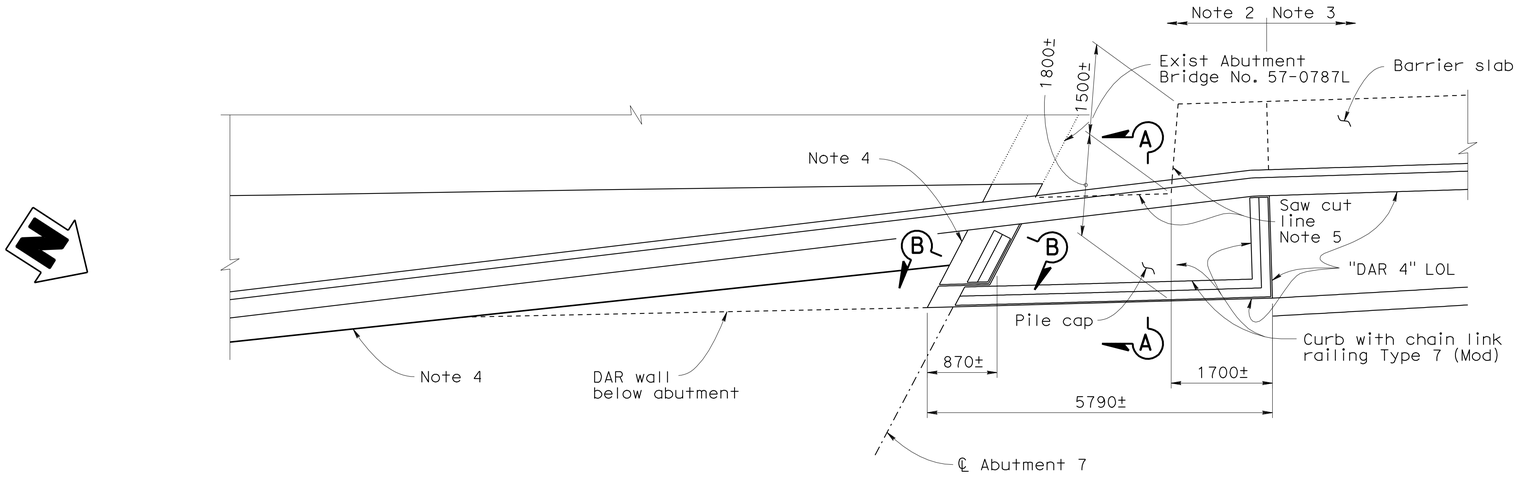

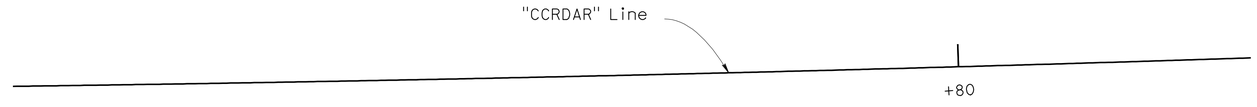

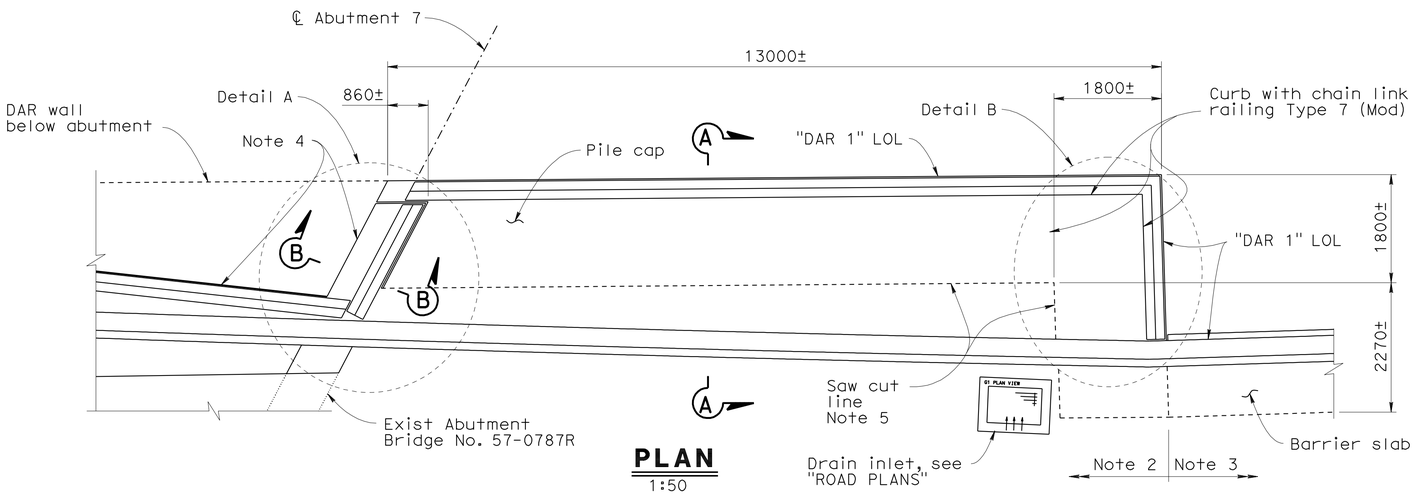

PLAN
1:50

NOTES

1. For SECTION "A-A" and "B-B", see "MISCELLANEOUS DETAILS NO. 3" sheet.
2. Concrete barrier Type 742 (Mod), see "SOLEDAD CANYON BR & OH (RECONSTRUCT) PLANS".
3. Concrete barrier Type 742 on barrier slab, see "DAR WALL BARRIER LAYOUT NO. 1" sheet.
4. For reconstructed deck, girder, and abutment, see "SOLEDAD CANYON BR & OH (RECONSTRUCT) PLANS".
5. For limits of saw cut line, see "SOLEDAD CANYON BR & OH (RECONSTRUCT) PLANS".
6. For "DETAIL A" and "DETAIL B", see "MISCELLANEOUS DETAILS NO. 2" sheet.

ALL DIMENSIONS ARE IN
MILLIMETERS UNLESS OTHERWISE SHOWN

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	801	886

Peter B Smith 4-28-09
REGISTERED CIVIL ENGINEER DATE

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
Pete B. Smith
No. C60122
Exp. 6-30-10
CIVIL
STATE OF CALIFORNIA

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SAN DIEGO, CA 92108

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Pete Smith	Anthony Sánchez
DETAILS	Ivan Martin	Anthony Sánchez
QUANTITIES	Andy Toledo	Shafi Sharifan

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO. 57E0075/76
KILOMETER POST KP43.2

CARROLL CANYON (DAR) RETAINING WALLS
MISCELLANEOUS DETAILS NO. 1

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 9/12/08 | 12/19/08 | 3/09/09 | 4/28/09

SHEET 31 OF 55

FILE => 57-e0075_76-s-miscdt01.dgn

USERNAME => ttimkes\ DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 11:58

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	802	886

Peter B Smith 4-28-09
REGISTERED CIVIL ENGINEER DATE

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Pete B. Smith — No. C60122 — Exp. 6-30-10 — CIVIL — STATE OF CALIFORNIA

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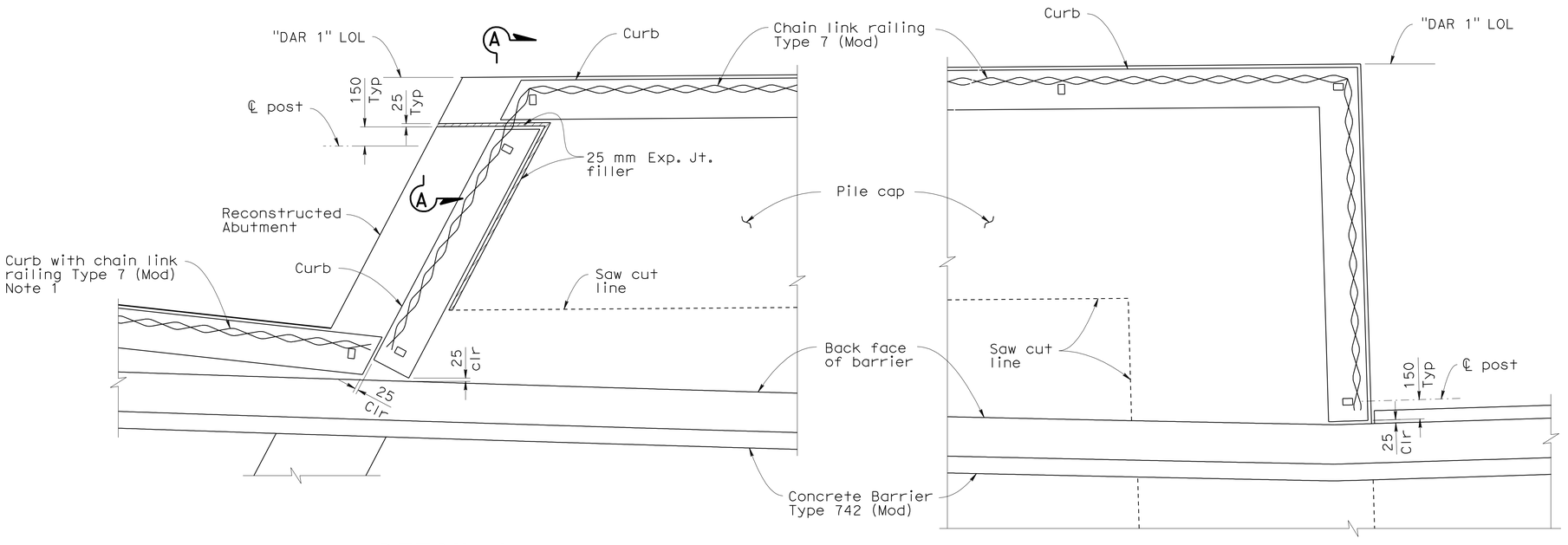
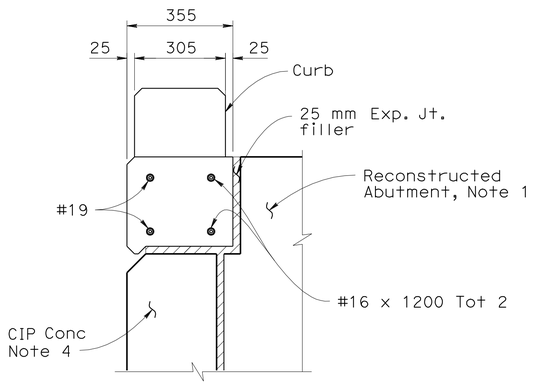
SAN DIEGO, CA 92108



DETAIL A
1:20

DETAIL B
1:20



SECTION A-A
1:10

NOTES

1. See "SOLEDAD CANYON BR & OH (RECONSTRUCT) PLANS" for details.
2. "DAR 1" pile cap shown, "DAR 4" pile cap similar.
3. For locations of "DETAIL A" and "DETAIL B", see "MISCELLANEOUS DETAILS NO. 1" sheet.
4. Top of CIP wall face, see "WALL FACING DETAILS NO. 2" sheet.

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Pete Smith	Anthony Sánchez
DETAILS	Ivan Martin	Anthony Sánchez
QUANTITIES	Andy Toledo	Shafi Sharifan

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

CU 11275
EA 2T0401

BRIDGE NO. 57E0075/76
KILOMETER POST KP43.2

CARROLL CANYON (DAR) RETAINING WALLS
MISCELLANEOUS DETAILS NO. 2

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 9/12/08, 12/19/08, 3/09/09, 4/28/09

SHEET 32 OF 55

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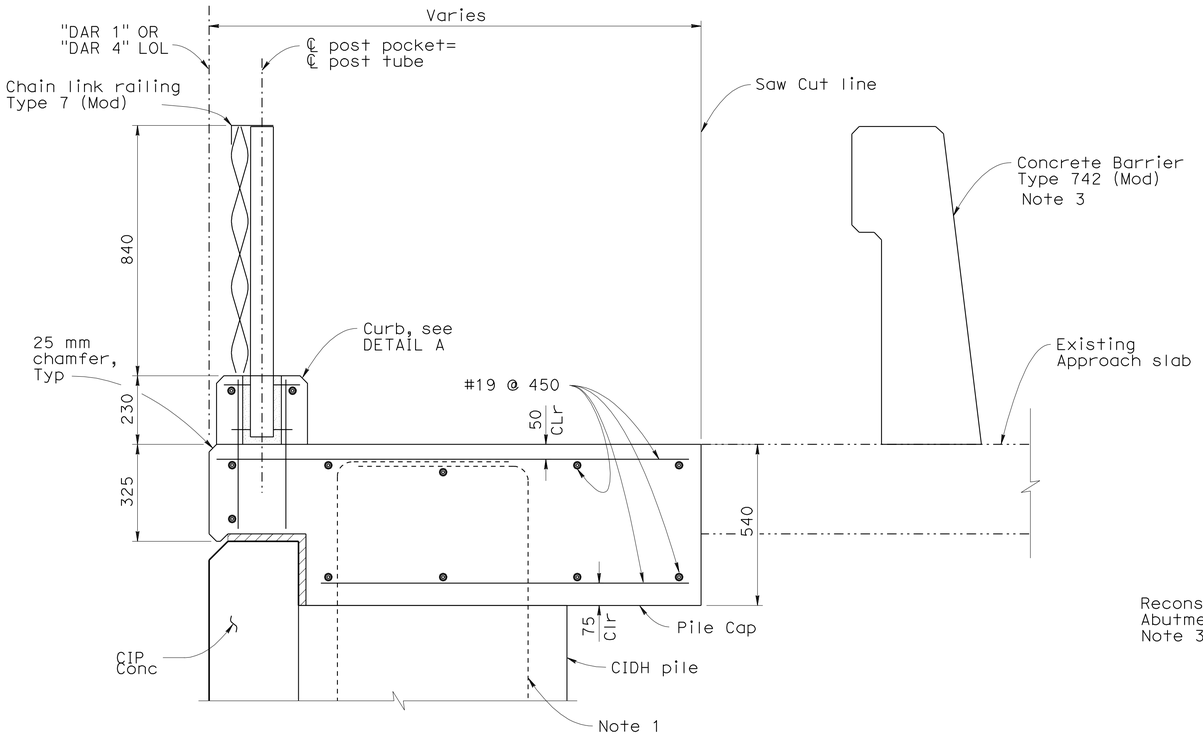
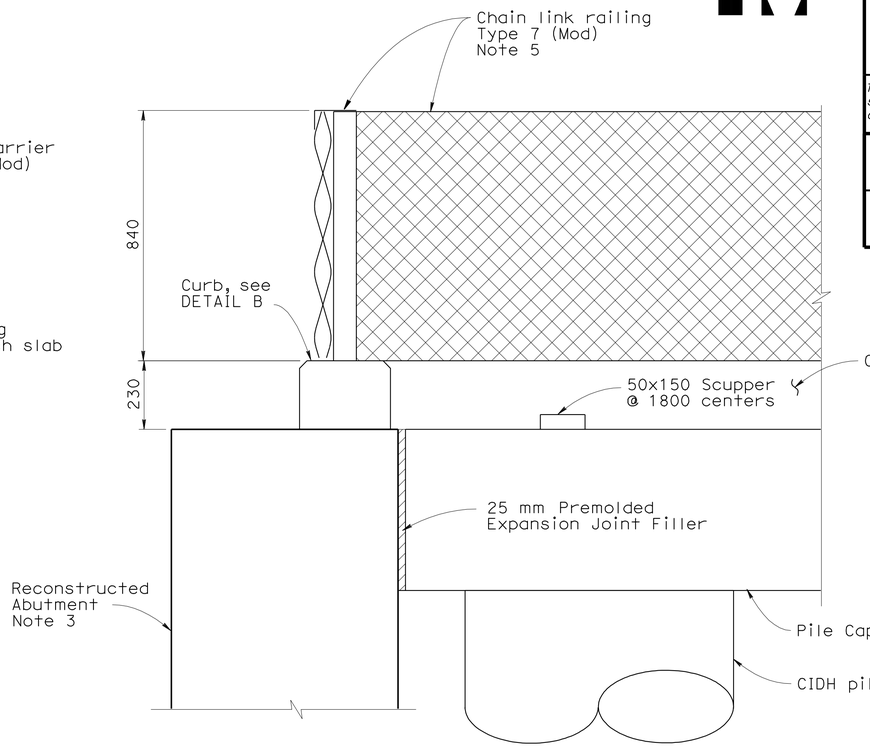
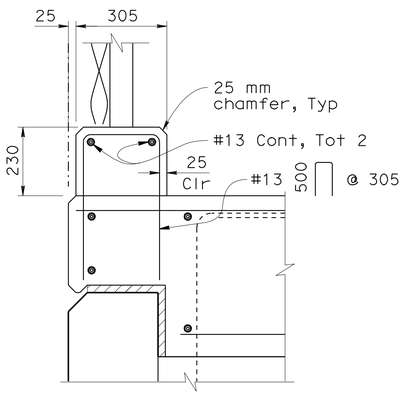


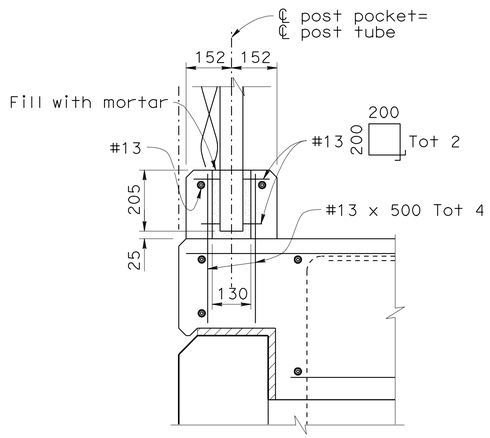
SECTION A-A
1:10



SECTION B-B
1:10

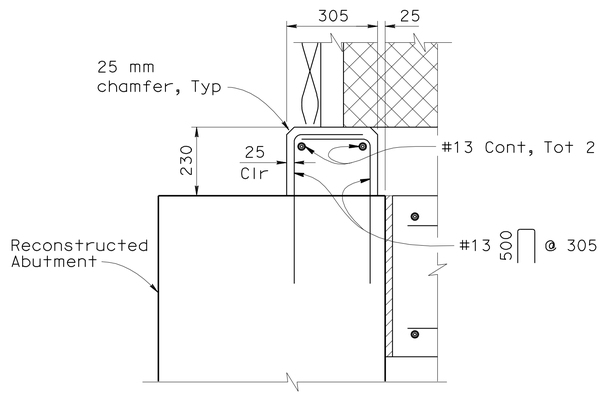


CURB DETAIL
1:10

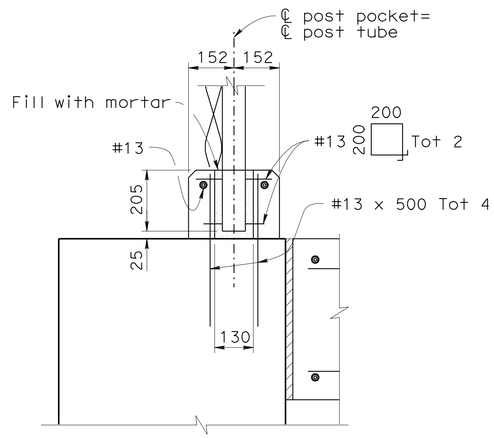


POST ANCHORAGE DETAIL
1:10

DETAIL A



CURB DETAIL
1:10



POST ANCHORAGE DETAIL
1:10

DETAIL B

NOTES

1. Extend pile reinforcement into pile cap. Use similar details as shown on "BARRIER SLAB DETAILS" sheet.
2. For locations of SECTIONS A-A and B-B, see "MISCELLANEOUS DETAILS NO. 1" sheet.
3. See "SOLEDAD CANYON BR & OH (RECONSTRUCT) PLANS".
4. "DAR 1" wall shown, "DAR 4" wall similar.
5. For details not shown, see B11-52
6. For location of "SECTION A-A" and "SECTION B-B" see "MISCELLANEOUS DETAILS NO. 1" sheet.

ALL DIMENSIONS ARE IN
MILLIMETERS UNLESS OTHERWISE SHOWN

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	803	886

Peter B Smith
REGISTERED CIVIL ENGINEER
4-28-09
DATE

REGISTERED PROFESSIONAL ENGINEER
Pete B. Smith
No. C60122
Exp. 6-30-10
CIVIL
STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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SAN DIEGO, CA 92108

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Pete Smith	Anthony Sánchez
DETAILS	Ivan Martin	Anthony Sánchez
QUANTITIES	Andy Toledo	Shafi Sharifan

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO. 57E0075/76
KILOMETER POST KP43.2

CARROLL CANYON (DAR) RETAINING WALLS
MISCELLANEOUS DETAILS NO. 3

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY): 9/12/08, 12/19/08, 3/09/09, 4/28/09

SHEET 33 OF 55

FILE => 57-e0075_76-s-miscdt03.dgn

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	804	886

Peter B Smith — 4-28-09
REGISTERED CIVIL ENGINEER — DATE

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Pete B. Smith — No. C60122 — Exp. 6-30-10 — CIVIL — STATE OF CALIFORNIA

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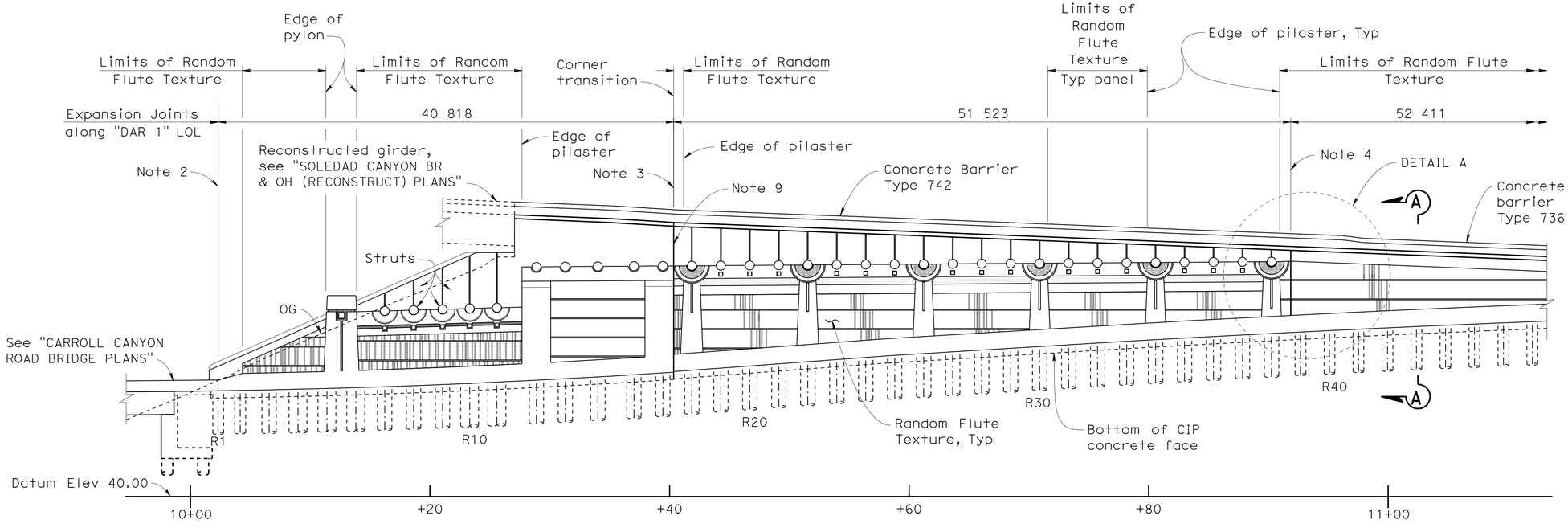
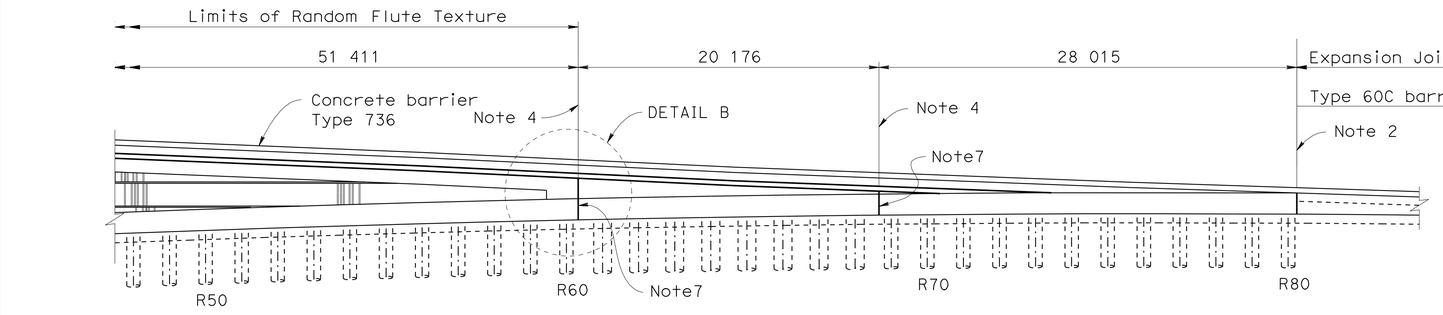
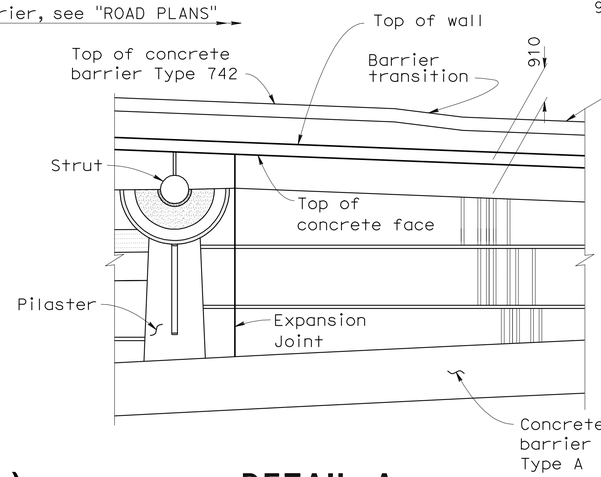
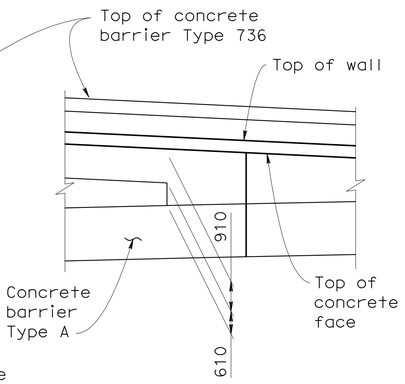
SAN DIEGO, CA 92108









NOTES

1. Expansion Joint shall not extend into barrier slab, Type 736, or Type 742 barriers.
2. For expansion Joint detail, see "TYPE A BARRIER DETAILS NO. 2" sheet.
3. See "WALL CORNER TRANSITION EXPANSION JOINT" on "WALL EXPANSION JOINT DETAILS" sheet.
4. See "TYPICAL WALL EXPANSION JOINT" on "WALL EXPANSION JOINT DETAILS" sheet.
5. All cast in place retaining wall concrete shall be integrally colored with variable sand blast finish.
6. Type A barrier shall be integrally colored. Barrier cap shall be integrally colored with variable sand blast finish.
7. Extend expansion joint through Type A barrier.
8. For "DETAIL A" and "DETAIL B" see "DAR 1 ARCHITECTURAL ELEVATION" sheet
9. Smooth finish on face of corner transition.

MIRROR ELEVATION ("DAR 1" WALL)
1:200

DETAIL A
1:80

DETAIL B
1:80

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Pete Smith	Anthony Sánchez
DETAILS	Ivan Martin	Anthony Sánchez
QUANTITIES	Andy Toledo	Shafi Sharifan

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.	57E0075/76
KILOMETER POST	KP43.2

CARROLL CANYON (DAR) RETAINING WALLS
DAR 1 ARCHITECTURAL ELEVATION

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 9/12/08 | 12/19/08 | 3/09/09 | 4/28/09

SHEET 34 OF 55

FILE => 57-e0075_76-u-arch_elev00.dgn

USERNAME => rtimmerst DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 11:59

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	805	886

Peter B Smith — 4-28-09
REGISTERED CIVIL ENGINEER — DATE

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Pete B. Smith — No. C60122 — Exp. 6-30-10 — CIVIL — STATE OF CALIFORNIA

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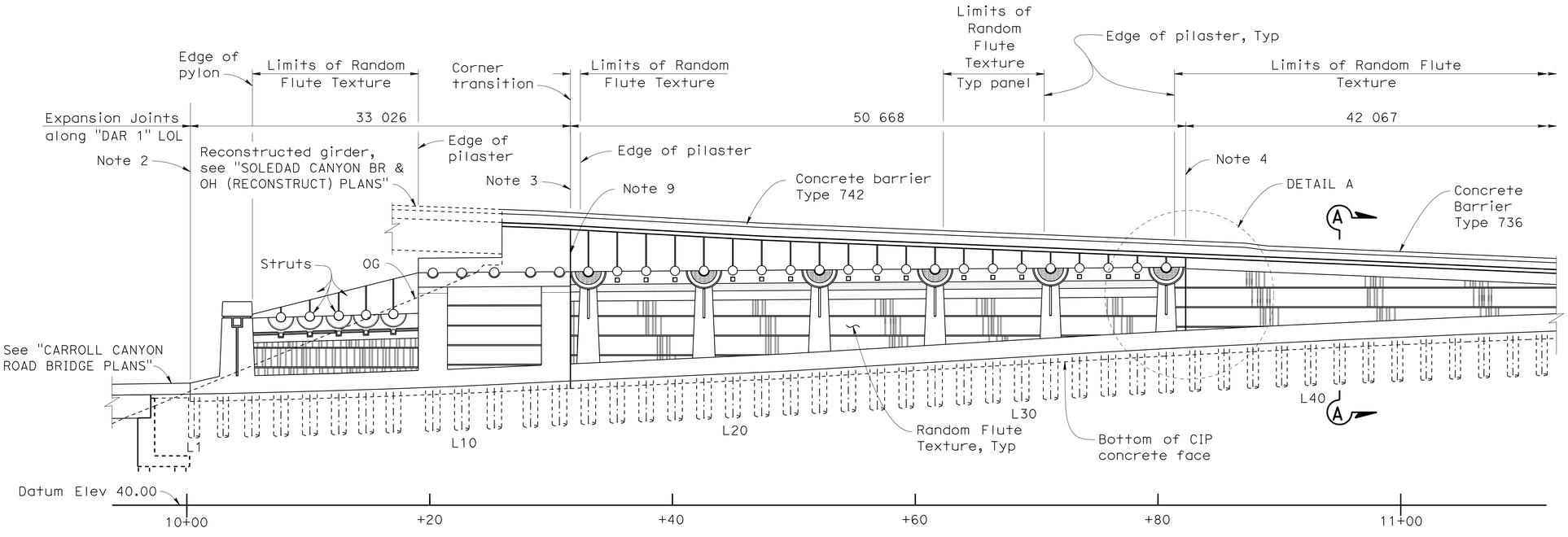
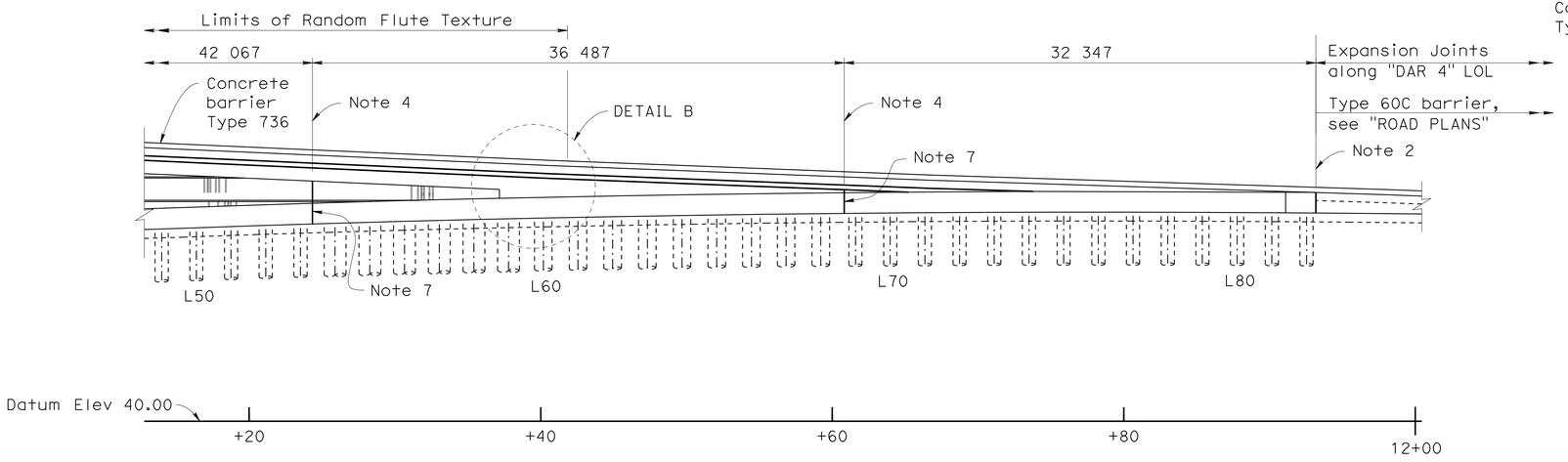
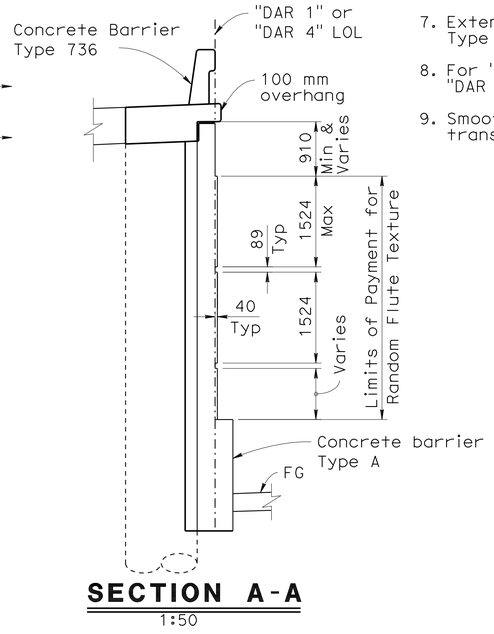
SAN DIEGO, CA 92108





ELEVATION ("DAR 4" WALL)
1:200



SECTION A-A
1:50

NOTES

1. Expansion Joint shall not extend into barrier slab, Type 736, or Type 742 barriers.
2. For expansion Joint detail, see "TYPE A BARRIER DETAILS NO. 2" sheet.
3. See "WALL CORNER TRANSITION EXPANSION JOINT" on "WALL EXPANSION JOINT DETAILS" sheet.
4. See "TYPICAL WALL EXPANSION JOINT" on "WALL EXPANSION JOINT DETAILS" sheet.
5. All cast in place retaining wall concrete shall be integrally colored with variable sand blast finish.
6. Type A barrier shall be integrally colored. Barrier cap shall be integrally colored with variable sand blast finish.
7. Extend expansion joint through Type A barrier.
8. For "DETAIL A" and "DETAIL B" see "DAR 1 ARCHITECTURAL ELEVATION" sheet
9. Smooth finish on face of corner transition.

