STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562-8833, FAX (510) 562-8858

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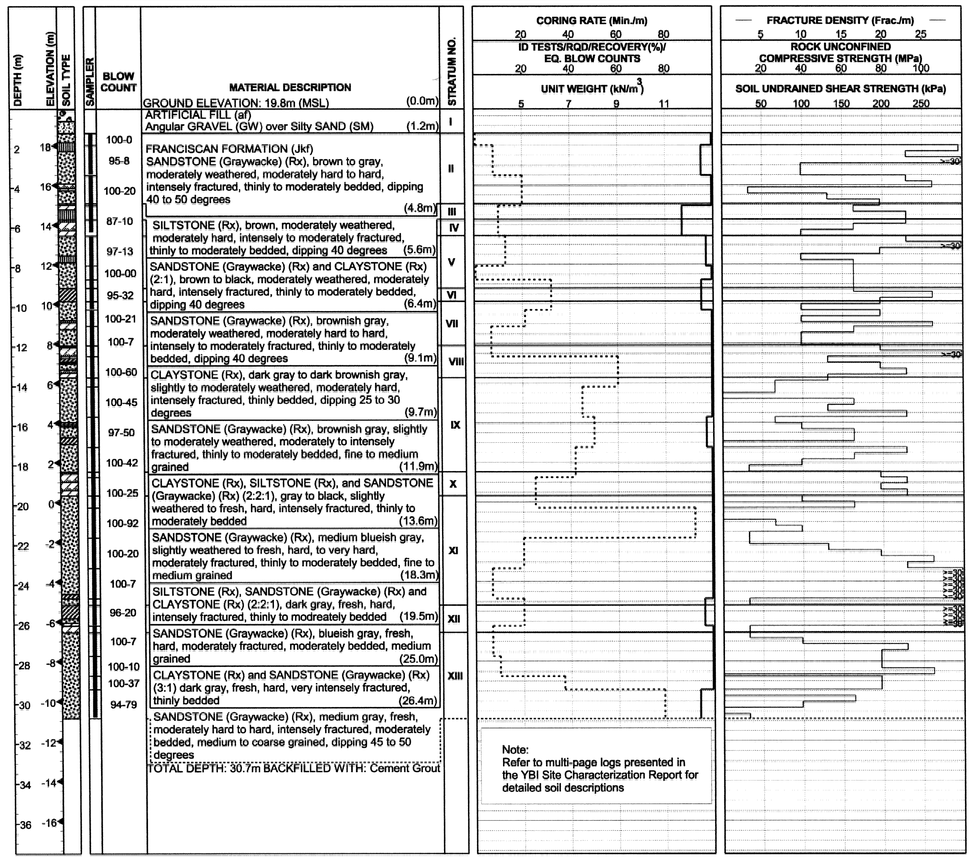
BORING 01-602

COORDINATES: E1836234 N647506
CA State Plane Zone 3, NAD83, Meters
GROUND ELEVATION: 19.8m (MSL)
START DATE: 06/28/01

STATION: 11.5m right of W Sta. 56+09
COMPLETION ELEVATION: -10.9m (MSL)
END DATE: 06/28/01

BLOW COUNT	MATERIAL DESCRIPTION	STRATUM NO.
	GROUND ELEVATION: 19.8m (MSL) (0.0m)	
	ARTIFICIAL FILL (af) Angular GRAVEL (GW) over Silty SAND (SM) (1.2m)	I
100-0 / 95-8 / 100-20	FRANCISCAN FORMATION (Jkf) SANDSTONE (Graywacke) (Rx), brown to gray, moderately weathered, moderately hard to hard, intensely fractured, thinly to moderately bedded, dipping 40 to 50 degrees (4.8m)	II
87-10	SILTSTONE (Rx), brown, moderately weathered, moderately hard, intensely to moderately fractured, thinly to moderately bedded, dipping 40 degrees (5.6m)	III
97-13		IV
100-00 / 95-32	SANDSTONE (Graywacke) (Rx) and CLAYSTONE (Rx) (2:1), brown to black, moderately weathered, moderately hard, intensely fractured, thinly to moderately bedded, dipping 40 degrees (6.4m)	V
		VI
100-21 / 100-7	SANDSTONE (Graywacke) (Rx), brownish gray, moderately weathered, moderately hard to hard, intensely to moderately fractured, thinly to moderately bedded, dipping 40 degrees (9.1m)	VII
		VIII
100-60 / 100-45	CLAYSTONE (Rx), dark gray to dark brownish gray, slightly to moderately weathered, moderately hard, intensely fractured, thinly bedded, dipping 25 to 30 degrees (9.7m)	IX
97-50 / 100-42	SANDSTONE (Graywacke) (Rx), brownish gray, slightly to moderately weathered, moderately to intensely fractured, thinly to moderately bedded, fine to medium grained (11.9m)	
100-25	CLAYSTONE (Rx), SILTSTONE (Rx), and SANDSTONE (Graywacke) (Rx) (2:2:1), gray to black, slightly weathered to fresh, hard, intensely fractured, thinly to moderately bedded (13.6m)	X
100-92 / 100-20	SANDSTONE (Graywacke) (Rx), medium blueish gray, slightly weathered to fresh, hard, to very hard, moderately fractured, thinly to moderately bedded, fine to medium grained (18.3m)	XI
100-7 / 96-20	SILTSTONE (Rx), SANDSTONE (Graywacke) (Rx) and CLAYSTONE (Rx) (2:2:1), dark gray, fresh, hard, intensely fractured, thinly to modreately bedded (19.5m)	XII
100-7 / 100-10	SANDSTONE (Graywacke) (Rx), blueish gray, fresh, hard, moderately fractured, moderately bedded, medium grained (25.0m)	
100-37 / 94-79	CLAYSTONE (Rx) and SANDSTONE (Graywacke) (Rx) (3:1) dark gray, fresh, hard, very intensely fractured, thinly bedded (26.4m)	XIII
	SANDSTONE (Graywacke) (Rx), medium gray, fresh, moderately hard to hard, intensely fractured, moderately bedded, medium to coarse grained, dipping 45 to 50 degrees	
	TOTAL DEPTH: 30.7m BACKFILLED WITH: Cement Grout	



Note:
Refer to multi-page logs presented in the YBI Site Characterization Report for detailed soil descriptions

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	545	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 2

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet 11 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN, GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY A. PALOMARES	B. SCHELL, FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
	CHECKED BY A. BROUGHTON	DATE SEE ABOVE	

M. KAPUSKAR, PROJECT ENGINEER

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

BRIDGE NO.	KM POST	POST MILE
34-0006 L/R	13.2/13.9	8.2/8.7

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 2

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 751 OF

FILENAME => 33-0025-p-ltb02_723.tif

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1169	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

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Metric

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- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
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- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
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- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
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Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ TOTAL UNIT WEIGHT (kN/m³)
- ○ THEORETICAL TOTAL UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT + LIQUID LIMIT +
- ⊗ EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
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- SWEDISH FALL CONE
- UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- UNCONFINED COMPRESSION (ROCK)
- + Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity;
  Intact sample would have greater strength
- FRACTURE DENSITY (ROCK)

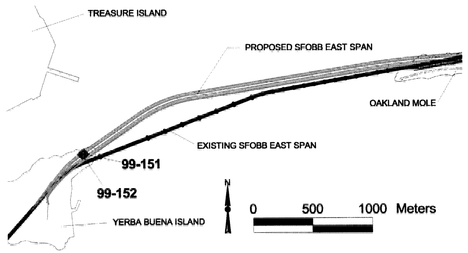
STRENGTH OF COHESIVE SOILS

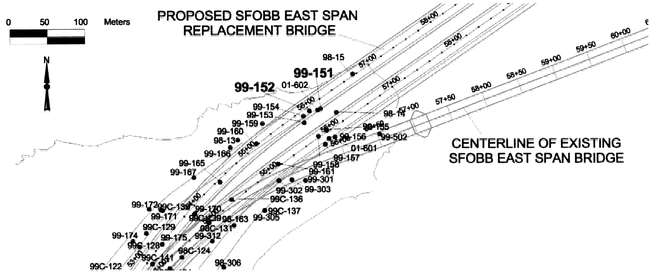
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

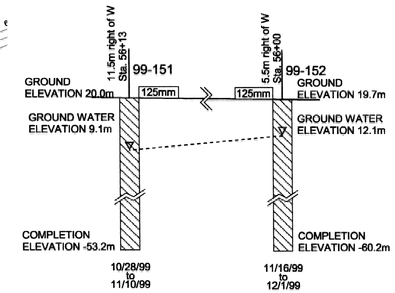
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.





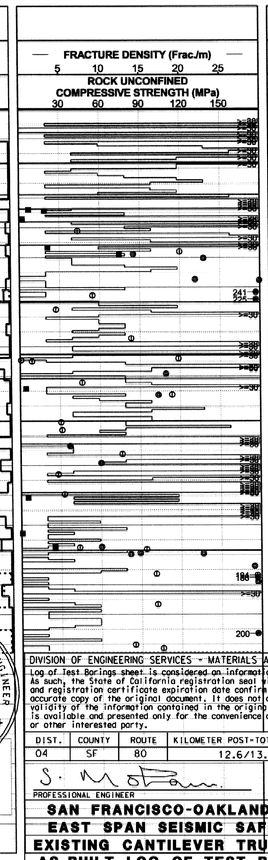


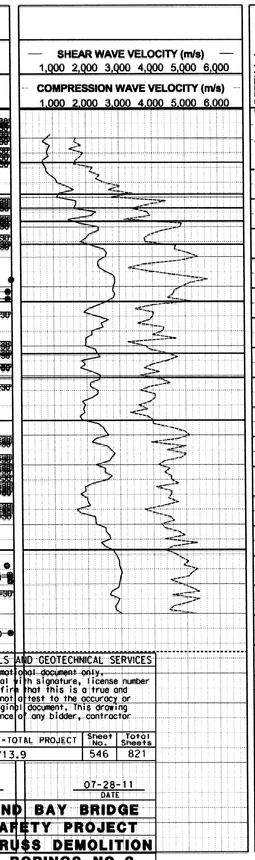
BORING 99-151

COORDINATES: E1836238 N647508
CA State Plane Zone 3, NAD83, Meters
GROUND ELEVATION: 20.0m (MSL)
START DATE: 10/28/99

STATION: 11.5m right of W Sta. 56+13
COMPLETION ELEVATION: -53.2m (MSL)
END DATE: 11/10/99

BLOW COUNT	MATERIAL DESCRIPTION	STRATUM NO.
	GROUND ELEVATION: 20.0m (MSL) (0.2m)	
90-44	ARTIFICIAL FILL (af)	I
90-23, 100-47, 100-30	FRANCISCAN FORMATION (JKf) SANDSTONE (Graywacke) (Rx), yellowish brown, intensely weathered, moderately hard (7.3m)	II
100-30, 100-44, 100-70, 100-48	SANDSTONE (Graywacke) (Rx), yellowish brown, moderately weathered, moderately hard (11.6m) (10.9m)	III
92-0, 100-76, 100-73	CLAYSTONE (Rx), SILTSTONE (Rx), and SANDSTONE (Graywacke) (Rx) [1:1:0.5], slightly to moderately weathered, hard (13.5m) (15.2m)	IV, V, VI
98-53, 100-17, 98-67, 100-80	CLAYSTONE (Rx), SILTSTONE (Rx), and SANDSTONE (Graywacke) (Rx) [1:1:0.5], fresh, hard (18.4m)	VI
100-73, 98-92, 97-100, 100-26	SANDSTONE (Graywacke) (Rx), light gray, fresh, hard -interbedded siltstone and claystone, dipping 30 degrees, 21.0m to 21.2m (26.1m)	VII
100-50, 98-53, 100-78, 100-45	CLAYSTONE (Rx), SILTSTONE (Rx), and SANDSTONE (Graywacke) (Rx) [2:1:1], fresh, hard, intensely to moderately fractured (33.1m)	VIII
93-48, 97-32	SANDSTONE (Graywacke) (Rx), light gray, fresh, hard, fine to medium grained (36.3m)	IX
100-52, 100-45, 98-53	SANDSTONE (Graywacke) (Rx), CLAYSTONE (Rx), SILTSTONE (Rx) [10:4:1], fresh, hard (42.1m)	X
100-63, 100-48, 87-85, 100-45, 95-26, 100-43, 98-11, 90-56, 86-18, 97-45, 100-92, 95-95, 100-92, 100-84, 100-99, 95-96, 98-98, 100-87, 100-53, 100-99, 100-99	SANDSTONE (Graywacke) (Rx), light gray, fresh, very hard -claystone, intensely fractured, 44.2m to 45.1m -interbedded claystone and siltstone, moderately soft to very hard, laminated to thickly bedded, very intensely to moderately fractured, 53.2m to 54.7m (59.4m) -vertical fracture zone, well developed slickensides, 54.9m to 55.5m -sandstone, 56.4m to 56.8m	XI
	SANDSTONE (Graywacke) (Rx), light gray, fresh, very hard -interbedded siltstone and claystone [1:1], dipping 50 degrees, 65.1m to 65.5m	XII
	TOTAL DEPTH: 73.2m BACKFILLED WITH: Cement Grout	





Note:
Refer to multi-page logs presented in the YBI Site Characterization Report for detailed soil descriptions

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES
Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	546	821

S. Mohan 07-28-11
PROFESSIONAL ENGINEER DATE

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO.3

CU 04
EA 0120T1

BRIDGE No. 33-0025
Sheet 12 of 87

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

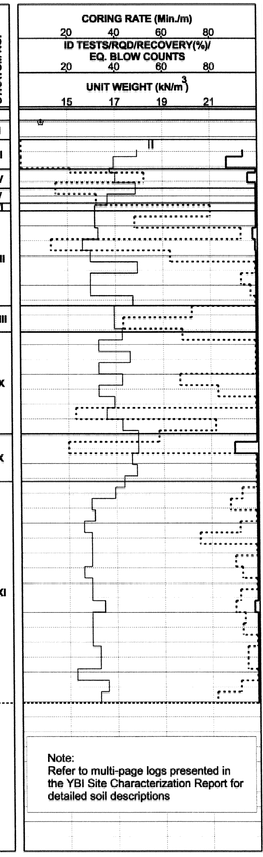
TO ACCOMPANY PLANS DATED 2-21-12

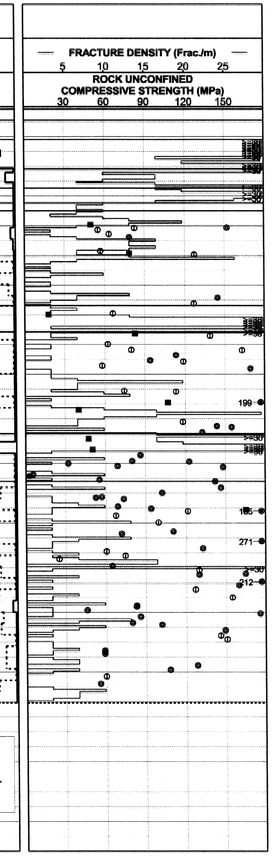
BORING 99-152

COORDINATES: E1836223 N647505
CA State Plane Zone 3, NAD83, Meters
GROUND ELEVATION: 19.7m (MSL)
START DATE: 11/16/99

STATION: 5.5m right of W Sta. 56+00
COMPLETION ELEVATION: -60.2m (MSL)
END DATE: 12/1/99

BLOW COUNT	MATERIAL DESCRIPTION	STRATUM NO.
	GROUND ELEVATION: 19.7m (MSL) (0.0m)	
9	ARTIFICIAL FILL (af) (1.5m)	I
56-0, 94-0, 87-0	SEDIMENTARY DEPOSITS (Qa) Silty Fine SAND (SM), medium loose, brown, dry to slightly moist, with small pieces of rock fragments (4.1m) (7.6m)	II, III
100-21, 96-82, 100-15, 100-32, 100-80	FRANCISCAN FORMATION (JKf) CLAYSTONE (Rx), SILTSTONE (Rx), and SANDSTONE (Graywacke) (Rx) [5:4:2], intensely weathered, soft to moderately soft, intensely fractured (8.1m)	IV, V, VI
100-48, 98-93, 99-13, 100-63	CLAYSTONE (Rx), SILTSTONE (Rx), and SANDSTONE (Graywacke) (Rx) [5:4:2], moderately weathered, moderately hard to hard, intensely fractured (10.7m)	VII
100-99, 100-93, 100-97, 100-99	CLAYSTONE (Rx), SILTSTONE (Rx), and SANDSTONE (Graywacke) (Rx) [5:4:2], slightly weathered, moderately hard to hard, intensely fractured (12.6m)	VII
100-72, 100-43, 100-68	CLAYSTONE (Rx), SILTSTONE (Rx), and SANDSTONE (Graywacke) (Rx) [5:4:2], fresh, moderately hard to hard, moderately fractured (13.7m)	VIII
100-99, 100-99, 100-99	SANDSTONE (Graywacke) (RX), fresh, gray, very hard, fine to medium grained (26.5m)	IX
100-67, 100-83, 100-99, 100-23	CLAYSTONE (Rx), SANDSTONE (Graywacke) (Rx), and SILTSTONE (Rx) [9:4:2], fresh, hard to very hard, slightly to moderately fractured (30.0m)	IX
100-82, 100-58	SANDSTONE (Graywacke) (RX) gray, fresh, very hard, slightly fractured, fine to medium grained (43.7m)	IX
90-20, 100-99, 100-99, 100-99	SANDSTONE (Graywacke) (Rx), SILTSTONE (Rx), and CLAYSTONE (Rx) [3:2:2], fresh, moderately hard to very hard (50.1m)	X
100-93, 100-88, 100-99, 100-92, 100-75, 100-99, 100-90, 100-93, 100-99, 100-92, 98-90, 100-94, 100-93, 100-99, 100-95, 100-95, 100-99, 100-92, 100-82	SANDSTONE (Graywacke) (RX), light gray, fresh, very hard, slightly fractured, very thin filling, smooth to moderately rough -interbedded claystone and siltstone, bedding dipping 30 to 50 degrees, 53.2m to 53.6m -gradational contact, siltstone, with abundant calcite filled fractures, 65.2m to 65.6m -moderately fractured, very thin, slightly rough to smooth, dipping 40 to 60 degrees, below 78.3m	XI
	TOTAL DEPTH: 79.9m BACKFILLED WITH: Cement Grout	





Note:
Refer to multi-page logs presented in the YBI Site Characterization Report for detailed soil descriptions

SABA MOHAN, GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY: C. CACERES	B. SCHELL, FIELD INVESTIGATOR	M. KAPUSKAR, PROJECT ENGINEER
S. Mohan	CHECKED BY: S. SICILIANO	DATE: SEE ABOVE	

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

BRIDGE NO.	KM POST	POST MILE
34-0006 L/R	13.2/13.9	8.2/8.7

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES →
REVISION DATES (PRELIMINARY STAGE ONLY)
SHEET 752 OF

FILENAME => 33-0025-p-ltb03_724.tif

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- PAVEMENT

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

STANDARD PENETRATION TEST (SPT) AND MODIFIED CALIFORNIA (MC) LINER SAMPLERS

Samplers were driven with a 63.5 kg hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ TOTAL UNIT WEIGHT (kN/m³)
- ○ THEORETICAL TOTAL UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT + LIQUID LIMIT +
- ⊕ EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- ···· ROCK QUALITY DESIGNATION (RQD)
- —— ROCK RECOVERY PERCENT
- —— ROCK CORING RATE

STRENGTH TESTS

- ● POCKET PENETROMETER
- ◆ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (◇ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
- ⊠ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- ● POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ⊕ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- \+ Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- —— FRACTURE DENSITY (ROCK)

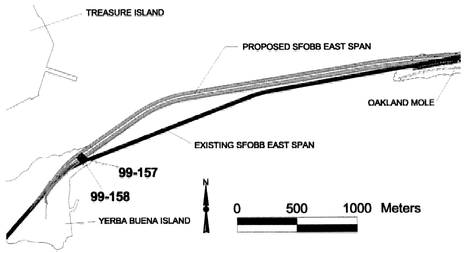
STRENGTH OF COHESIVE SOILS

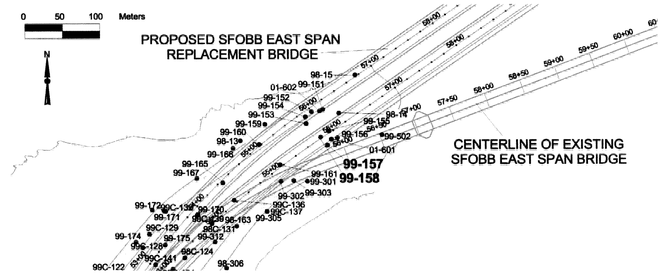
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

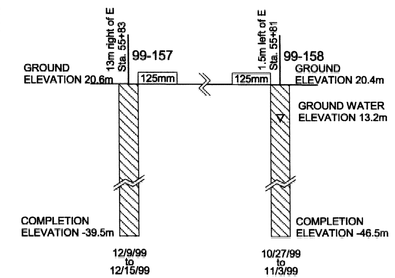
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1170	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER MIKE KAPUSKAR No. GE 2564 Exp. 12-31-06 GEOTECHNICAL STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 646,
Oakland, CA 94621
(510) 562-8833, FAX (510) 562-8858

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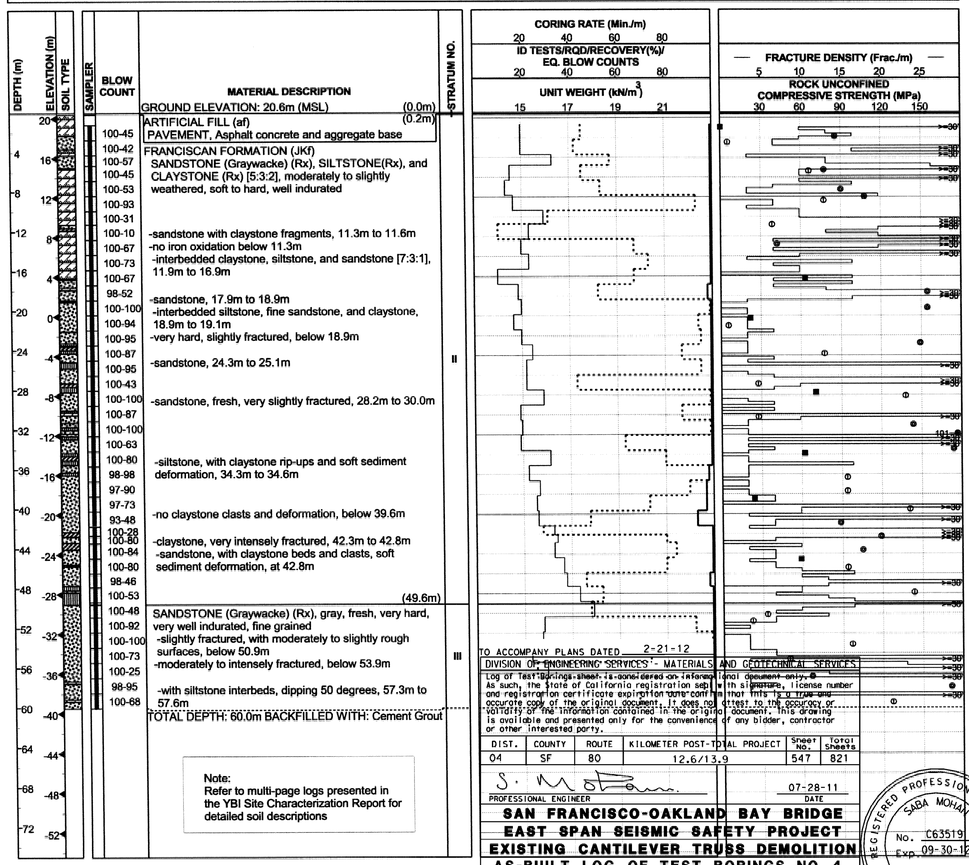
BORING 99-157

COORDINATES: E1836244 N647460
CA State Plane Zone 3, NAD83, Meters
GROUND ELEVATION: 20.6m (MSL)
START DATE: 12/9/99

STATION: 13m right of E Sta. 55+83
COMPLETION ELEVATION: -39.5m (MSL)
END DATE: 12/15/99

BLOW COUNT	MATERIAL DESCRIPTION	STRATUM NO.
	GROUND ELEVATION: 20.6m (MSL) (0.0m)	
	ARTIFICIAL FILL (af) PAVEMENT, Asphalt concrete and aggregate base (0.2m)	
100-45	FRANCISCAN FORMATION (JKf)	
100-42	SANDSTONE (Graywacke) (Rx), SILTSTONE(Rx), and	
100-57	CLAYSTONE (Rx) [5:3:2], moderately to slightly	
100-45	weathered, soft to hard, well indurated	
100-53		
100-93		
100-31		
100-10	-sandstone with claystone fragments, 11.3m to 11.6m	
100-67	-no iron oxidation below 11.3m	
100-73	-interbedded claystone, siltstone, and sandstone [7:3:1],	
100-67	11.9m to 16.9m	
98-52		
100-100	-sandstone, 17.9m to 18.9m	
100-94	-interbedded siltstone, fine sandstone, and claystone,	
100-95	18.9m to 19.1m	
100-87	-very hard, slightly fractured, below 18.9m	
100-95	-sandstone, 24.3m to 25.1m	II
100-43		
100-100	-sandstone, fresh, very slightly fractured, 28.2m to 30.0m	
100-87		
100-100		
100-63		
100-80	-siltstone, with claystone rip-ups and soft sediment	
98-98	deformation, 34.3m to 34.6m	
97-90		
97-73		
93-48	-no claystone clasts and deformation, below 39.6m	
100-28		
100-80	-claystone, very intensely fractured, 42.3m to 42.8m	
100-84	-sandstone, with claystone beds and clasts, soft	
100-80	sediment deformation, at 42.8m	
98-46		
100-53	(49.6m)	
100-48	SANDSTONE (Graywacke) (Rx), gray, fresh, very hard,	
100-92	very well indurated, fine grained	
100-100	-slightly fractured, with moderately to slightly rough	
100-73	surfaces, below 50.9m	
100-25	-moderately to intensely fractured, below 53.9m	III
98-95		
100-68	-with siltstone interbeds, dipping 50 degrees, 57.3m to 57.6m	
	TOTAL DEPTH: 60.0m BACKFILLED WITH: Cement Grout	

Note:
Refer to multi-page logs presented in the YBI Site Characterization Report for detailed soil descriptions



TO ACCOMPANY PLANS DATED 2-21-12
DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirms that this is a true and accurate copy of the original document. It does not attest to the accuracy or correctness of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	547	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE EAST SPAN SEISMIC SAFETY PROJECT EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 4

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA — Sheet 13 of 87

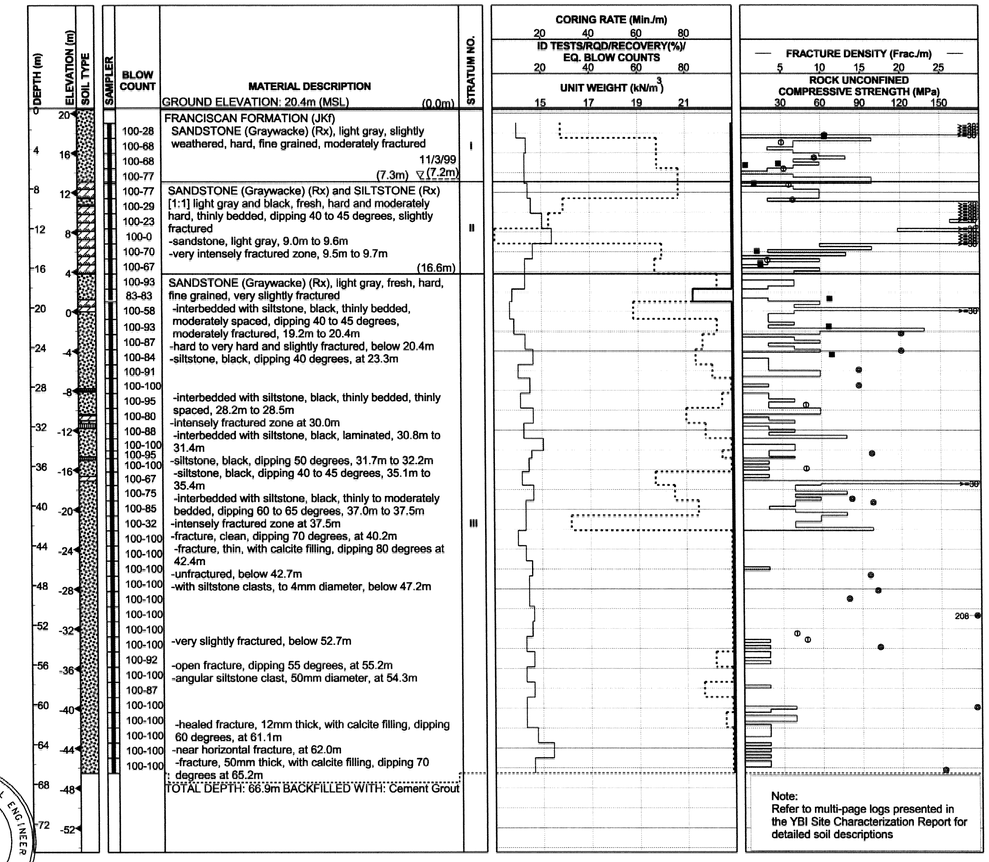
REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

BORING 99-158

COORDINATES: E1836235 N647471
CA State Plane Zone 3, NAD83, Meters
GROUND ELEVATION: 20.4m (MSL)
START DATE: 10/27/99

STATION: 1.5m left of E Sta. 55+81
COMPLETION ELEVATION: -46.5m (MSL)
END DATE: 11/3/99

BLOW COUNT	MATERIAL DESCRIPTION	STRATUM NO.
	GROUND ELEVATION: 20.4m (MSL) (0.0m)	
	FRANCISCAN FORMATION (JKf)	
100-28	SANDSTONE (Graywacke) (Rx), light gray, slightly	
100-68	weathered, hard, fine grained, moderately fractured	
100-68	11/3/99	
100-77	(7.3m) ▽(7.2m)	
100-77	SANDSTONE (Graywacke) (Rx) and SILTSTONE (Rx)	
100-29	[1:1] light gray and black, fresh, hard and moderately	
100-23	hard, thinly bedded, dipping 40 to 45 degrees, slightly	
100-0	fractured	
100-70	-sandstone, light gray, 9.0m to 9.6m	II
100-67	-very intensely fractured zone, 9.5m to 9.7m	
	(16.6m)	
100-93	SANDSTONE (Graywacke) (Rx), light gray, fresh, hard,	
83-83	fine grained, very slightly fractured	
100-58	-interbedded with siltstone, black, thinly bedded,	
100-93	moderately spaced, dipping 40 to 45 degrees,	
100-87	moderately fractured, 19.2m to 20.4m	
100-84	-hard to very hard and slightly fractured, below 20.4m	
100-91	-siltstone, black, dipping 40 degrees, at 23.3m	
100-100		
100-95	-interbedded with siltstone, black, thinly bedded, thinly	
100-80	spaced, 28.2m to 28.5m	
100-88	-intensely fractured zone at 30.0m	
100-100	-interbedded with siltstone, black, laminated, 30.8m to	
100-95	31.4m	
100-100	-siltstone, black, dipping 50 degrees, 31.7m to 32.2m	
100-67	-siltstone, black, dipping 40 to 45 degrees, 35.1m to	
100-75	35.4m	
100-85	-interbedded with siltstone, black, thinly to moderately	
100-32	bedded, dipping 60 to 65 degrees, 37.0m to 37.5m	
100-100	-intensely fractured zone at 37.5m	III
100-100	-fracture, clean, dipping 70 degrees, at 40.2m	
100-100	-fracture, thin, with calcite filling, dipping 80 degrees at	
100-100	42.4m	
100-100	-unfractured, below 42.7m	
100-100	-with siltstone clasts, to 4mm diameter, below 47.2m	
100-100		
100-100		
100-100	-very slightly fractured, below 52.7m	
100-92		
100-100	-open fracture, dipping 55 degrees, at 55.2m	
100-87	-angular siltstone clast, 50mm diameter, at 54.3m	
100-100		
100-100		
100-100	-healed fracture, 12mm thick, with calcite filling, dipping	
100-100	60 degrees, at 61.1m	
100-100	-near horizontal fracture, at 62.0m	
100-100	-fracture, 50mm thick, with calcite filling, dipping 70	
	degrees at 65.2m	
	TOTAL DEPTH: 66.9m BACKFILLED WITH: Cement Grout	



Note:
Refer to multi-page logs presented in the YBI Site Characterization Report for detailed soil descriptions

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY	J.PALMER	B.SCHELL, S. SICILIANO — FIELD INVESTIGATOR
	CHECKED BY	M. KAPUSKAR, S. SICILIANO	DATE SEE ABOVE

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

M. KAPUSKAR — PROJECT ENGINEER

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

BRIDGE NO. 34-0006 L/R
KM POST 13.2/13.9
POST MILE 8.2/8.7

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 4

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 753 OF

FILENAME => 33-0025-p-ltb04_725.tif

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1171	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER MIKE KAPUSKAR No. GE 2564 Exp. 12-31-06 GEOTECHNICAL STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562-8833, FAX (510) 562-8858

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SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- PAVEMENT

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

STANDARD PENETRATION TEST (SPT) AND MODIFIED CALIFORNIA (MC) LINER SAMPLERS

Samplers were driven with a 63.5 kg hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ TOTAL UNIT WEIGHT (kN/m³)
- ○ THEORETICAL TOTAL UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT + LIQUID LIMIT +
- ⊙ EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- ROCK QUALITY DESIGNATION (RQD)
- ROCK RECOVERY PERCENT
- ROCK CORING RATE

STRENGTH TESTS

- POCKET PENETROMETER
- TORVANE
- REMOTE VANE
- MINIATURE VANE (⊗ RESIDUAL VANE)
- UNCONSOLIDATED UNDRAINED TRIAXIAL
- SWEDISH FALL CONE
- UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- UNCONFINED COMPRESSION (ROCK)
- + Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- FRACTURE DENSITY (ROCK)

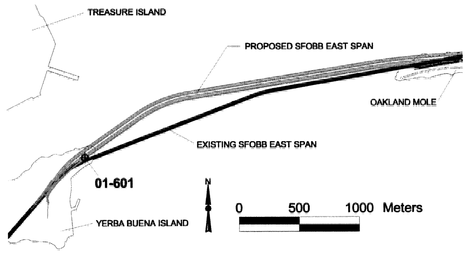
STRENGTH OF COHESIVE SOILS

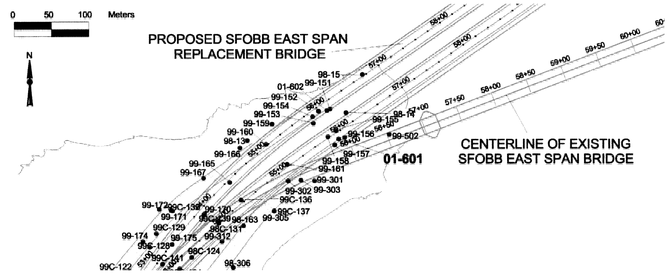
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

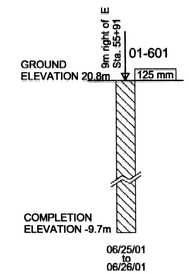
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.





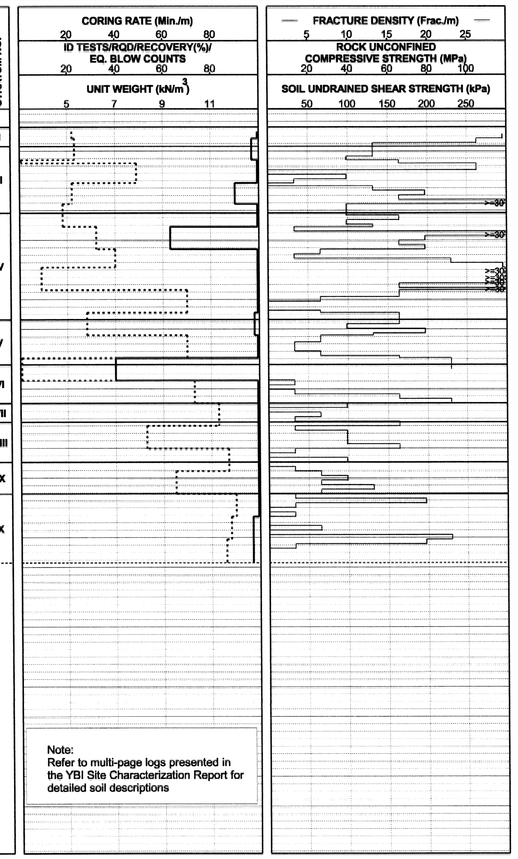


BORING 01-601

COORDINATES: E1836249 N647468
CA State Plane Zone 3, NAD83, Meters
GROUND ELEVATION: 20.8m (MSL)
START DATE: 06/25/01

STATION: 9m right of E Sta. 55+91
COMPLETION ELEVATION: -9.7m (MSL)
END DATE: 06/26/01

BLOW COUNT	MATERIAL DESCRIPTION	STRATUM NO.
	GROUND ELEVATION: 20.8m (MSL) (0.0m)	
100-22	ARTIFICIAL FILL (af) (1.2m)	I
	PAVEMENT, Asphalt Concrete over Aggregate Base	
97-23	FRANCISCAN FORMATION (Jkf) (2.5m)	II
100-0 100-49 90-22	SANDSTONE (Graywacke) (Rx), slightly weathered, hard to very hard, moderately fractured, thinly to moderately bedded (7.0m)	III
100-18 63-32 100-40 100-9 100-70	Interbedded CLAYSTONE (Rx) and SILTSTONE (Rx), dark gray to black, slightly weathered, moderately hard, intensely to moderately fractured, moderately bedded (14.2m)	IV
98-28 100-70	SANDSTONE (Graywacke) (Rx), slightly weathered to fresh, hard to very hard, moderately to intensely fractured, moderately bedded (17.2m)	V
40-0 100-73	CLAYSTONE (Rx) and SILTSTONE (Rx) (1:1), fresh, very hard, moderately fractured, thinly to moderately bedded (19.8m)	VI
100-83	SILTSTONE (Rx) and Fine SANDSTONE (Graywacke) (Rx) (1:1), fresh, very hard, moderately to slightly fractured, moderately to thickly bedded (21.1m)	VII
100-53		VIII
100-87 100-65	CLAYSTONE (Rx) and SILTSTONE (Rx) (3:2), fresh, very hard, moderately fractured, thinly to moderately bedded (23.8m)	IX
100-90 97-88	SILTSTONE (Rx) and SANDSTONE (Graywacke) (Rx) (2:1), fresh, hard to very hard, moderately fractured, thinly to moderately bedded (25.9m)	X
97-86	SANDSTONE (Graywacke) (Rx), fresh, hard to very hard, moderately fractured, moderately bedded	
	TOTAL DEPTH: 30.5m BACKFILLED WITH: Cement Grout	



Note:
Refer to multi-page logs presented in the YBI Site Characterization Report for detailed soil descriptions

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	548	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 5

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA — Sheet 14 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY	A. PALOMARES	B. SCHELL — FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	M. KAPUSKAR — PROJECT ENGINEER
	CHECKED BY	S. SICILIANO	DATE SEE ABOVE		

BRIDGE NO. 34-0006 L/R
KM POST 13.2/13.9
POST MILE 8.2/8.7

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 5

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY) SHEET 754 OF

FILENAME => 33-0025-p-1tb05_726.tif

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- PAVEMENT

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

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Samplers were driven with a 63.5 kg hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
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Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
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CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ TOTAL UNIT WEIGHT (kN/m³)
- ○ THEORETICAL TOTAL UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT LIQUID LIMIT
- ⊗ EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- ···· ROCK QUALITY DESIGNATION (RQD)
- —— ROCK RECOVERY PERCENT
- —— ROCK CORING RATE

STRENGTH TESTS

- ⊕ POCKET PENETROMETER
- ◆ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (◇ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
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- ◇△ (Open symbols indicate remolded tests)
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- ● POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ⊕ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- \+ Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- —— FRACTURE DENSITY (ROCK)

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Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
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Firm	25 to 50
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Very Stiff	100 to 200
Hard	greater than 200

DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
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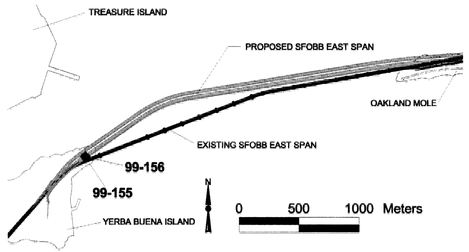
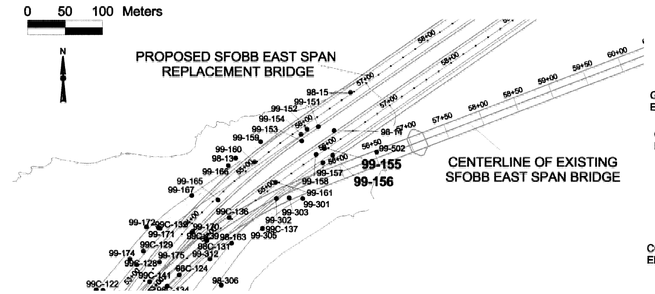
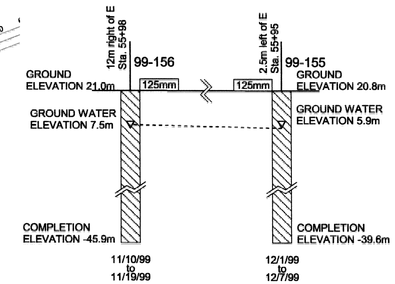
*Estimated from sampler driving record and CPT tip resistance.







Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1172	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER MIKE KAPUSKAR No. GE 2564 Exp. 12-31-06 GEOTECHNICAL STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562-8833, FAX (510) 562-8858

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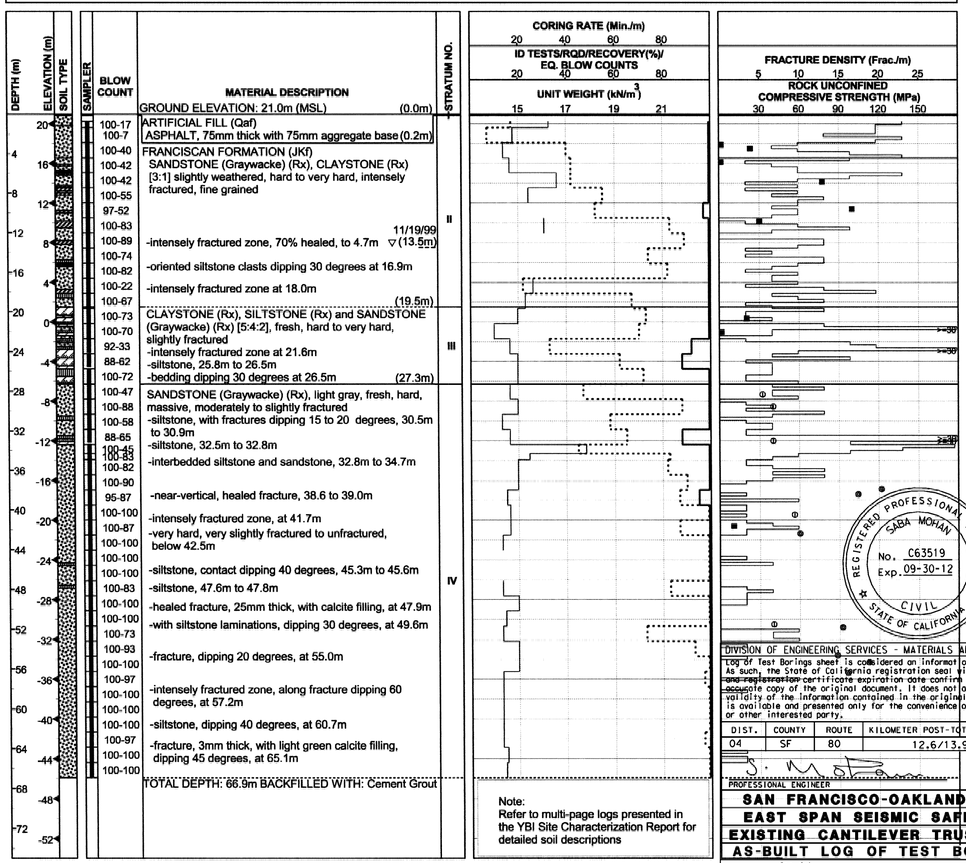
BORING 99-156

COORDINATES: E1836257 N647470
CA State Plane Zone 3, NAD83, Meters
GROUND ELEVATION: 21.0m (MSL)
START DATE: 11/10/99

STATION: 12m right of E Sta. 55+98
COMPLETION ELEVATION: -45.9m (MSL)
END DATE: 11/19/99

BLOW COUNT	MATERIAL DESCRIPTION	STRATUM NO.
	GROUND ELEVATION: 21.0m (MSL) (0.0m)	
100-17 100-7	ARTIFICIAL FILL (Qaf) ASPHALT, 75mm thick with 75mm aggregate base (0.2m)	I
100-40 100-42 100-42 100-55 97-52	FRANCISCAN FORMATION (JKf) SANDSTONE (Graywacke) (Rx), CLAYSTONE (Rx) [3:1] slightly weathered, hard to very hard, intensely fractured, fine grained	II
100-83	11/19/99	
100-89	-intensely fractured zone, 70% healed, to 4.7m ▽(13.5m)	
100-74		
100-82	-oriented siltstone clasts dipping 30 degrees at 16.9m	
100-22	-intensely fractured zone at 18.0m	
100-67	(19.5m)	
100-73 100-70 92-33 88-62 100-72	CLAYSTONE (Rx), SILTSTONE (Rx) and SANDSTONE (Graywacke) (Rx) [5:4:2], fresh, hard to very hard, slightly fractured -intensely fractured zone at 21.6m -siltstone, 25.8m to 26.5m -bedding dipping 30 degrees at 26.5m (27.3m)	III
100-47 100-88 100-58 88-65 100-45 100-83 100-82 100-90 95-87 100-100 100-87 100-100 100-100 100-100 100-83 100-100 100-100 100-73 100-93 100-100 100-97 100-100 100-100 100-100 100-97 100-100 100-100	SANDSTONE (Graywacke) (Rx), light gray, fresh, hard, massive, moderately to slightly fractured -siltstone, with fractures dipping 15 to 20 degrees, 30.5m to 30.9m -siltstone, 32.5m to 32.8m -interbedded siltstone and sandstone, 32.8m to 34.7m -near-vertical, healed fracture, 38.6 to 39.0m -intensely fractured zone, at 41.7m -very hard, very slightly fractured to unfractured, below 42.5m -siltstone, contact dipping 40 degrees, 45.3m to 45.6m -siltstone, 47.6m to 47.8m -healed fracture, 25mm thick, with calcite filling, at 47.9m -with siltstone laminations, dipping 30 degrees, at 49.6m -fracture, dipping 20 degrees, at 55.0m -intensely fractured zone, along fracture dipping 60 degrees, at 57.2m -siltstone, dipping 40 degrees, at 60.7m -fracture, 3mm thick, with light green calcite filling, dipping 45 degrees, at 65.1m	IV
	TOTAL DEPTH: 66.9m BACKFILLED WITH: Cement Grout	



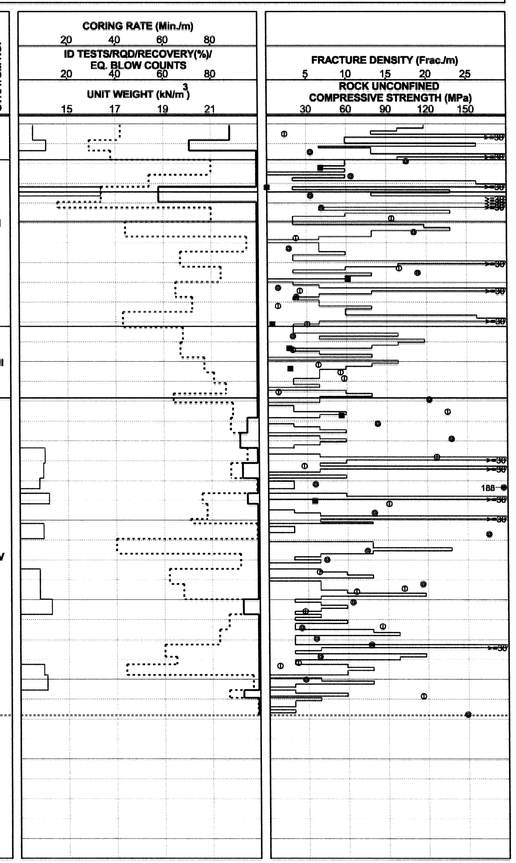
Note:
Refer to multi-page logs presented in the YBI Site Characterization Report for detailed soil descriptions

BORING 99-155

COORDINATES: E1836246 N647479
CA State Plane Zone 3, NAD83, Meters
GROUND ELEVATION: 20.8m (MSL)
START DATE: 12/1/99

STATION: 2.5m left of E Sta. 55+95
COMPLETION ELEVATION: -39.6m (MSL)
END DATE: 12/7/99

BLOW COUNT	MATERIAL DESCRIPTION	STRATUM NO.
	GROUND ELEVATION: 20.8m (MSL) (0.0m)	
88-42 71-29 100-38 100-80	FRANCISCAN FORMATION (JKf) SANDSTONE (Graywacke) (Rx) and SILTSTONE(Rx) -light gray sandstone laminated with black siltstone, moderately weathered, moderately hard, moderately indurated, intensely fractured, fine to medium-grained (4.4m)	I
100-54 58-34 100-16 100-80 100-44	SANDSTONE (Graywacke) (Rx), light gray, moderately weathered, moderately hard to hard, well indurated, moderately fractured, fine to medium grained	II
100-95	-healed fracture zone, 14.3m to 14.6m 12/14/99	
100-67	-siltstone, 14.6m to 14.8m ▽(14.9m)	
100-84 100-65 100-72 100-43	-siltstone, very intensely fractured, moderately soft, dipping 40 degrees, 17.5m to 18.0m -intensely fractured zone at 20.4m (21.2m)	
100-68 100-67 100-77 100-81 100-86 100-64	SANDSTONE (Graywacke) (Rx) and SILTSTONE(Rx) -light gray and black, fresh, moderately hard to hard -siltstone, dipping 60 to 80 degrees, 23.9m to 24.4m -bedding plane fractures, dipping 40 degrees, 24.4m to 27.0m (28.5m)	III
100-89 95-88 92-92 100-95 93-88 100-100 100-100 95-76 100-78 100-71 100-100 100-40 100-92 100-62 100-68 93-93 100-87 100-83 100-60 100-65 100-44 100-97 93-87 100-100 100-100	SANDSTONE (Graywacke) (Rx), light gray, fresh, hard to very hard, well indurated, slightly fractured, fine to medium grained -fractures with very thin to moderately thin calcite fillings, slightly rough, dipping 40 to 60 degrees -with 0.125mm to 1.0mm sand sized siltstone clasts, below 28.5m -silty sandstone layer with siltstone dipping at 45 degrees, 30.1m to 30.5m -siltstone, very intensely fractured, at 34.7m -interbedded siltstone and sandstone 35.4m to 35.8m -very thin to closed healed fractures, dipping 50 degrees to sub-vertical, 35.8m to 37.6m -siltstone, intensely fractured, moderately hard to moderately soft, 38.3m to 38.5m -healed fracture zone, intensley fractured, with light green mineralized calcite fillings, at 42.0m -interbedded sandstone, siltstone, and silty sandstone, 43.1m to 45.1m -siltstone, intensely fractured, moderately hard, 43.1m to 43.4m -very intensely fractured and distorted, mottled with calcite and siltstone, 46.1m to 46.6m	IV
	TOTAL DEPTH: 60.4m BACKFILLED WITH: Cement Grout	



Note:
Refer to multi-page logs presented in the YBI Site Characterization Report for detailed soil descriptions

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES
Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This document is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	549	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 6

CU 04 EA 0120T1	BRIDGE No. 33-0025
	Sheet 15 of 87

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA
TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY C.CACERES	B. SCHELL, S. SICILIANO, E. CHASE — FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
	CHECKED BY M. KAPUSKAR	DATE SEE ABOVE	

M. KAPUSKAR — PROJECT ENGINEER

BRIDGE NO.	KM POST	POST MILE
34-0006 L/R	13.2/13.9	8.2/8.7

CU 04
EA 0120F1

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 6

DISREGARD PRINTS BEARING EARLIER REVISION DATES →
REVISION DATES (PRELIMINARY STAGE ONLY)
SHEET 755 OF

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1173	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER MIKE KAPUSKAR No. GE 2564 Exp. 12-31-06 GEOTECHNICAL STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

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Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- PAVEMENT

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 76mm-OD, 60mm-ID Modified California Liner
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- 63.5mm-OD, 54mm-ID Offshore Liner
- Rock Core (Inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

STANDARD PENETRATION TEST (SPT) AND MODIFIED CALIFORNIA (MC) LINER SAMPLERS

Samplers were driven with a 63.5 kg hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ TOTAL UNIT WEIGHT (KN/m³)
- ○ THEORETICAL TOTAL UNIT WEIGHT (KN/m³)
- PLASTIC LIMIT + LIQUID LIMIT +
- ⊕ EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- ···· ROCK QUALITY DESIGNATION (RQD)
- —— ROCK RECOVERY PERCENT
- —— ROCK CORING RATE

STRENGTH TESTS

- ● POCKET PENETROMETER
- ◆ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (⊗ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
- ⊠ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- ● POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ⊕ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- + Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- —— FRACTURE DENSITY (ROCK)

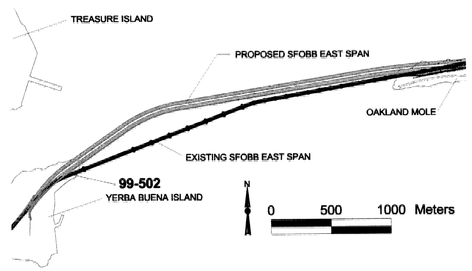
STRENGTH OF COHESIVE SOILS

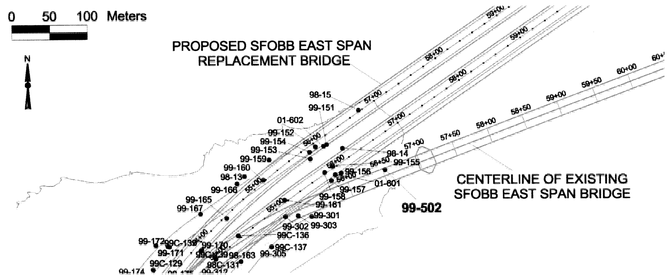
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

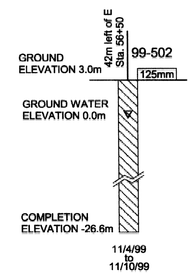
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 85
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.





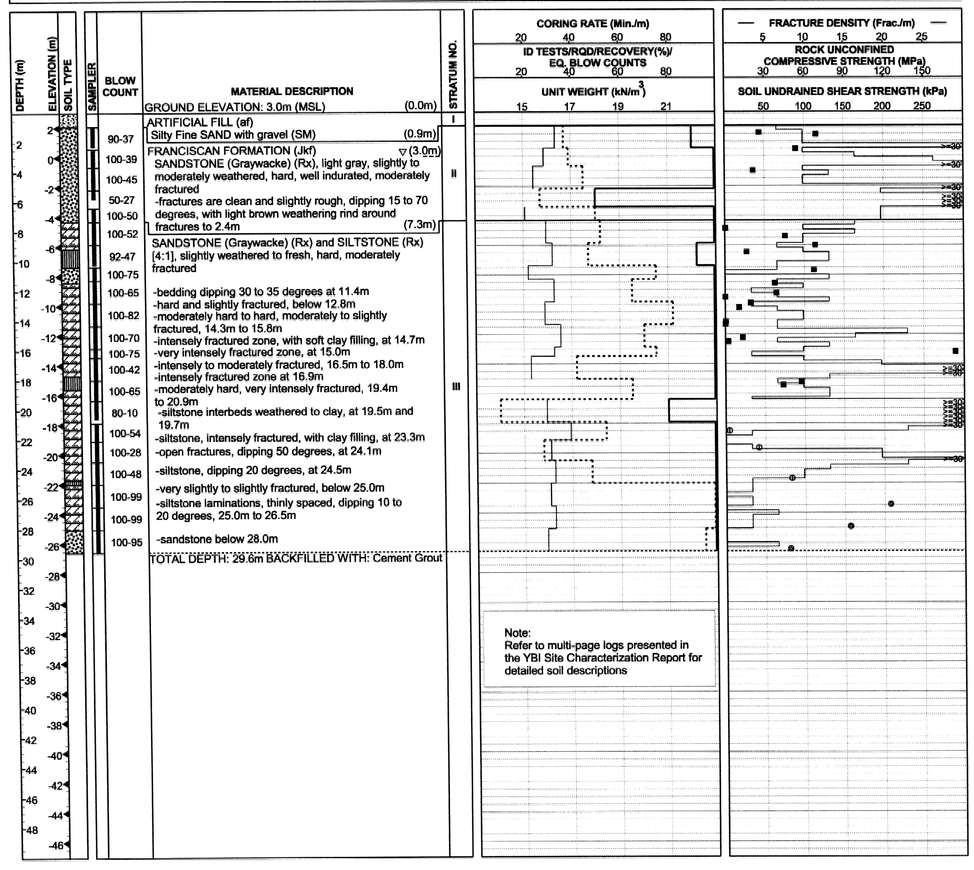


BORING 99-502

COORDINATES: E1836316 N647474
CA State Plane Zone 3, NAD83, Meters
GROUND ELEVATION: 3.0m (MSL)
START DATE: 11/4/99

STATION: 42m left of E Bound Sta. 56+50
COMPLETION ELEVATION: -26.6m (MSL)
END DATE: 11/10/99

BLOW COUNT	MATERIAL DESCRIPTION	STRATUM NO.
	GROUND ELEVATION: 3.0m (MSL) (0.0m)	
	ARTIFICIAL FILL (af)	I
	Silty Fine SAND with gravel (SM) (0.9m)	
	FRANCISCAN FORMATION (Jkf) ▽ (3.0m)	
90-37	SANDSTONE (Graywacke) (Rx), light gray, slightly to moderately weathered, hard, well indurated, moderately fractured	II
100-39	-fractures are clean and slightly rough, dipping 15 to 70 degrees, with light brown weathering rind around fractures to 2.4m (7.3m)	
100-45		
50-27		
100-50		
100-52	SANDSTONE (Graywacke) (Rx) and SILTSTONE (Rx) [4:1], slightly weathered to fresh, hard, moderately fractured	III
92-47		
100-75		
100-65	-bedding dipping 30 to 35 degrees at 11.4m	
	-hard and slightly fractured, below 12.8m	
100-82	-moderately hard to hard, moderately to slightly fractured, 14.3m to 15.8m	
100-70	-intensely fractured zone, with soft clay filling, at 14.7m	
100-75	-very intensely fractured zone, at 15.0m	
100-42	-intensely to moderately fractured, 16.5m to 18.0m	
	-intensely fractured zone at 16.9m	
100-65	-moderately hard, very intensely fractured, 19.4m to 20.9m	
80-10	-siltstone interbeds weathered to clay, at 19.5m and 19.7m	
100-54	-siltstone, intensely fractured, with clay filling, at 23.3m	
100-28	-open fractures, dipping 50 degrees, at 24.1m	
100-48	-siltstone, dipping 20 degrees, at 24.5m	
100-99	-very slightly to slightly fractured, below 25.0m	
100-99	-siltstone laminations, thinly spaced, dipping 10 to 20 degrees, 25.0m to 26.5m	
100-95	-sandstone below 28.0m	
	TOTAL DEPTH: 29.6m BACKFILLED WITH: Cement Grout	



Note:
Refer to multi-page logs presented in the YBI Site Characterization Report for detailed soil descriptions

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	550	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 7

CU 04
EA 0120T1

BRIDGE No. 33-0025

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TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY F. BAEZ	S. SICILIANO — FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
	CHECKED BY R. HOWARD	DATE SEE ABOVE	

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

M. KAPUSKAR — PROJECT ENGINEER

CU 04
EA 0120F1

BRIDGE NO.	KM POST	POST MILE
34-0006L/R	13.2/13.9	8.2/8.7

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 7

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY) SHEET 756 OF

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1174	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER MIKE KAPUSKAR No. GE 2564 Exp. 12-31-06 GEOTECHNICAL STATE OF CALIFORNIA

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- Sandy lean CLAY (CL)
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- SILT (ML)
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- Low plasticity ORGANICS (OL)
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- Interbedded Rock Strata (Rx)
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- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
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- ◇△ (Open symbols indicate remolded tests)
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- + Soil: Strength Exceeds Capacity of Measuring Device; Rock: Sample broke along discontinuity; Intact sample would have greater strength
- FRACTURE DENSITY (ROCK)

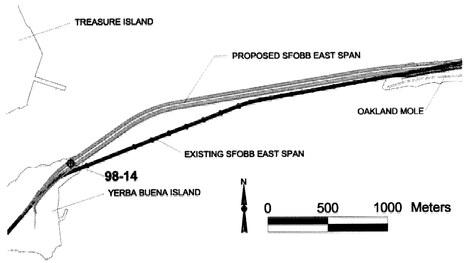
STRENGTH OF COHESIVE SOILS

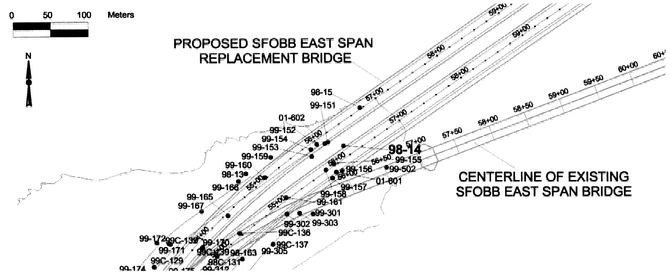
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

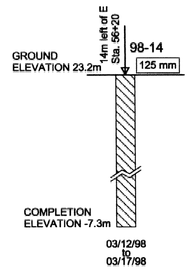
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.





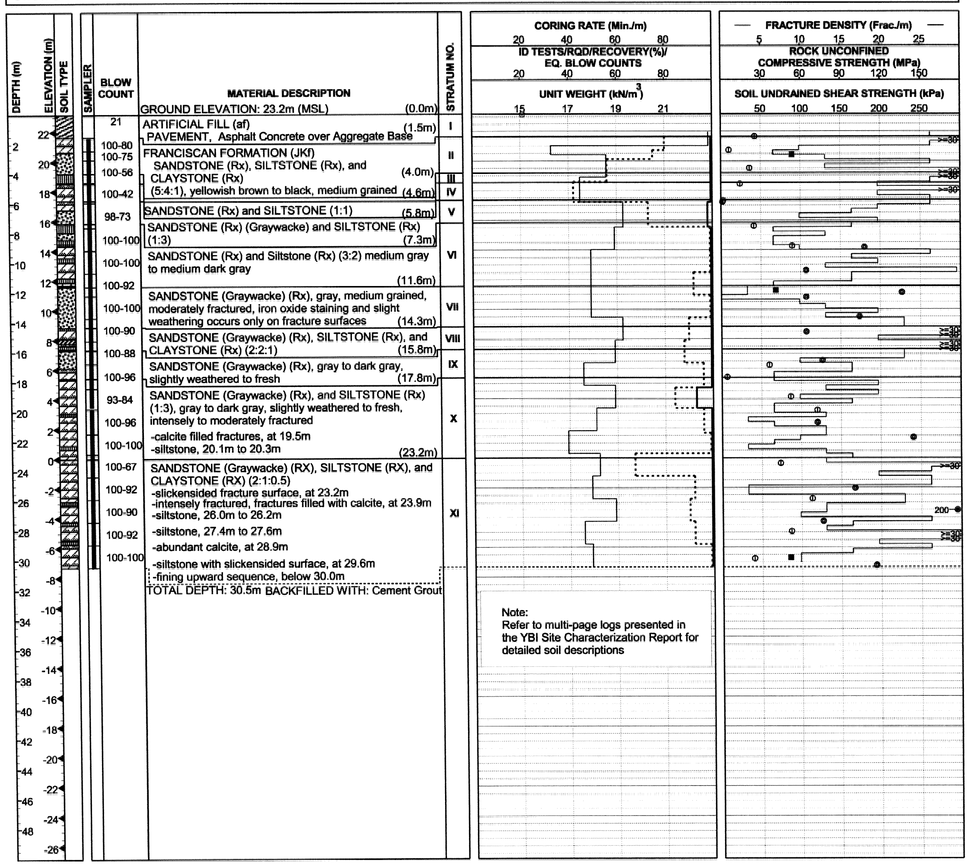


BORING 98-14

COORDINATES: E1836259 N647503
CA State Plane Zone 3, NAD83, Meters
GROUND ELEVATION: 23.2m (MSL)
START DATE: 03/12/98

STATION: 14m left of E Sta. 56+20
COMPLETION ELEVATION: -7.3m (MSL)
END DATE: 03/17/98

BLOW COUNT	MATERIAL DESCRIPTION	STRATUM NO.
	GROUND ELEVATION: 23.2m (MSL) (0.0m)	
21	ARTIFICIAL FILL (af) (1.5m)	I
	PAVEMENT, Asphalt Concrete over Aggregate Base	
100-80	FRANCISCAN FORMATION (JKf)	II
100-75	SANDSTONE (Rx), SILTSTONE (Rx), and CLAYSTONE (Rx) (4.0m)	
100-56		III
100-42	(5:4:1), yellowish brown to black, medium grained (4.6m)	IV
98-73	SANDSTONE (Rx) and SILTSTONE (1:1) (5.8m)	V
100-100	SANDSTONE (Rx) (Graywacke) and SILTSTONE (Rx) (1:3) (7.3m)	
100-100	SANDSTONE (Rx) and Siltstone (Rx) (3:2) medium gray to medium dark gray (11.6m)	VI
100-92		
100-100	SANDSTONE (Graywacke) (Rx), gray, medium grained, moderately fractured, iron oxide staining and slight weathering occurs only on fracture surfaces (14.3m)	VII
100-90	SANDSTONE (Graywacke) (Rx), SILTSTONE (Rx), and CLAYSTONE (Rx) (2:2:1) (15.8m)	VIII
100-88		
100-96	SANDSTONE (Graywacke) (Rx), gray to dark gray, slightly weathered to fresh (17.8m)	IX
93-84	SANDSTONE (Graywacke) (Rx), and SILTSTONE (Rx) (1:3), gray to dark gray, slightly weathered to fresh, intensely to moderately fractured	X
100-96	-calcite filled fractures, at 19.5m	
100-100	-siltstone, 20.1m to 20.3m (23.2m)	
100-67	SANDSTONE (Graywacke) (RX), SILTSTONE (RX), and CLAYSTONE (RX) (2:1:0.5)	XI
100-92	-slickensided fracture surface, at 23.2m	
100-90	-intensely fractured, fractures filled with calcite, at 23.9m -siltstone, 26.0m to 26.2m	
100-92	-siltstone, 27.4m to 27.6m	
	-abundant calcite, at 28.9m	
100-100	-siltstone with slickensided surface, at 29.6m -fining upward sequence, below 30.0m	
	TOTAL DEPTH: 30.5m BACKFILLED WITH: Cement Grout	



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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	551	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 8

CU 04 EA 0120T1	BRIDGE No. 33-0025	
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TO ACCOMPANY PLANS DATED 2-21-12

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DRAWN BY F. BAEZ
CHECKED BY R. HOWARD
S. BRATHWHITE — FIELD INVESTIGATOR
DATE SEE ABOVE

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

M. KAPUSKAR — PROJECT ENGINEER

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

BRIDGE NO.	KM POST	POST MILE
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EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 8

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1175	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER MIKE KAPUSKAR No. GE 2584 Exp. 12-31-06 GEOTECHNICAL STATE OF CALIFORNIA

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- SILTSTONE (Rx)
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- Rock Core (Inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

STANDARD PENETRATION TEST (SPT) AND MODIFIED CALIFORNIA (MC) LINER SAMPLERS

Samplers were driven with a 63.5 kg hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
88/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ TOTAL UNIT WEIGHT (kN/m³)
- ○ THEORETICAL TOTAL UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT LIQUID LIMIT
- ⊗ EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- RQD ROCK QUALITY DESIGNATION (RQD)
- RR ROCK RECOVERY PERCENT
- RCR ROCK CORING RATE

STRENGTH TESTS

- ● POCKET PENETROMETER
- ◆ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (⊗ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
- ⊠ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- ● POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ⊙ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- ┼ Soil: Strength Exceeds Capacity of Measuring Device Rock: Sample broke along discontinuity; Intact sample would have greater strength
- FRACTURE DENSITY (ROCK)

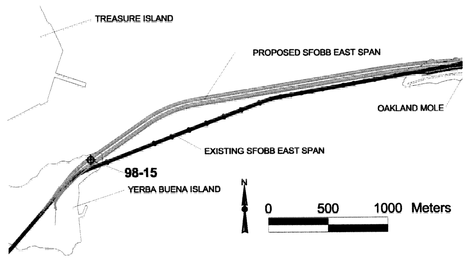
STRENGTH OF COHESIVE SOILS

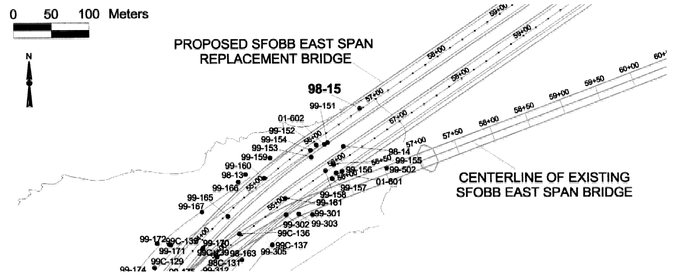
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

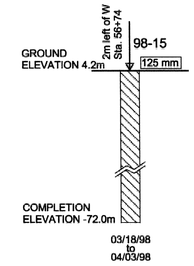
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.





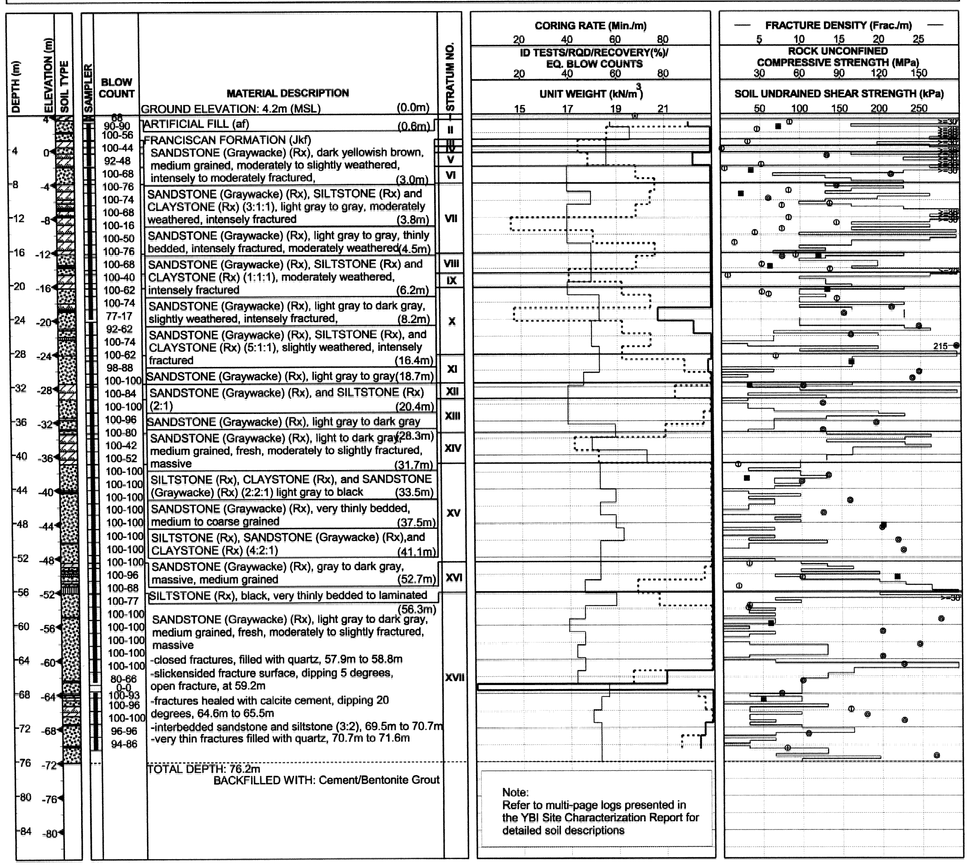


BORING 98-15

COORDINATES: E1836281 N647554
CA State Plane Zone 3, NAD83, Meters
GROUND ELEVATION: 4.2m (MSL)
START DATE: 03/18/98

STATION: 2m left of W Sta. 56+74
COMPLETION ELEVATION: -72.0m (MSL)
END DATE: 04/03/98

MATERIAL DESCRIPTION	STRATUM NO.
GROUND ELEVATION: 4.2m (MSL) (0.0m)	
ARTIFICIAL FILL (af) (0.6m)	II
FRANCISCAN FORMATION (Jkf)	
SANDSTONE (Graywacke) (Rx), dark yellowish brown, medium grained, moderately to slightly weathered, intensely to moderately fractured, (3.0m)	III, IV, V, VI
SANDSTONE (Graywacke) (Rx), SILTSTONE (Rx) and CLAYSTONE (Rx) (3:1:1), light gray to gray, moderately weathered, intensely fractured (3.8m)	VII
SANDSTONE (Graywacke) (Rx), light gray to gray, thinly bedded, intensely fractured, moderately weathered (4.5m)	VIII
SANDSTONE (Graywacke) (Rx), SILTSTONE (Rx) and CLAYSTONE (Rx) (1:1:1), moderately weathered, intensely fractured (6.2m)	IX
SANDSTONE (Graywacke) (Rx), light gray to dark gray, slightly weathered, intensely fractured, (8.2m)	X
SANDSTONE (Graywacke) (Rx), SILTSTONE (Rx), and CLAYSTONE (Rx) (5:1:1), slightly weathered, intensely fractured (16.4m)	
SANDSTONE (Graywacke) (Rx), light gray to gray (18.7m)	XI
SANDSTONE (Graywacke) (Rx), and SILTSTONE (Rx) (2:1) (20.4m)	XII
SANDSTONE (Graywacke) (Rx), light gray to dark gray (28.3m)	XIII
SANDSTONE (Graywacke) (Rx), light to dark gray, medium grained, fresh, moderately to slightly fractured, massive (31.7m)	XIV
SILTSTONE (Rx), CLAYSTONE (Rx), and SANDSTONE (Graywacke) (Rx) (2:2:1) light gray to black (33.5m)	
SANDSTONE (Graywacke) (Rx), very thinly bedded, medium to coarse grained (37.5m)	XV
SILTSTONE (Rx), SANDSTONE (Graywacke) (Rx), and CLAYSTONE (Rx) (4:2:1) (41.1m)	
SANDSTONE (Graywacke) (Rx), gray to dark gray, massive, medium grained (52.7m)	XVI
SILTSTONE (Rx), black, very thinly bedded to laminated (56.3m)	
SANDSTONE (Graywacke) (Rx), light gray to dark gray, medium grained, fresh, moderately to slightly fractured, massive -closed fractures, filled with quartz, 57.9m to 58.8m -slickensided fracture surface, dipping 5 degrees, open fracture, at 59.2m -fractures healed with calcite cement, dipping 20 degrees, 64.6m to 65.5m -interbedded sandstone and siltstone (3:2), 69.5m to 70.7m -very thin fractures filled with quartz, 70.7m to 71.6m	XVII
TOTAL DEPTH: 76.2m BACKFILLED WITH: Cement/Bentonite Grout	



Note:
Refer to multi-page logs presented in the YBI Site Characterization Report for detailed soil descriptions

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	552	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 9

	BRIDGE No.
CU 04 EA 0120T1	33-0025
NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA	Sheet 18 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT
DRAWN BY F. BAEZ
CHECKED BY R. HOWARD
S. BRATHWHITE — FIELD INVESTIGATOR
DATE SEE ABOVE

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

M. KAPUSKAR — PROJECT ENGINEER

BRIDGE NO. 34-0006L/R
KM POST 13.2/13.9
POST MILE 8.2/8.7

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 9

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 758 OF

FILENAME => 33-0025-p-ltb09_730.tif

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- PAVEMENT

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

STANDARD PENETRATION TEST (SPT) AND MODIFIED CALIFORNIA (MC) LINER SAMPLERS

Samplers were driven with a 63.5 kg hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the Initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (kN/m³)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT + LIQUID LIMIT +
- ⊗ EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- ···· ROCK QUALITY DESIGNATION (RQD)
- —— ROCK RECOVERY PERCENT
- —— ROCK CORING RATE

STRENGTH TESTS

- ⊕ POCKET PENETROMETER
- ◆ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (⊗ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
- ⊡ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- ● POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ⊕ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- + Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- —— FRACTURE DENSITY (ROCK)

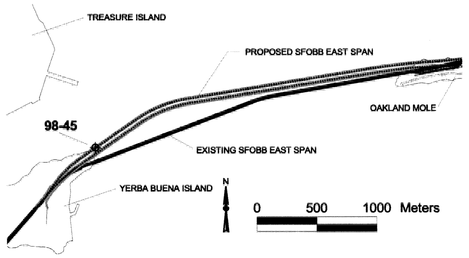
STRENGTH OF COHESIVE SOILS

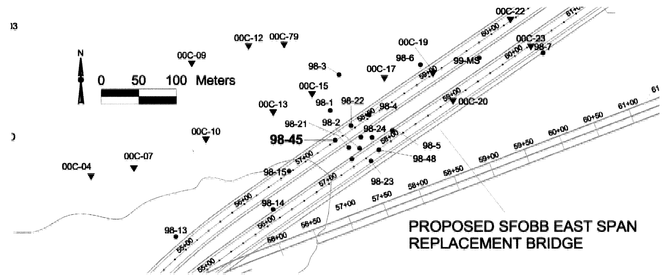
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

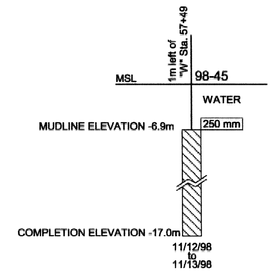
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







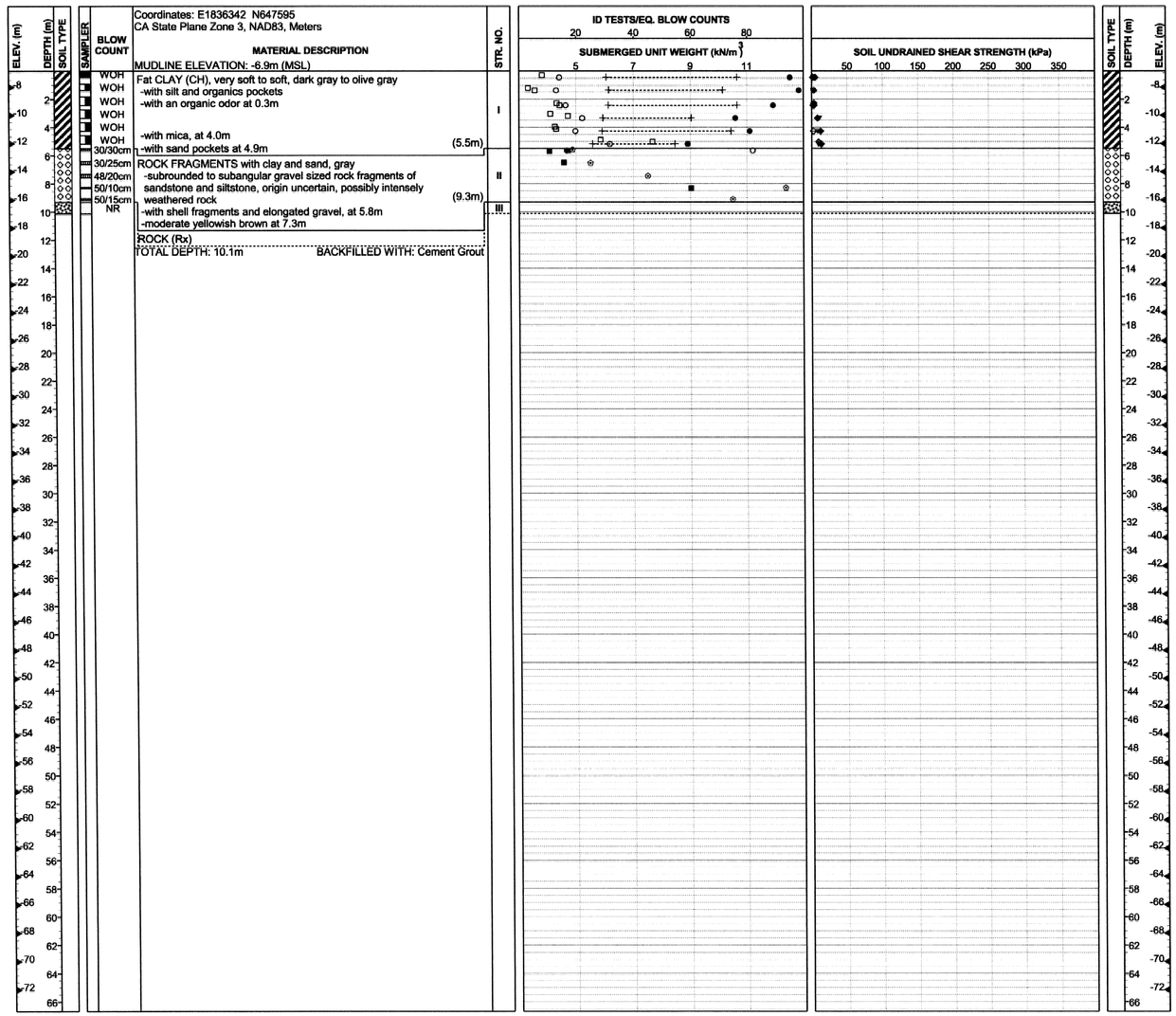
BORING 98-45

Coordinates: E1836342 N647595
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -6.9m (MSL)

BLOW COUNT	MATERIAL DESCRIPTION	STR. NO.
WOH, WOH, WOH, WOH, WOH, WOH, 30/30cm	Fat CLAY (CH), very soft to soft, dark gray to olive gray -with silt and organics pockets -with an organic odor at 0.3m -with mica, at 4.0m -with sand pockets at 4.9m (5.5m)	I
30/25cm, 48/20cm, 50/10cm, 50/15cm, NR	ROCK FRAGMENTS with clay and sand, gray -subrounded to subangular gravel sized rock fragments of sandstone and siltstone, origin uncertain, possibly intensely weathered rock (9.3m) -with shell fragments and elongated gravel, at 5.8m -moderate yellowish brown at 7.3m	II
	ROCK (Rx)	III

TOTAL DEPTH: 10.1m BACKFILLED WITH: Cement Grout



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1176	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

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REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	553	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 10

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA — Sheet 19 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT

DRAWN BY S.DESHPANDE
CHECKED BY T. MCADAM

J.CHACKO — FIELD INVESTIGATOR
DATE SEE ABOVE

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

T.W.McNEILAN — PROJECT ENGINEER

BRIDGE NO. 34-0006L/R
KM POST 13.2/13.9
POST MILE 8.2/8.7

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 10

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY) SHEET 759 OF

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1177	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

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Metric

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 76mm-OD, 60mm-ID Modified California Liner
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- 83.5mm-OD, 54mm-ID Offshore Liner
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- PERCENT PASSING #200 SIEVE
- WATER CONTENT (%)
- SUBMERGED UNIT WEIGHT (kN/m³)
- THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT LIQUID LIMIT
- EQUIVALENT SPT BLOW COUNT
- ROCK QUALITY DESIGNATION (RQD)
- ROCK RECOVERY PERCENT
- ROCK CORING RATE

STRENGTH TESTS

- POCKET PENETROMETER
- TORVANE
- REMOTE VANE
- MINIATURE VANE (RESIDUAL VANE)
- UNCONSOLIDATED UNDRAINED TRIAXIAL
- SWEDISH FALL CONE
- UNCONFINED COMPRESSION (SOIL)
- (Open symbols indicate remolded tests)
- Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- Shear Strength Interpreted from CPT Tip Resistance (Nk=12-15)
- POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- UNCONFINED COMPRESSION (ROCK)
- FRACTURE DENSITY (ROCK)

STRENGTH OF COHESIVE SOILS

Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
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Dense	65 to 85
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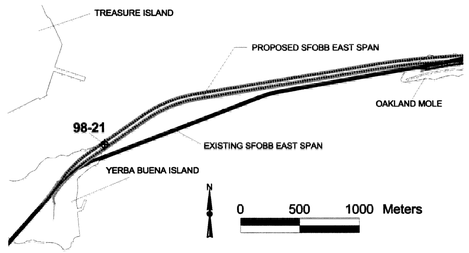
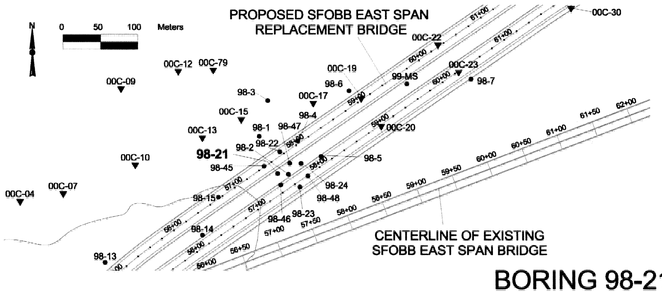
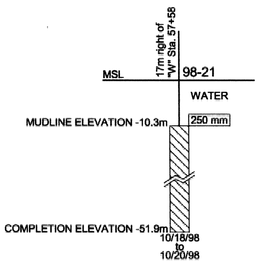
*Estimated from sampler driving record and CPT tip resistance.







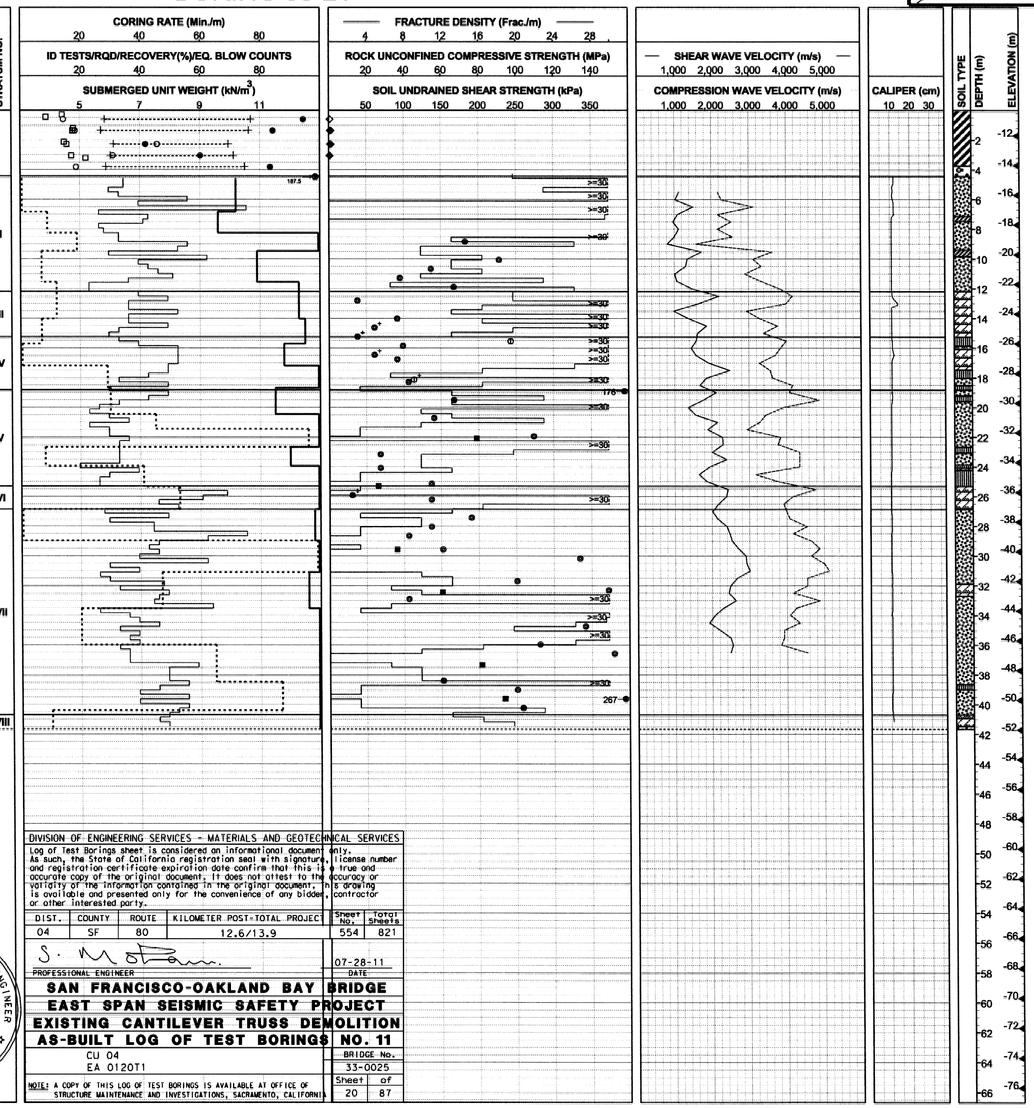
BORING 98-21

Coordinates: E1836360 N647585
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -10.3m (MSL)

Elevation (m)	Depth (m)	Blow Count	Material Description	Stratum No.
		WOH, WOH, WOH, WOH, 60/5cm, 50/5cm	FAT CLAY (CH), dark olive gray to dark gray, very soft (4.4m)	I
			-subangular, moderate yellowish brown, sandstone gravel, below 4.3m	
		72-0, 66-9, 100-19, 79-7	SANDSTONE (Graywacke) (Rx) with interbedded SILTSTONE (Rx), [10:1], moderate to dark yellowish brown, intensely to moderately weathered, moderately soft, poorly indurated, fine to coarse grained, moderately fractured (12.2m)	II
			-moderately weathered, subrounded to rounded coarse sandstone/conglomerate bed, at 6.8m	
			-claystone interbed, slightly weathered, 9.4m to 9.8m	
			-slightly weathered, moderately to intensely fractured sandstone, below 9.8m	
		93-12, 95-7	SANDSTONE (Graywacke) (Rx), interbedded with SILTSTONE (Rx), [5:1], olive gray, slightly weathered, hard, intensely fractured to very intensely fractured (15.2m)	III
		88-0, 100-29	SILTSTONE (Rx), dark gray, fresh, hard, thinly bedded, very intensely to intensely fractured with clean, smooth to slightly rough fracture surfaces	IV
			-very intensely sheared with interbedded sandstone, 17.1m to 17.5m	
		85-30, 100-45, 100-96	-fractures with 25mm to 50mm spacing, dipping 30 to 40 degrees, with smooth, clean surfaces, 17.5m to 18.1m	V
			-sandstone, medium dark gray, fresh, hard, well indurated, moderately bedded, moderately fractured, 18.0m to 18.5m (18.8m)	
		90-8, 100-41, 100-53	SANDSTONE (Graywacke) (Rx) with interbedded SILTSTONE (Rx), [10:1], moderate to dark yellowish brown, intensely to moderately weathered, moderately soft, poorly indurated, fine to coarse grained, moderately fractured (25.3m)	VI
			-siltstone interbed, dipping 30 degrees, 19.2m to 19.6m	
		98-0, 100-99	-90mm thick siltstone interbed, very intensely fractured, 22.7m to 23.1m	VII
			-siltstone interbed, slightly fractured, bedding dipping 35 degrees, 23.9m to 24.1m	
			-siltstone interbed, dipping at 35 degrees, 24.2m to 24.8m (26.9m)	
			Interbedded SANDSTONE (Graywacke) (Rx) and SILTSTONE (Rx)	
		96-47, 100-20, 100-65, 100-87, 100-10	SANDSTONE (Graywacke) (Rx), medium dark gray, fresh, hard, moderately indurated, fine to coarse grained, thickly bedded, intensely to moderately fractured with slightly rough, clean to very thinly coated surfaces	VII
			-sandstone with interbedded siltstone, 31.9m to 38.6m	
			-60mm thick, very intensely fractured zone, with moderately rough, calcite/quartz filled fractures, at 33.0m	
			-very intensely fractured zone with numerous, closely spaced, healed, 8mm thick, calcite filled fractures, 33.9m to 34.2m	
			-very thickly bedded, moderately to slightly fractured, at 36.9m	
			-dark gray, hard, intensely to very intensely fractured, siltstone interbed with numerous, healed, 3mm thick, calcite filled fractures, 38.7m to 39.0m (40.7m)	VIII
			SILTSTONE (Rx) with interbedded SANDSTONE (Graywacke) (Rx) [3:1]	
			-sandstone below 41.5m	
			TOTAL DEPTH: 41.6m BACKFILLED WITH: Cement Grout	

Note: Refer to multi-page logs presented in Volume 2 of the Final Marine Site Characterization Report for detailed soil and rock descriptions.



DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	554	821

PROFESSIONAL ENGINEER — DATE 07-28-11

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 11

CU 04
EA 0120T1

BRIDGE No. 33-0025
Sheet 20 of 87

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN, GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY: SACHIN DESHPANDE	C. PRENTICE/J. BIANCHIN, FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
	CHECKED BY: J.CHACKO	DATE: SEE ABOVE	

T.W.McNEILAN, PROJECT ENGINEER

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

BRIDGE NO.	KM POST	POST MILE
34-0006L/R	13.2/13.9	8.2/8.7

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 11

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 760 OF

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1178	1204

Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

REGISTERED GEOTECHNICAL ENGINEER

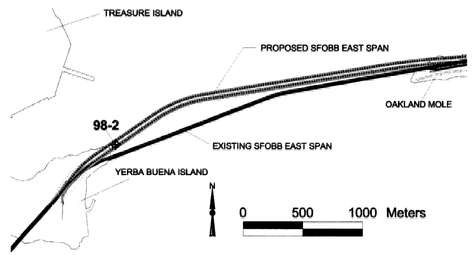
12-6-04
PLANS APPROVAL DATE

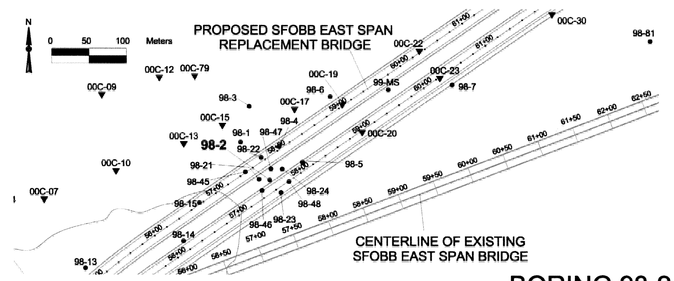
REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

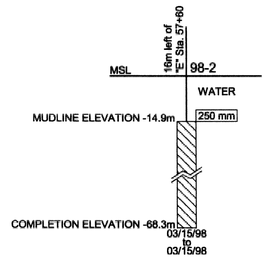
Metric

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

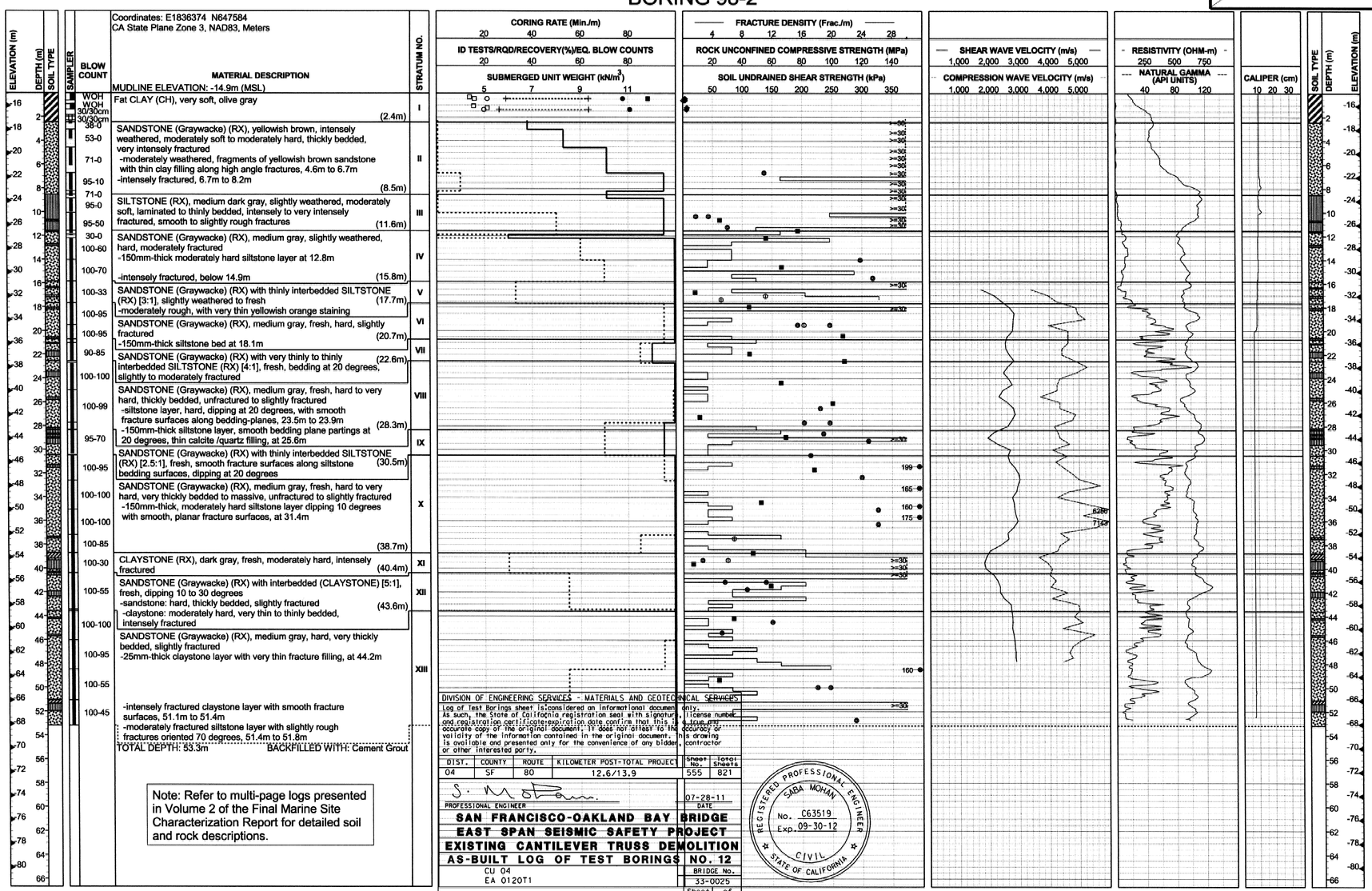
The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.







BORING 98-2



Coordinates: E1836374 N647584
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -14.9m (MSL)

Blow count	Material description	Stratum
WOH WOH 30/30cm 30/30cm	Fat CLAY (CH), very soft, olive gray (2.4m)	I
38-0 53-0 71-0 95-10	SANDSTONE (Graywacke) (RX), yellowish brown, intensely weathered, moderately soft to moderately hard, thickly bedded, very intensely fractured -moderately weathered, fragments of yellowish brown sandstone with thin clay filling along high angle fractures, 4.6m to 6.7m -intensely fractured, 6.7m to 8.2m (8.5m)	II
71-0 95-0 95-50	SILTSTONE (RX), medium dark gray, slightly weathered, moderately soft, laminated to thinly bedded, intensely to very intensely fractured, smooth to slightly rough fractures (11.6m)	III
30-0 100-60 100-70	SANDSTONE (Graywacke) (RX), medium gray, slightly weathered, hard, moderately fractured -150mm-thick moderately hard siltstone layer at 12.8m -intensely fractured, below 14.9m (15.8m)	IV
100-33	SANDSTONE (Graywacke) (RX) with thinly interbedded SILTSTONE (RX) [3:1], slightly weathered to fresh (17.7m)	V
100-95	-moderately rough, with very thin yellowish orange staining	VI
100-95	SANDSTONE (Graywacke) (RX), medium gray, fresh, hard, slightly fractured (20.7m)	VII
90-85	-150mm-thick siltstone bed at 18.1m	
100-100	SANDSTONE (Graywacke) (RX) with very thinly to thinly interbedded SILTSTONE (RX) [4:1], fresh, bedding at 20 degrees, slightly to moderately fractured (22.6m)	VIII
100-99	SANDSTONE (Graywacke) (RX), medium gray, fresh, hard to very hard, thickly bedded, unfractured to slightly fractured -siltstone layer, hard, dipping at 20 degrees, with smooth fracture surfaces along bedding-planes, 23.5m to 23.3m -150mm-thick siltstone layer, smooth bedding plane partings at 20 degrees, thin calcite /quartz filling, at 25.6m (28.3m)	IX
95-70		
100-95	SANDSTONE (Graywacke) (RX) with thinly interbedded SILTSTONE (RX) [2.5:1], fresh, smooth fracture surfaces along siltstone bedding surfaces, dipping at 20 degrees (30.5m)	X
100-100 100-100 100-85	SANDSTONE (Graywacke) (RX), medium gray, fresh, hard to very hard, very thickly bedded to massive, unfractured to slightly fractured -150mm-thick, moderately hard siltstone layer dipping 10 degrees with smooth, planar fracture surfaces, at 31.4m (38.7m)	
100-30	CLAYSTONE (RX), dark gray, fresh, moderately hard, intensely fractured (40.4m)	XI
100-55 100-100	SANDSTONE (Graywacke) (RX) with interbedded (CLAYSTONE) [5:1], fresh, dipping 10 to 30 degrees -sandstone: hard, thickly bedded, slightly fractured -claystone: moderately hard, very thin to thinly bedded, intensely fractured (43.6m)	XII
100-95 100-55 100-45	SANDSTONE (Graywacke) (RX), medium gray, hard, very thickly bedded, slightly fractured -25mm-thick claystone layer with very thin fracture filling, at 44.2m -intensely fractured claystone layer with smooth fracture surfaces, 51.1m to 51.4m -moderately fractured siltstone layer with slightly rough fractures oriented 70 degrees, 51.4m to 51.8m	XIII

TOTAL DEPTH: 53.3m BACKFILLED WITH: Cement Grout

Note: Refer to multi-page logs presented in Volume 2 of the Final Marine Site Characterization Report for detailed soil and rock descriptions.

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	555	821

PROFESSIONAL ENGINEER — DATE 07-28-11

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 12

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet 21 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SOIL AND ROCK TYPES

Well graded GRAVEL (GW)
Poorly graded GRAVEL (GP)
GRAVEL with sand (GP or GW)
GRAVEL with clay (GP or GW)
Clayey GRAVEL (GC)
GRAVEL with silt (GP or GW)
Silty GRAVEL (GM)
Well graded SAND (SW)
Poorly graded SAND (SP)
SAND with gravel (SP or SW)
SAND with clay (SP-SC)
Clayey SAND (SC)
Silty SAND (SM)
SAND with silt (SP-SM)
Fat CLAY (CH)
Sandy fat CLAY (CH)
Lean CLAY (CL)
Sandy lean CLAY (CL)
Silty CLAY (CL-ML)
Elastic SILT (MH)
SILT (ML)
Sandy SILT (ML)
Clayey silt (ML/CL)
Highly plastic ORGANICS (OH)
Low plasticity ORGANICS (OL)
SANDSTONE (Rx)
SILTSTONE (Rx)
CLAYSTONE (Rx)
Interbedded Rock Strata (Rx)
CONGLOMERATE (Rx)

SAMPLERS

76mm-OD, 72mm-ID Thin Walled Tube
57mm-OD, 54mm-ID* Thin Walled Driven Tube
63.5mm-OD, 54mm-ID Offshore Liner
76mm-OD, 60mm-ID Modified California Liner
51mm-OD, 35mm-ID SPT Split Spoon Sampler
Rock Core (Inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- PERCENT PASSING #200 SIEVE
- WATER CONTENT (%)
- SUBMERGED UNIT WEIGHT (kN/m³)
- THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT LIQUID LIMIT
- EQUIVALENT SPT BLOW COUNT
- ROCK QUALITY DESIGNATION (RQD)
- ROCK RECOVERY PERCENT
- ROCK CORING RATE

STRENGTH TESTS

- POCKET PENETROMETER
- TORVANE
- REMOTE VANE
- MINIATURE VANE (RESIDUAL VANE)
- UNCONSOLIDATED UNDRAINED TRIAXIAL
- SWEDISH FALL CONE
- UNCONFINED COMPRESSION (SOIL)
- (Open symbols indicate remolded tests)
- Soil: Strength Exceeds Capacity of Measuring Device
- Rock: Sample broke along discontinuity; Intact sample would have greater strength
- Shear Strength Interpreted from CPT Tip Resistance (Nk=12-15)
- POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- UNCONFINED COMPRESSION (ROCK)
- FRACTURE DENSITY (ROCK)

STRENGTH OF COHESIVE SOILS

Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.

SABA MOHAN
GEOTECHNICAL DESIGN OVERSIGHT

DRAWN BY SACHIN DESHPANDE
CHECKED BY J.CHACKO

C. PRENTICE/ F. ARNOLD
FIELD INVESTIGATOR
DATE SEE ABOVE

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

T.W.McNEILAN
PROJECT ENGINEER

BRIDGE NO. 34-0006L/R
KM POST 13.2/13.9
POST MILE 8.2/8.7

CU 04
EA 0120F1

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 12

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY) SHEET 761 OF

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1179	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

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Metric

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

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SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 76mm-OD, 60mm-ID Modified California Liner
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- 63.5mm-OD, 54mm-ID Offshore Liner
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (kN/m³)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT + — LIQUID LIMIT +
- ⊗ EQUIVALENT SPT BLOW COUNT
- ···· ROCK QUALITY DESIGNATION (RQD)
- —— ROCK RECOVERY PERCENT
- —— ROCK CORING RATE

STRENGTH TESTS

- ● POCKET PENETROMETER
- ◆ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (⊗ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
- ⊡ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- + Soil: Strength Exceeds Capacity of Measuring Device
- Rock: Sample broke along discontinuity; Intact sample would have greater strength
- Shear Strength Interpreted from CPT Tip Resistance (Nk=12-15)
- ● POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ⊙ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- —— FRACTURE DENSITY (ROCK)

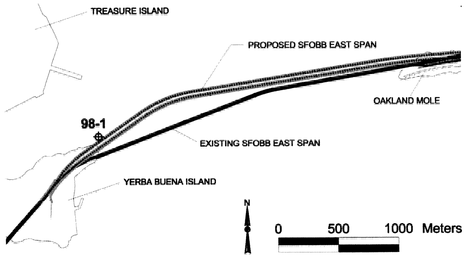
STRENGTH OF COHESIVE SOILS

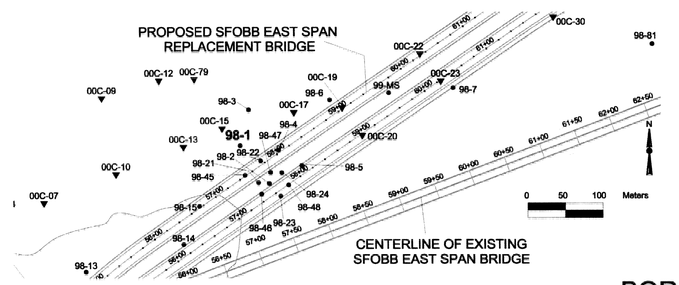
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

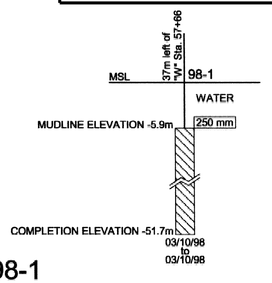
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







BORING 98-1

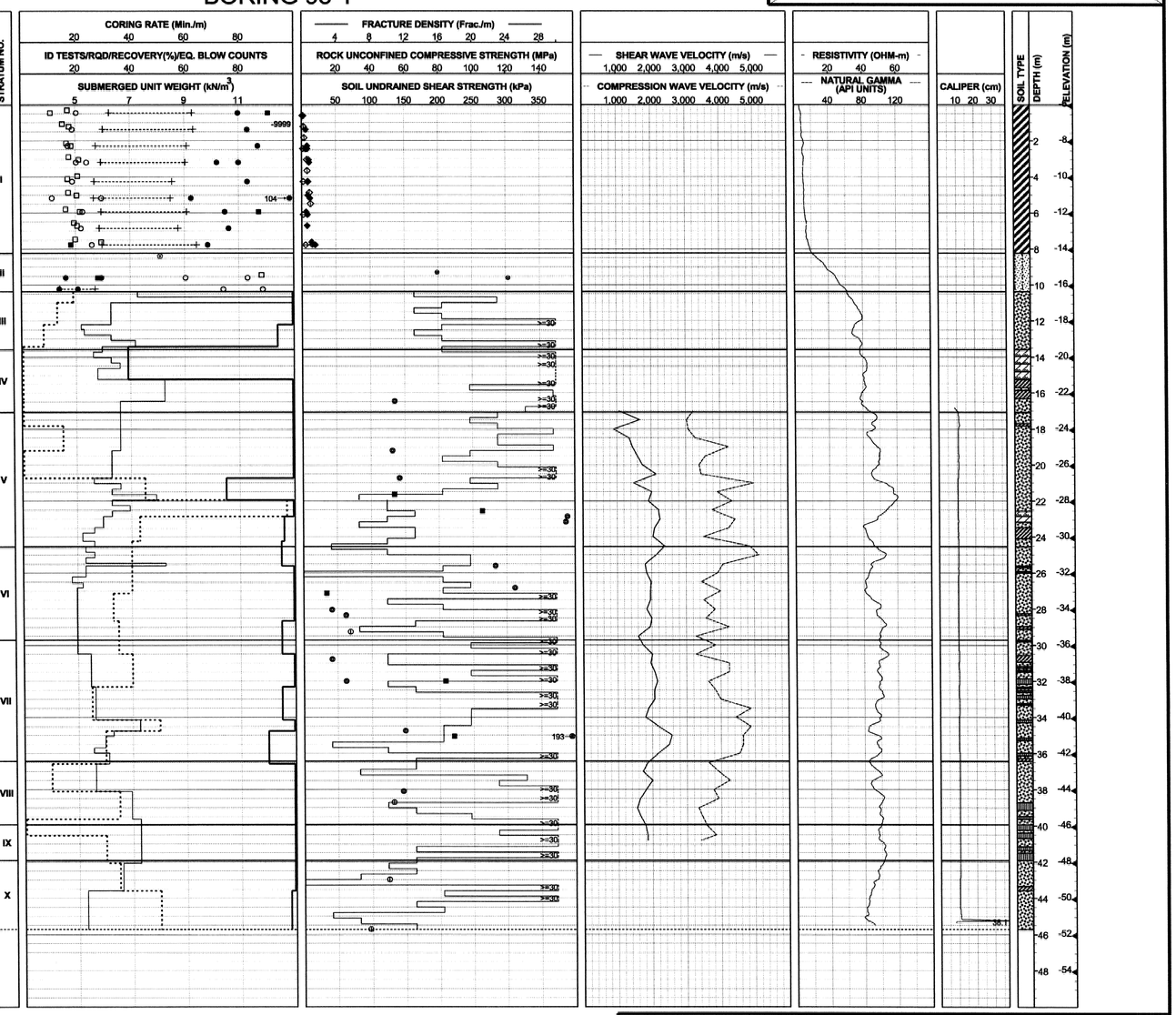
Coordinates: E1836336 N647635
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -5.9m (MSL)

Elevation (m)	Depth (m)	Blow Count	Material Description	Stratum No.
		WOH, WOH, WOH, WOH, WOH, WOH, WOH, WOH, WOH, 51, 25/60cm, 50/5cm, 30/30cm, NR, 100-19, 100-13, 94-8, 39-0, 100-0, 100-0, 100-15, 100-0, 75-45, 100-97, 96-43, 95-40, 100-40, 100-33, 95-35, 100-40, 95-25, 100-50, 90-30, 100-10, 100-35, 100-0, 100-30, 100-35, 98-50	Fat CLAY (CH), dark olive gray, very soft to soft -with sandy silt pockets -with an organic odor and mica flakes at 0.3m -with a few shell fragments and mica flakes at 1.2m -with shell fragments at 2.1m -with mica flakes and organic matter pockets at 3.0m -with shell fragments, 3.7m to 6.1m -with an organic odor at 4.0m -with sandy silt seams and an organic odor, at 5.8m -with a few shell fragments, mica flakes, and with olive gray pockets, at 6.7m -with mica flakes at 7.6m (8.2m)	I
			Silty fine SAND (SM), very dense, dark yellowish brown -with light gray clay pockets -olive gray slightly cemented clayey sand layer with fine gravel and iron oxide stains, at 9.4m (10.4m)	II
			SANDSTONE (Graywacke) (RX), dark yellowish brown, intensely weathered, hard, fine grained, intensely fractured -with moderately rough fractures inclined 20 to 70 degrees and moderately thin calcite and clay fracture filling (13.6m)	III
			-with a 12mm-thick claystone lens dipping at 35 degrees, and smooth fractures, at 11.0m -with a 50mm-thick siltstone bed dipping 45 degrees, at 13.4m -moderately weathered, with a very thin dark gray moderately soft claystone layer at 13.6m	IV
			CLAYSTONE (RX) interbedded with SANDSTONE (Graywacke) (RX) [3:1] -claystone: dark gray, moderately weathered, moderately hard, intensely fractured, with yellowish orange stains on fracture surfaces -sandstone: moderate yellowish brown, moderately weathered, hard, moderately fractured, fractures inclined at 40 to 80 degrees, with iron oxide staining within fractures (17.1m)	V
			SANDSTONE (Graywacke) (RX), dark gray with very thin olive gray beds, moderately to slightly weathered, moderately hard to hard, moderately fractured -very thin calcite/quartz fracture filling and fractures inclined from 35 to 80 degrees, with iron oxide staining within fractures, to 20.7m -with a 150mm-thick dark gray claystone bed at 17.7m (24.5m)	
			-thinly interbedded claystone, dark gray, moderately hard, intensely fractured into 50mm- to 125mm-long pieces, dipping at 20 degrees, 22.6m to 23.2m -moderately fractured, slightly to moderately rough with thin (6mm-thick) calcite/quartz filling, below 23.2m -slickensided claystone layer with vertical flow banding, 23.5m to 24.1m	VI
			SANDSTONE (Graywacke) (RX) interbedded with CLAYSTONE (RX) [10:1] -laminated, intensely fractured claystone lenses, 25.6m to 26.5m (29.7m) -very thin, slightly rough, partially calcite filled fractures, with striations dipping from 60 degrees to dip of fractures, at 28.3m	
			SANDSTONE (Graywacke) (RX) with thinly to moderately interbedded CLAYSTONE (RX) and SILTSTONE (RX) [4:1:1] -siltstone: light gray, hard, very thinly bedded, intensely fractured (36.4m)	VII
			-claystone with slickensides, and well developed striations inclined at 20 to 30 degrees from horizontal, at 36.3m	
			SANDSTONE (Graywacke) (RX) with interbedded SILTSTONE (RX) [1.5:1], fresh (39.9m)	VIII
			Interbedded SANDSTONE (Graywacke) (RX), SILTSTONE (RX) and CLAYSTONE (RX) [2:2:1], fresh (41.9m)	IX
			SANDSTONE (Graywacke) (RX), medium dark gray, fresh, hard, slightly to moderately fractured, fractures dipping at 50 to 80 degrees, moderately rough to rough, with very thin calcite filling -175mm-thick claystone bed with polished fractures at 43.4m -thinly interbedded claystone at 43.6m	X

TOTAL DEPTH: 45.7m

BACKFILLED WITH: Cement Grout



DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This document is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	556	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 13

CU	BRIDGE NO.
04 EA 0120T1	33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA — Sheet 22 of 87

TO ACCOMPANY PLANS DATED 2-21-12

Note: Refer to multi-page logs presented in Volume 2 of the Final Marine Site Characterization Report for detailed soil and rock descriptions.

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SABA MOHAN, GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY: SACHIN DESHPANDE	J.CHACKO/M.ZUEGER, FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
	CHECKED BY: J.CHACKO	DATE: SEE ABOVE	

T.W.McNEILAN, PROJECT ENGINEER

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

BRIDGE NO.	KM POST	POST MILE
34-0006L/R	13.2/13.9	8.2/8.7

CU 04 EA 0120F1

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 13

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 762 OF

FILENAME => 33-0025-p-ltb13_734.tif

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (kN/m³)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT LIQUID LIMIT
- ⊗ EQUIVALENT SPT BLOW COUNT
- ROCK QUALITY DESIGNATION (RQD)
- ROCK RECOVERY PERCENT
- ROCK CORING RATE

STRENGTH TESTS

- ● POCKET PENETROMETER
- ◆ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (◇ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
- ⊡ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- + Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- Shear Strength Interpreted from CPT Tip Resistance (Nk=12-15)
- ● POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ⊕ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- FRACTURE DENSITY (ROCK)

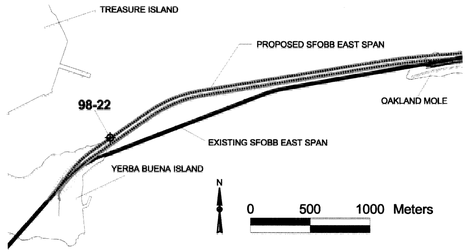
STRENGTH OF COHESIVE SOILS

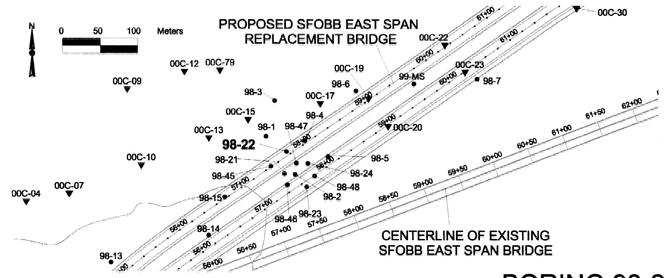
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.





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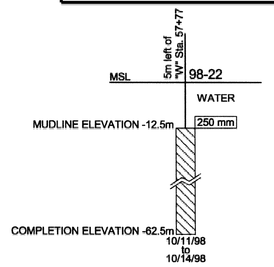

Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1180	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

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BORING 98-22

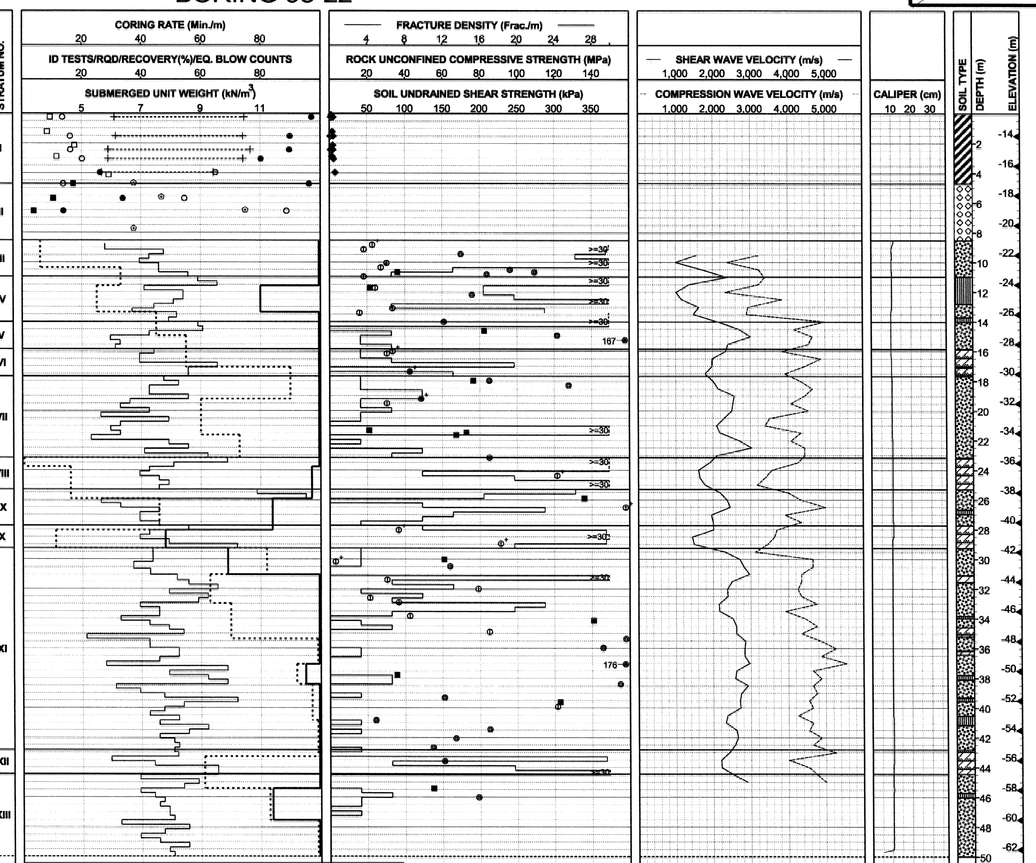
Coordinates: E1836363 N647614
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -12.5m (MSL.)

Elevation (m)	Depth (m)	Blow Count	Material Description	Stratum No.
		WOH, WOH, WOH, WOH, WOH, 30/15cm, 50/20cm, 50/15cm, 30/15cm	Fat CLAY (CH), olive gray to gray, very soft to soft (4.7m)	I
			ROCK FRAGMENTS with sand and fat clay, light brown -subangular gravel to cobble size sandstone rock fragments, origin uncertain, possibly intensely weathered rock (8.5m)	II
		100-6, 100-33	SANDSTONE (Graywacke) (Rx), light yellowish brown, intensely weathered, moderately soft to moderately hard, intensely fractured (11.0m)	III
		80-25, 100-45	SILTSTONE (Rx) with interbedded SANDSTONE (Rx) [4:1], moderately weathered, dark gray, moderately hard, thinly bedded, moderately to intensely fractured -sandstone, 12.8m to 13.7m (14.0m)	IV
		100-55	SANDSTONE (Graywacke) (Rx), medium dark gray, slightly weathered to fresh, hard, thickly bedded, slightly fractured (15.8m)	V
		100-90	SILTSTONE (Rx) with interbedded CLAYSTONE (Rx) and SANDSTONE (Graywacke) (Rx) [2:1:1], slightly weathered to fresh (17.7m)	VI
		100-60, 100-73	SANDSTONE (Graywacke) (Rx) with minor thinly interbedded SILTSTONE (Rx) [10:1], medium gray, fresh, hard, thinly to thickly bedded, slightly to moderately fractured (23.2m)	VII
		100-0, 97-16	SILTSTONE (Rx) with interbedded SANDSTONE (Graywacke) (Rx) [2:1], fresh, medium dark gray, moderately hard to hard, intensely fractured (25.3m)	VIII
		84-46	SANDSTONE (Graywacke) (Rx) fresh, medium dark gray, hard, moderately fractured (27.7m)	IX
		48-11	-siltstone, dark gray, hard, very thinly to thinly bedded, moderately to intensely fractured, 26.7m to 27.0m	X
		69-82	CLAYSTONE (Rx) with interbedded SANDSTONE (Graywacke) (Rx) [2:1], dark gray to black, fresh, hard, thinly bedded, slightly to intensely fractured (29.3m)	
		100-63, 100-70, 100-99, 95-92, 100-97, 100-99	SANDSTONE (Graywacke) (Rx) with minor thinly interbedded SILTSTONE (Rx) [10:1], medium gray, fresh, hard, thinly to thickly bedded, slightly to moderately fractured -interbedded sandstone and siltstone, 31.1m to 31.5m -siltstone, 33.8m to 34.0m -interbedded sandstone and siltstone, 34.6m to 35.2m -interbedded sandstone and siltstone, 36.1m to 36.4m -siltstone, 37.8m to 38.1m -dark gray siltstone, 39.3m to 39.6m -dark gray siltstone 40.7m to 40.8m -undulating siltstone bed dipping 30 degrees, at 41.1m (42.8m)	XI
		100-61	SANDSTONE (Graywacke) (Rx) interbedded with SILTSTONE (Rx) [2:1], medium dark gray, hard, fresh, very slightly fractured (44.4m)	XII
		84-83, 100-99	SANDSTONE (Graywacke) (Rx) with minor thinly bedded SILTSTONE (Rx) [10:1], medium dark gray, fresh, hard, medium to coarse grained, very thickly bedded, slightly fractured -siltstone dipping 32 degrees, 45.7m to 46.0m	XIII

TOTAL DEPTH: 50.0m BACKFILLED WITH: Cement Grout

Note: Refer to multi-page logs presented in Volume 2 of the Final Marine Site Characterization Report for detailed soil and rock descriptions.



DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	557	821

PROFESSIONAL ENGINEER — DATE 07-28-11

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 14

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet 23 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 14

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY SACHIN DESHPANDE	J.CHACKO/M.ZUEGER — FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
	CHECKED BY J.CHACKO	DATE SEE ABOVE	

T.W.McNEILAN — PROJECT ENGINEER

CU 04
EA 0120F1

BRIDGE NO. 34-0006L/R
KM POST 13.2/13.9
POST MILE 8.2/8.7

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 763 OF

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1181	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
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Metric

SOIL AND ROCK TYPES

Well graded GRAVEL (GW)
Poorly graded GRAVEL (GP)
GRAVEL with sand (GP or GW)
GRAVEL with clay (GP or GW)
Clayey GRAVEL (GC)
GRAVEL with silt (GP or GW)
Silty GRAVEL (GM)
Well graded SAND (SW)
Poorly graded SAND (SP)
SAND with gravel (SP or SW)
SAND with clay (SP-SC)
Clayey SAND (SC)
Silty SAND (SM)
SAND with silt (SP-SM)
Fat CLAY (CH)
Sandy fat CLAY (CH)
Lean CLAY (CL)
Sandy lean CLAY (CL)
Silty CLAY (CL-ML)
Elastic SILT (MH)
SILT (ML)
Sandy SILT (ML)
Clayey silt (ML/CL)
Highly plastic ORGANICS (OH)
Low plasticity ORGANICS (OL)
SANDSTONE (Rx)
SILTSTONE (Rx)
CLAYSTONE (Rx)
Interbedded Rock Strata (Rx)
CONGLOMERATE (Rx)

SAMPLERS

76mm-OD, 72mm-ID Thin Walled Tube
57mm-OD, 54mm-ID* Thin Walled Driven Tube
63.5mm-OD, 54mm-ID Offshore Liner
76mm-OD, 60mm-ID Modified California Liner
51mm-OD, 35mm-ID SPT Split Spoon Sampler
Rock Core (Inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH — Offshore Liner sample advanced with the weight of an 80 kg hammer.

PUSH or SAVE — Pushed thin-walled 76mm-OD-tube.

15/60cm — Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20 — Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.

86/28cm — Number of blows required to produce the indicated penetration after an initial 15 cm seating.

Ref/8cm — 50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- PERCENT PASSING #200 SIEVE
- WATER CONTENT (%)
- SUBMERGED UNIT WEIGHT (kN/m³)
- THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT LIQUID LIMIT
- EQUIVALENT SPT BLOW COUNT
- ROCK QUALITY DESIGNATION (RQD)
- ROCK RECOVERY PERCENT
- ROCK CORING RATE

STRENGTH TESTS

- POCKET PENETROMETER
- TORVANE
- REMOTE VANE
- MINIATURE VANE (RESIDUAL VANE)
- UNCONSOLIDATED UNDRAINED TRIAXIAL
- SWEDISH FALL CONE
- UNCONFINED COMPRESSION (SOIL)
- (Open symbols indicate remolded tests)
- Soil: Strength Exceeds Capacity of Measuring Device
- Rock: Sample broke along discontinuity; Intact sample would have greater strength
- Shear Strength Interpreted from CPT Tip Resistance (Nk=12-15)
- POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- UNCONFINED COMPRESSION (ROCK)
- FRACTURE DENSITY (ROCK)

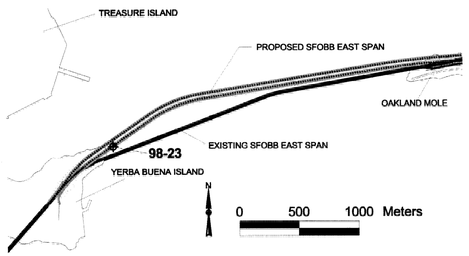
STRENGTH OF COHESIVE SOILS

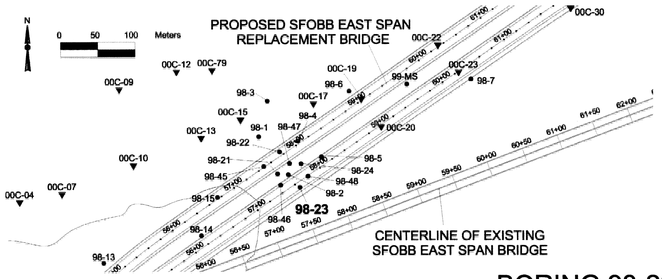
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

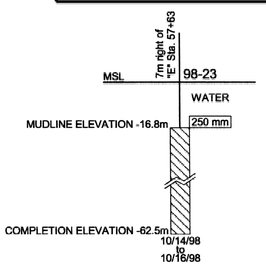
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.