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Pete Smith	Anthony Sánchez
DETAILS	Ivan Martin	Anthony Sánchez
QUANTITIES	Andy Toledo	Shafi Sharifan

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO. 57E0075/76
KILOMETER POST KP43.2

CARROLL CANYON (DAR) RETAINING WALLS
DAR 4 ARCHITECTURAL ELEVATION

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY): 9/12/08 | 12/19/08 | 3/09/09 | 4/28/09

SHEET 35 OF 55

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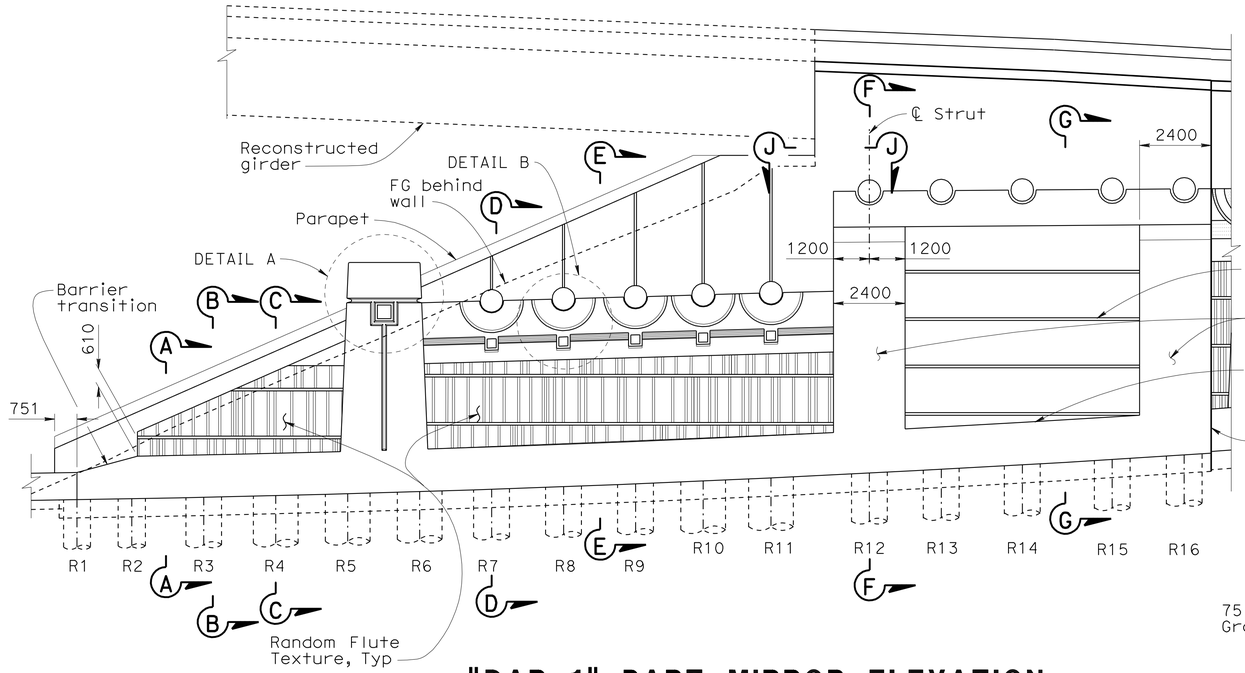
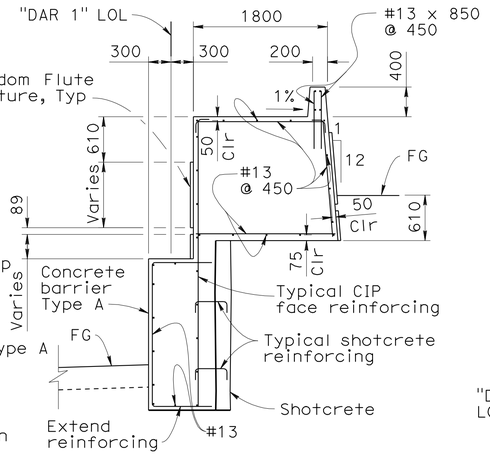


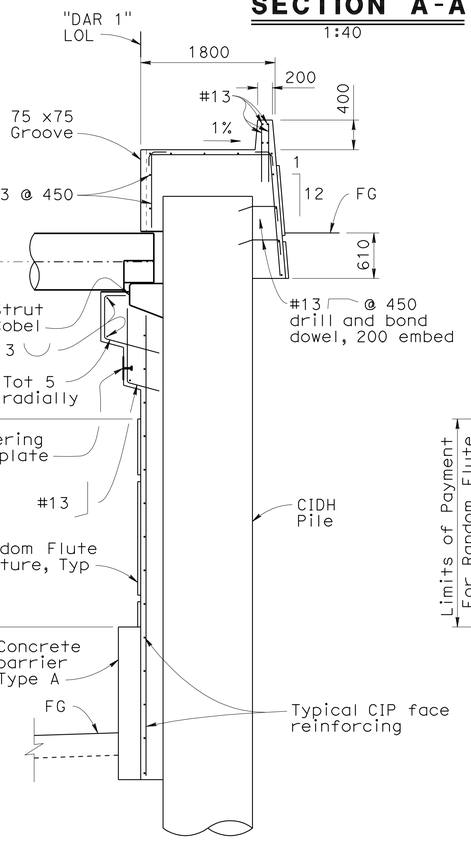
"DAR 1" PART MIRROR ELEVATION

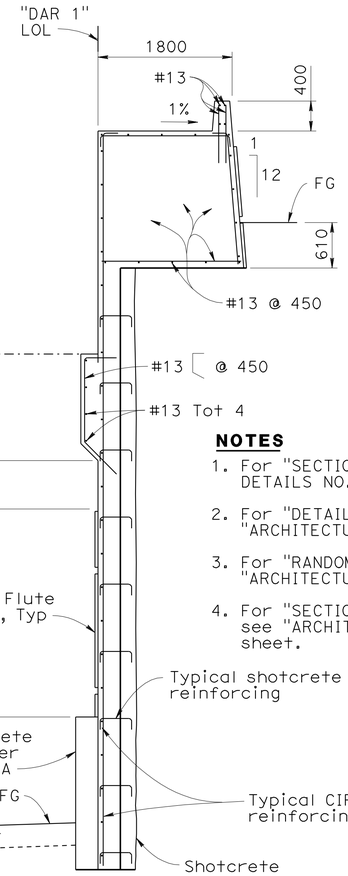
1:100

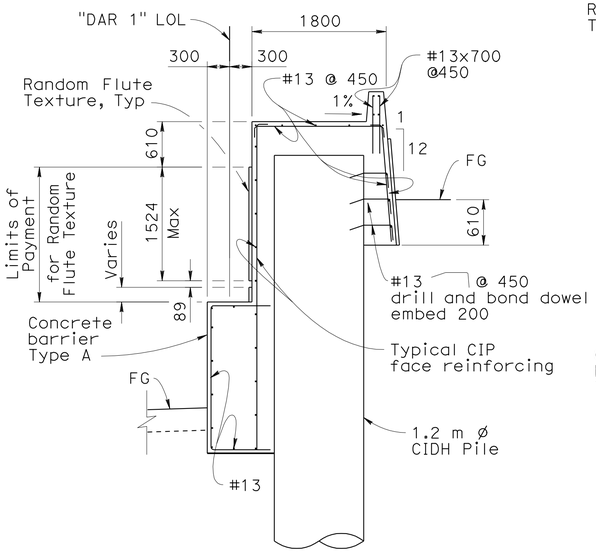


SECTION A-A

1:40

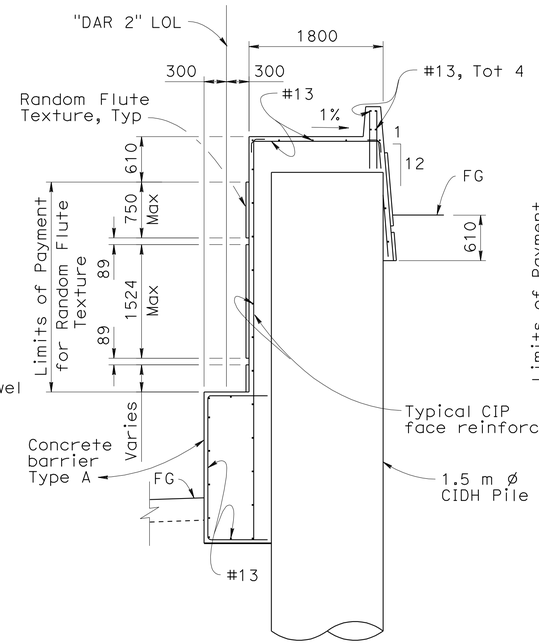






SECTION B-B

1:40



SECTION C-C

1:40

SECTION D-D

1:40

Note: See "SECTION B-B" on "ARCHITECTURAL DETAILS NO. 4" sheet for bracket, shelf and texture dimensions.

SECTION E-E

1:40

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

NOTES

1. For "SECTION J-J" see "ARCHITECTURAL DETAILS NO. 7" sheet similar detail.
2. For "DETAIL A" and "DETAIL B" see "ARCHITECTURAL DETAILS NO. 4" sheet.
3. For "RANDOM FLUTE TEXTURE" see "ARCHITECTURAL DETAILS NO. 6" sheet.
4. For "SECTION F-F" and "SECTION G-G" see "ARCHITECTURAL DETAILS NO. 2" sheet.

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	806	886

Peter B Smith
REGISTERED CIVIL ENGINEER — 4-28-09 DATE

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Pete B. Smith — No. C60122 — Exp. 6-30-10 — CIVIL — STATE OF CALIFORNIA

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SAN DIEGO, CA 92108

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Pete Smith	Anthony Sánchez
DETAILS	Ivan Martin	Anthony Sánchez
QUANTITIES	Andy Toledo	Shafi Sharifan

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO. 57E0075/76
KILOMETER POST KP43.2

CARROLL CANYON (DAR) RETAINING WALLS
ARCHITECTURAL DETAILS NO. 1

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 9/12/08 | 12/19/08 | 3/09/09 | 4/28/09

SHEET 36 OF 55

FILE => 57-e0075_76-u-archdt01.dgn

USERNAME => trmikesi DATE PLOTTED => 13-OCT-2010 TIME PLOTTED => 14:03

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	807	886

Peter B Smith — 4-28-09
REGISTERED CIVIL ENGINEER — DATE

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Pete B. Smith — No. C60122 — Exp. 6-30-10 — CIVIL — STATE OF CALIFORNIA

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T.Y. LIN INTERNATIONAL
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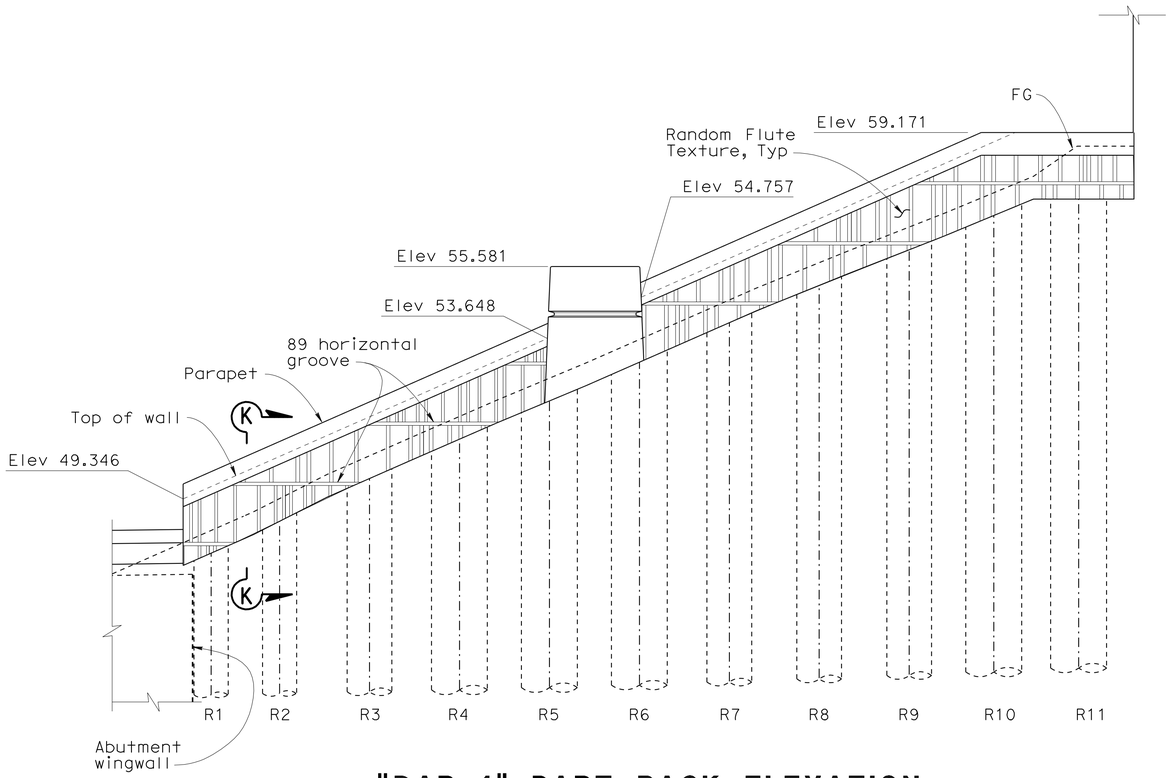
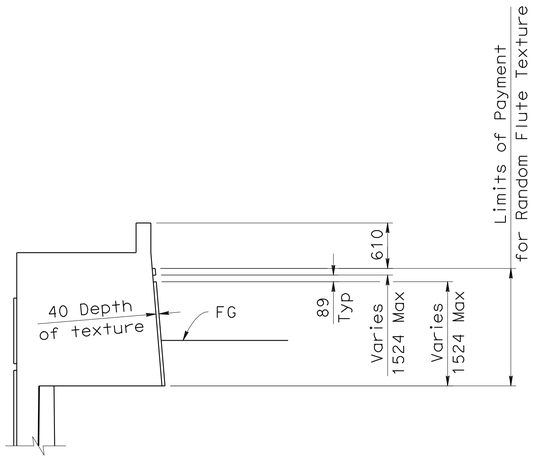
SAN DIEGO, CA 92108

NOTES

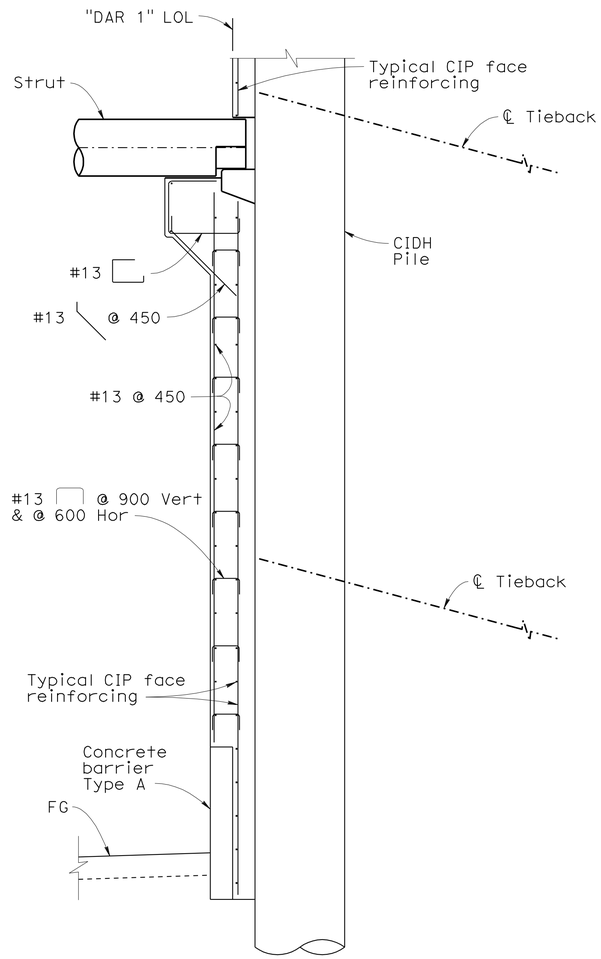
1. For location of "SECTION F-F" and "SECTION G-G", see "ARCHITECTURAL DETAILS NO. 1" sheet.



"DAR 1" PART BACK ELEVATION
1:80

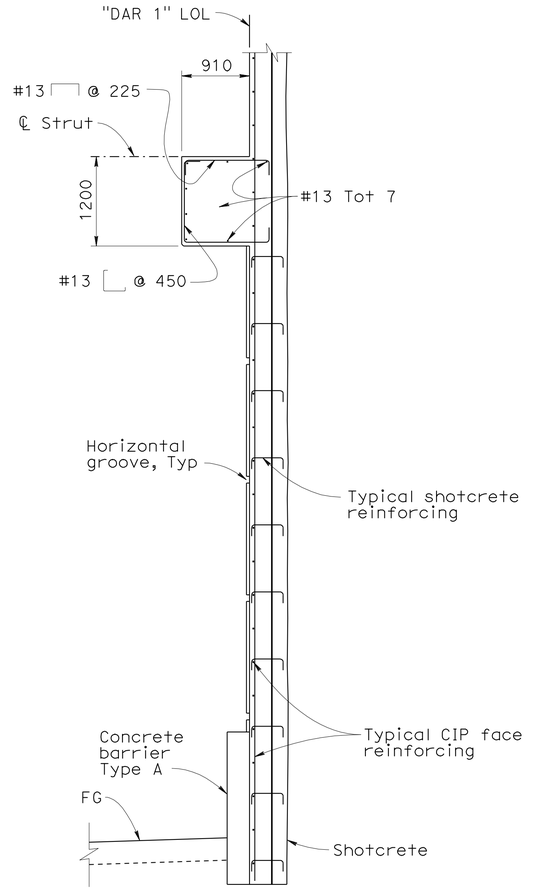


SECTION K-K
1:40



Note: See "SECTION C-C" on "ARCHITECTURAL DETAILS NO. 4" sheet for concrete shelf dimensions.

SECTION F-F
1:40



Note: See "SECTION D-D" on "ARCHITECTURAL DETAILS NO. 4" sheet for groove details.

SECTION G-G
1:40

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Pete Smith	Anthony Sánchez
DETAILS	Ivan Martin	Anthony Sánchez
QUANTITIES	Andy Toledo	Shafi Sharifan

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO. 57E0075/76
KILOMETER POST KP43.2

CARROLL CANYON (DAR) RETAINING WALLS
ARCHITECTURAL DETAILS NO. 2

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 9/12/08 12/19/08 3/09/09 4/28/09

SHEET 37 OF 55

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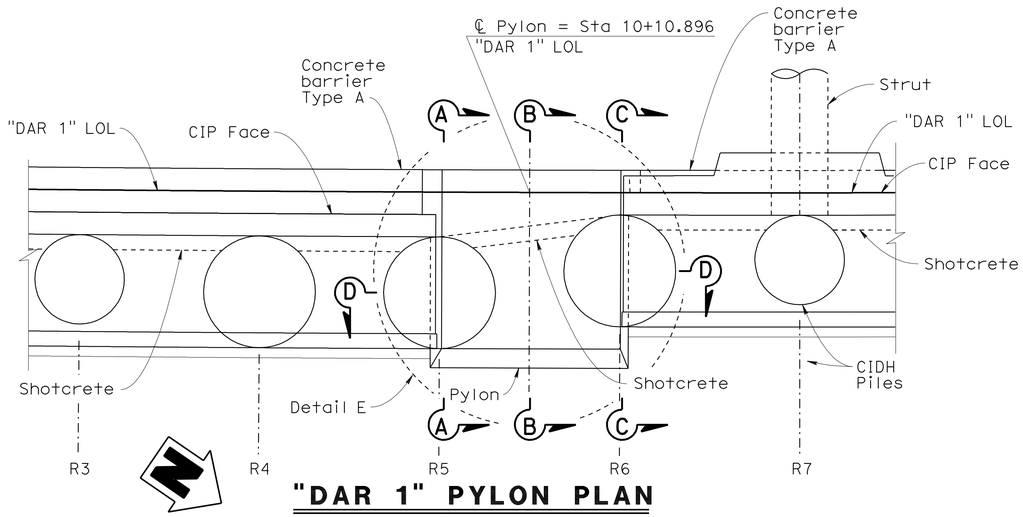
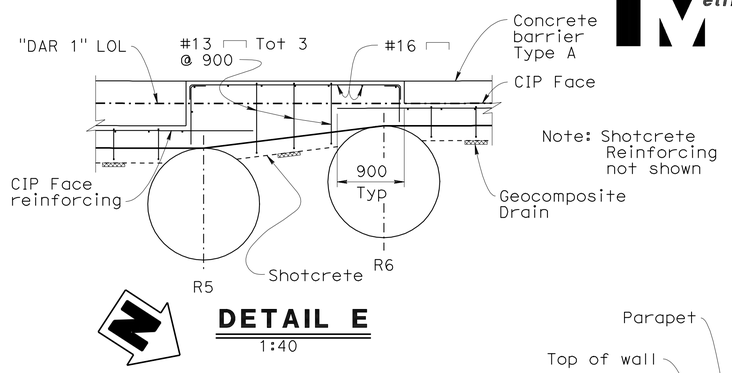
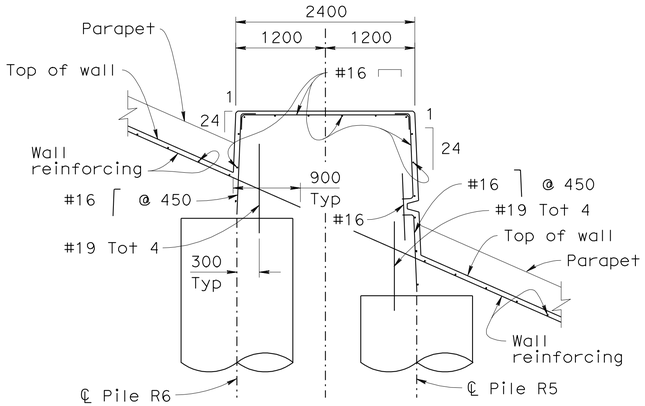


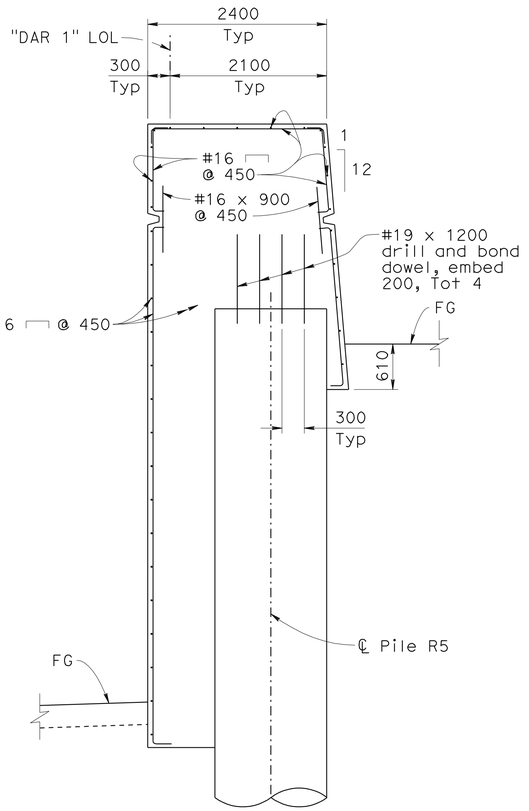
"DAR 1" PYLON PLAN
1:40



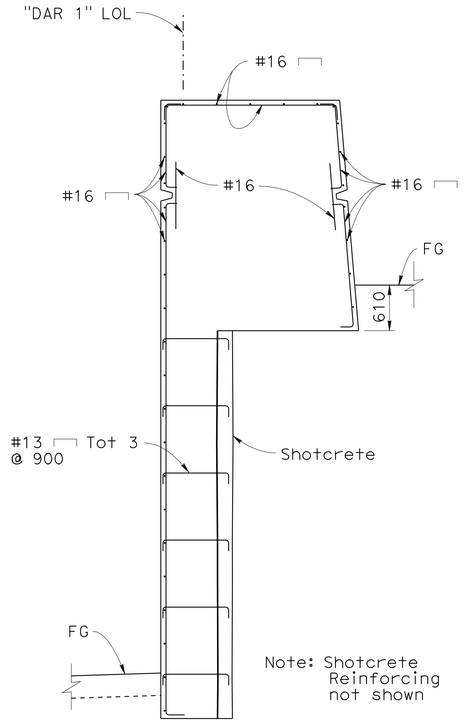
DETAIL E
1:40



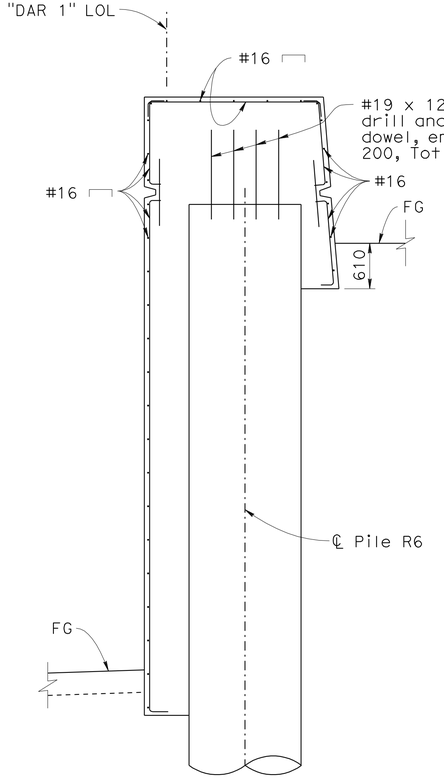
SECTION D-D
1:40



SECTION A-A
1:40



SECTION B-B
1:40



SECTION C-C
1:40

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	808	886

Peter B Smith — 4-28-09
REGISTERED CIVIL ENGINEER — DATE

9-27-10
PLANS APPROVAL DATE

Pete B. Smith, No. C60122, Exp. 6-30-10, CIVIL, STATE OF CALIFORNIA, REGISTERED PROFESSIONAL ENGINEER

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SAN DIEGO, CA 92108

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Pete Smith	Anthony Sánchez
DETAILS	Ivan Martin	Anthony Sánchez
QUANTITIES	Andy Toledo	Shafi Sharifan

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO. 57E0075/76
KILOMETER POST KP43.2

CARROLL CANYON (DAR) RETAINING WALLS
ARCHITECTURAL DETAILS NO. 3

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

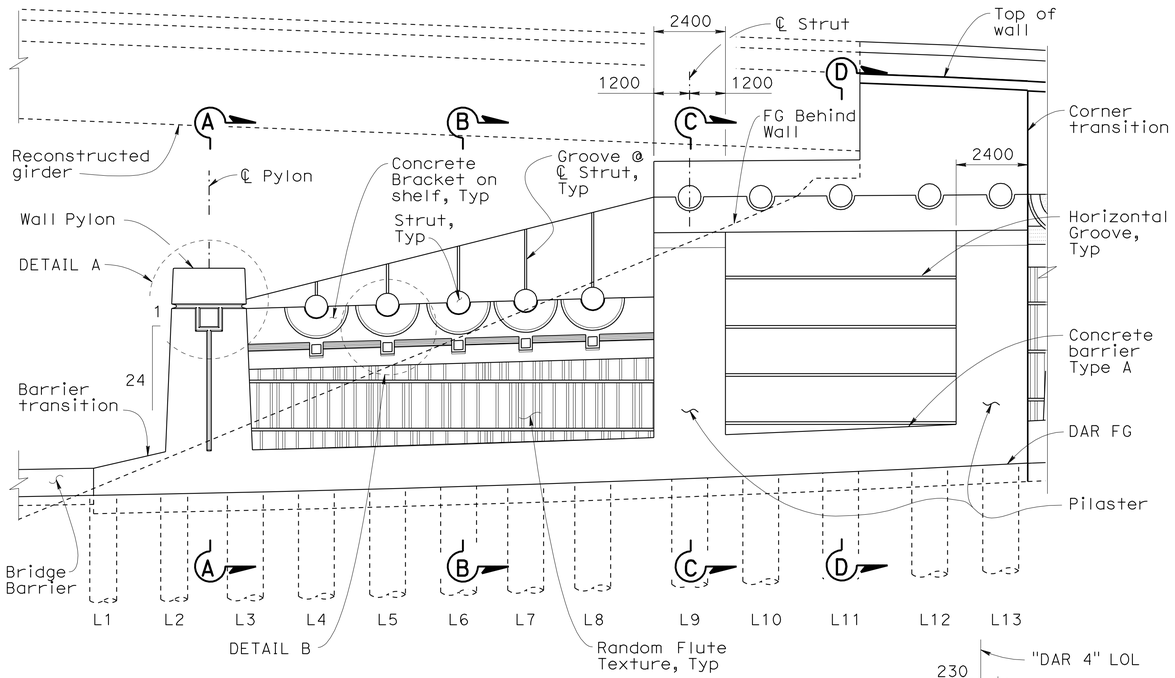
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 9/12/08, 12/19/08, 3/09/09, 4/28/09

SHEET 38 OF 55

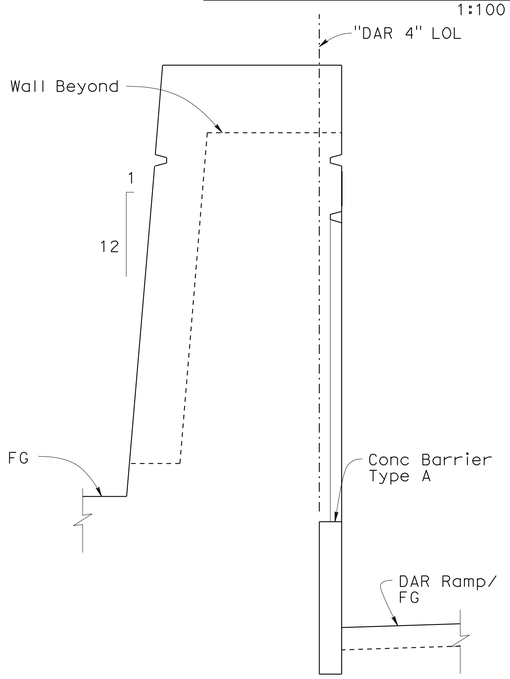
FILE => 57-e0075_76-u-archdt03.dgn

USERNAME => trmikesl DATE PLOTTED => 13-OCT-2010 TIME PLOTTED => 14:09



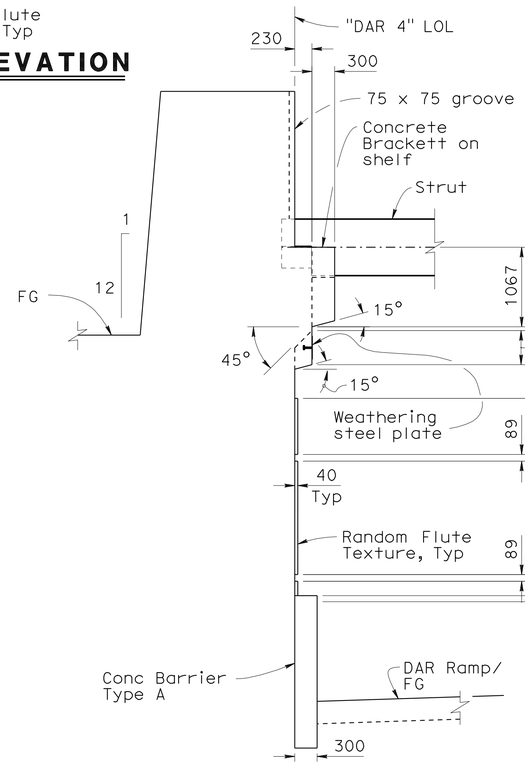
"DAR 4" PART FRONT ELEVATION

1:100



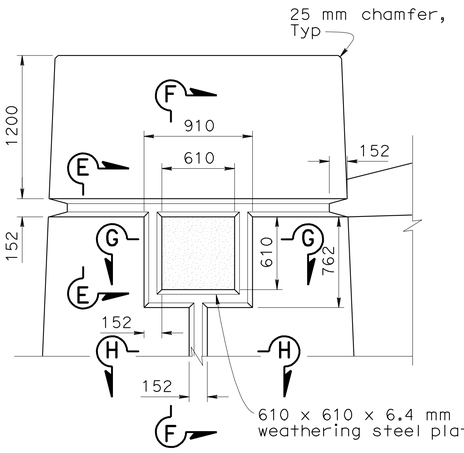
SECTION A-A

1:40



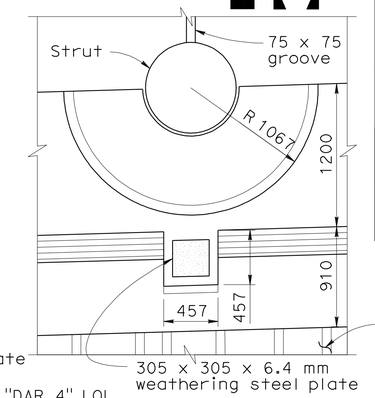
SECTION B-B

1:40



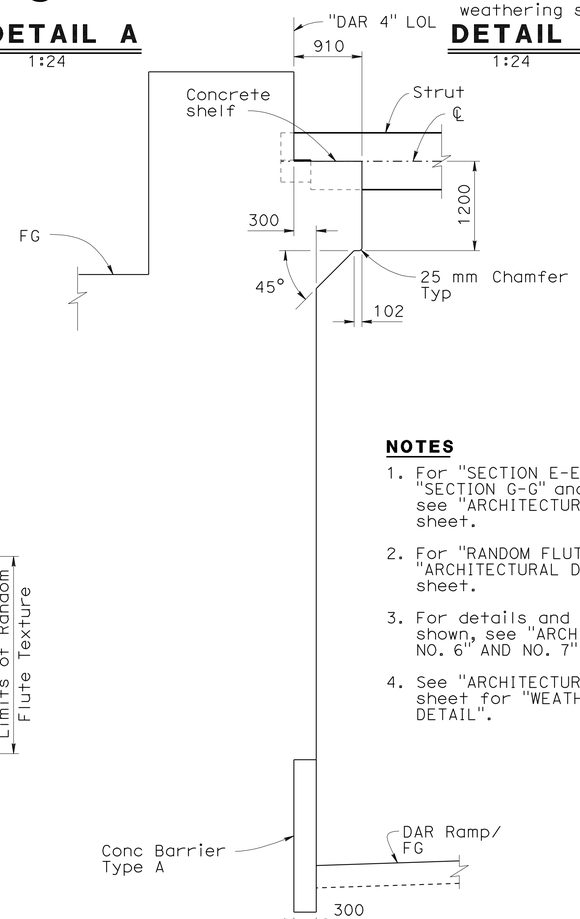
DETAIL A

1:24



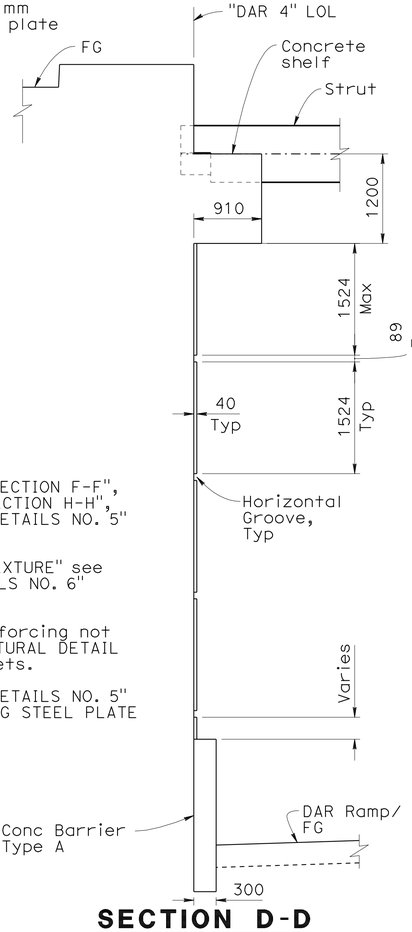
DETAIL B

1:24



SECTION C-C

1:40



SECTION D-D

1:40

Random Flute Texture

NOTES

1. For "SECTION E-E", "SECTION F-F", "SECTION G-G" and "SECTION H-H", see "ARCHITECTURAL DETAILS NO. 5" sheet.
2. For "RANDOM FLUTE TEXTURE" see "ARCHITECTURAL DETAILS NO. 6" sheet.
3. For details and reinforcing not shown, see "ARCHITECTURAL DETAIL NO. 6" AND NO. 7" sheets.
4. See "ARCHITECTURAL DETAILS NO. 5" sheet for "WEATHERING STEEL PLATE DETAIL".