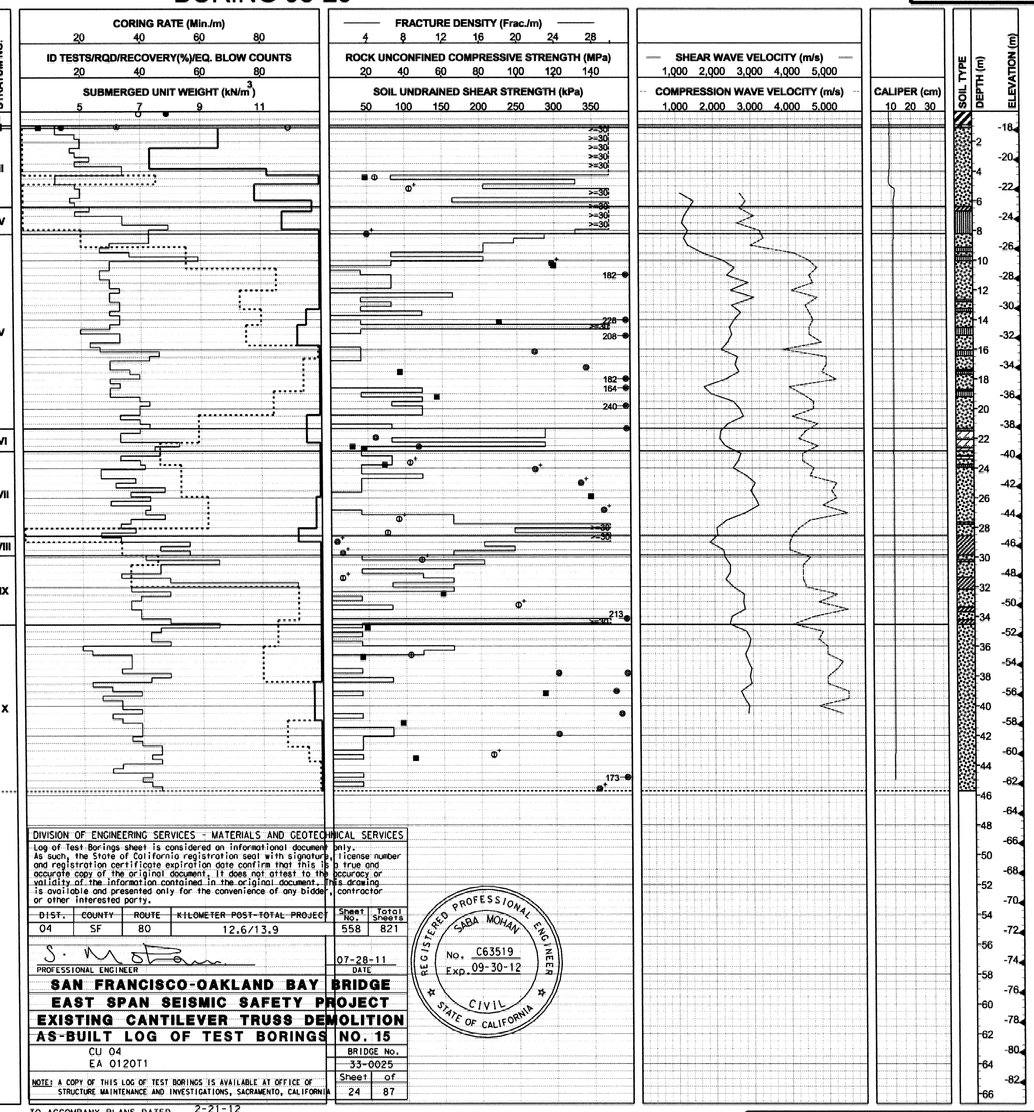


BORING 98-23

Coordinates: E1836389 N647567
CA State Plane Zone 3, NAD83, Meters

ELEVATION (m)	DEPTH (m)	BLOW COUNT	MATERIAL DESCRIPTION	STRATUM NO.
			MUDLINE ELEVATION: -16.8m (MSL)	
		WOH	Fat CLAY (CH), gray, very soft (0.9m)	I
		30/20cm	Fine GRAVEL (GP-GM) with silt, clay, sand, and coarse gravel, gray to olive gray (1.1m)	
		66-0		
		43-0	SANDSTONE (Graywacke) (Rx), olive gray, moderately to intensely weathered, moderately hard	III
		82-0		
		100-45		
		78-0	(6.4m)	
		97-0	SILTSTONE (Rx) dark greenish gray, moderately to intensely weathered, moderately soft to moderately hard, poorly indurated, very thinly bedded, bedding dips 30 degrees, intensely fractured (8.2m)	IV
		87-0		
		100-20		
		100-55	SANDSTONE (Graywacke) (Rx) with interbedded SILTSTONE (Rx) [10:1]	V
		100-85	-slightly to moderately rough fractures, slightly undulating, with very thin, dark yellowish brown iron oxide staining along 30, 60, and 80 degree fractures, and few healed fractures, below 9.1m	
		100-73		
		95-80	-fine grained gravel (pebbly sandstone) interbed at 13.5m	
		92-75		
		100-99	-siltstone, 16.1m to 16.5m	
		100-94	-60mm thick, intensely fractured, claystone interbed, at 17.4m -siltstone with bedding dipping 25 degrees, 17.5m to 17.7m	
		100-84	-fresh, hard, thinly bedded claystone, with bedding dipping 20 degrees, 18.7m to 18.8m (21.3m)	
		95-59	-thinly bedded siltstone, dipping 20 degrees, 18.8m to 19.2m -iron oxide staining on steeply dipping (>60 degree) fractures, at 19.2m	VI
		100-46	SANDSTONE (Graywacke) (Rx) interbedded with SILTSTONE (Rx) [1:1] -sandstone: medium dark gray, fresh, hard, moderately indurated, fine to medium grained (22.9m)	VII
		100-53		
		98-62	SANDSTONE (Graywacke) (Rx), moderate dark gray, fresh, hard -interbedded siltstone and sandstone, 23.2m to 23.4m -siltstone, dipping 20 degrees, pyrite mineralization along fracture plane, 23.8m to 24.0m (28.6m)	
		92-0		
		100-33	-numerous vertical and near vertical healed, very thin (1mm), calcite/quartz filled fractures, 24.0m to 25.6m	VIII
		100-45		
		100-36	-dark gray, fresh, moderately hard claystone, 27.6m to 27.8m	
		100-92	CLAYSTONE (Rx), dark gray, fresh (29.9m) -very thinly bedded to laminated, bedding dipping 25 degrees, intensely fractured with smooth to slightly rough fracture planes, very thin calcite/quartz infilling	IX
		100-85	SANDSTONE (Graywacke) (Rx) with interbedded CLAYSTONE (Rx) [2:1]	X
		100-80	-sandstone: medium dark gray, fresh, hard, moderately indurated, fine to medium grained with scattered coarse grains, thinly bedded, slightly fractured	
		97-97	-claystone, intensely fractured, 33.4m to 33.7m -claystone with bedding dipping 20 degrees, below 34.2m (34.5m)	
		100-88	SANDSTONE (Graywacke) (Rx), medium dark gray, fresh, hard to very hard	
		100-95	-moderately fractured with 60 degree to vertical fractures, at 35.2m	
		100-99	-60mm thick, siltstone interbed, with bedding dipping 20 degrees, at 35.2m -moderately fractured, with slightly rough, calcite/quartz filled fractures, generally dipping 20 degrees, at 40.7m	
			TOTAL DEPTH: 45.7m BACKFILLED WITH: Cement Grout	

Note: Refer to multi-page logs presented in Volume 2 of the Final Marine Site Characterization Report for detailed soil and rock descriptions.



DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	558	821

PROFESSIONAL ENGINEER — DATE 07-28-11

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 15

CU 04
EA 0120T1

BRIDGE No. 33-0025
Sheet 24 of 87

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY SACHIN DESHPANDE CHECKED BY J.CHACKO	C. PRENTICE/ J. BIANCHIN FIELD INVESTIGATOR DATE SEE ABOVE	**PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION**

T.W.McNEILAN
PROJECT ENGINEER

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

BRIDGE NO.	KM POST	POST MILE
34-0006L/R	13.2/13.9	8.2/8.7

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 15

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 764 OF

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Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1182	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

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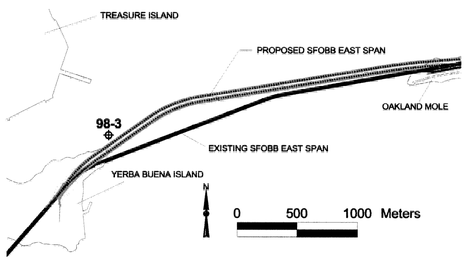
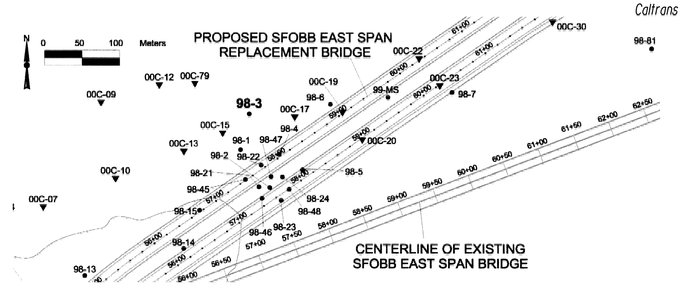
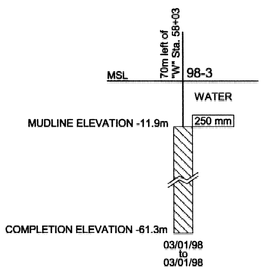
Metric







SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (kN/m³)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT LIQUID LIMIT
- EQUIVALENT SPT BLOW COUNT
- ROCK QUALITY DESIGNATION (RQD)
- ROCK RECOVERY PERCENT
- ROCK CORING RATE

STRENGTH TESTS

- POCKET PENETROMETER
- TORVANE
- REMOTE VANE
- MINIATURE VANE (◇ RESIDUAL VANE)
- UNCONSOLIDATED UNDRAINED TRIAXIAL
- SWEDISH FALL CONE
- UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- \+ Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- Shear Strength Interpreted from CPT Tip Resistance (Nk=12-15)
- POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- UNCONFINED COMPRESSION (ROCK)
- FRACTURE DENSITY (ROCK)

STRENGTH OF COHESIVE SOILS

Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

DENSITY OF GRANULAR SOILS

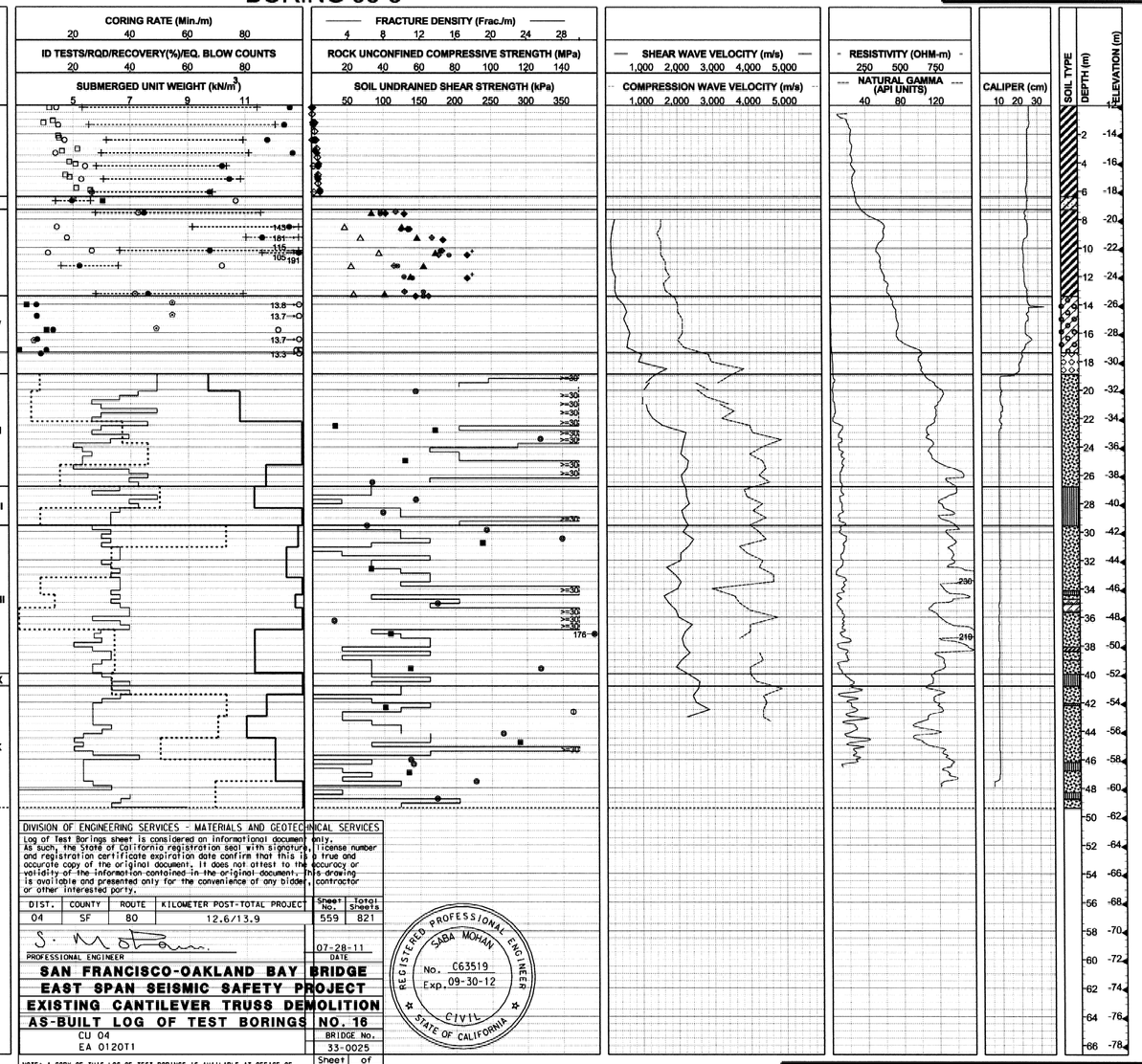
Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.

BORING 98-3

Coordinates: E1836347 N647683
CA State Plane Zone 3, NAD83, Meters

ELEVATION (m)	DEPTH (m)	BLOW COUNT	MATERIAL DESCRIPTION	STRATUM NO.
			MUDLINE ELEVATION: -11.9m (MSL)	
14	2	WOH	Fat CLAY (CH), very soft, dark olive gray	I
		WOH		
16	4	WOH		
		WOH		
		WOH		
18	6	WOH	(6.4m)	
		20	Sandy Lean CLAY (CL), olive gray, very stiff (7.3m)	II
20	8	18/60cm	Fat CLAY (CH), very stiff, greenish gray	III
		PUSH		
22	10	PUSH		
		PUSH		
24	12	PUSH		
		PUSH	(13.4m)	
26	14	50/30cm	Fine GRAVEL with fine to coarse sand (GP-GC)	IV
28	16	50/30cm		
		49		
		8	(17.4m)	
30	18	30/30cm		
		50/30cm		
		100/10cm	ROCK FRAGMENTS, yellowish brown (18.9m)	V
		30/15cm		
32	20	30/5cm	SANDSTONE (Graywacke) (RX), dark greenish gray to grayish black, moderately weathered, moderately hard to very hard	VI
		67-8		
34	22	78-5		
		100-37	-grayish black, slightly weathered, moderately fractured, below 22.3m	
36	24	100-46		
38	26	87-15	-with 25mm- to 50mm-thick, claystone beds, at 25.9m and 26.2m (26.8m)	
40	28	83-50	SILTSTONE (RX), dark gray, slightly weathered, moderately hard to hard, moderately fractured	VII
		100-8	(29.6m)	
42	30	98-73	SANDSTONE (Graywacke) (RX), dark gray, slightly weathered, hard to very hard, slightly fractured	VIII
44	32	94-33		
46	34	100-8	-intensely fractured, near vertical fractures with discontinuous calcite/quartz filling, 33.2m to 36.9m	
		97-13	-black siltstone layer, 34.3m to 34.5m	
48	36	100-0	-thinly interbedded claystone, 34.7m to 35.7m	
			-vertical fractures, 35.7m to 36.9m	
50	38	83-34	-claystone bed, dipping about 15 degrees, 38.1m to 38.4m	
52	40		(40.0m)	
		100-33	SILTSTONE (RX) with thinly interbedded SANDSTONE (Graywacke) (RX) and CLAYSTONE (RX), light to dark gray	IX
54	42	87-73	-fresh, moderately hard, moderately fractured (40.8m)	
56	44	80-70	SANDSTONE (Graywacke) (RX), light gray, fresh, moderately hard to hard, thickly bedded, moderately fractured	X
58	46	90-50	-dark gray siltstone bed, 42.1m to 42.2m	
		90-90		
60	48	100-69	-thinly interbedded siltstone and claystone, dipping 30 degrees, 48.3m to 48.8m	
62	50		TOTAL DEPTH: 49.4m BACKFILLED WITH: Cement Grout	



Note: Refer to multi-page logs presented in Volume 2 of the Final Marine Site Characterization Report for detailed soil and rock descriptions.

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	559	821

PROFESSIONAL ENGINEER — DATE 07-28-11

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 16

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet 25 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT

DRAWN BY SACHIN DESHPANDE
CHECKED BY J.CHACKO

C. PRENTICE/ C. LOVATO — FIELD INVESTIGATOR
DATE SEE ABOVE

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

T.W.McNEILAN — PROJECT ENGINEER

BRIDGE NO. 34-0006L/R
KM POST 13.2/13.9
POST MILE 8.2/8.7

CU 04
EA 0120F1

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 16

DISREGARD PRINTS BEARING EARLIER REVISION DATES →
REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 765 OF

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1183	1204

Metric

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

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SOIL AND ROCK TYPES

Well graded GRAVEL (GW)
Poorly graded GRAVEL (GP)
GRAVEL with sand (GP or GW)
GRAVEL with clay (GP or GW)
Clayey GRAVEL (GC)
GRAVEL with silt (GP or GW)
Silty GRAVEL (GM)
Well graded SAND (SW)
Poorly graded SAND (SP)
SAND with gravel (SP or SW)
SAND with clay (SP-SC)
Clayey SAND (SC)
Silty SAND (SM)
SAND with silt (SP-SM)
Fat CLAY (CH)
Sandy fat CLAY (CH)
Lean CLAY (CL)
Sandy lean CLAY (CL)
Silty CLAY (CL-ML)
Elastic SILT (MH)
SILT (ML)
Sandy SILT (ML)
Clayey silt (ML/CL)
Highly plastic ORGANICS (OH)
Low plasticity ORGANICS (OL)
SANDSTONE (Rx)
SILTSTONE (Rx)
CLAYSTONE (Rx)
Interbedded Rock Strata (Rx)
CONGLOMERATE (Rx)

SAMPLERS

76mm-OD, 72mm-ID Thin Walled Tube
57mm-OD, 54mm-ID* Thin Walled Driven Tube
63.5mm-OD, 54mm-ID Offshore Liner
76mm-OD, 60mm-ID Modified California Liner
51mm-OD, 35mm-ID SPT Split Spoon Sampler
Rock Core (Inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH — Offshore Liner sample advanced with the weight of an 80 kg hammer.

PUSH or SAVE — Pushed thin-walled 76mm-OD-tube.

15/60cm — Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20 — Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.

86/28cm — Number of blows required to produce the indicated penetration after an initial 15 cm seating.

Ref/8cm — 50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- PERCENT PASSING #200 SIEVE
- WATER CONTENT (%)
- SUBMERGED UNIT WEIGHT (kN/m³)
- THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)

PLASTIC LIMIT LIQUID LIMIT

- EQUIVALENT SPT BLOW COUNT
- ROCK QUALITY DESIGNATION (RQD)
- ROCK RECOVERY PERCENT
- ROCK CORING RATE

STRENGTH TESTS

- POCKET PENETROMETER
- TORVANE
- REMOTE VANE
- MINIATURE VANE (& RESIDUAL VANE)
- UNCONSOLIDATED UNDRAINED TRIAXIAL
- SWEDISH FALL CONE
- UNCONFINED COMPRESSION (SOIL)
- (Open symbols indicate remolded tests)
- Soil: Strength Exceeds Capacity of Measuring Device
- Rock: Sample broke along discontinuity; Intact sample would have greater strength
- Shear Strength Interpreted from CPT Tip Resistance (Nk=12-15)
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- POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- UNCONFINED COMPRESSION (ROCK)
- FRACTURE DENSITY (ROCK)

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Consistency	Undrained Shear Strength kPa
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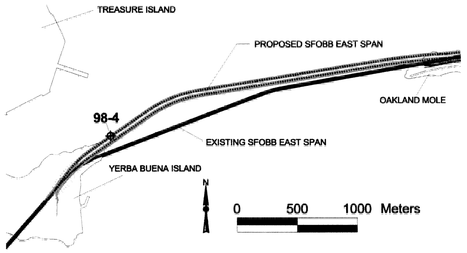
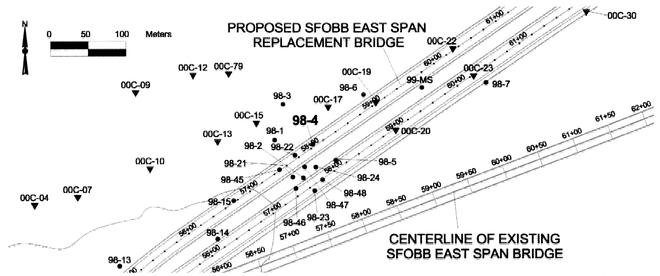
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

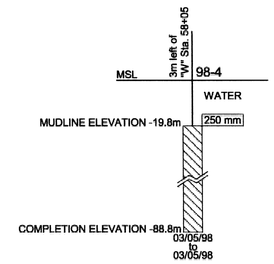
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







BORING 98-4

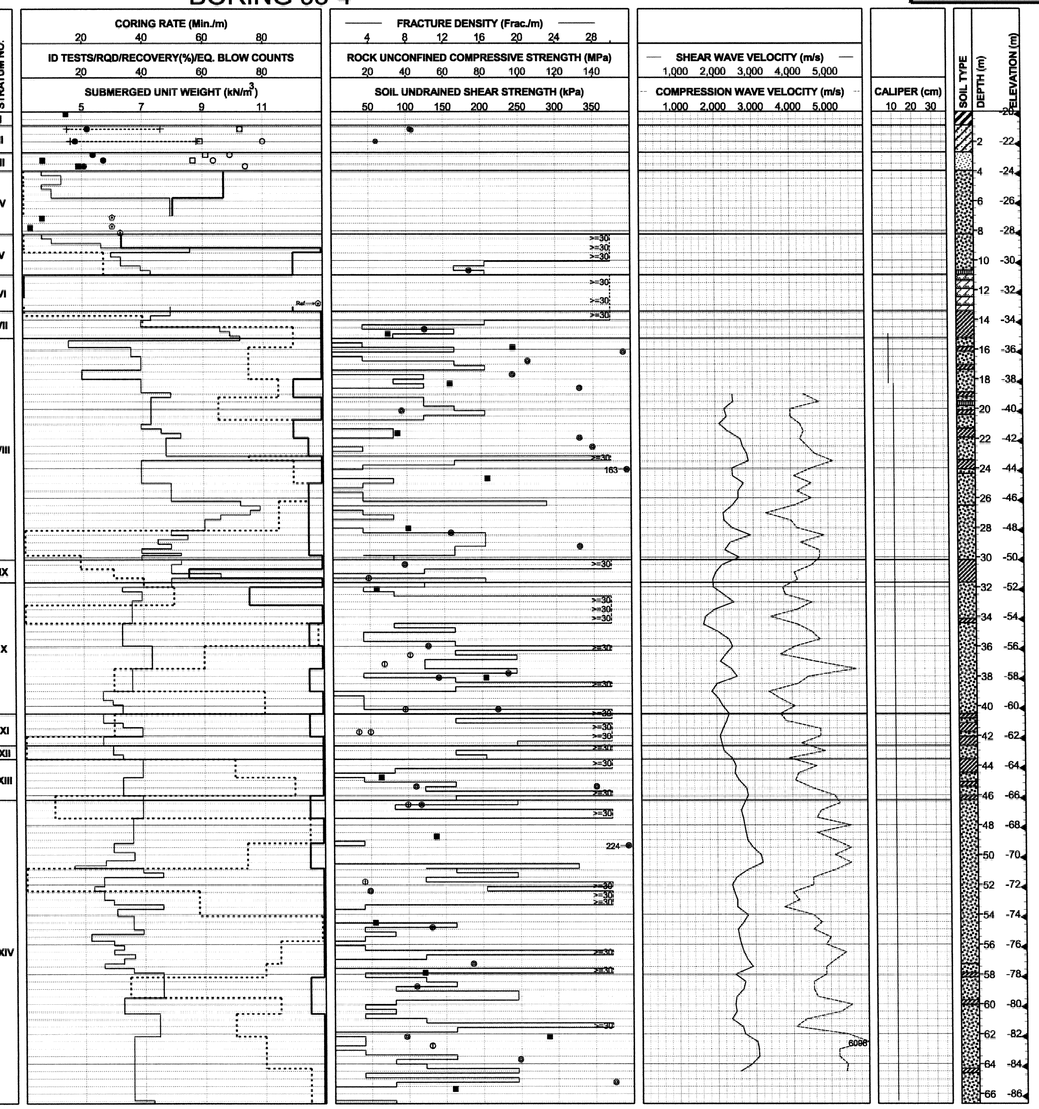
Coordinates: E1836387 N647629
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -19.8m (MSL)

Stratum	Material Description	Depth
I	Fat CLAY with gravel (CH), very soft, dark olive gray	(0.9m)
II	Sandy fat CLAY with gravel (CH), very stiff, olive gray	(2.7m)
III	SAND (SP), dense to very dense, dark gray	(4.0m)
IV	SANDSTONE (Graywacke) (Rx)/rock fragments, origin uncertain, olive gray	(8.2m)
V	SANDSTONE (Graywacke) (RX), moderate yellowish brown, intensely weathered, soft to moderately hard, thickly to very thickly bedded, fine to medium grained, moderately to well sorted, subangular to subrounded	(11.0m)
VI	-moderately weathered, moderately fractured, below 9.4m	
VII	Interbedded SILTSTONE (RX), CLAYSTONE (RX),and SANDSTONE (Graywacke) (RX), medium to dark gray, moderately weathered, moderately soft, thinly to thickly bedded, very intensely fractured	(13.4m)
VIII	CLAYSTONE (RX) with thinly interbedded SANDSTONE (Graywacke) (RX) [5:1], moderately to slightly weathered, moderately to intensely fractured, with thin clay infilling along fractures	(15.2m)
	SANDSTONE (Graywacke) (RX) with thinly interbedded CLAYSTONE (RX) [4:1], medium to dark gray, slightly weathered, moderately hard to hard, thinly to thickly bedded, moderately to slightly fractured -slightly weathered, moderately hard siltstone, 19.5m to 19.8m -medium gray fresh sandstone below 19.8m -claystone grading to siltstone, 20.1m to 20.4m -claystone bed dipping 25 degrees, 23.3m to 23.8m -150mm-thick, intensely fractured claystone bed dipping 20 degrees, at 26.4m	(30.2m)
IX	CLAYSTONE (RX), dark gray to black, slightly weathered, moderately hard, intensely to very intensely fractured	(31.7m)
X	SANDSTONE (Graywacke) (RX), dark gray, slightly weathered to fresh, hard, massive, moderately fractured, with a few thin interbedded siltstone and claystone layers -interbedded claystone, dipping 20 degrees, dark gray, moderately hard, intensely fractured, 34.0m to 34.4m	(40.5m)
XI	CLAYSTONE (RX) with interbedded SANDSTONE (Graywacke) (RX) [3:1], fresh, intensely fractured	
XII	-claystone: dark gray, moderately hard, thinly interbedded to laminated, smooth, polished bedding plane surfaces	(42.7m)
XIII	SANDSTONE (Graywacke) (RX), moderate dark gray, fresh, hard, moderately fractured	(43.6m)
XIV	CLAYSTONE (RX) interbedded with SANDSTONE (Graywacke) (RX) [1:1], fresh	(46.3m)
	SANDSTONE (Graywacke) (RX), moderately dark gray, fresh to slightly weathered, hard to very hard, fine grained, moderately to intensely fractured -intensely to very intensely fractured zone -intensely to very intensely fractured sandstone, with thinly interbedded claystone and calcite-filled fractures inclined 30, 50, 60, and 80 degrees, 50.6m to 53.0m -dark gray, hard, moderately to intensely fractured claystone bed, 57.8m to 58.2m -intensely fractured, 58.1m to 61.6m -intensely to moderately fractured, 58.2m to 59.6m -dark gray claystone layer, 59.8m to 59.9m	

TOTAL DEPTH: 69.0m

BACKFILLED WITH: Cement Grout



REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	560	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 17

CU 04
EA 0120T1

Br/Dbe 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheets 26 of 87

TO ACCOMPANY PLANS DATED 2-21-12

Note: Refer to multi-page logs presented in Volume 2 of the Final Marine Site Characterization Report for detailed soil and rock descriptions.

SABA MOHAN, GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY: SACHIN DESHPANDE	C. PRENTICE/C. LOVATO, FIELD INVESTIGATOR	T.W.McNEILAN, PROJECT ENGINEER
	CHECKED BY: J.CHACKO	DATE: SEE ABOVE	

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

BRIDGE NO.	KM POST	POST MILE
34-0006L/R	13.2/13.9	8.2/8.7

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 17

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY) | SHEET 766 | OF

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Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1184	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

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Metric

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows producad the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (kN/m³)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT +———+ LIQUID LIMIT
- ⊗ EQUIVALENT SPT BLOW COUNT
- ···· ROCK QUALITY DESIGNATION (RQD)
- —— ROCK RECOVERY PERCENT
- —— ROCK CORING RATE

STRENGTH TESTS

- ● POCKET PENETROMETER
- ◆ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (⊗ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
- ⊡ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- + Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- Shear Strength Interpreted from CPT Tip Resistance (Nk=12-15)
- ● POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ⊕ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- —— FRACTURE DENSITY (ROCK)

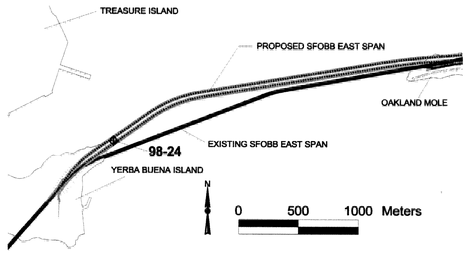
STRENGTH OF COHESIVE SOILS

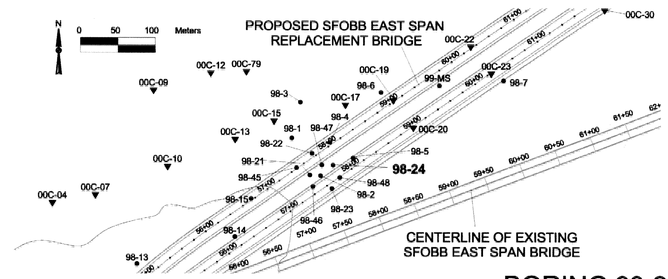
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

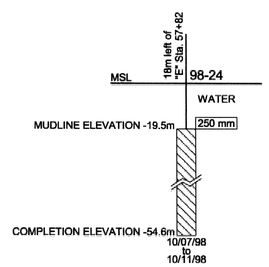
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







BORING 98-24

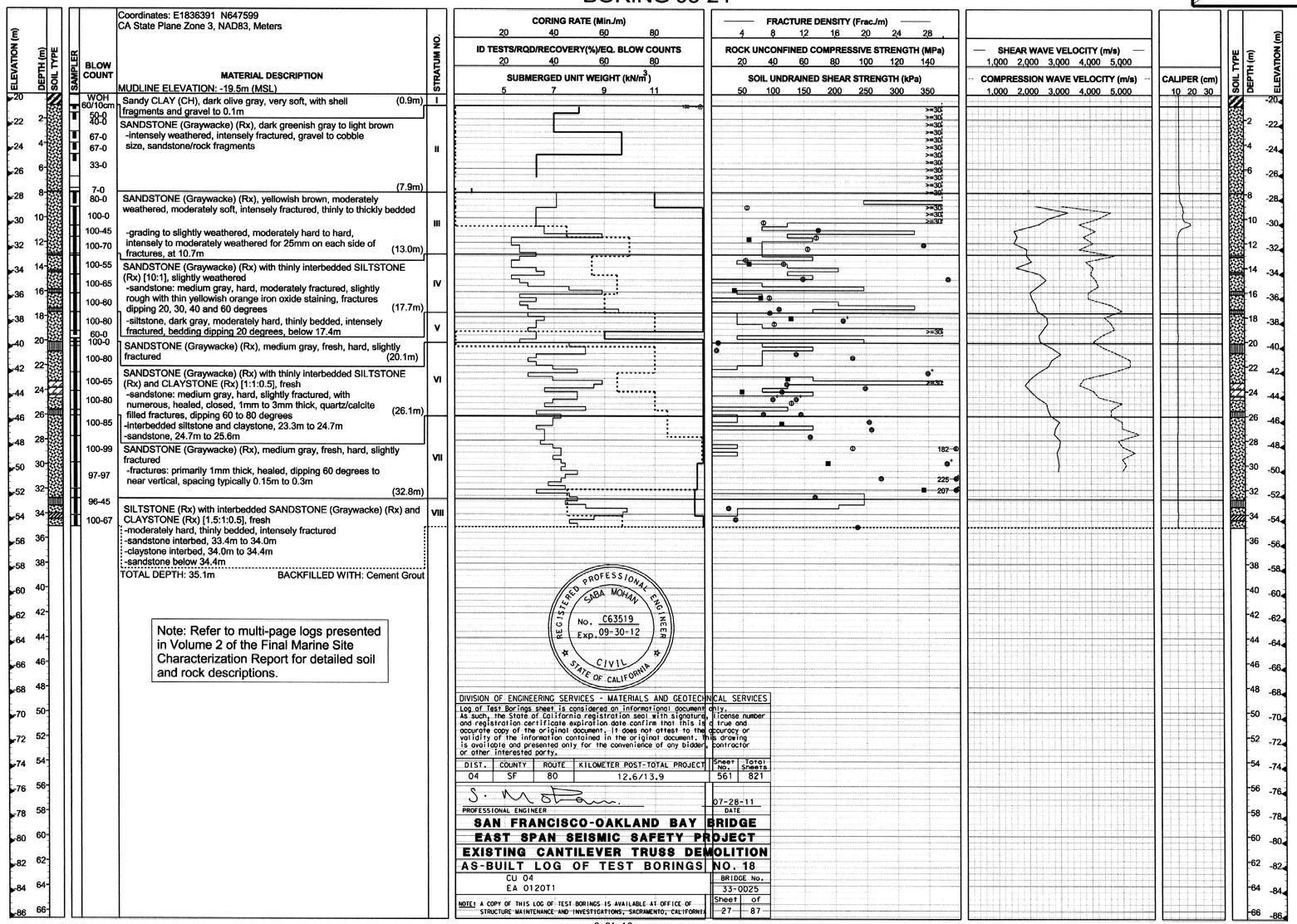
Coordinates: E1836391 N647599
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -19.5m (MSL)

Blow Count	Material Description	Stratum No.
WOH 60/10cm 50-0 40-0	Sandy CLAY (CH), dark olive gray, very soft, with shell fragments and gravel to 0.1m (0.9m)	I
67-0 67-0 33-0 7-0	SANDSTONE (Graywacke) (Rx), dark greenish gray to light brown -intensely weathered, intensely fractured, gravel to cobble size, sandstone/rock fragments (7.9m)	II
80-0 100-0 100-45 100-70	SANDSTONE (Graywacke) (Rx), yellowish brown, moderately weathered, moderately soft, intensely fractured, thinly to thickly bedded -grading to slightly weathered, moderately hard to hard, intensely to moderately weathered for 25mm on each side of fractures, at 10.7m (13.0m)	III
100-55 100-65 100-60	SANDSTONE (Graywacke) (Rx) with thinly interbedded SILTSTONE (Rx) [10:1], slightly weathered -sandstone: medium gray, hard, moderately fractured, slightly rough with thin yellowish orange iron oxide staining, fractures dipping 20, 30, 40 and 60 degrees (17.7m)	IV
100-80 60-0 100-0	-siltstone, dark gray, moderately hard, thinly bedded, intensely fractured, bedding dipping 20 degrees, below 17.4m	V
100-80	SANDSTONE (Graywacke) (Rx), medium gray, fresh, hard, slightly fractured (20.1m)	VI
100-65 100-80 100-85	SANDSTONE (Graywacke) (Rx) with thinly interbedded SILTSTONE (Rx) and CLAYSTONE (Rx) [1:1:0.5], fresh -sandstone: medium gray, hard, slightly fractured, with numerous, healed, closed, 1mm to 3mm thick, quartz/calcite filled fractures, dipping 60 to 80 degrees (26.1m) -interbedded siltstone and claystone, 23.3m to 24.7m -sandstone, 24.7m to 25.6m	
100-99 97-97	SANDSTONE (Graywacke) (Rx), medium gray, fresh, hard, slightly fractured -fractures: primarily 1mm thick, healed, dipping 60 degrees to near vertical, spacing typically 0.15m to 0.3m (32.8m)	VII
96-45 100-67	SILTSTONE (Rx) with interbedded SANDSTONE (Graywacke) (Rx) and CLAYSTONE (Rx) [1.5:1:0.5], fresh -moderately hard, thinly bedded, intensely fractured -sandstone interbed, 33.4m to 34.0m -claystone interbed, 34.0m to 34.4m -sandstone below 34.4m	VIII

TOTAL DEPTH: 35.1m BACKFILLED WITH: Cement Grout

Note: Refer to multi-page logs presented in Volume 2 of the Final Marine Site Characterization Report for detailed soil and rock descriptions.



REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	561	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 18

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet 27 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY SACHIN DESHPANDE CHECKED BY J.CHACKO	J.CHACKO, C. PRENTICE, J. PALMER, J. BIANCHIN FIELD INVESTIGATOR DATE SEE ABOVE	**PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION**	T.W.McNEILAN PROJECT ENGINEER

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

BRIDGE NO. 34-0006L/R
KM POST 13.2/13.9
POST MILE 8.2/8.7

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 18

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 767 OF

FILENAME => 33-0025-p-ltb18_739.tif

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1185	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
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Metric

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- GRAVEL with silt (GP or GW)
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- SILT (ML)
- Sandy SILT (ML)
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- ● WATER CONTENT (%)
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- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m^3)
- PLASTIC LIMIT LIQUID LIMIT
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- REMOTE VANE
- MINIATURE VANE (◇ RESIDUAL VANE)
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- SWEDISH FALL CONE
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- ◇△ (Open symbols indicate remolded tests)
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- UNCONFINED COMPRESSION (ROCK)
- FRACTURE DENSITY (ROCK)

STRENGTH OF COHESIVE SOILS

Consistency	Undrained Shear Strength kPa
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Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
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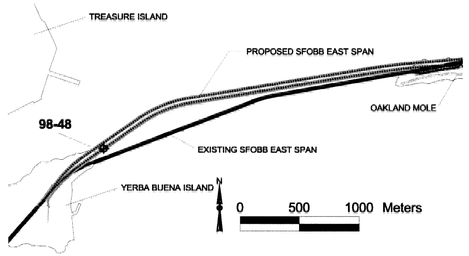
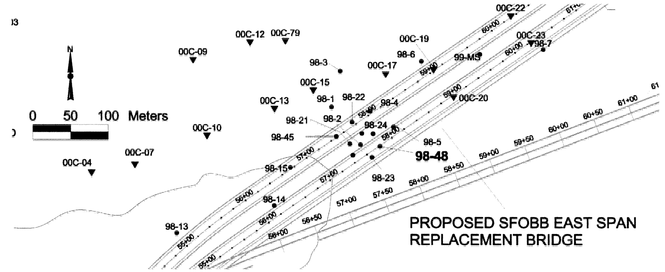
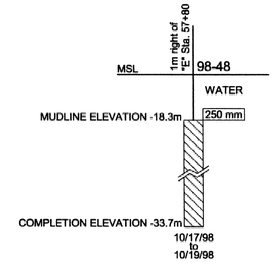
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.





PROPOSED SFOBB EAST SPAN REPLACEMENT BRIDGE



BORING 98-48

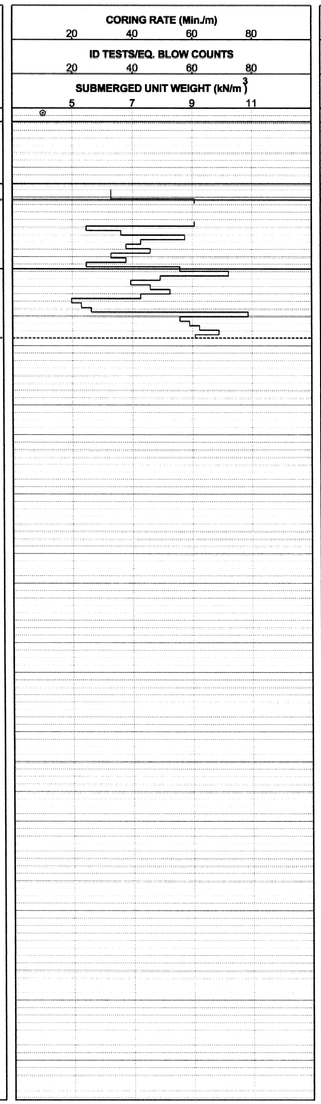
Coordinates: E1836400.0 N0647583.0
CA State Plane Zone 3, NAD83, Meters

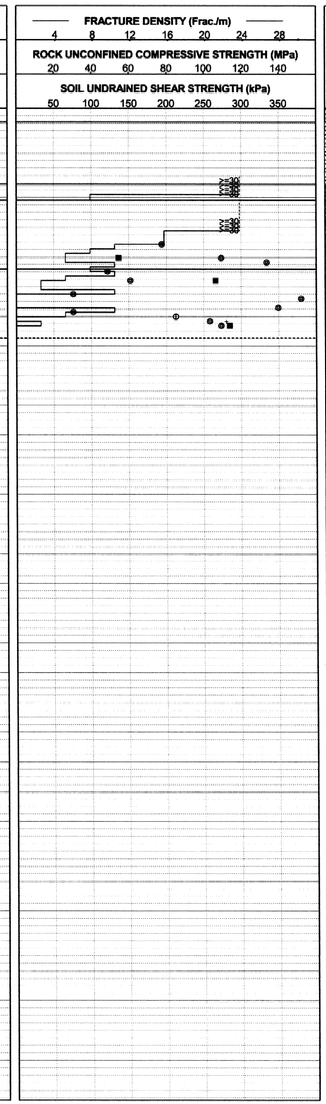
MUDLINE ELEVATION: -18.3m (MSL)

Material description	Stratum No.
Fine to Coarse SAND with gravel (SW), olive gray (0.9m) -with clay pockets	I
ROCK FRAGMENTS with sand, olive gray (5.1m) -subrounded to subangular, gravel to cobble size sandstone rock fragments, origin uncertain, possibly intensely weathered rock	II
SANDSTONE (Graywacke) (Rx), light yellowish brown, intensely weathered, subangular (6.2m)	III
SANDSTONE (Graywacke) (Rx) with interbedded SILTSTONE (RX) [10:1], light yellowish brown, moderately weathered (10.8m) -moderately soft to moderately hard, intensely fractured, clean, slightly to moderately rough fracture surfaces -claystone, intensely fractured, 7.7m to 8.0m -moderate yellowish brown, moderately fractured with moderately to slightly rough, clean to very thin calcite/quartz and iron oxide filling, dipping 25 to 40 degrees, at 7.9m -claystone, 60mm thick, bedding dipping 30 degrees, 8.6m to 8.7m -dark greenish gray at 8.7m -slightly rough fractures dipping 30 to 40 degrees, with minor calcite/quartz filling, at 9.1m -moderate yellowish brown with minor clay (<1mm) along discontinuity planes, at 9.5m -olive gray at 9.6m -rough, partially open (<1mm) clean fractures, at 9.7m -grading to slightly weathered, with 35mm wide, moderate yellowish brown, weathering rinds parallel to discontinuities, at 9.8m -slightly rough to rough fractures dipping 30 to 60 degrees with less than 1mm thick clay infilling, at 10.1m -numerous healed, 1mm to 3mm wide calcite/quartz filled fractures, dipping 70 to 80 degrees, at 10.5m	IV V
SANDSTONE (Graywacke) (Rx) with interbedded SILTSTONE (Rx) [5:1] -sandstone: medium dark gray, slightly weathered to fresh, hard, thickly to very thickly bedded, moderately to slightly fractured, very thin, slightly to moderately rough fracture surfaces -siltstone: dark gray, slightly weathered, moderately hard, thickly bedded (0.4 to 0.5m), bedding dipping 20 to 30 degrees, moderately to intensely fractured, smooth, clean to very thin, iron oxide and calcite/quartz filled fractures, dipping 20 to 35 degrees -silstone to 11.2m -siltstone, 12.5m to 12.8m -siltstone, 13.8m to 14.0m -interbedded sandstone and siltstone, 14.0m to 14.2m -several very thin, healed, calcite/quartz filled fractures dipping 70 to 80 degrees, at 14.9m	

TOTAL DEPTH: 15.5m BACKFILLED WITH: Cement Grout

Blow count
30/55cm
33-0
50-0
47-0
86-0
94-19
100-41
100-90





REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	562	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 19

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA — Sheet 28 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 19

SABA MOHAN GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY SACHIN DESHPANDE CHECKED BY T. MCADAM	C. PRENTICE, J. BIANCHIN FIELD INVESTIGATOR DATE SEE ABOVE	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

T.W.McNEILAN
PROJECT ENGINEER

BRIDGE NO.	KM POST	POST MILE
34-0006L/R	13.2/13.9	8.2/8.7

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 768 OF

FILENAME => 33-0025-p-1tb19_740.tif

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Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1186	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

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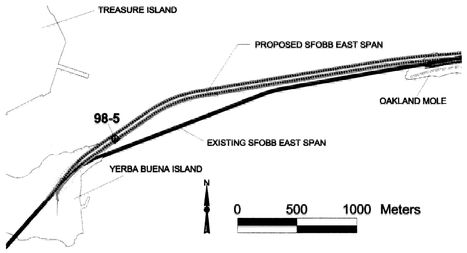
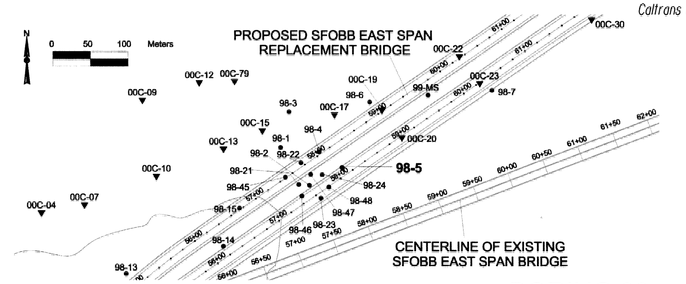
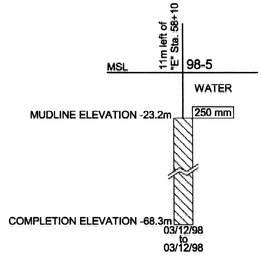






SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- PERCENT PASSING #200 SIEVE
- WATER CONTENT (%)
- SUBMERGED UNIT WEIGHT (kN/m³)
- THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT LIQUID LIMIT
- EQUIVALENT SPT BLOW COUNT
- ROCK QUALITY DESIGNATION (RQD)
- ROCK RECOVERY PERCENT
- ROCK CORING RATE

STRENGTH TESTS

- POCKET PENETROMETER
- TORVANE
- REMOTE VANE
- MINIATURE VANE (RESIDUAL VANE)
- UNCONSOLIDATED UNDRAINED TRIAXIAL
- SWEDISH FALL CONE
- UNCONFINED COMPRESSION (SOIL)
- (Open symbols indicate remolded tests)
- Soil: Strength Exceeds Capacity of Measuring Device
- Rock: Sample broke along discontinuity; Intact sample would have greater strength
- Shear Strength Interpreted from CPT Tip Resistance (Nk=12-15)
- POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- UNCONFINED COMPRESSION (ROCK)
- FRACTURE DENSITY (ROCK)

STRENGTH OF COHESIVE SOILS

Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.

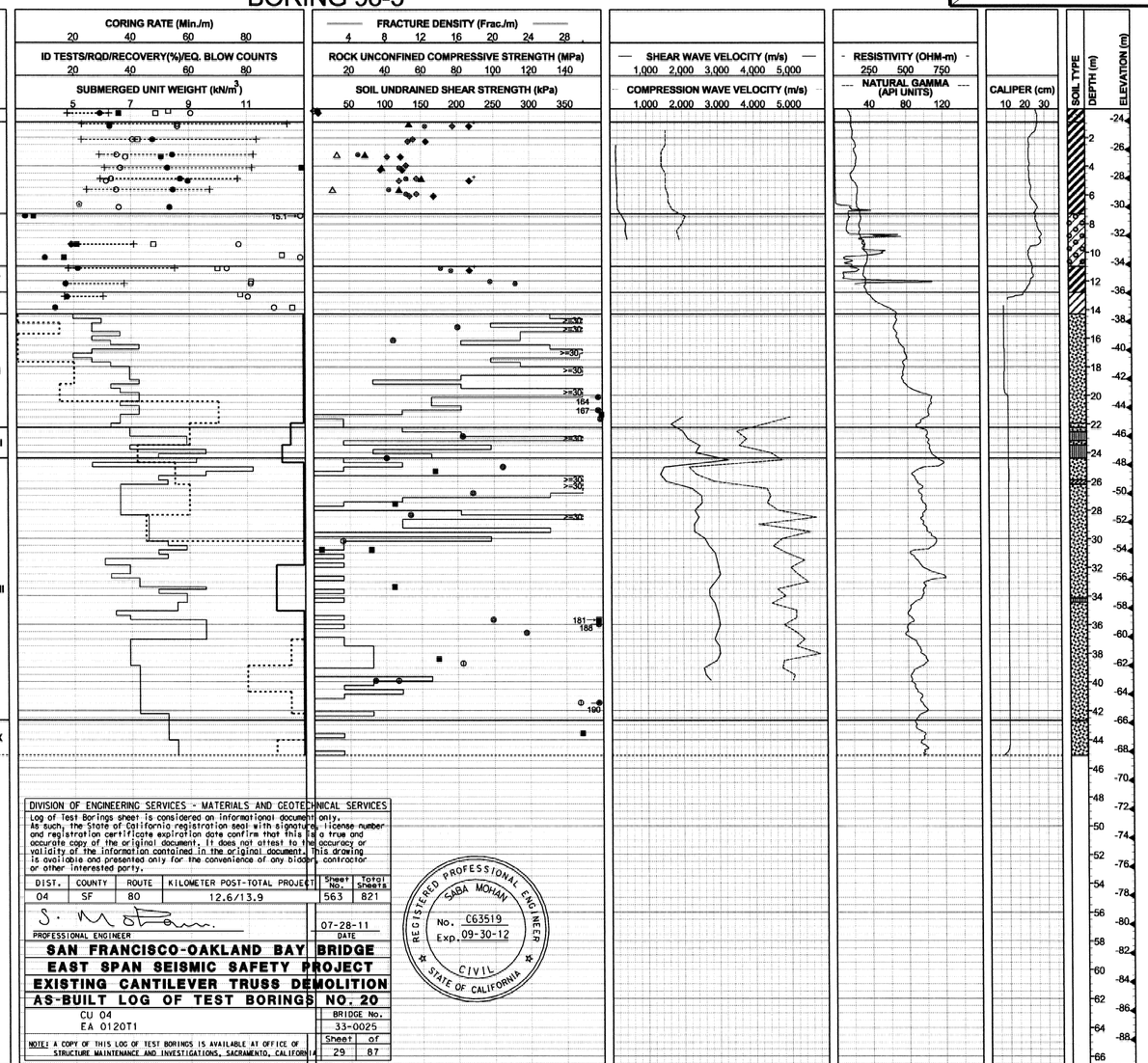
BORING 98-5

Coordinates: E1836418 N647608
CA State Plane Zone 3, NAD83, Meters

Elevation (m)	Depth (m)	Blow Count	Material Description	Stratum No.
			MUDLINE ELEVATION: -23.2m (MSL)	
		WOH / 15/45cm	Sandy Fat CLAY (CH), very soft, olive gray, with shell fragments (0.9m)	I
		12/45cm, 16/60cm, 28/60cm, PUSH, PUSH, 22	Fat CLAY (CH), very stiff to hard, olive green -with shell fragments and mica -with sand pockets to 2.4m -with silt pockets below 2.7m -with silt partings at 5.5m (7.3m)	II
		50/25cm, 47/30cm, 60/30cm, 30/30cm	Coarse GRAVEL with clay (GP-GC) to Clayey Coarse GRAVEL (GC), hard, olive green (11.0m)	III
		19/30cm, 30/30cm	Lean to Fat CLAY (CH), hard, olive brown (12.8m)	IV
		30/25cm, 30/15cm	Lean CLAY (CL), hard , moderate yellowish brown (14.3m)	V
		30/5cm, 100-0, 100-15, 100-0, 100-0, 100-20, 100-15, 100-70, 95-60	SANDSTONE (Graywacke)(RX), moderate brown, soft, intensely fractured into 2- to 4-inch-long pieces -yellowish brown, intensely weathered to moderately weathered, moderately hard, 14.6m to 19.5m -moderately weathered, 18.0m to 18.9m -very intensely fractured, 18.3m to 18.6m -medium dark gray, moderately to slightly weathered, moderately hard to hard, 19.5m to 20.4m -slightly weathered, moderately to slightly fractured, below 20.4m (22.3m) -with a 150mm-thick claystone bed dipping 20 degrees, at 21.9m	VI
		92-42, 100-55	SILTSTONE (RX) thinly interbedded with CLAYSTONE (RX) and SANDSTONE (Graywacke)(RX) dark gray, slightly weathered, moderately hard to hard, moderately fractured (24.4m) -polished fractures (bedding plane) surfaces in siltstone and claystone	VII
		100-60, 100-45, 100-100, 90-90, 90-90, 100-100, 100-100, 100-95, 100-80, 100-95	SANDSTONE (Graywacke) (RX), dark gray, fresh, hard, slightly to moderately fractured -very intensely fractured claystone bed, 25.9m to 26.2m -moderately fractured with intensely fractured intervals, 20, 50, and 60 degrees, slightly to moderately rough, clean to thin patchy calcite/quartz filling, 26.2m to 30.2m -50mm-thick claystone bed dipping at 25 degrees, at 34.3m (42.7m)	VIII
		100-100, 100-90	SANDSTONE (RX), medium dark gray, slightly weathered, hard, very slightly to slightly fractured	IX

TOTAL DEPTH: 45.1m BACKFILLED WITH: Cement Grout

Note: Refer to multi-page logs presented in Volume 2 of the Final Marine Site Characterization Report for detailed soil and rock descriptions.



DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES
Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total sheets
04	SF	80	12.6/13.9	563	821

PROFESSIONAL ENGINEER — DATE 07-28-11

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 20

CU 04
EA 0120T1

BRIDGE No. 33-0025
Sheet 29 of 87

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

TO ACCOMPANY PLANS DATED 2-21-12

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 20

SABA MOHAN, GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY: SACHIN DESHPANDE	C. PRENTICE/ C. LOVATO, FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
	CHECKED BY: J.CHACKO	DATE: SEE ABOVE	

T.W.McNEILAN, PROJECT ENGINEER

BRIDGE NO.	KM POST	POST MILE
34-0006L/R	13.2/13.9	8.2/8.7

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY) | SHEET 769 | OF

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Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1187	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

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.

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (kN/m³)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT LIQUID LIMIT
- ⊗ EQUIVALENT SPT BLOW COUNT
- ROCK QUALITY DESIGNATION (RQD)
- ROCK RECOVERY PERCENT
- ROCK CORING RATE

STRENGTH TESTS

- POCKET PENETROMETER
- TORVANE
- REMOTE VANE
- MINIATURE VANE (R RESIDUAL VANE)
- UNCONSOLIDATED UNDRAINED TRIAXIAL
- SWEDISH FALL CONE
- UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- Shear Strength Interpreted from CPT Tip Resistance (Nk=12-15)
- POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- FRACTURE DENSITY (ROCK)

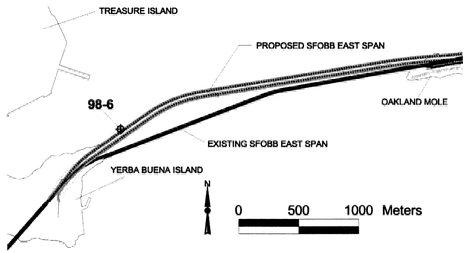
STRENGTH OF COHESIVE SOILS

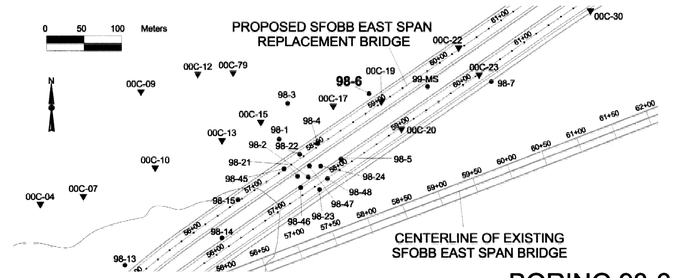
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

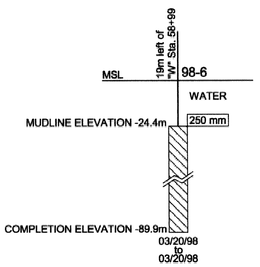
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







BORING 98-6

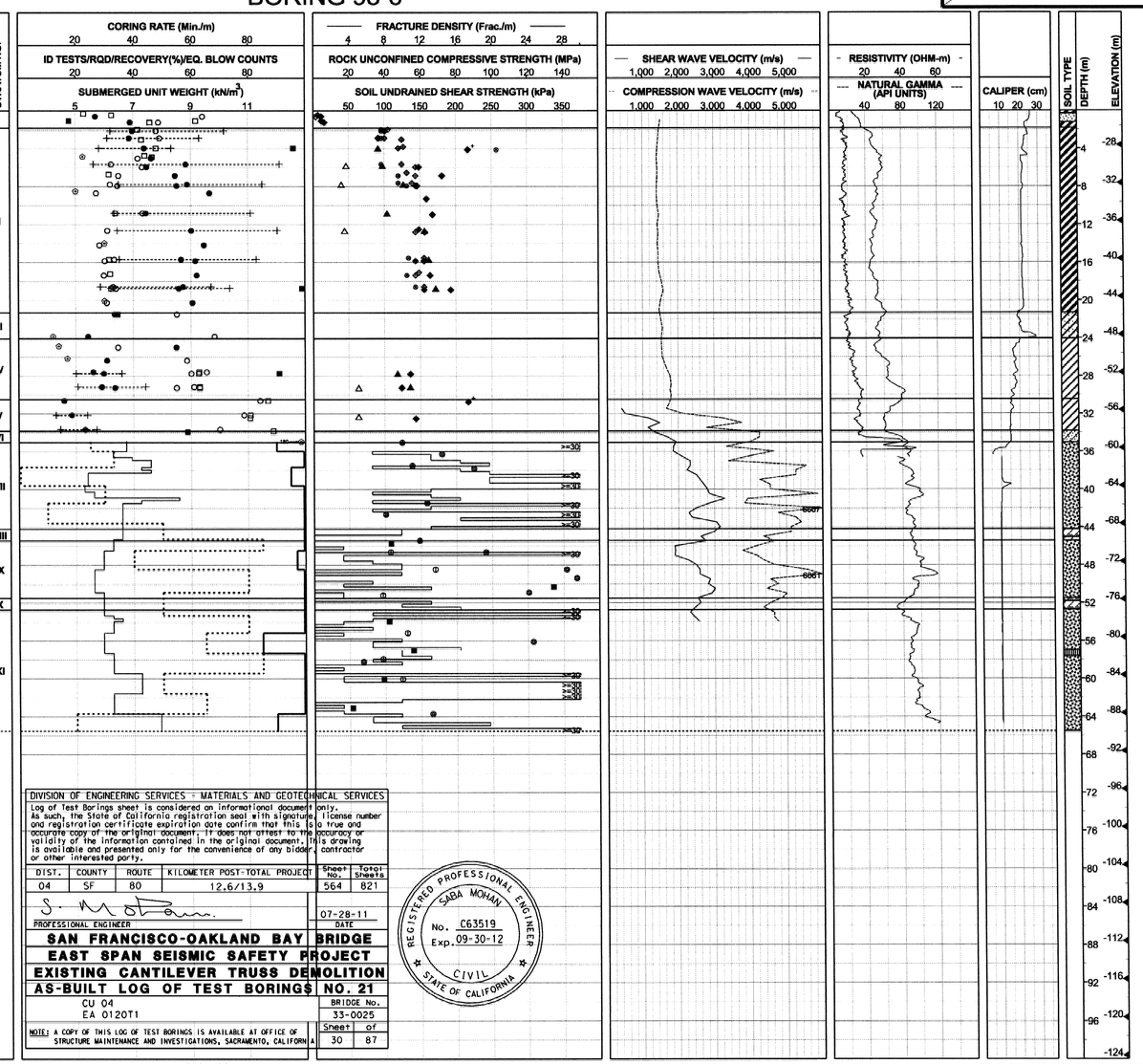
Coordinates: E1836455 N647696
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -24.4m (MSL)

Blow Count	Material Description	Stratum No.
WOH, WOH	Fat CLAY (CH), very soft, olive gray (1.8m)	I
5/30cm, 8/30cm, 22/45cm, 36	-with organic matter pockets at 0.2m -sand layer with clay pockets and shell fragments, 0.3m to 1.1m -with sand pockets and shell fragments, at 1.2m	
PUSH, PUSH, PUSH, 20, PUSH, PUSH, 30, PUSH, PUSH, PUSH, 30, PUSH	Fat CLAY (CH), greenish gray to olive gray, stiff to hard -with a few silt partings and seams, at 2.1m -with silt partings at 3.0m -greenish gray, 3.7m to 6.1m -with cemented sand pockets, 3.7m to 5.2m -with sand pockets at 4.9m -with shell fragments, 7.3m to 15.8m -with silt partings at 7.6m -with silt partings at 17.1m -with silt partings and shell fragments, at 20.1m (21.3m)	II
12, 14, 17	Sandy Lean CLAY with gravel (CL), stiff to very stiff, grayish green -with many shell fragments and rounded gravel to 20mm-diameter -with sand pockets and a few shell fragments, at 23.8m (24.1m)	III
15/35cm, 30/50cm, 30/25cm	Lean CLAY (CL), very stiff, grayish green -with many shell fragments (30.5m)	IV
30/45cm, 30/50cm	Lean CLAY (CL), very stiff, dark gray to olive gray (33.8m)	V
30/5cm	Clayey SAND (SC), grayish green (35.1m)	VI
90-25, 100-33, 95-0, 100-30, 100-10	SANDSTONE-Graywacke (RX), moderate yellowish brown, moderately weathered, moderately hard, thickly to very thickly bedded, intensely fractured, fractures in sets inclined at 20, 50, 60, and 70-80 degrees (44.2m)	VII
100-50, 100-85, 97-40	SANDSTONE moderately to thinly interbedded with SILTSTONE (RX) [3:1], slightly weathered, moderately to intensely fractured, moderately spaced fractures, moderately thin fractures, slightly rough (45.4m)	VIII, IX
100-80, 100-50	SANDSTONE-Graywacke (RX), medium dark gray, slightly weathered to fresh, hard, thickly bedded, with closed, tight calcite filled fractures, moderately thin to thin, slightly rough (51.5m)	X
100-80, 85-65, 100-85	SANDSTONE (RX) interbedded with SILTSTONE (RX)[2:1], slightly weathered, moderately to intensely fractured, moderately spaced, clean, slightly rough, with yellowish brown stains and large patches of calcite (52.7m)	
100-50, 100-65, 90-20	SANDSTONE-Graywacke (RX), medium dark gray, slightly weathered, hard, thickly bedded, unfractured to slightly fractured, widely spaced, clean, moderately to slightly rough, with a few closed, tight, calcite and quartz filled fractures -with laminated, dark gray, moderately hard to hard, intensely fractured siltstone, 56.8m to 57.5m -with thin quartz and calcite filled fractures dipping at 30 to 80 degrees, below 57.5m	XI

TOTAL DEPTH: 65.5m BACKFILLED WITH: Cement Grout

Note: Refer to multi-page logs presented in Volume 2 of the Final Marine Site Characterization Report for detailed soil and rock descriptions.



DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	564	821

PROFESSIONAL ENGINEER — DATE 07-28-11

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 21

CU 04
EA 0120T1

BRIDGE No. 33-0025

Sheet 30 of 87

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

TO ACCOMPANY PLANS DATED 2-21-12

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 21

SABA MOHAN, GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY SACHIN DESHPANDE	C. PRENTICE, K. NESSLER, C. LOVATO, R. PETERS, FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
	CHECKED BY J.CHACKO	DATE SEE ABOVE	

T.W.McNEILAN, PROJECT ENGINEER

BRIDGE NO. 34-0006L/R
KM POST 13.2/13.9
POST MILE 8.2/8.7

CU 04
EA 0120F1

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 770 OF

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1188	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

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Metric

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- PAVEMENT

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

STANDARD PENETRATION TEST (SPT) AND MODIFIED CALIFORNIA (MC) LINER SAMPLERS

Samplers were driven with a 63.5 kg hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (kN/m³)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT + LIQUID LIMIT +
- ⊕ EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- •••• ROCK QUALITY DESIGNATION (RQD)
- —— ROCK RECOVERY PERCENT
- —— ROCK CORING RATE

STRENGTH TESTS

- ⊛ POCKET PENETROMETER
- ◆ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (⊗ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
- ⊠ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- ● POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ⊘ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- + Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- —— FRACTURE DENSITY (ROCK)

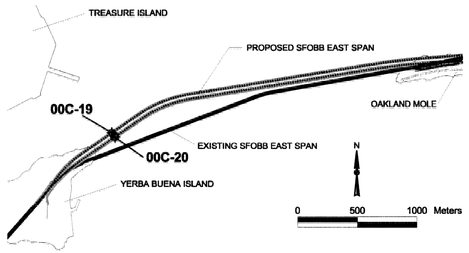
STRENGTH OF COHESIVE SOILS

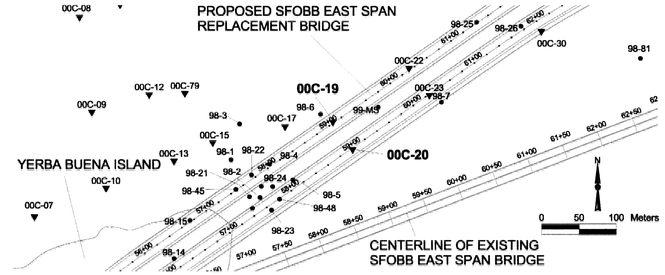
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

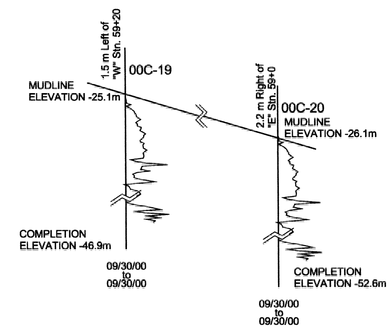
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







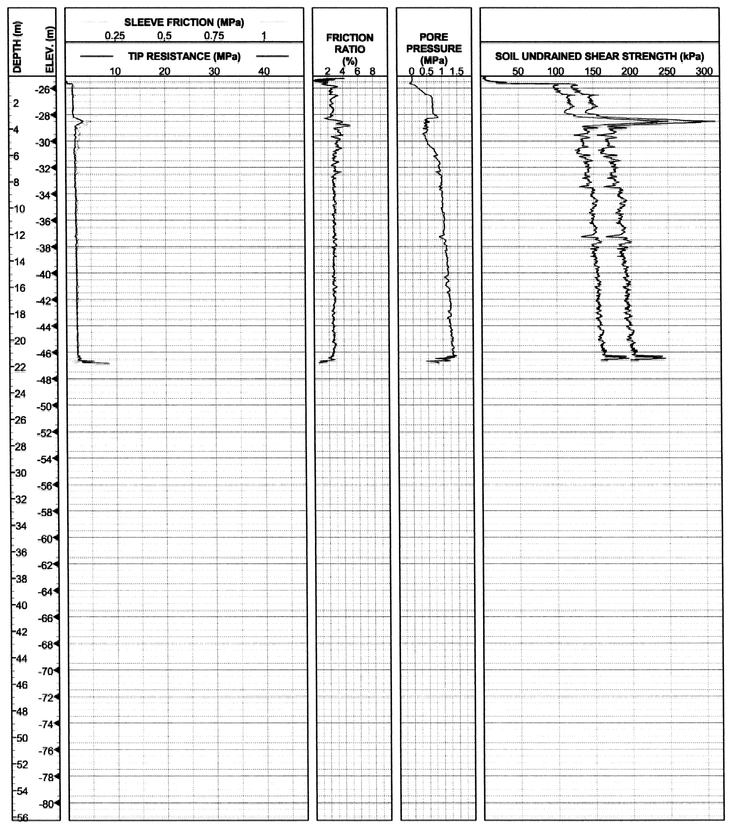
NOTES:

1. Pore pressures are relative to hydrostatic pressure at the mudline.
2. Breaks in the data are due to pauses in the sounding during installation of casing.

CPT 00C-19

COORDINATES: E1836472 N647684
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -25.1m (MSL)
START DATE: 09/30/00

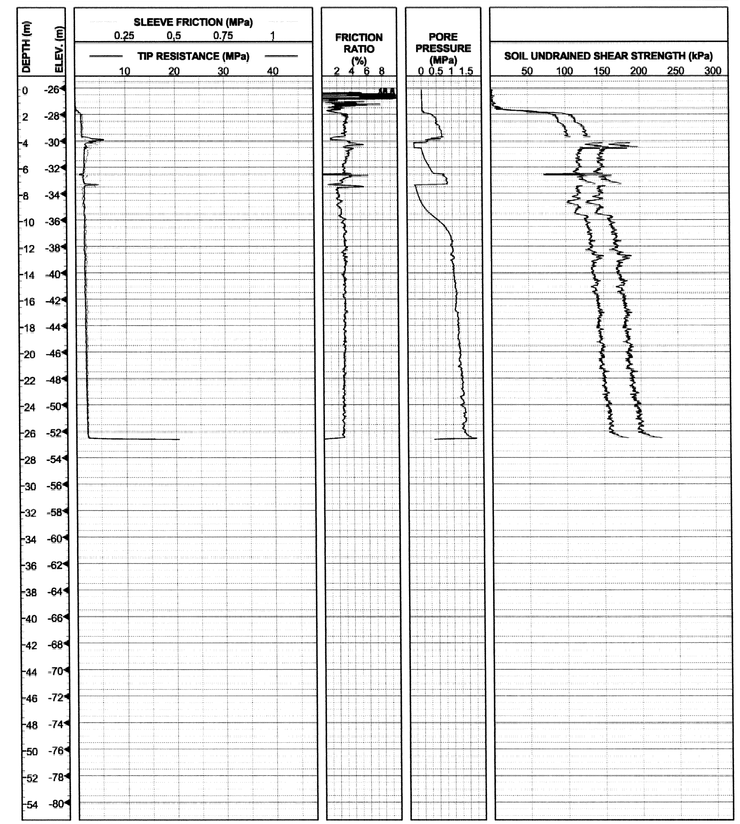
STATION: 1.5 m Left of "W" Stn. 59+20
COMPLETION ELEVATION: -46.9m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



CPT 00C-20

COORDINATES: E1836498 N647647
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -26.1m (MSL)
START DATE: 09/30/00

STATION: 2.2 m Right of "E" Stn. 59+0
COMPLETION ELEVATION: -52.6m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	565	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 22

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA — Sheet 31 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT
DRAWN BY S.DESHPANDE
CHECKED BY A. BROUGHTON
P.ROBINS — FIELD INVESTIGATOR — DATE See above

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

T.W.McNEILAN — PROJECT ENGINEER

BRIDGE NO. 34-0006R/L
KM POST 13.2/13.9
POST MILE 8.2/8.7

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 22

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 771 OF

FILENAME => 33-0025-p-1tb22_743.tif

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- PAVEMENT

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

STANDARD PENETRATION TEST (SPT) AND MODIFIED CALIFORNIA (MC) LINER SAMPLERS

Samplers were driven with a 63.5 kg hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (kN/m³)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)

PLASTIC LIMIT + — + LIQUID LIMIT

- ⊗ EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- ···· ROCK QUALITY DESIGNATION (RQD)
- —— ROCK RECOVERY PERCENT
- —— ROCK CORING RATE

STRENGTH TESTS

- ⊕ POCKET PENETROMETER
- ◆ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (◇ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
- ⊠ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- ● POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ◐ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- ┼ Soil: Strength Exceeds Capacity of Measuring Device. Rock: Sample broke along discontinuity; Intact sample would have greater strength
- —— FRACTURE DENSITY (ROCK)

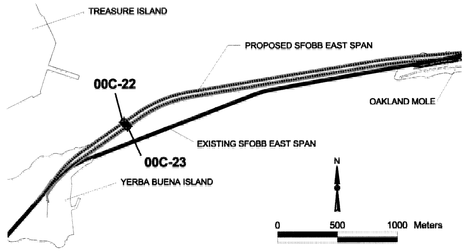
STRENGTH OF COHESIVE SOILS

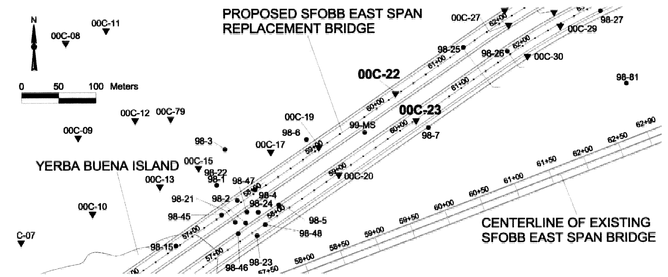
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

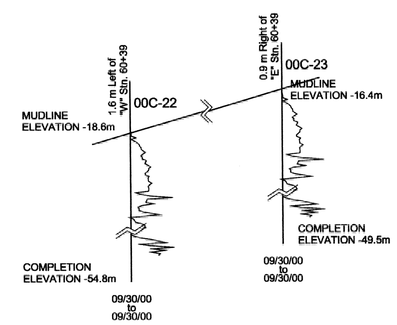
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.



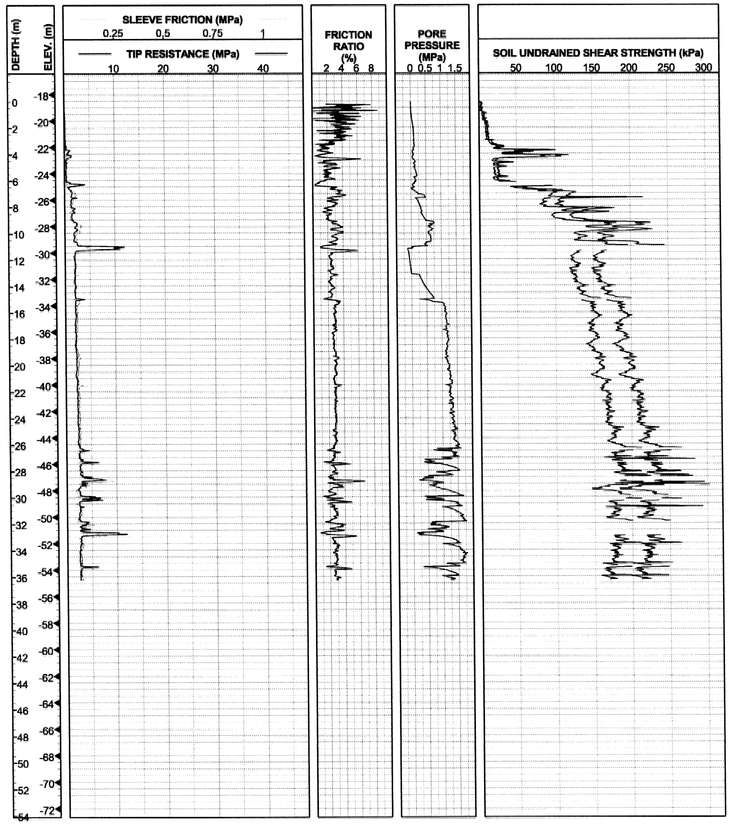




CPT 00C-22

COORDINATES: E1836575 N647756
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -18.6m (MSL)
START DATE: 09/30/00

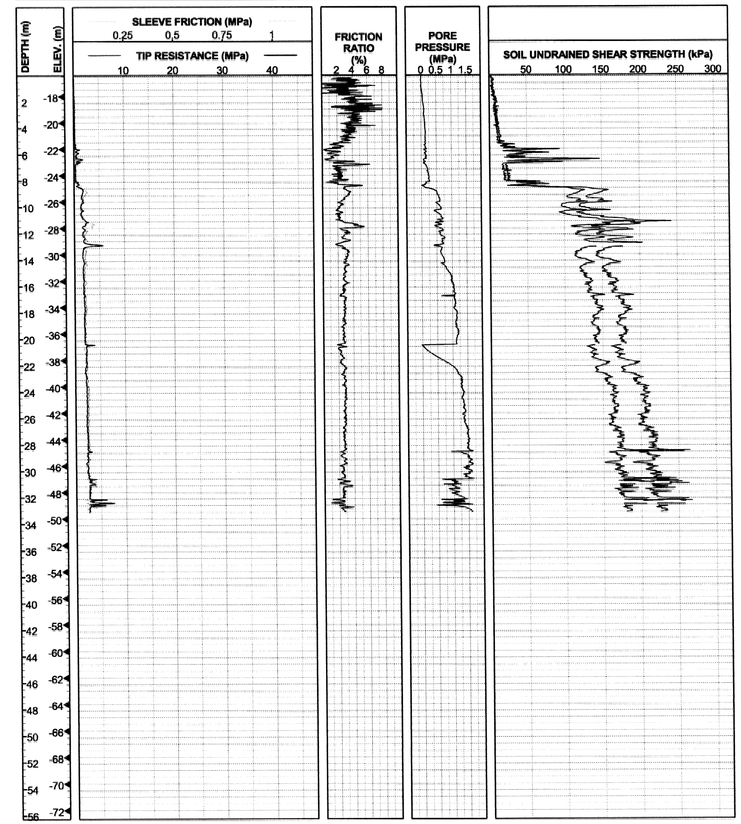
STATION: 1.6 m Left of "W" Stn. 60+39
COMPLETION ELEVATION: -54.8m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



CPT 00C-23

COORDINATES: E1836602 N647720
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -16.4m (MSL)
START DATE: 09/30/00

STATION: 0.9 m Right of "E" Stn. 60+39
COMPLETION ELEVATION: -49.5m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1189	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

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Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

NOTES:

1. Pore pressures are relative to hydrostatic pressure at the mudline.
2. Breaks in the data are due to pauses in the sounding during installation of casing.

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	566	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 23

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet 32 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT

DRAWN BY S.DESHPANDE
CHECKED BY A. BROUGHTON

P.ROBINS — FIELD INVESTIGATOR
DATE See above

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

T.W.McNEILAN — PROJECT ENGINEER

BRIDGE NO. 34-0006R/L
KM POST 13.2/13.9
POST MILE 8.2/8.7
CU 04
EA 0120F1

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 23

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 772 OF

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1190	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

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Metric

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 76mm-OD, 60mm-ID Modified California Liner
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- 63.5mm-OD, 54mm-ID Offshore Liner
- Rock Core (Inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (kN/m³)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT +---------+ LIQUID LIMIT
- ⊗ EQUIVALENT SPT BLOW COUNT
- ···· ROCK QUALITY DESIGNATION (RQD)
- —— ROCK RECOVERY PERCENT
- — ROCK CORING RATE

STRENGTH TESTS

- ● POCKET PENETROMETER
- ◆ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (⊗ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
- ⊠ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- \+ Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- ● POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ⊕ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- —— FRACTURE DENSITY (ROCK)

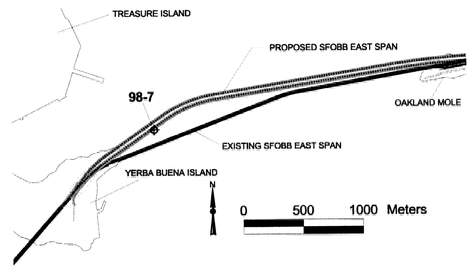
STRENGTH OF COHESIVE SOILS

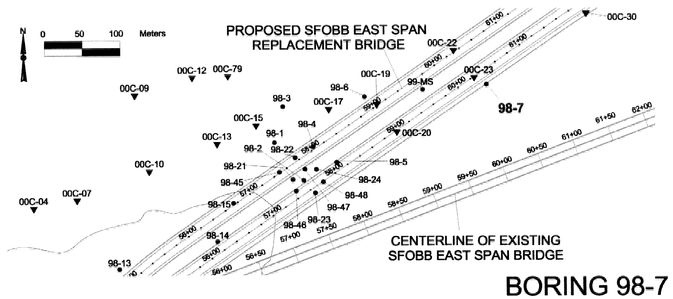
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

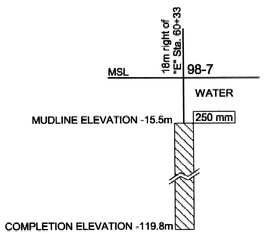
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.





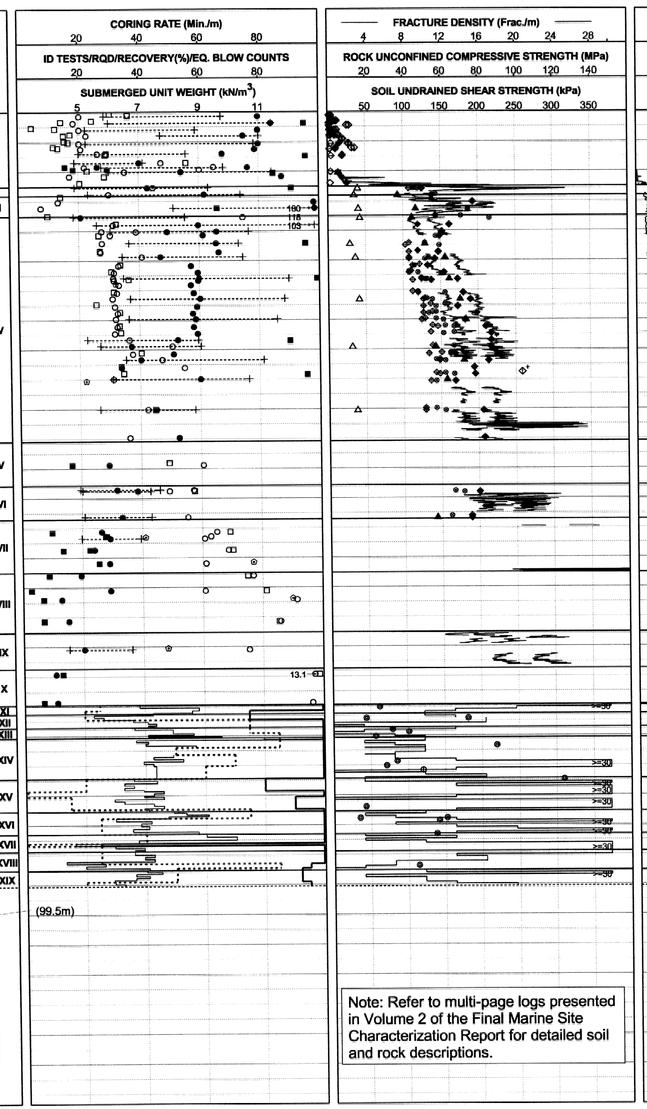


03/11/98

BORING 98-7

Coordinates: E1836618 N647712
CA State Plane Zone 3, NAD83, Meters

ELEVATION (m)	DEPTH (m)	BLOW COUNT	MATERIAL DESCRIPTION	STRATUM NO.
			MUDLINE ELEVATION: -15.5m (MSL)	
		WOH WOH WOH WOH WOH WOH WOH 4/60cm PUSH	Fat CLAY (CH), very soft to soft, olive gray (10.1m)	I
		PUSH PUSH	Fat CLAY (CH), very stiff, greenish gray to grayish green -olive gray with organic pockets at, 11.1m (11.3m)	II
		PUSH PUSH PUSH PUSH SAVE	Sandy organic CLAY (OH), very stiff, mottled with brown and gray, with an organic odor (14.0m)	III
		PUSH PUSH PUSH PUSH 43/45cm 32 PUSH PUSH PUSH PUSH PUSH PUSH PUSH PUSH PUSH PUSH 22 PUSH SAVE PUSH	Fat CLAY (CH), very stiff to hard, gray -with a sand layer at 14.0m -greenish gray, expansive, desiccated and with a few silt pockets and gas blisters, to 15.5m -with shell fragments and shells, below 15.5m -with silt partings, 16.5m to 18.0m -expansive and with gas blisters, 17.4m to 22.6m -with mica flakes, 19.2m to 29.0m -with silt pockets at 19.5m -with a few silt pockets and partings, at 23.2m -with sand pockets and partings, below 23.8m -with many shells at 29.9m -with sand seams, 33.8m to 36.6m -with shell fragments at 36.0m -with sand layers, 36.6m to 37.2m -with a very dense sand layer, 38.4m to 38.7m -with a few shell fragments and mica flakes, below 39.6m -with sand seams, 41.5m to 42.7m (44.3m)	IV
		PUSH	Silty fine to medium SAND (SM),dense, gray (50.3m)	V
		PUSH	Lean CLAY (CL), hard, gray (54.9m)	VI
		PUSH 30/20cm 41 30/25cm 77 30/25cm 30/5cm 90	Silty fine SAND (SM), dense, gray to dark gray -with a clay layer, 55.6m to 55.9m -with a lean clay layer, 57.2m to 57.5m -clay layer with organic partings, below 61.6m (62.0m)	VII
			Fine to medium SAND (SP), with coarse sand, silt and a trace of fine gravel, very dense, gray (70.1m)	VIII
		65/30cm 48	Lean CLAY (CL), hard, gray (75.0m)	IX
		63/30cm 85/45cm 82/55cm	Medium to coarse SAND (SW), with silt and fine gravel, very dense, gray (79.9m)	X
		100-25 75-20 100-75 100-85 100-85 100-50 100-70 100-60	SANDSTONE (Graywacke) (RX), medium gray, slightly weathered to fresh, hard, intensely to moderately fractured (81.1m)	XI XII XIII
			SANDSTONE (Graywacke) (RX) with thinly interbedded SILTSTONE (RX) [5:1], dark gray, fresh, moderately hard to hard, moderately fractured (82.9m)	XIV
		80-20 100-0 90-15	SILTSTONE (RX) interbedded with SANDSTONE (Graywacke) (RX) [3:1], fresh, intensely to slightly fractured (84.3m)	XV
		100-75 100-25	SANDSTONE (Graywacke) (RX) with interbedded SILTSTONE (RX) [1:1], medium gray, slightly weathered to fresh, hard (89.8m)	XVI
		100-40 25-0 100-25	SILTSTONE (Graywacke) (RX) with thinly interbedded SANDSTONE (Graywacke) (RX) [5:1], dark gray, slightly weathered, moderately hard, intensely to moderately fractured (94.2m)	XVII
		95-85 92-50 95-20	SANDSTONE (Graywacke) (RX) with thinly interbedded SILTSTONE (RX) [4:1], medium gray, fresh, hard, moderately fractured (97.2m)	XVIII
			SILTSTONE (RX), dark gray, fresh, hard, slightly to moderately fractured (99.5m)	XIX
			SANDSTONE (Graywacke) (RX) with thinly interbedded SILTSTONE (RX) [2:1], medium gray to dark gray, fresh, hard, fine grained, moderately to intensely fractured (102.1m)	
			SILTSTONE (RX)with highly interbedded SANDSTONE (Graywacke) (RX) [5:1], dark gray, fresh, moderately hard, moderately to intensely fractured	
			TOTAL DEPTH: 104.2m BACKFILLED WITH: Cement Grout	



Note: Refer to multi-page logs presented in Volume 2 of the Final Marine Site Characterization Report for detailed soil and rock descriptions.

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	567	821

PROFESSIONAL ENGINEER — DATE 07-28-11

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 24

CU 04
EA 0120T1

BRIDGE No. 33-0025
Sheet 33 of 87

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA TO ACCOMPANY PLANS DATED 2-21-12

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 24

SABA MOHAN, GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY: SACHIN DESHPANDE	J. CHACKO, M. ZUEGER, M. SEBESTA, FIELD INVESTIGATOR	T.W.McNEILAN, PROJECT ENGINEER
S. Mohan	CHECKED BY: A.RIDGWAY	DATE: SEE ABOVE	

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

BRIDGE NO.	KM POST	POST MILE
34-0006L/R	13.2/13.9	8.2/8.7

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY) SHEET 773 OF

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1191	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8933, FAX (510) 562- 8858

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Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

Metric

SOIL AND ROCK TYPES

Well graded GRAVEL (GW)
Poorly graded GRAVEL (GP)
GRAVEL with sand (GP or GW)
GRAVEL with clay (GP or GW)
Clayey GRAVEL (GC)
GRAVEL with silt (GP or GW)
Silty GRAVEL (GM)
Well graded SAND (SW)
Poorly graded SAND (SP)
SAND with gravel (SP or SW)
SAND with clay (SP-SC)
Clayey SAND (SC)
Silty SAND (SM)
SAND with silt (SP-SM)
Fat CLAY (CH)
Sandy fat CLAY (CH)
Lean CLAY (CL)
Sandy lean CLAY (CL)
Silty CLAY (CL-ML)
Elastic SILT (MH)
SILT (ML)
Sandy SILT (ML)
Clayey silt (ML/CL)
Highly plastic ORGANICS (OH)
Low plasticity ORGANICS (OL)
SANDSTONE (Rx)
SILTSTONE (Rx)
CLAYSTONE (Rx)
Interbedded Rock Strata (Rx)
CONGLOMERATE (Rx)

SAMPLERS

76mm-OD, 72mm-ID Thin Walled Tube
57mm-OD, 54mm-ID* Thin Walled Driven Tube
63.5mm-OD, 54mm-ID Offshore Liner
76mm-OD, 60mm-ID Modified California Liner
51mm-OD, 35mm-ID SPT Split Spoon Sampler
Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH — Offshore Liner sample advanced with the weight of an 80 kg hammer.

PUSH or SAVE — Pushed thin-walled 76mm-OD-tube.

15/60cm — Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20 — Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.

86/28cm — Number of blows required to produce the indicated penetration after an initial 15 cm seating.

Ref/8cm — 50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

■ PERCENT PASSING #200 SIEVE
● WATER CONTENT (%)
□ SUBMERGED UNIT WEIGHT (kN/m³)
○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
PLASTIC LIMIT LIQUID LIMIT
⊗ EQUIVALENT SPT BLOW COUNT

STRENGTH TESTS

● POCKET PENETROMETER
◆ TORVANE
◇ REMOTE VANE
◆ MINIATURE VANE (◇ RESIDUAL VANE)
▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
▼ SWEDISH FALL CONE
⊠ UNCONFINED COMPRESSION (SOIL)
◇△ (Open symbols indicate remolded tests)
+ Soil: Strength Exceeds Capacity of Measuring Device
Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)

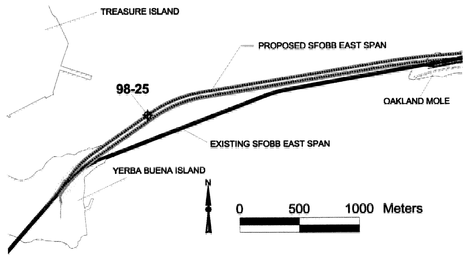
STRENGTH OF COHESIVE SOILS

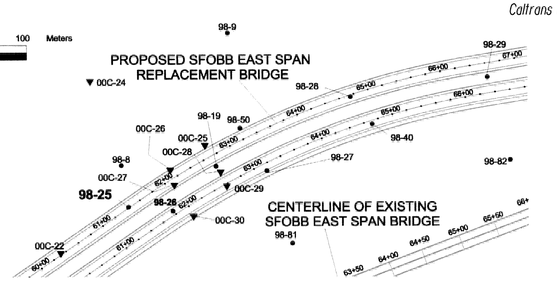
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

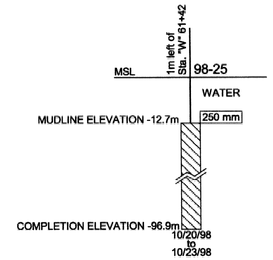
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.





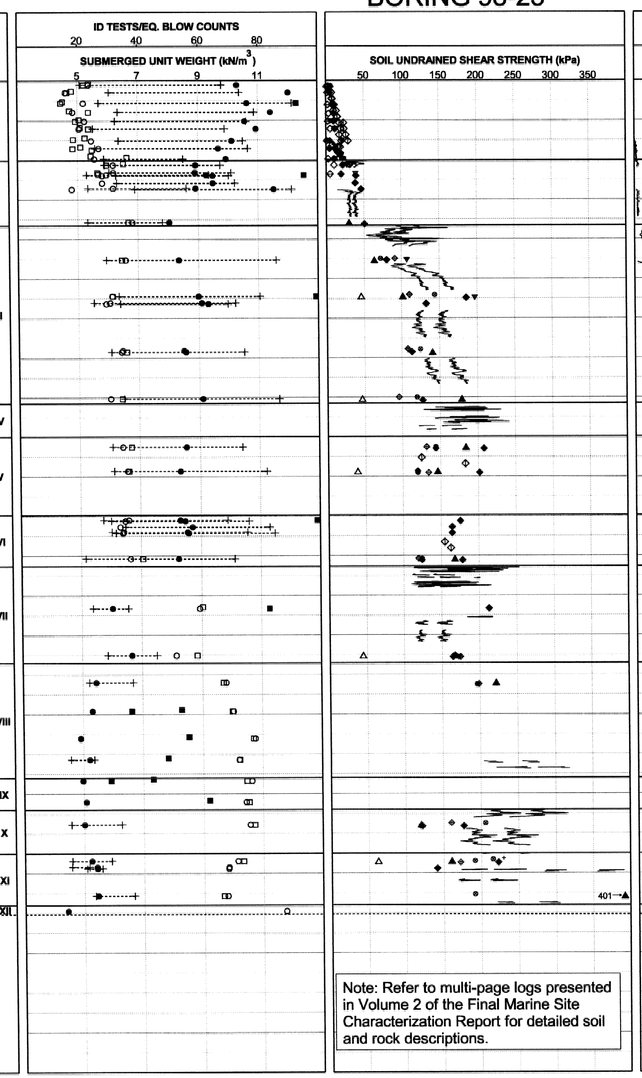


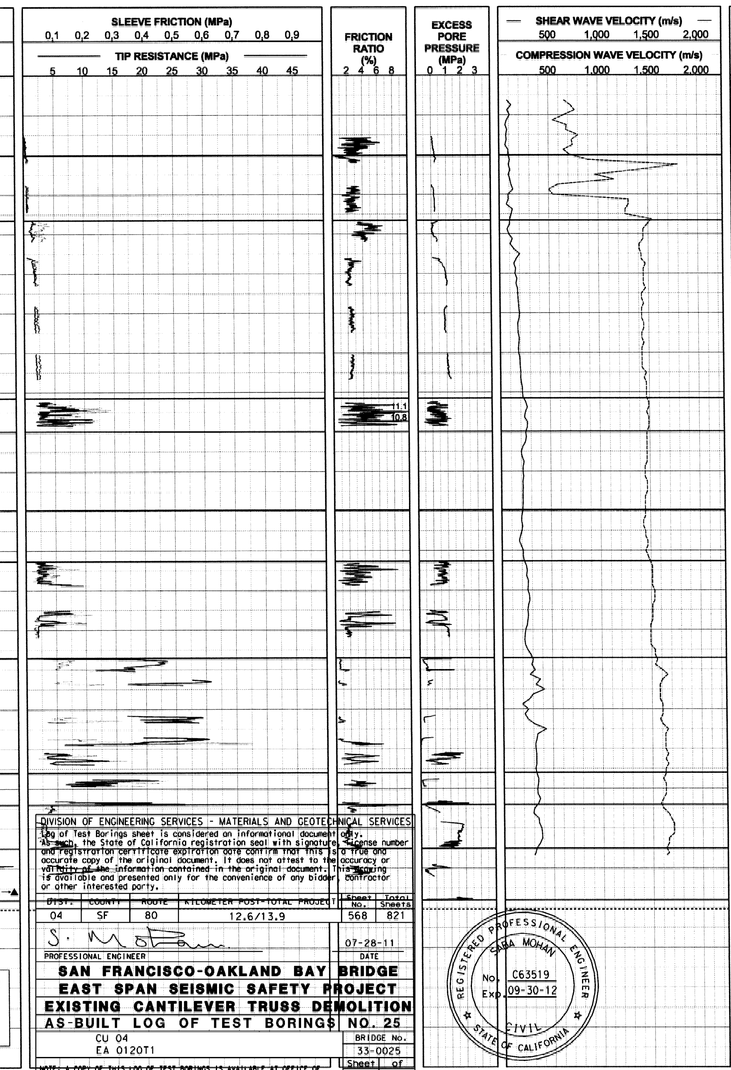
BORING 98-25

Coordinates: E1836666 N647819
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -12.7m (MSL)

BLOW COUNT	MATERIAL DESCRIPTION	STR. NO.
WOH	Fat CLAY (CH), very soft to soft, olive gray (8.1m)	I
WOH, SAVE	Fat CLAY (CH), firm, gray -with shell fragments -with silt pockets and many sand pockets, at 9.1m -platy, 9.1m to 11.0m -with organic pockets at 11.0m (14.6m)	II
PUSH, 26/30cm	-with organic pockets, at 14.3m -intermixed sand and clay, below 14.3m Fat CLAY (CH), stiff to very stiff, greenish gray	III
PUSH, SAVE	-with silt partings and gas blisters, 21.3m to 27.4m	
PUSH	-with silt pockets, silt seams and shell fragments, at 27.1m (32.6m)	
PUSH	-with silty sand pockets, shell fragments and slickensides, at 32.0m	
	Fat CLAY (CH), very stiff, greenish gray -with dense, silty fine sand layers (36.0m)	IV
PUSH	Fat CLAY (CH), very stiff, greenish gray	V
PUSH	-with silt pockets, silty sand seams and shell fragments, at 36.9m -with silty sand pockets and seams, and shell fragments, at 39.5m -interlayered dense, silty fine sand and very stiff clay, 40.2m to 42.7m (43.9m)	
SAVE, SAVE, SAVE	Fat CLAY (CH), very stiff, greenish gray	VI
PUSH	-with organic pockets, and silt pockets and partings, at 48.2m (49.1m)	
PUSH	Lean CLAY (CL), very stiff, greenish gray -interlayered, lean clay, silty sand and sandy silt to 55.5m -with sand seams, 49.4m to 51.2m -clay with many silt pockets, partings and seams, at 53.0m	VII
PUSH	-with silty sand partings, organic pockets, a few shells, and shell fragments, at 57.9m (58.8m)	
PUSH, 30/30cm, 30/30cm, 30/30cm, 30/30cm	Silty Fine SAND (SM), very dense, gray -lean clay layer with fine to medium sand and wood pockets, 60.4m to 61.0m (70.4m)	VIII
30/25cm	Silty Fine SAND (SM), very dense, dark gray -with clay layers at 71.3m, 71.6m, and 71.8m (73.6m)	IX
PUSH	Lean CLAY (CL), hard, dark greenish gray -with organic pockets and calcareous nodules, at 75.0m (78.0m)	X
PUSH, SAVE	-sandy silt below 77.4m Lean CLAY (CL), hard, greenish gray -silty sand layer, 79.9m to 80.6m (83.2m)	XI
PUSH, 50/5cm, 50/5cm, 50/5cm	SANDSTONE (Graywacke) (Rx), soft, intensely weathered, intensely fractured to decomposed TOTAL DEPTH: 84.2m BACKFILLED WITH: Cement Grout	XII





Note: Refer to multi-page logs presented in Volume 2 of the Final Marine Site Characterization Report for detailed soil and rock descriptions.

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES
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DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	568	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 25

CU 04
EA 0120T1
BRIDGE No. 33-0025
Sheet 34 of 87

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN
GEOTECHNICAL DESIGN OVERSIGHT

DRAWN BY: SACHIN DESHPANDE
CHECKED BY: T. MCADAM

P. ROBBINS, C. LAVATO, R. HOWARD
FIELD INVESTIGATOR
DATE SEE ABOVE

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

T.W.McNEILAN
PROJECT ENGINEER

BRIDGE NO. 34-0006
KM POST 13.2/13.9
POST MILE 8.2/8.7

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 25

DISREGARD PRINTS BEARING EARLIER REVISION DATES →
REVISION DATES (PRELIMINARY STAGE ONLY)
SHEET 774 OF

FILENAME => 33-0025-p-ltb25_746.tif

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1192	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

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Metric

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (kN/m³)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT + LIQUID LIMIT +
- ⊛ EQUIVALENT SPT BLOW COUNT
- ---- ROCK QUALITY DESIGNATION (RQD)
- —— ROCK RECOVERY PERCENT
- —— ROCK CORING RATE

STRENGTH TESTS

- ● POCKET PENETROMETER
- ◆ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (⊗ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
- ⊠ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- \+ Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- ● POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ⊙ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- —— FRACTURE DENSITY (ROCK)

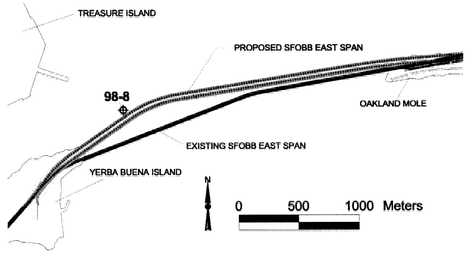
STRENGTH OF COHESIVE SOILS

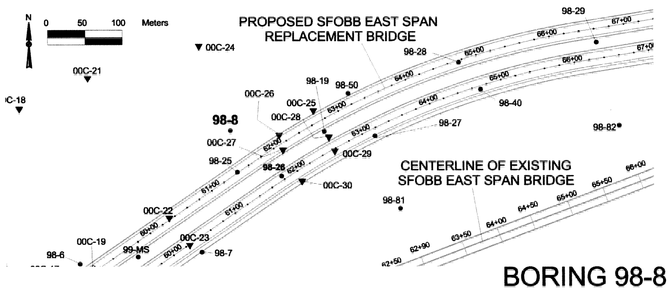
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

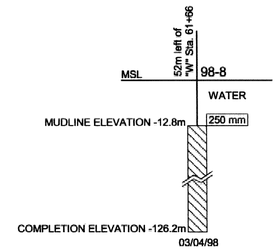
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







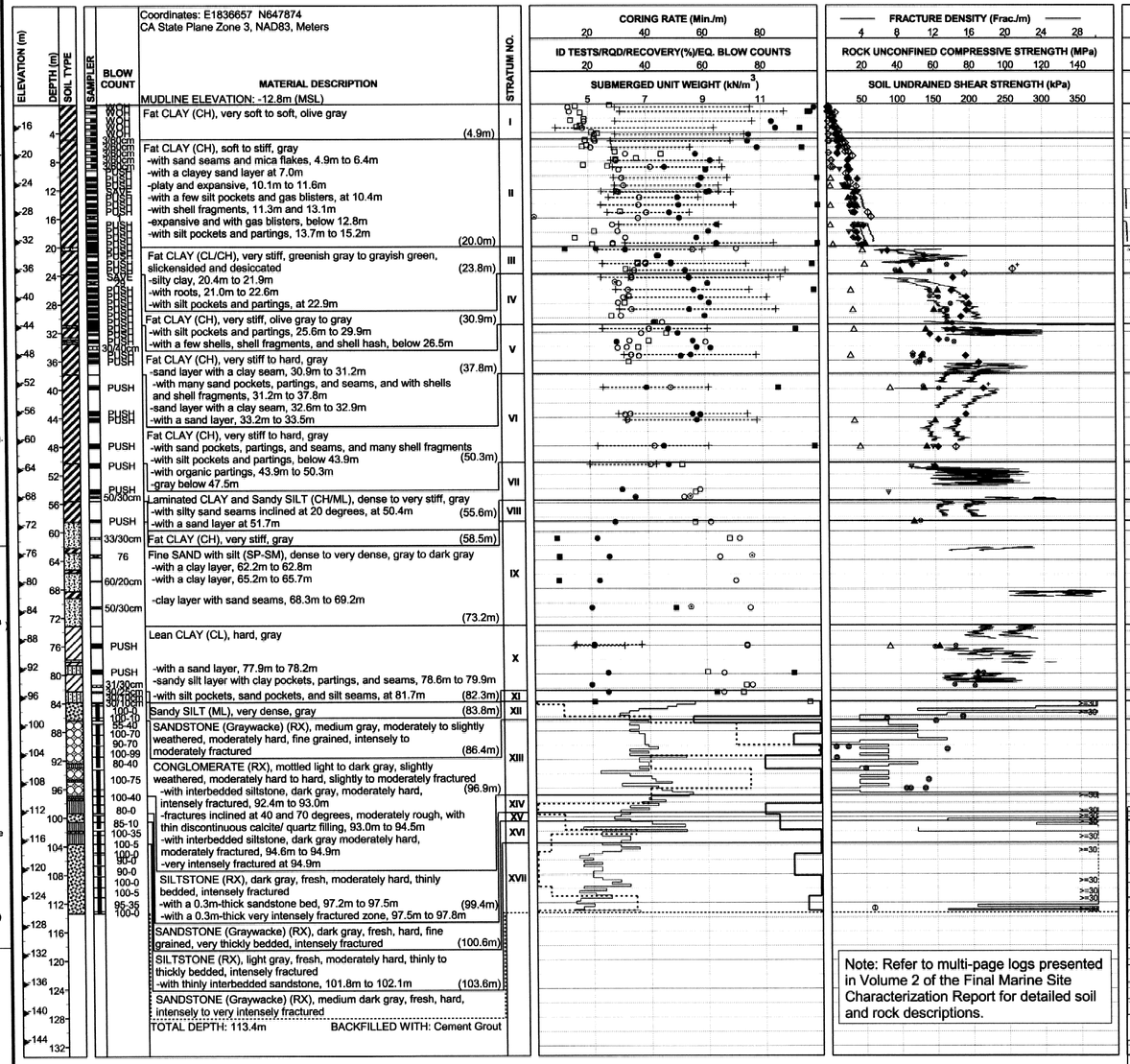
BORING 98-8

Coordinates: E1836657 N647874
CA State Plane Zone 3, NAD83, Meters

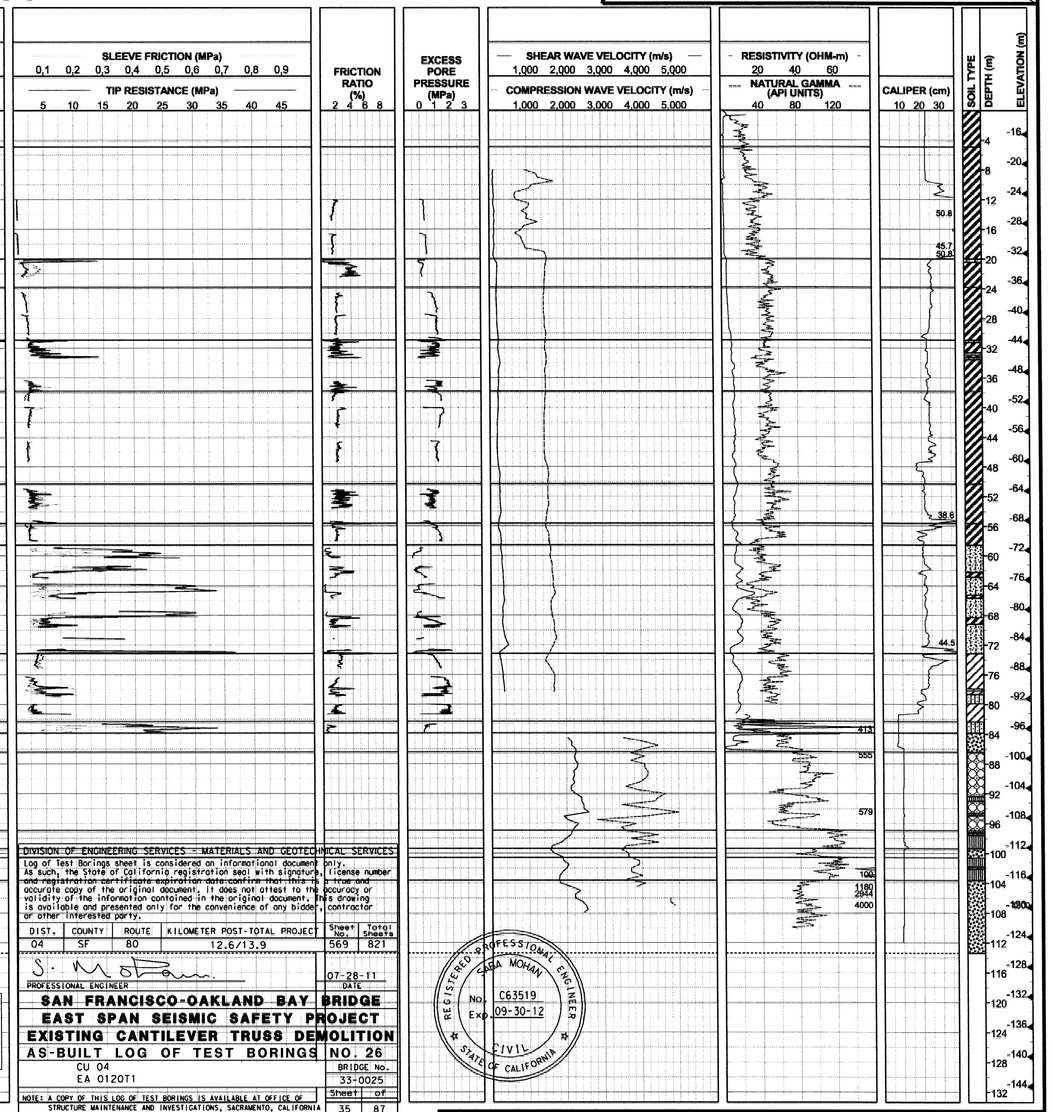
MUDLINE ELEVATION: -12.8m (MSL)

Material Description	Stratum No.
Fat CLAY (CH), very soft to soft, olive gray (4.9m)	I
Fat CLAY (CH), soft to stiff, gray -with sand seams and mica flakes, 4.9m to 6.4m -with a clayey sand layer at 7.0m -platy and expansive, 10.1m to 11.6m -with a few silt pockets and gas blisters, at 10.4m -with shell fragments, 11.3m and 13.1m -expansive and with gas blisters, below 12.8m -with silt pockets and partings, 13.7m to 15.2m (20.0m)	II
Fat CLAY (CL/CH), very stiff, greenish gray to grayish green, slickensided and desiccated (23.8m) -silty clay, 20.4m to 21.9m -with roots, 21.0m to 22.6m -with silt pockets and partings, at 22.9m	III
Fat CLAY (CH), very stiff, olive gray to gray (30.9m) -with silt pockets and partings, 25.6m to 29.9m -with a few shells, shell fragments, and shell hash, below 26.5m	IV
Fat CLAY (CH), very stiff to hard, gray (37.8m) -sand layer with a clay seam, 30.9m to 31.2m -with many sand pockets, partings, and seams, and with shells and shell fragments, 31.2m to 37.8m -sand layer with a clay seam, 32.6m to 32.9m -with a sand layer, 33.2m to 33.5m	V, VI
Fat CLAY (CH), very stiff to hard, gray -with sand pockets, partings, and seams, and many shell fragments -with silt pockets and partings, below 43.9m (50.3m) -with organic partings, 43.9m to 50.3m -gray below 47.5m	VI, VII
Laminated CLAY and Sandy SILT (CH/ML), dense to very stiff, gray -with silty sand seams inclined at 20 degrees, at 50.4m (55.6m) -with a sand layer at 51.7m	VII, VIII
Fat CLAY (CH), very stiff, gray (58.5m)	VIII
Fine SAND with silt (SP-SM), dense to very dense, gray to dark gray -with a clay layer, 62.2m to 62.8m -with a clay layer, 65.2m to 65.7m -clay layer with sand seams, 68.3m to 69.2m (73.2m)	IX
Lean CLAY (CL), hard, gray -with a sand layer, 77.9m to 78.2m -sandy silt layer with clay pockets, partings, and seams, 78.6m to 79.9m -with silt pockets, sand pockets, and silt seams, at 81.7m (82.3m)	X, XI
Sandy SILT (ML), very dense, gray (83.8m)	XII
SANDSTONE (Graywacke) (RX), medium gray, moderately to slightly weathered, moderately hard, fine grained, intensely to moderately fractured (86.4m)	XIII
CONGLOMERATE (RX), mottled light to dark gray, slightly weathered, moderately hard to hard, slightly to moderately fractured (96.9m) -with interbedded siltstone, dark gray, moderately hard, intensely fractured, 92.4m to 93.0m -fractures inclined at 40 and 70 degrees, moderately rough, with thin discontinuous calcite/ quartz filling, 93.0m to 94.5m -with interbedded siltstone, dark gray moderately hard, moderately fractured, 94.6m to 94.9m -very intensely fractured at 94.9m	XIV, XV, XVI
SILTSTONE (RX), dark gray, fresh, moderately hard, thinly bedded, intensely fractured -with a 0.3m-thick sandstone bed, 97.2m to 97.5m (99.4m) -with a 0.3m-thick very intensely fractured zone, 97.5m to 97.8m	XVI, XVII
SANDSTONE (Graywacke) (RX), dark gray, fresh, hard, fine grained, very thickly bedded, intensely fractured (100.6m)	XVII
SILTSTONE (RX), light gray, fresh, moderately hard, thinly to thickly bedded, intensely fractured -with thinly interbedded sandstone, 101.8m to 102.1m (103.6m)	XVII
SANDSTONE (Graywacke) (RX), medium dark gray, fresh, hard, intensely to very intensely fractured	XVII

TOTAL DEPTH: 113.4m BACKFILLED WITH: Cement Grout



Note: Refer to multi-page logs presented in Volume 2 of the Final Marine Site Characterization Report for detailed soil and rock descriptions.



DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	569	821

PROFESSIONAL ENGINEER — DATE 07-28-11

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 26

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet 35 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT

DRAWN BY: SACHIN DESHPANDE
CHECKED BY: T. MCADAM

J.CHACKO, M.ZUEGER — FIELD INVESTIGATOR
DATE See above

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

T.W.McNEILAN — PROJECT ENGINEER

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

BRIDGE NO.	KM POST	POST MILE
34-0006L/R	13.2/13.9	8.2/8.7

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 26

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 775 OF

FILENAME => 33-0025-p-ltb26_747.tif

Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1193	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

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SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (kN/m³)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT LIQUID LIMIT
- ⊗ EQUIVALENT SPT BLOW COUNT

STRENGTH TESTS

- POCKET PENETROMETER
- TORVANE
- REMOTE VANE
- MINIATURE VANE (⊗ RESIDUAL VANE)
- UNCONSOLIDATED UNDRAINED TRIAXIAL
- SWEDISH FALL CONE
- UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- \+ Soil: Strength Exceeds Capacity of Measuring Device
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)

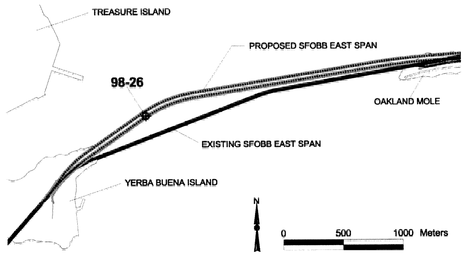
STRENGTH OF COHESIVE SOILS

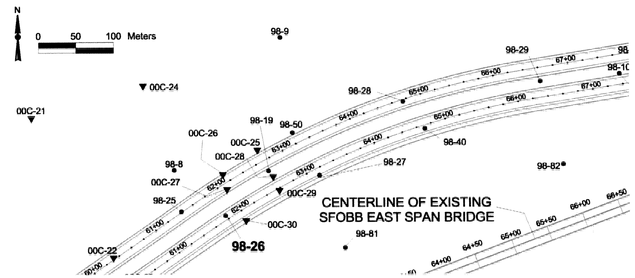
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

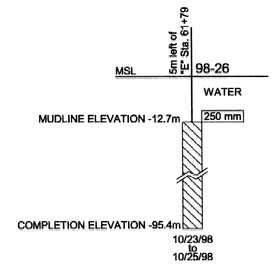
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







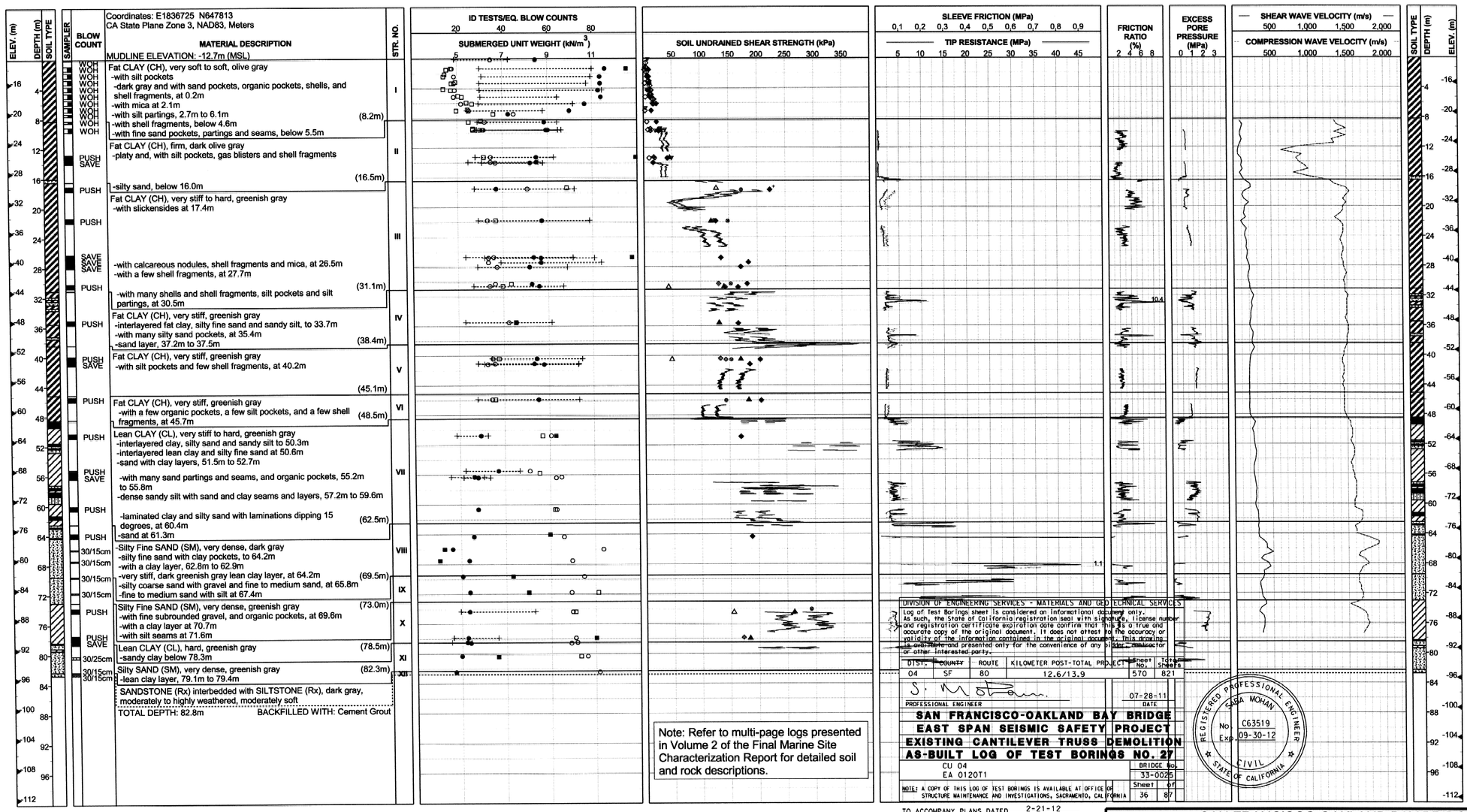
BORING 98-26

Coordinates: E1836725 N647813
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -12.7m (MSL)

BLOW COUNT	MATERIAL DESCRIPTION	STR. NO.
WOH, WOH, WOH, WOH, WOH, WOH, WOH, WOH, WOH	Fat CLAY (CH), very soft to soft, olive gray -with silt pockets -dark gray and with sand pockets, organic pockets, shells, and shell fragments, at 0.2m -with mica at 2.1m -with silt partings, 2.7m to 6.1m -with shell fragments, below 4.6m -with fine sand pockets, partings and seams, below 5.5m (8.2m)	I
PUSH, SAVE	Fat CLAY (CH), firm, dark olive gray -platy and, with silt pockets, gas blisters and shell fragments -silty sand, below 16.0m (16.5m)	II
PUSH, PUSH, SAVE, SAVE, SAVE, PUSH	Fat CLAY (CH), very stiff to hard, greenish gray -with slickensides at 17.4m -with calcareous nodules, shell fragments and mica, at 26.5m -with a few shell fragments, at 27.7m -with many shells and shell fragments, silt pockets and silt partings, at 30.5m (31.1m)	III
PUSH	Fat CLAY (CH), very stiff, greenish gray -interlayered fat clay, silty fine sand and sandy silt, to 33.7m -with many silty sand pockets, at 35.4m -sand layer, 37.2m to 37.5m (38.4m)	IV
PUSH, SAVE	Fat CLAY (CH), very stiff, greenish gray -with silt pockets and few shell fragments, at 40.2m (45.1m)	V
PUSH	Fat CLAY (CH), very stiff, greenish gray -with a few organic pockets, a few silt pockets, and a few shell fragments, at 45.7m (48.5m)	VI
PUSH, PUSH, SAVE, PUSH	Lean CLAY (CL), very stiff to hard, greenish gray -interlayered clay, silty sand and sandy silt to 50.3m -interlayered lean clay and silty fine sand at 50.6m -sand with clay layers, 51.5m to 52.7m -with many sand partings and seams, and organic pockets, 55.2m to 55.8m -dense sandy silt with sand and clay seams and layers, 57.2m to 59.6m -laminated clay and silty sand with laminations dipping 15 degrees, at 60.4m -sand at 61.3m (62.5m)	VII
PUSH, 30/15cm, 30/15cm, 30/15cm, 30/15cm	Silty Fine SAND (SM), very dense, dark gray -silty fine sand with clay pockets, to 64.2m -with a clay layer, 62.8m to 62.9m -very stiff, dark greenish gray lean clay layer, at 64.2m -silty coarse sand with gravel and fine to medium sand, at 65.8m -fine to medium sand with silt at 67.4m (69.5m)	VIII
PUSH, SAVE	Silty Fine SAND (SM), very dense, greenish gray -with fine subrounded gravel, and organic pockets, at 69.6m -with a clay layer at 70.7m -with silt seams at 71.6m (73.0m)	IX
30/25cm	Lean CLAY (CL), hard, greenish gray -sandy clay below 78.3m (78.5m)	X
30/15cm, 30/15cm	Silty SAND (SM), very dense, greenish gray -lean clay layer, 79.1m to 79.4m (82.3m)	XI
	SANDSTONE (Rx) interbedded with SILTSTONE (Rx), dark gray, moderately to highly weathered, moderately soft	XII

TOTAL DEPTH: 82.8m BACKFILLED WITH: Cement Grout



Note: Refer to multi-page logs presented in Volume 2 of the Final Marine Site Characterization Report for detailed soil and rock descriptions.

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES
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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	570	821

PROFESSIONAL ENGINEER — DATE 07-28-11

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 27

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet 36 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 27

SABA MOHAN, GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY: SACHIN DESHPANDE	P. ROBBINS, C. LAVATO, R. HOWARD, FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
	CHECKED BY: T. MCADAM	DATE: SEE ABOVE	

T.W.McNEILAN, PROJECT ENGINEER

BRIDGE NO. 34-0006L/R
KM POST 13.2/13.9
POST MILE 8.2/8.7

CU 04
EA 0120F1

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 776 OF

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1194	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
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7700, Edgewater Dr., Ste. 846,
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SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- PAVEMENT

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 76mm-OD, 60mm-ID Modified California Liner
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- 63.5mm-OD, 54mm-ID Offshore Liner
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

STANDARD PENETRATION TEST (SPT) AND MODIFIED CALIFORNIA (MC) LINER SAMPLERS

Samplers were driven with a 63.5 kg hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (kN/m^3)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m^3)
- PLASTIC LIMIT + LIQUID LIMIT +
- ⊗ EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- ROCK QUALITY DESIGNATION (RQD)
- ROCK RECOVERY PERCENT
- ROCK CORING RATE

STRENGTH TESTS

- POCKET PENETROMETER
- TORVANE
- REMOTE VANE
- MINIATURE VANE (⊗ RESIDUAL VANE)
- UNCONSOLIDATED UNDRAINED TRIAXIAL
- SWEDISH FALL CONE
- UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- UNCONFINED COMPRESSION (ROCK)
- Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- FRACTURE DENSITY (ROCK)

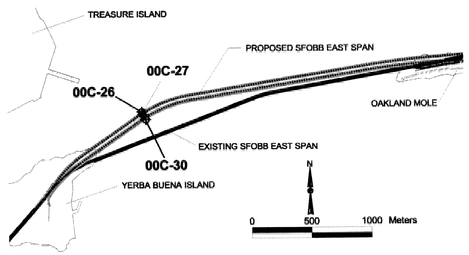
STRENGTH OF COHESIVE SOILS

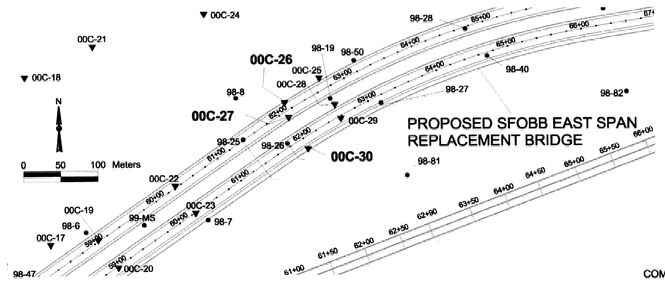
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

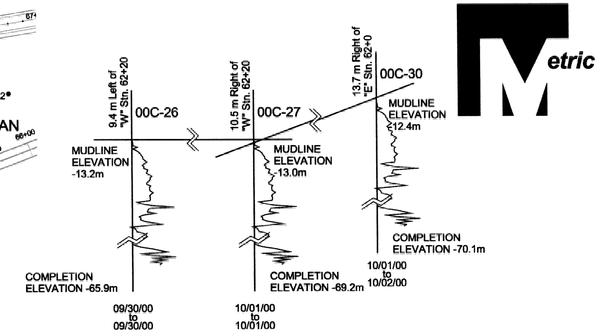
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







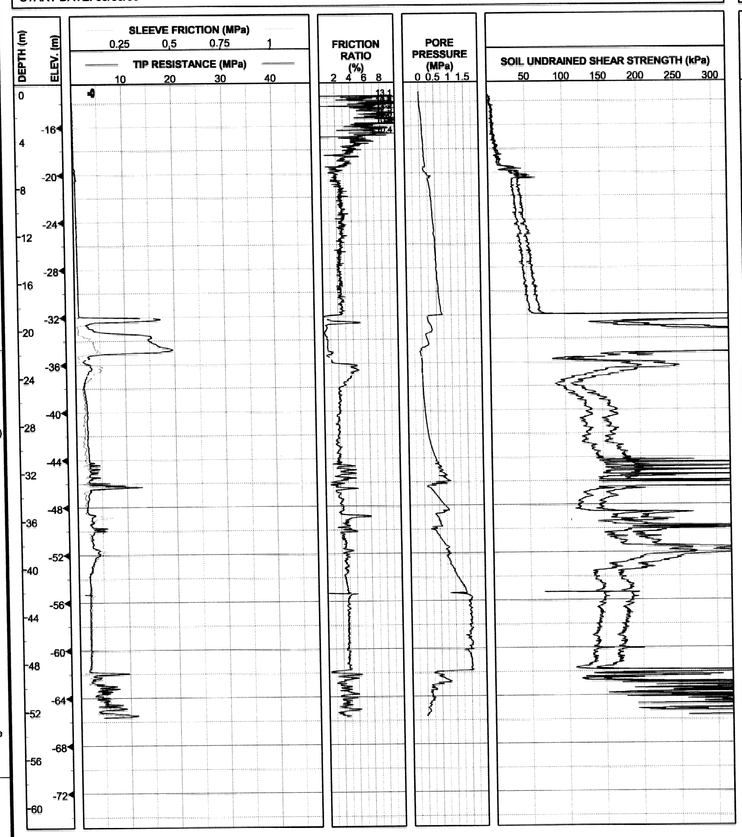
Metric

NOTES:
1. Pore pressures are relative to hydrostatic pressure at the mudline.
2. Breaks in the data are due to pauses in the sounding during installation of casing.

CPT 00C-26

COORDINATES: E1836721 N647867
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -13.2m (MSL)
START DATE: 09/30/00

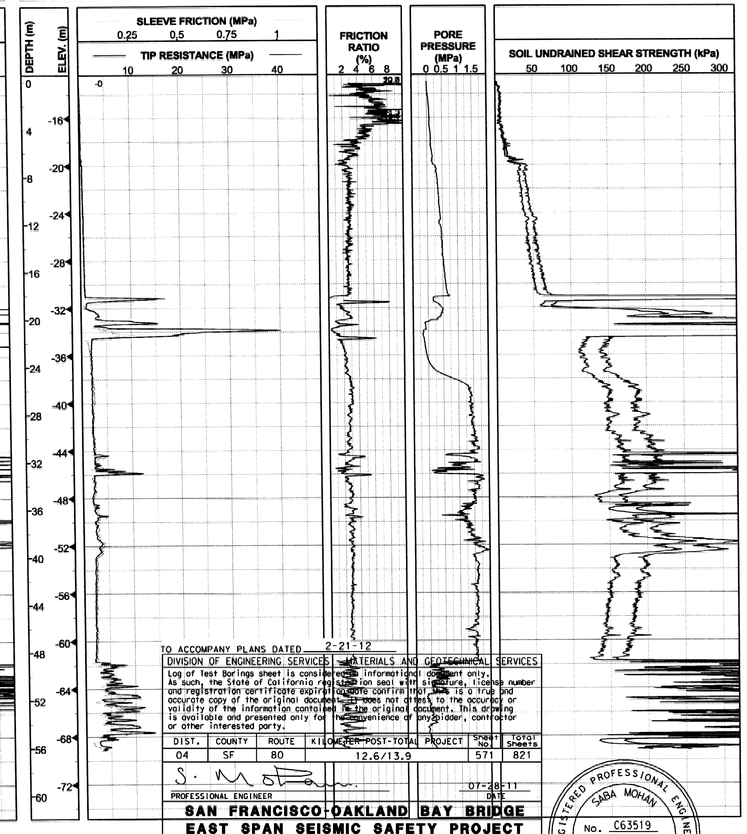
STATION: 9.4 m Left of "W" Stn. 62+20
COMPLETION ELEVATION: -65.9m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



CPT 00C-27

COORDINATES: E1836727 N647847
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -13.0m (MSL)
START DATE: 10/01/00

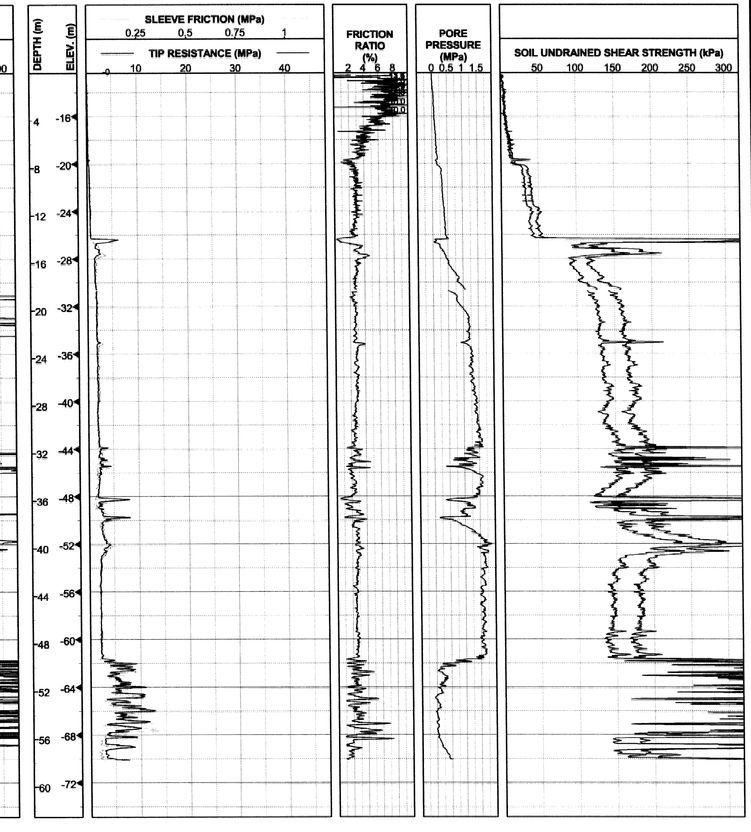
STATION: 10.5 m Right of "W" Stn. 62+20
COMPLETION ELEVATION: -69.2m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



CPT 00C-30

COORDINATES: E1836752 N647805
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -12.4m (MSL)
START DATE: 10/01/00

STATION: 13.7 m Right of "E" Stn. 62+0
COMPLETION ELEVATION: -70.1m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



TO ACCOMPANY PLANS DATED 2-21-12
DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	571	821

S. Mohan — PROFESSIONAL ENGINEER — 07-28-11 DATE

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 28

CU 04
EA 0120T1

BRIDGE No. 33-0025
Sheet 37 of 87

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT — S. Mohan
DRAWN BY S.DESHPANDE
CHECKED BY T. MCADAM
P.ROBINS — FIELD INVESTIGATOR
DATE SEE ABOVE

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

T.W.McNEILAN — PROJECT ENGINEER

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

BRIDGE NO. 34-0006L/R
KM POST 13.2/13.9
POST MILE 8.2/8.7

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 28

DISREGARD PRINTS BEARING EARLIER REVISION DATES →
REVISION DATES (PRELIMINARY STAGE ONLY)
SHEET 777 OF

FILENAME => 33-0025-p-ltb28_749.tif

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1195	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

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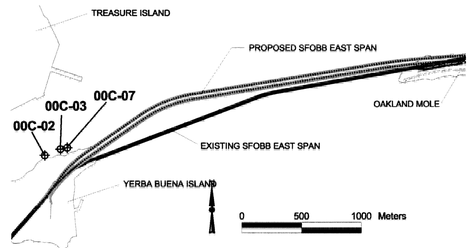
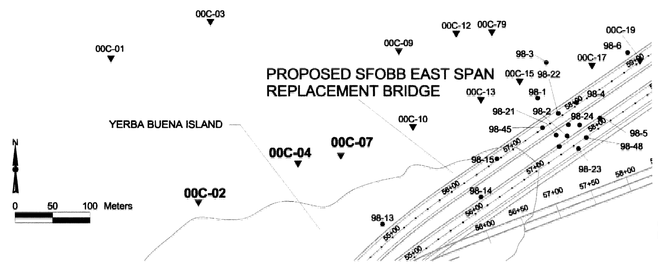
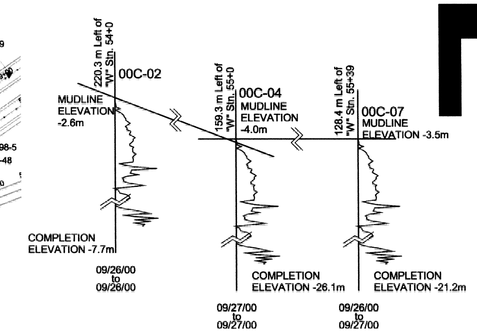






NOTES:

1. Pore pressures are relative to hydrostatic pressure at the mudline.
2. Breaks in the data are due to pauses in the sounding during installation of casing.