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	809	886

Peter B Smith — 4-28-09
REGISTERED CIVIL ENGINEER — DATE

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Pete B. Smith — No. C60122 — Exp. 6-30-10 — CIVIL — STATE OF CALIFORNIA

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CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

	BY	CHECKED
DESIGN	Pete Smith	Anthony Sánchez
DETAILS	Ivan Martin/OColcol	Anthony Sánchez
QUANTITIES	Andy Toledo	Shafi Sharifan

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

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

CU 11275
EA 2T0401

BRIDGE NO. 57E0075/76
KILOMETER POST KP43.2

CARROLL CANYON (DAR) RETAINING WALLS
ARCHITECTURAL DETAILS NO. 4

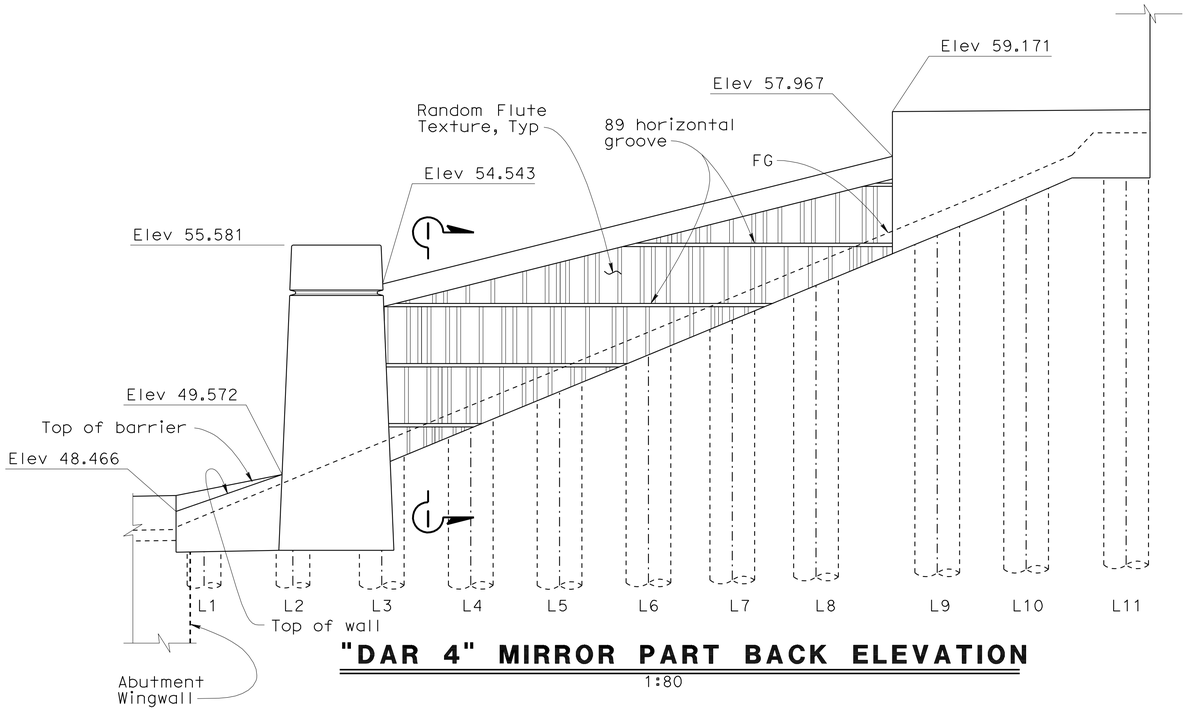
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 9/12/08 | 12/19/08 | 3/09/09 | 4/28/09

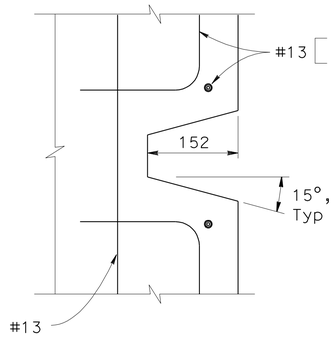
SHEET 39 OF 55

FILE => 57-e0075_76-u-archdt04.dgn

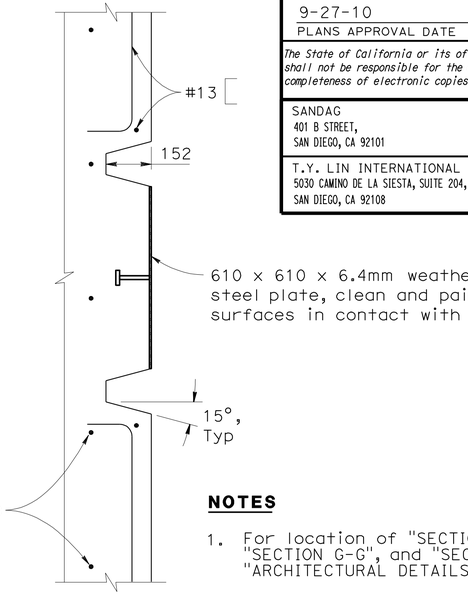
USERNAME => trmikesl DATE PLOTTED => 13-OCT-2010 TIME PLOTTED => 14:09



"DAR 4" MIRROR PART BACK ELEVATION
1:80



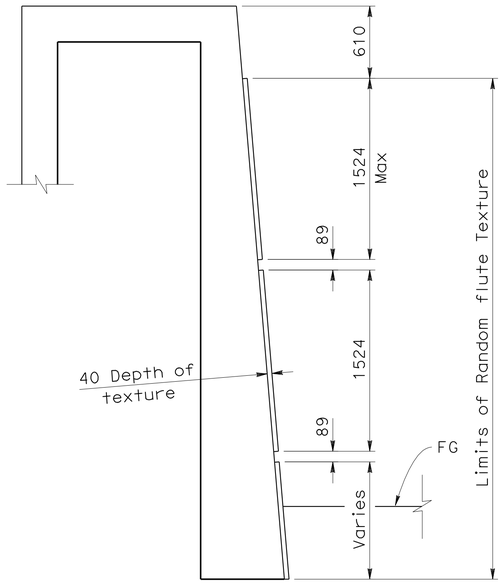
SECTION E-E
1:5



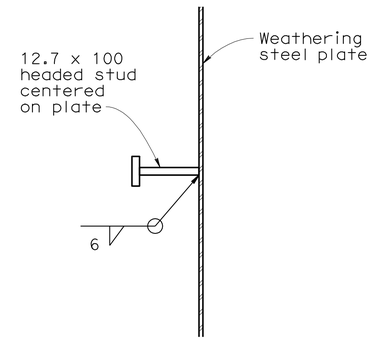
SECTION F-F
1:10

NOTES

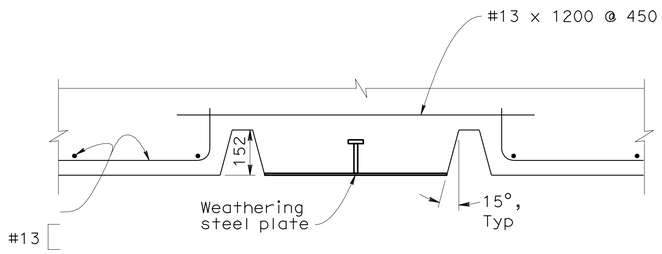
1. For location of "SECTION E-E", "SECTION F-F", "SECTION G-G", and "SECTION H-H", see "ARCHITECTURAL DETAILS NO. 4" sheet.



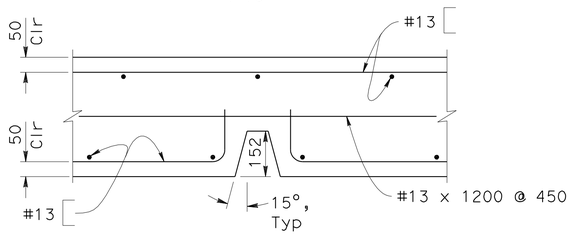
SECTION I-I
1:25



WEATHERING STEEL PLATE DETAIL
No Scale



SECTION G-G
1:10



SECTION H-H
1:10

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	810	886

Peter B Smith — 4-28-09
REGISTERED CIVIL ENGINEER — DATE

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Pete B. Smith, No. C60122, Exp. 6-30-10, CIVIL, STATE OF CALIFORNIA

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SAN DIEGO, CA 92108

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

	BY	CHECKED
DESIGN	Pete Smith	Anthony Sánchez
DETAILS	Ivan Martin	Anthony Sánchez
QUANTITIES	Andy Toledo	Shafi Sharifan

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO. 57E0075/76
KILOMETER POST KP43.2

CARROLL CANYON (DAR) RETAINING WALLS
ARCHITECTURAL DETAILS NO. 5

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY): 9/12/08, 12/19/08, 3/09/09, 4/28/09

SHEET 40 OF 55

FILE => 57-e0075_76-u-archdt05.dgn

USERNAME => tmhikes1 DATE PLOTTED => 13-OCT-2010 TIME PLOTTED => 14:09

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	811	886

Peter B Smith
REGISTERED CIVIL ENGINEER — 4-28-09 DATE

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Pete B. Smith, No. C60122, Exp. 6-30-10, CIVIL, STATE OF CALIFORNIA

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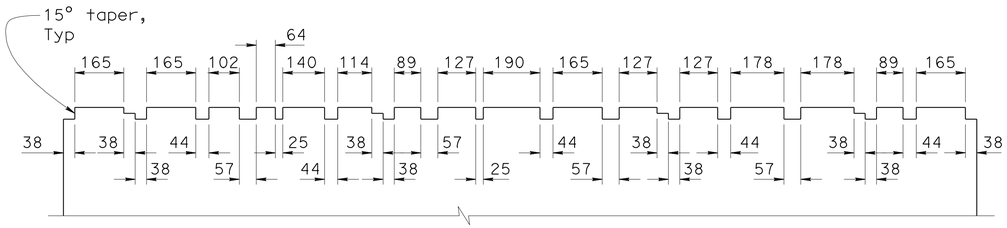
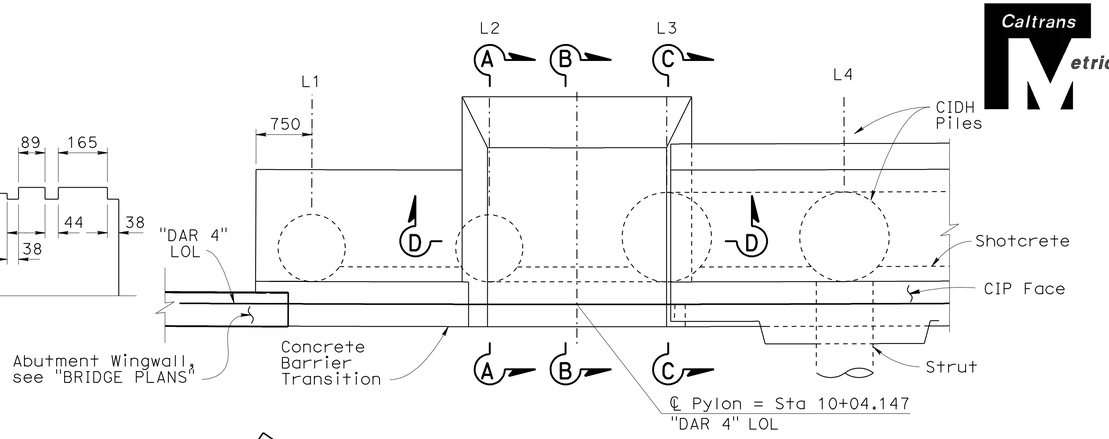
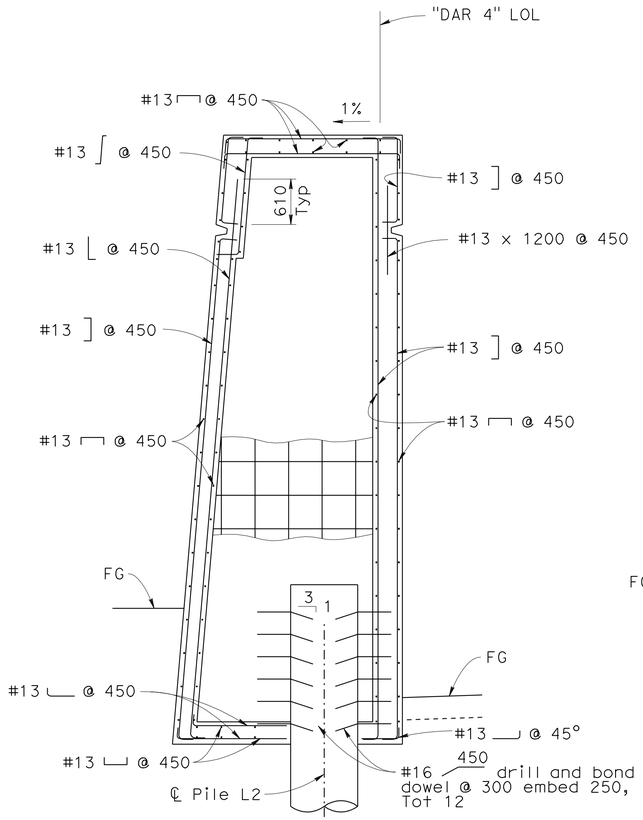
Caltrans Metric



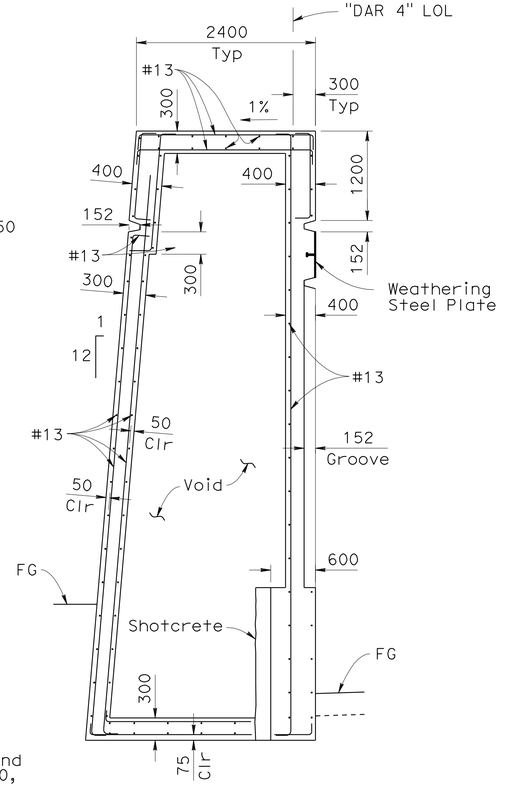
RANDOM FLUTE TEXTURE DETAIL
1:10



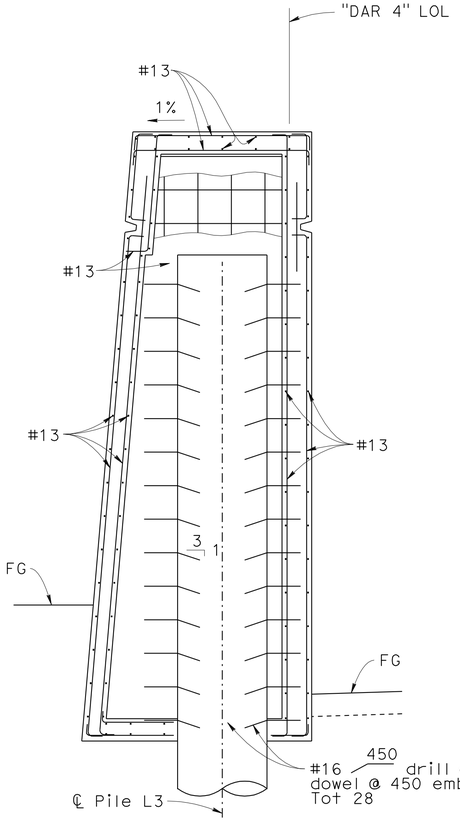
"DAR 4" PYLON PLAN
1:40



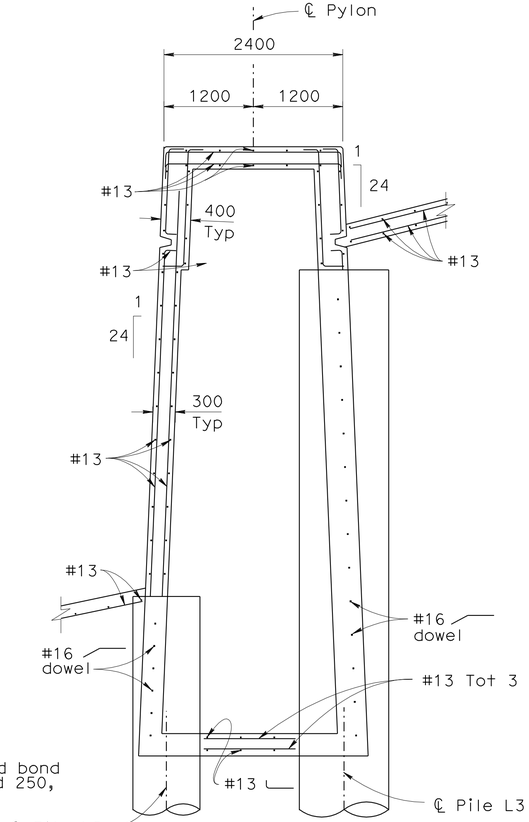
SECTION A-A
1:40



SECTION B-B
1:40



SECTION C-C
1:40



SECTION D-D
1:40

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

DESIGN	BY Pete Smith	CHECKED Anthony Sánchez	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
DETAILS	BY Ivan Martin	CHECKED Anthony Sánchez	
QUANTITIES	BY Andy Toledo	CHECKED Shafi Sharifan	

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

Brett Makley
PROJECT ENGINEER

BRIDGE NO. 57E0075/76
KILOMETER POST KP43.2

CARROLL CANYON (DAR) RETAINING WALLS
ARCHITECTURAL DETAILS NO. 6

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

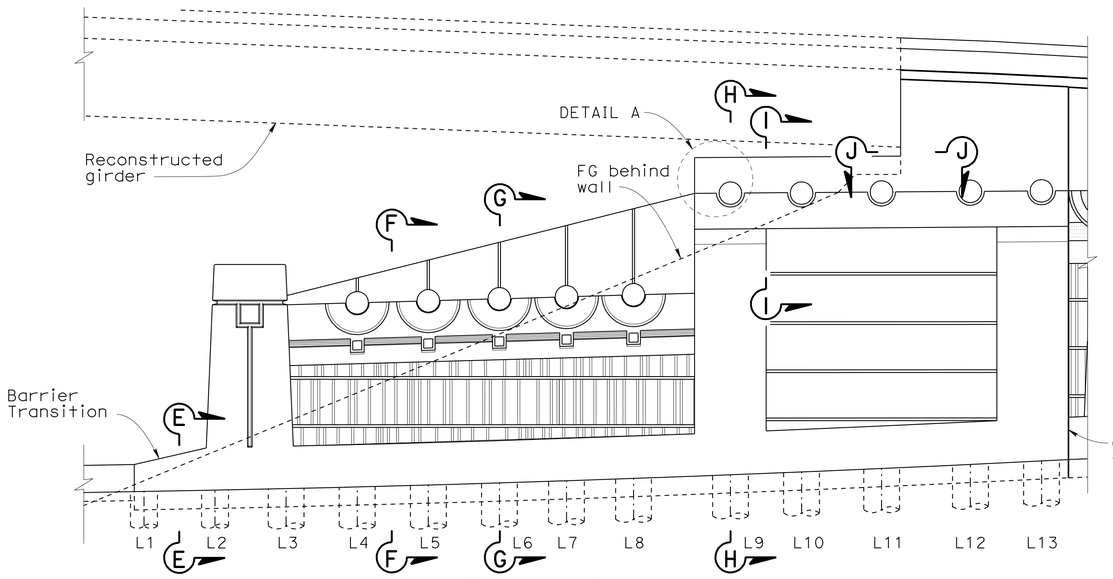
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 9/12/08, 12/19/08, 3/09/09, 4/28/09

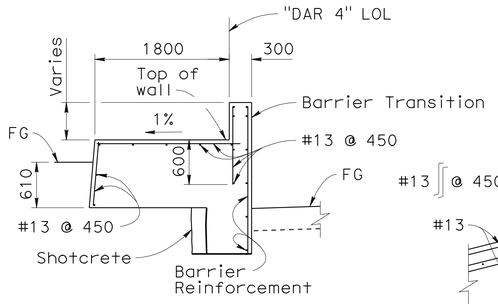
SHEET 41 OF 55

FILE => 57-e0075_76-u-archdt06.dgn

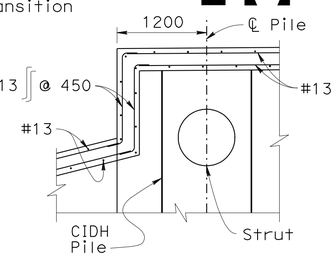
USERNAME => trmikesl DATE PLOTTED => 13-OCT-2010 TIME PLOTTED => 14:10



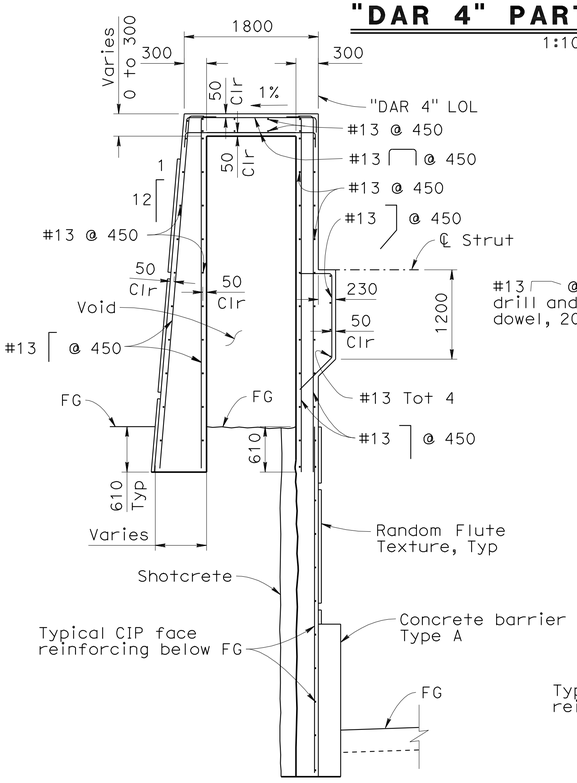
"DAR 4" PART ELEVATION
1:100



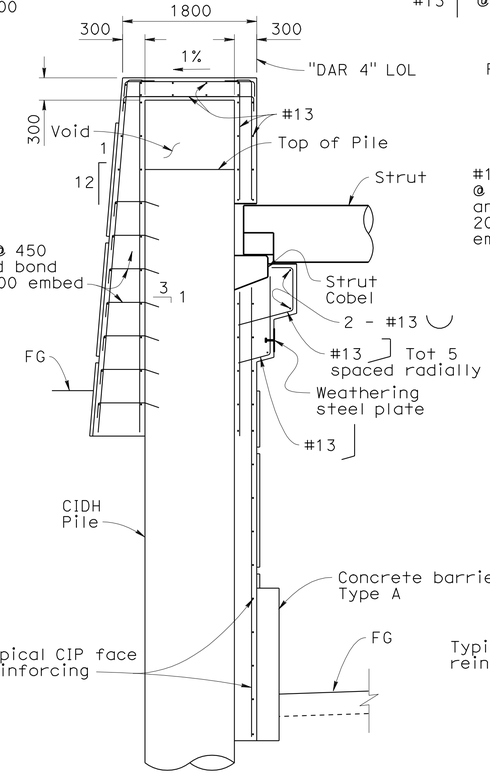
SECTION E-E
1:40



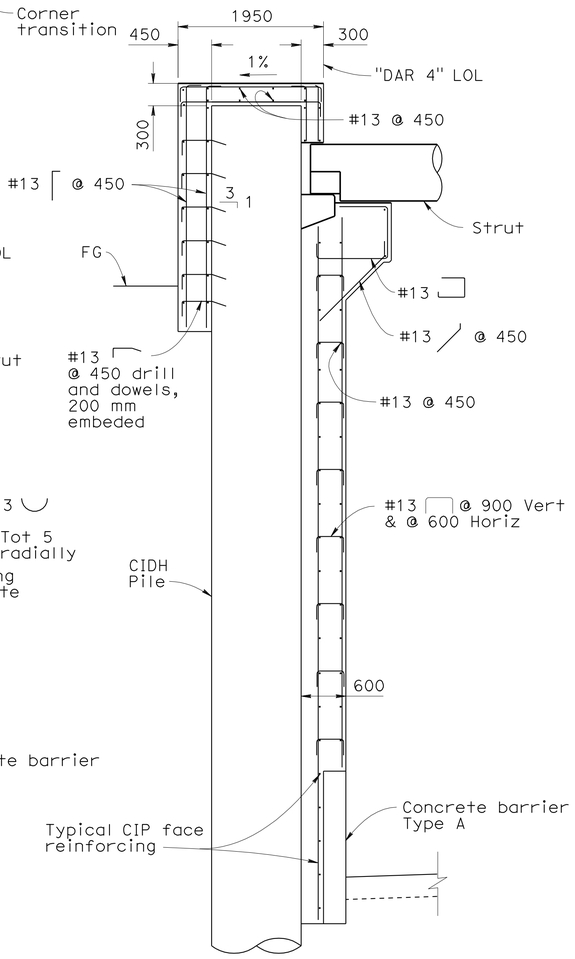
DETAIL A
1:40



SECTION F-F
1:40



SECTION G-G
1:40



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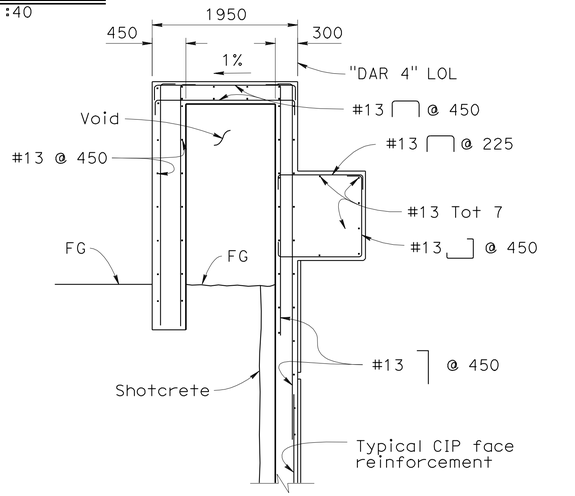
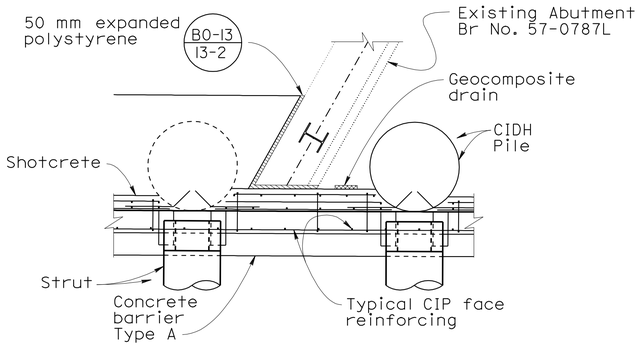
1:40



SECTION I-I
1:40



SECTION J-J
1:40

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	812	886

Peter B Smith — 4-28-09
REGISTERED CIVIL ENGINEER — DATE

9-27-10
PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER — Pete B. Smith — No. C60122 — Exp. 6-30-10 — CIVIL — STATE OF CALIFORNIA

SANDAG
401 B STREET,
SAN DIEGO, CA 92101

T.Y. LIN INTERNATIONAL
5030 CAMINO DE LA SIESTA, SUITE 204,
SAN DIEGO, CA 92108

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Pete Smith	Anthony Sánchez
DETAILS	Ivan Martin	Anthony Sánchez
QUANTITIES	Andy Toledo	Shafi Sharifan

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO. 57E0075/76
KILOMETER POST KP43.2

CARROLL CANYON (DAR) RETAINING WALLS
ARCHITECTURAL DETAILS NO. 7

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

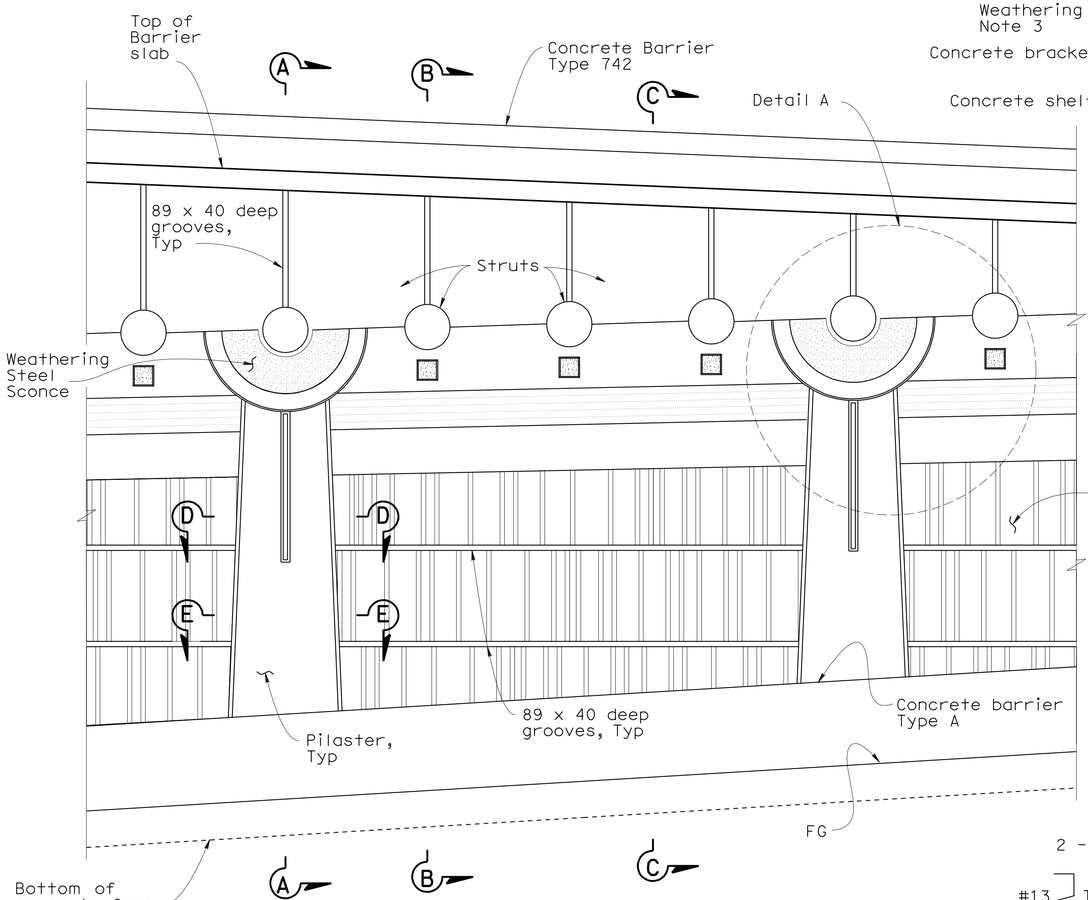
DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY): 9/12/08 | 12/19/08 | 3/09/09 | 4/28/09