SOIL AND ROCK TYPES

Well graded GRAVEL (GW)
Poorly graded GRAVEL (GP)
GRAVEL with sand (GP or GW)
GRAVEL with clay (GP or GW)
Clayey GRAVEL (GC)
GRAVEL with silt (GP or GW)
Silty GRAVEL (GM)
Well graded SAND (SW)
Poorly graded SAND (SP)
SAND with gravel (SP or SW)
SAND with clay (SP-SC)
Clayey SAND (SC)
Silty SAND (SM)
SAND with silt (SP-SM)
Fat CLAY (CH)
Sandy fat CLAY (CH)
Lean CLAY (CL)
Sandy lean CLAY (CL)
Silty CLAY (CL-ML)
Elastic SILT (MH)
SILT (ML)
Sandy SILT (ML)
Clayey silt (ML/CL)
Highly plastic ORGANICS (OH)
Low plasticity ORGANICS (OL)
SANDSTONE (Rx)
SILTSTONE (Rx)
CLAYSTONE (Rx)
Interbedded Rock Strata (Rx)
PAVEMENT

SAMPLERS

76mm-OD, 72mm-ID Thin Walled Tube
57mm-OD, 54mm-ID* Thin Walled Driven Tube
63.5mm-OD, 54mm-ID Offshore Liner
76mm-OD, 60mm-ID Modified California Liner
51mm-OD, 35mm-ID SPT Split Spoon Sampler
Rock Core (Inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

STANDARD PENETRATION TEST (SPT) AND MODIFIED CALIFORNIA (MC) LINER SAMPLERS

Samplers were driven with a 63.5 kg hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows producad the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- PERCENT PASSING #200 SIEVE
- WATER CONTENT (%)
- SUBMERGED UNIT WEIGHT (kN/m³)
- THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)

PLASTIC LIMIT + LIQUID LIMIT +

- EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- ROCK QUALITY DESIGNATION (RQD)
- ROCK RECOVERY PERCENT
- ROCK CORING RATE

STRENGTH TESTS

- POCKET PENETROMETER
- TORVANE
- REMOTE VANE
- MINIATURE VANE (RESIDUAL VANE)
- UNCONSOLIDATED UNDRAINED TRIAXIAL
- SWEDISH FALL CONE
- UNCONFINED COMPRESSION (SOIL)
- (Open symbols indicate remolded tests)
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- UNCONFINED COMPRESSION (ROCK)
- Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- FRACTURE DENSITY (ROCK)

STRENGTH OF COHESIVE SOILS

Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

DENSITY OF GRANULAR SOILS

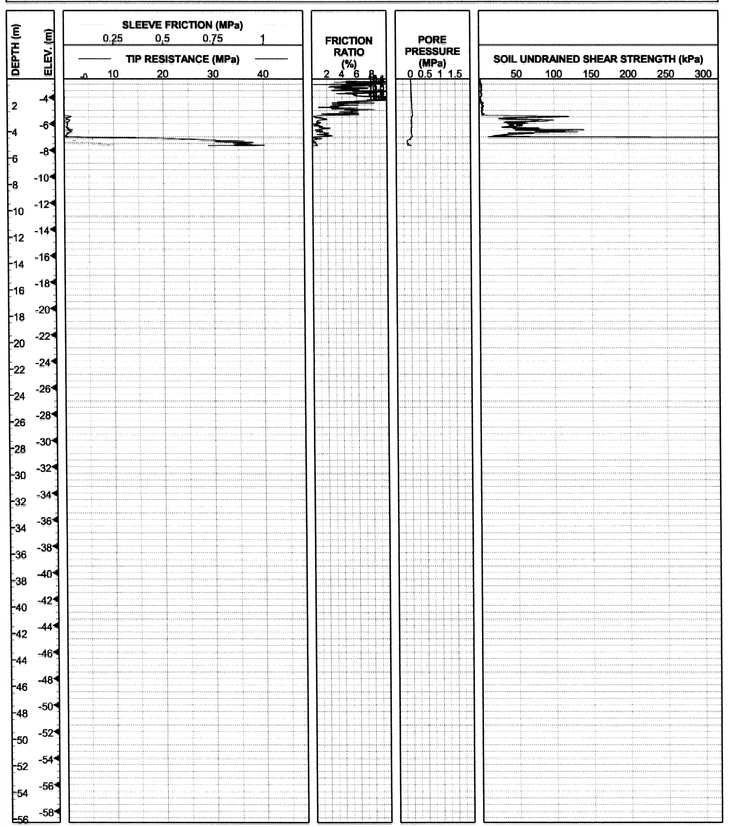
Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.

CPT 00C-02

COORDINATES: E1835882 N647495
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -2.6m (MSL)
START DATE: 09/26/00

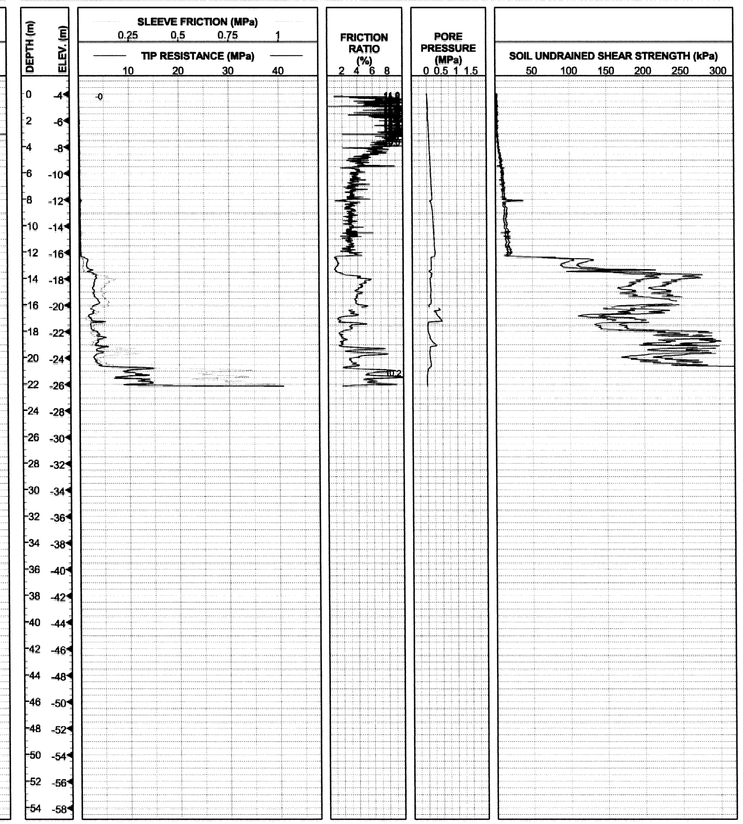
STATION: 220.3 m Left of "W" Stn. 54+0
COMPLETION ELEVATION: -7.7m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



CPT 00C-04

COORDINATES: E1836015 N647547
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -4.0m (MSL)
START DATE: 09/27/00

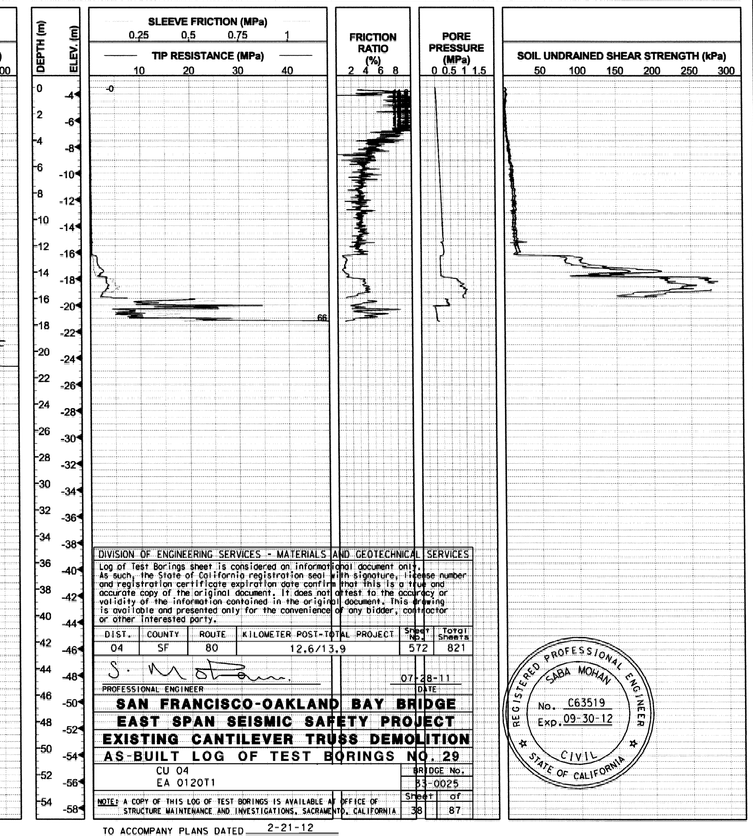
STATION: 159.3 m Left of "W" Stn. 55+0
COMPLETION ELEVATION: -26.1m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



CPT 00C-07

COORDINATES: E1836072 N647557
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -3.5m (MSL)
START DATE: 09/26/00

STATION: 128.4 m Left of "W" Stn. 55+39
COMPLETION ELEVATION: -21.2m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	572	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 29

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet 38 of 87

TO ACCOMPANY PLANS DATED 2-21-12

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SABA MOHAN, GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY S.DESHPANDE	P.ROBINS, FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	T.W.McNEILAN, PROJECT ENGINEER	BRIDGE NO. 34-0006L/R
	CHECKED BY T. MCADAM	DATE SEE ABOVE			KM POST 13.2/13.9
				CU 04 EA 0120F1	POST MILE 8.2/8.7

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 29

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY) SHEET 778 OF

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SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- PAVEMENT

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
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- Rock Core (Inset symbol represents recovery (%)

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Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

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TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (kN/m^3)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m^3)
- PLASTIC LIMIT + LIQUID LIMIT +
- ⊗ EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- ---- ROCK QUALITY DESIGNATION (RQD)
- ▬ ROCK RECOVERY PERCENT
- — ROCK CORING RATE

STRENGTH TESTS

- ● POCKET PENETROMETER
- ◆ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (⊗ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
- ⊞ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- ● POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ⊕ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- + Soil: Strength Exceeds Capacity of Measuring Device Rock: Sample broke along discontinuity; Intact sample would have greater strength
- — FRACTURE DENSITY (ROCK)

STRENGTH OF COHESIVE SOILS

Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
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Very Stiff	100 to 200
Hard	greater than 200

DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
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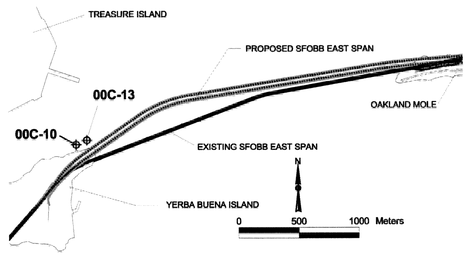
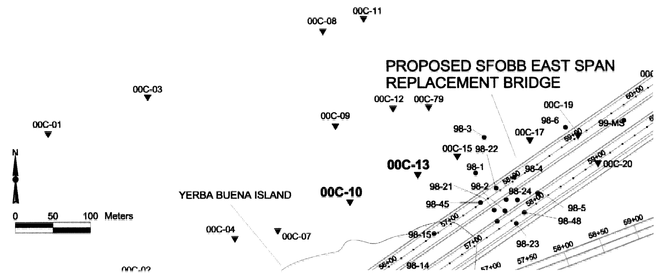
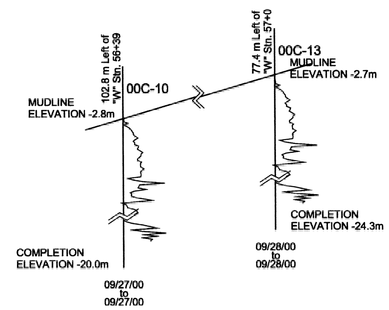
*Estimated from sampler driving record and CPT tip resistance.



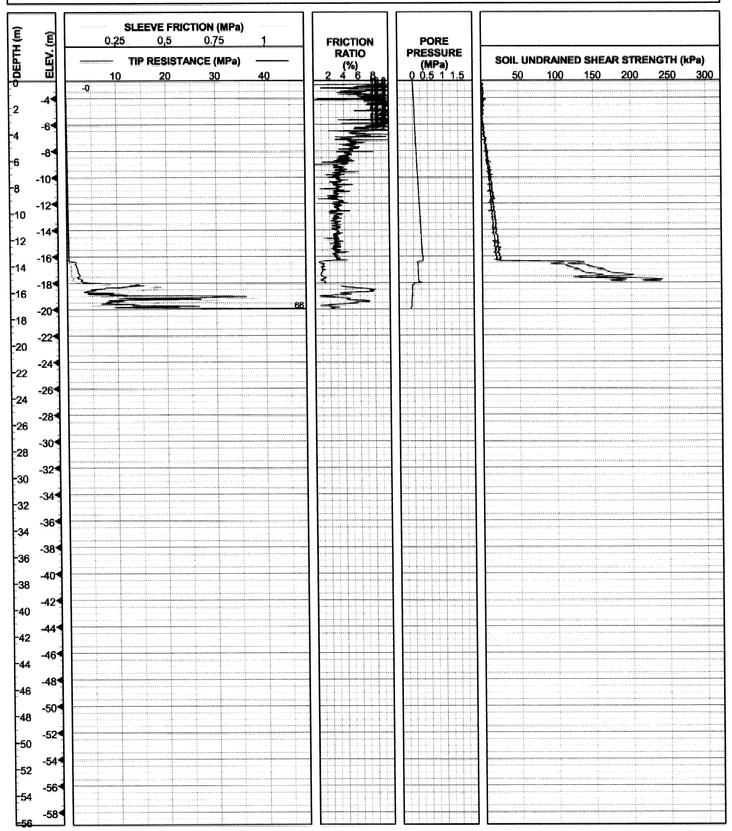




CPT 00C-10

COORDINATES: E1836169 N647596
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -2.8m (MSL)
START DATE: 09/27/00

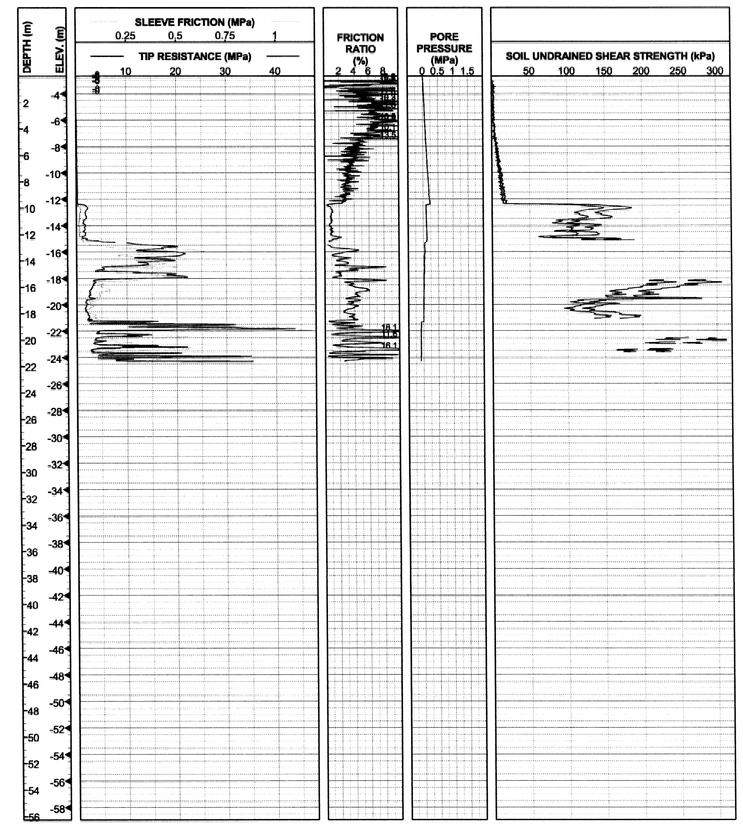
STATION: 102.8 m Left of "W" Stn. 56+39
COMPLETION ELEVATION: -20.0m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



CPT 00C-13

COORDINATES: E1836259 N647632
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -2.7m (MSL)
START DATE: 09/28/00

STATION: 77.4 m Left of "W" Stn. 57+0
COMPLETION ELEVATION: -24.3m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1196	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

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NOTES:

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2. Breaks in the data are due to pauses in the sounding during installation of casing.

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	573	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 30

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA — Sheet 39 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT
DRAWN BY S.DESHPANDE
CHECKED BY T. MCADAM
P.ROBINS — FIELD INVESTIGATOR
DATE SEE ABOVE

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

T.W.McNEILAN — PROJECT ENGINEER

BRIDGE NO. 34-0006L/R
KM POST 13.2/13.9
POST MILE 8.2/8.7

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 30

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY) — SHEET 779 OF

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751.tif

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1197	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
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- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
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- Poorly graded SAND (SP)
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- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- PAVEMENT

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
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TUBE AND OFFSHORE LINER SAMPLERS

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PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
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CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (kN/m³)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT + LIQUID LIMIT +
- ⊗ EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- ···· ROCK QUALITY DESIGNATION (RQD)
- —— ROCK RECOVERY PERCENT
- —— ROCK CORING RATE

STRENGTH TESTS

- ⊛ POCKET PENETROMETER
- ◆ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (⊛ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
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- —— FRACTURE DENSITY (ROCK)

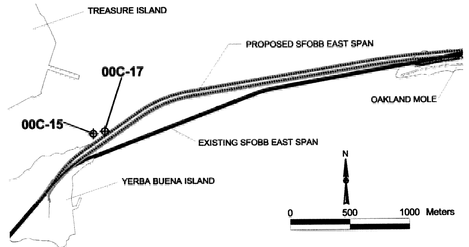
STRENGTH OF COHESIVE SOILS

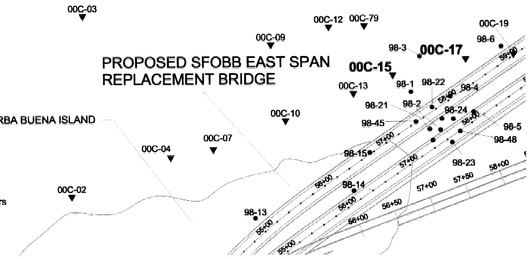
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

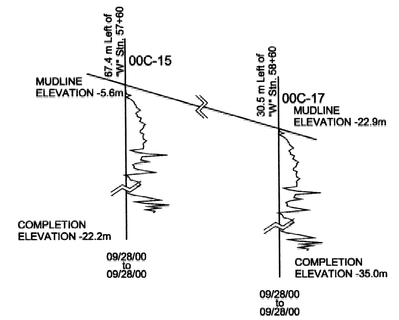
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







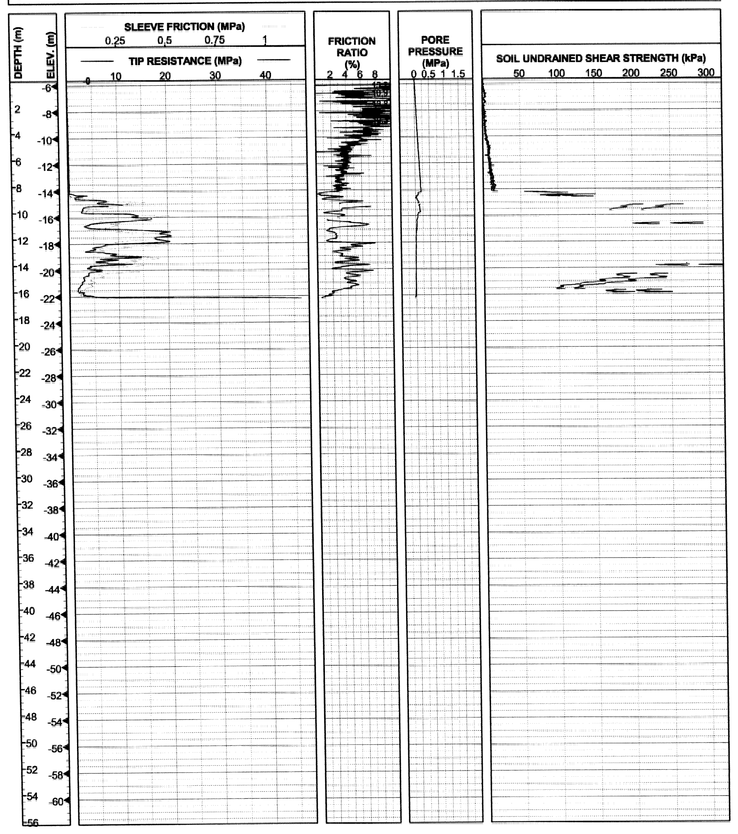
NOTES:

1. Pore pressures are relative to hydrostatic pressure at the mudline.
2. Breaks in the data are due to pauses in the sounding during installation of casing.

CPT 00C-15

COORDINATES: E1836312 N647656
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -5.6m (MSL)
START DATE: 09/28/00

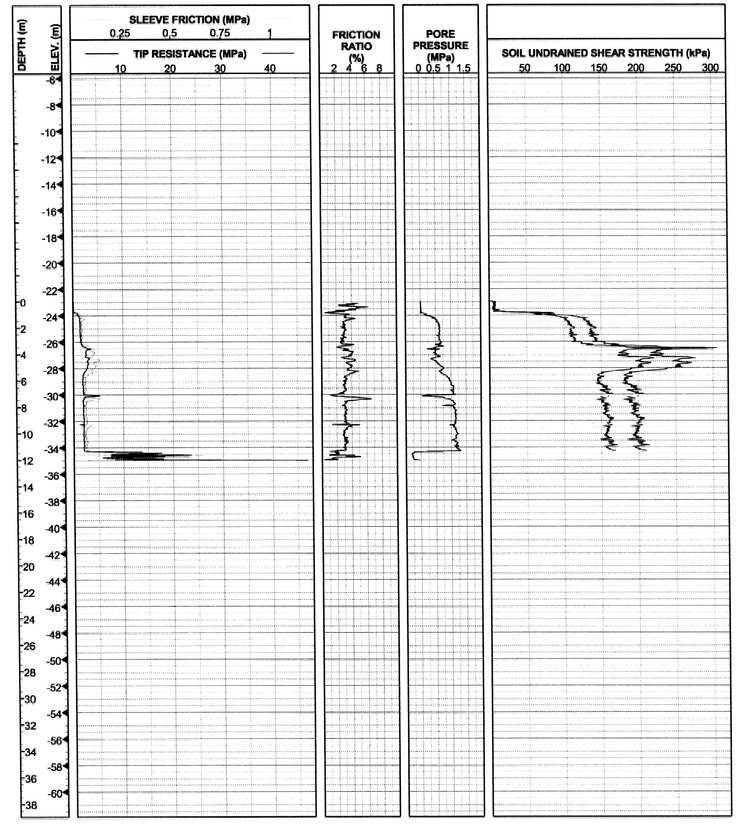
STATION: 67.4 m Left of "W" Stn. 57+60
COMPLETION ELEVATION: -22.2m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



CPT 00C-17

COORDINATES: E1836408 N647678
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -22.9m (MSL)
START DATE: 09/28/00

STATION: 30.5 m Left of "W" Stn. 58+60
COMPLETION ELEVATION: -35.0m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document; it does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	574	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 31

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet 40 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY S.DESHPANDE	P.ROBINS — FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
	CHECKED BY T. MCADAM	DATE SEE ABOVE	

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

T.W.McNEILAN — PROJECT ENGINEER

CU 04
EA 0120F1

BRIDGE NO.	KM POST	POST MILE
34-0006L/R	13.2/13.9	8.2/8.7

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 31

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 780 OF

FILENAME => 33-0025-p-1tb31_752.tif

752.tif

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- PAVEMENT

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

STANDARD PENETRATION TEST (SPT) AND MODIFIED CALIFORNIA (MC) LINER SAMPLERS

Samplers were driven with a 63.5 kg hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- ◻ SUBMERGED UNIT WEIGHT (kN/m³)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT + LIQUID LIMIT +
- ⊗ EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.5) OR SPT BLOWCOUNT
- ROCK QUALITY DESIGNATION (RQD)
- ROCK RECOVERY PERCENT
- ROCK CORING RATE

STRENGTH TESTS

- POCKET PENETROMETER
- TORVANE
- REMOTE VANE
- MINIATURE VANE (◇ RESIDUAL VANE)
- UNCONSOLIDATED UNDRAINED TRIAXIAL
- SWEDISH FALL CONE
- UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- UNCONFINED COMPRESSION (ROCK)
- + Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- FRACTURE DENSITY (ROCK)

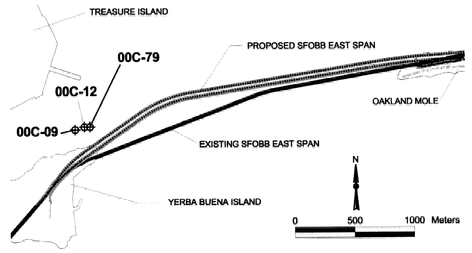
STRENGTH OF COHESIVE SOILS

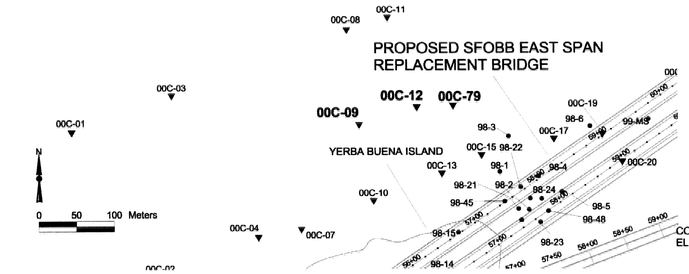
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

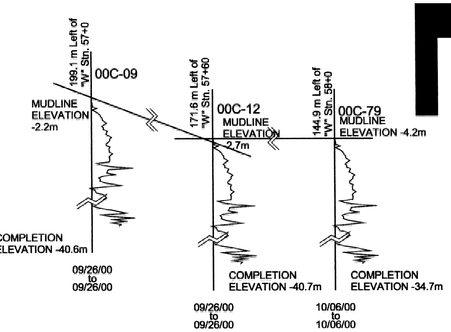
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1198	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

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Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

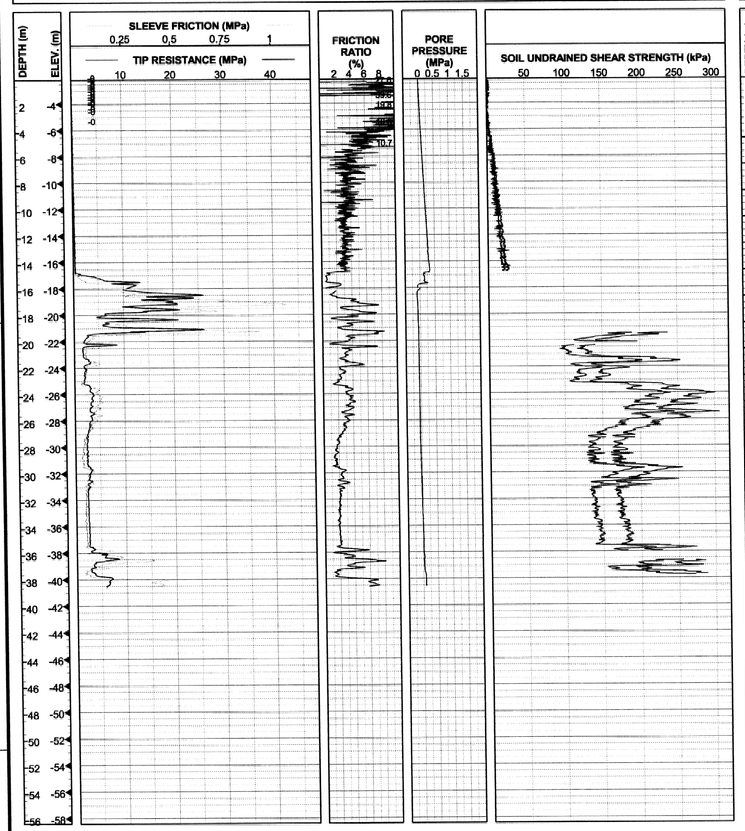
NOTES:

1. Pore pressures are relative to hydrostatic pressure at the mudline.
2. Breaks in the data are due to pauses in the sounding during installation of casing.

CPT 00C-09

COORDINATES: E1836150 N647697
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -2.2m (MSL)
START DATE: 09/26/00

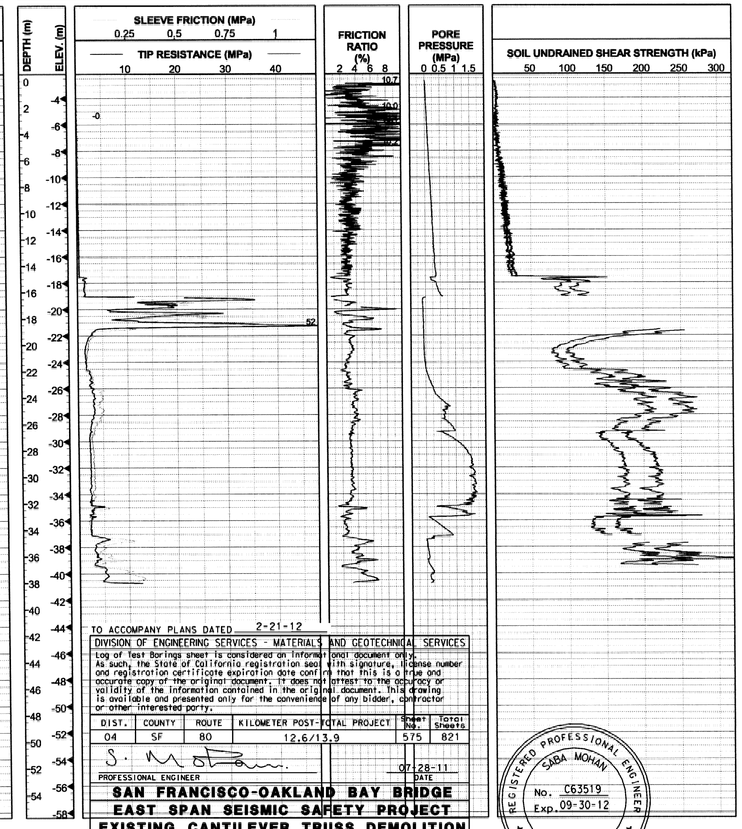
STATION: 199.1 m Left of "W" Stn. 57+0
COMPLETION ELEVATION: -40.6m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



CPT 00C-12

COORDINATES: E1836227 N647721
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -2.7m (MSL)
START DATE: 09/26/00

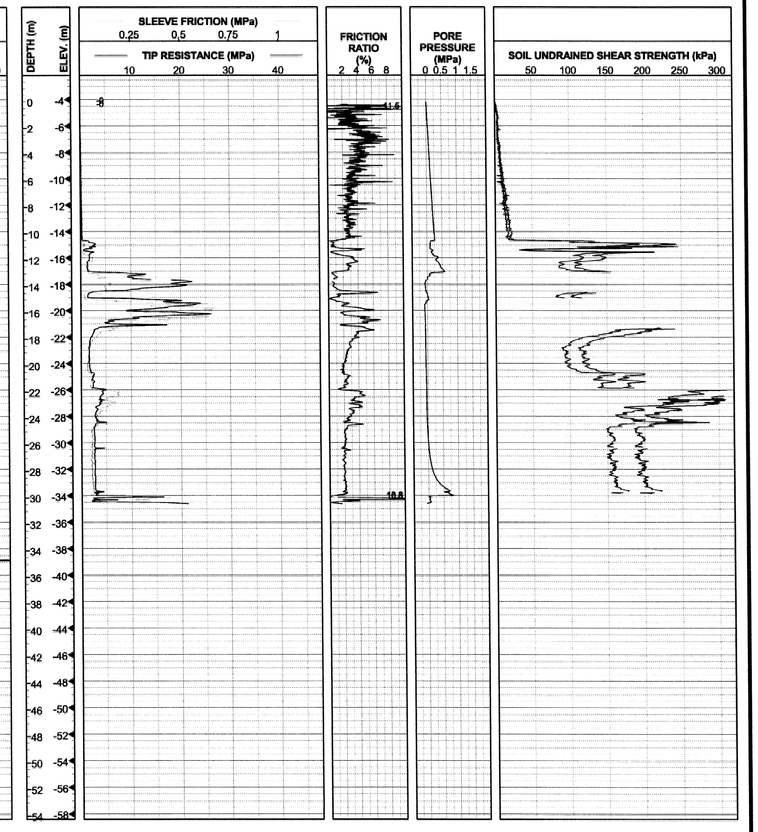
STATION: 171.6 m Left of "W" Stn. 57+60
COMPLETION ELEVATION: -40.7m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



CPT 00C-79

COORDINATES: E1836275 N647723
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -4.2m (MSL)
START DATE: 10/06/00

STATION: 144.9 m Left of "W" Stn. 58+0
COMPLETION ELEVATION: -34.7m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



TO ACCOMPANY PLANS DATED 2-21-12
DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	575	821

PROFESSIONAL ENGINEER — DATE 07-28-11

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 32

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet 41 of 87

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT

DRAWN BY S.DESHPANDE
CHECKED BY T. MCADAM

P.ROBINS — FIELD INVESTIGATOR
DATE SEE ABOVE

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

T.W.McNEILAN — PROJECT ENGINEER

CU 04
EA 0120F1

BRIDGE NO. 34-0006L/R
KM POST 13.2/13.9
POST MILE 8.2/8.7

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 32

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 781 OF

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SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- PAVEMENT

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

STANDARD PENETRATION TEST (SPT) AND MODIFIED CALIFORNIA (MC) LINER SAMPLERS

Samplers were driven with a 63.5 kg hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (kN/m³)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT + LIQUID LIMIT +
- ⊗ EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- ---- ROCK QUALITY DESIGNATION (RQD)
- ▬ ROCK RECOVERY PERCENT
- ▬ ROCK CORING RATE

STRENGTH TESTS

- ⊕ POCKET PENETROMETER
- ◈ TORVANE
- ⊕ REMOTE VANE
- ◆ MINIATURE VANE (⊗ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
- ⊠ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- ● POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ⊕ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- \+ Soil: Strength Exceeds Capacity of Measuring Device Rock: Sample broke along discontinuity; Intact sample would have greater strength
- ▬ FRACTURE DENSITY (ROCK)

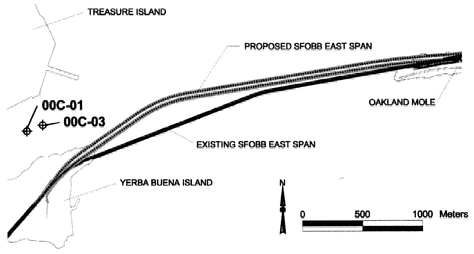
STRENGTH OF COHESIVE SOILS

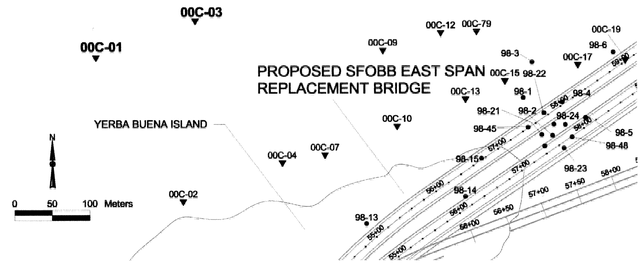
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

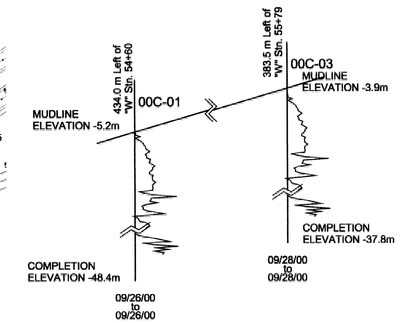
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1199	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8933, FAX (510) 562- 8858

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Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

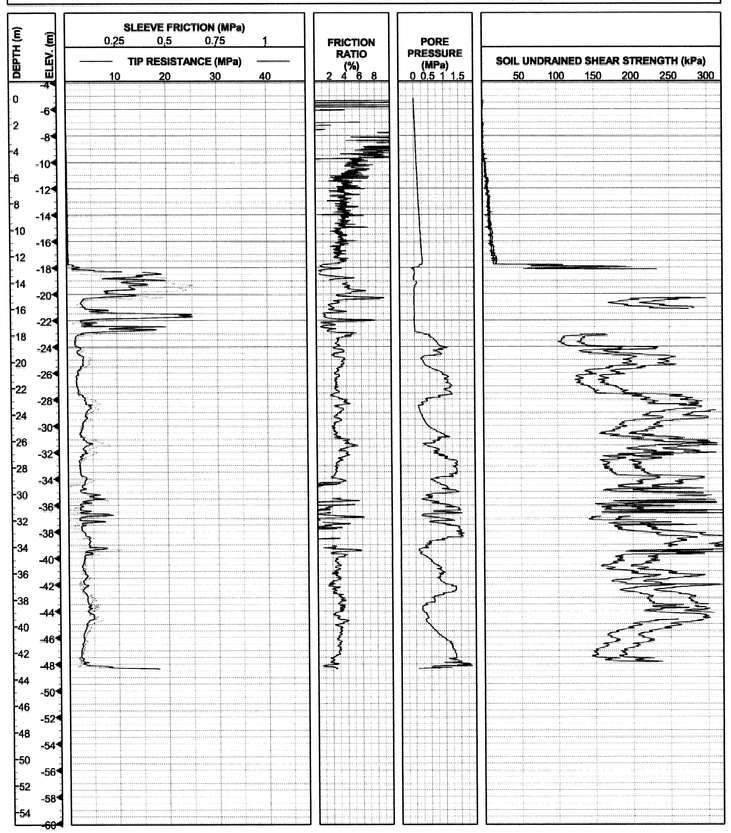
NOTES:

1. Pore pressures are relative to hydrostatic pressure at the mudline.
2. Breaks in the data are due to pauses in the sounding during installation of casing.

CPT 00C-01

COORDINATES: E1835767 N647688
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -5.2m (MSL)
START DATE: 09/26/00

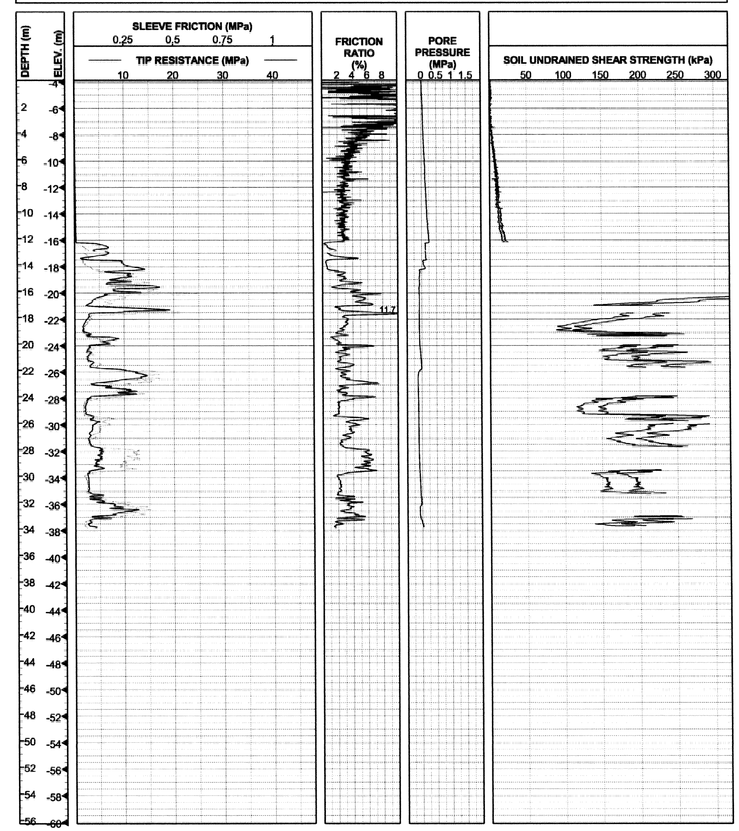
STATION: 434.0 m Left of "W" Stn. 54+60
COMPLETION ELEVATION: -48.4m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



CPT 00C-03

COORDINATES: E1835900 N647737
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -3.9m (MSL)
START DATE: 09/28/00

STATION: 383.5 m Left of "W" Stn. 55+79
COMPLETION ELEVATION: -37.8m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	576	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 33

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet 42 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT
DRAWN BY S.DESHPANDE
CHECKED BY T. MCADAM
P.ROBINS — FIELD INVESTIGATOR
DATE SEE ABOVE

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

T.W.McNEILAN — PROJECT ENGINEER

BRIDGE NO. 34-0006L/R
KM POST 13.2/13.9
POST MILE 8.2/8.7

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 33

DISREGARD PRINTS BEARING EARLIER REVISION DATES →
REVISION DATES (PRELIMINARY STAGE ONLY)
SHEET 782 OF

FILENAME => 33-0025-p-ltb33_754.tif

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1200	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

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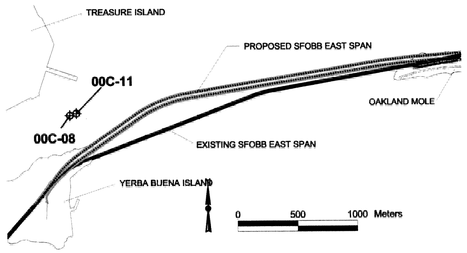
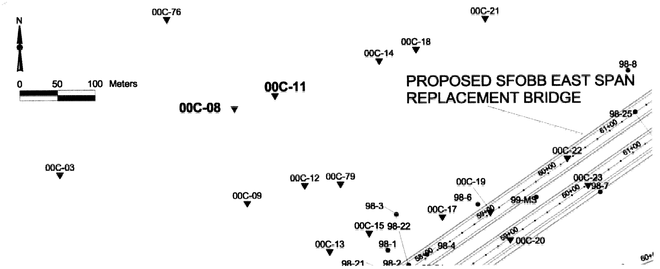
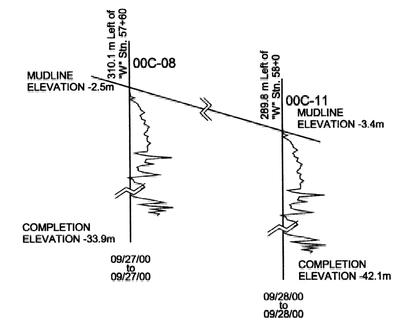
Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

NOTES:

1. Pore pressures are relative to hydrostatic pressure at the mudline.
2. Breaks in the data are due to pauses in the sounding during installation of casing.







Metric

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- PAVEMENT

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

STANDARD PENETRATION TEST (SPT) AND MODIFIED CALIFORNIA (MC) LINER SAMPLERS

Samplers were driven with a 63.5 kg hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- PERCENT PASSING #200 SIEVE
- WATER CONTENT (%)
- SUBMERGED UNIT WEIGHT (kN/m³)
- THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)

PLASTIC LIMIT LIQUID LIMIT

- EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- ROCK QUALITY DESIGNATION (RQD)
- ROCK RECOVERY PERCENT
- ROCK CORING RATE

STRENGTH TESTS

- POCKET PENETROMETER
- TORVANE
- REMOTE VANE
- MINIATURE VANE (RESIDUAL VANE)
- UNCONSOLIDATED UNDRAINED TRIAXIAL
- SWEDISH FALL CONE
- UNCONFINED COMPRESSION (SOIL)
- (Open symbols indicate remolded tests)
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- UNCONFINED COMPRESSION (ROCK)
- Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- FRACTURE DENSITY (ROCK)

STRENGTH OF COHESIVE SOILS

Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

DENSITY OF GRANULAR SOILS

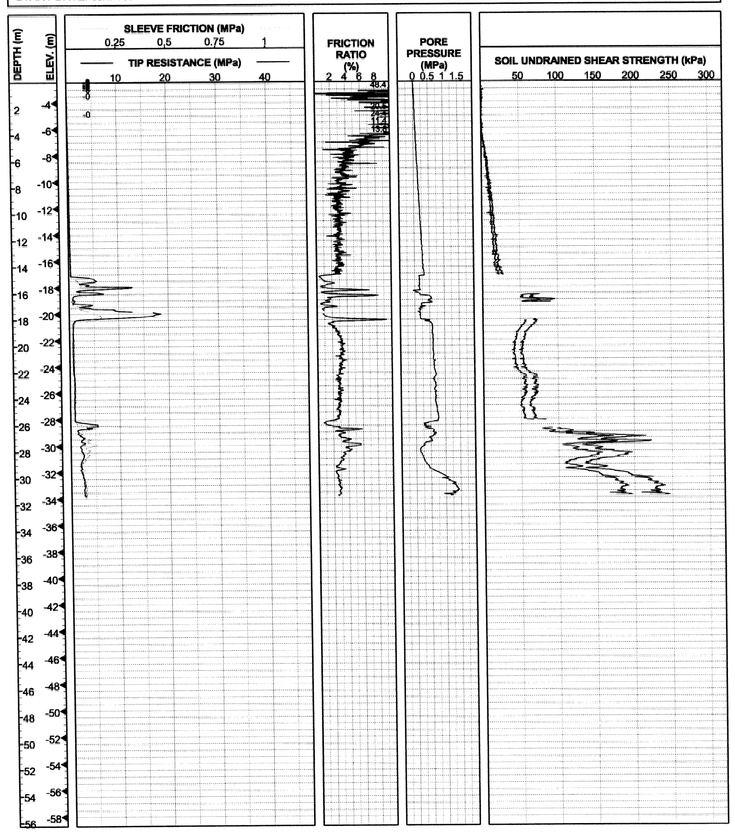
Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.

CPT 00C-08

COORDINATES: E1836135 N647824
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -2.5m (MSL)
START DATE: 09/27/00

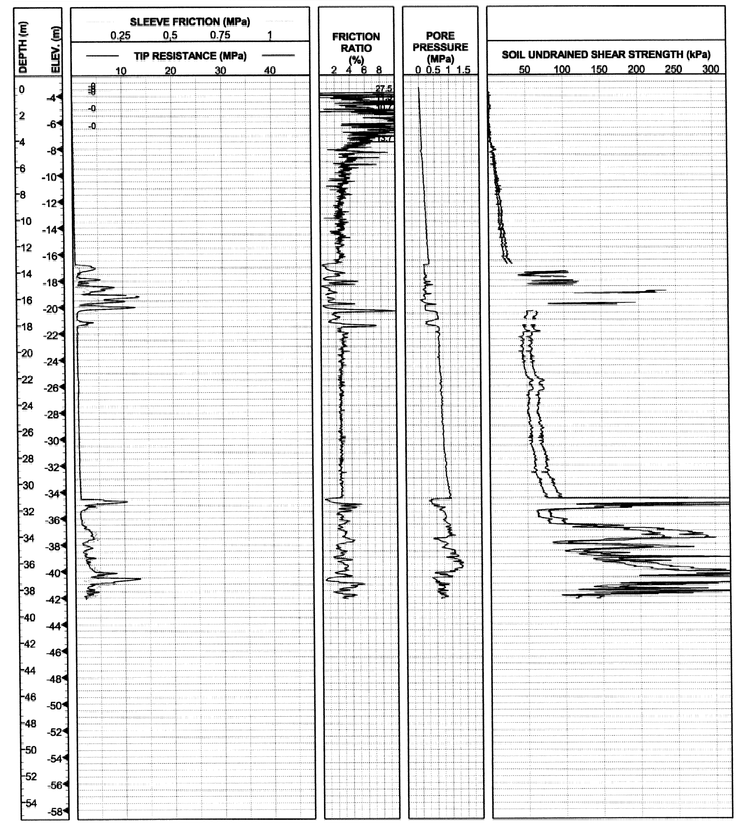
STATION: 310.1 m Left of "W" Stn. 57+60
COMPLETION ELEVATION: -33.9m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



CPT 00C-11

COORDINATES: E1836189 N647841
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -3.4m (MSL)
START DATE: 09/28/00

STATION: 289.8 m Left of "W" Stn. 58+0
COMPLETION ELEVATION: -42.1m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	577	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 34

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet 43 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT
DRAWN BY S.DESHPANDE
CHECKED BY T. MCADAM
P.ROBINS — FIELD INVESTIGATOR
DATE SEE ABOVE

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

T.W.McNEILAN — PROJECT ENGINEER

BRIDGE NO. 34-0006L/R
KM POST 13.2/13.9
POST MILE 8.2/8.7

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 34

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 783 OF

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1201	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
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NOTES:

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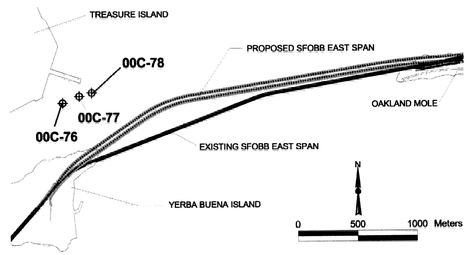

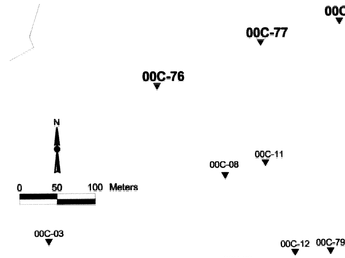

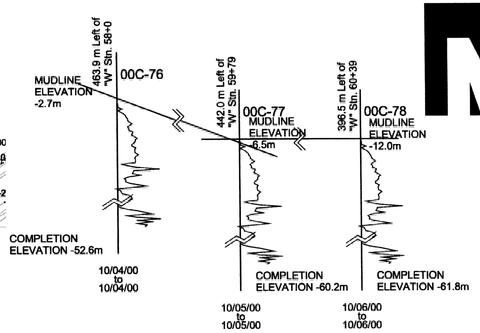

Metric

SOIL AND ROCK TYPES

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- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- PAVEMENT

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%))

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Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (kN/m³)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT + LIQUID LIMIT +
- ⊗ EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- .... ROCK QUALITY DESIGNATION (RQD)
- —— ROCK RECOVERY PERCENT
- —— ROCK CORING RATE

STRENGTH TESTS

- ● POCKET PENETROMETER
- ◆ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (◇ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
- ⊠ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- ● POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ⦶ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- \+ Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- —— FRACTURE DENSITY (ROCK)

STRENGTH OF COHESIVE SOILS

Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

DENSITY OF GRANULAR SOILS

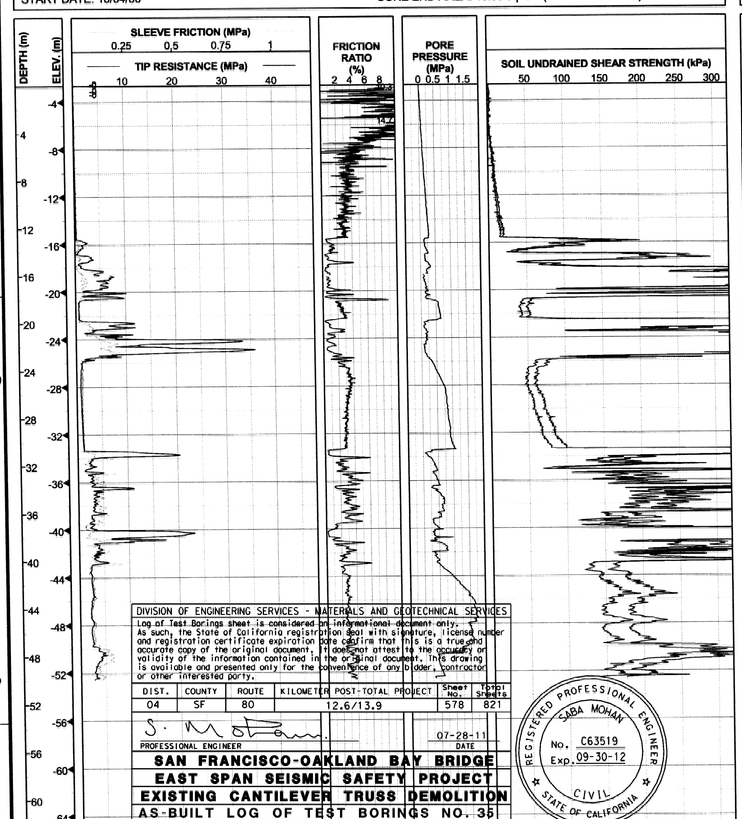
Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.

CPT 00C-76

COORDINATES: E1836045 N647944
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -2.7m (MSL)
START DATE: 10/04/00

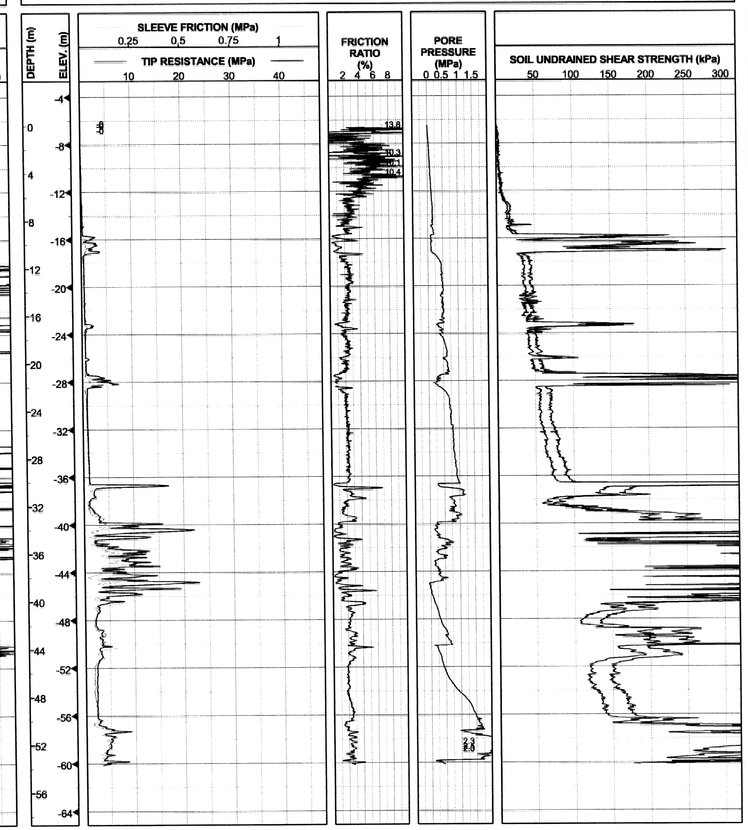
STATION: 463.9 m Left of "W" Stn. 58+0
COMPLETION ELEVATION: -52.6m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



CPT 00C-77

COORDINATES: E1836184 N648002
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -6.5m (MSL)
START DATE: 10/05/00

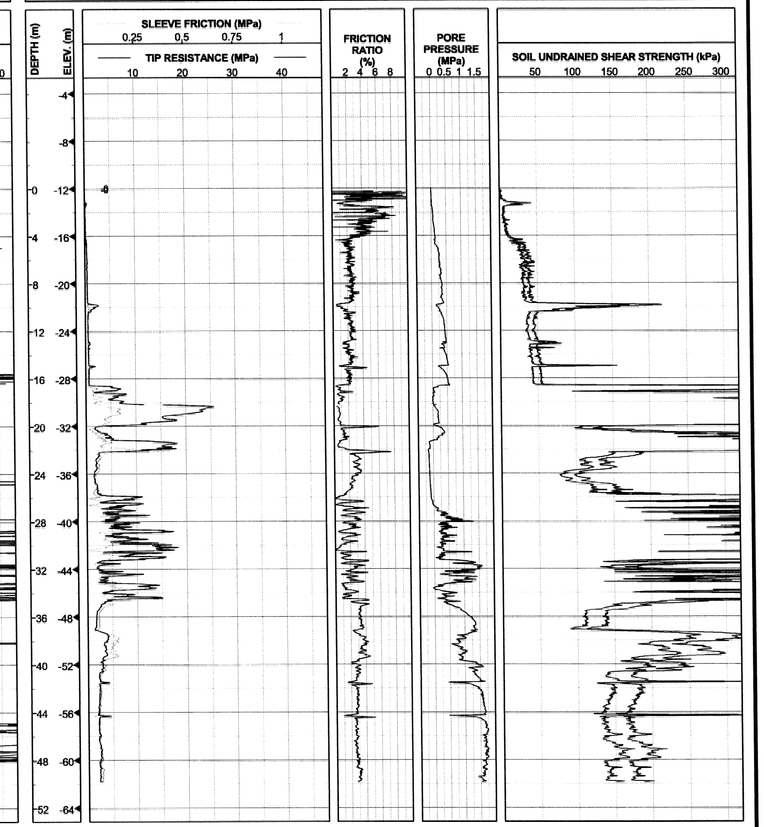
STATION: 442.0 m Left of "W" Stn. 59+79
COMPLETION ELEVATION: -60.2m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



CPT 00C-78

COORDINATES: E1836290 N648030
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -12.0m (MSL)
START DATE: 10/06/00

STATION: 396.5 m Left of "W" Stn. 60+39
COMPLETION ELEVATION: -61.8m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	578	821

PROFESSIONAL ENGINEER — DATE 07-28-11

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 35

CU 04
EA 0120T1

BRIDGE NO. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet 44 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT	DRAWN BY S.DESHPANDE	P.ROBINS — FIELD INVESTIGATOR	T.W.McNEILAN — PROJECT ENGINEER
	CHECKED BY T. MCADAM	DATE SEE ABOVE	

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

BRIDGE NO.	KM POST	POST MILE
34-0006L/R	13.2/13.9	8.2/8.7

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 35

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 784 OF

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SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
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- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
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- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
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- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- PAVEMENT

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- SUBMERGED UNIT WEIGHT (kN/m^3)
- THEORETICAL SUBMERGED UNIT WEIGHT (kN/m^3)

PLASTIC LIMIT LIQUID LIMIT

- EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- ROCK QUALITY DESIGNATION (RQD)
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STRENGTH TESTS

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Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

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Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
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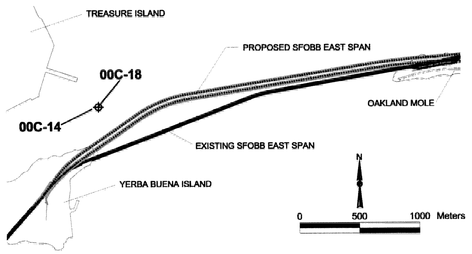
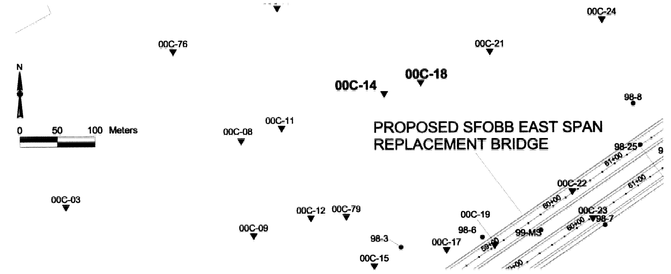
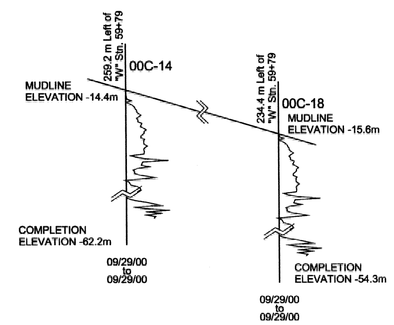
*Estimated from sampler driving record and CPT tip resistance.







Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1202	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562- 8833, FAX (510) 562- 8858

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Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

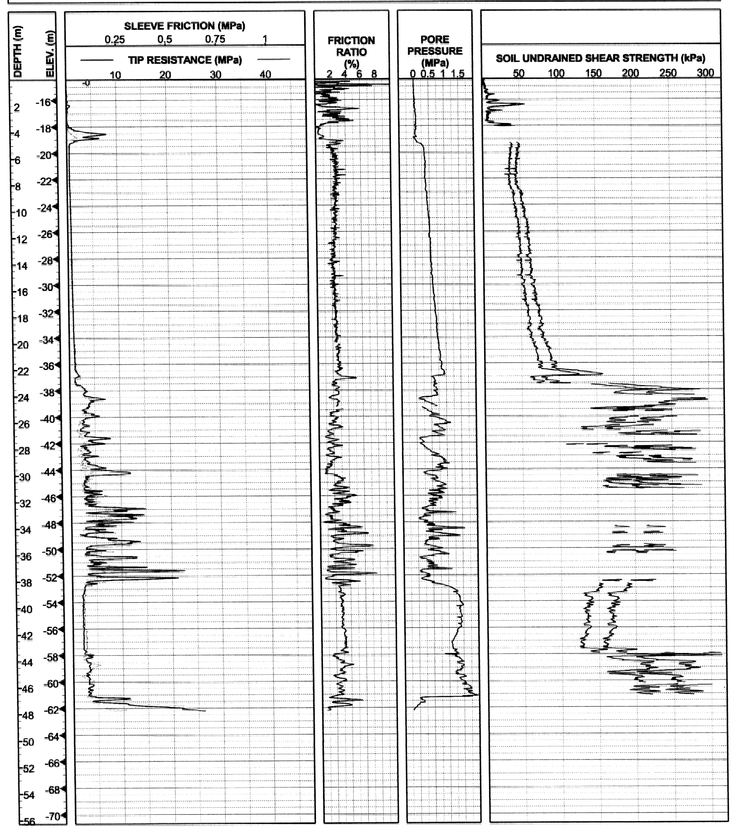
NOTES:

1. Pore pressures are relative to hydrostatic pressure at the mudline.
2. Breaks in the data are due to pauses in the sounding during installation of casing.

CPT 00C-14

COORDINATES: E1836327 N647887
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -14.4m (MSL)
START DATE: 09/29/00

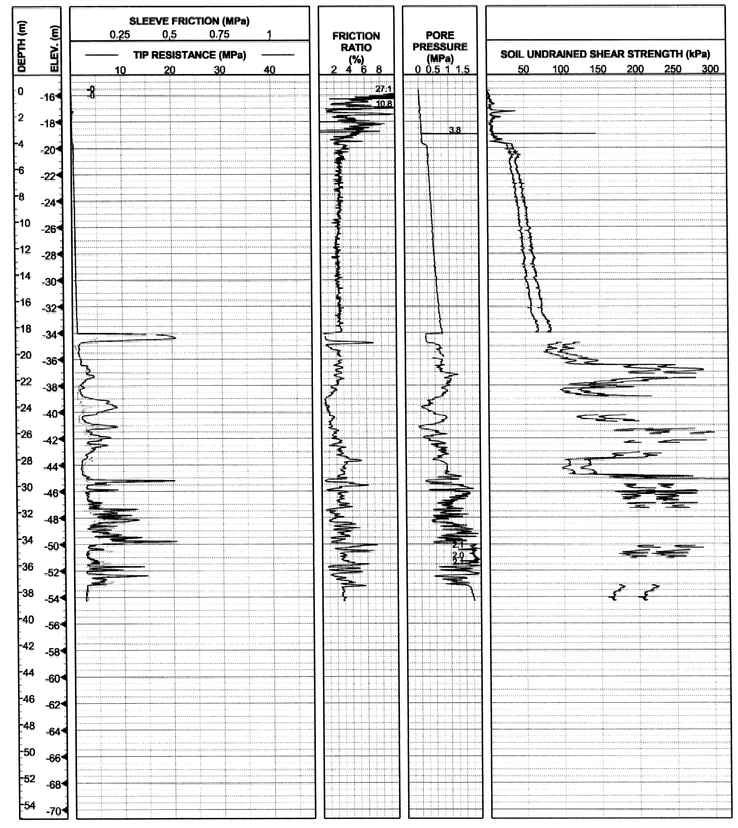
STATION: 259.2 m Left of "W" Stn. 59+79
COMPLETION ELEVATION: -62.2m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



CPT 00C-18

COORDINATES: E1836375 N647902
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -15.6m (MSL)
START DATE: 09/29/00

STATION: 234.4 m Left of "W" Stn. 59+79
COMPLETION ELEVATION: -54.3m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	579	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 36

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet 45 of 87

2-21-12

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT

DRAWN BY S.DESHPANDE
CHECKED BY T. MCADAM

P.ROBINS — FIELD INVESTIGATOR
DATE SEE ABOVE

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

T.W.McNEILAN — PROJECT ENGINEER

BRIDGE NO. 34-0006L/R
KM POST 13.2/13.9
POST MILE 8.2/8.7

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 36

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 785 OF

FILENAME => 33-0025-p-ltb36_757.tif

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- PAVEMENT

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

STANDARD PENETRATION TEST (SPT) AND MODIFIED CALIFORNIA (MC) LINER SAMPLERS

Samplers were driven with a 63.5 kg hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (kN/m³)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT + LIQUID LIMIT +
- ⊗ EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- •••• ROCK QUALITY DESIGNATION (RQD)
- ▬ ROCK RECOVERY PERCENT
- ▭ ROCK CORING RATE

STRENGTH TESTS

- ⊕ POCKET PENETROMETER
- ◆ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (◇ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
- ⊞ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- ● POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ⊙ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- ┼ Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- ▭ FRACTURE DENSITY (ROCK)

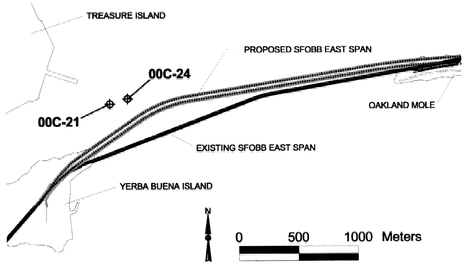
STRENGTH OF COHESIVE SOILS

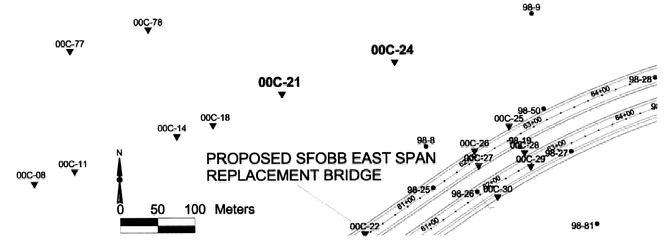
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

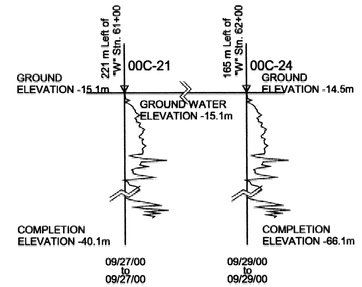
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1203	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS, A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562-8833, FAX (510) 562-8858

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Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

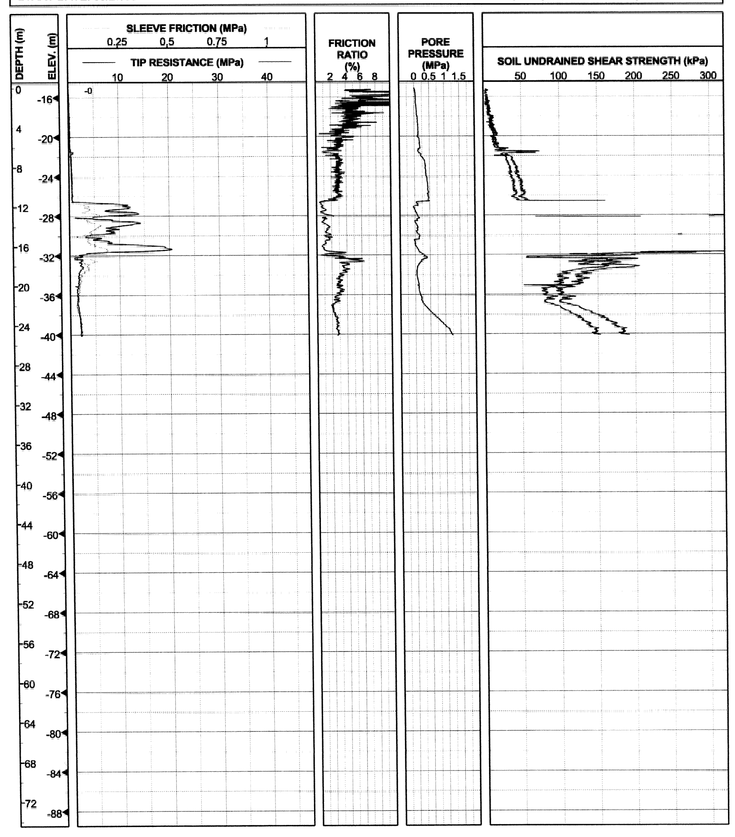
NOTES:

1. Pore pressures are relative to hydrostatic pressure at the mudline.
2. Breaks in the data are due to pauses in the sounding during installation of casing.

CPT FH00C021 (00C-21)

COORDINATES: E1836467 N647943
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -15.1m (MSL)
START DATE: 09/27/00

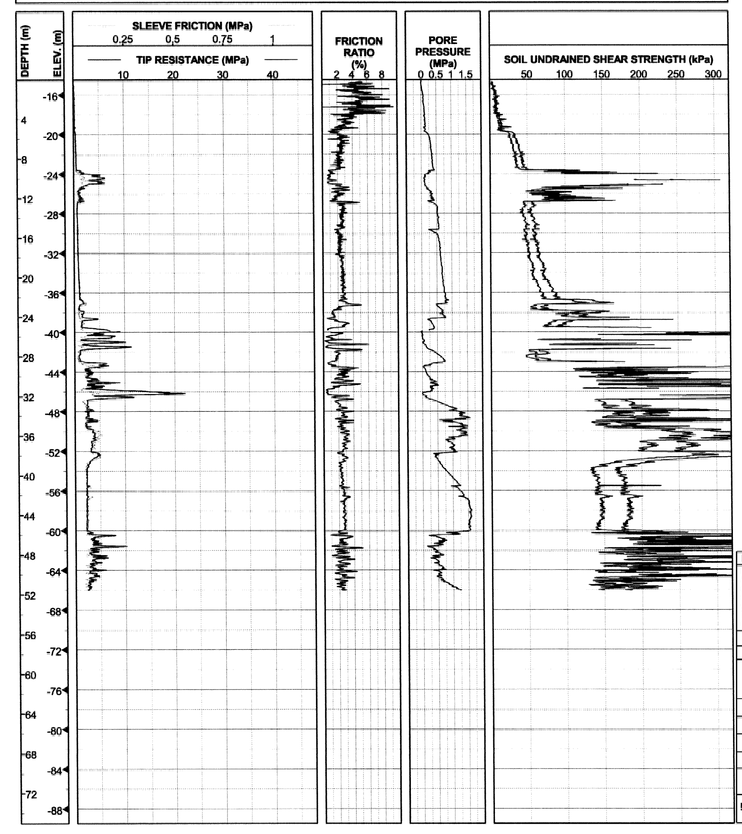
STATION: 221 m Left of "W" Stn. 61+00
COMPLETION ELEVATION: -40.1m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



CPT FH00C024 (00C-24)

COORDINATES: E1836616 N647986
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -14.5m (MSL)
START DATE: 09/29/00

STATION: 165 m Left of "W" Stn. 62+00
COMPLETION ELEVATION: -66.1m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	580	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 37

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA — Sheet 46 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT

DRAWN BY A.W.PALOMARES
CHECKED BY R.HOWARD

R.HOWARD — FIELD INVESTIGATOR
DATE SEE ABOVE

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

T.W.McNEILAN — PROJECT ENGINEER

BRIDGE NO. 34-0006L/R
KM POST 13.2/13.9
POST MILE 8.2/8.7

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 37

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 786 OF

FILENAME => 33-0025-p-1tb37_758.tif

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1204	1204

REGISTERED GEOTECHNICAL ENGINEER

12-6-04
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/06 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 846,
Oakland, CA 94621
(510) 562-8833, FAX (510) 562-8858

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NOTES:

1. Pore pressures are relative to hydrostatic pressure at the mudline.
2. Breaks in the data are due to pauses in the sounding during installation of casing.

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- PAVEMENT

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

STANDARD PENETRATION TEST (SPT) AND MODIFIED CALIFORNIA (MC) LINER SAMPLERS

Samplers were driven with a 63.5 kg hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (kN/m³)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (kN/m³)
- PLASTIC LIMIT + ····· + LIQUID LIMIT
- ⊗ EQUIVALENT SPT BLOW COUNT = (MC BLOWCOUNT/1.6) OR SPT BLOWCOUNT
- ···· ROCK QUALITY DESIGNATION (RQD)
- ▬ ROCK RECOVERY PERCENT
- — ROCK CORING RATE

STRENGTH TESTS

- ● POCKET PENETROMETER
- ✥ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (⊗ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
- ⊠ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- Shear Strength Interpreted from CPT Tip Resistance (Nk = 12-15)
- ● POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ⊕ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- + Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- — FRACTURE DENSITY (ROCK)

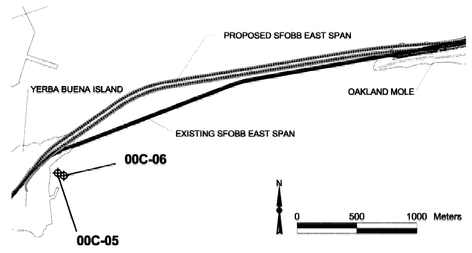
STRENGTH OF COHESIVE SOILS

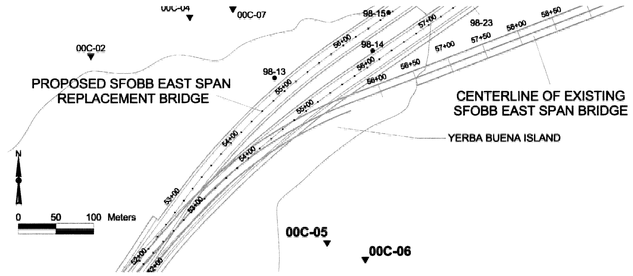
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

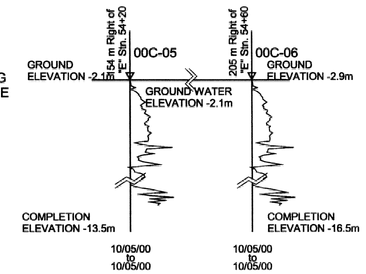
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.



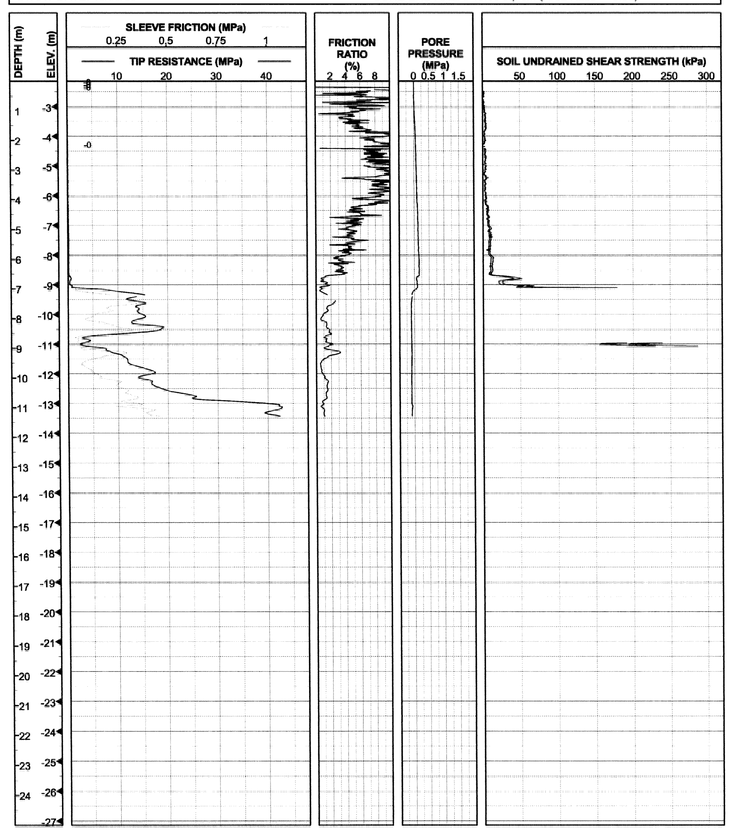




CPT FH00C005 (00C-05)

COORDINATES: E1836197 N647245
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -2.1m (MSL)
START DATE: 10/05/00

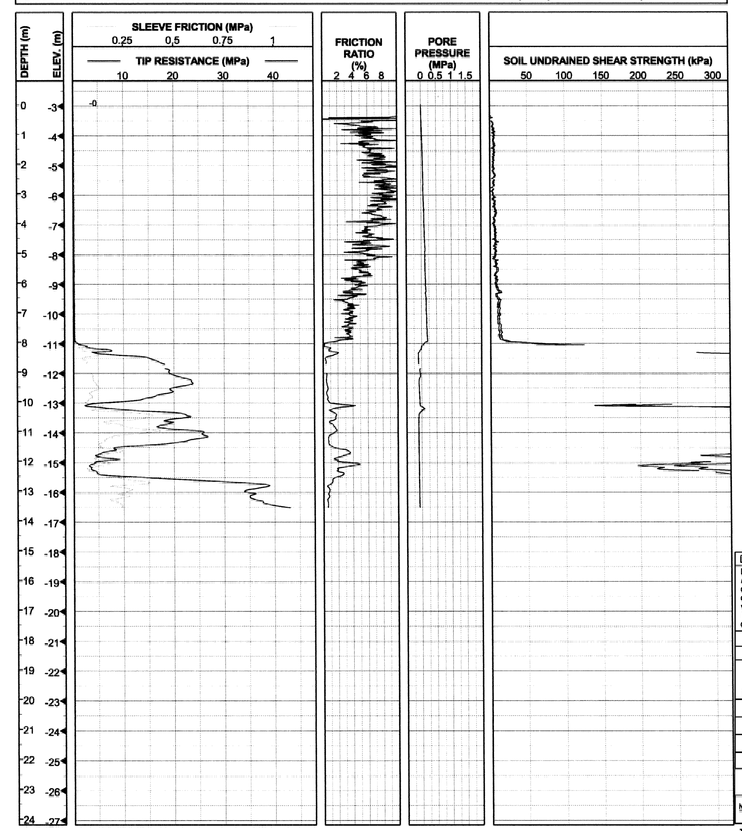
STATION: 154 m Right of "E" Stn. 54+20
COMPLETION ELEVATION: -13.5m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



CPT FH00C006 (00C-06)

COORDINATES: E1836248 N647222
CA State Plane Zone 3, NAD83, meters
MUDLINE ELEVATION: -2.9m (MSL)
START DATE: 10/05/00

STATION: 205 m Right of "E" Stn. 54+60
COMPLETION ELEVATION: -16.5m (MSL)
CONE END AREA: 15.03 sq. cm (Area Ratio = 0.56)



REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	581	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 38

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet 47 of 87

TO ACCOMPANY PLANS DATED 2-21-12

SABA MOHAN — GEOTECHNICAL DESIGN OVERSIGHT

DRAWN BY A.W.PALOMARES
CHECKED BY R.HOWARD

A.RIDGEWAY — FIELD INVESTIGATOR
DATE SEE ABOVE

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

T.W.McNEILAN — PROJECT ENGINEER

BRIDGE NO. 34-0006L/R
KM POST 13.2/13.9
POST MILE 8.2/8.7

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 0120F1

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)

LOG OF TEST BORINGS NO. 38

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY) | SHEET 787 | OF

FILENAME => 33-0025-p-ltb38_759.tif

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF, Ala	80	13.9/14.3, 0.0/1.6	932	978

GEOTECHNICAL PROFESSIONAL

6-4-01
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — T.W. McNeilan — No. 0583 — Exp. 12/31/00 — Geotechnical — STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 848,
Oakland, CA 94621
(510) 633-5100

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Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

Metric

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (KCF)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (KCF)
- PLASTIC LIMIT + — LIQUID LIMIT +
- ⊙ EQUIVALENT SPT BLOW COUNT
- ···· ROCK QUALITY DESIGNATION (RQD)
- —— ROCK RECOVERY PERCENT
- —— ROCK CORING RATE

STRENGTH TESTS

- ⊗ POCKET PENETROMETER
- ◇ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (◇ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▽ SWEDISH FALL CONE
- ⊠ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- + Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- Shear Strength Interpreted from CPT Tip Resistance
- ⊕ POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ⊕ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- —— FRACTURE DENSITY (ROCK)

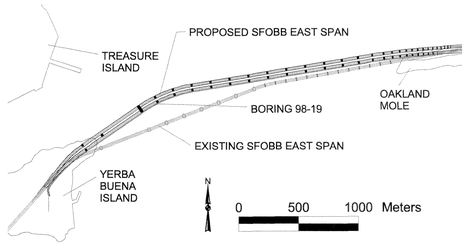
STRENGTH OF COHESIVE SOILS

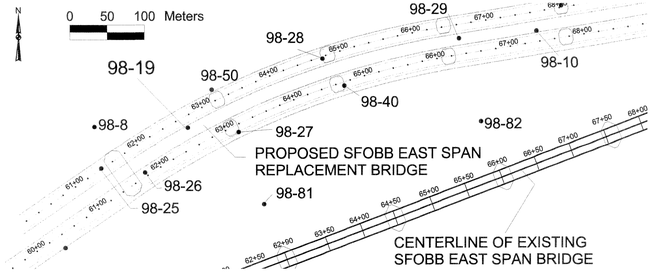
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

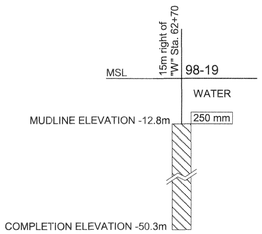
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







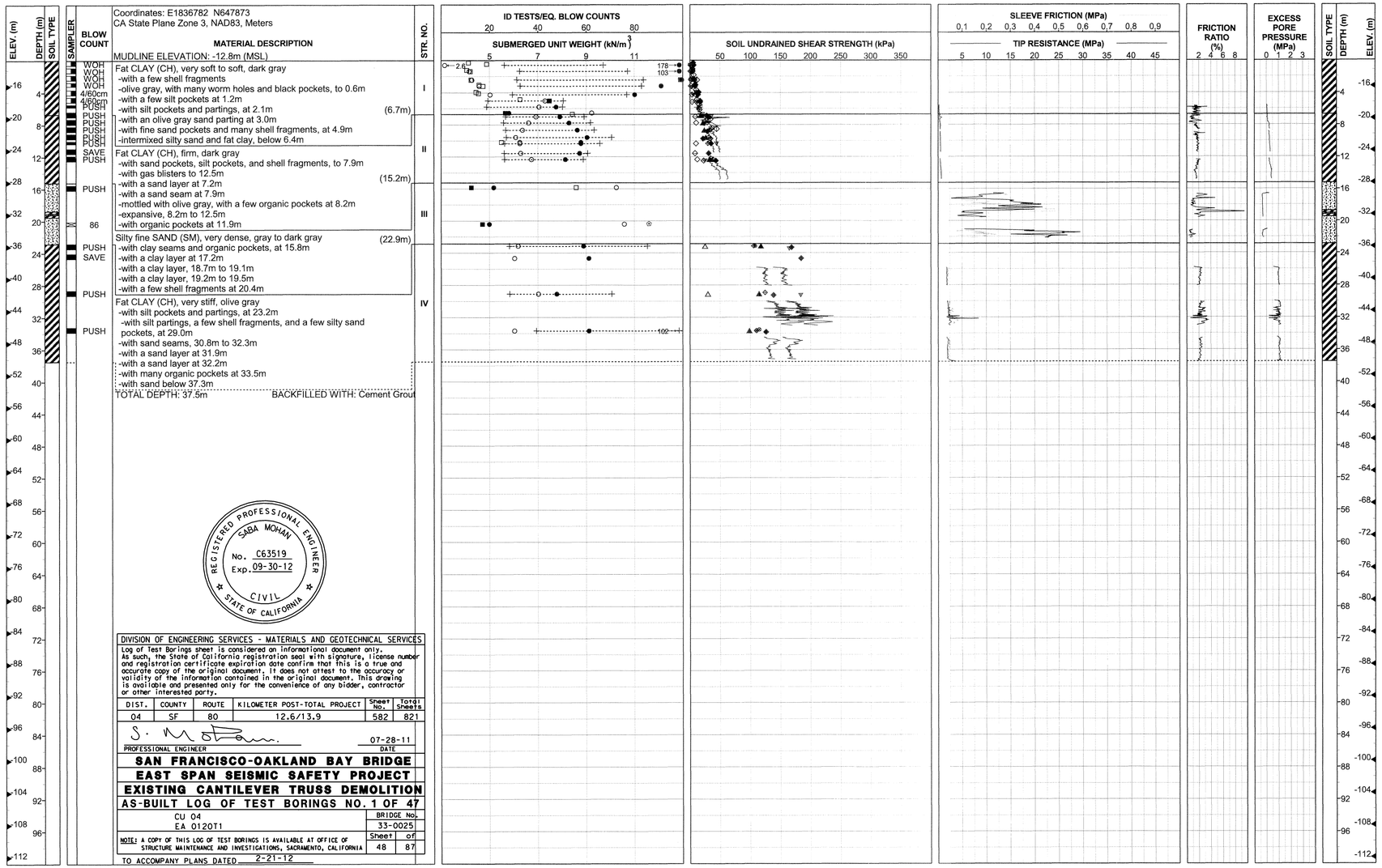
BORING 98-19

Coordinates: E1836782 N647873
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -12.8m (MSL)

BLOW COUNT	MATERIAL DESCRIPTION	STR. NO.
WOH, WOH, WOH, WOH, 4/60cm, 4/60cm, PUSH, PUSH, PUSH, PUSH, PUSH, PUSH, SAVE, PUSH	Fat CLAY (CH), very soft to soft, dark gray -with a few shell fragments -olive gray, with many worm holes and black pockets, to 0.6m -with a few silt pockets at 1.2m -with silt pockets and partings, at 2.1m (6.7m) -with an olive gray sand parting at 3.0m -with fine sand pockets and many shell fragments, at 4.9m -intermixed silty sand and fat clay, below 6.4m	I
	Fat CLAY (CH), firm, dark gray -with sand pockets, silt pockets, and shell fragments, to 7.9m -with gas blisters to 12.5m (15.2m) -with a sand layer at 7.2m -with a sand seam at 7.9m -mottled with olive gray, with a few organic pockets at 8.2m -expansive, 8.2m to 12.5m	II
PUSH, 86	-with organic pockets at 11.9m	III
PUSH, SAVE, PUSH, PUSH	Silty fine SAND (SM), very dense, gray to dark gray (22.9m) -with clay seams and organic pockets, at 15.8m -with a clay layer at 17.2m -with a clay layer, 18.7m to 19.1m -with a clay layer, 19.2m to 19.5m -with a few shell fragments at 20.4m Fat CLAY (CH), very stiff, olive gray -with silt pockets and partings, at 23.2m -with silt partings, a few shell fragments, and a few silty sand pockets, at 29.0m -with sand seams, 30.8m to 32.3m -with a sand layer at 31.9m -with a sand layer at 32.2m -with many organic pockets at 33.5m -with sand below 37.3m	IV

TOTAL DEPTH: 37.5m — BACKFILLED WITH: Cement Grout



REGISTERED PROFESSIONAL ENGINEER — SABA MOHAN — No. C63519 — Exp. 09-30-12 — CIVIL — STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	582	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 1 OF 47

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA — Sheet 48 of 87

TO ACCOMPANY PLANS DATED 2-21-12

100% PS&E

REID BUELL, DESIGN OVERSIGHT	DRAWN BY: SACHIN DESHPANDE	J.CHACKO/M.ZUEGER, FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
	CHECKED BY: J.CHACKO	DATE 06/14/99	

T.W.McNEILAN, PROJECT ENGINEER

BRIDGE NO. 34-0006 — KM POST — POST MILE

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

LOG OF TEST BORINGS 1 OF 47

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 012021

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY): ~~7/18/99~~ ~~2/15/00~~ 8/02/00 11/17/00 — SHEET 500 — OF

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF, Ala	80	13.9/14.3, 0.0/1.6	933	978

GEOTECHNICAL PROFESSIONAL

6-4-01
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/00 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 848,
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(510) 633-5100

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- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
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- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

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WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
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- ◇△ (Open symbols indicate remolded tests)
- + Soil: Strength Exceeds Capacity of Measuring Device
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- Shear Strength Interpreted from CPT Tip Resistance
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- ⊕ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- —— FRACTURE DENSITY (ROCK)

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Firm	25 to 50
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Hard	greater than 200

DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
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Dense	65 to 85
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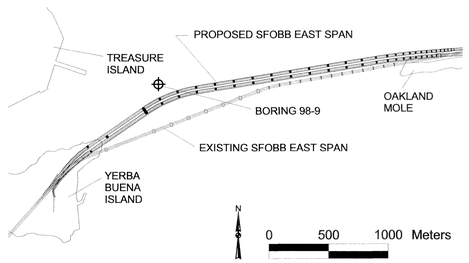
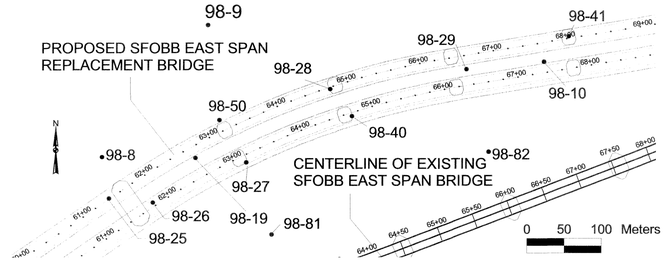
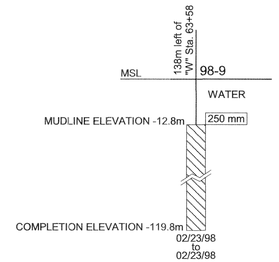
*Estimated from sampler driving record and CPT tip resistance.







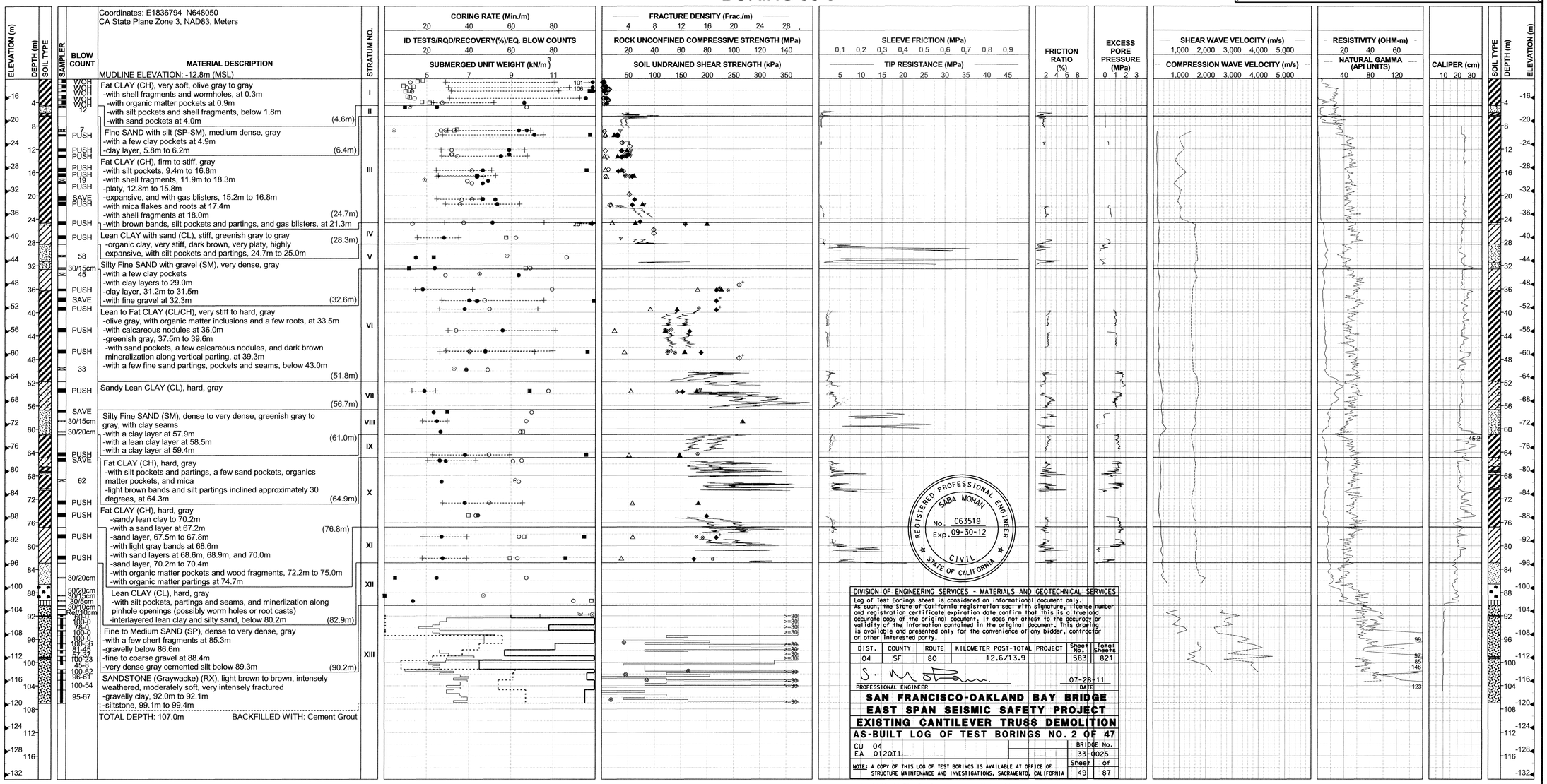
BORING 98-9

Coordinates: E1836794 N648050
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -12.8m (MSL)

Blow Count	Material Description	Stratum No.
WOH, WOH, WOH, WOH, WOH, 12	Fat CLAY (CH), very soft, olive gray to gray -with shell fragments and wormholes, at 0.3m -with organic matter pockets at 0.9m -with silt pockets and shell fragments, below 1.8m -with sand pockets at 4.0m (4.6m)	I, II
7, PUSH, PUSH, PUSH	Fine SAND with silt (SP-SM), medium dense, gray -with a few clay pockets at 4.9m -clay layer, 5.8m to 6.2m (6.4m)	
PUSH, PUSH, PUSH, 19, PUSH, SAVE, PUSH, PUSH	Fat CLAY (CH), firm to stiff, gray -with silt pockets, 9.4m to 16.8m -with shell fragments, 11.9m to 18.3m -platy, 12.8m to 15.8m -expansive, and with gas blisters, 15.2m to 16.8m -with mica flakes and roots at 17.4m -with shell fragments at 18.0m (24.7m) -with brown bands, silt pockets and partings, and gas blisters, at 21.3m	III
PUSH	Lean CLAY with sand (CL), stiff, greenish gray to gray -organic clay, very stiff, dark brown, very platy, highly expansive, with silt pockets and partings, 24.7m to 25.0m (28.3m)	IV
58, 30/15cm, 45, PUSH, SAVE, PUSH	Silty Fine SAND with gravel (SM), very dense, gray -with a few clay pockets -with clay layers to 29.0m -clay layer, 31.2m to 31.5m -with fine gravel at 32.3m (32.6m)	V
33, PUSH	Lean to Fat CLAY (CL/CH), very stiff to hard, gray -olive gray, with organic matter inclusions and a few roots, at 33.5m -with calcareous nodules at 36.0m -greenish gray, 37.5m to 39.6m -with sand pockets, a few calcareous nodules, and dark brown mineralization along vertical parting, at 39.3m -with a few fine sand partings, pockets and seams, below 43.0m (51.8m)	VI
PUSH	Sandy Lean CLAY (CL), hard, gray (56.7m)	VII
SAVE, 30/15cm, 30/20cm	Silty Fine SAND (SM), dense to very dense, greenish gray to gray, with clay seams -with a clay layer at 57.9m -with a lean clay layer at 58.5m -with a clay layer at 59.4m (61.0m)	VIII
PUSH, SAVE		IX
62, PUSH, PUSH	Fat CLAY (CH), hard, gray -with silt pockets and partings, a few sand pockets, organics matter pockets, and mica -light brown bands and silt partings inclined approximately 30 degrees, at 64.3m (64.9m)	X
PUSH, PUSH, PUSH	Fat CLAY (CH), hard, gray -sandy lean clay to 70.2m -with a sand layer at 67.2m (76.8m) -sand layer, 67.5m to 67.8m -with light gray bands at 68.6m -with sand layers at 68.6m, 68.9m, and 70.0m -sand layer, 70.2m to 70.4m -with organic matter pockets and wood fragments, 72.2m to 75.0m -with organic matter partings at 74.7m	XI
30/20cm		XII
50/20cm, 30/15cm, 30/5cm, 30/10cm, Ref/10cm	Lean CLAY (CL), hard, gray -with silt pockets, partings and seams, and minerlization along pinhole openings (possibly worm holes or root casts) -interlayered lean clay and silty sand, below 80.2m (82.9m)	
100-0, 78-0, 100-0, 100-0, 100-56, 87-45, 100-23, 45-8, 100-62, 96-61, 100-54, 95-67	Fine to Medium SAND (SP), dense to very dense, gray -with a few chert fragments at 85.3m -gravelly below 86.6m -fine to coarse gravel at 88.4m -very dense gray cemented silt below 89.3m (90.2m)	XIII
	SANDSTONE (Graywacke) (RX), light brown to brown, intensely weathered, moderately soft, very intensely fractured -gravelly clay, 92.0m to 92.1m -siltstone, 99.1m to 99.4m	

TOTAL DEPTH: 107.0m BACKFILLED WITH: Cement Grout



REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

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PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 2 OF 47

CU 04
EA 012021
BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA — Sheet 49 of 87

TO ACCOMPANY PLANS DATED 2-21-12

100% PS&E

REID BUELL, DESIGN OVERSIGHT	DRAWN BY SACHIN DESHPANDE	J.CHACKO/M.ZUEGER, FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
11/17/00	CHECKED BY J.CHACKO	DATE 06/14/99	

T.W.McNEILAN, PROJECT ENGINEER

BRIDGE NO. 34-0006
KM POST
POST MILE

CU 04
EA 012021

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

LOG OF TEST BORINGS 2 OF 47

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

DISREGARD PRINTS BEARING EARLIER REVISION DATES → 7/15/99 2/15/00 8/02/00 11/17/00

REVISION DATES (PRELIMINARY STAGE ONLY) | SHEET 501 | OF

FILENAME => 33-0025-q-1tb02of47.tif

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- ○ THEORETICAL SUBMERGED UNIT WEIGHT (KCF)
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- ◇ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (◇ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▽ SWEDISH FALL CONE
- ⊡ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- + Soil: Strength Exceeds Capacity of Measuring Device
- Shear Strength Interpreted from CPT Tip Resistance

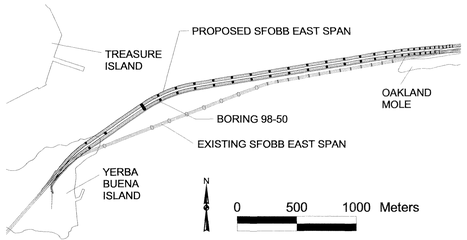
STRENGTH OF COHESIVE SOILS

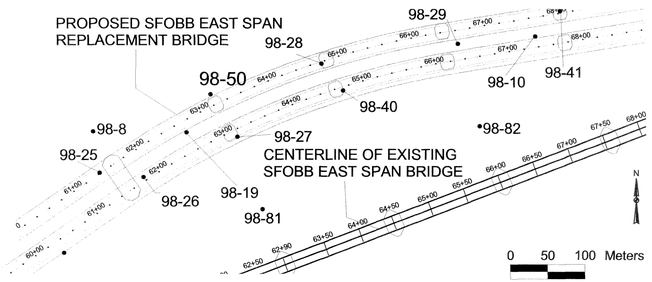
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

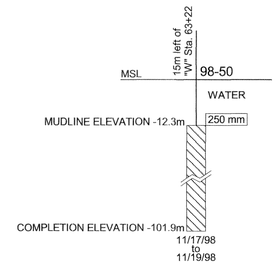
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







BORING 98-50

Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF, Ala	80	13.9/14.3, 0.0/1.6	934	978

GEOTECHNICAL PROFESSIONAL

6-4-01
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/00 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 848,
Oakland, CA 94621
(510) 633-5100

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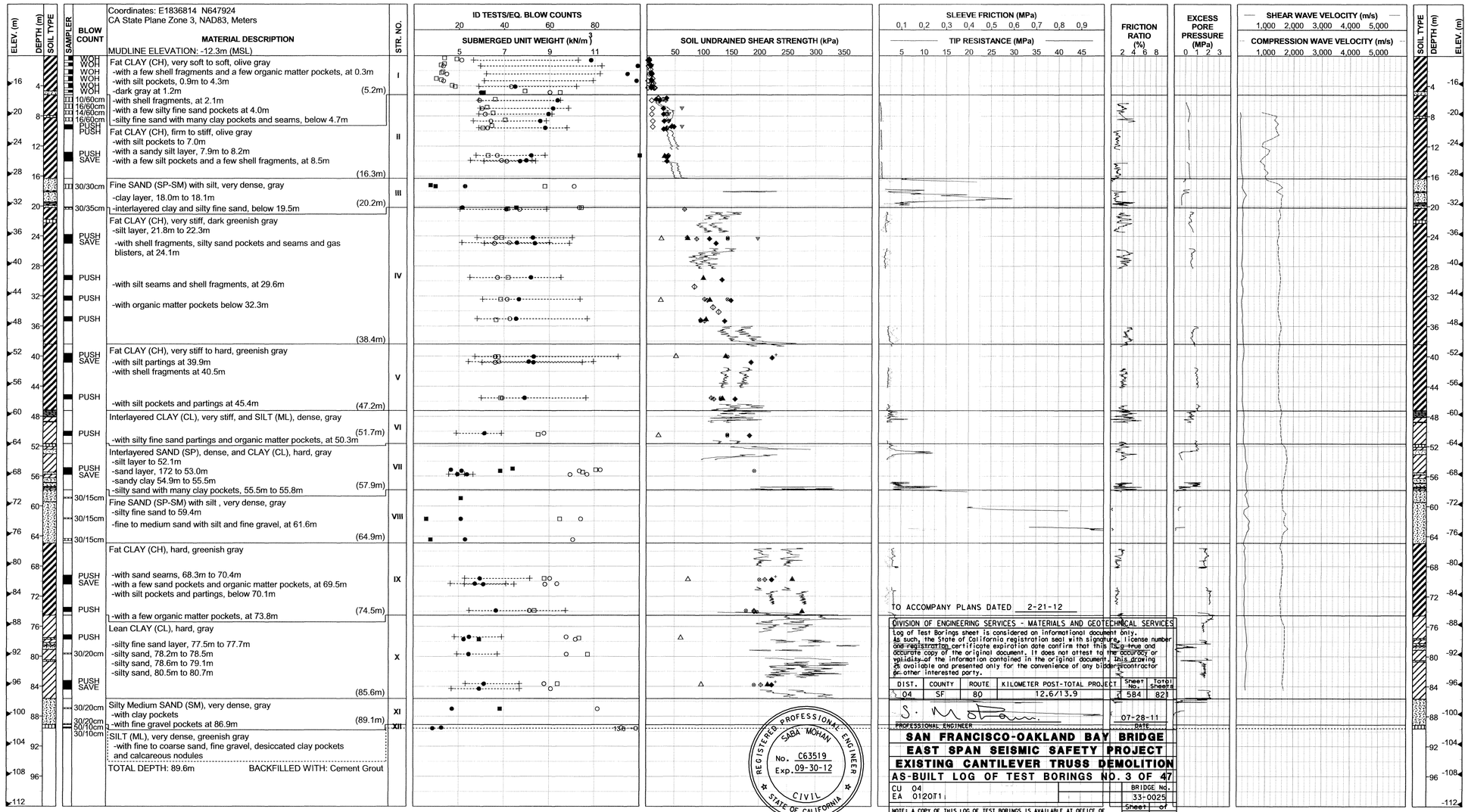
Coordinates: E1836814 N647924
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -12.3m (MSL)

BLOW COUNT	MATERIAL DESCRIPTION	STR. NO.
WOH, WOH, WOH, WOH, WOH, WOH	Fat CLAY (CH), very soft to soft, olive gray -with a few shell fragments and a few organic matter pockets, at 0.3m -with silt pockets, 0.9m to 4.3m -dark gray at 1.2m (5.2m)	I
10/60cm, 16/60cm, 14/60cm, 16/60cm, PUSH, PUSH	-with shell fragments, at 2.1m -with a few silty fine sand pockets at 4.0m -silty fine sand with many clay pockets and seams, below 4.7m	II
PUSH, SAVE	Fat CLAY (CH), firm to stiff, olive gray -with silt pockets to 7.0m -with a sandy silt layer, 7.9m to 8.2m -with a few silt pockets and a few shell fragments, at 8.5m (16.3m)	
30/30cm, 30/35cm	Fine SAND (SP-SM) with silt, very dense, gray -clay layer, 18.0m to 18.1m -interlayered clay and silty fine sand, below 19.5m (20.2m)	III
PUSH, SAVE, PUSH, PUSH, PUSH	Fat CLAY (CH), very stiff, dark greenish gray -silt layer, 21.8m to 22.3m -with shell fragments, silty sand pockets and seams and gas blisters, at 24.1m -with silt seams and shell fragments, at 29.6m -with organic matter pockets below 32.3m (38.4m)	IV
PUSH, SAVE, PUSH	Fat CLAY (CH), very stiff to hard, greenish gray -with silt partings at 39.9m -with shell fragments at 40.5m -with silt pockets and partings at 45.4m (47.2m)	V
PUSH	Interlayered CLAY (CL), very stiff, and SILT (ML), dense, gray -with silty fine sand partings and organic matter pockets, at 50.3m (51.7m)	VI
PUSH, SAVE	Interlayered SAND (SP), dense, and CLAY (CL), hard, gray -silt layer to 52.1m -sand layer, 172 to 53.0m -sandy clay 54.9m to 55.5m -silty sand with many clay pockets, 55.5m to 55.8m (57.9m)	VII
30/15cm, 30/15cm, 30/15cm	Fine SAND (SP-SM) with silt , very dense, gray -silty fine sand to 59.4m -fine to medium sand with silt and fine gravel, at 61.6m (64.9m)	VIII
PUSH, SAVE, PUSH	Fat CLAY (CH), hard, greenish gray -with sand seams, 68.3m to 70.4m -with a few sand pockets and organic matter pockets, at 69.5m -with silt pockets and partings, below 70.1m -with a few organic matter pockets, at 73.8m (74.5m)	IX
PUSH, 30/20cm, PUSH	Lean CLAY (CL), hard, gray -silty fine sand layer, 77.5m to 77.7m -silty sand, 78.2m to 78.5m -silty sand, 78.6m to 79.1m -silty sand, 80.5m to 80.7m (85.6m)	X
30/20cm, 30/20cm, 50/10cm, 30/10cm	Silty Medium SAND (SM), very dense, gray -with clay pockets -with fine gravel pockets at 86.9m (89.1m)	XI
	SILT (ML), very dense, greenish gray -with fine to coarse sand, fine gravel, desiccated clay pockets and calcareous nodules	XII

TOTAL DEPTH: 89.6m BACKFILLED WITH: Cement Grout



TO ACCOMPANY PLANS DATED 2-21-12

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES
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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	584	821

PROFESSIONAL ENGINEER — DATE 07-28-11

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 3 OF 47

CU 04
EA 012011

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA — Sheet 50 of 87

100% PS&E

REID BUELL, DESIGN OVERSIGHT	DRAWN BY SACHIN DESHPANDE	P. ROBBINS, R. HOWARD, FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	T.W.McNEILAN, PROJECT ENGINEER
	CHECKED BY J.CHACKO	DATE 06/14/99		

BRIDGE NO. 34-0006 — KM POST — POST MILE

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

LOG OF TEST BORINGS 3 of 47

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 012021

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY) 7/15/99 2/15/00 11/17/00

SHEET 502 OF

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF, Ala	80	13.9/14.3, 0.0/1.6	935	978

GEOTECHNICAL PROFESSIONAL

6-4-01
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/00 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 848,
Oakland, CA 94621
(510) 633-5100

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Metric

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (KCF)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (KCF)
- PLASTIC LIMIT LIQUID LIMIT
- ⊗ EQUIVALENT SPT BLOW COUNT

STRENGTH TESTS

- ⊗ POCKET PENETROMETER
- ◇ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (◇ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▽ SWEDISH FALL CONE
- ⊡ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- + Soil: Strength Exceeds Capacity of Measuring Device
- Shear Strength Interpreted from CPT Tip Resistance

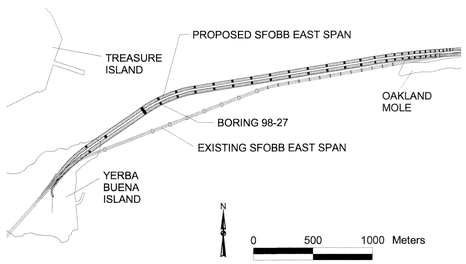
STRENGTH OF COHESIVE SOILS

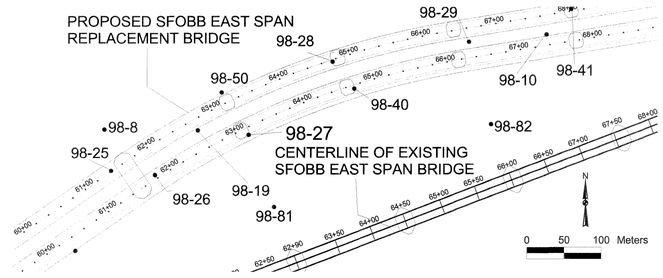
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

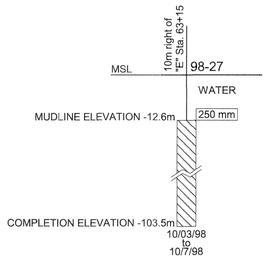
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

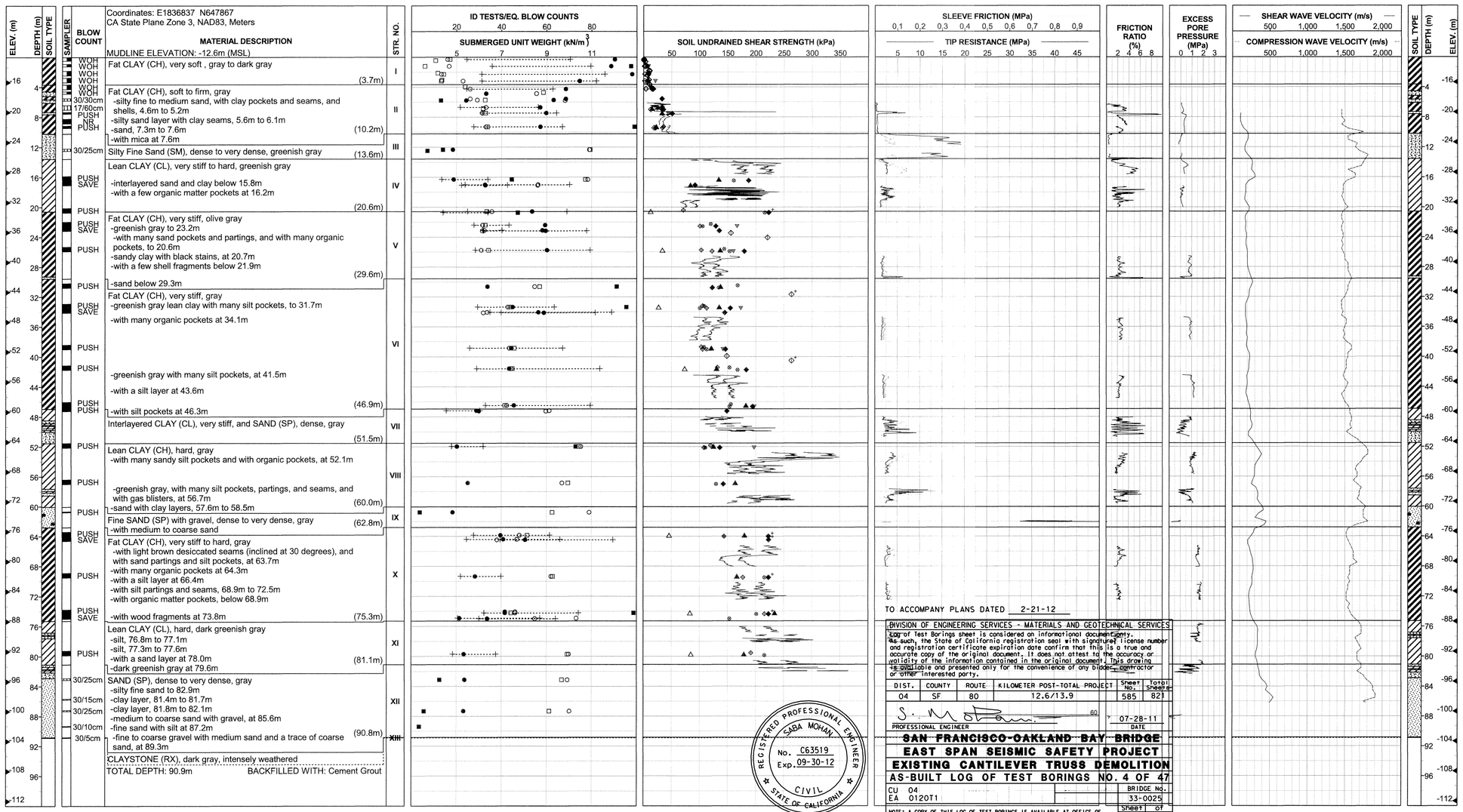
*Estimated from sampler driving record and CPT tip resistance.







BORING 98-27



Coordinates: E1836837 N647867
CA State Plane Zone 3, NAD83, Meters

MATERIAL DESCRIPTION
MUDLINE ELEVATION: -12.6m (MSL)

BLOW COUNT	MATERIAL DESCRIPTION	STR. NO.
WOH WOH WOH WOH WOH WOH	Fat CLAY (CH), very soft , gray to dark gray (3.7m)	I
30/30cm 17/60cm PUSH NS PUSH	Fat CLAY (CH), soft to firm, gray -silty fine to medium sand, with clay pockets and seams, and shells, 4.6m to 5.2m -silty sand layer with clay seams, 5.6m to 6.1m -sand, 7.3m to 7.6m -with mica at 7.6m (10.2m)	II
30/25cm	Silty Fine Sand (SM), dense to very dense, greenish gray (13.6m)	III
PUSH SAVE	Lean CLAY (CL), very stiff to hard, greenish gray -interlayered sand and clay below 15.8m -with a few organic matter pockets at 16.2m (20.6m)	IV
PUSH PUSH SAVE PUSH	Fat CLAY (CH), very stiff, olive gray -greenish gray to 23.2m -with many sand pockets and partings, and with many organic pockets, to 20.6m -sandy clay with black stains, at 20.7m -with a few shell fragments below 21.9m (29.6m)	V
PUSH	-sand below 29.3m	
PUSH SAVE	Fat CLAY (CH), very stiff, gray -greenish gray lean clay with many silt pockets, to 31.7m -with many organic pockets at 34.1m	VI
PUSH PUSH PUSH PUSH PUSH	-greenish gray with many silt pockets, at 41.5m -with a silt layer at 43.6m (46.9m)	
PUSH	-with silt pockets at 46.3m	
	Interlayered CLAY (CL), very stiff, and SAND (SP), dense, gray (51.5m)	VII
PUSH	Lean CLAY (CH), hard, gray -with many sandy silt pockets and with organic pockets, at 52.1m	VIII
PUSH PUSH	-greenish gray, with many silt pockets, partings, and seams, and with gas blisters, at 56.7m (60.0m)	
PUSH	-sand with clay layers, 57.6m to 58.5m	
PUSH SAVE	Fine SAND (SP) with gravel, dense to very dense, gray (62.8m) -with medium to coarse sand	IX
PUSH PUSH PUSH PUSH SAVE	Fat CLAY (CH), very stiff to hard, gray -with light brown desiccated seams (inclined at 30 degrees), and with sand partings and silt pockets, at 63.7m -with many organic pockets at 64.3m -with a silt layer at 66.4m -with silt partings and seams, 68.9m to 72.5m -with organic matter pockets, below 68.9m -with wood fragments at 73.8m (75.3m)	X
PUSH	Lean CLAY (CL), hard, dark greenish gray -silt, 76.8m to 77.1m -silt, 77.3m to 77.6m -with a sand layer at 78.0m (81.1m) -dark greenish gray at 79.6m	XI
30/25cm 30/15cm 30/25cm 30/10cm 30/5cm	SAND (SP), dense to very dense, gray -silty fine sand to 82.9m -clay layer, 81.4m to 81.7m -clay layer, 81.8m to 82.1m -medium to coarse sand with gravel, at 85.6m -fine sand with silt at 87.2m (90.8m) -fine to coarse gravel with medium sand and a trace of coarse sand, at 89.3m	XII
	CLAYSTONE (RX), dark gray, intensely weathered	XIII

TOTAL DEPTH: 90.9m BACKFILLED WITH: Cement Grout

TO ACCOMPANY PLANS DATED 2-21-12

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	585	821

PROFESSIONAL ENGINEER — DATE 07-28-11

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 4 OF 47

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet 51 of 87

100% PS&E

REID BUELL, DESIGN OVERSIGHT — Reid Buell 11/17/00	DRAWN BY: SACHIN DESHPANDE	CHECKED BY: J.CHACKO	J.CHACKO, M.ZUEGER, R. HOWARD — FIELD INVESTIGATOR — DATE 06/14/99

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

T.W.McNEILAN — PROJECT ENGINEER

BRIDGE NO. 34-0006 — KM POST — POST MILE

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

LOG OF TEST BORINGS 4 OF 47

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 012021

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY) 7/15/99 2/15/00 8/02/00 11/17/00

SHEET 503 OF

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF, Ala	80	13.9/14.3, 0.0/1.6	936	978

GEOTECHNICAL PROFESSIONAL

6-4-01
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/00 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 848,
Oakland, CA 94621
(510) 633-5100

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Metric

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- PERCENT PASSING #200 SIEVE
- WATER CONTENT (%)
- SUBMERGED UNIT WEIGHT (KCF)
- THEORETICAL SUBMERGED UNIT WEIGHT (KCF)

PLASTIC LIMIT LIQUID LIMIT

- EQUIVALENT SPT BLOW COUNT
- ROCK QUALITY DESIGNATION (RQD)
- ROCK RECOVERY PERCENT
- ROCK CORING RATE

STRENGTH TESTS

- POCKET PENETROMETER
- TORVANE
- REMOTE VANE
- MINIATURE VANE (RESIDUAL VANE)
- UNCONSOLIDATED UNDRAINED TRIAXIAL
- SWEDISH FALL CONE
- UNCONFINED COMPRESSION (SOIL)
- (Open symbols indicate remolded tests)
- Soil: Strength Exceeds Capacity of Measuring Device
- Rock: Sample broke along discontinuity; Intact sample would have greater strength
- Shear Strength Interpreted from CPT Tip Resistance
- POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- UNCONFINED COMPRESSION (ROCK)
- FRACTURE DENSITY (ROCK)

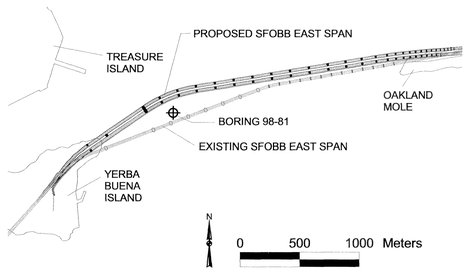
STRENGTH OF COHESIVE SOILS

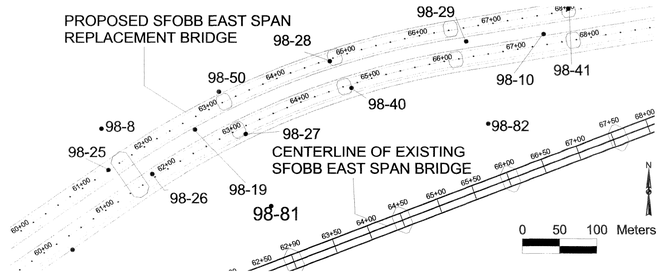
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

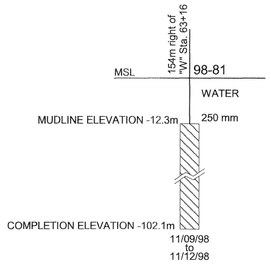
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

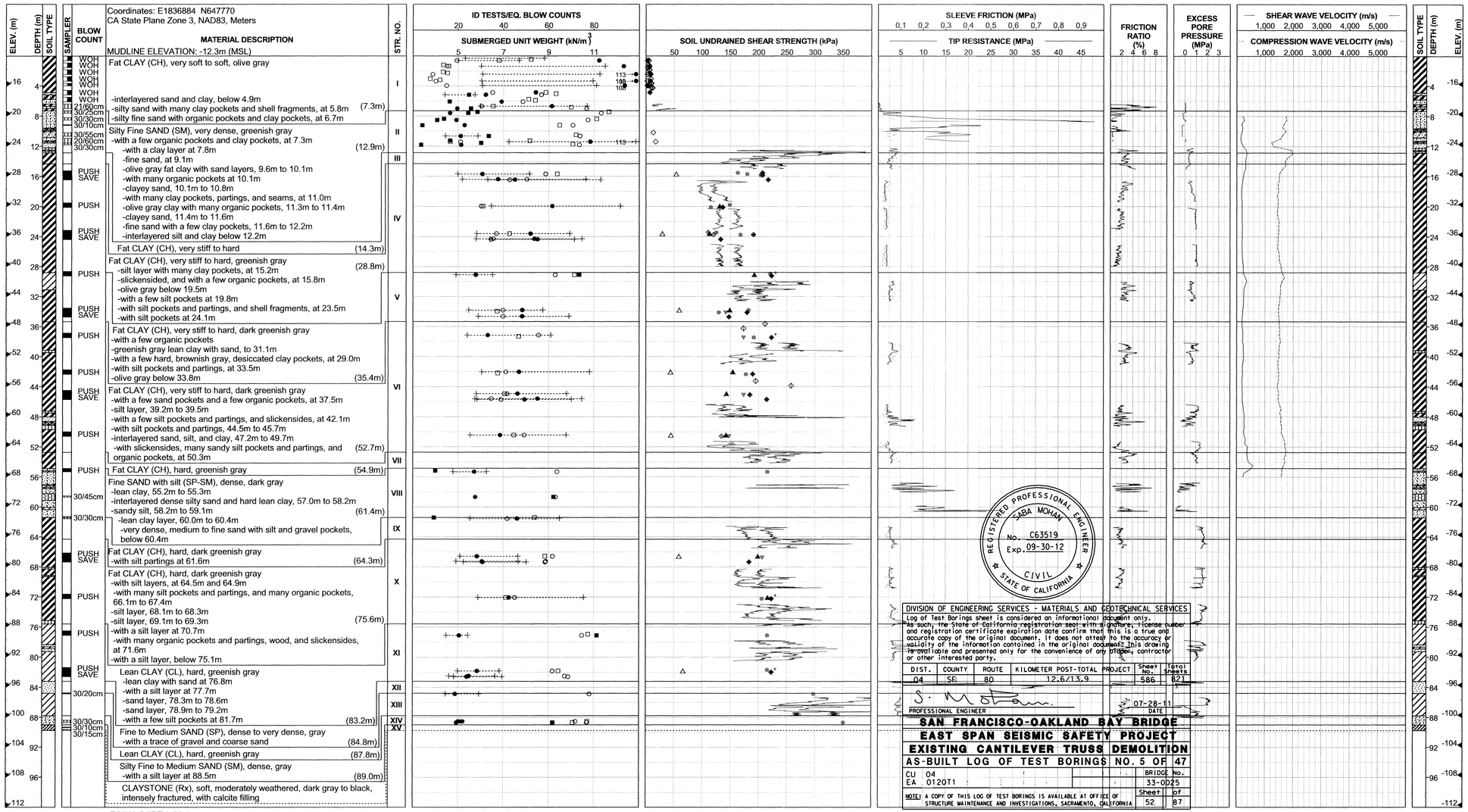
*Estimated from sampler driving record and CPT tip resistance.