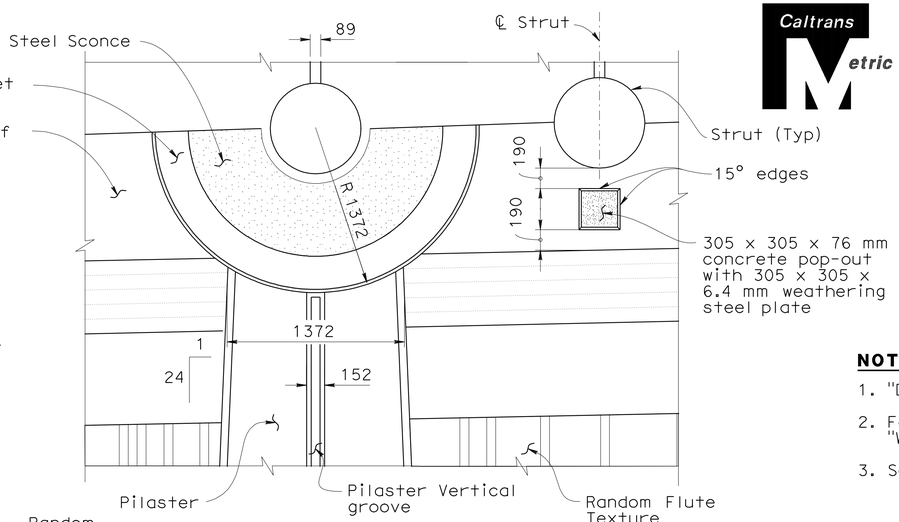
SHEET 42 OF 55

FILE => 57-e0075_76-u-archdt07.dgn

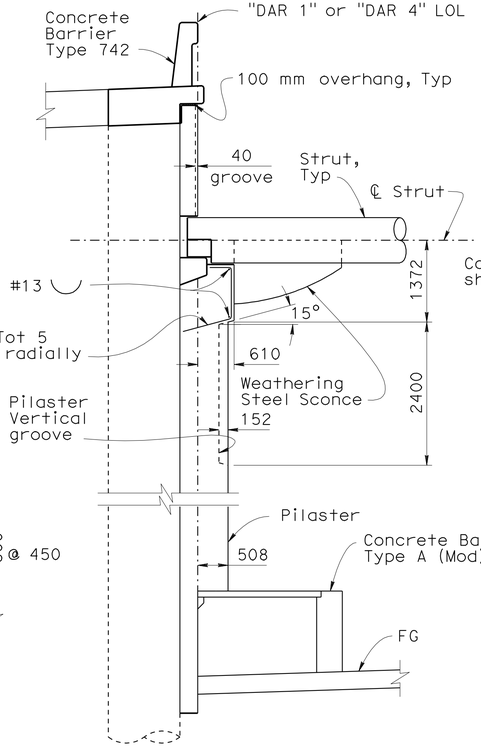
USERNAME => trmikesl DATE PLOTTED => 13-OCT-2010 TIME PLOTTED => 14:10



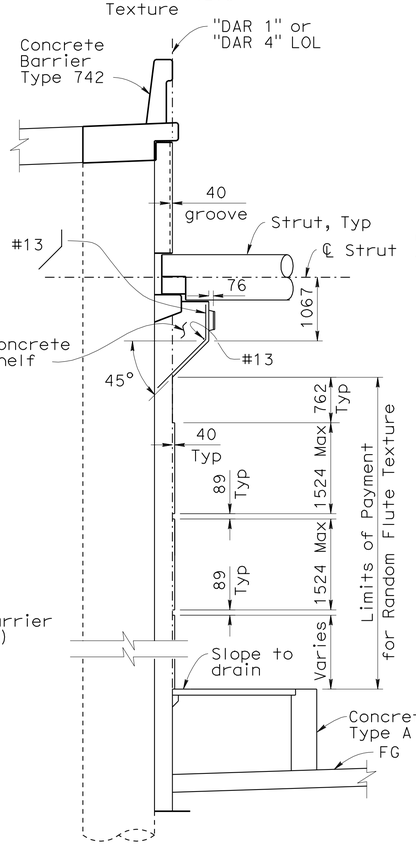
"DAR 4" WALL PART ELEVATION
1:50



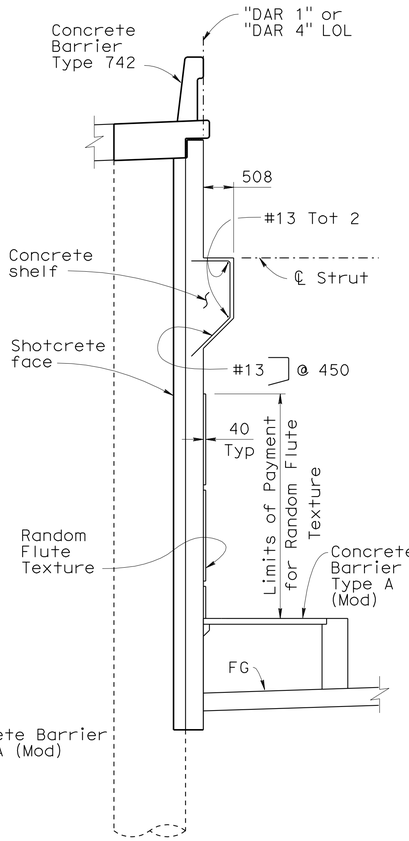
DETAIL A
1:25



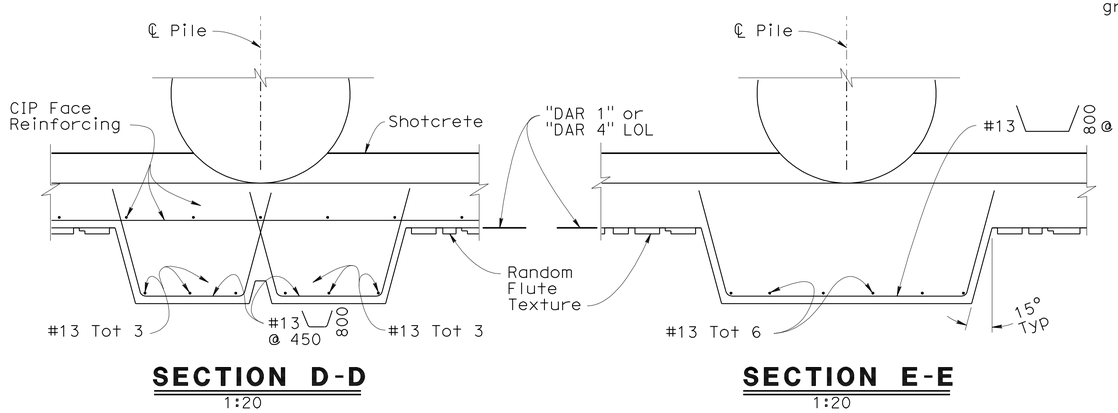
SECTION A-A
1:50



SECTION B-B
1:50



SECTION C-C
1:50



SECTION D-D
1:20

SECTION E-E
1:20

NOTES

1. "DAR 4" wall shown, "DAR 1" wall similar
2. For reinforcement not shown see "WALL FACING DETAILS NO. 1" sheet
3. See "WEATHERING STEEL SCONCE" sheet

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
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Peter B Smith
REGISTERED CIVIL ENGINEER — 4-28-09 DATE

9-27-10
PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER — Pete B. Smith — No. C60122 — Exp. 6-30-10 — CIVIL — STATE OF CALIFORNIA

SANDAG
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T.Y. LIN INTERNATIONAL
5030 CAMINO DE LA SIESTA, SUITE 204,
SAN DIEGO, CA 92108

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

DESIGN	BY Pete Smith	CHECKED Anthony Sánchez	
DETAILS	BY Tatyana Gnip	CHECKED Anthony Sánchez	
QUANTITIES	BY Andy Toledo	CHECKED Shafi Sharifan	

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO. 57E0075/76
KILOMETER POST KP43.2

CARROLL CANYON (DAR) RETAINING WALLS
ARCHITECTURAL DETAILS NO. 8

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 9/12/08 | 12/19/08 | 3/09/09 | 4/28/09

SHEET 43 OF 55

FILE => 57-e0075_76-u-archdt08.dgn

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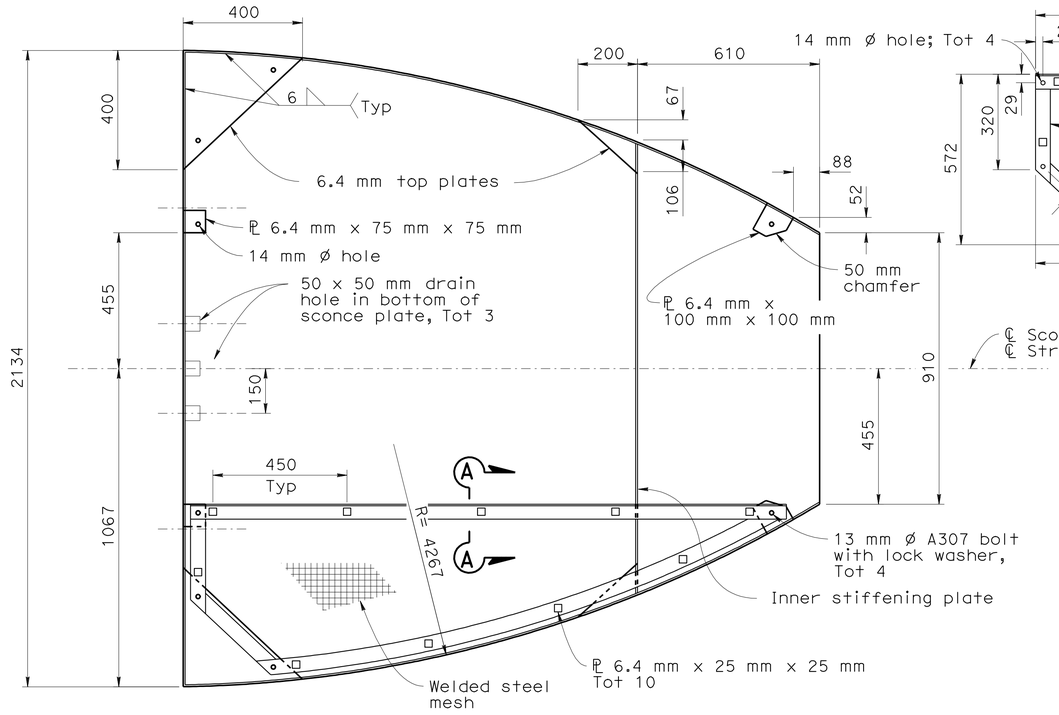
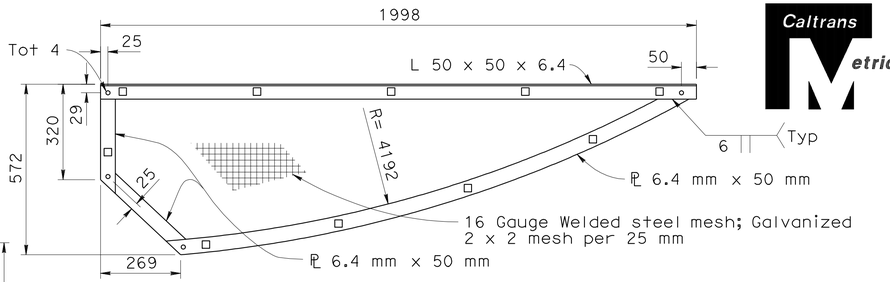
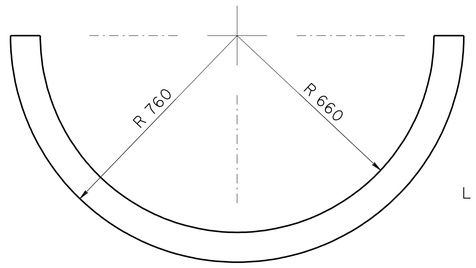


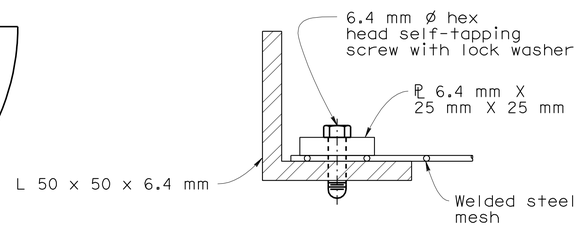
PLAN
1:10 (Note 3)



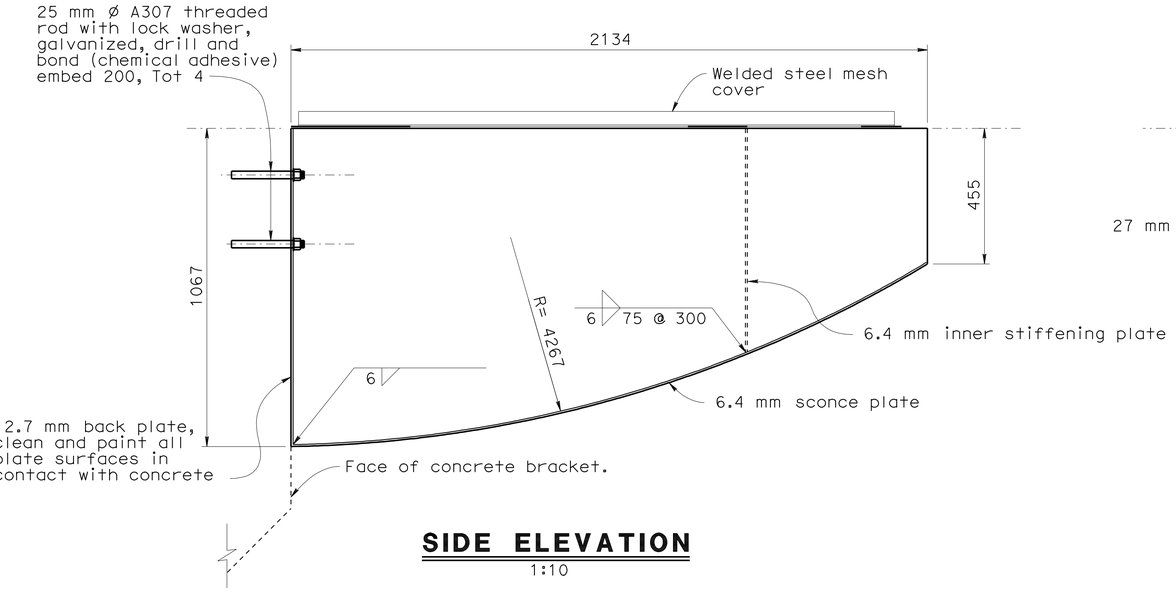
WELDED STEEL MESH COVER
1:10



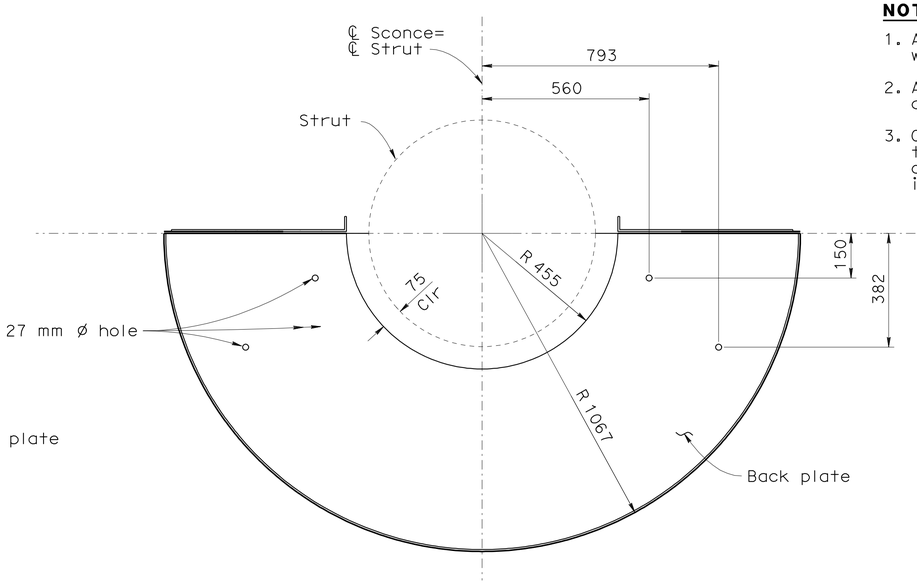
INNER STIFFENING PLATE
1:10



SECTION A-A
1:10



SIDE ELEVATION
1:10



FRONT ELEVATION
1:10

NOTES
1. All steel plates shall be weathering steel.
2. All bolts, nuts, washers and screws shall be galvanized.
3. One cover shown for clarity, two covers per sconce. Install cover on sconce after sconce is attached to concrete bracket.

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
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Peter B Smith — 4-28-09
REGISTERED CIVIL ENGINEER — DATE

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Pete B. Smith — No. C60122 — Exp. 6-30-10 — CIVIL — STATE OF CALIFORNIA

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SANDAG
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T.Y. LIN INTERNATIONAL
5030 CAMINO DE LA SIESTA, SUITE 204,
SAN DIEGO, CA 92108

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Pete Smith	Anthony Sánchez
DETAILS	Ivan Martin	Anthony Sánchez
QUANTITIES	Andy Toledo	Shafi Sharifan

PREPARED FOR THE STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO. 57E0075/76
KILOMETER POST KP43.2

CARROLL CANYON (DAR) RETAINING WALLS
WEATHERING STEEL SCONCE

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 9/12/08 | 12/19/08 | 3/09/09 | 4/28/09

SHEET 44 OF 55

FILE => 57-e0075_76-u-archdt.dgn

USERNAME => trmikesi DATE PLOTTED => 13-OCT-2010 TIME PLOTTED => 14:10

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90)
Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166)
Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	815	886

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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SANDAG
401 B STREET,
SAN DIEGO, CA. 92101

BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111

APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 300 mm)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 300 mm
Cobble		76 mm to 300 mm
Gravel	Coarse	19 mm to 76 mm
	Fine	No. 4 to 19 mm
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

SOIL LEGEND

ENGINEERING SERVICES		GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	CARROLL CANYON (DAR) RETAINING WALLS
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER		DESIGN BRANCH	57-E0075/76	LOG OF TEST BORINGS SHEET NO. 1 OF 11
NAME:	CHECKED BY: G. CUSTENBORDER				POST MILES KP43.2/PM26.8	

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

FILE => 57-e0075_76-z-lotb01.dgn

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES									SHEET	OF
10/14/08	3/9/09	4/28/09							45	55

DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:01
USERNAME => trmikesl

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
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4-28-09
REGISTERED GEOTECHNICAL ENGINEER

9-27-10
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BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111

CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring
Size	R P	Rotary drilled boring Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (25 mm soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778-95)
⬚	O	Other

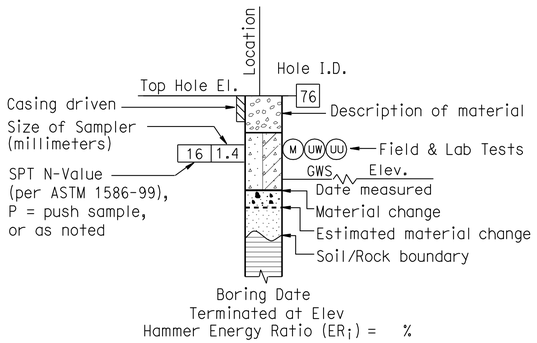
Note: Size in millimeters.

CONSISTENCY OF COHESIVE SOILS

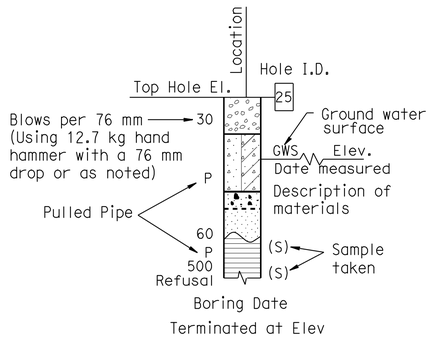
Description	Unconfined Compressive Strength (tsm)	Pocket Penetrometer Measurement (tsm)	Torvane Measurement (tsm)	Field Approximation
Very Soft	< 24	< 24	< 12	Easily penetrated several inches by fist
Soft	24 to 48	24 to 48	12 to 24	Easily penetrated several inches by thumb
Medium Stiff	48 to 96	48 to 96	24 to 48	Penetrated several inches by thumb with moderate effort
Stiff	96 to 192	96 to 192	48 to 96	Readily indented by thumb but penetrated only with great effort
Very Stiff	192 to 383	192 to 383	96 to 192	Readily indented by thumbnail
Hard	> 383	> 383	> 192	Indented by thumbnail with difficulty

PLASTICITY OF FINE-GRAINED SOILS

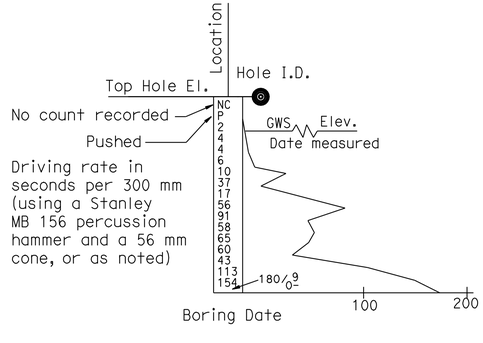
Description	Criteria
Nonplastic	A 3 mm thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.



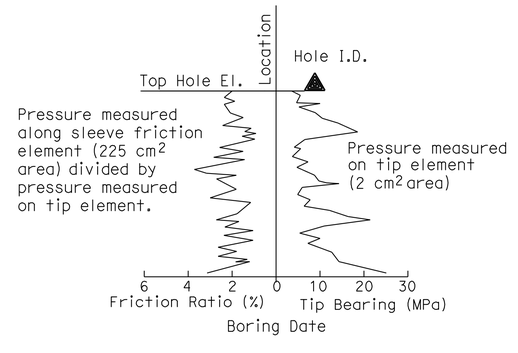
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) SOUNDING

SOIL LEGEND

ENGINEERING SERVICES	GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO. 57-E0075/76	CARROLL CANYON (DAR) RETAINING WALLS
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS		DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 2 OF 11
NAME:	CHECKED BY: G. CUSTENBORDER	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER			

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES: 10/14/08 | 3/9/09 | 4/28/09

SHEET 46 OF 55

FILE => 57-e0075_76-z-lotb02.dgn

DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:01

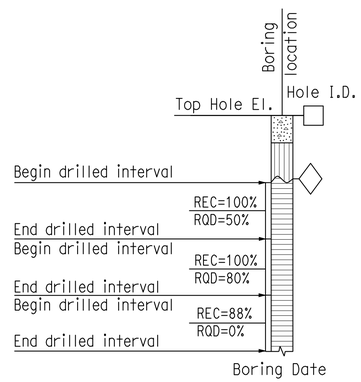
USERNAME => tmirkes

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

$$REC = \frac{\sum \text{Length of the recovered core pieces}}{\text{Total length of core run}} \times 100\%$$

$$RQD = \frac{\sum \text{Length of intact core pieces} \geq 100 \text{ mm}}{\text{Total length of core run}} \times 100\%$$



ROCK HARDNESS

Description	Criteria
Extremely Hard	Specimen cannot be scratched with a pocket knife or sharp pick; can only be chipped with repeated heavy hammer blows.
Very Hard	Specimen cannot be scratched with a pocket knife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Specimen can be scratched with a pocket knife or sharp pick with difficulty (heavy pressure). Heavy hammer blows required to break specimen.
Moderately Hard	Specimen can be scratched with pocket knife or sharp pick with light or moderate pressure. Core breaks with moderate hammer pressure.
Moderately Soft	Specimen can be grooved 5 mm deep with a pocket knife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Specimen can be grooved or gouged easily by a pocket knife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Specimen can be readily indented, grooved or gouged with fingernail, or carved with a pocket knife. Breaks with light manual pressure.

FRACTURE DENSITY

Description	Observed Fracture Density
Unfractured	No fractures.
Very slightly fractured	Lengths greater than 1 m.
Slightly fractured	Lengths from 300 mm to 1000 mm with few lengths less than 300 mm or greater than 1000 mm.
Moderately fractured	Lengths mostly in 100 mm to 300 mm range with most lengths about 200 mm.
Intensely fractured	Lengths average from 30 mm to 100 mm with scattered fragmented intervals with lengths less than 100 mm.
Very intensely fractured	Mostly chips and fragments with a few scattered short core lengths.

Combination descriptors (such as "Very intensely to intensely fractured") are used where equal distribution of both fracture density characteristics is present over a significant interval or exposure, or where characteristics are "in between" the descriptor definitions. Only two adjacent descriptors may be combined.

RELATIVE STRENGTH OF INTACT ROCK

Term	Uniaxial Compressive Strength (MPa)
Extremely Strong	> 207
Very Strong	100 - 207
Strong	49 - 100
Medium Strong	25 - 49
Weak	5 - 25
Very Weak	1 - 5
Extremely Weak	< 1

BEDDING SPACING

Description	Thickness / Spacing
Massive	Greater than 3 m
Very thickly bedded	1 m to 3 m
Thickly bedded	300 mm to 1 m
Moderately bedded	100 mm to 300 mm
Thinly bedded	30 mm to 100 mm
Very thinly bedded	10 mm to 30 mm
Laminated	Less than 10 mm

WEATHERING DESCRIPTORS FOR INTACT ROCK

Description	Diagnostic features					General Characteristics
	Chemical Weathering-Discoloration and/or oxidation		Mechanical Weathering-Grain boundary conditions (disaggregation) primarily for granitics and some coarse-grained sediments	Texture and Solutioning		
	Body of Rock	Fracture Surfaces		Texture	Solutioning	
Fresh	No discoloration, not oxidized.	No discoloration or oxidation.	No separation, intact (tight).	No change.	No solutioning.	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull.	Minor to complete discoloration or oxidation of most surfaces.	No visible separation, intact (tight).	Preserved.	Minor leaching of some soluble minerals may be noted.	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty," feldspar crystals are "cloudy."	All fracture surfaces are discolored or oxidized.	Partial separation of boundaries visible.	Generally preserved.	Soluble minerals may be mostly leached.	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in-situ disaggregation, see grain boundary conditions.	All fracture surfaces are discolored or oxidized, surfaces friable.	Partial separation, rock is friable; in semiarid conditions granitics are disaggregated.	Texture altered by chemical disintegration (hydration, argillation).	Leaching of soluble minerals may be complete.	Dull sound when struck with hammer, usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures, or veinlets. Rock is significantly weakened.
Decomposed	Discolored or oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay.		Complete separation of grain boundaries (disaggregated).	Resembles a soil, partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete.		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes."

Combination descriptors (such as "slightly weathered to fresh") are permissible where equal distribution of both weathering characteristics is present over significant intervals or where characteristics present are "in between" the diagnostic feature. However, combination descriptors should not be used where significant, identifiable zones can be delineated. Only two adjacent descriptors may be combined. "Very intensely weathered" is the combination descriptor for "intensely weathered to decomposed."

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	817	886

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

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SANDAG
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SAN DIEGO, CA. 92111

LEGEND OF ROCK MATERIALS

- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

ROCK LEGEND

ENGINEERING SERVICES		GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO. 57-E0075/76	CARROLL CANYON (DAR) RETAINING WALLS
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER		DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 3 OF 11
NAME:	CHECKED BY: G. CUSTENBORDER					

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES: 10/14/08 | 3/9/09 | 4/28/09

SHEET 47 OF 55

FILE => 57-e0075_76-z-lotb03.dgn

USERNAME => tmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:01

Bench Mark
All elevations shown in the LOTBs are in meters and are referenced to the NGVD 1929 Datum.

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5, 805	R49.9/R51.7, 42.6/46.5	818	886

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

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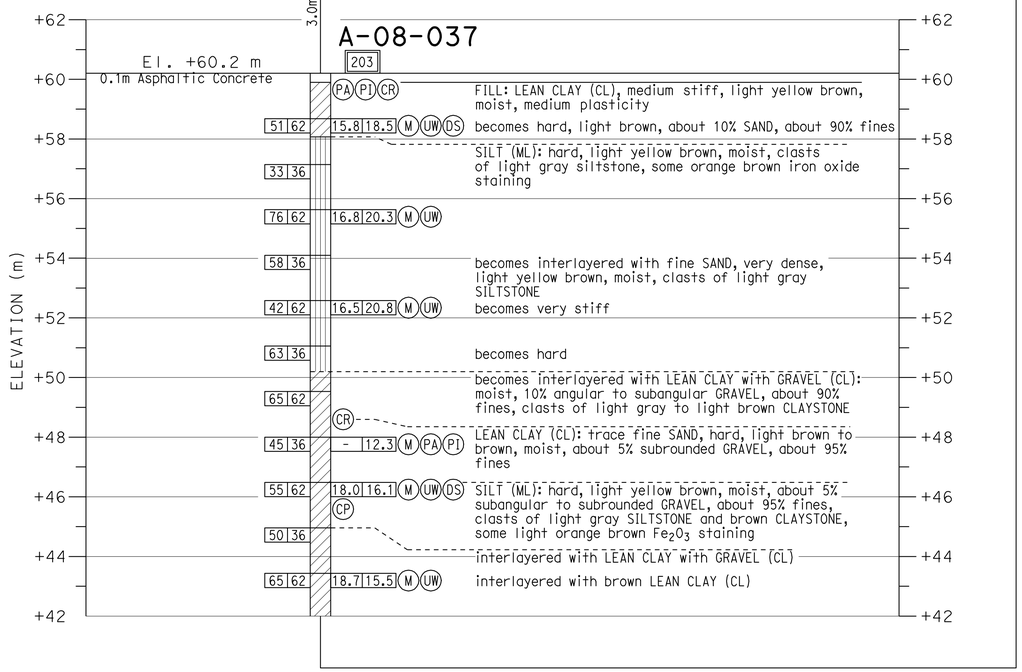
SAN DIEGO, CA. 92111

PLAN
1 : 500



4-4-08
Terminated at El. 20.1 m
$ER_i \cong 1.45$

PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

NOTES:

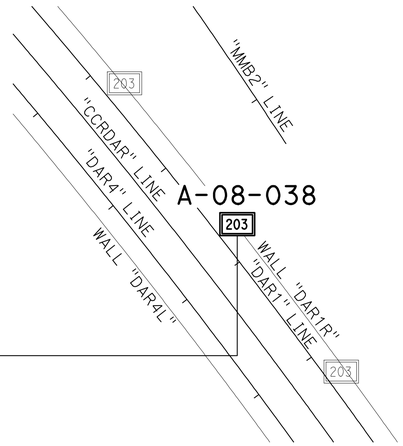
1. 62 mm diameter samples were taken using a California split-barrel sampler with an inside diameter (I.D.) of 62 mm and an outside diameter (O.D.) of 83 mm.
2. Automatic trip and safety hammer systems consisting of hammer weight of 62.5 kg falling a distance of 762 mm were used to advance the drive samplers in accordance with ASTM D1586.
3. The average hammer energy ratio (ER_i) reflects the percentage efficiency of SPT blowcounts (N-value). The estimated ER_i for the various drilling equipment used was as follows:
   Boart Longyear:
   Longyear 1405: $ER_i \cong 1.45$
   Prosonic Track Mounted: $ER_i \cong 1.00$
   Prosonic 1: $ER_i \cong 1.45$
   Minisonic: $ER_i \cong 1.00$
   Pacific Drilling:
   Unimog: $ER_i \cong 1.27$
   Mole: $ER_i \cong 1.00$
   Minimole: $ER_i \cong 1.00$
   Test America:
   CME 95: $ER_i \cong 1.45$
4. The sedimentary rock was obtained utilizing a sonic drilling technique; this method resulted in Core Recovery (REC) values of essentially 100%. Also, given the nature of the Sedimentary Rock (ie., friable, highly fractured, decomposed rock) a Rock Quality Designation (RQD) index is not relevant and therefore not reported on LOTBs.

ENGINEERING SERVICES	GEOTECHNICAL SERVICES		STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO. 57-E0075/76	CARROLL CANYON (DAR) RETAINING WALLS
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN G. CUSTENBORDER		DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 4 OF 11
NAME:	CHECKED BY: G. CUSTENBORDER					

OGS CIVIL LOG OF TEST BORINGS SHEET
ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100
CU 11275
EA 2T0401
DISREGARD PRINTS BEARING EARLIER REVISION DATES →
REVISION DATES: 10/14/08 | 3/28/09 | 4/28/09
SHEET 48 OF 55

FILE => 57-e0075_76-z-lotb04.dgn
USERNAME => trmikesl
DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:02

Bench Mark
All elevations shown in the LOTBs are in meters and are referenced to the NGVD 1929 Datum.



PLAN
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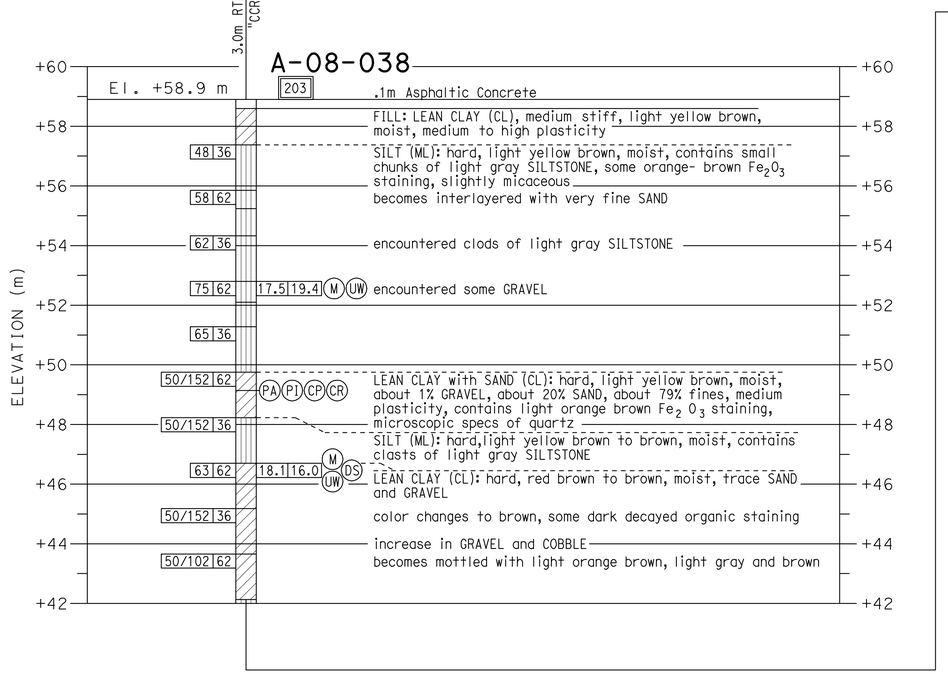
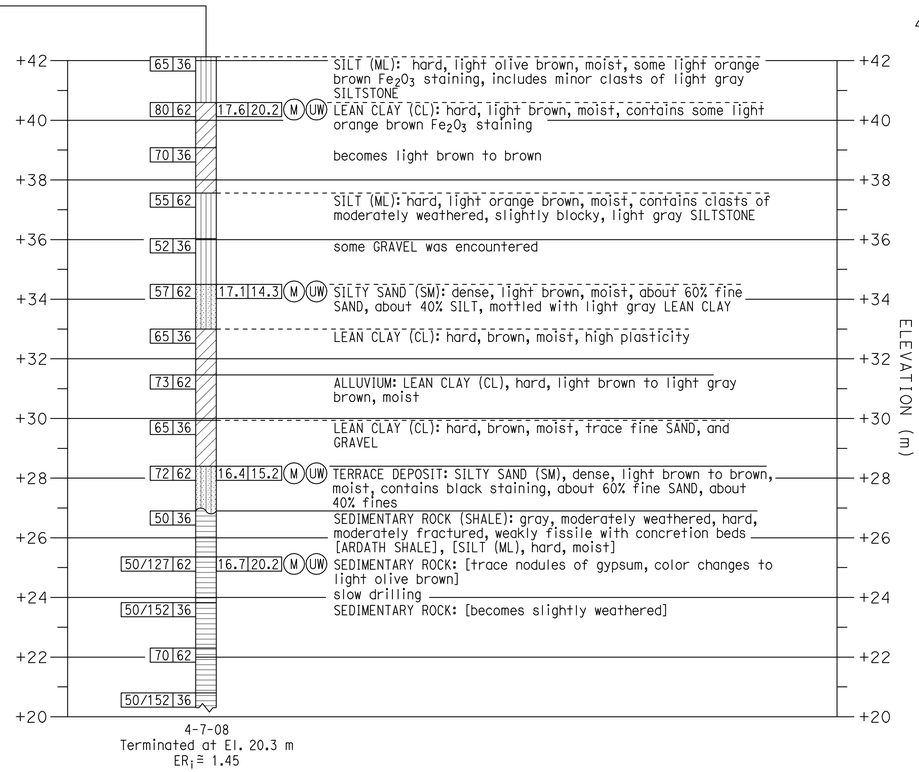


PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5, 805	R49.9/R51.7, 42.6/46.5	819	886

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER
VAN OLIN
NO. 2578
EXP. 6-30-10
GEOTECHNICAL
STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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SAN DIEGO, CA. 92111

NOTES:

1. 62 mm diameter samples were taken using a California split-barrel sampler with an inside diameter (I.D.) of 62 mm and an outside diameter (O.D.) of 83 mm.

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   Prosonic Track Mounted: $ER_i \cong 1.00$
   Prosonic 1: $ER_i \cong 1.45$
   Minisonic: $ER_i \cong 1.00$
   Pacific Drilling:
   Unimog: $ER_i \cong 1.27$
   Mole: $ER_i \cong 1.00$
   Minimole: $ER_i \cong 1.00$
   Test America:
   CME 95: $ER_i \cong 1.45$

4. The sedimentary rock was obtained utilizing a sonic drilling technique; this method resulted in Core Recovery (REC) values of essentially 100%. Also, given the nature of the Sedimentary Rock (ie., friable, highly fractured, decomposed rock) a Rock Quality Designation (RQD) index is not relevant and therefore not reported on LOTBs.

ENGINEERING SERVICES	GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO. 57-E0075/76	CARROLL CANYON (DAR) RETAINING WALLS
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS		DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 5 OF 11
NAME:	CHECKED BY: G. CUSTENBORDER	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER	CU 11275 EA 2T0401	DISREGARD PRINTS BEARING EARLIER REVISION DATES →	REVISION DATES: 10/14/08, 3/09/09, 4/28/09

OGS CIVIL LOG OF TEST BORINGS SHEET
ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100
SHEET 49 OF 55
FILE => 57-e0075_76-z-lotb05.dgn
DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:02
USERNAME => tmikesl

Bench Mark
All elevations shown in the LOTBs are in meters and are referenced to the NGVD 1929 Datum.

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5, 805	R49.9/R51.7, 42.6/46.5	820	886

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER
VAN OLIN
NO. 2578
EXP. 6-30-10
GEOTECHNICAL
STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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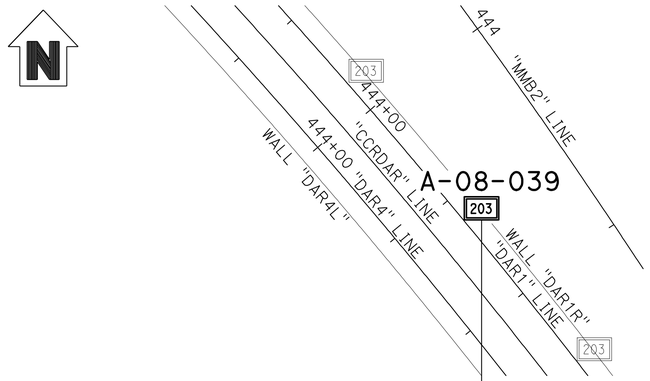

PLAN
1 : 500

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   Unimog: $ER_i \cong 1.27$
   Mole: $ER_i \cong 1.00$
   Minimole: $ER_i \cong 1.00$
   Test America:
   CME 95: $ER_i \cong 1.45$

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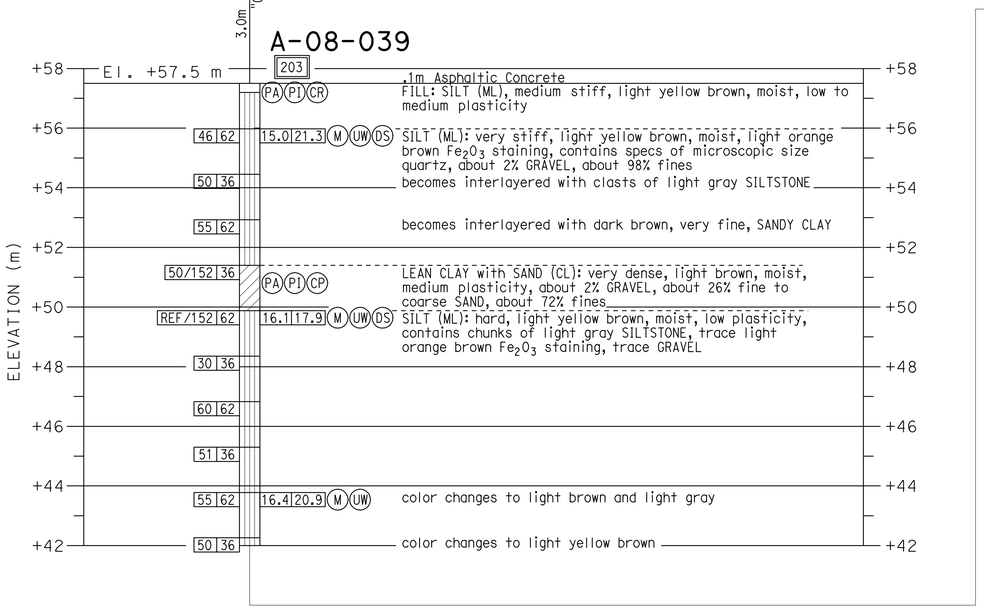
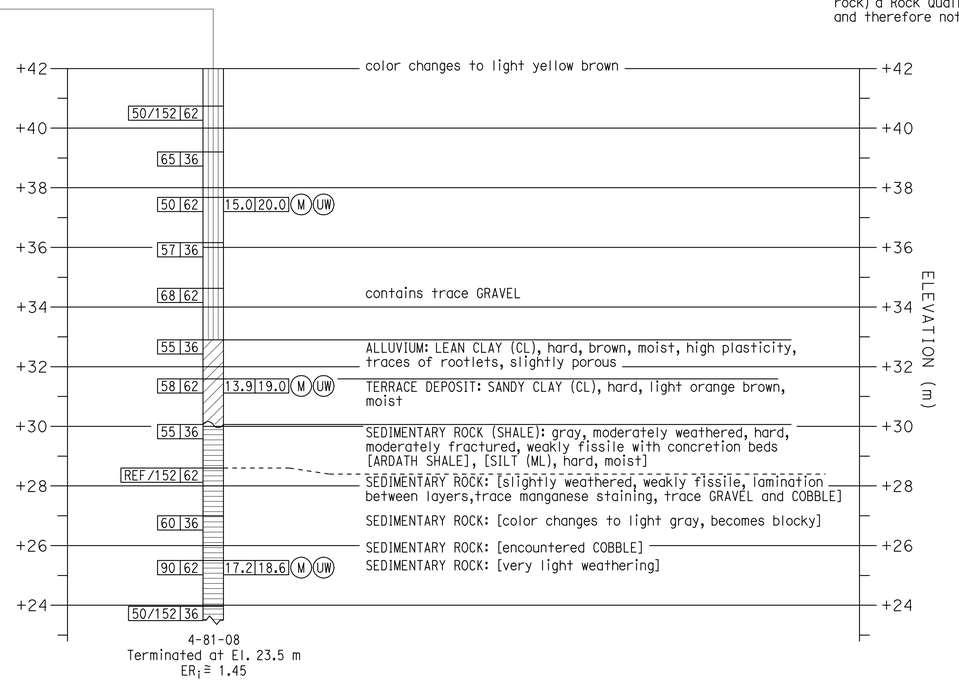




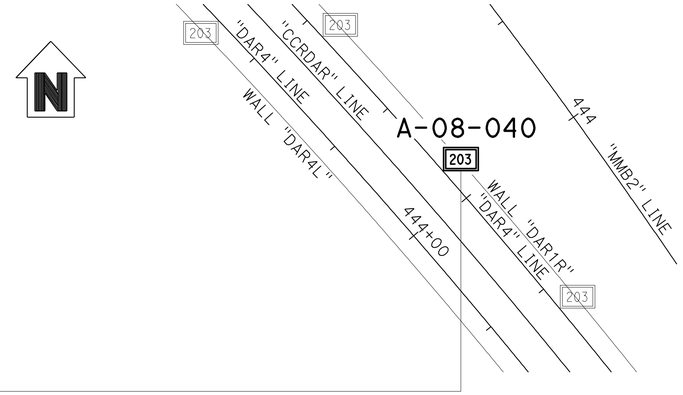
PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

ENGINEERING SERVICES		GEOTECHNICAL SERVICES				
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO. 57-E0075/76	CARROLL CANYON (DAR) RETAINING WALLS
NAME:	CHECKED BY: G. CUSTENBORDER			DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 6 OF 11

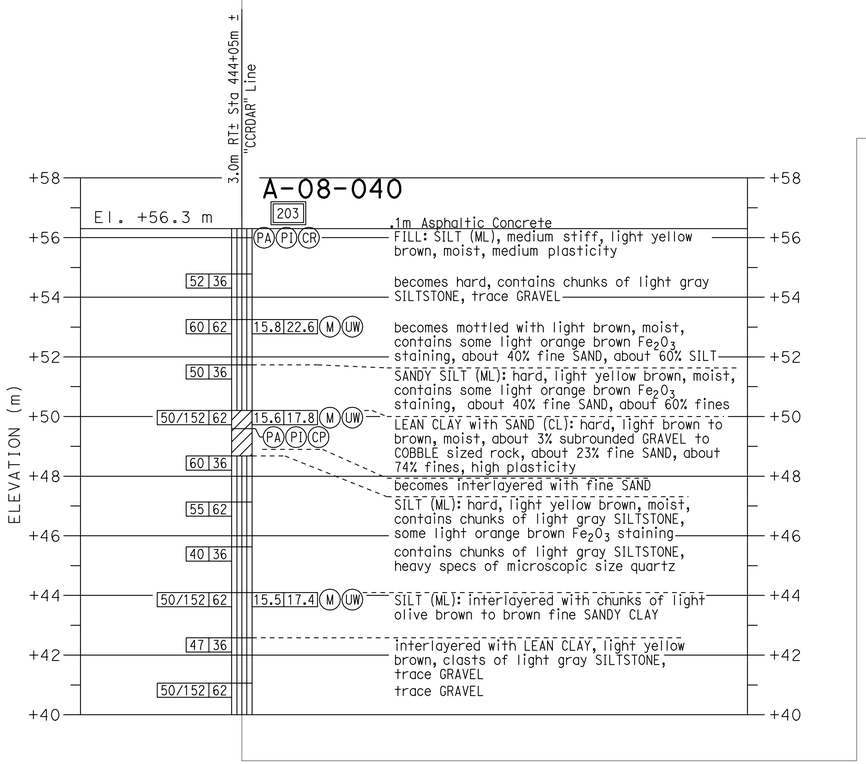
OGS CIVIL LOG OF TEST BORINGS SHEET
ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100
CU 11275
EA 2T0401
DISREGARD PRINTS BEARING EARLIER REVISION DATES →
REVISION DATES: 10/14/08 3/9/09 4/28/09
SHEET 50 OF 55

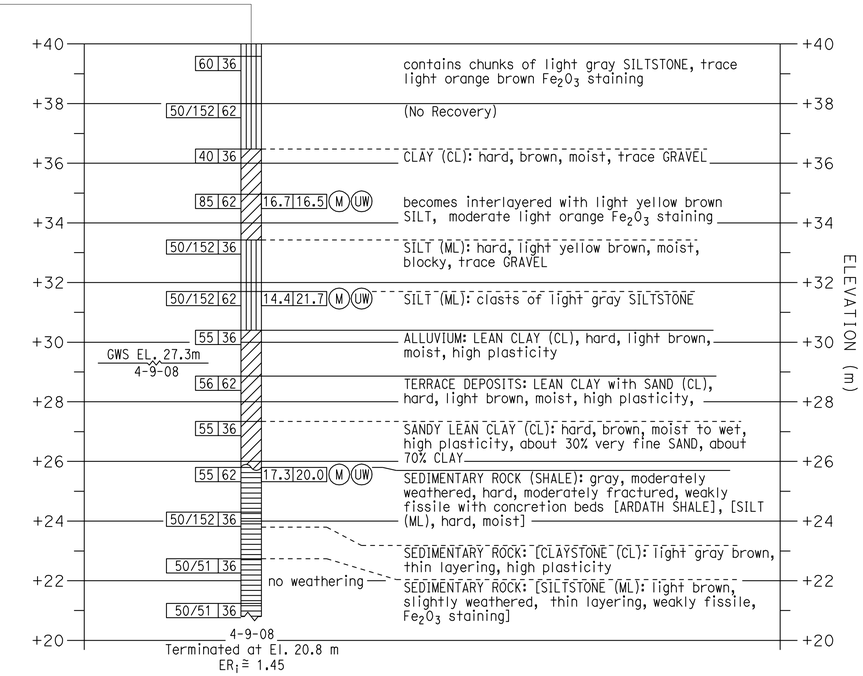
FILE => 57-e0075_76-z-lotb06.dgn
DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:02
USERNAME => tmikesl

Bench Mark
All elevations shown in the LOTBs are in meters and are referenced to the NGVD 1929 Datum.



PLAN
1 : 500





PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	821	886

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER ☆ VAN OLIN NO. 2578 EXP. 6-30-10 ☆ GEOTECHNICAL ☆ STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111

NOTES:

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ENGINEERING SERVICES	GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO. 57-E0075/76	CARROLL CANYON (DAR) RETAINING WALLS
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS		DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 7 OF 11
NAME:	CHECKED BY: G. CUSTENBORDER	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER			

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

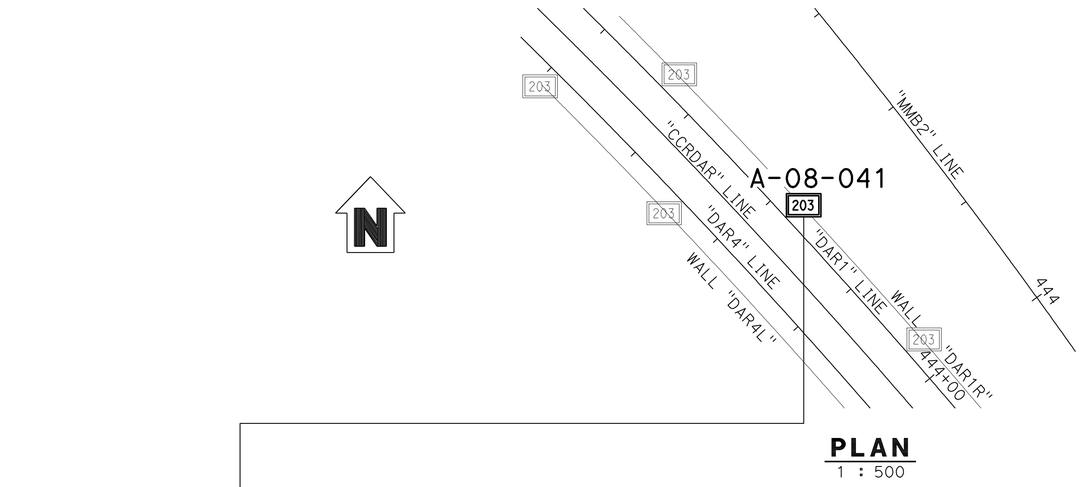
REVISION DATES: 10/14/08 | 3/9/09 | 4/28/09

SHEET 51 OF 55

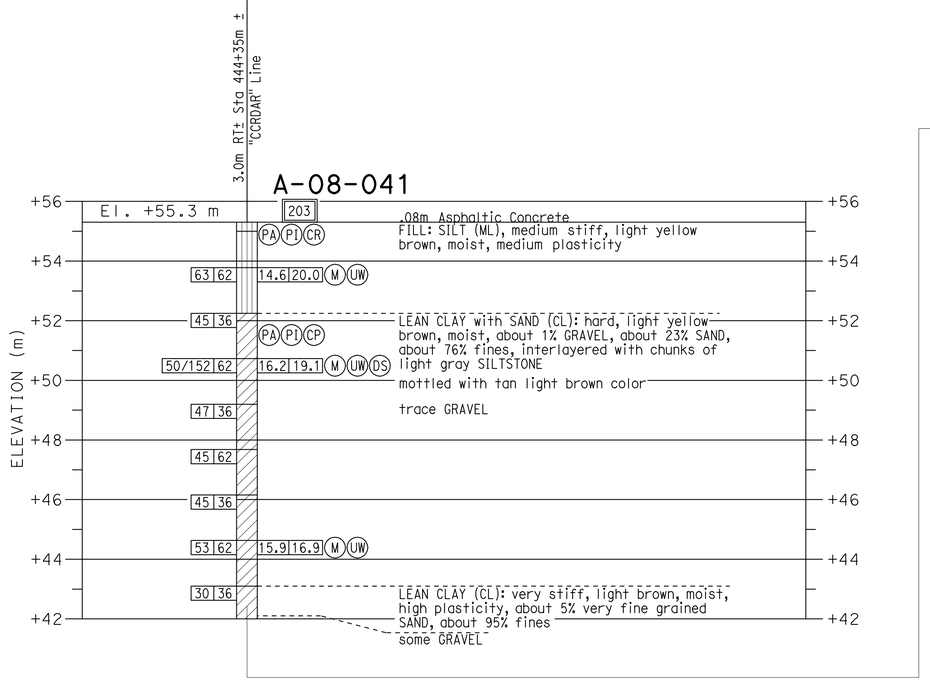
FILE => 57-e0075_76-z-lotb07.dgn

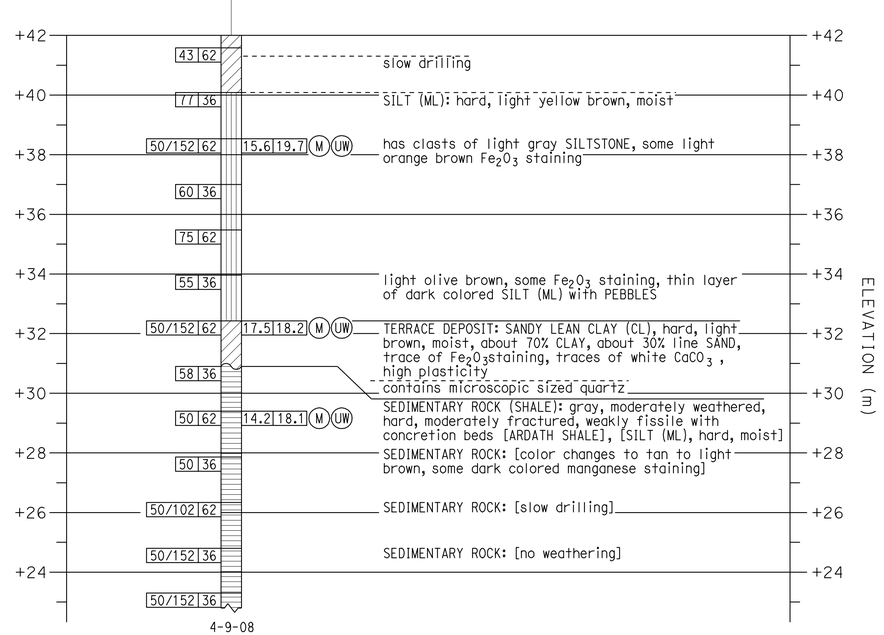
DATE PLOTTED => 23-SEP-2010 TIME PLOTTED => 12:02
USERNAME => rmikes

Bench Mark
All elevations shown in the LOTBs are in meters and are referenced to the NGVD 1929 Datum.



PLAN
1 : 500





4-9-08
Terminated at El. 22.8 m
ER_i = 1.45

PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	822	886

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER
VAN OLIN
NO. 2578
EXP. 6-30-10
GEOTECHNICAL
STATE OF CALIFORNIA

9-27-10
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.

SANDAG
401 B STREET,
SAN DIEGO, CA. 92101

BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111

NOTES:

1. 62 mm diameter samples were taken using a California split-barrel sampler with an inside diameter (I.D.) of 62 mm and an outside diameter (O.D.) of 83 mm.
2. Automatic trip and safety hammer systems consisting of hammer weight of 62.5 kg falling a distance of 762 mm were used to advance the drive samplers in accordance with ASTM D1586.
3. The average hammer energy ratio (ER_i) reflects the percentage efficiency of SPT blowcounts (N-value). The estimated ER_i for the various drilling equipment used was as follows:
   Boart Longyear:
   Longyear 1405: $ER_i \cong 1.45$
   Prosonic Track Mounted: $ER_i \cong 1.00$
   Prosonic 1: $ER_i \cong 1.45$
   Minisonic: $ER_i \cong 1.00$
   Test America:
   CME 95: $ER_i \cong 1.45$
   Pacific Drilling:
   Unimog: $ER_i \cong 1.27$
   Mole: $ER_i \cong 1.00$
   Minimole: $ER_i \cong 1.00$
4. The sedimentary rock was obtained utilizing a sonic drilling technique; this method resulted in Core Recovery (REC) values of essentially 100%. Also, given the nature of the Sedimentary Rock (ie., friable, highly fractured, decomposed rock) a Rock Quality Designation (RQD) index is not relevant and therefore not reported on LOTBs.

ENGINEERING SERVICES		GEOTECHNICAL SERVICES		STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO. 57-E0075/76	CARROLL CANYON (DAR) RETAINING WALLS
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN G. CUSTENBORDER			DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 8 OF 11
NAME:	CHECKED BY: G. CUSTENBORDER				CU 11275 EA 2T0401		

OGS CIVIL LOG OF TEST BORINGS SHEET

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

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

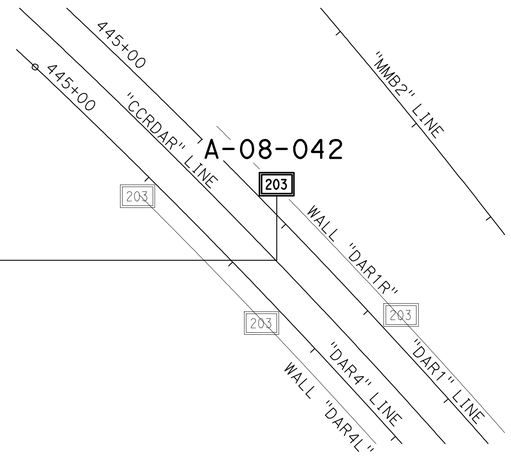
REVISION DATES: 10/14/08 | 3/9/09 | 4/28/09

SHEET 52 OF 55

FILE => 57-e0075_76-z-lotb08.dgn

USERNAME => trmikesl
DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:02

Bench Mark
All elevations shown in the LOTBs are in meters and are referenced to the NGVD 1929 Datum.



PLAN
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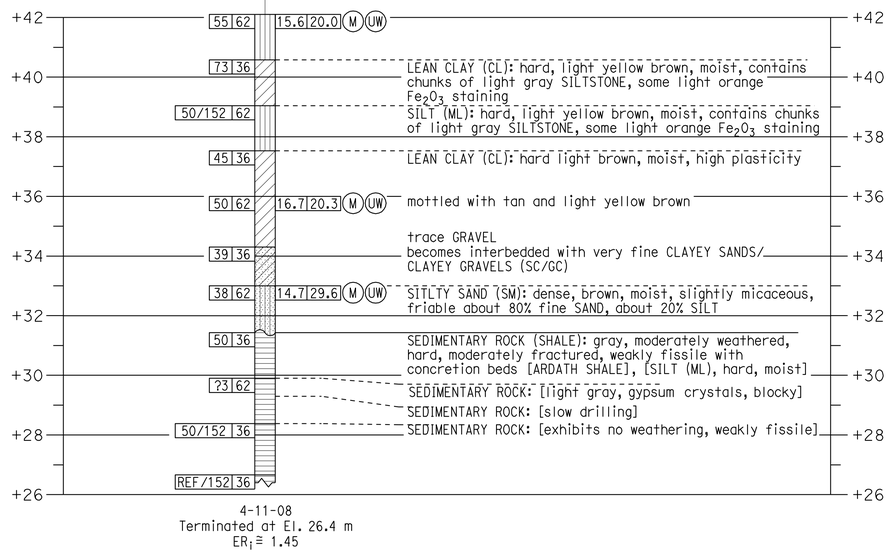

4-11-08
Terminated at El. 26.4 m
$ER_i \cong 1.45$

PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	823	886

REGISTERED GEOTECHNICAL ENGINEER — 4-28-09

PLANS APPROVAL DATE — 9-27-10

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN — NO. 2578 — EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

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SANDAG
401 B STREET,
SAN DIEGO, CA. 92101

BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111

NOTES:

1. 62 mm diameter samples were taken using a California split-barrel sampler with an inside diameter (I.D.) of 62 mm and an outside diameter (O.D.) of 83 mm.
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   Prosonic 1: $ER_i \cong 1.45$
   Minisonic: $ER_i \cong 1.00$
   Pacific Drilling:
   Unimog: $ER_i \cong 1.27$
   Mole: $ER_i \cong 1.00$
   Minimole: $ER_i \cong 1.00$
   Test America:
   CME 95: $ER_i \cong 1.45$
4. The sedimentary rock was obtained utilizing a sonic drilling technique; this method resulted in Core Recovery (REC) values of essentially 100%. Also, given the nature of the Sedimentary Rock (ie., friable, highly fractured, decomposed rock) a Rock Quality Designation (RQD) index is not relevant and therefore not reported on LOTBs.

ENGINEERING SERVICES		GEOTECHNICAL SERVICES		STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	CARROLL CANYON (DAR) RETAINING WALLS
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN G. CUSTENBORDER			DESIGN BRANCH	57-E0075/76	
NAME:	CHECKED BY: G. CUSTENBORDER					POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 9 OF 11

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

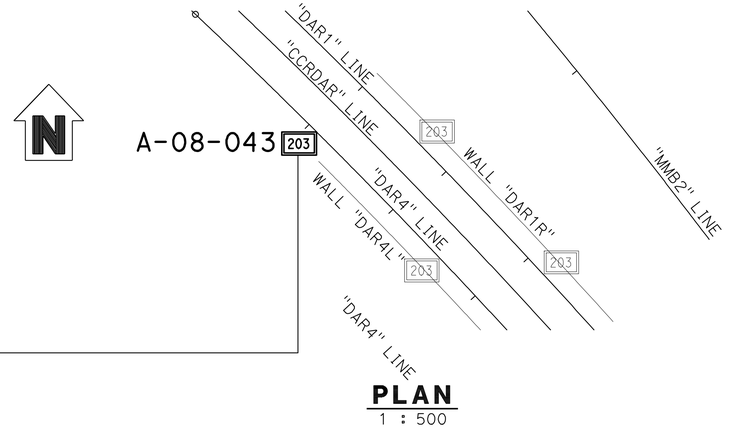
REVISION DATES: 10/14/08 | 3/9/09 | 4/28/09

SHEET 53 OF 55

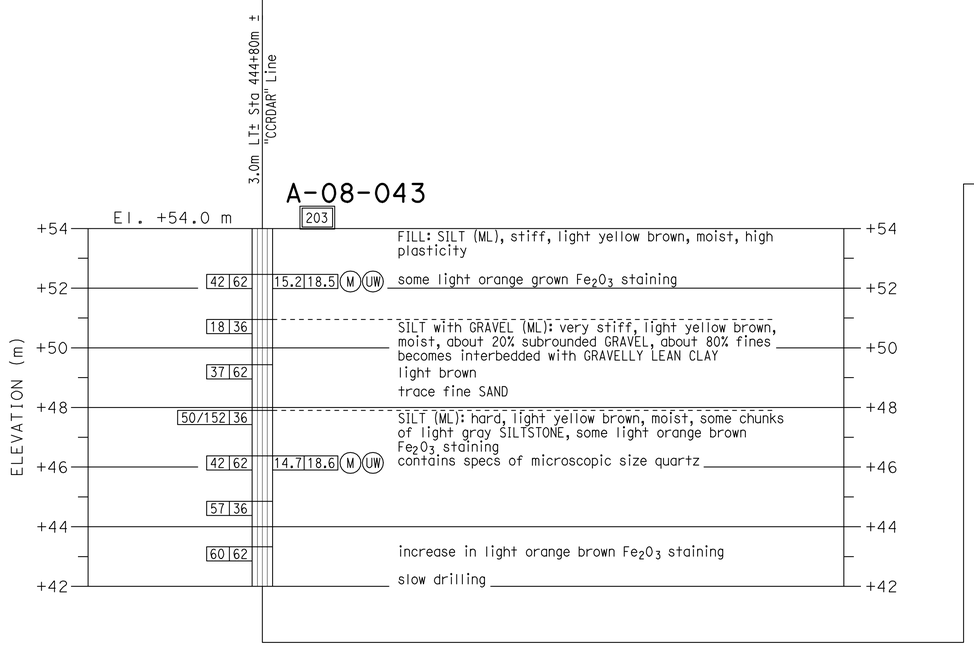
FILE => 57-e0075_76-z-lotb09.dgn

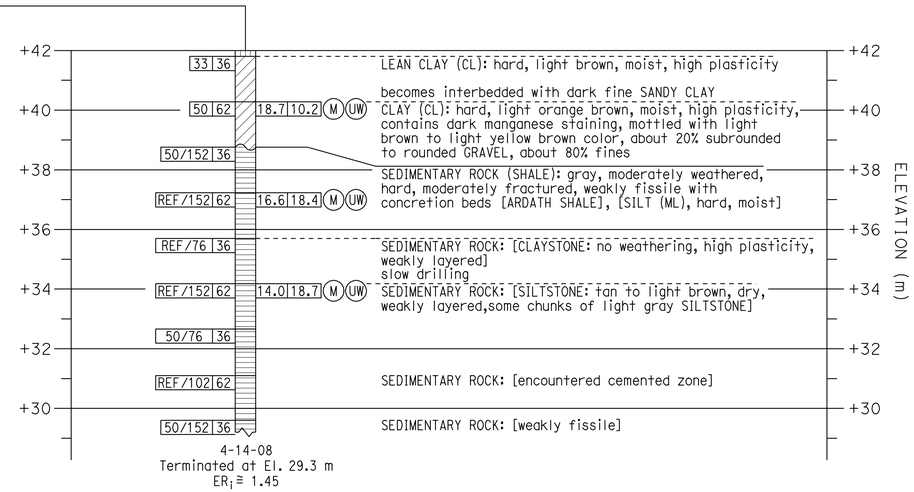
DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:03
USERNAME => trmikesl

Bench Mark
All elevations shown in the LOTBs are in meters and are referenced to the NGVD 1929 Datum.