BORING 98-81



Coordinates: E1836884 N647770
CA State Plane Zone 3, NAD83, Meters

MATERIAL DESCRIPTION

MUDLINE ELEVATION: -12.3m (MSL)

Fat CLAY (CH), very soft to soft, olive gray
-interlayered sand and clay, below 4.9m
-silty sand with many clay pockets and shell fragments, at 5.8m (7.3m)
-silty fine sand with organic pockets and clay pockets, at 6.7m

Silty Fine SAND (SM), very dense, greenish gray
-with a few organic pockets and clay pockets, at 7.3m
-with a clay layer at 7.8m (12.9m)
-fine sand, at 9.1m
-olive gray fat clay with sand layers, 9.6m to 10.1m
-with many organic pockets at 10.1m
-clayey sand, 10.1m to 10.8m
-with many clay pockets, partings, and seams, at 11.0m
-olive gray clay with many organic pockets, 11.3m to 11.4m
-clayey sand, 11.4m to 11.6m
-fine sand with a few clay pockets, 11.6m to 12.2m
-interlayered silt and clay below 12.2m

Fat CLAY (CH), very stiff to hard (14.3m)

Fat CLAY (CH), very stiff to hard, greenish gray (28.8m)
-silt layer with many clay pockets, at 15.2m
-slickensided, and with a few organic pockets, at 15.8m
-olive gray below 19.5m
-with a few silt pockets at 19.8m
-with silt pockets and partings, and shell fragments, at 23.5m
-with silt pockets at 24.1m

Fat CLAY (CH), very stiff to hard, dark greenish gray
-with a few organic pockets
-greenish gray lean clay with sand, to 31.1m
-with a few hard, brownish gray, desiccated clay pockets, at 29.0m
-with silt pockets and partings, at 33.5m
-olive gray below 33.8m (35.4m)

Fat CLAY (CH), very stiff to hard, dark greenish gray
-with a few sand pockets and a few organic pockets, at 37.5m
-silt layer, 39.2m to 39.5m
-with a few silt pockets and partings, and slickensides, at 42.1m
-with silt pockets and partings, 44.5m to 45.7m
-interlayered sand, silt, and clay, 47.2m to 49.7m
-with slickensides, many sandy silt pockets and partings, and organic pockets, at 50.3m (52.7m)

Fat CLAY (CH), hard, greenish gray (54.9m)

Fine SAND with silt (SP-SM), dense, dark gray
-lean clay, 55.2m to 55.3m
-interlayered dense silty sand and hard lean clay, 57.0m to 58.2m
-sandy silt, 58.2m to 59.1m (61.4m)
-lean clay layer, 60.0m to 60.4m
-very dense, medium to fine sand with silt and gravel pockets, below 60.4m

Fat CLAY (CH), hard, dark greenish gray
-with silt partings at 61.6m (64.3m)

Fat CLAY (CH), hard, dark greenish gray
-with silt layers, at 64.5m and 64.9m
-with many silt pockets and partings, and many organic pockets, 66.1m to 67.4m
-silt layer, 68.1m to 68.3m
-silt layer, 69.1m to 69.3m (75.6m)
-with a silt layer at 70.7m
-with many organic pockets and partings, wood, and slickensides, at 71.6m
-with a silt layer, below 75.1m

Lean CLAY (CL), hard, greenish gray
-lean clay with sand at 76.8m
-with a silt layer at 77.7m
-sand layer, 78.3m to 78.6m
-sand layer, 78.9m to 79.2m
-with a few silt pockets at 81.7m (83.2m)

Fine to Medium SAND (SP), dense to very dense, gray
-with a trace of gravel and coarse sand (84.8m)

Lean CLAY (CL), hard, greenish gray (87.8m)

Silty Fine to Medium SAND (SM), dense, gray
-with a silt layer at 88.5m (89.0m)

CLAYSTONE (Rx), soft, moderately weathered, dark gray to black, intensely fractured, with calcite filling

TOTAL DEPTH: 89.8m BACKFILLED WITH: Cement Grout

TO ACCOMPANY PLANS DATED 2-21-12

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES
Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	586	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 5 OF 47

CU 04
EA 0120T1
BRIDGE No. 33-0025
Sheet 52 of 87

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

100% PS&E

REID BUELL, DESIGN OVERSIGHT	DRAWN BY: SACHIN DESHPANDE	J.CHACKO/M.ZUEGER, FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	T.W.McNEILAN, PROJECT ENGINEER
	CHECKED BY: J.CHACKO	DATE 06/14/99		

BRIDGE NO. 34-0006 | KM POST | POST MILE

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

LOG OF TEST BORINGS 5 OF 47

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 012021

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY) 7/15/99 2/15/00 8/02/00 11/17/00

SHEET 504 OF

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF, Ala	80	13.9/14.3, 0.0/1.6	937	978

GEOTECHNICAL PROFESSIONAL

6-4-01
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — T.W. McNeilan — No. 0583 — Exp. 12/31/00 — Geotechnical — STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 848,
Oakland, CA 94621
(510) 633-5100

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Metric

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (KCF)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (KCF)
- PLASTIC LIMIT + — LIQUID LIMIT +
- ⊗ EQUIVALENT SPT BLOW COUNT

STRENGTH TESTS

- ⊗ POCKET PENETROMETER
- ✥ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (◇ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▽ SWEDISH FALL CONE
- ⊡ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- + Soil: Strength Exceeds Capacity of Measuring Device
- Shear Strength Interpreted from CPT Tip Resistance

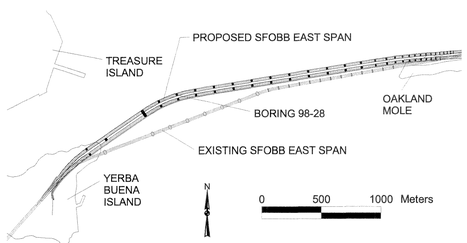
STRENGTH OF COHESIVE SOILS

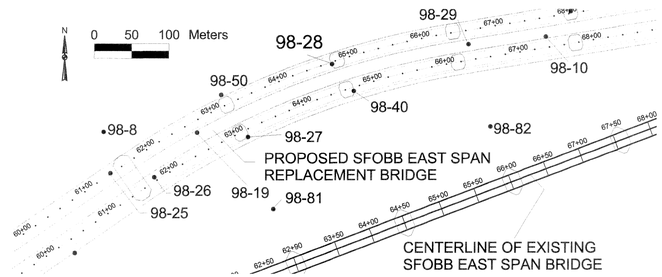
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

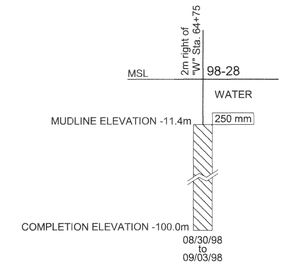
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







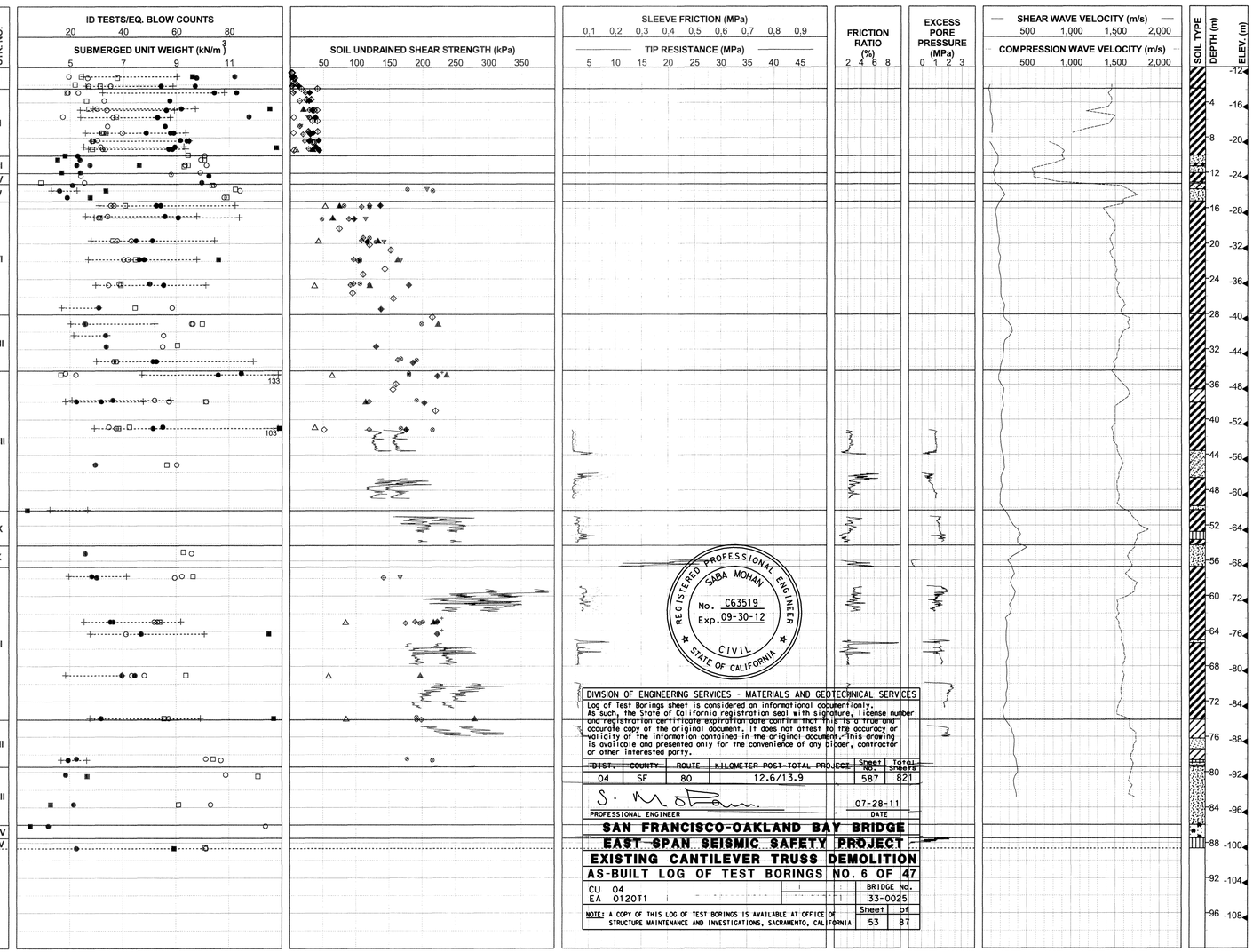
BORING 98-28

Coordinates: E1836963 N647965
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -11.4m (MSL)

ELEV. (m)	DEPTH (m)	BLOW COUNT	MATERIAL DESCRIPTION	STR. NO.
		NR	Fat CLAY (CH), very soft, olive gray	I
		WOH	-with silty sand pockets at 0.9m (2.4m)	
		WOH	Fat CLAY (CH), firm, olive gray	II
		WOH		
		PUSH		
		PUSH		
		PUSH		
		SAVE		
		30/30cm	(10.1m)	
		13/30cm	Silty Fine SAND (SM), dense, gray	III
		30/30cm	-intermixed clay and sand, at 11.3m (12.0m)	
		58		IV
		PUSH	Fat CLAY (CH), firm, olive gray	
		30/30cm	-with a silty sand layer, below 13.1m (13.3m)	V
		PUSH		
		30/40cm	Silty Fine SAND (SP), dense, greenish gray (15.2m)	
		30/60cm	Fat CLAY (CH), very stiff, gray	VI
			-greenish gray and with slickensides, to 15.8m	
		PUSH	-with silt pockets, silty sand pockets and shell fragments, 19.2m to 24.7m	
		PUSH	-with many shell fragments at 19.2m	
		PUSH		
		PUSH	-greenish gray with many sand pockets and seams, and a few shells, at 27.1m (28.0m)	
		30/20cm	Fat CLAY (CH), very stiff to hard, greenish gray	VII
		SAVE	-with silt seams at 30.2m	
		30/30cm		
		PUSH	(34.4m)	
		PUSH	Fat CLAY (CH), very stiff to hard, gray	VIII
			-with many large organic pockets and partings at 34.7m	
		PUSH	-lean clay, 36.6m to 37.8m	
			-vertical organic partings, organic pockets, and desiccated pockets, at 37.8m	
		PUSH	-with a few silt pockets and partings, at 40.8m	
		PUSH	-intermixed fine sand and clay, 43.6m to 46.6m	
		SAVE	-silty sand, below 49.8m (50.3m)	
			Fat CLAY (CH), hard, gray	IX
			-silt with clay seams, 52.7m to 53.6m (54.3m)	
		PUSH	Silty Fine SAND (SM), very dense, gray	X
			-with clay partings at 54.9m (56.7m)	
		30/40cm	-with a fat clay layer at 55.2m	
			-with clay seams at 56.2m	
			Fat CLAY (CH), hard, gray	XI
			-lean clay with a few sand and silt pockets, at 57.9m	
		PUSH	-with organic pockets and a few silt pockets, below 62.5m	
		SAVE		
			-with a sand layer, 65.1m to 65.4m	
			-with sand layers, at 65.8m and 66.3m	
		PUSH	-with silt pockets and partings, at 68.9m	
		PUSH	-with organic pockets and organic stains, at 73.8m (74.1m)	
			Lean CLAY (CL), hard, greenish gray to gray	XII
			-sand layer, 76.2m to 77.4m	
			-intermixed silt and clay layer, 78.6m to 78.9m	
		30/40cm	-sand layer, 78.9m to 79.2m (79.4m)	
		30/40cm	Silty Fine SAND (SM), very dense, greenish gray to gray	XIII
			-with clay pockets	
		30/15cm	(86.0m)	
		30/15cm	Fine GRAVEL with sand (GP), very dense, black to gray (87.5m)	XIV
		30/25cm	Sandy SILT (ML),very dense, greenish gray to gray	XV

TOTAL DEPTH: 88.6m BACKFILLED WITH: Cement Grout



REGISTERED PROFESSIONAL ENGINEER — SABA MOHAN — No. C63519 — Exp. 09-30-12 — CIVIL — STATE OF CALIFORNIA

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	587	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 6 OF 47

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA — Sheet 53 of 87

TO ACCOMPANY PLANS DATED 2-21-12

100% PS&E

REID BUELL — DESIGN OVERSIGHT — Reid Buell 11/17/00	DRAWN BY SACHIN DESHPANDE	J.CHACKO, M.ZUEGER, P. ROBBINS — FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	T.W.McNEILAN — PROJECT ENGINEER	BRIDGE NO. 34-0006
	CHECKED BY J.CHACKO	DATE 06/14/99			KM POST
			ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10	CU 04 EA 012021	POST MILE

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

LOG OF TEST BORINGS 6 OF 47

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY) 7/13/99 2/15/00 8/02/00 11/17/00 — SHEET 505 — OF

FILENAME => 33-0025-q-1tb06of47.tif

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF, Ala	80	13.9/14.3, 0.0/1.6	938	978

GEOTECHNICAL PROFESSIONAL

6-4-01
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/00 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS, A JOINT VENTURE, 7700, Edgewater Dr., Ste. 848, Oakland, CA 94621 (510) 633-5100

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SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (KCF)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (KCF)
- PLASTIC LIMIT + LIQUID LIMIT +
- ⊗ EQUIVALENT SPT BLOW COUNT
- ---- ROCK QUALITY DESIGNATION (RQD)
- —— ROCK RECOVERY PERCENT
- —— ROCK CORING RATE

STRENGTH TESTS

- ⊗ POCKET PENETROMETER
- ◇ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (◇ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▽ SWEDISH FALL CONE
- ⊡ UNCONFINED COMPRESSION (SOIL)
- ⊕ POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ⊕ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)

△◇ (Open symbols indicate remolded tests)
+ Strength Exceeds Capacity of Measuring Device
Shear Strength Interpreted from CPT Tip Resistance

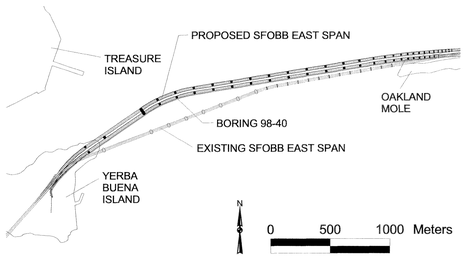
STRENGTH OF COHESIVE SOILS

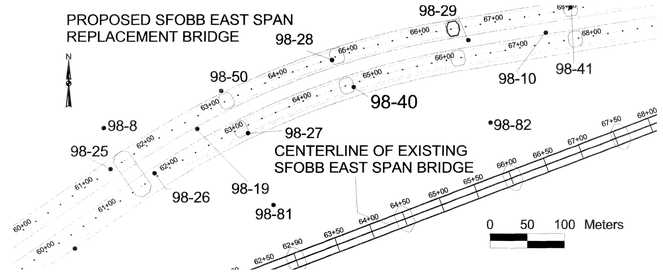
Consistency	Undrained Shear Strength, kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

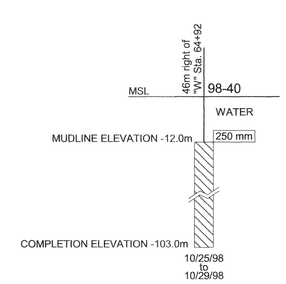
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







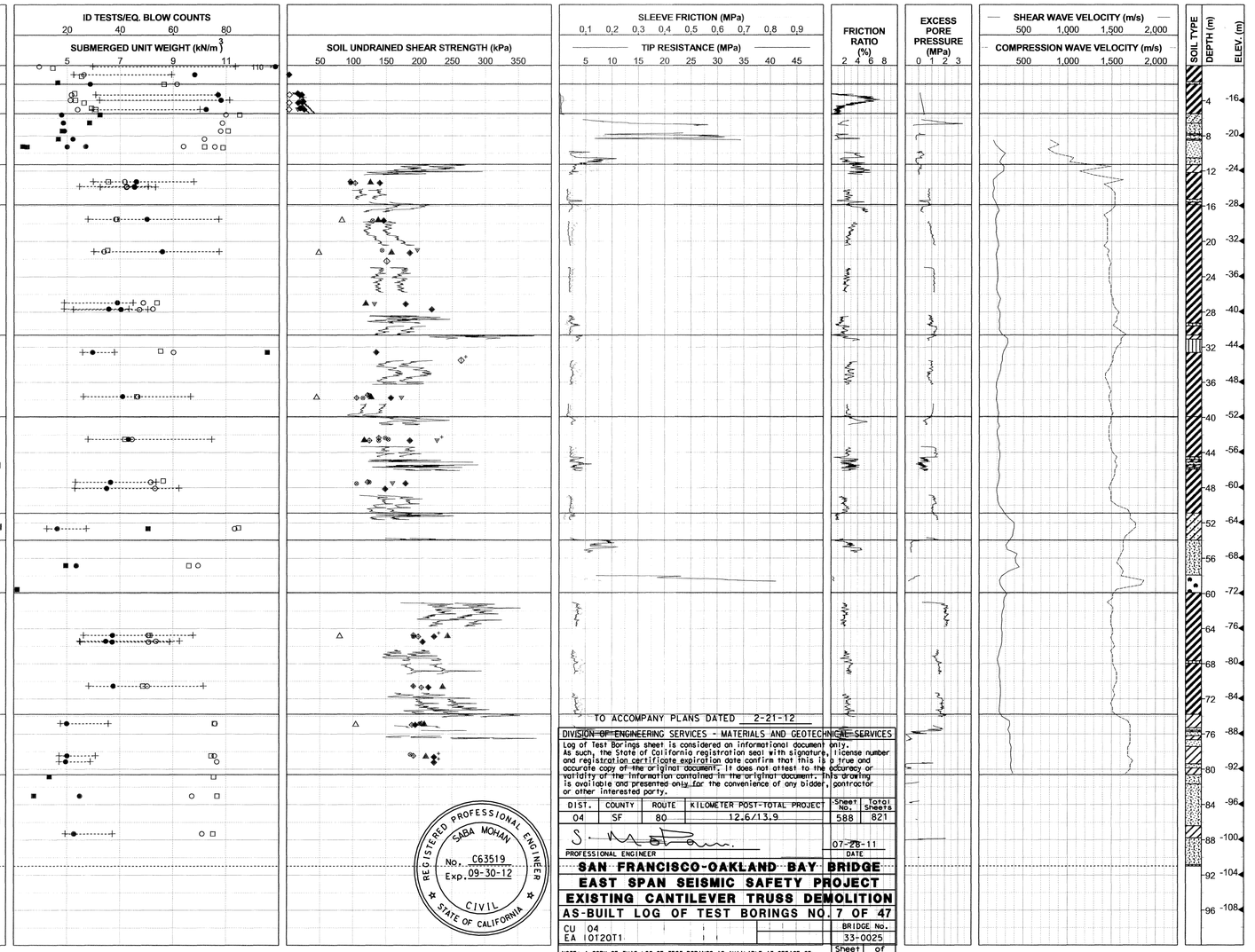
BORING 98-40

Coordinates: E1836992 N647929
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -12.0m (MSL)

BLOW COUNT	MATERIAL DESCRIPTION	STR. NO.
WOH, WOH, WOH	Fat CLAY (CH), very soft, olive gray (2.1m)	I
5/30cm, 10/30cm, 8/30cm	-silty fine sand with many clay pockets, 1.8m to 2.1m; Fat CLAY (CH), soft to firm, olive gray (5.5m)	II
22/15cm, 30/15cm, 30/15cm, 30/20cm, 30/10cm	Silty Fine SAND (SM), very dense, olive gray; -with clay layers, at 7.8m and 8.4m; -fine sand, 8.8m to 10.5m; -silty fine sand with clay seams and layers, below 10.5m (11.3m)	III
PUSH, SAVE, PUSH	Fat CLAY (CH), very stiff, olive gray; -lean clay to 12.2m; -with many silt pockets, partings and seams and organic pockets, 12.8m to 14.0m; -fine sand layer, 15.2m to 15.5m (15.8m)	IV
PUSH, PUSH, PUSH, SAVE	Fat CLAY (CH), very stiff, greenish gray; -with slickensides at 17.4m; -with many shells and shell fragments, below 20.7m; -with many silt and sand pockets and seams, 26.5m to 27.7m; -silt layer, 29.3m to 29.6m (30.6m)	V
PUSH, PUSH	Fat CLAY (CH), very stiff to hard, greenish gray; -lean clay to 31.1m; -silt with fat clay pockets, 31.1m to 32.6m; -with a few organic pockets and partings, at 37.5m (39.9m)	VI
PUSH, PUSH, SAVE	Fat CLAY (CH), very stiff, greenish gray; -with silty fine sand pockets, partings and seams, below 42.1m; -with silt partings and gas blisters, at 42.4m; -interlayered silt, sand, and clay, 44.5m to 46.0m; -with organic pockets at 47.2m (50.9m)	VII
30/20cm	Sandy Lean CLAY (CL), very stiff to hard, greenish gray (53.9m)	VIII
30/15cm, 30/10cm	Silty Fine SAND (SM), dense, dark gray; -with gravel pockets, 54.9m to 56.7m; -very dense dark gray fine gravel below 57.9m (59.9m)	IX
PUSH, SAVE, PUSH	Fat CLAY (CH), very stiff to hard, olive gray; -with a few silt pockets and organic pockets, at 64.6m; -with silt pockets at 65.2m; -silt layer, 67.7m to 68.0m; -with many organic pockets at 70.4m (73.8m)	X
PUSH, SAVE	Lean CLAY (CL), hard, greenish gray to gray; -with a few silt pockets and few organic pockets, at 74.7m; -dense sand with clay layers, 75.3m to 76.2m; -dense fine sand layer, 76.7m to 77.4m; -with silt pockets at 78.3m (80.6m)	XI
30/10cm, 30/15cm, 50/5cm, 30/25cm, 30/15cm, 60/15cm	-very dense, fine sand layer, 79.4m to 79.9m; Fine SAND with silt (SP-SM), very dense, gray; -silty fine sand to 81.7m; -with a few clay pockets and a clay seam, at 82.9m; -hard, olive gray, lean clay layer, 86.4m to 87.8m; -gravel with clay pockets, at 89.3m; -very dense, greenish gray, sandy silt with gravel fragments, below 90.8m	XII

TOTAL DEPTH: 91.0m BACKFILLED WITH: Cement Grout



TO ACCOMPANY PLANS DATED 2-21-12

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	588	821

PROFESSIONAL ENGINEER — DATE 07-28-11

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 7 OF 47

CU 04
EA 10T20T1

BRIDGE No. 33-0025
Sheet 54 of 87

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

100% PS&E

REID BUELL, DESIGN OVERSIGHT	DRAWN BY: SACHIN DESHPANDE	R. HOWARD, P. ROBBINS, C. LOVATO, L. PRENTICE, FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
	CHECKED BY: J.CHACKO	DATE 06/14/99	

T.W.McNEILAN, PROJECT ENGINEER

BRIDGE NO. 34-0006
KM POST
POST MILE

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

LOG OF TEST BORINGS 7 OF 47

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 012021

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY) 7/15/99 2/15/00 8/02/00 11/17/00

SHEET 506 OF

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SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%)

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (KCF)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (KCF)
- PLASTIC LIMIT + ····· + LIQUID LIMIT
- ⊙ EQUIVALENT SPT BLOW COUNT

STRENGTH TESTS

- ⊗ POCKET PENETROMETER
- ◇ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (◇ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▽ SWEDISH FALL CONE
- ⊡ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- \+ Soil: Strength Exceeds Capacity of Measuring Device
- Shear Strength Interpreted from CPT Tip Resistance

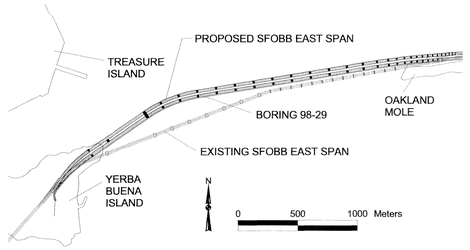
STRENGTH OF COHESIVE SOILS

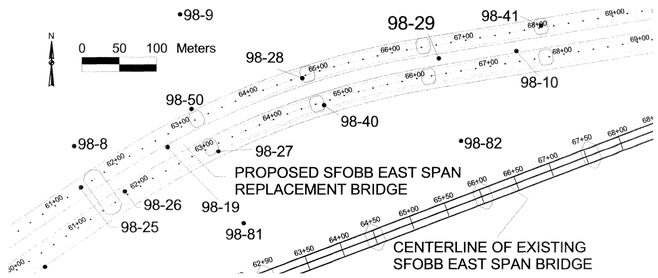
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

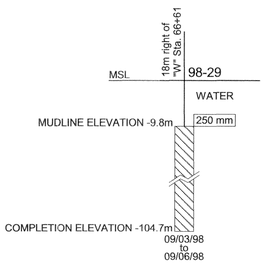
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







BORING 98-29

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF, Ala	80	13.9/14.3, 0.0/1.6	939	978

GEOTECHNICAL PROFESSIONAL

6-4-01
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/00 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS, A JOINT VENTURE.
7700, Edgewater Dr., Ste. 848,
Oakland, CA 94621
(510) 633-5100

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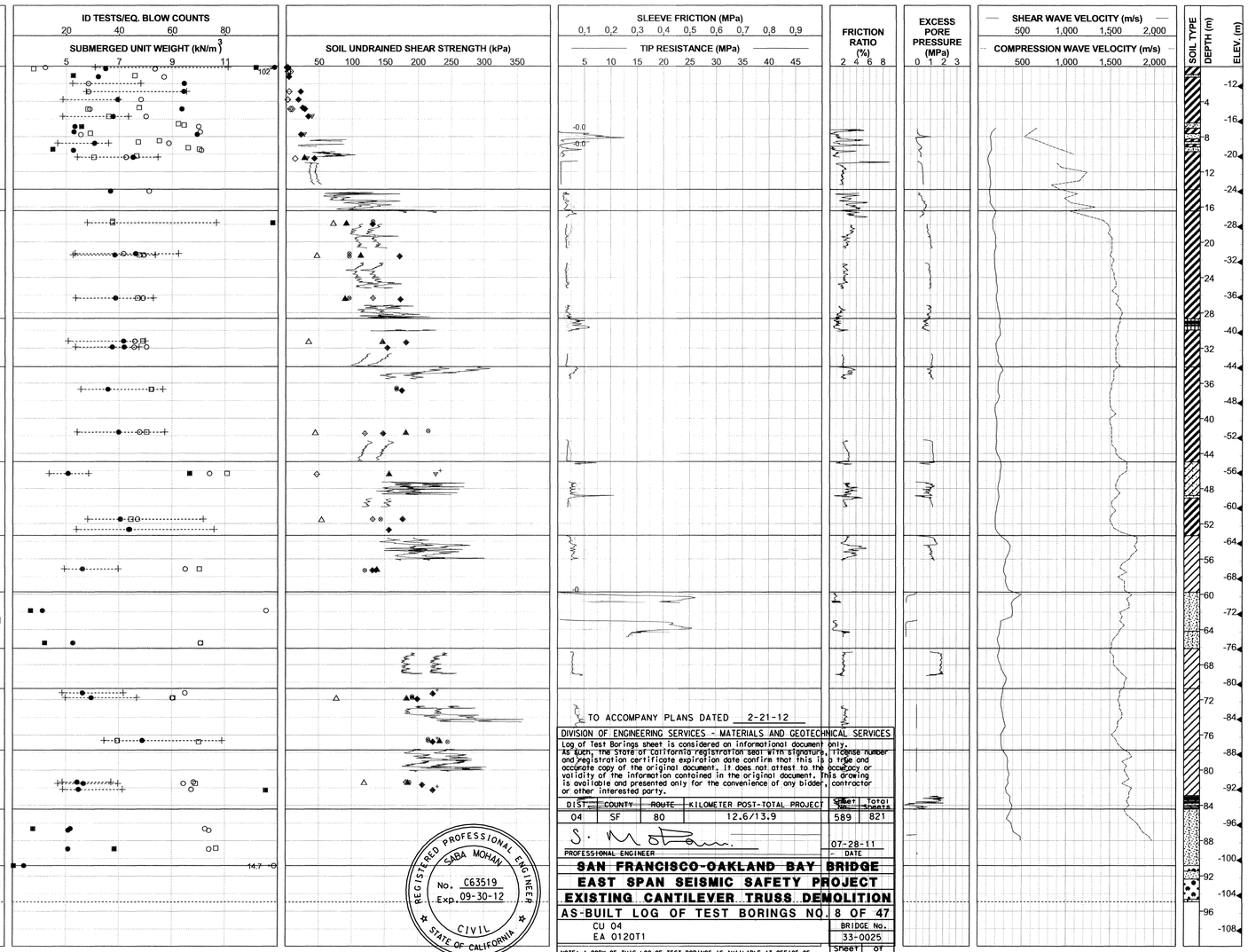
Metric

ELEV. (m)	DEPTH (m)	BLOW COUNT	MATERIAL DESCRIPTION (Coordinates: E1837145 N647992, CA State Plane Zone 3, NAD83, Meters; MUDLINE ELEVATION: -9.8m (MSL))	STR. NO.
		WOH, WOH, WOH, WOH, WOH, WOH, WOH, 17/45cm, 18/60cm, 30/55cm, 30/45cm, PUSH	Fat CLAY (CH), soft to firm, dark gray -very soft, dark gray clay, to 0.9m -with many sand seams and pockets to 0.6m -very loose, olive gray, silty fine sand layer, with many clay pockets, 0.9m to 1.2m -with many shell fragments below 3.7m -with sand pockets, 3.7m to 4.7m -intermixed clay and sand, 6.4m to 7.0m -sand layer, 7.6m to 8.2m -sand layer, 8.5m to 8.8m -silty sand layer with clay pockets, 9.1m to 9.7m (14.0m)	I
		SAVE	Fat CLAY (CH), stiff to very stiff, olive gray to gray (16.5m)	II
		PUSH, PUSH, PUSH	Fat CLAY (CH), very stiff, gray -with a silt layer at 16.8m -greenish gray, and with a few silt pockets, slickensides and gas blisters, at 17.7m -with a few shell fragments and silt pockets, at 21.3m -greenish gray with silty sand pockets, a few shell fragments, and mica flakes, at 26.2m (28.7m)	III
		PUSH, SAVE	Fat CLAY (CH), very stiff, gray -silt with clay layers to 29.9m -with sandy silt pockets and partings, and shell fragments, 30.8m to 32.0m (34.1m)	IV
		PUSH, PUSH	Fat CLAY (CH), very stiff to hard, gray -greenish gray with silt pockets and partings, at 36.6m -with a few silt pockets at 41.1m -with organic stains and organic pockets, below 41.1m (45.0m)	V
		30/40cm, PUSH, SAVE	Fat CLAY (CH), very stiff, gray -very stiff to hard sandy lean clay with many silt seams, to 48.8m -with a sand layer at 45.1m with silty sand pockets and seams, at 46.3m -sand layer, 48.8m to 49.1m (53.3m)	VI
		30/40cm	Lean CLAY (CL), very stiff to hard, greenish gray -with a few silt pockets and partings, gas blisters, and organic stains, at 57.2m (59.7m)	VII
		30/15cm, 30/30cm	Fine to Coarse SAND with silt (SW-SM), dense, gray -with gravel at 61.7m -silty fine sand below 64.2m -with clay pockets, partings and seams, at 65.2m (66.1m)	VIII
		NR, SAVE	Lean CLAY (CL), very stiff to hard, olive gray -with a sand layer at 69.2m (70.7m)	IX
		PUSH, PUSH	Lean CLAY (CL), hard, olive gray -with silt partings and pockets, to 71.9m -with silty sand pockets and partings, at 71.6m -with wood fragments and organic pockets, at 76.5m (77.7m)	X
		PUSH, SAVE	Lean CLAY (CL), hard, gray -with silt pockets and a few shell fragments, at 81.4m -interlayered sand and clay, below 82.9m (84.4m)	XI
		30/30cm, 30/25cm, 30/5cm	Fine to Medium SAND with silt (SP-SM), dense to very dense, gray -with a clay layer at 86.7m -with a lean clay layer at 88.8m (90.8m)	XII
		50/5cm	Fine GRAVEL (GP), very dense, dark gray -sand layer, 91.4m to 92.4m -dense to very dense, fine to coarse sand, at 94.8m TOTAL DEPTH: 94.9m BACKFILLED WITH: Cement Grout	XIII



TO ACCOMPANY PLANS DATED 2-21-12

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	589	821

PROFESSIONAL ENGINEER — DATE 07-28-11

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 8 OF 47

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet 55 OF 87

100% PS&E

REID BUELL, DESIGN OVERSIGHT	DRAWN BY SACHIN DESHPANDE	J.CHACKO/M.ZUEGER, FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
11/17/00	CHECKED BY J.CHACKO	DATE 06/14/99	

T.W.McNEILAN, PROJECT ENGINEER

BRIDGE NO. 34-0006 — KM POST — POST MILE

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

LOG OF TEST BORINGS 8 OF 47

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 012021

DISREGARD PRINTS BEARING EARLIER REVISION DATES → 7/18/99 2/15/00 8/02/00 11/17/00

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 507 OF

FILENAME => 33-0025-q-ltb08of47.tif

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF, Ala	80	13.9/14.3, 0.0/1.6	940	978

GEOTECHNICAL PROFESSIONAL

6-4-01
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — T.W. McNeilan — No. 0583 — Exp. 12/31/00 — Geotechnical — STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 848,
Oakland, CA 94621
(510) 633-5100

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Metric

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (KCF)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (KCF)
- PLASTIC LIMIT + — + LIQUID LIMIT
- ⊙ EQUIVALENT SPT BLOW COUNT

STRENGTH TESTS

- ⊗ POCKET PENETROMETER
- ◇ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (◇ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▽ SWEDISH FALL CONE
- ⊡ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- + Soil: Strength Exceeds Capacity of Measuring Device
- Shear Strength Interpreted from CPT Tip Resistance

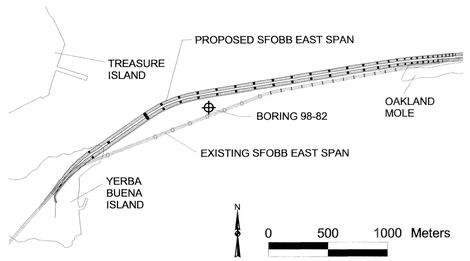
STRENGTH OF COHESIVE SOILS

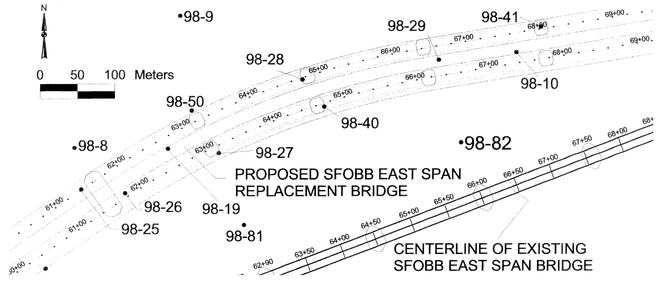
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

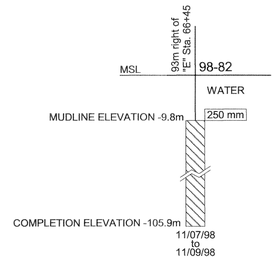
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







BORING 98-82

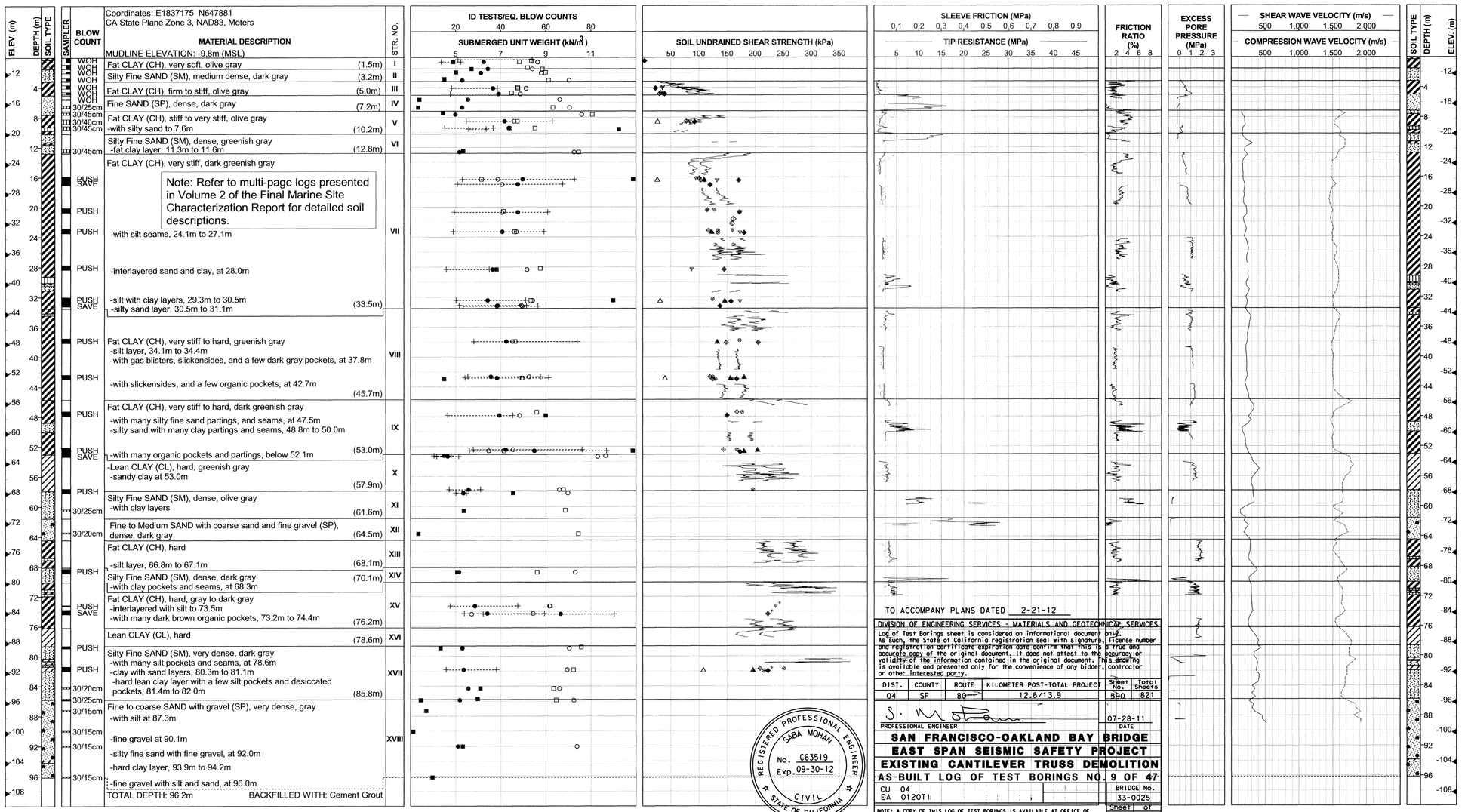
Coordinates: E1837175 N647881
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -9.8m (MSL)

STR. NO.	MATERIAL DESCRIPTION	BLOW COUNT / SAMPLER
I	Fat CLAY (CH), very soft, olive gray (1.5m)	WOH WOH
II	Silty Fine SAND (SM), medium dense, dark gray (3.2m)	WOH WOH
III	Fat CLAY (CH), firm to stiff, olive gray (5.0m)	WOH WOH WOH
IV	Fine SAND (SP), dense, dark gray (7.2m)	WOH 30/25cm
V	Fat CLAY (CH), stiff to very stiff, olive gray -with silty sand to 7.6m (10.2m)	30/40cm 30/45cm
VI	Silty Fine SAND (SM), dense, greenish gray -fat clay layer, 11.3m to 11.6m (12.8m)	30/45cm
VII	Fat CLAY (CH), very stiff, dark greenish gray -with silt seams, 24.1m to 27.1m -interlayered sand and clay, at 28.0m -silt with clay layers, 29.3m to 30.5m -silty sand layer, 30.5m to 31.1m (33.5m)	PUSH SAVE; PUSH; PUSH; PUSH; PUSH SAVE
VIII	Fat CLAY (CH), very stiff to hard, greenish gray -silt layer, 34.1m to 34.4m -with gas blisters, slickensides, and a few dark gray pockets, at 37.8m -with slickensides, and a few organic pockets, at 42.7m (45.7m)	PUSH; PUSH
IX	Fat CLAY (CH), very stiff to hard, dark greenish gray -with many silty fine sand partings, and seams, at 47.5m -silty sand with many clay partings and seams, 48.8m to 50.0m -with many organic pockets and partings, below 52.1m (53.0m)	PUSH; PUSH SAVE
X	-Lean CLAY (CL), hard, greenish gray -sandy clay at 53.0m (57.9m)	PUSH
XI	Silty Fine SAND (SM), dense, olive gray -with clay layers (61.6m)	30/25cm
XII	Fine to Medium SAND with coarse sand and fine gravel (SP), dense, dark gray (64.5m)	30/20cm
XIII	Fat CLAY (CH), hard -silt layer, 66.8m to 67.1m (68.1m)	PUSH
XIV	Silty Fine SAND (SM), dense, dark gray -with clay pockets and seams, at 68.3m (70.1m)	
XV	Fat CLAY (CH), hard, gray to dark gray -interlayered with silt to 73.5m -with many dark brown organic pockets, 73.2m to 74.4m (76.2m)	PUSH SAVE
XVI	Lean CLAY (CL), hard (78.6m)	PUSH
XVII	Silty Fine SAND (SM), very dense, dark gray -with many silt pockets and seams, at 78.6m -clay with sand layers, 80.3m to 81.1m -hard lean clay layer with a few silt pockets and desiccated pockets, 81.4m to 82.0m (85.8m)	PUSH; PUSH; 30/20cm; 30/25cm
XVIII	Fine to coarse SAND with gravel (SP), very dense, gray -with silt at 87.3m -fine gravel at 90.1m -silty fine sand with fine gravel, at 92.0m -hard clay layer, 93.9m to 94.2m -fine gravel with silt and sand, at 96.0m	30/15cm; 30/15cm; 30/15cm; 30/15cm

Note: Refer to multi-page logs presented in Volume 2 of the Final Marine Site Characterization Report for detailed soil descriptions.

TOTAL DEPTH: 96.2m BACKFILLED WITH: Cement Grout



TO ACCOMPANY PLANS DATED 2-21-12

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	590	821

PROFESSIONAL ENGINEER — DATE 07-28-11

REGISTERED PROFESSIONAL ENGINEER — SABA MOHAN — No. C63519 — Exp. 09-30-12 — CIVIL — STATE OF CALIFORNIA

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 9 OF 47

CU	04	BRIDGE No.
EA	0120T1	33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA — Sheet 56 OF 87

100% PS&E

REID BUELL, DESIGN OVERSIGHT	DRAWN BY SACHIN DESHPANDE	C.LOVATO/M.ZUEGER, FIELD INVESTIGATOR	T. W. McNEILAN, PROJECT ENGINEER
	CHECKED BY J.CHACKO	DATE 06/14/99	

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 34-0006
km POST
POST MILE

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

LOG OF TEST BORINGS 9 OF 47

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 012021

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY) 7/18/99 2/15/00 8/02/00 11/17/00 — SHEET 508 — OF

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF, Ala	80	13.9/14.3, 0.0/1.6	941	978

GEOTECHNICAL PROFESSIONAL

6-4-01
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/00 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 848,
Oakland, CA 94621
(510) 633-5100

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Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

Metric

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (KCF)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (KCF)
- PLASTIC LIMIT + ····· + LIQUID LIMIT
- ⊗ EQUIVALENT SPT BLOW COUNT
- ···· ROCK QUALITY DESIGNATION (RQD)
- —— ROCK RECOVERY PERCENT
- —— ROCK CORING RATE

STRENGTH TESTS

- ⊗ POCKET PENETROMETER
- ◇ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE ◇ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▽ SWEDISH FALL CONE
- ⊡ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- + Soil: Strength Exceeds Capacity of Measuring Device
  Rock: Sample broke along discontinuity; Intact sample would have greater strength
- Shear Strength Interpreted from CPT Tip Resistance
- ◎ POINT LOAD TEST (ROCK-INTACT SPECIMEN)
- ⊕ POINT LOAD TEST (ROCK-ALONG WEAK PLANE)
- ■ UNCONFINED COMPRESSION (ROCK)
- —— FRACTURE DENSITY (ROCK)

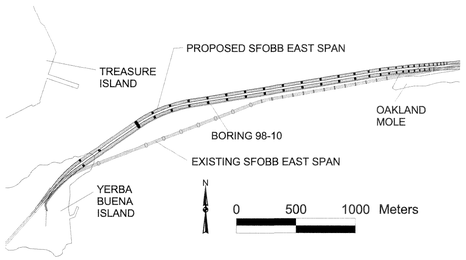
STRENGTH OF COHESIVE SOILS

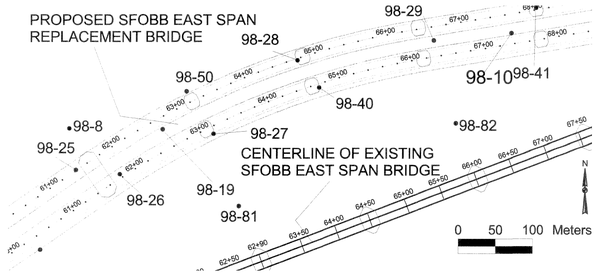
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

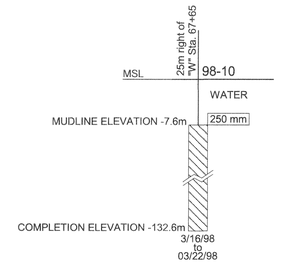
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







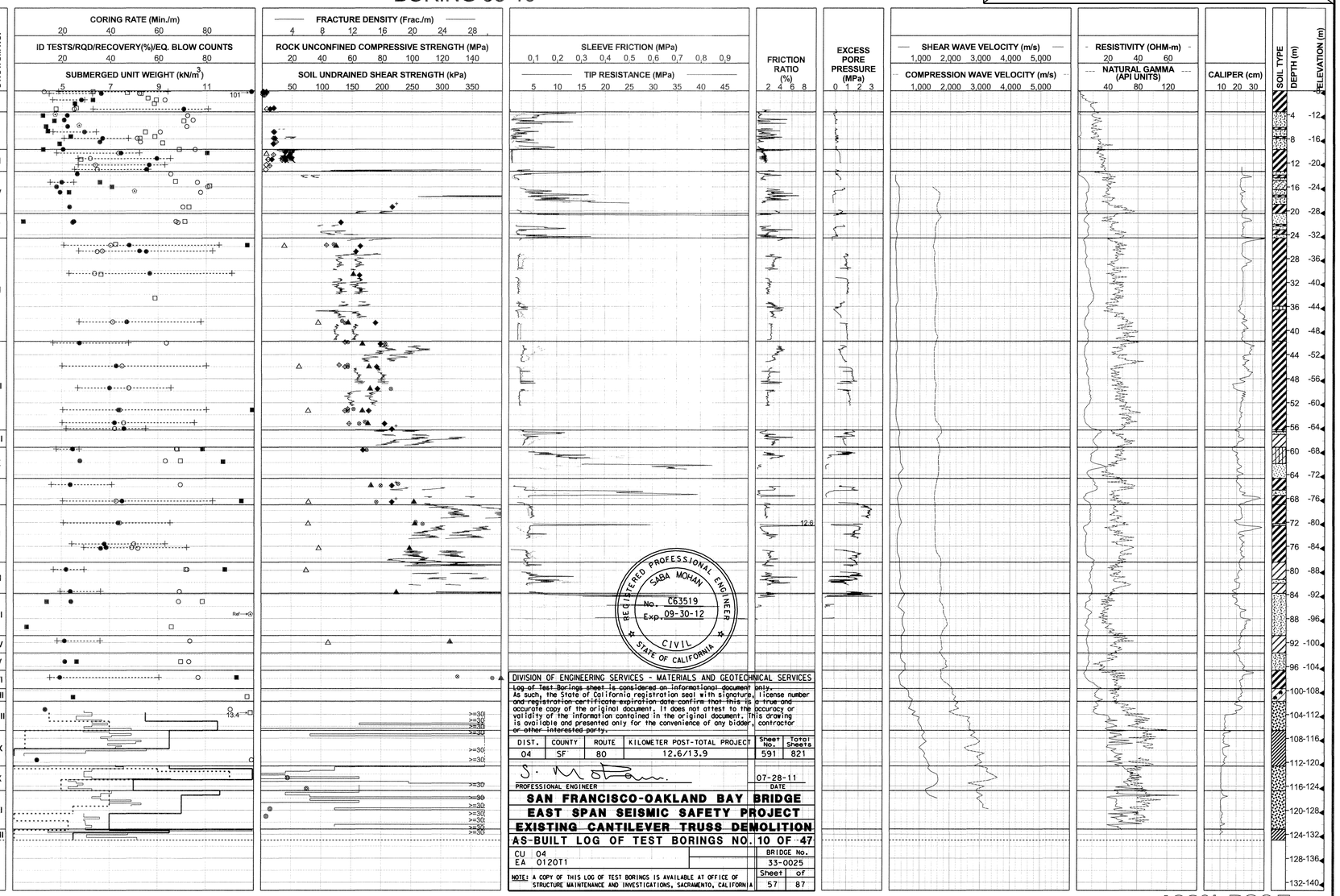
BORING 98-10

Coordinates: E1837249 N648002
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -7.6m (MSL)

Elevation (m)	Depth (m)	Blow Count	Material Description	Stratum No.
		WOH	Fat CLAY (CH), very soft to soft, gray (3.5m)	I
12	4	WOH, WOH, 17/45cm	Silty Fine SAND (SM), dense to very dense, gray	II
16	8	13/45cm, 7/60cm	-fat clay, 6.1m to 6.4m -soft, gray clay layer, with many sand pockets, seams, and layers, 7.6m to 7.9m (9.8m)	
20	12	30/60cm, PUSH, PUSH, PUSH, PUSH	Fat CLAY (CH), soft to firm, olive gray (13.4m)	III
24	16	26/60cm, 34/55cm	Silty Fine SAND (SM), very dense, greenish gray -with a clay layer, 14.0m to 14.5m -clayey sand, 14.9m to 16.5m	IV
28	20	50, 30/15cm, 55/15cm	-clay layer with sand seams, 17.4m to 17.7m -fat clay below 18.9m (20.4m)	V
32	24	PUSH, SAVE	Fine SAND (SP), dense to very dense, gray -fat clay, 22.3m to 22.6m -fat clay, 23.2m to 23.9m (24.5m)	
36	28	PUSH	Fat CLAY (CH), very stiff, gray	VI
40	32	PUSH		
44	36	PUSH	-silt, 36.0m to 36.6m (41.8m)	
48	40	PUSH	Fat CLAY (CH), very stiff to hard, greenish gray	VII
52	44	PUSH		
56	48	PUSH, PUSH, SAVE	(56.5m)	
60	52	PUSH	Lean CLAY (CL), hard, greenish gray -sand layer, 56.8m to 57.3m (59.4m)	VIII
64	56	SAVE, PUSH		
68	60	30/30cm	Clayey SILT with sand (ML), very dense, greenish gray -sand with a few clay seams, below 62.2m (64.6m)	IX
72	64	PUSH	Fat CLAY (CH), hard, gray -dense sand, 66.6m to 67.5m (69.0m)	X
76	68	PUSH		
80	72	PUSH	Fat CLAY (CH), hard, greenish gray -dense sand layer, 72.2m to 72.5m	XI
84	76	SAVE, PUSH	(78.6m)	
88	80	PUSH	Lean CLAY (CL) with sand, hard, greenish gray -fine sand with clay seams, 81.5m to 82.1m	XII
92	84	PUSH	(83.8m)	
96	88	15?, Ref/10cm, 30/15cm	Fine to Coarse SAND with silt (SP-SM), very dense, gray (90.8m)	XIII
100	92	PUSH	Lean CLAY (CL), hard, greenish gray to gray (93.7m)	XIV
104	96	40/10cm	Silty Fine SAND (SM), very dense, yellowish greenish brown (96.6m)	XV
108	100	PUSH	Fat CLAY (CH), hard, yellowish brown (99.7m)	XVI
112	104	30/20cm	Clayey GRAVEL (GC), very dense, yellowish red (101.8m)	XVII
116	108	30/15cm, 30/15cm, 55-31, 85-40	SANDSTONE (Graywacke) (RX) with thinly interbedded CLAYSTONE (RX) [3:1], olive brown, very intensely weathered to decomposed, soft, intensely to very intensely fractured (106.7m)	XVIII
120	112	65-5, 0-0, 30/30cm, 8/10cm, 65-0	CLAYSTONE (RX) with interbedded SILTSTONE (RX) and SANDSTONE (Graywacke) (RX) [2:2:1], black, moderately to intensely weathered, soft, very intensely fractured (112.6m)	XIX
124	116	100-60, 100-90, 59-20	SANDSTONE (Graywacke) (RX), dark gray, moderately weathered, moderately soft, moderately fractured (116.7m)	XX
128	120	86-40, 70-40, 70-25, 40-0	SANDSTONE (Graywacke) (RX) with thinly interbedded CLAYSTONE (RX) [6:1], dark gray, slightly weathered to fresh, moderately hard, moderately fractured (123.1m)	XXI
132	124	40-23, 55-0, 25-0	CLAYSTONE (RX), dark gray to black, fresh, moderately soft to moderately hard, intensely to very intensely fractured	XXII
136	128		TOTAL DEPTH: 125.0m BACKFILLED WITH: Cement Grout	
140	132			

Note: Refer to multi-page logs presented in Volume 2B of the Preliminary Marine Site Characterization Report for detailed soil and rock descriptions.



DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	591	821

PROFESSIONAL ENGINEER — DATE 07-28-11

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 10 OF 47

CU	04	BRIDGE No.
EA	0120T1	33-0025
		Sheet 57 of 87

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

100% PS&E

REID BUELL, DESIGN OVERSIGHT	DRAWN BY: SACHIN DESHPANDE	J.CHACKO/M.ZUEGER, M. SEBESTA/C. LOVATO, FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
	CHECKED BY: J.CHACKO	DATE 06/14/99	

THOMAS W. McNEILAN, PROJECT ENGINEER

BRIDGE NO. 34-0006 — km POST — POST MILE

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

LOG OF TEST BORINGS 10 OF 47

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04 EA 012021

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY) ~~7/15/99~~ ~~2/15/00~~ 8/02/00 11/17/00 — SHEET 509 OF

FILENAME => 33-0025-q-1tb10of47.tif

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF, Ala	80	13.9/14.3, 0.0/1.6	942	978

GEOTECHNICAL PROFESSIONAL

6-4-01
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/00 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS
A JOINT VENTURE
7700, Edgewater Dr., Ste. 848,
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(510) 633-5100

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- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
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TUBE AND OFFSHORE LINER SAMPLERS

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STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

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CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

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- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (KCF)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (KCF)
- PLASTIC LIMIT + LIQUID LIMIT +
- ⊗ EQUIVALENT SPT BLOW COUNT

STRENGTH TESTS

- ⊕ POCKET PENETROMETER
- ◈ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (◇ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
- ⊠ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- + Soil: Strength Exceeds Capacity of Measuring Device
- Shear Strength Interpreted from CPT Tip Resistance

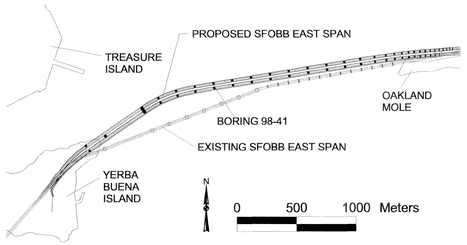
STRENGTH OF COHESIVE SOILS

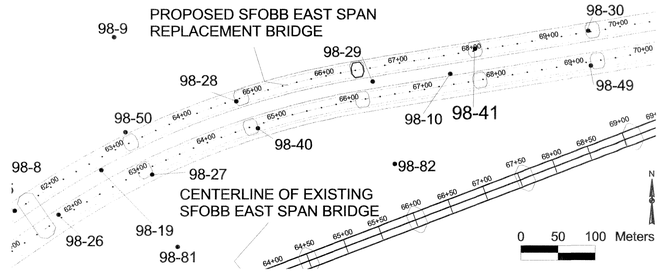
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

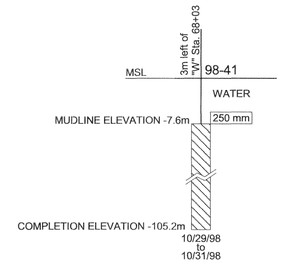
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







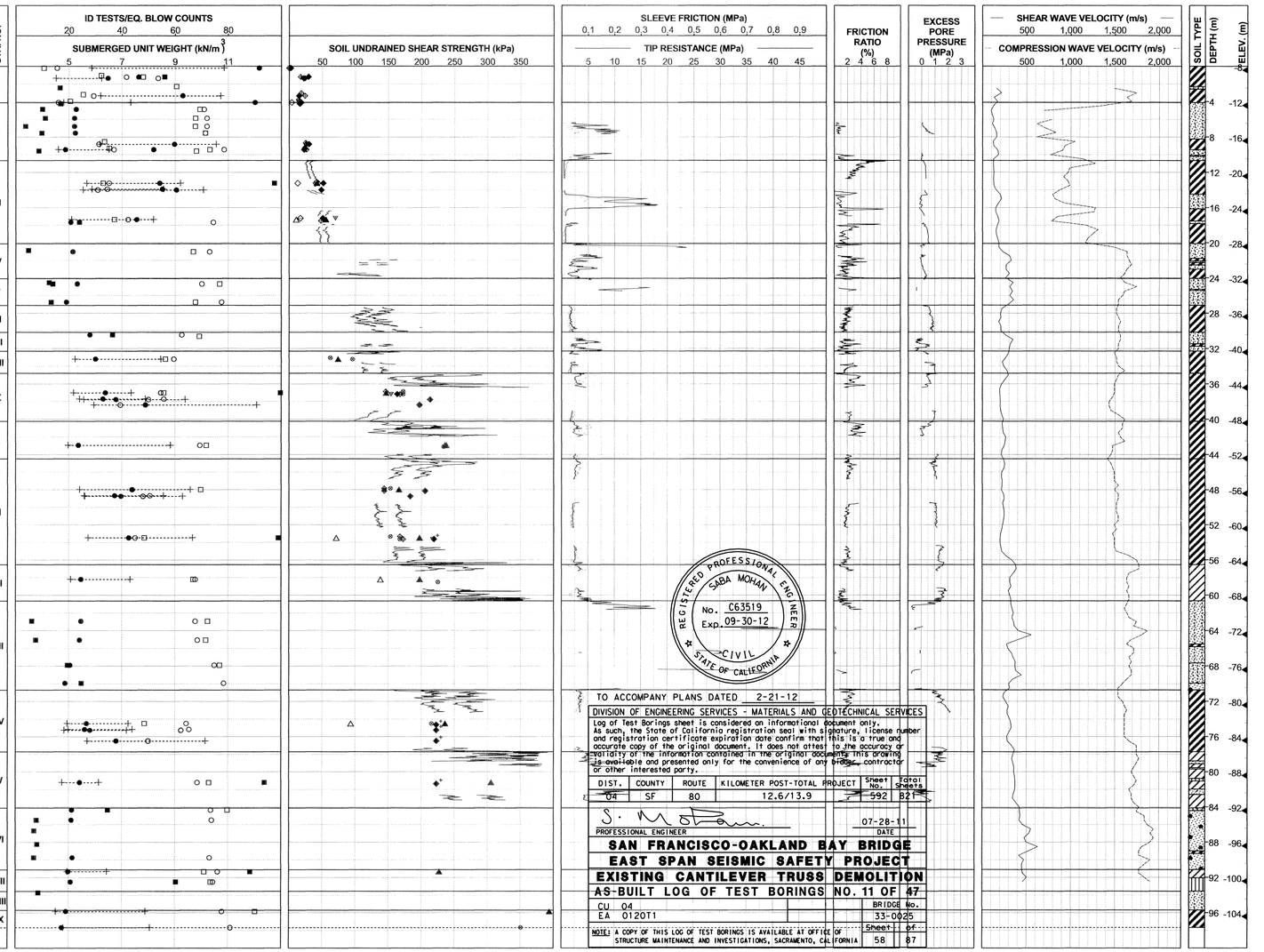
BORING 98-41

Coordinates: E1837283 N648036
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -7.6m (MSL)

STR. NO.	MATERIAL DESCRIPTION	BLOW COUNT / SAMPLER
I	Fat CLAY (CH), soft to firm, dark olive gray -medium dense, silty fine sand layer, with clay pockets, 2.3m to 2.6m (4.1m)	WOH WOH 13/30cm 2/30cm 9/30cm
II	Fine SAND with silt (SP-SM), dense, olive gray -firm, dark olive gray fat clay with many shells and shell fragments, 8.2m to 9.4m -medium dense, silty fine sand, 9.4m to 10.5m -with clay at 10.1m (10.7m)	20/30cm 21/30cm 26/30cm 30/25cm 7/30cm 30/30cm
III	Fat CLAY (CH), firm to stiff, olive gray -with organic pockets and gas blisters, at 13.1m -with a sand seam and shell fragments, at 13.4m -dense, silty fine sand, 14.5m to 16.2m -with shell fragments at 17.5m -olive gray fine sand, with clay pockets and seams, 17.5m to 17.8m (20.1m)	PUSH SAVE PUSH 30/30cm
IV	Fine SAND with silt (SP-SM), dense to very dense, dark gray -with a few organic pockets and a few clay partings, at 20.9m -interlayered sand and clay, 21.8m to 24.1m (24.1m)	30/30cm
V	Silty Fine SAND (SM), dense, dark gray -with a clay layer at 25.3m -with a few clay pockets and partings, at 26.7m (27.1m)	30/25cm
VI	Fat CLAY (CH), very stiff, greenish gray (30.2m)	PUSH
VII	Silty Fine SAND (SM), medium dense to dense, dark olive gray -very stiff clay layer with sand seams, 31.5m to 31.8m (32.3m)	PUSH
VIII	Fat CLAY (CH), very stiff, olive gray to dark gray (34.8m)	
IX	Fat CLAY (CH), very stiff to hard, olive gray (40.2m)	PUSH SAVE SAVE
X	Fat CLAY (CH), very stiff, greenish gray -slickensided, with fine gravel and a few shell fragments, at 43.0m (44.5m)	PUSH
XI	Fat CLAY (CH), very stiff to hard, olive gray -with silt pockets and seams and sand pockets and seams, at 47.9m -with sand pockets at 48.5m -with organic pockets at 53.3m (56.5m)	PUSH SAVE PUSH
XII	Lean CLAY (CL), hard, gray -with calcareous nodules and silt pockets, at 58.2m (60.7m)	PUSH
XIII	Fine SAND with silt (SP-SM), dense to very dense, dark olive gray to gray -with many clay seams to 63.1m - with medium sand at 64.9m -clay layer, 65.5m to 65.8m -silty sand below 67.7m -with a clay layer at 69.8m -with medium and coarse sand and fine gravel, below 70.0m (70.7m)	30/15cm 30/15cm 30/20cm 30/20cm
XIV	Fat CLAY (CH), hard, greenish gray -with silt pockets and seams, a few organic pockets, and desiccated pockets, at 74.4m - with silty fine sand seams and silt pockets and seams at 75.0m -with organic pockets at 76.2m (77.7m)	PUSH SAVE SAVE
XV	Lean CLAY (CL), hard, greenish gray -dense sand layer, 78.8m to 79.1m -with a sand layer at 79.6m -sandy silt layer, 80.8m to 81.1m -dense sand with clay seams and layers, 82.0m to 82.6m (84.1m)	PUSH 30/25cm 30/15cm 30/15cm
XVI	Fine to Medium SAND with fine gravel and silt (SP-SM), very dense, gray -hard clay layer, 89.0m to 89.3m (91.1m)	30/15cm 30/15cm 30/15cm
XVII	Lean CLAY (CL), hard, greenish gray -sandy silt below 92.0m (93.6m)	30/20cm 30/15cm 30/10cm
XVIII	Fine to Coarse SAND with silt and fine gravel (SW-SM), very dense, olive gray to gray (95.7m)	30/15cm
XIX	Fat CLAY (CH), hard, yellowish brown	30/15cm

TOTAL DEPTH: 97.7m BACKFILLED WITH: Cement Grout



REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED 2-21-12

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	592	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 11 OF 47

CU 04
EA 0120T1

BRIDGE No. 33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet 58 of 87

100% PS&E

REID BUELL, DESIGN OVERSIGHT	DRAWN BY: SACHIN DESHPANDE	M.ZUEGER, R. HOWARD, C. LOVATO, FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
	CHECKED BY: J.CHACKO	DATE 06/14/99	

T.W.McNEILAN, PROJECT ENGINEER

BRIDGE NO. 34-0006
KM POST
POST MILE

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

LOG OF TEST BORINGS 11 OF 47

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 012021

DISREGARD PRINTS BEARING EARLIER REVISION DATES → 7/15/99 2/15/00 8/02/00 11/17/00

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 510 OF

FILENAME => 33-0025-q-1tb11of47.tif

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF, Ala	80	13.9/14.3, 0.0/1.6	943	978

GEOTECHNICAL PROFESSIONAL

6-4-01
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/00 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 848,
Oakland, CA 94621
(510) 633-5100

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Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

Metric

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

Note: In rock coring interval recovery(%)-RQD are shown in the Blow Count column.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (KCF)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (KCF)
- PLASTIC LIMIT LIQUID LIMIT
- ⊙ EQUIVALENT SPT BLOW COUNT

STRENGTH TESTS

- ⊗ POCKET PENETROMETER
- ✥ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (◇ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▼ SWEDISH FALL CONE
- ⊠ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- \+ Soil: Strength Exceeds Capacity of Measuring Device
- Shear Strength Interpreted from CPT Tip Resistance

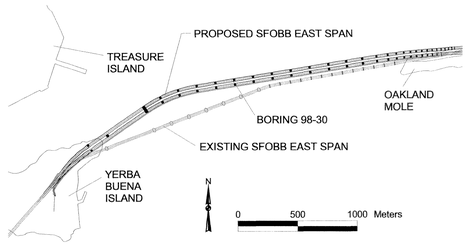
STRENGTH OF COHESIVE SOILS

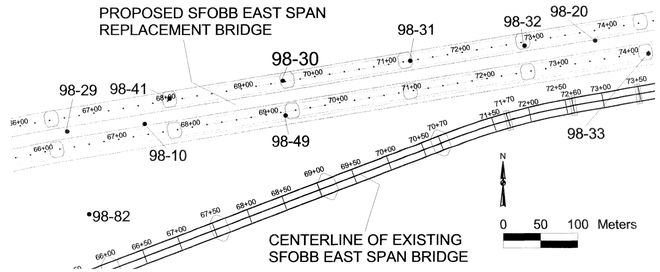
Consistency	Undrained Shear Strength kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

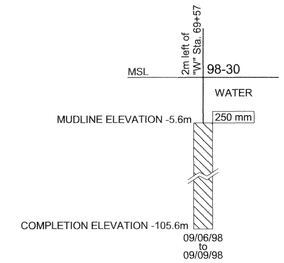
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.