PLAN
1 : 500





PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	824	886

Caltrans Metric

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER ☆ VAN OLIN NO. 2578 EXP. 6-30-10 ☆ GEOTECHNICAL STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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SANDAG
401 B STREET,
SAN DIEGO, CA. 92101

BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111

NOTES:

1. 62 mm diameter samples were taken using a California split-barrel sampler with an inside diameter (I.D.) of 62 mm and an outside diameter (O.D.) of 83 mm.
2. Automatic trip and safety hammer systems consisting of hammer weight of 62.5 kg falling a distance of 762 mm were used to advance the drive samplers in accordance with ASTM D1586.
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ENGINEERING SERVICES	GEOTECHNICAL SERVICES		STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO. 57-E0075/76	CARROLL CANYON (DAR) RETAINING WALLS
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN G. CUSTENBORDER		DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 10 OF 11
NAME:	CHECKED BY: G. CUSTENBORDER					

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

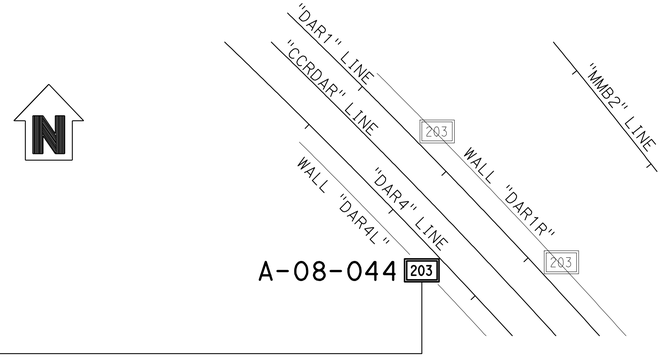
REVISION DATES: 10/14/08 | 3/27/09 | 4/28/09

SHEET 54 OF 55

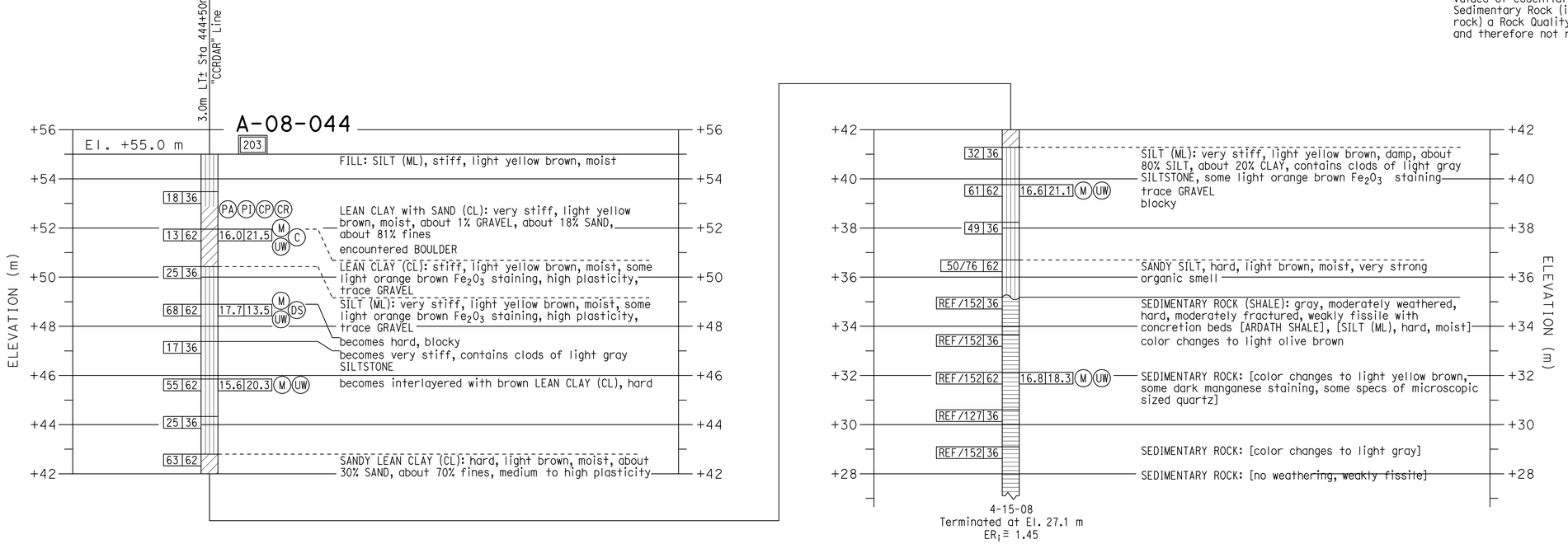
FILE => 57-e0075_76-z-lotb10.dgn

USERNAME => trmirkes DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:03

Bench Mark
All elevations shown in the LOTBs are in meters and are referenced to the NGVD 1929 Datum.



PLAN
1 : 500



PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	825	886

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER
VAN OLIN
NO. 2578
EXP. 6-30-10
GEOTECHNICAL
STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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SANDAG
401 B STREET,
SAN DIEGO, CA. 92101

BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111

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   Pacific Drilling:
   Unimog: $ER_i \cong 1.27$
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ENGINEERING SERVICES		GEOTECHNICAL SERVICES		STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	CARROLL CANYON (DAR) RETAINING WALLS
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER			DESIGN BRANCH	57-E0075/76	
NAME:	CHECKED BY: G. CUSTENBORDER					POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 11 OF 11

OGS CIVIL LOG OF TEST BORINGS SHEET

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

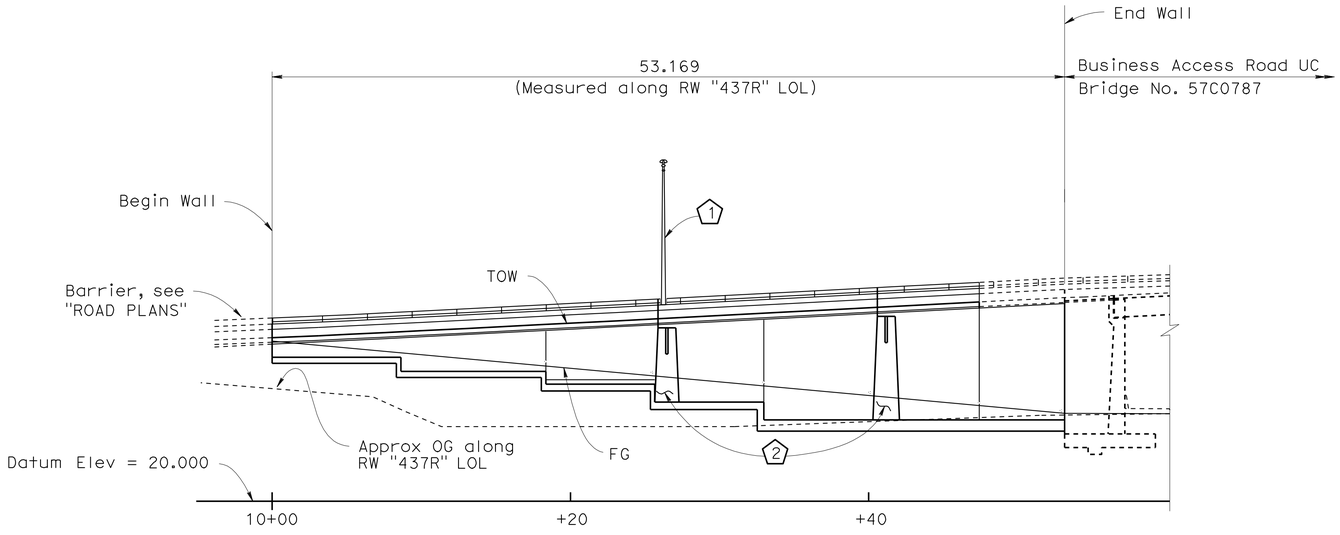
CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES									SHEET	OF
10/14/08	3/31/09	4/28/09							55	55

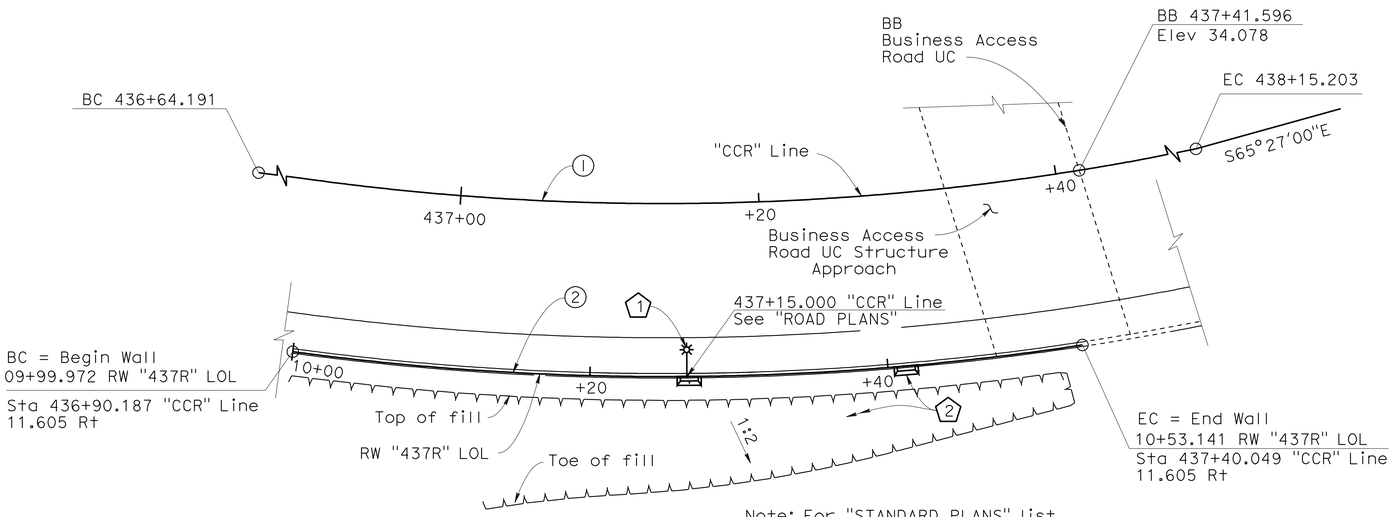
FILE => 57-e0075_76-z-lotb11.dgn

DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:03
USERNAME => rmikesl



DEVELOPED ELEVATION

1:200



Note: For "STANDARD PLANS" list, see "RETAINING WALL PLAN" sheet.

PLAN

1:200

CURVE DATA

No.	R	△	T	L
1	175.000	49°26'31"	80.569	151.012
2	186.605	16°19'31"	26.766	53.169

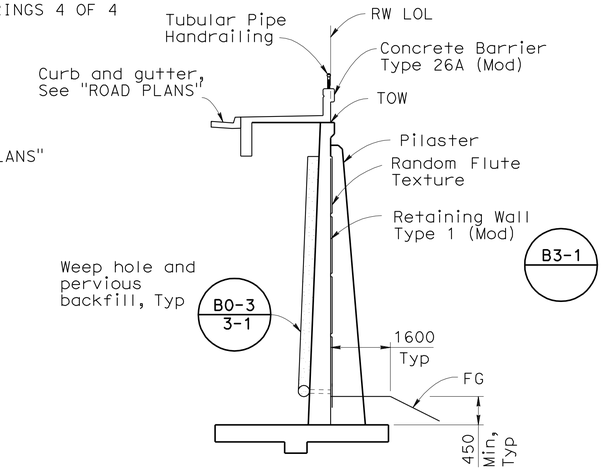
INDEX TO RETAINING WALL PLANS

SHEET No.	TITLE
1.	GENERAL PLAN
2.	RETAINING WALL PLAN
3.	ARCHITECTURAL DETAILS NO. 1
4.	ARCHITECTURAL DETAILS NO. 2
5.	ARCHITECTURAL DETAILS NO. 3
6.	TUBULAR PIPE HANDRAILING
7.	MISCELLANEOUS DETAILS
8.	LOG OF TEST BORINGS 1 OF 4
9.	LOG OF TEST BORINGS 2 OF 4
10.	LOG OF TEST BORINGS 3 OF 4
11.	LOG OF TEST BORINGS 4 OF 4

LEGEND

(1) - Electrolier, See "ROAD PLANS"

(2) - Pilaster



TYPICAL SECTION

1:80

QUANTITIES

STRUCTURE EXCAVATION (RETAINING WALL)	380	m3
STRUCTURE BACKFILL (RETAINING WALL)	740	m3
PERVIOUS BACKFILL MATERIAL (RETAINING WALL)	56	m3
STRUCTURAL CONCRETE, RETAINING WALL	273	m3
ARCHITECTURAL TREATMENT (RANDOM FLUTE TEXTURE)	180	m2
BAR REINFORCING STEEL (RETAINING WALL)	37 660	kg
TUBULAR PIPE HANDRAILING	47	m
CONCRETE BARRIER (TYPE 26A MODIFIED)	47	m

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	826	886

REGISTERED CIVIL ENGINEER — DATE 4-28-09

REGISTERED PROFESSIONAL ENGINEER — James L. Rucker, No. 47796, Exp. 12-31-09, CIVIL, STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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SANDAG
401 B STREET,
SAN DIEGO, CA 92101

T.Y. LIN INTERNATIONAL
5030 CAMINO DE LA SIESTA, SUITE 204,
SAN DIEGO, CA 92108

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED	LOAD FACTOR DESIGN		
DESIGN	Arash Monsefan	Brett Makley			
DETAILS	Yihong Wang	Arash Monsefan	LAYOUT	Arash Monsefan	Brett Makley
QUANTITIES	Yihong Wang	Arash Monsefan	SPECIFICATIONS	Jeremy LaHaye	Jeremy LaHaye

PREPARED FOR THE STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

CU 11275
EA 2T0401

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 437R
GENERAL PLAN

DESIGN GENERAL PLAN SHEET (METRIC) (REV. 10/27/05)

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

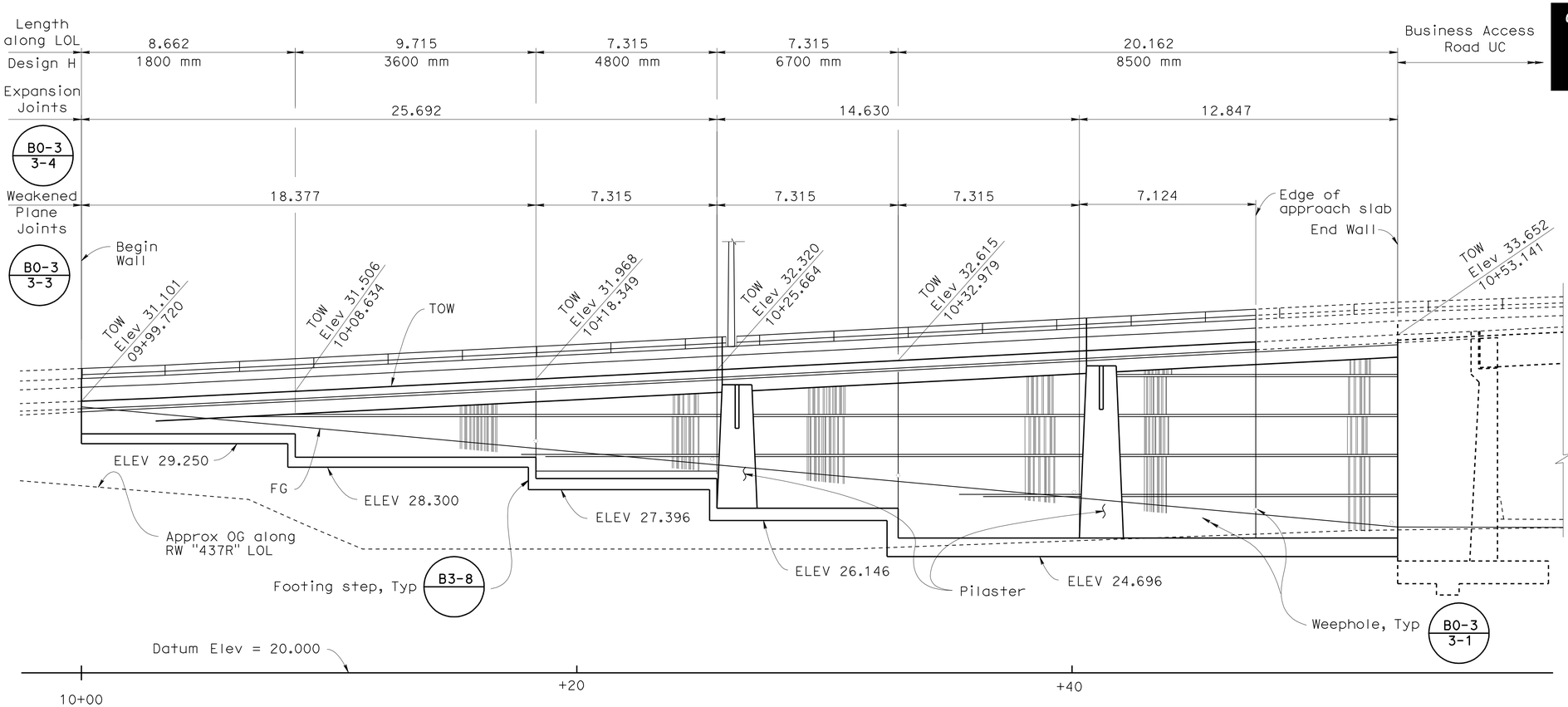
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08, 12-19-08, 3-9-09, 4-28-09

SHEET 1 OF 11

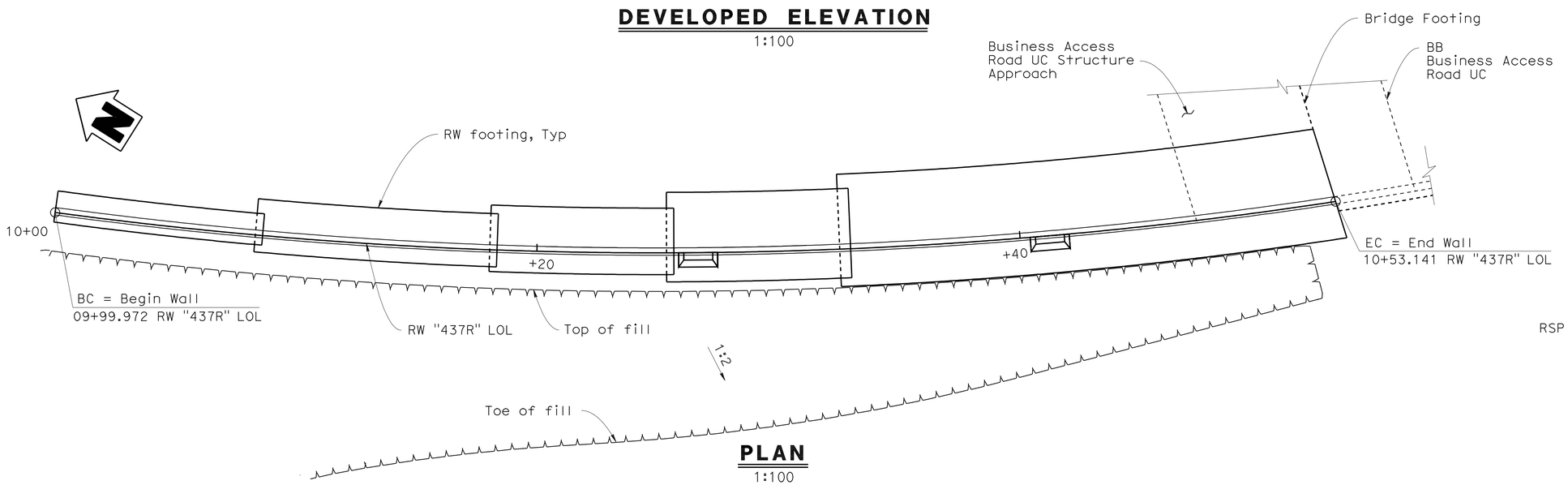
FILE => 57-rw437r-a-gp01.dgn

USERNAME => rmikesi DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:03



DEVELOPED ELEVATION

1:100



PLAN

1:100

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	827	886

REGISTERED CIVIL ENGINEER — 4-28-09 DATE

9-27-10
PLANS APPROVAL DATE

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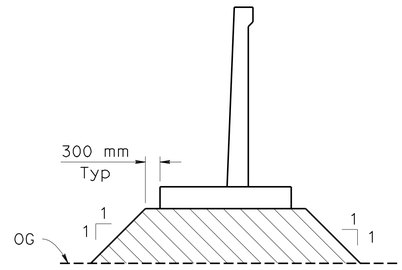
REGISTERED PROFESSIONAL ENGINEER — James L. Rucker — No. 47796 — Exp. 12-31-09 — CIVIL — STATE OF CALIFORNIA

SANDAG
401 B STREET,
SAN DIEGO, CA 92101

T.Y. LIN INTERNATIONAL
5030 CAMINO DE LA SIESTA, SUITE 204,
SAN DIEGO, CA 92108

LEGEND

▨ = Structure Backfill (Retaining Wall)



Approx Station 9+99 to 10+33

LIMITS OF PAYMENT FOR EARTHWORK

N.T.S

Note: Earthwork limits in addition to A62C

STANDARD PLANS (DATED JULY 2004)

A10A	ACRONYMS AND ABBREVIATIONS (A-L)
A10B	ACRONYMS AND ABBREVIATIONS (M-Z)
A62C	LIMITS OF PAYMENT FOR EXCAVATION AND BACKFILL BRIDGE
B0-3	BRIDGE DETAILS
B3-1	RETAINING WALL TYPE 1 (H=1200 THROUGH 9100 mm)
B3-8	RETAINING WALL DETAIL NO. 1
B11-51	TUBULAR HAND RAILING
B11-54	CONCRETE BARRIER TYPE 26
RSP ES-6A	ELECTRICAL SYSTEMS (LIGHTING STANDARDS TYPES 15 AND 21)

STANDARD PLAN SHEET NO.

DETAIL NO.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Arash Monsefan	Brett Makley
DETAILS	Tatyana Gnip	Arash Monsefan
QUANTITIES	Yihong Wang	Arash Monsefan

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 437R
RETAINING WALL PLAN

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 1-14-08, 12-19-08, 3-9-09, 4-28-09

SHEET 2 OF 11

FILE => 57-rw437r-c-sp01.dgn

USERNAME => trmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:03

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	828	886

REGISTERED CIVIL ENGINEER — 4-28-09 DATE

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — James L. Rucker — No. 47796 — Exp. 12-31-09 — CIVIL — STATE OF CALIFORNIA

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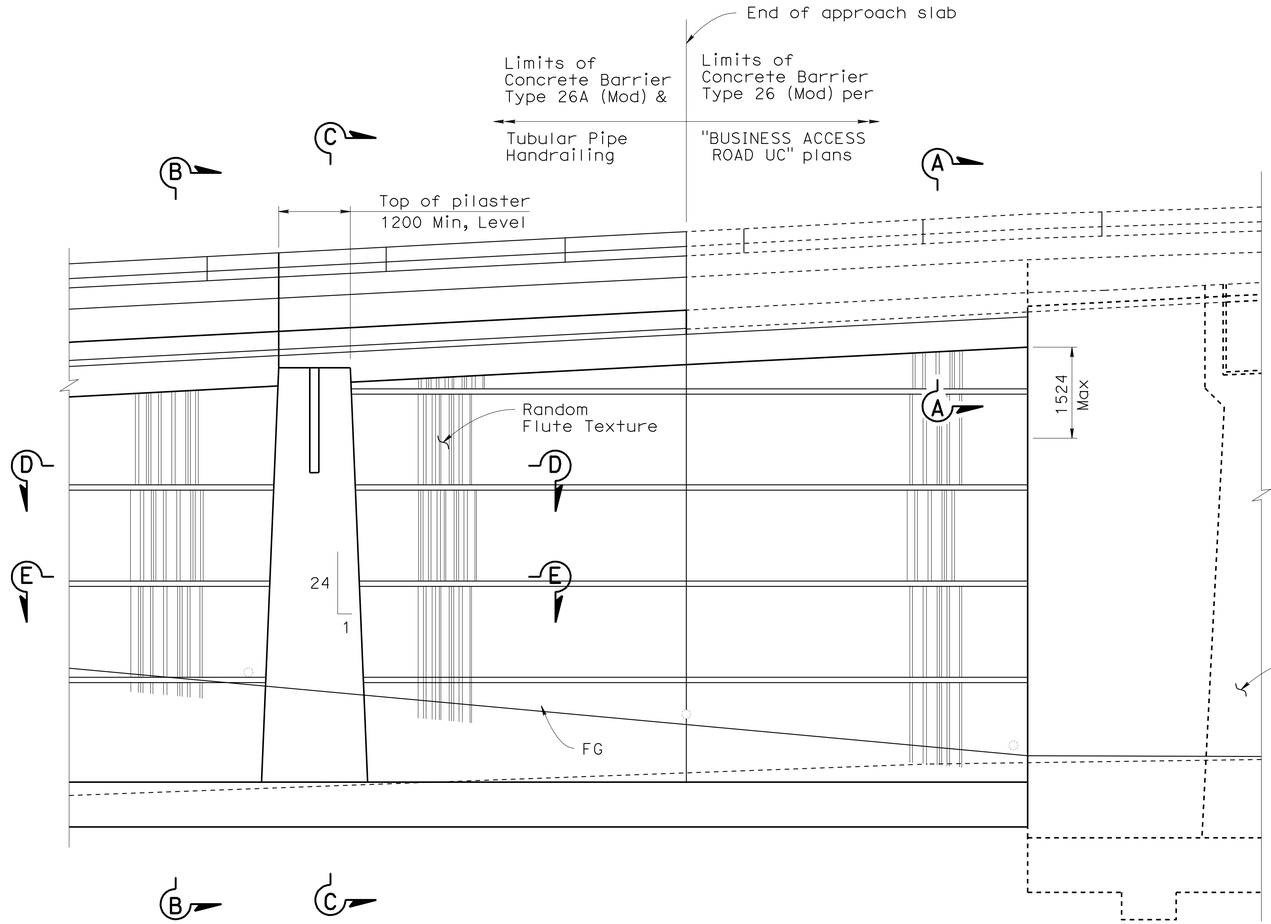
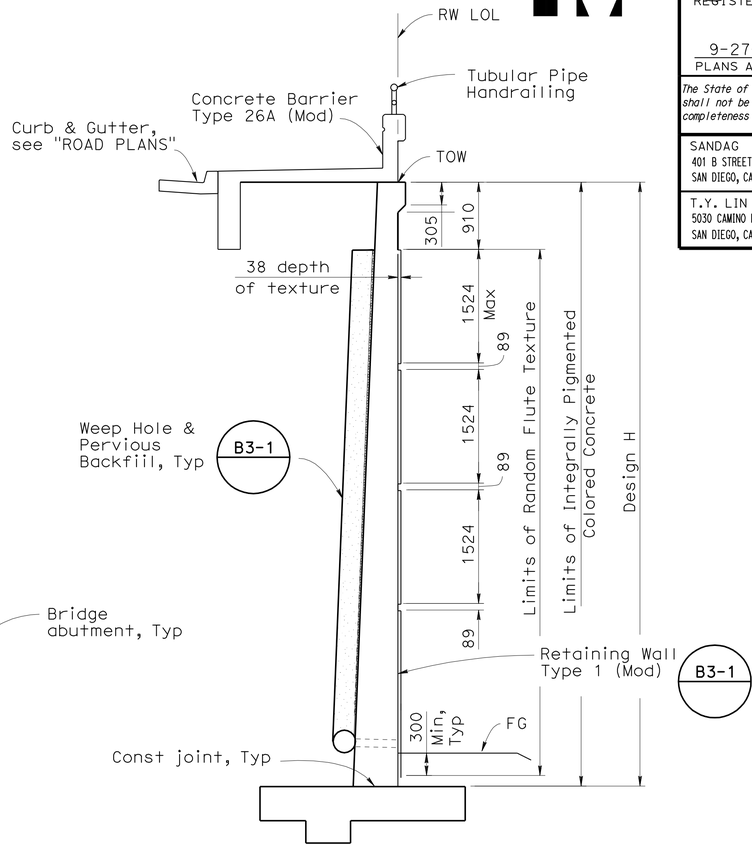


PART ELEVATION

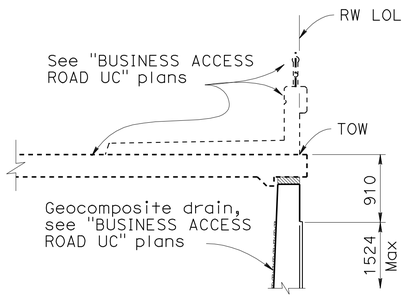
1:50



TYPICAL SECTION

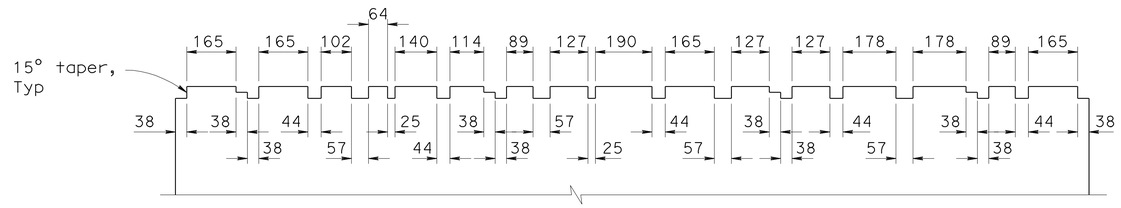
N.T.S

Note: For SECTION B-B through E-E, see "ARCHITECTURAL DETAILS NO. 2" sheet.



SECTION A-A

1:40



RANDOM FLUTE TEXTURE DETAIL

1:10

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN DESIGN OVERSIGHT 4-28-09 SIGN OFF DATE		DESIGN	BY Arash Monsefan	CHECKED Brett Makley	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	Brett Makley PROJECT ENGINEER	BRIDGE NO. KILOMETER POST KP43.2	RETAINING WALL 437R ARCHITECTURAL DETAILS NO. 1
		DETAILS	BY Tatyana Gnip	CHECKED Arash Monsefan				
		QUANTITIES	BY Yihong Wang	CHECKED Arash Monsefan				

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

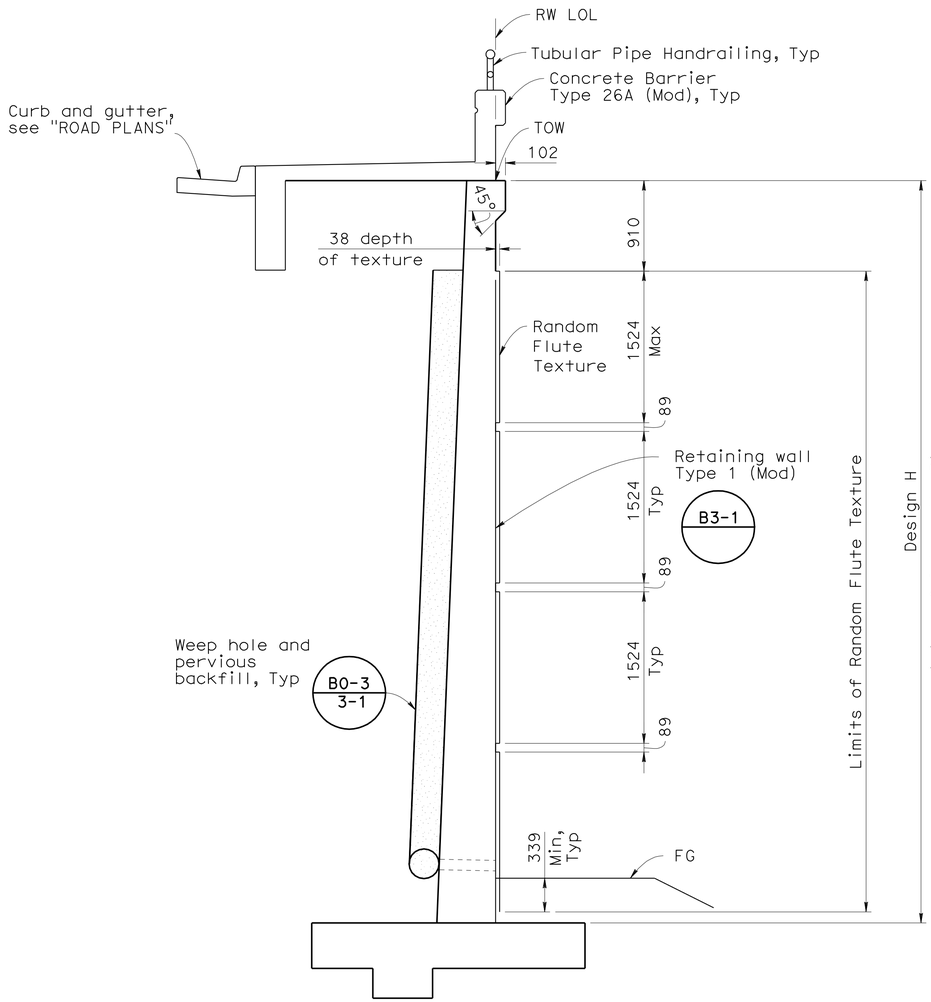
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08 | 12-18-08 | 3-9-09 | 4-28-09

SHEET 3 OF 11

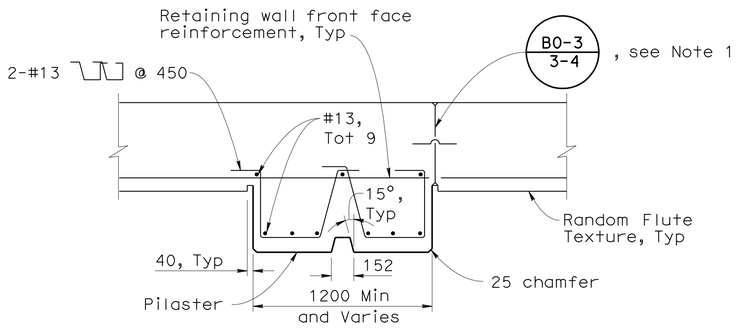
FILE => 57-rw437r-g-rwdt01.dgn

USERNAME => <tmikes> DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:04



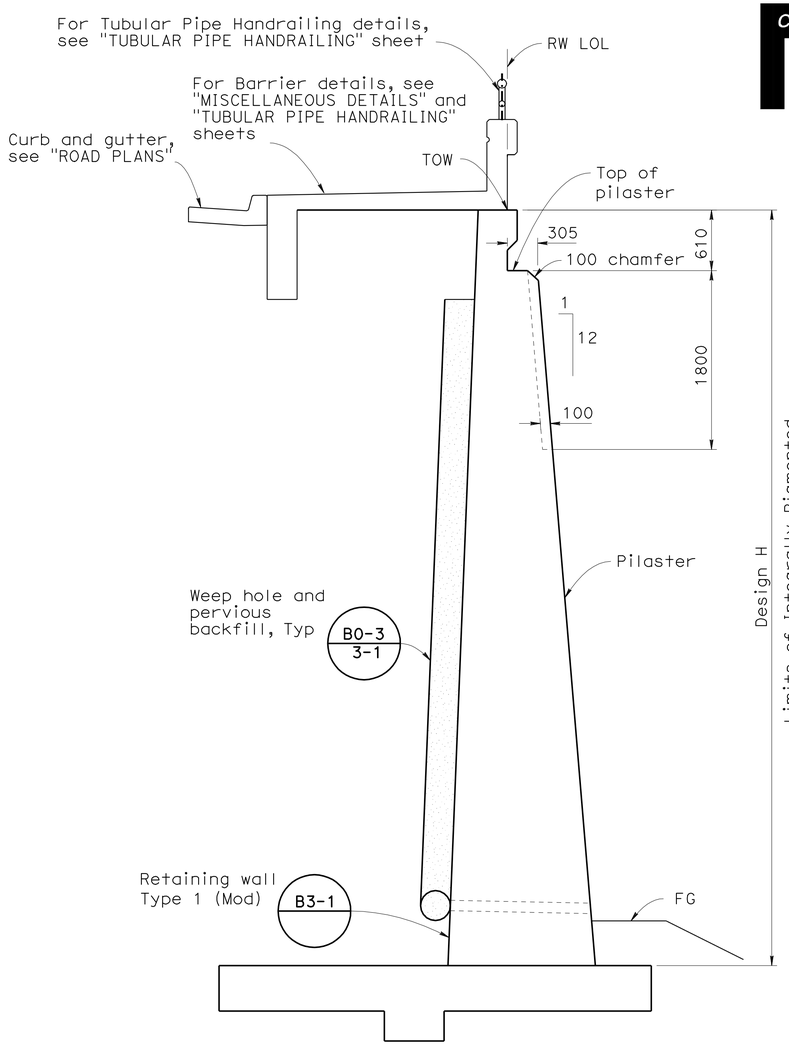
SECTION B-B

1:30



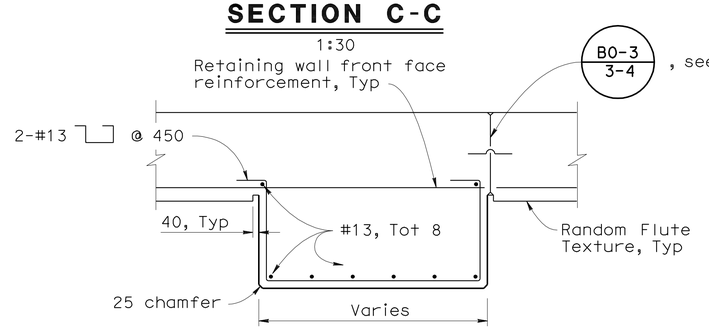
SECTION D-D

1:20



SECTION C-C

1:30



SECTION E-E

1:20

NOTES:

1. Expansion joint to follow edge of pilaster.
2. For details not shown, see B3-1.

ALL DIMENSIONS ARE IN
MILLIMETERS UNLESS OTHERWISE SHOWN

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	829	886

REGISTERED CIVIL ENGINEER — 4-28-09 DATE

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — James L. Rucker — No. 47796 — Exp. 12-31-09 — CIVIL — STATE OF CALIFORNIA

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CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

DESIGN	BY Arash Monsefan	CHECKED Brett Makley	
DETAILS	BY Tatyana Gnip	CHECKED Arash Monsefan	
QUANTITIES	BY Yihong Wang	CHECKED Arash Monsefan	

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 437R
ARCHITECTURAL DETAILS NO. 2

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08 | 12-19-08 | 3-9-09 | 4-28-09

SHEET 4 OF 11

FILE => 57-rw437r-g-rwdt02.dgn

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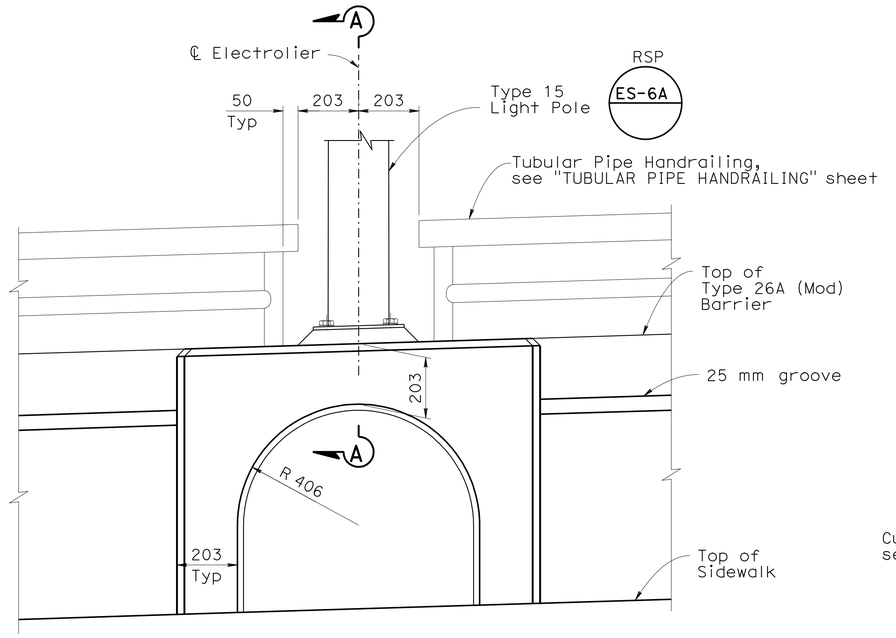
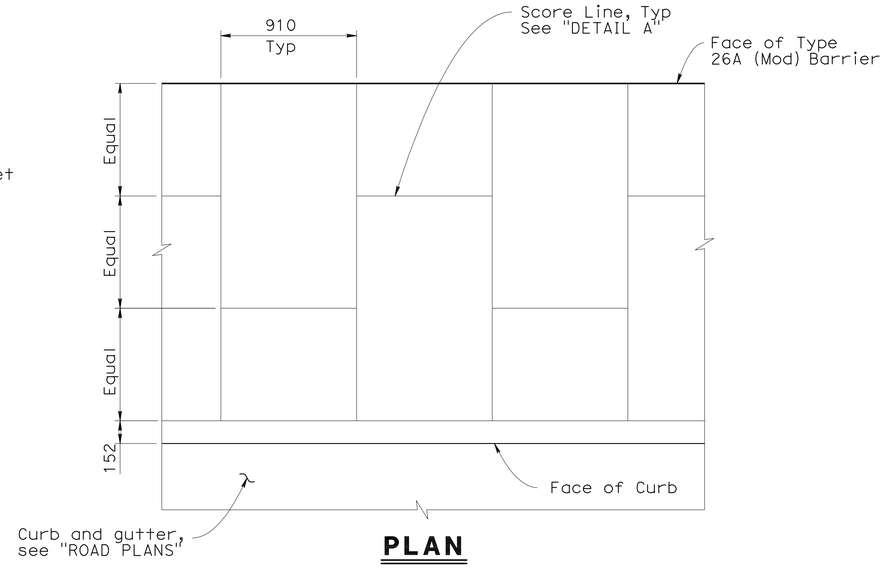
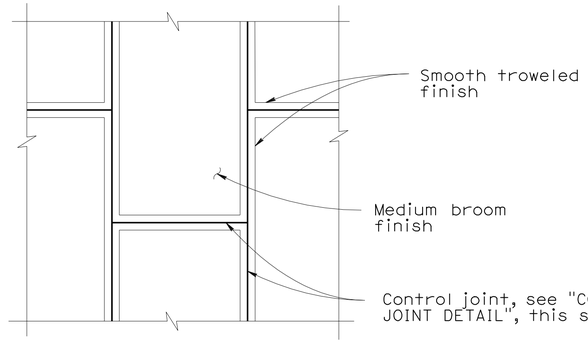


ELEVATION



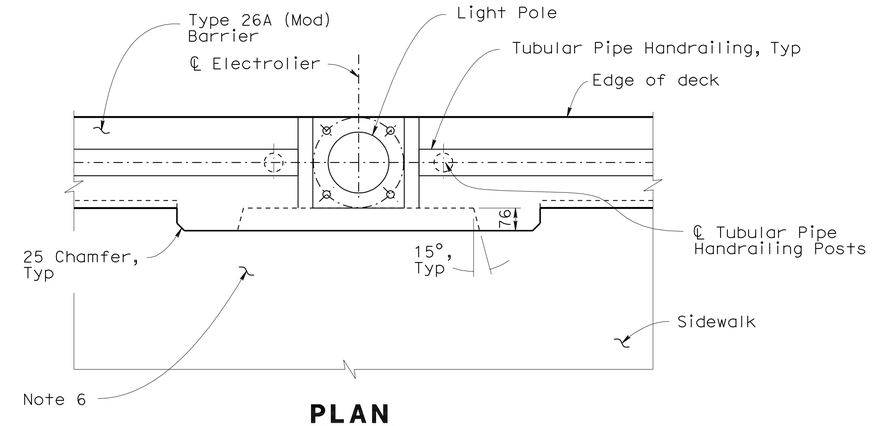
PLAN

1:20



DETAIL A

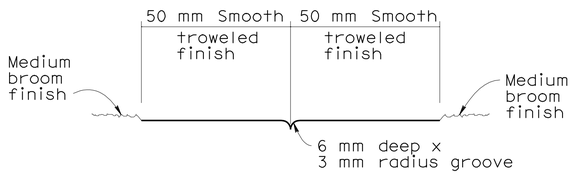
1:20



PLAN

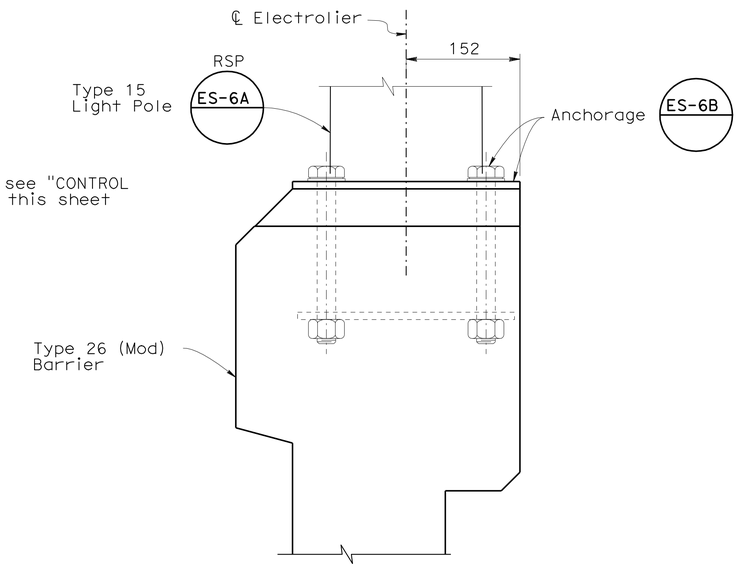
ELECTROLIER BASE DETAIL

1:10



CONTROL JOINT DETAIL

1:1



SECTION A-A

1:4

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	830	886

REGISTERED CIVIL ENGINEER — 4-28-09 DATE

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — James L. Rucker — No. 47796 — Exp. 12-31-09 — CIVIL — STATE OF CALIFORNIA

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NOTES:

1. Post shall be vertical.
2. Top rail tubular pipe shall be continuous over not less than two posts.
3. BLANK
4. For concrete barrier details and reinforcement not shown, see "TUBULAR PIPE HANDRAILING" and "MISCELLANEOUS DETAILS" sheets.
5. Rails are NPS standard weight A53 grade B Type E Pipes.
6. Scoring detail not shown for clarity.
7. For electrolier locations, see "ROAD PLANS".

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

	BY	CHECKED
DESIGN	Arash Monsefan	Brett Makley
DETAILS	Tatyana Gnip	Arash Monsefan
QUANTITIES	Yihong Wang	Arash Monsefan

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

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

CU 11275
EA 2T0401

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 437R
ARCHITECTURAL DETAILS NO. 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08 | 12-19-08 | 3-9-09 | 4-28-09

SHEET 5 OF 11

FILE => 57-rw437r-q-Arch01.dgn

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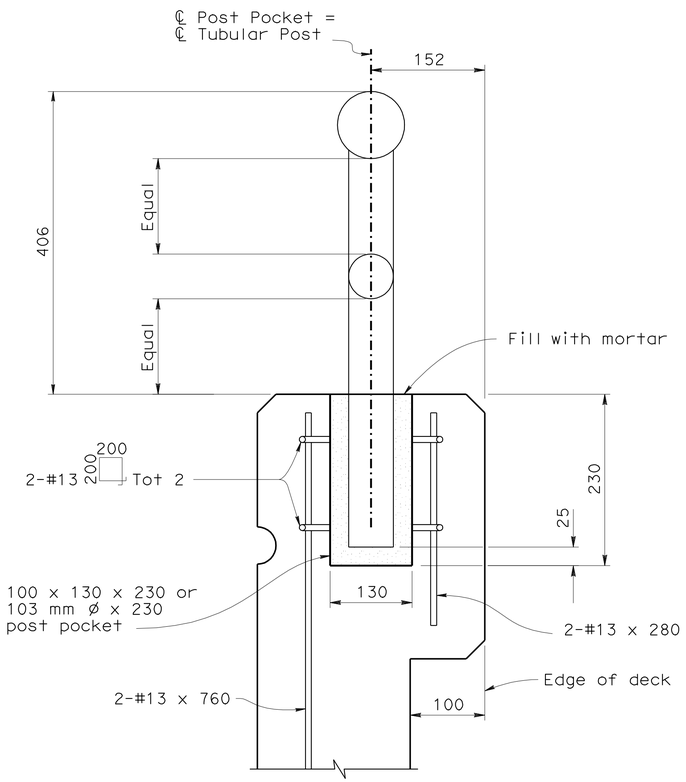
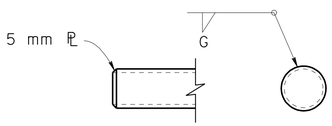


POST ANCHORAGE DETAILS

No Scale



RAIL CAP DETAILS

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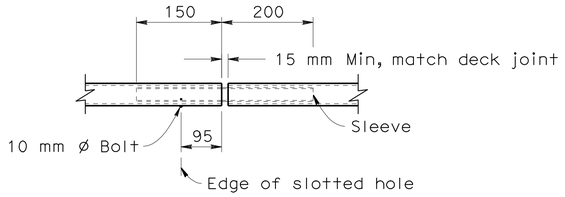
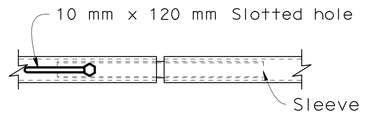
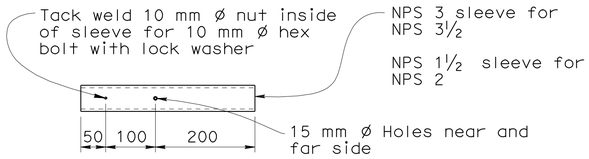


VIEW G-G



VIEW H-H



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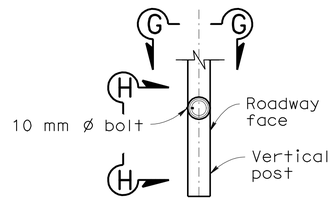
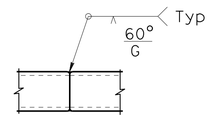


SECTION

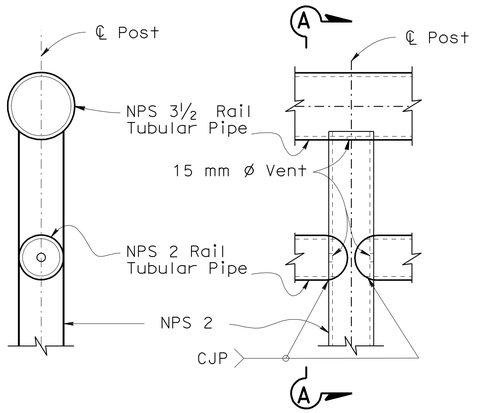


TUBE-WELD SPLICE

No Scale

TUBULAR PIPE SPLICE DETAILS

No Scale



SECTION A-A

1:10

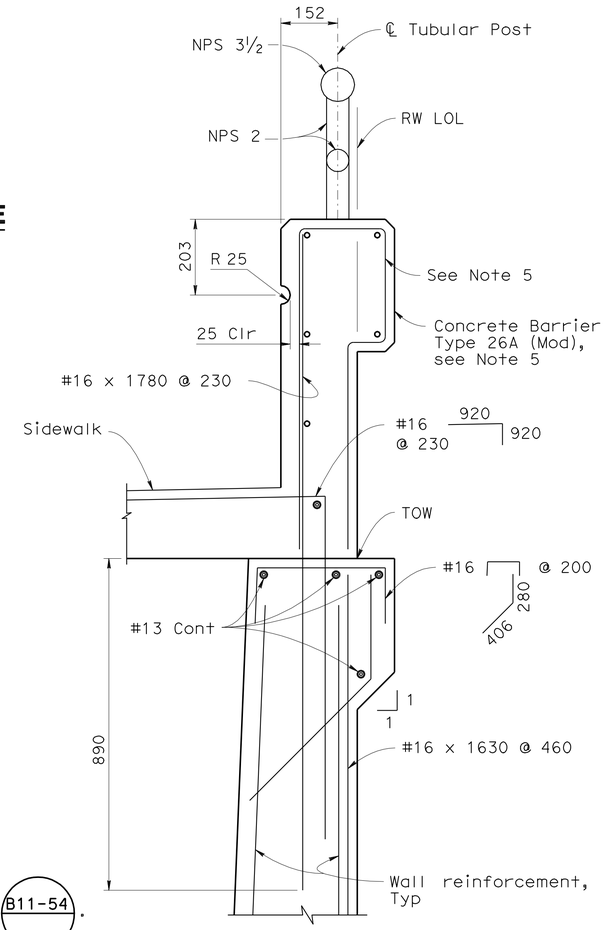
ELEVATION

1:10

For Typ Welded Section

NOTES:

1. Galvanize rail assembly after fabrication.
2. Post shall be vertical.
3. Tubular pipe splices shall be located in the pipes spanning deck or wall joints. Increase joint width in pipes to match expansion joint width and increase sleeve length accordingly.
4. Top rail tubular pipe shall be continuos over not less than two posts.
5. For details and reinforcement not shown see "ARCHITECTURAL DETAILS NO. 3" sheet, B11-51 and B11-54.
6. All tubular pipe posts and rails shall be NPS standard weight A53 grade B Type E Pipes.



CONCRETE BARRIER TYPE 26A (MOD)

No Scale

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Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	831	886

REGISTERED CIVIL ENGINEER — DATE 4-28-09

9-27-10
PLANS APPROVAL DATE

James L. Rucker No. 47796 Exp. 12-31-09 CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

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SAN DIEGO, CA 92108

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Arash Monsefan	Brett Makley
DETAILS	Tatyana Gnip	Arash Monsefan
QUANTITIES	Yihong Wang	Arash Monsefan

PREPARED FOR THE STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 437R
TUBULAR PIPE HANDRAILING

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

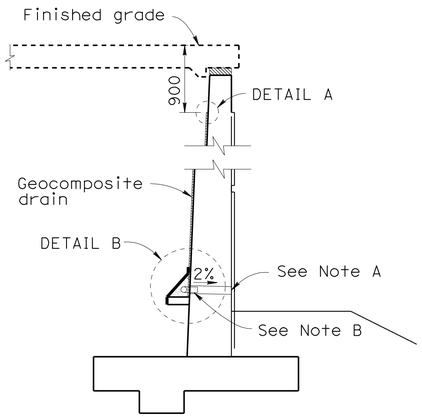
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08, 12-14-08, 3-9-09, 4-28-09

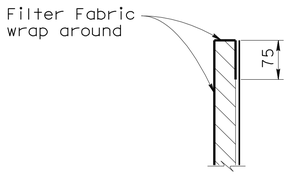
SHEET 6 OF 11

FILE => 57-rw437r-q-Arch02.dgn

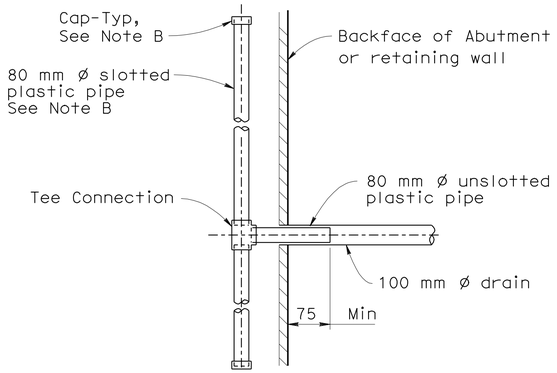
USERNAME => rmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:04



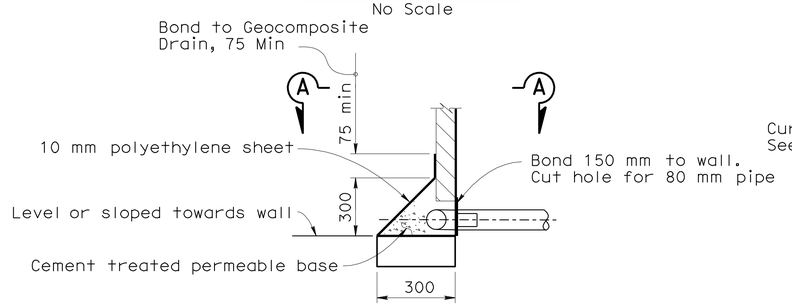
WALL SECTION
No Scale



DETAIL A
No Scale



SECTION A-A
No Scale



DETAIL B
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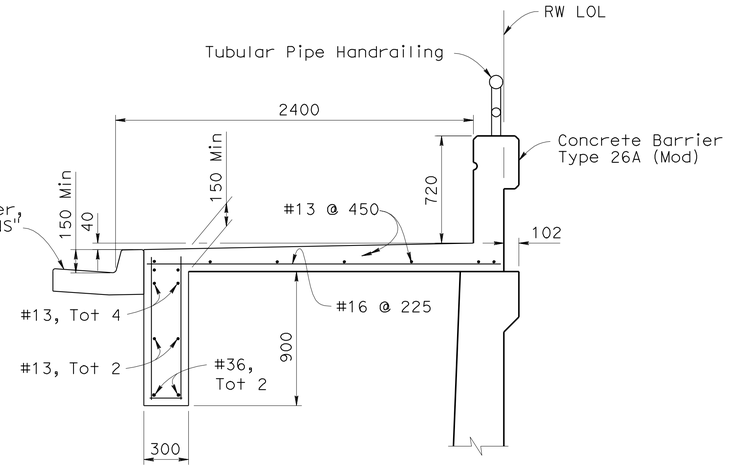

Note: Reinforcement shown is in addition to standard reinforcement in sidewalk. For details not shown, see B11-54.

SIDEWALK DETAIL
1:20

WEEP HOLE AND GEOCOMPOSITE DRAIN

Alternative to Bridge Detail B0-3 / 3-1

NOTES:

A. 100 mm ø drains at intermediate sag points and at 7620 mm max. center to center (2743 mm c-c for Type 3 and 2819 mm c-c for Type 4 retaining walls). For walls adjacent to sidewalks or curbs, provide 100 mm plastic pipe under sidewalk to discharge through curb face. Exposed wall drains shall be located 75 mm± above finished grade.

B. Geocomposite drain, cement treated permeable base, and 80 mm ø slotted plastic pipe continuous behind retaining wall or abutment. Cap ends of pipe. Provide "Tee" connection at each 80 mm ø drain.

C. Connect the low end of plastic pipe to the main outlet pipe as applicable.

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

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Caltrans Metric

REGISTERED CIVIL ENGINEER — DATE 4-28-09

PLANS APPROVAL DATE 9-27-10

REGISTERED PROFESSIONAL ENGINEER — James L. Rucker, No. 47796, Exp. 12-31-09, CIVIL, STATE OF CALIFORNIA

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CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Arash Monsefan	Brett Makley
DETAILS	Tatyana Gnip	Arash Monsefan
QUANTITIES	Yihong Wang	Arash Monsefan

PREPARED FOR THE STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 437R
MISCELLANEOUS DETAILS

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08, 12-18-08, 3-9-09, 4-16-09, 4-28-09

SHEET 7 OF 11

FILE => 57-rw437r-u-miscdt01.dgn

USERNAME => rtmikes DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:04

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90)
Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166)
Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	833	886

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

9-27-10
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.

SANDAG
401 B STREET,
SAN DIEGO, CA. 92101

BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111

APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 300 mm)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 300 mm
Cobble		76 mm to 300 mm
Gravel	Coarse	19 mm to 76 mm
	Fine	No. 4 to 19 mm
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

SOIL LEGEND

ENGINEERING SERVICES	GEOTECHNICAL SERVICES	STATE OF CALIFORNIA	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 437R
FUNCTIONAL SUPERVISOR NAME:	DRAWN BY: J. JOHNS CHECKED BY: G. CUSTENBORDER FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER	DEPARTMENT OF TRANSPORTATION	DESIGN BRANCH	POST MILES XP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 1 OF 4

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES: 10/24/08, 3/27/09, 4/28/09

SHEET 8 OF 11

FILE => 57-rw437-z-lotb01.dgn

USERNAME => trmikesl
DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:04

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	834	886

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

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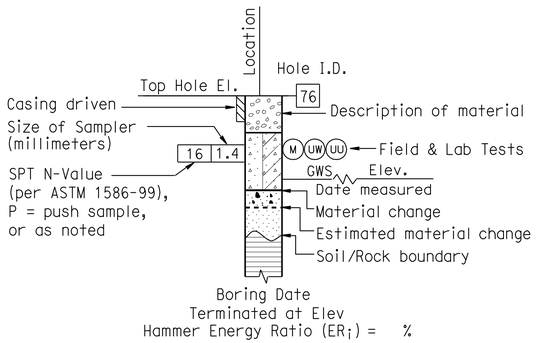
CEMENTATION	
Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

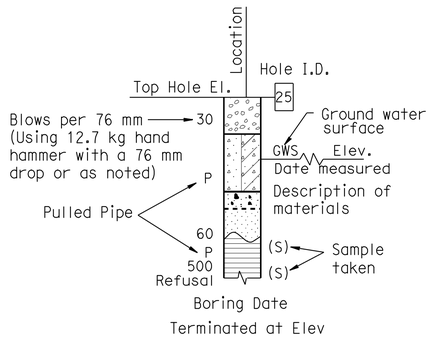
BOREHOLE IDENTIFICATION		
Symbol	Hole Type	Description
Size	A	Auger Boring
Size	R P	Rotary drilled boring Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (25 mm soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778-95)
⬚	O	Other
Note: Size in millimeters.		

CONSISTENCY OF COHESIVE SOILS				
Description	Unconfined Compressive Strength (tsm)	Pocket Penetrometer Measurement (tsm)	Torvane Measurement (tsm)	Field Approximation
Very Soft	< 24	< 24	< 12	Easily penetrated several inches by fist
Soft	24 to 48	24 to 48	12 to 24	Easily penetrated several inches by thumb
Medium Stiff	48 to 96	48 to 96	24 to 48	Penetrated several inches by thumb with moderate effort
Stiff	96 to 192	96 to 192	48 to 96	Readily indented by thumb but penetrated only with great effort
Very Stiff	192 to 383	192 to 383	96 to 192	Readily indented by thumbnail
Hard	> 383	> 383	> 192	Indented by thumbnail with difficulty

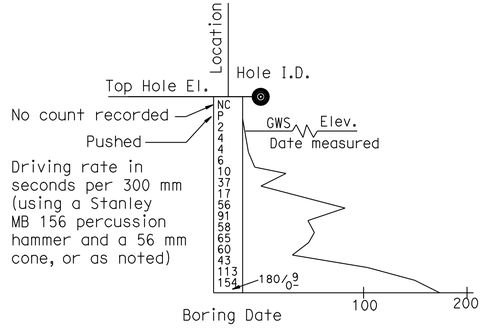
PLASTICITY OF FINE-GRAINED SOILS	
Description	Criteria
Nonplastic	A 3 mm thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.



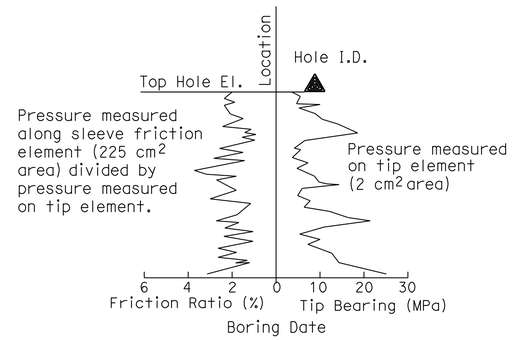
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) SOUNDING

SOIL LEGEND

ENGINEERING SERVICES	GEOTECHNICAL SERVICES		STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 437R
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER		DESIGN BRANCH	POST MILES XP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 2 OF 4
NAME:	CHECKED BY: G. CUSTENBORDER					

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

FILE => 57-rw437-z-lotb02.dgn

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 10/1/08 | 3/3/09 | 4/28/09

SHEET 9 OF 11

USERNAME => tfmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:05

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	835	886

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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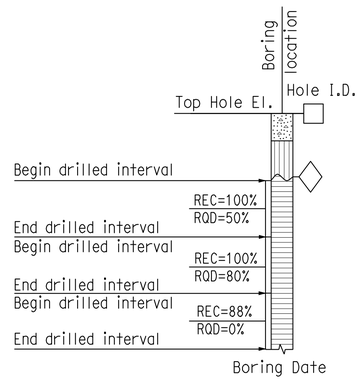
PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

$$REC = \frac{\sum \text{Length of the recovered core pieces}}{\text{Total length of core run}} \times 100\%$$

$$RQD = \frac{\sum \text{Length of intact core pieces} \geq 100\ mm}{\text{Total length of core run}} \times 100\%$$



RELATIVE STRENGTH OF INTACT ROCK

Term	Uniaxial Compressive Strength (MPa)
Extremely Strong	> 207
Very Strong	100 - 207
Strong	49 - 100
Medium Strong	25 - 49
Weak	5 - 25
Very Weak	1 - 5
Extremely Weak	< 1

BEDDING SPACING

Description	Thickness / Spacing
Massive	Greater than 3 m
Very thickly bedded	1 m to 3 m
Thickly bedded	300 mm to 1 m
Moderately bedded	100 mm to 300 mm
Thinly bedded	30 mm to 100 mm
Very thinly bedded	10 mm to 30 mm
Laminated	Less than 10 mm

LEGEND OF ROCK MATERIALS

- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

ROCK HARDNESS

Description	Criteria
Extremely Hard	Specimen cannot be scratched with a pocket knife or sharp pick; can only be chipped with repeated heavy hammer blows.
Very Hard	Specimen cannot be scratched with a pocket knife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Specimen can be scratched with a pocket knife or sharp pick with difficulty (heavy pressure). Heavy hammer blows required to break specimen.
Moderately Hard	Specimen can be scratched with pocket knife or sharp pick with light or moderate pressure. Core breaks with moderate hammer pressure.
Moderately Soft	Specimen can be grooved 5 mm deep with a pocket knife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Specimen can be grooved or gouged easily by a pocket knife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Specimen can be readily indented, grooved or gouged with fingernail, or carved with a pocket knife. Breaks with light manual pressure.

FRACTURE DENSITY

Description	Observed Fracture Density
Unfractured	No fractures.
Very slightly fractured	Lengths greater than 1 m.
Slightly fractured	Lengths from 300 mm to 1000 mm with few lengths less than 300 mm or greater than 1000 mm.
Moderately fractured	Lengths mostly in 100 mm to 300 mm range with most lengths about 200 mm.
Intensely fractured	Lengths average from 30 mm to 100 mm with scattered fragmented intervals with lengths less than 100 mm.
Very intensely fractured	Mostly chips and fragments with a few scattered short core lengths.

Combination descriptors (such as "Very intensely to intensely fractured") are used where equal distribution of both fracture density characteristics is present over a significant interval or exposure, or where characteristics are "in between" the descriptor definitions. Only two adjacent descriptors may be combined.

WEATHERING DESCRIPTORS FOR INTACT ROCK

Description	Diagnostic features: Chemical Weathering-Discoloration and/or oxidation — Body of Rock	Diagnostic features: Chemical Weathering-Discoloration and/or oxidation — Fracture Surfaces	Diagnostic features: Mechanical Weathering-Grain boundary conditions (disaggregation) primarily for granitics and some coarse-grained sediments	Diagnostic features: Texture and Solutioning — Texture	Diagnostic features: Texture and Solutioning — Solutioning	General Characteristics
Fresh	No discoloration, not oxidized.	No discoloration or oxidation.	No separation, intact (tight).	No change.	No solutioning.	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull.	Minor to complete discoloration or oxidation of most surfaces.	No visible separation, intact (tight).	Preserved.	Minor leaching of some soluble minerals may be noted.	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty," feldspar crystals are "cloudy."	All fracture surfaces are discolored or oxidized.	Partial separation of boundaries visible.	Generally preserved.	Soluble minerals may be mostly leached.	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in-situ disaggregation, see grain boundary conditions.	All fracture surfaces are discolored or oxidized, surfaces friable.	Partial separation, rock is friable; in semiarid conditions granitics are disaggregated.	Texture altered by chemical disintegration (hydration, argillation).	Leaching of soluble minerals may be complete.	Dull sound when struck with hammer, usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures, or veinlets. Rock is significantly weakened.
Decomposed	Discolored or oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay.		Complete separation of grain boundaries (disaggregated).	Resembles a soil, partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete.		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes."

Combination descriptors (such as "slightly weathered to fresh") are permissible where equal distribution of both weathering characteristics is present over significant intervals or where characteristics present are "in between" the diagnostic feature. However, combination descriptors should not be used where significant, identifiable zones can be delineated. Only two adjacent descriptors may be combined. "Very intensely weathered" is the combination descriptor for "intensely weathered to decomposed."