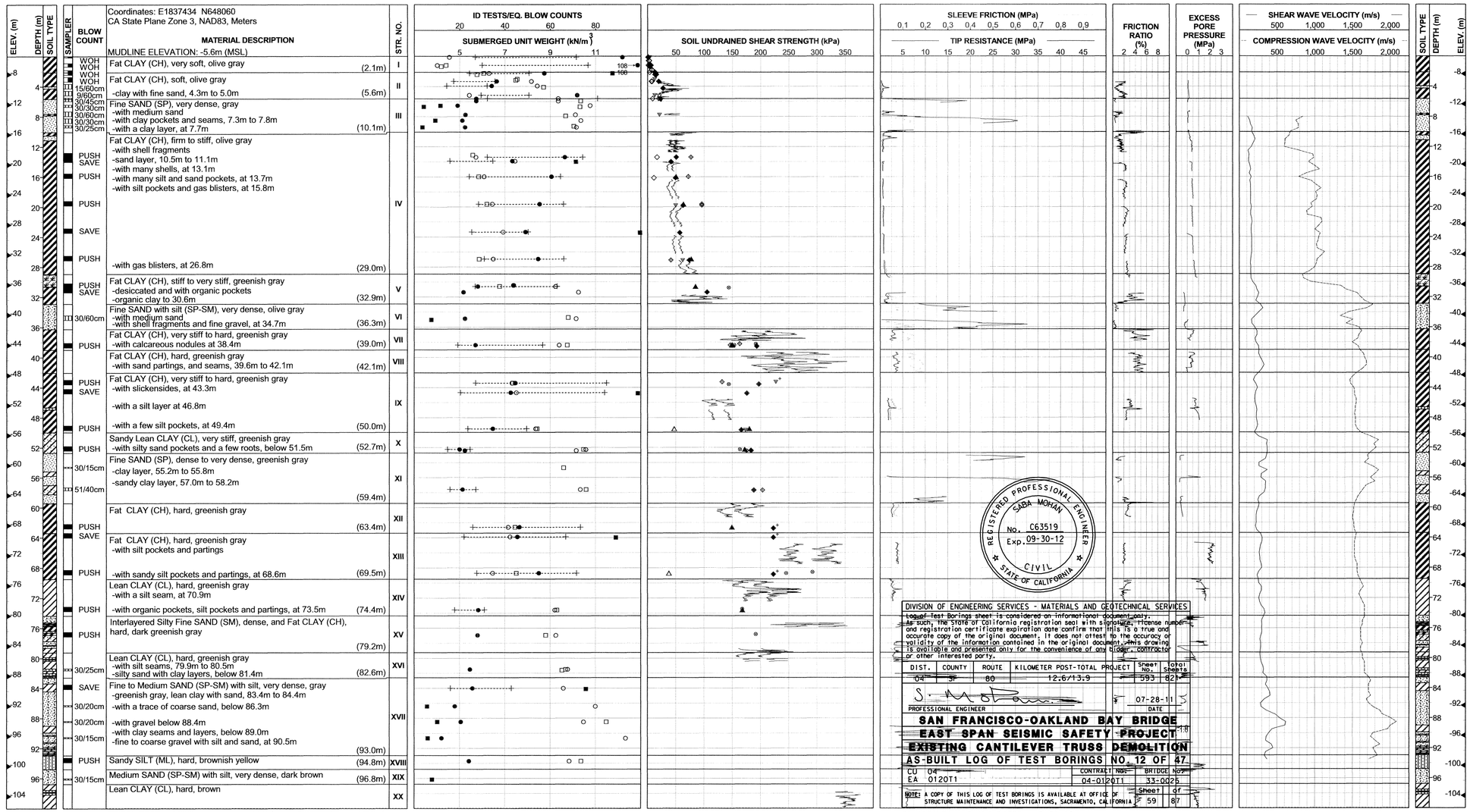


BORING 98-30

Coordinates: E1837434 N648060
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -5.6m (MSL)

BLOW COUNT / SAMPLER	MATERIAL DESCRIPTION	STR. NO.
WOH, WOH, WOH	Fat CLAY (CH), very soft, olive gray (2.1m)	I
WOH, 15/60cm	Fat CLAY (CH), soft, olive gray -clay with fine sand, 4.3m to 5.0m (5.6m)	II
9/60cm, 30/45cm, 30/30cm, 30/60cm, 30/30cm, 30/25cm	Fine SAND (SP), very dense, gray -with medium sand -with clay pockets and seams, 7.3m to 7.8m -with a clay layer, at 7.7m (10.1m)	III
PUSH, SAVE, PUSH, PUSH, SAVE, PUSH	Fat CLAY (CH), firm to stiff, olive gray -with shell fragments -sand layer, 10.5m to 11.1m -with many shells, at 13.1m -with many silt and sand pockets, at 13.7m -with silt pockets and gas blisters, at 15.8m -with gas blisters, at 26.8m (29.0m)	IV
PUSH, SAVE	Fat CLAY (CH), stiff to very stiff, greenish gray -desiccated and with organic pockets -organic clay to 30.6m (32.9m)	V
30/60cm	Fine SAND with silt (SP-SM), very dense, olive gray -with medium sand -with shell fragments and fine gravel, at 34.7m (36.3m)	VI
PUSH	Fat CLAY (CH), very stiff to hard, greenish gray -with calcareous nodules at 38.4m (39.0m)	VII
	Fat CLAY (CH), hard, greenish gray -with sand partings, and seams, 39.6m to 42.1m (42.1m)	VIII
PUSH, SAVE, PUSH	Fat CLAY (CH), very stiff to hard, greenish gray -with slickensides, at 43.3m -with a silt layer at 46.8m -with a few silt pockets, at 49.4m (50.0m)	IX
PUSH	Sandy Lean CLAY (CL), very stiff, greenish gray -with silty sand pockets and a few roots, below 51.5m (52.7m)	X
30/15cm, 51/40cm	Fine SAND (SP), dense to very dense, greenish gray -clay layer, 55.2m to 55.8m -sandy clay layer, 57.0m to 58.2m (59.4m)	XI
PUSH, SAVE	Fat CLAY (CH), hard, greenish gray (63.4m)	XII
PUSH	Fat CLAY (CH), hard, greenish gray -with silt pockets and partings -with sandy silt pockets and partings, at 68.6m (69.5m)	XIII
PUSH	Lean CLAY (CL), hard, greenish gray -with a silt seam, at 70.9m -with organic pockets, silt pockets and partings, at 73.5m (74.4m)	XIV
PUSH	Interlayered Silty Fine SAND (SM), dense, and Fat CLAY (CH), hard, dark greenish gray (79.2m)	XV
30/25cm	Lean CLAY (CL), hard, greenish gray -with silt seams, 79.9m to 80.5m -silty sand with clay layers, below 81.4m (82.6m)	XVI
SAVE, 30/20cm, 30/20cm, 30/15cm	Fine to Medium SAND (SP-SM) with silt, very dense, gray -greenish gray, lean clay with sand, 83.4m to 84.4m -with a trace of coarse sand, below 86.3m -with gravel below 88.4m -with clay seams and layers, below 89.0m -fine to coarse gravel with silt and sand, at 90.5m (93.0m)	XVII
PUSH	Sandy SILT (ML), hard, brownish yellow (94.8m)	XVIII
30/15cm	Medium SAND (SP-SM) with silt, very dense, dark brown (96.8m)	XIX
	Lean CLAY (CL), hard, brown	XX



TOTAL DEPTH: 100.0m BACKFILLED WITH: Cement Grout

REGISTERED PROFESSIONAL ENGINEER SADA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES
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PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 12 OF 47

CU	04	CONTRACT NO.	BRIDGE NO.
EA	012OT1	04-012OT1	33-0025

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TO ACCOMPANY PLANS DATED 2-21-12

100% PS&E

REID BUELL, DESIGN OVERSIGHT	DRAWN BY: SACHIN DESHPANDE	J.CHACKO/M.ZUEGER, FIELD INVESTIGATOR	T.W.McNEILAN, PROJECT ENGINEER
Reid Buell 11/17/00	CHECKED BY: J.CHACKO	DATE 06/14/99	

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 34-0006
KM POST
POST MILE

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

LOG OF TEST BORINGS 12 OF 47

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 012021

DISREGARD PRINTS BEARING EARLIER REVISION DATES → 7/15/99 2/15/00 8/02/00 11/17/00

REVISION DATES (PRELIMINARY STAGE ONLY) | SHEET 511 | OF

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
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GEOTECHNICAL PROFESSIONAL

6-4-01
PLANS APPROVAL DATE

T.W. McNeilan
No. 0583
Exp. 12/31/00
Geotechnical

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 848,
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- GRAVEL with silt (GP or GW)
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- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
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- Low plasticity ORGANICS (OL)
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- ○ THEORETICAL SUBMERGED UNIT WEIGHT (KCF)
- PLASTIC LIMIT + LIQUID LIMIT +
- ⊙ EQUIVALENT SPT BLOW COUNT

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- ✧ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (◇ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▽ SWEDISH FALL CONE
- ⊡ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
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- Shear Strength Interpreted from CPT Tip Resistance

STRENGTH OF COHESIVE SOILS

Consistency	Undrained Shear Strength kPa
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Hard	greater than 200

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Descriptive Term	Relative Density (%)*
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Loose	15 to 35
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Dense	65 to 85
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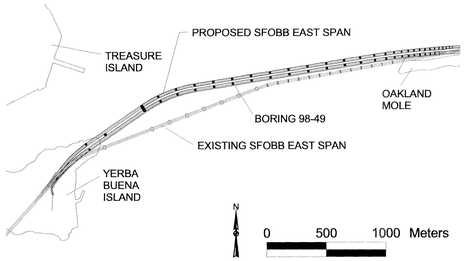
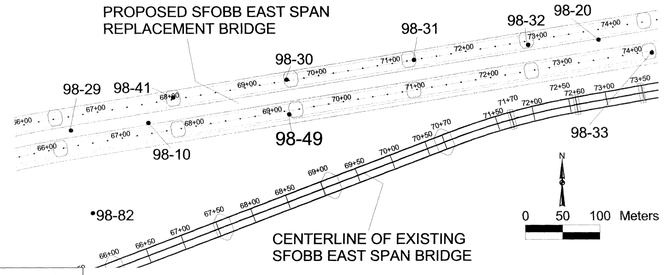
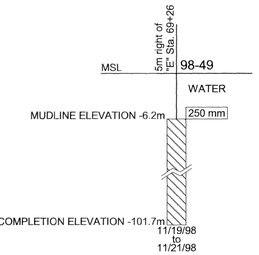
*Estimated from sampler driving record and CPT tip resistance.







Note: Refer to multi-page logs presented in Volume 2 of the Final Marine Site Characterization Report for detailed soil descriptions.

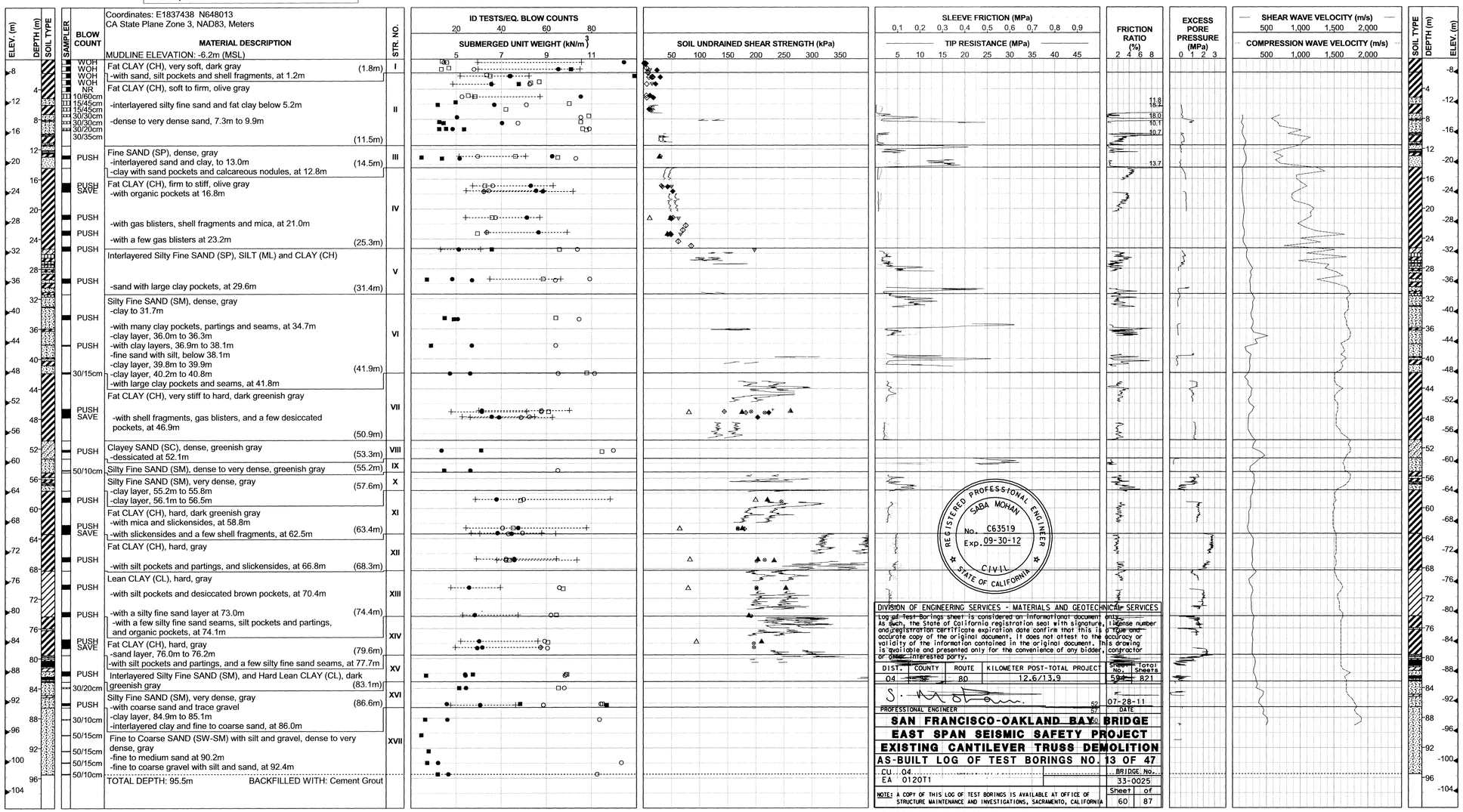
BORING 98-49

Coordinates: E1837438 N648013
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -6.2m (MSL)

BLOW COUNT	MATERIAL DESCRIPTION	STR. NO.
WOH, WOH, WOH, WOH	Fat CLAY (CH), very soft, dark gray (1.8m) -with sand, silt pockets and shell fragments, at 1.2m	I
NR, 10/60cm, 15/45cm, 15/45cm, 30/30cm, 30/30cm, 30/20cm, 30/35cm	Fat CLAY (CH), soft to firm, olive gray -interlayered silty fine sand and fat clay below 5.2m -dense to very dense sand, 7.3m to 9.9m (11.5m)	II
PUSH	Fine SAND (SP), dense, gray -interlayered sand and clay, to 13.0m -clay with sand pockets and calcareous nodules, at 12.8m (14.5m)	III
PUSH, SAVE, PUSH, PUSH, PUSH	Fat CLAY (CH), firm to stiff, olive gray -with organic pockets at 16.8m -with gas blisters, shell fragments and mica, at 21.0m -with a few gas blisters at 23.2m (25.3m)	IV
PUSH	Interlayered Silty Fine SAND (SP), SILT (ML) and CLAY (CH) -sand with large clay pockets, at 29.6m (31.4m)	V
PUSH, PUSH, 30/15cm	Silty Fine SAND (SM), dense, gray -clay to 31.7m -with many clay pockets, partings and seams, at 34.7m -clay layer, 36.0m to 36.3m -with clay layers, 36.9m to 38.1m -fine sand with silt, below 38.1m -clay layer, 39.8m to 39.9m -clay layer, 40.2m to 40.8m -with large clay pockets and seams, at 41.8m (41.9m)	VI
PUSH, SAVE	Fat CLAY (CH), very stiff to hard, dark greenish gray -with shell fragments, gas blisters, and a few desiccated pockets, at 46.9m (50.9m)	VII
PUSH	Clayey SAND (SC), dense, greenish gray -dessicated at 52.1m (53.3m)	VIII
50/10cm	Silty Fine SAND (SM), dense to very dense, greenish gray (55.2m)	IX
PUSH	Silty Fine SAND (SM), very dense, gray -clay layer, 55.2m to 55.8m -clay layer, 56.1m to 56.5m (57.6m)	X
PUSH, SAVE	Fat CLAY (CH), hard, dark greenish gray -with mica and slickensides, at 58.8m -with slickensides and a few shell fragments, at 62.5m (63.4m)	XI
PUSH	Fat CLAY (CH), hard, gray -with silt pockets and partings, and slickensides, at 66.8m (68.3m)	XII
PUSH	Lean CLAY (CL), hard, gray -with silt pockets and desiccated brown pockets, at 70.4m	XIII
PUSH	-with a silty fine sand layer at 73.0m (74.4m) -with a few silty fine sand seams, silt pockets and partings, and organic pockets, at 74.1m	XIV
PUSH, SAVE	Fat CLAY (CH), hard, gray -sand layer, 76.0m to 76.2m (79.6m) -with silt pockets and partings, and a few silty fine sand seams, at 77.7m	XV
PUSH, 30/20cm	Interlayered Silty Fine SAND (SM), and Hard Lean CLAY (CL), dark greenish gray (83.1m)	XVI
PUSH, 30/10cm, 50/15cm, 50/15cm, 50/15cm, 50/10cm	Silty Fine SAND (SM), very dense, gray -with coarse sand and trace gravel -clay layer, 84.9m to 85.1m -interlayered clay and fine to coarse sand, at 86.0m (86.6m)	XVII

TOTAL DEPTH: 95.5m BACKFILLED WITH: Cement Grout



REGISTERED PROFESSIONAL ENGINEER
SABA MOHAN
No. C63519
Exp. 09-30-12
CIVIL
STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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S. Mohan 52 57 07-28-11
PROFESSIONAL ENGINEER DATE

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 13 OF 47

CU 04
EA 0120T1
BRIDGE No. 33-0025
Sheet 60 of 87

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TO ACCOMPANY PLANS DATED 2-21-12

100% PS&E

REID BUELL, DESIGN OVERSIGHT (Reid Buell 11/17/00)	DRAWN BY SACHIN DESHPANDE	R.HOWARD/P.ROBBINS, FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	T. W. McNEILAN, PROJECT ENGINEER	BRIDGE NO. 34-0006
	CHECKED BY J.CHACKO	DATE 06/14/99			km POST

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

LOG OF TEST BORINGS 13 OF 47

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 012021

POST MILE

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES (PRELIMINARY STAGE ONLY) 7/15/99 2/15/00 8/02/00 11/17/00

SHEET 512 OF

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF, Ala	80	13.9/14.3, 0.0/1.6	945	978

GEOTECHNICAL PROFESSIONAL

6-4-01
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/00 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE
7700, Edgewater Dr., Ste. 848,
Oakland, CA 94621
(510) 633-5100

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Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

Metric

SOIL AND ROCK TYPES

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy fat CLAY (CH)
- Lean CLAY (CL)
- Sandy lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)
- SILT (ML)
- Sandy SILT (ML)
- Clayey silt (ML/CL)
- Highly plastic ORGANICS (OH)
- Low plasticity ORGANICS (OL)
- SANDSTONE (Rx)
- SILTSTONE (Rx)
- CLAYSTONE (Rx)
- Interbedded Rock Strata (Rx)
- CONGLOMERATE (Rx)

SAMPLERS

- 76mm-OD, 72mm-ID Thin Walled Tube
- 57mm-OD, 54mm-ID* Thin Walled Driven Tube
- 63.5mm-OD, 54mm-ID Offshore Liner
- 76mm-OD, 60mm-ID Modified California Liner
- 51mm-OD, 35mm-ID SPT Split Spoon Sampler
- Rock Core (Inset symbol represents recovery (%))

* A variable-OD, 54-mm-ID tapered driven tube was used to sample coarse sand, gravel and rock

TUBE AND OFFSHORE LINER SAMPLERS

WOH	Offshore Liner sample advanced with the weight of an 80 kg hammer.
PUSH or SAVE	Pushed thin-walled 76mm-OD-tube.
15/60cm	Number of blows required to produce the indicated penetration using a 54mm-ID-tube sampler. The sampler was driven with an 80 kg downhole hammer dropped approximately 1.5 m.

STANDARD PENETRATION TEST AND MODIFIED CALIFORNIA LINER SAMPLERS

Samplers were driven with a 63.5 kg above deck hammer dropped approximately 760 mm.

20	Number of blows to produce 30 cm of penetration after the initial 15 cm of seating.
86/28cm	Number of blows required to produce the indicated penetration after an initial 15 cm seating.
Ref/8cm	50 blows produced the indicated penetration during the initial 15 cm interval.

CLASSIFICATION TESTS BLOW COUNTS AND ROCK QUALITY

- ■ PERCENT PASSING #200 SIEVE
- ● WATER CONTENT (%)
- □ SUBMERGED UNIT WEIGHT (KCF)
- ○ THEORETICAL SUBMERGED UNIT WEIGHT (KCF)
- PLASTIC LIMIT + LIQUID LIMIT +
- ⊗ EQUIVALENT SPT BLOW COUNT

STRENGTH TESTS

- ⊗ POCKET PENETROMETER
- ◇ TORVANE
- ◇ REMOTE VANE
- ◆ MINIATURE VANE (◇ RESIDUAL VANE)
- ▲ UNCONSOLIDATED UNDRAINED TRIAXIAL
- ▽ SWEDISH FALL CONE
- ⊡ UNCONFINED COMPRESSION (SOIL)
- ◇△ (Open symbols indicate remolded tests)
- \+ Soil: Strength Exceeds Capacity of Measuring Device
- Shear Strength Interpreted from CPT Tip Resistance

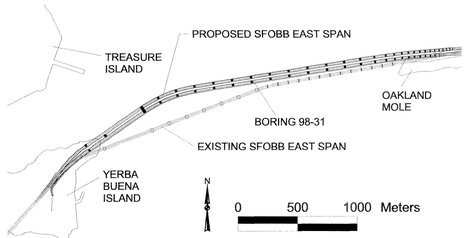
STRENGTH OF COHESIVE SOILS

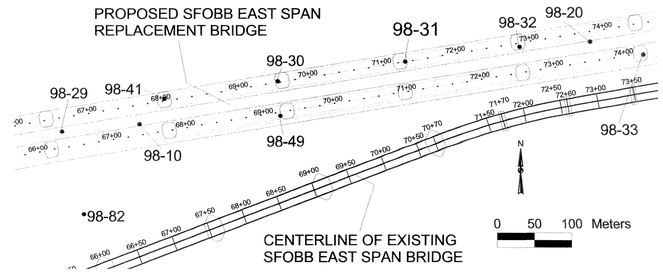
Consistency	Undrained Shear Strength, kPa
Very Soft	less than 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	100 to 200
Hard	greater than 200

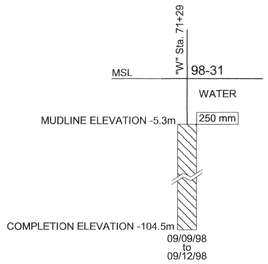
DENSITY OF GRANULAR SOILS

Descriptive Term	Relative Density (%)*
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record and CPT tip resistance.







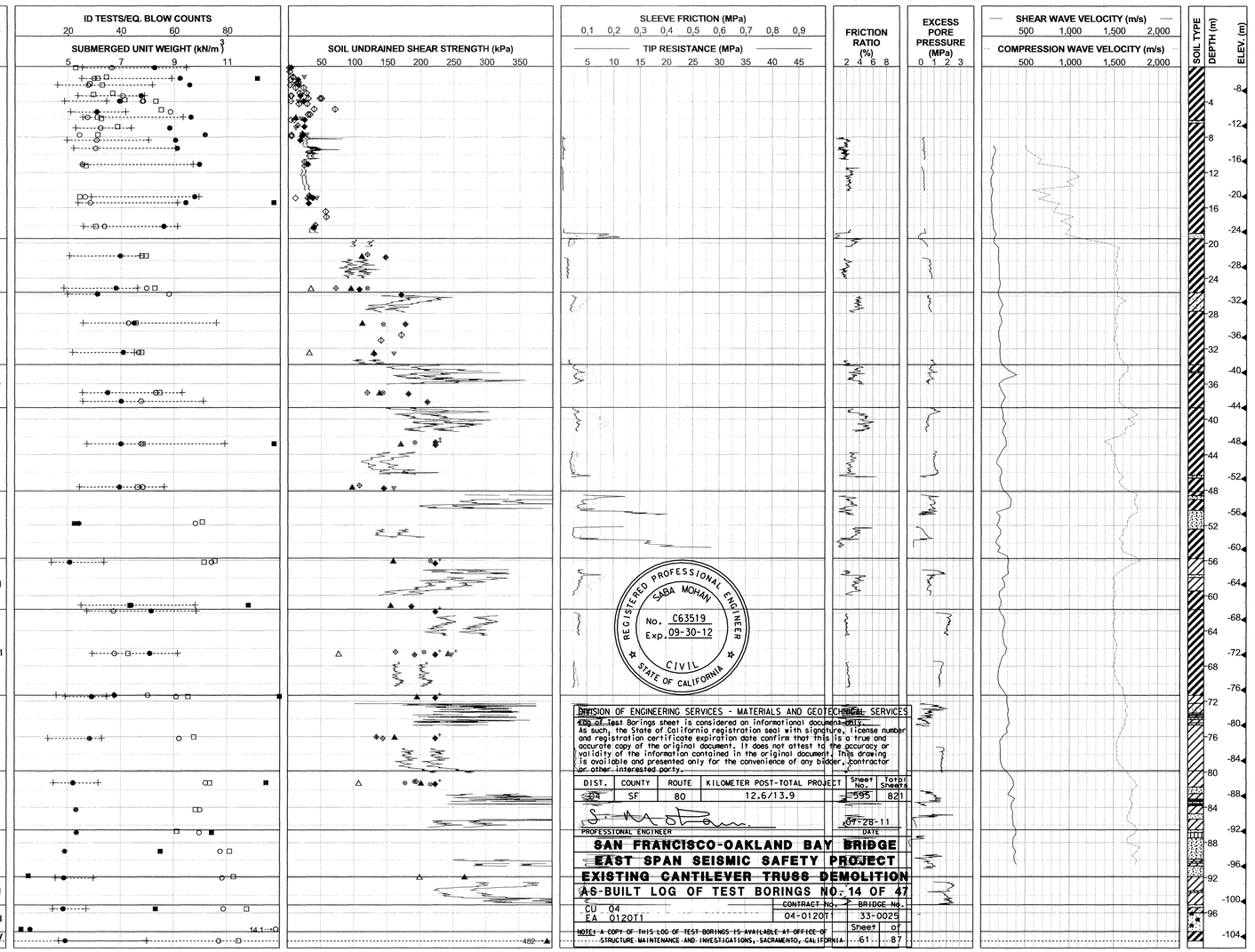
BORING 98-31

Coordinates: E1837605 N648086
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -5.3m (MSL)

STR. NO.	MATERIAL DESCRIPTION	BLOW COUNT
I	Fat CLAY (CH), soft to firm, olive gray -with silt pockets, shells and shell fragments -very soft clay to 0.6m -with sand pockets at 3.7m -sand layer, 6.1m to 6.4m -with a sand layer at 8.2m -with organic pockets, 9.1m to 11.3m -with sand pockets at 9.4m -platy, 11.0m to 18.3m -blocky and with gas blisters, at 14.6m -with gas blisters at 18.0m -dense sand, 18.9m to 19.5m (19.5m)	WOH, WOH, WOH, WOH, WOH, 8/60cm, 30/60cm, 9/60cm, 9/60cm, PUSH, PUSH, PUSH, PUSH, SAVE, PUSH
II	Fat CLAY (CH), very stiff to stiff, olive gray to gray -with silt and sand pockets -with a few shell fragments and mica, at 24.7m (25.6m)	PUSH, PUSH, SAVE
III	Fat CLAY (CH), hard to very stiff, greenish gray -slightly micaceous sandy lean clay to 27.7m -desiccated, with organic pockets and gas blisters, at 29.3m -gray, with shell fragments and many silt pockets and partings, at 32.3m (33.8m)	PUSH, PUSH
IV	Fat CLAY (CH), very stiff to hard, gray -with a silt layer, 34.6m to 34.7m -with silt partings, organic pockets and gas blisters, at 37.2m (38.7m)	PUSH, SAVE
V	Fat CLAY (CH), very stiff to hard, gray -with organic pockets -with a few gas blisters, slickensides and wood fragments, at 42.7m -sand layer, 46.3m to 46.6m -with silt pockets at 47.5m (48.2m)	PUSH, PUSH
VI	-Interlayered Fat CLAY (CH), hard to very stiff, and Silty SAND (SM), dense -greenish gray silty sand, with clay pockets, seams and layers, 50.3m to 52.4m -with medium to coarse sand, gravel, and shell fragments, at 51.5m (55.8m)	PUSH
VII	Lean to Fat CLAY (CL/CH), hard to very stiff, gray -hard greenish gray lean clay to 59.4m -with a sand layer at 57.6m (61.6m)	PUSH, PUSH SAVE
VIII	Fat CLAY (CH), hard, gray -with greenish gray bands and silt pockets, partings and seams, at 66.4m (71.3m)	PUSH, PUSH
IX	Lean CLAY (CL), hard, gray -interlayered with silt and sand, with organic pockets, to 76.2m -with desiccated clay seams at 76.2m (79.9m)	30/30cm
X	Lean CLAY (CL), hard, greenish gray -with silt pockets and a few calcareous nodules, at 81.1m -gray silty fine sand layer, 81.7m to 82.4m -with sand layers, 83.1m to 83.8m -dense sand with clay seams, 84.7m to 85.3m (86.6m)	PUSH SAVE, 30/35cm, 30/30cm, 30/30cm, 30/30cm
XI	Silty Fine SAND (SM), dense, gray -clay layer, 89.9m to 90.2m -clay layer, 90.4m to 90.7m -with a clay layer at 90.8m (91.9m)	30/30cm
XII	Lean CLAY (CL), hard, greenish gray -with a silt layer at 93.6m (95.1m)	30/25cm
XIII	GRAVEL with sand (GP), very dense, gray, subangular -olive brown sandy lean clay with gravel, 95.4m to 96.0m (98.1m)	30/35cm
XIV	Fat CLAY (CH), hard, dark yellowish brown mottled with gray	30/15cm

TOTAL DEPTH: 99.2m BACKFILLED WITH: Cement Grout



REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES
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DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	595	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 14 OF 47

	CONTRACT NO.	BRIDGE No.
CU 04	04-0120T1	33-0025
EA 0120T1	Sheet 61	of 87

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

TO ACCOMPANY PLANS DATED 2-21-12

100% PS&E

REID BUELL, DESIGN OVERSIGHT (11/17/00)	DRAWN BY: SACHIN DESHPANDE	J.CHACKO/M.ZUEGER, FIELD INVESTIGATOR	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
	CHECKED BY: J.CHACKO	DATE 06/14/99	

T.W.McNEILAN, PROJECT ENGINEER

BRIDGE NO. 34-0006
KM POST
POST MILE

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

LOG OF TEST BORINGS 14 OF 47

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 012021

DISREGARD PRINTS BEARING EARLIER REVISION DATES → 7/13/99 2/15/00 8/02/00 11/17/00

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 513 OF

FILENAME => 33-0025-q-1tb14of47.tif

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF, Ala	80	13.9/14.3, 0.0/1.6	946	978

GEOTECHNICAL PROFESSIONAL

6-4-01
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T.W. McNeilan No. 0583 Exp. 12/31/00 Geotechnical STATE OF CALIFORNIA

FUGRO-EARTH MECHANICS,
A JOINT VENTURE.
7700, Edgewater Dr., Ste. 848,
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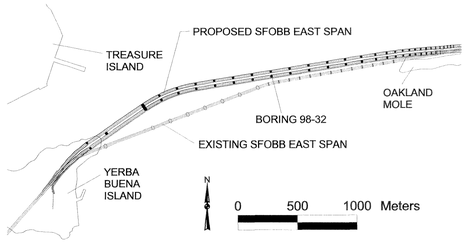
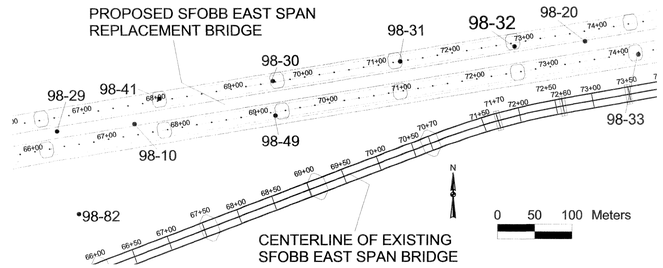
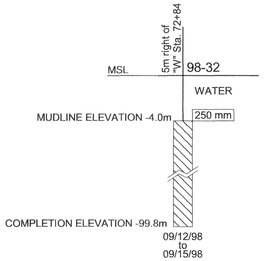






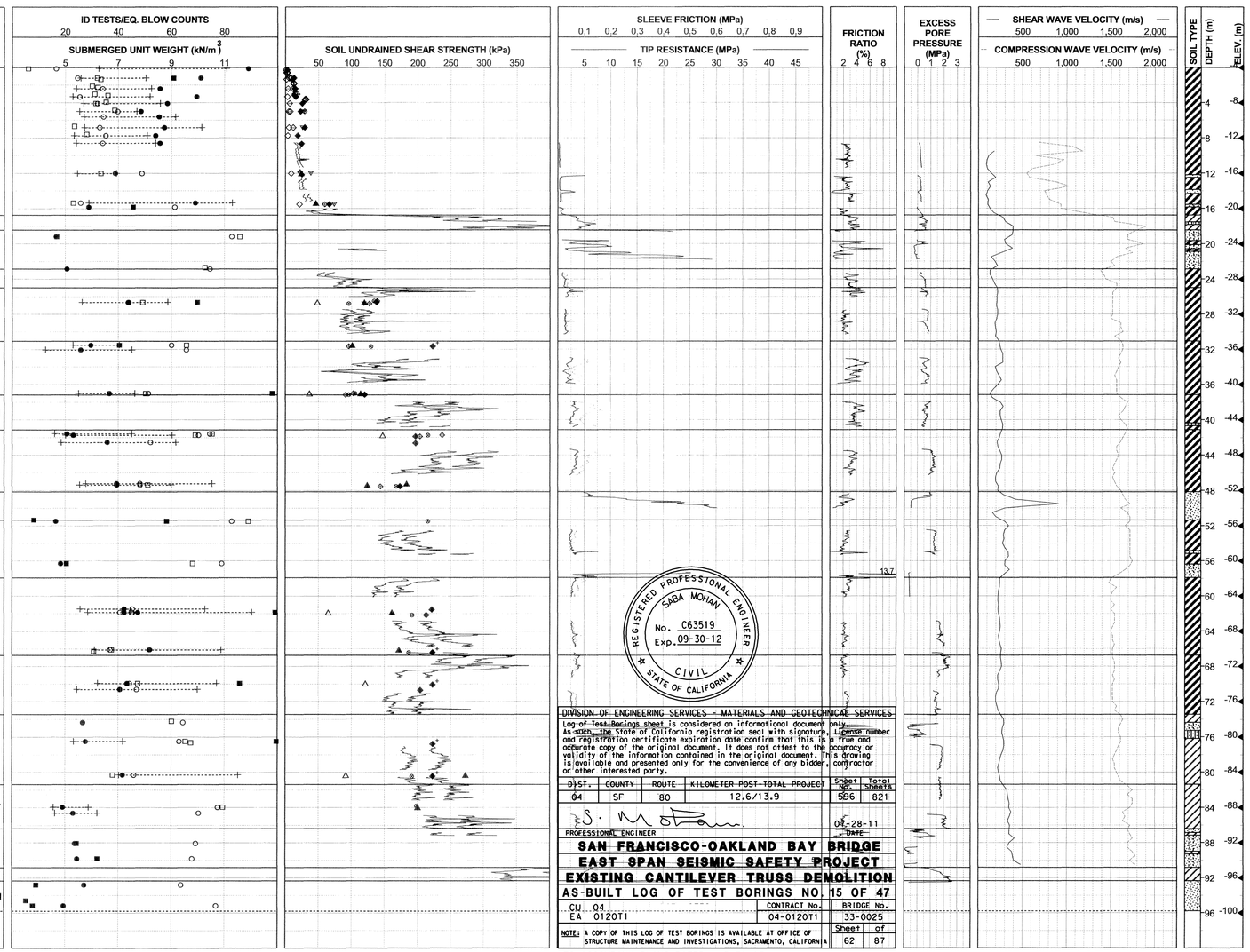
BORING 98-32

Coordinates: E1837758 N648106
CA State Plane Zone 3, NAD83, Meters

MUDLINE ELEVATION: -4.0m (MSL)

BLOW COUNT	MATERIAL DESCRIPTION	STR. NO.
WOH, WOH, WOH, WOH, WOH, PUSH, PUSH, PUSH, PUSH, SAVE	Fat CLAY (CH), soft, olive gray -with silt pockets, 1.8m to 8.8m -with gas blisters, 2.7m to 7.0m -with an H2S odor, 3.7m to 5.2m -with sand pockets and wood fragments, at 4.9m -with sand pockets at 6.7m -with silty sand pockets and seams, a few shell fragments, and a few organic pockets, at 11.9m -sand layer, 12.2m to 12.5m	I
PUSH	-sand layer, 13.9m to 14.3m -stiff, with sand and organic pockets, below 15.2m -medium dense silty fine sand, with clay pockets and organic pockets, 15.5m to 15.8m (16.8m)	
PUSH	Lean CLAY (CL), hard (18.4m) -silt layer, 17.5m to 17.8m	II
PUSH	Silty Fine SAND (SM), very dense, gray -clay layer, 19.7m to 20.0m -clay layer, 20.4m to 20.7m (22.9m)	III
PUSH	Fat CLAY (CH), stiff, greenish gray (25.0m)	IV
PUSH	Fat CLAY (CH), very stiff, greenish gray -with a sand layer at 25.5m -with silt pockets at 26.5m -with a sand seam at 29.0m (31.1m)	V
PUSH, SAVE	Fat CLAY (CH), very stiff, greenish gray -clayey sand, with sand pockets, calcareous nodules and a few shell fragments, at 31.4m -with silt pockets below 36.6m (37.2m)	VI
PUSH	Fat CLAY (CH), hard to very stiff, greenish gray -silt layer, 40.4m to 40.7m (41.1m)	VII
PUSH, SAVE	Fat CLAY (CH), hard to very stiff, greenish gray -with a few calcareous nodules at 41.8m	VIII
PUSH	-with silt pockets at 47.2m (48.2m)	
	Fine SAND with silt (SP-SM), dense to very dense, gray (51.4m)	IX
30/30cm	Fat CLAY (CH), hard to very stiff, gray -with a sandy lean clay layer at 51.5m -silty fine sand layer, 54.9m to 55.2m	X
PUSH	-silty fine to medium sand with trace coarse sand and gravel, below 56.1m (57.9m)	
SAVE, PUSH	Fat CLAY (CH), very stiff, olive gray -with gas blisters, shell fragments and a few wood fragments, at 61.9m	XI
PUSH	-platy and expansive, with dessicated pockets and silt pockets and partings, at 66.1m (66.8m)	
PUSH, SAVE	Fat CLAY (CH), hard, dark gray -with organic pockets and wood fragments, at 69.8m -with many large organic pockets at 70.4m (73.5m)	XII
PUSH, PUSH	Lean CLAY (CL), hard, gray -with a sand layer at 73.5m -with organic pockets and many silt pockets, partings, and seams, at 74.1m	XIII
PUSH	-silty sand layer, 74.2m to 75.3m -sandy silt, with clay seams and layers, 75.3m to 76.2m (81.4m)	
PUSH, SAVE	Lean CLAY (CL), hard, gray -with silt and sand pockets and seams, 83.8m to 84.4m -with a sand layer at 84.1m (86.4m)	XIV
30/30cm, 30/45cm	Silty Fine SAND (SM), very dense, gray -clay layer, 86.9m to 87.2m -sandy clay at 88.8m -clay layer, 89.0m to 89.3m (90.8m)	XV
	Lean CLAY (CL), hard, gray (92.4m)	XVI
30/15cm, 30/15cm, 30/15cm, 30/10cm	Fine to Medium SAND (SW-SM) with silt and gravel, very dense, gray	XVII

TOTAL DEPTH: 95.8m BACKFILLED WITH: Cement Grout



REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	596	821

PROFESSIONAL ENGINEER — DATE 02-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 15 OF 47

CU	04	CONTRACT No.	BRIDGE No.
EA	0120T1	04-0120T1	33-0025

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Sheet	of
62	87

TO ACCOMPANY PLANS DATED 2-21-12

100% PS&E

REID BUELL
DESIGN OVERSIGHT
11/7/00

DRAWN BY SACHIN DESHPANDE
CHECKED BY J.CHACKO

J.CHACKO/M.ZUEGER
FIELD INVESTIGATOR
DATE 06/14/99

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

T.W.McNEILAN
PROJECT ENGINEER

BRIDGE NO. 34-0006
KM POST
POST MILE

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

LOG OF TEST BORINGS 15 OF 47

ORIGINAL SCALE IN CENTIMETERS FOR REDUCED PLANS 0 1 2 3 4 5 6 7 8 9 10

CU 04
EA 012021

DISREGARD PRINTS BEARING EARLIER REVISION DATES → 7/18/99 2/15/00 8/02/00 11/17/00

SHEET 514 OF

FILENAME => 33-0025-q-ltb15of47.tif

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80			

REGISTERED ENGINEER - CIVIL

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER J. CHAI No. 052137 Exp. 12-31-98 CIVIL STATE OF CALIFORNIA

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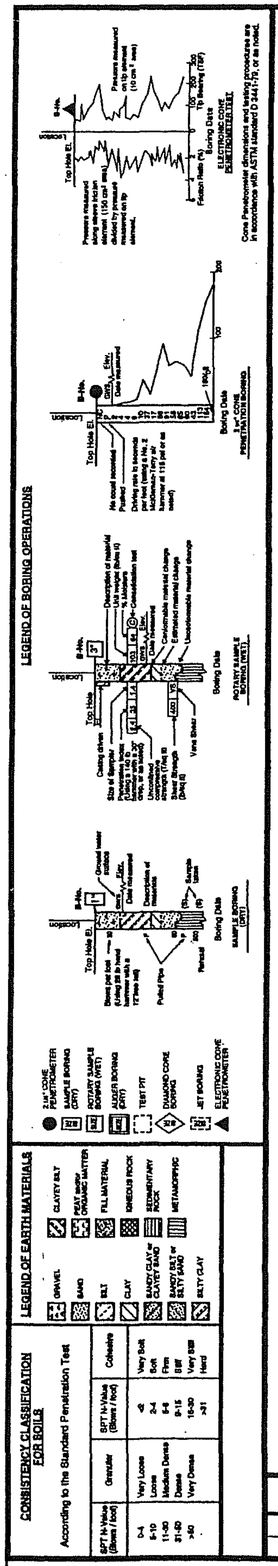

LEGEND OF BORING OPERATIONS
LEGEND OF EARTH MATERIALS
GRAVEL
SAND
SILT
CLAY
SANDY SILT or CLAYEY SAND
SANDY SILT or SILTY SAND
SILTY CLAY
CLAYEY SILT
PEAT WITH ORGANIC MATTER
FILL MATERIAL
IGNEOUS ROCK
SEDIMENTARY ROCK
METAMORPHIC
CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test
SPT N-Value (Blows / foot)
Granular
SPT N-Value (Blows / foot)
Cohesive
2-4 Very Loose
5-10 Loose
11-30 Medium Dense
31-50 Dense
>50 Very Dense
<2 Very Soft
2-4 Soft
5-8 Firm
9-15 Stiff
16-30 Very Stiff
>31 Hard
2.5" CONE PENETROMETER
SAMPLE BORING (DRY)
ROTARY SAMPLE BORING (WET)
AUGER BORING (DRY)
TEST PIT
DIAMOND CORE BORING
JET BORING
ELECTRONIC CONE PENETROMETER
Top Hole El.
Boring Data
Pressure measured along sleeve (cell pressure minus water pressure) divided by pressure measured on tip element.
Pressure measured on tip element (tip pore pressure)
Top 200 Tip Resistance (TSF)
Friction Ratio (%)
ELECTRONIC CONE PENETROMETER
Cone Penetrometer dimensions and testing procedures are in accordance with ASTM standard D 5441-93, or as noted.
No cover provided
Pushed
Pushed and to be tripped per hole (using a No. 2 McDonald-Terry air hammer at 115 psi or as noted)
1x1" CONE PENETROMETER
Rotary Sample Boring
Rotary Sample Boring (Wet)
Rotary Sample Boring (Dry)
Sample Taken
Ground water encountered
Date Encountered
Description of Materials
Perched
Perched Pipe
Boring was not cleared (closing the hole or hammer with a 12" bit)
Sample Boring
Sample Boring (Dry)
Sample Taken
Sample Boring (Wet)
Sample Taken

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80			

REGISTERED ENGINEER- CIVIL

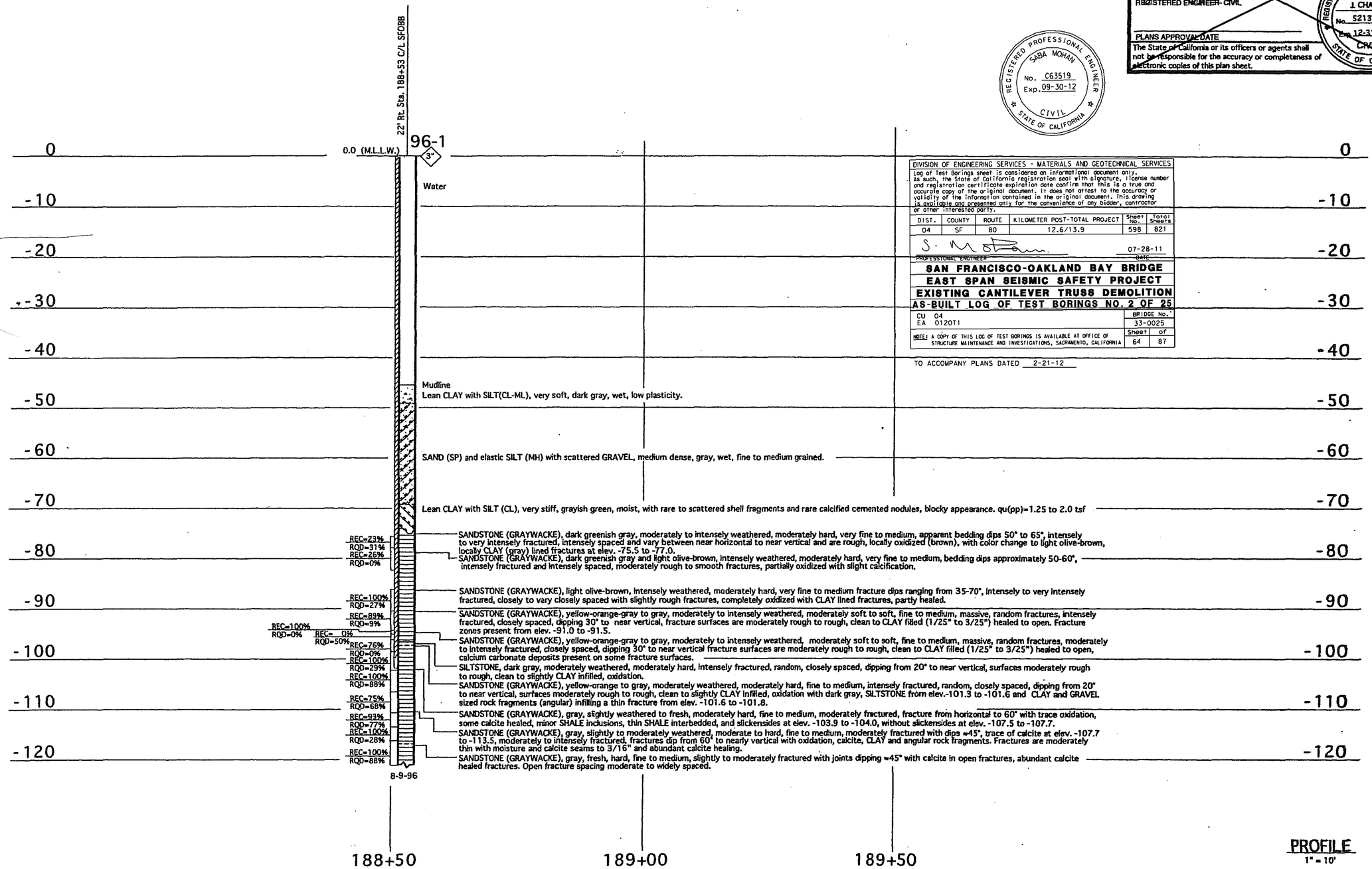
PLANS APPROVAL DATE

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.

REGISTERED PROFESSIONAL ENGINEER J. CHAI No. 52137 Exp. 12-31-98 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER SABA MOHAN No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

FOR PLAN VIEW, SEE "LOG OF TEST BORINGS", SHEET 1 OF 25.



PROFILE
1" = 10'

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	598	821

PROFESSIONAL ENGINEER — DATE 07-28-11

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 2 OF 25

CU 04
EA 0120T1

BRIDGE No. 33-0025

Sheet 64 of 87

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

TO ACCOMPANY PLANS DATED 2-21-12

LEGEND OF BORING OPERATIONS

LEGEND OF EARTH MATERIALS: GRAVEL, SAND, SILT, CLAY, SANDY CLAY or CLAYEY SAND, SANDY SILT or SILTY SAND, SILTY CLAY, CLAY/SILT, PEAT (organic matter), FILL MATERIAL, IGNEOUS ROCK, SEDIMENTARY, METAMORPHIC

CONSISTENCY CLASSIFICATION FOR SOILS According to the Standard Penetration Test

SPT N-Value (Blows/ foot)	Granular	SPT N-Value (Blows/ foot)	Cohesive
0-4	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-30	Medium Dense	5-8	Medium Stiff
31-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

ENGINEERING SERVICE CENTER	STRUCTURE FOUNDATIONS
DRAWN BY Ken Wall 8-96	
CHECKED BY	

FIELD INVESTIGATION BY: J. CHAI, T. WITMAN, T. CROSBY, E. HUMER, J. REGINATO, J. THORNE, B. TRINH, M. FELIBERTI

State of CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF STRUCTURES STRUCTURE DESIGN

CU: 04
EA: 0434A1

BRIDGE NO. 33-0025
POST MILE 1.15

EARTHQUAKE RETROFIT PROJECT NO. 3

SFOBB EAST SPAN - E2 TO E5

LOG OF TEST BORINGS

2 OF 25

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS → 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY) 1-22-97 3-12-97 6-8-97 SHEET OF

TL 605Z REV. 6/95

FILENAME => 33-0025-r-l+b02of25.tif

CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test

SPT N-Value (Blows / foot)	Granular	SPT N-Value (Blows / foot)	Cohesive
0-4	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-30	Medium Dense	5-8	Firm
31-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		>31	Hard

LEGEND OF EARTH MATERIALS

GRAVEL, SAND, SILT, CLAY, SANDY CLAY or CLAYEY SAND, SANDY SILT or SILTY SAND, SILTY CLAY, CLAYEY SILT, PEAT and/or ORGANIC MATTER, FILL MATERIAL, IGNEOUS ROCK, SEDIMENTARY ROCK, METAMORPHIC

LEGEND OF BORING OPERATIONS

2 1/4" CONE PENETROMETER; SAMPLE BORING (DRY); ROTARY SAMPLE BORING (WET); AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; JET BORING; ELECTRONIC CONE PENETROMETER

SAMPLE BORING (DRY) — Top Hole El. B-No. 1; Ground water surface; Elev.; Date measured; Description of materials; Sample taken; Stone per foot (Using 35 lb hand hammer with a 12" drive hd); Pushed Pipe; Refusal; Boring Date

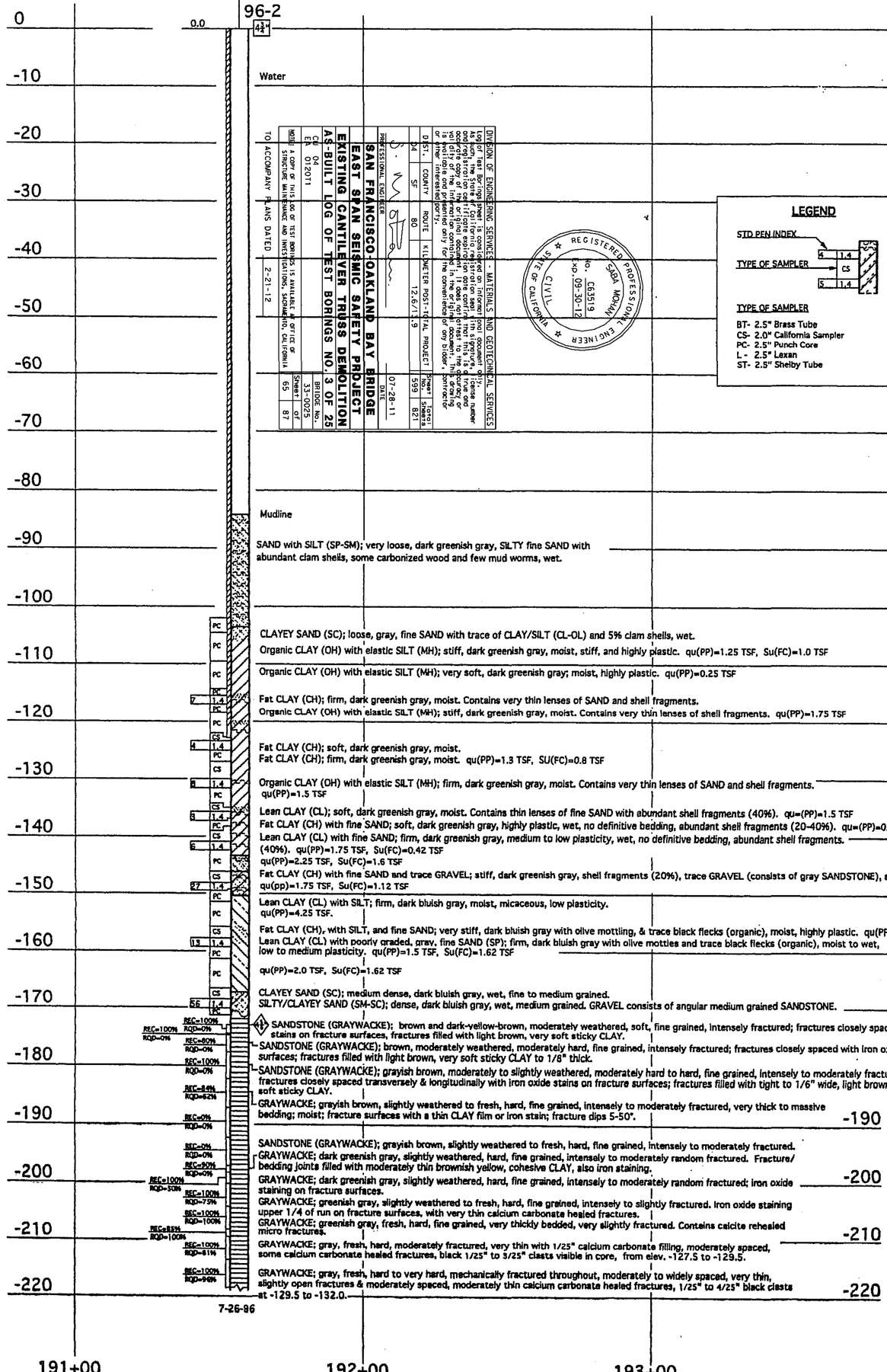
ROTARY SAMPLE BORING (WET) — Top Hole El. B-No. 3; Casing drive; Size of Sampler; Penetration Resistance (Blows to 140 lb hammer falling 30" drop, or as noted); Unconfined compressive strength (Tsf); Shear Strength (Tsf); Vane Shear; Description of material; Unit weight (lb/cu ft); % Moisture; Consolidation test; Elev.; Date measured; Comfortable material change; Estimated material change; Uncomfortable material change; Boring Date

3 1/4" CONE PENETRATION BORING — Top Hole El. B-No. 4; Elev.; Date measured; No record recorded; Pushed; Driving rate in seconds per foot (using a No. 2 McKiernan/Terry air hammer at 115 psi or as noted); Boring Date

ELECTRONIC CONE PENETROMETER TEST — Top Hole El. B-No.; Pressure measured along sleeve friction element (150 cm² area) divided by pressure measured on tip element; Pressure measured on tip element (10 cm² area); Friction Ratio (%); Tip Bearing (TSF); Boring Date

Cone Penetrometer dimensions and testing procedures are in accordance with ASTM Standard D 3441-79, or as noted.

FOR PLAN VIEW, SEE
"LOG OF TEST BORINGS 1 OF 25"



LEGEND

STD PEN INDEX; TYPE OF SAMPLER

TYPE OF SAMPLER
BT- 2.5" Brass Tube
CS- 2.0" California Sampler
PC- 2.5" Punch Core
L - 2.5" Lexan
ST- 2.5" Shelby Tube

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

Log of test borings represent information obtained at the time of exploration at the locations and depths shown. Soil conditions may change at other locations and depths. This log is a true and correct representation of the information obtained at the time of exploration to the best of our knowledge and ability. The information contained in this drawing is not to be construed as a guarantee of subsurface conditions or conditions presented only for the convenience of any bidder, contractor or other party.

DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	SHEET	TOTAL SHEETS
04	SF	80	12.6/13.9	599	821

PROFESSIONAL ENGINEER — REGISTERED PROFESSIONAL ENGINEER, STATE OF CALIFORNIA, CIVIL, No. C63519, Exp. 09-30-12, SAGA MOHAN

07-28-11
DATE

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 3 OF 25

BRIDGE No. 33-0025

Sheet 65 of 87

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

TO ACCOMPANY PLANS DATED 2-21-12

CU 04
EA 01201I

FIELD INVESTIGATION BY:
T. BECK, J. CHAN, M. FERLINETTI, T. LE, J. LEGVAL, C. MALTBY, M. ROBERTS, K. SHAW, J. THORNE, B. TRIN

ENGINEERING SERVICE CENTER — STRUCTURE FOUNDATIONS

DRAWN BY: Chad Guerra 8/96
CHECKED BY

State of CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF STRUCTURES
STRUCTURE DESIGN

CU: 04
EA: 0434A1

BRIDGE NO. 33-25
POST MILE 1.15

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)
7-25-97 7-7-97 6-12-97

EARTHQUAKE RETROFIT - PROJECT No. 3

SFOBB EAST SPAN - E2 TO E5

LOG OF TEST BORINGS 3 OF 25

SHEET OF

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS → 0 1 2 3

FILENAME => 33-0025-r-lt003of25.tif

TL 6032 REV. 3/97

PLANS APPROVAL DATE

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REGISTERED ENGINEER - CIVIL

REGISTERED PROFESSIONAL ENGINEER, STATE OF CALIFORNIA, CIVIL, No. 52137, Exp. 12-31-98, J. CHAN

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80			

CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test

SPT N-Value (Blows / foot)	Granular	SPT N-Value (Blows / foot)	Cohesive
0-4	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
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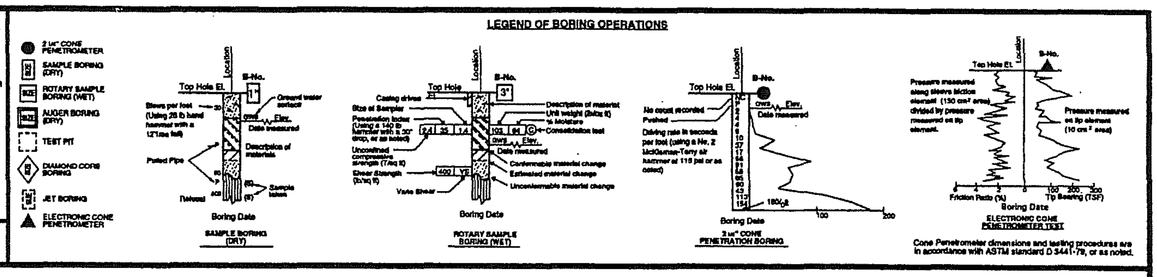
LEGEND OF EARTH MATERIALS

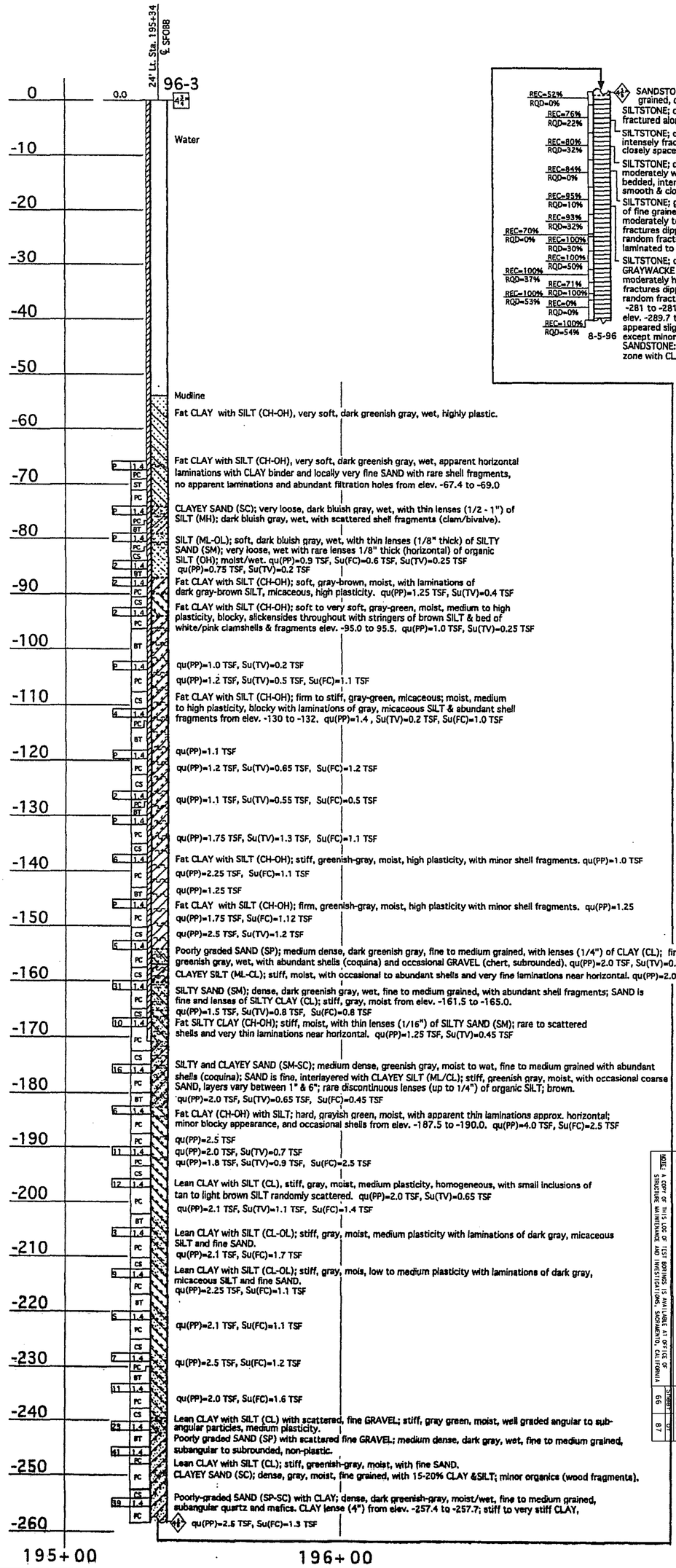
GRAVEL, SAND, SILT, CLAY, SANDY CLAY or CLAYEY SAND, SANDY SILT or SILTY SAND, SILTY CLAY, CLAYEY SILT, PEAT and/or ORGANIC MATTER, FILL MATERIAL, IGNEOUS ROCK, SEDIMENTARY ROCK, METAMORPHIC

LEGEND OF BORING OPERATIONS

3 1/4" CONE PENETROMETER; SAMPLE BORING (DRY); ROTARY SAMPLE BORING (WET); AUGER BORING (DRY); TEST PIT; DIAMOND CORE BORING; JET BORING; ELECTRONIC CONE PENETROMETER



Cone Penetrometer dimensions and testing procedures are in accordance with ASTM standard D 5441-79, or as noted.



SANDSTONE; dark grayish-green, slightly weathered, moderately hard, fine to medium grained, quartz grains (subangular); 20-25% mafic minerals. -260

SILTSTONE; dark gray, slightly weathered, moderately soft, thinly bedded, intensely fractured along bedding planes, dipping approx. 50°.

SILTSTONE; dark gray, slightly to moderately weathered, moderately soft, thinly bedded, intensely fractured; foliation joints at approximately 60°; fractures are smooth and closely spaced & oxidized. -270

SILTSTONE; dark gray with fine SANDSTONE; yellowish/orange laminations; slightly to moderately weathered, moderately hard to moderately soft; moderately to thinly bedded, intensely fractured; foliation joints dipping approximately at 45°; fractures are smooth & closely spaced & oxidized with local fracture zones.

SILTSTONE; gray to dark gray, interbedded with laminations to moderately thick beds of fine grained GRAYWACKE SANDSTONE; slightly to moderately weathered, soft, moderately to intensely fractured; bedding fractures dipping ~40° to 50°; random fractures dipping ~40° to 60°; bedding fractures are smooth, closely spaced & oxidized, random fractures are moderately rough, closely spaced & fresh. GRAYWACKE beds are laminated to very thin & becoming moderately weathered from elev. -275.5 to -277.0 -280

SILTSTONE; dark gray with interbedded laminations to thin beds of gray, fine grained GRAYWACKE SANDSTONE; moderately to slightly weathered, moderately soft to moderately hard, moderately fractured, bedding fractures dipping ~40° to 50°; random fractures dipping ~30° to 90°. Bedding fractures are smooth, closely space & oxidized; random fractures are rough, closely spaced & fresh. Fracture zones present from elev. -281 to -281.6. Locally GRAYWACKE is fine to medium grained; fracture zone from elev. -289.7 to -290.0; apparent flow banding from elev. -289 to -290.6; all fractures appeared slightly open, moderately rough & clean with no oxidation or calcification except minor gray CLAY noted on one fracture at approximately elev. -289.6; SANDSTONE: intensely fractured from elev. -291.9 to -293; Intensely fractured+ zone with CLAY & calcite from elev. -295.7 to -300.0. -290 -300

FOR PLAN VIEW, SEE "LOG OF TEST BORINGS 1 OF 25"

LEGEND

STD PEN INDEX — 4 1.4

TYPE OF SAMPLER — CS

5 1.4

TYPE OF SAMPLER

BT- 2.5" Brass Tube
CS- 2.0" California Sampler
PC- 2.5" Punch Core
L - 2.5" Lexan
ST- 2.5" Shelby Tube

REGISTERED PROFESSIONAL ENGINEER SASA MOHAMMAD No. C63519 Exp. 09-30-12 CIVIL STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

Log of Test Borings sheet is considered an informal document only. Information shown on this sheet is not to be used for bidding purposes. Please number and preserve this original document in your records. Do not make copies of this original document. Copies of this document are uncontrolled and may not be the latest revision. This is a true and correct copy of the original document in the office of the Structure Maintenance and Investigations, Sacramento, California. This copy is provided for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	KILOMETER POST-TOTAL PROJECT	Sheet No.	Total Sheets
04	SF	80	12.6/13.9	600	821

S. Mohammad 07-28-11
PROFESSIONAL ENGINEER DATE

CU 04 EA 012011

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

BRIDGE No. 33-0025

STRUCT	SHEET	OF
66	87	

SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
EXISTING CANTILEVER TRUSS DEMOLITION
AS-BUILT LOG OF TEST BORINGS NO. 4 OF 25

PROFILE
Hor. 1" = 20'
Ver. 1" = 10'

REGISTERED ENGINEER - CIVIL

PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER J. CHAI No. SE137 Exp. 12-31-98 CIVIL STATE OF CALIFORNIA

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80			

ENGINEERING SERVICE CENTER — STRUCTURE FOUNDATIONS

DRAWN BY / CHECKED BY — Jim Gomez — 8/96

FIELD INVESTIGATION BY: J. CHAI, M. FERRERITO, E. HILMER, T. LE, J. REGNATO, M. ROGERS, H. SALIMI, L. THORNE, B. TRINN, T. WHITMAN

State of CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF STRUCTURES — STRUCTURE DESIGN

CU: 04 EA: 0434A1

BRIDGE NO. 33-25 — POST MILE 1.15

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY) 7-23-97 7-24-97 7-12-97

EARTHQUAKE RETROFIT - PROJECT No. 3

SFOBB EAST SPAN - E2 TO E5

LOG OF TEST BORINGS 4 OF 25

SHEET OF

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS → 0 1 2 3

FILENAME => 33-0025-r-lb004of25.tif

TL 6021 REV. 3/97