ROCK LEGEND

ENGINEERING SERVICES	GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 437R
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS		DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 3 OF 4
NAME:	CHECKED BY: G. CUSTENBORDER	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER			

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

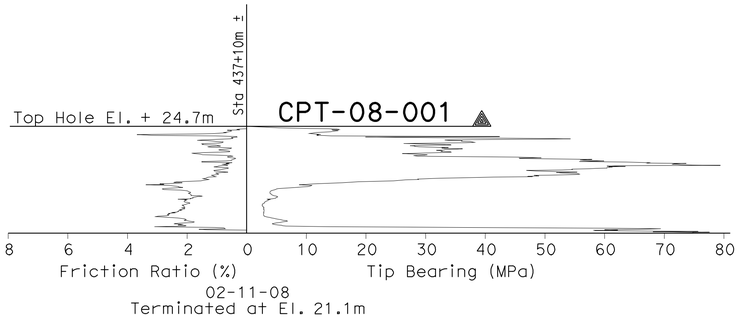
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

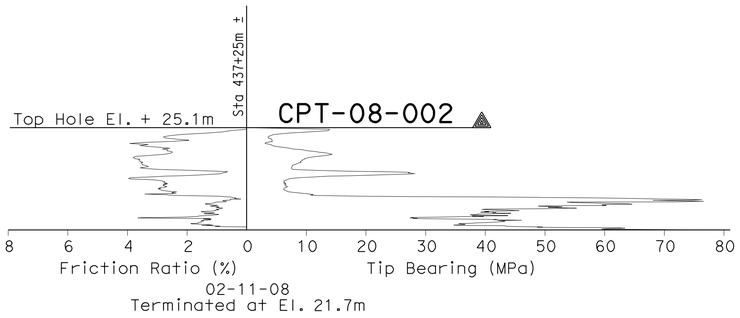
REVISION DATES								SHEET	OF
10/14/08	3/31/09	4/28/09						10	11

FILE => 57-rw437-z-lotb03.dgn

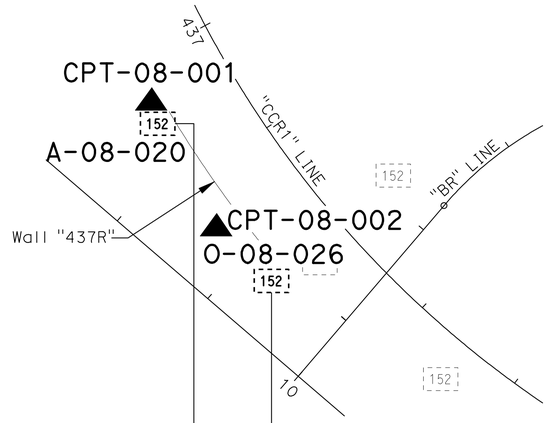
USERNAME => tmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:05

Bench Mark
All elevations shown in the LOTBs are in meters and are referenced to the NGVD 1929 Datum.

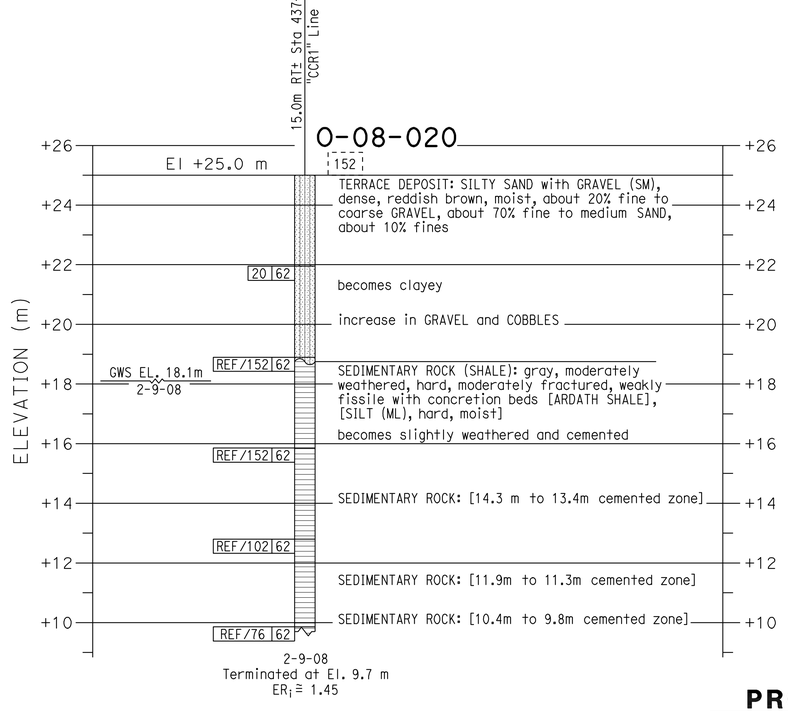


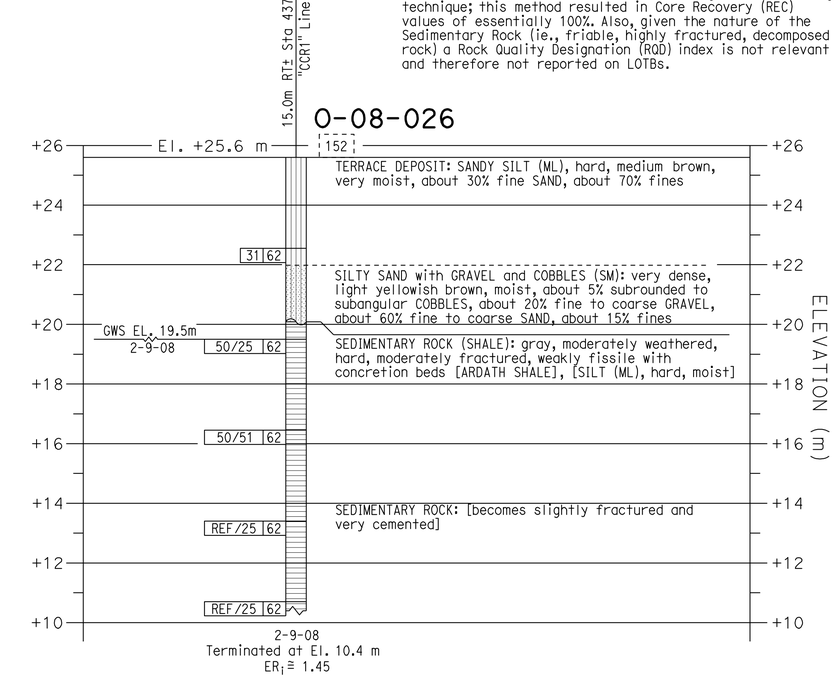


CONE PENETRATION TEST (CPT) SOUNDINGS



PLAN
1 : 500





PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	836	886

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

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SAN DIEGO, CA. 92111

NOTES:
1. 62 mm diameter samples were taken using a California split-barrel sampler with an inside diameter (I.D.) of 62 mm and an outside diameter (O.D.) of 83 mm.
2. Automatic trip and safety hammer systems consisting of hammer weight of 62.5 kg falling a distance of 762 mm were used to advance the drive samplers in accordance with ASTM D1586.
3. The average hammer energy ratio (ER$_i$) reflects the percentage efficiency of SPT blowcounts (N-value). The estimated ER$_i$ for the various drilling equipment used was as follows:
   Boart Longyear:
   Longyear 1405: ER$_i$≅1.45
   Prosonic Track Mounted: ER$_i$≅1.00
   Prosonic 1: ER$_i$≅1.45
   Minisonic: ER$_i$≅1.00
   Test America:
   CME 95: ER$_i$≅1.45
   Pacific Drilling:
   Unimog: ER$_i$≅1.27
   Mole: ER$_i$≅1.00
   Minimole: ER$_i$≅1.00
4. The sedimentary rock was obtained utilizing a sonic drilling technique; this method resulted in Core Recovery (REC) values of essentially 100%. Also, given the nature of the Sedimentary Rock (ie., friable, highly fractured, decomposed rock) a Rock Quality Designation (RQD) index is not relevant and therefore not reported on LOTBs.

ENGINEERING SERVICES	GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 437R
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS				
NAME:	CHECKED BY: G. CUSTENBORDER	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER	DESIGN BRANCH	POST MILES XP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 4 OF 4

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

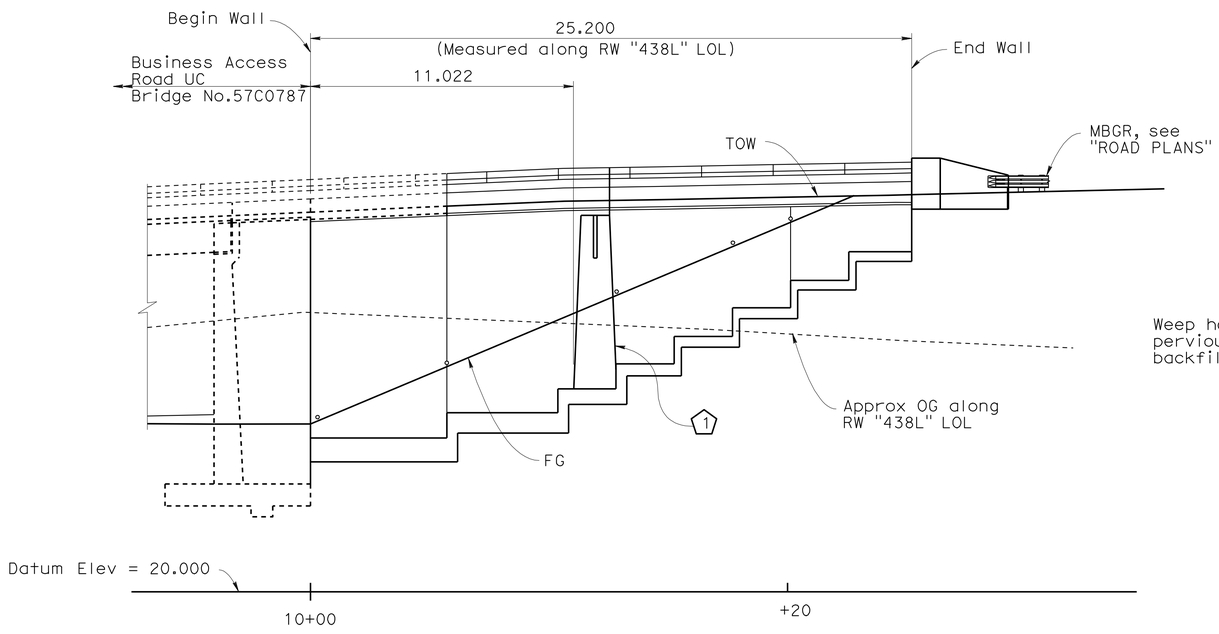
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES: 10/11/08, 3/9/09, 4/28/09

SHEET 11 OF 11

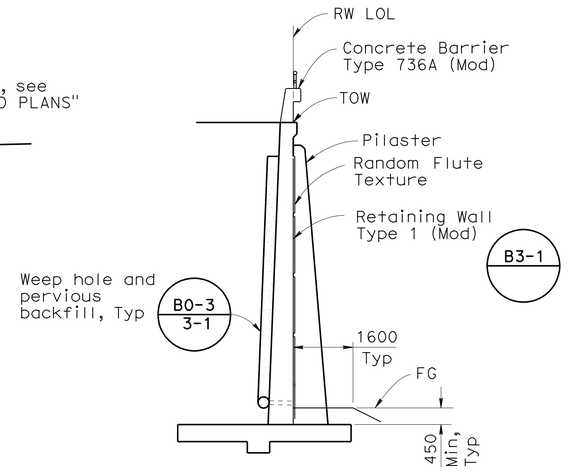
FILE => 57-rw437-z-lotb04.dgn

DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:05
USERNAME => rmikes



DEVELOPED ELEVATION (MIRRORED)

1:125



TYPICAL SECTION

1:80

CURVE DATA

No.	R	△	T	L
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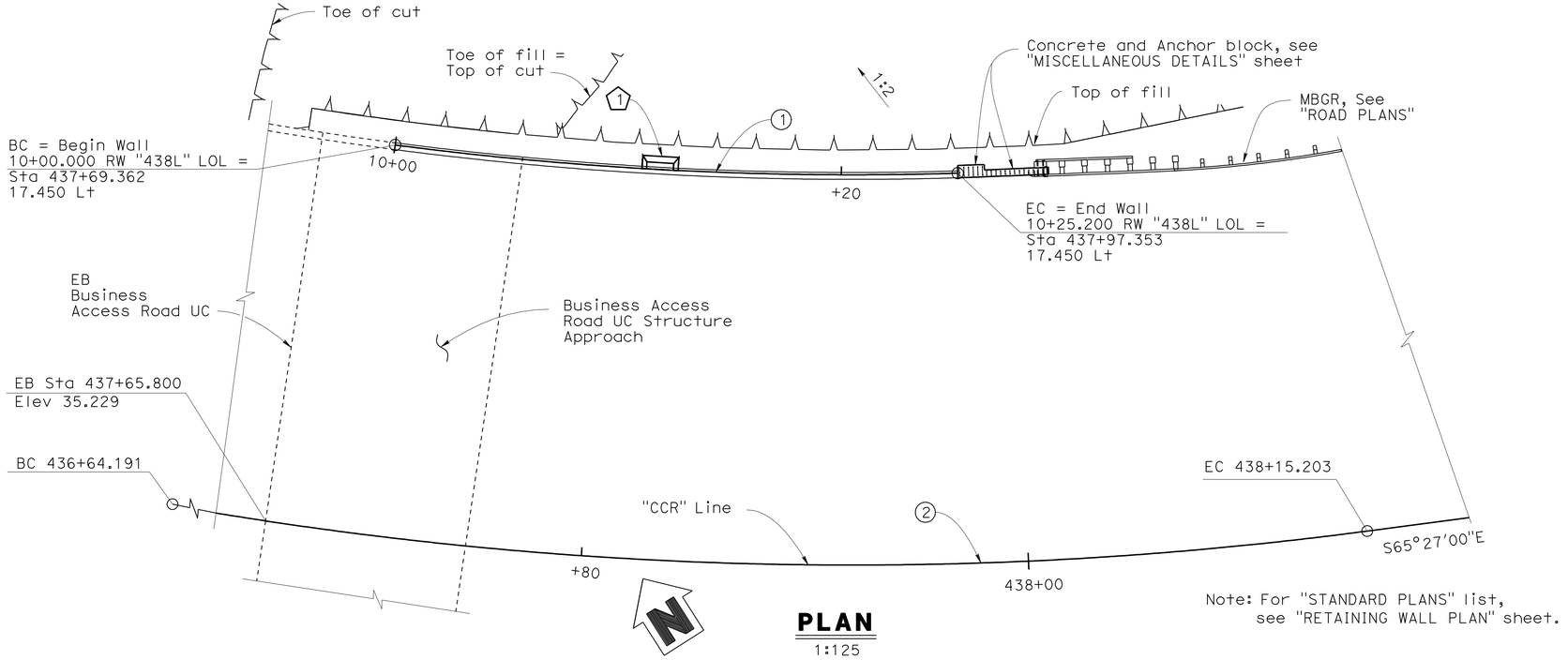
②	175.000	49°26'31"	80.569	151.012



PLAN

1:125

Note: For "STANDARD PLANS" list,
see "RETAINING WALL PLAN" sheet.

LEGEND

① - Pilaster

QUANTITIES

STRUCTURE EXCAVATION (RETAINING WALL)	510	m3
STRUCTURE BACKFILL (RETAINING WALL)	590	m3
PERVIOUS BACKFILL MATERIAL (RETAINING WALL)	25	m3
STRUCTURAL CONCRETE, RETAINING WALL	198	m3
ARCHITECTURAL TREATMENT (RANDOM FLUTE TEXTURE)	75	m2
BAR REINFORCING STEEL (RETAINING WALL)	25 550	kg
TUBULAR PIPE HANDRAILING	20	m
CONCRETE BARRIER (TYPE 736A MODIFIED)	20	m

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	837	886

REGISTERED CIVIL ENGINEER — 4-28-09 DATE

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — James L. Rucker — No. 47796 — Exp. 12-31-09 — CIVIL — STATE OF CALIFORNIA

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INDEX TO RETAINING WALL PLANS

ALL DIMENSIONS ARE IN
METERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED	LOAD FACTOR DESIGN		
DESIGN	Arash Monsefan	Brett Makley			
DETAILS	Tatyana Gnip	Arash Monsefan	LAYOUT	Arash Monsefan	Brett Makley
QUANTITIES	Tatyana Gnip	Arash Monsefan	SPECIFICATIONS	Jeremy LaHaye	PLANS AND SPECS COMPARED Jeremy LaHaye

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 438L
GENERAL PLAN

DESIGN GENERAL PLAN SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

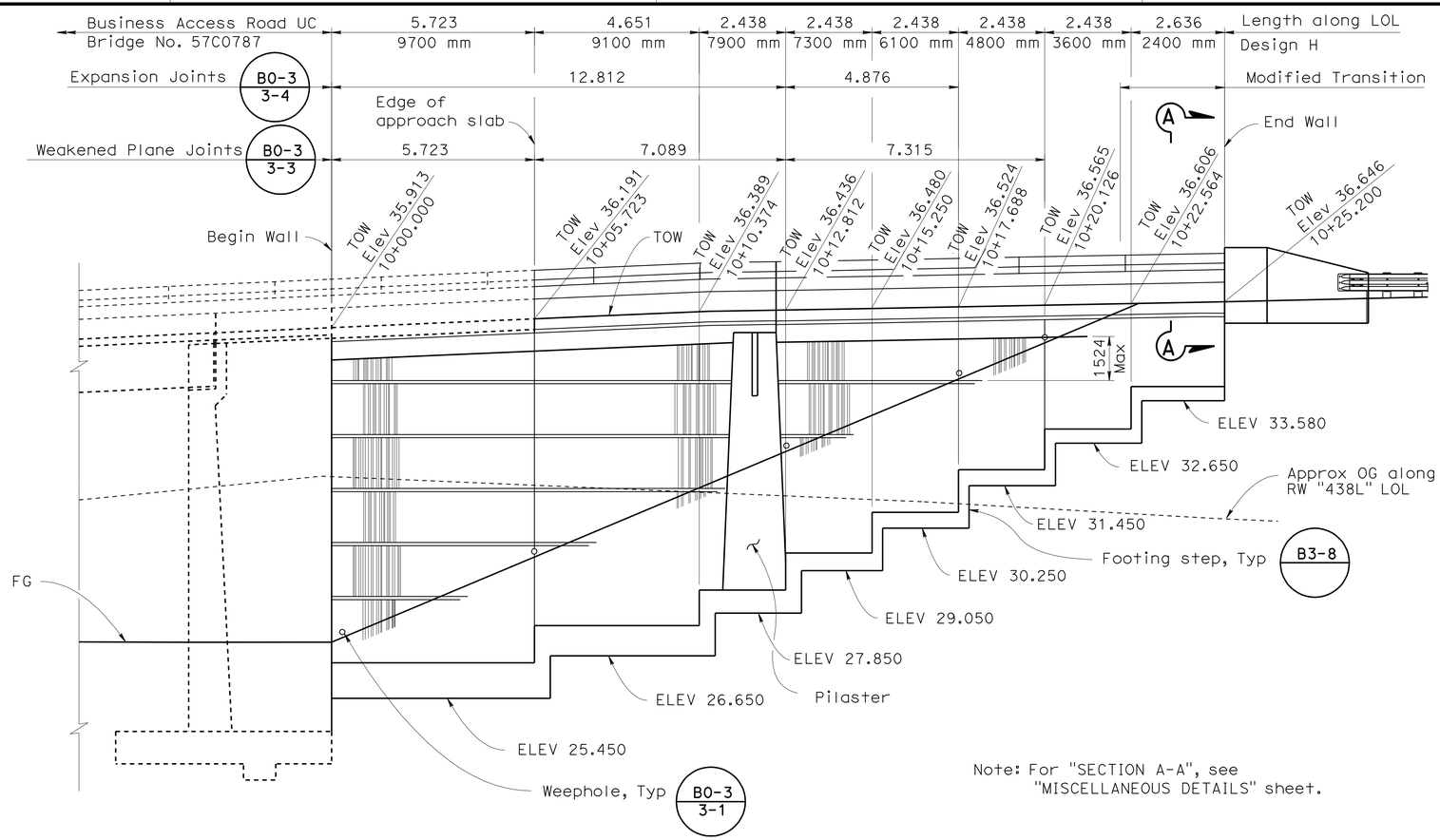
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 12-19-08 | 3-9-09 | 4-28-09

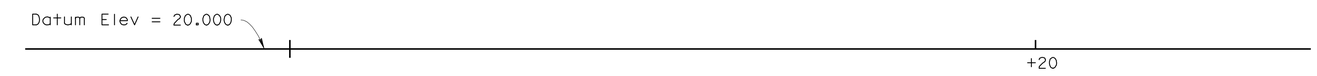
SHEET 1 OF 10

FILE => 57-rw438L-a-gp01.dgn

USERNAME => trmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:05

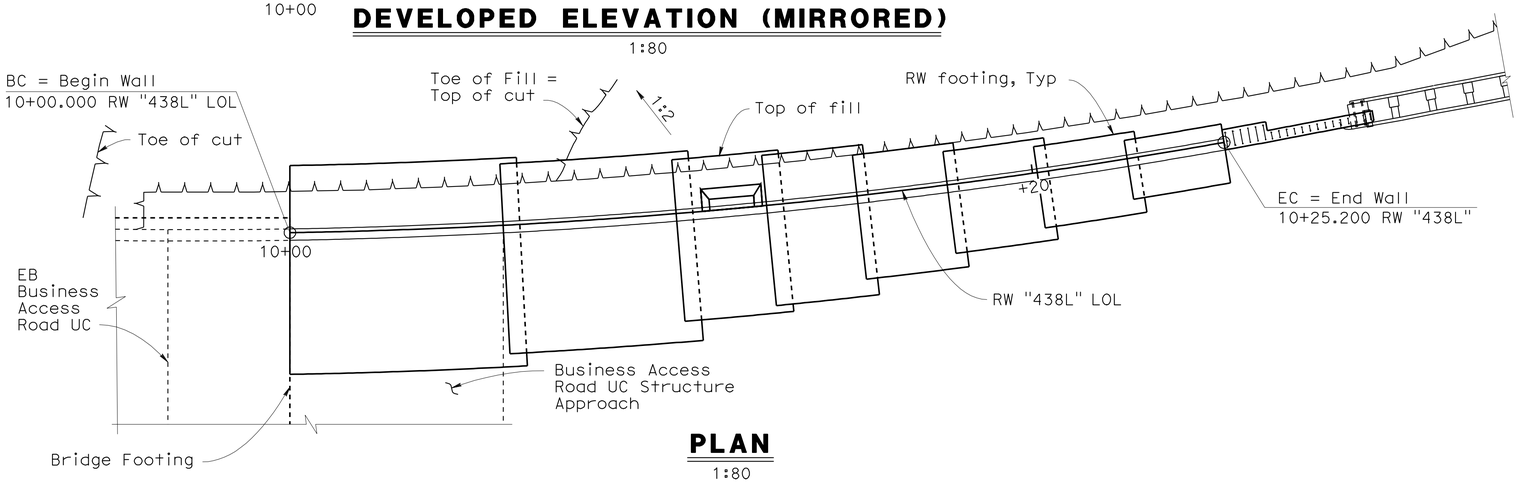


Note: For "SECTION A-A", see "MISCELLANEOUS DETAILS" sheet.



DEVELOPED ELEVATION (MIRRORED)

1:80



PLAN

1:80

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	838	886

REGISTERED CIVIL ENGINEER — 4-28-09 DATE

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — James L. Rucker — No. 47796 — Exp. 12-31-09 — CIVIL — STATE OF CALIFORNIA

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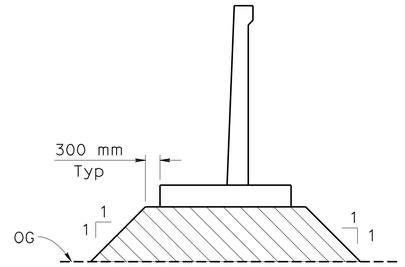
LEGEND

▨ - Structure Backfill (Retaining Wall)



Approx Station 10+18 to 10+25

LIMITS OF PAYMENT FOR EARTHWORK

N.T.S

Note: Earthwork limits in addition to A62C

STANDARD PLANS (DATED JULY 2004)

A10A	ACRONYMS AND ABBREVIATIONS (A-L)
A10B	ACRONYMS AND ABBREVIATIONS (M-Z)
A62C	LIMITS OF PAYMENT FOR EXCAVATION AND BACKFILL BRIDGE
A77J3	METAL BEAM GUARD RAILING CONNECTIONS TO ABUTMENT AND WALLS
B0-3	BRIDGE DETAILS
B3-1	RETAINING WALL TYPE 1 (H=1200 THROUGH 9100 mm)
B3-8	RETAINING WALL DETAIL NO. 1
B11-51	TUBULAR HAND RAILING
B11-56	CONCRETE BARRIER TYPE 736

STANDARD PLAN SHEET NO.

DETAIL NO.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Arash Monsefan	Brett Makley
DETAILS	Tatyana Gnip	Arash Monsefan
QUANTITIES	Tatyana Gnip	Arash Monsefan

PREPARED FOR THE STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 438L
RETAINING WALL PLAN

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY): 12-19-08 | 3-9-09 | 4-28-09

SHEET 2 OF 10

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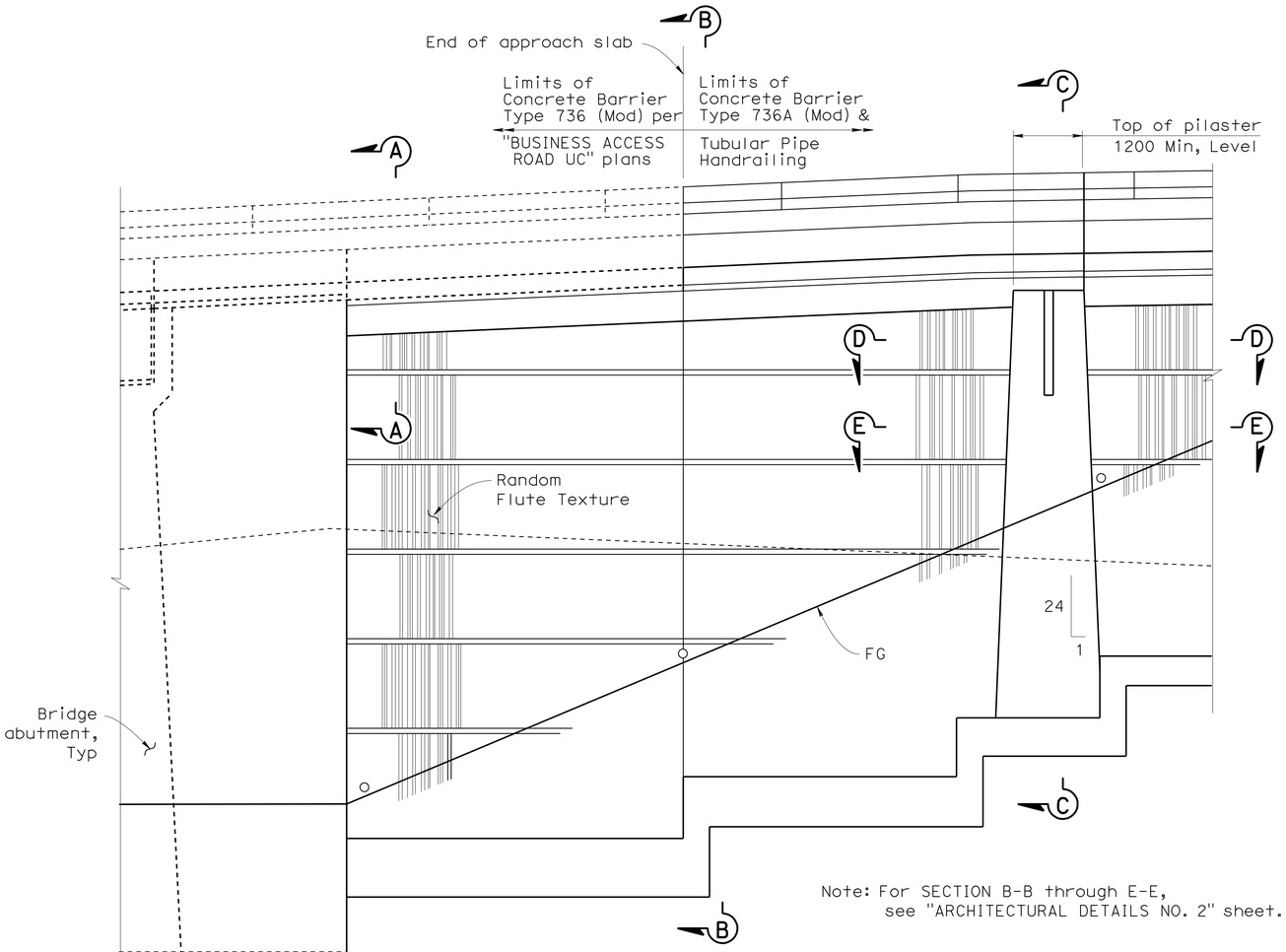
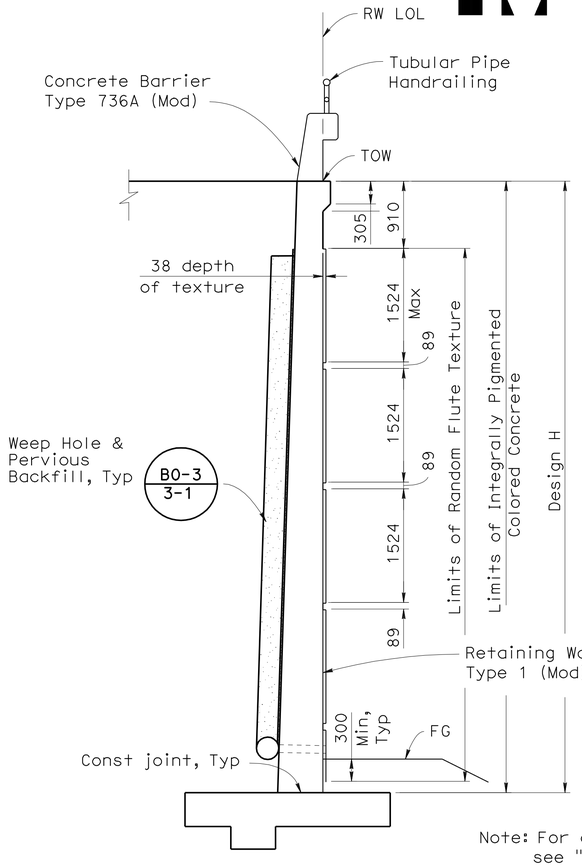
USERNAME => rmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:06



Note: For SECTION B-B through E-E, see "ARCHITECTURAL DETAILS NO. 2" sheet.

PART ELEVATION (MIRRORED)

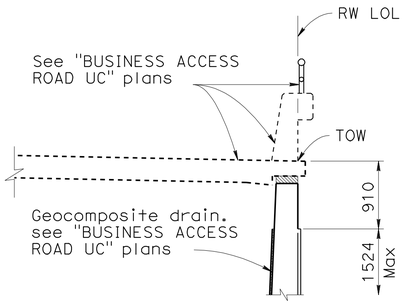
1:40



Note: For control dimension, see "RETAINING WALL PLAN" sheet.

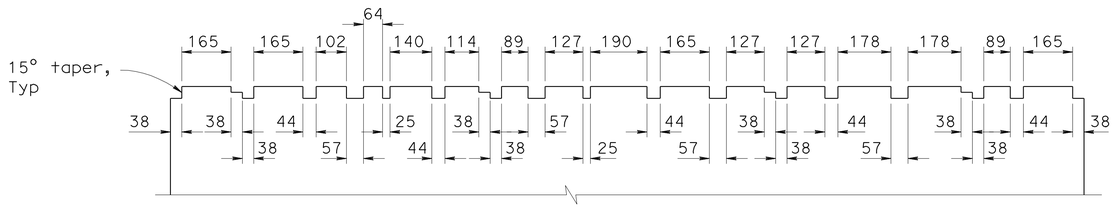
TYPICAL SECTION

N.T.S



SECTION A-A

1:40



RANDOM FLUTE TEXTURE DETAIL

1:10

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	839	886

REGISTERED CIVIL ENGINEER — DATE 4-28-09

James L. Rucker, No. 47796, Exp. 12-31-09, CIVIL, REGISTERED PROFESSIONAL ENGINEER, STATE OF CALIFORNIA

PLANS APPROVAL DATE 9-27-10

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CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Arash Monsefan	Brett Makley
DETAILS	Tatyana Gnip	Arash Monsefan
QUANTITIES	Tatyana Gnip	Arash Monsefan

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 438L
ARCHITECTURAL DETAILS NO. 1

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY): 12-19-08, 3-9-09, 4-15-09, 4-28-09

SHEET 3 OF 10

FILE => 57-rw438L-g-rwdt01.dgn

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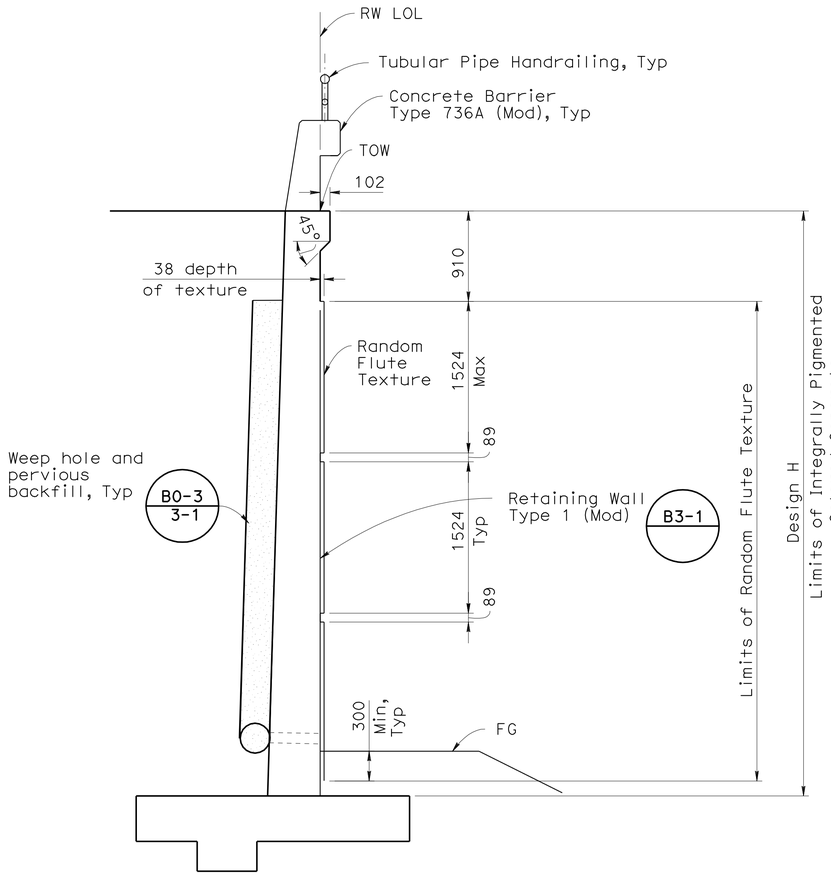

SECTION B-B

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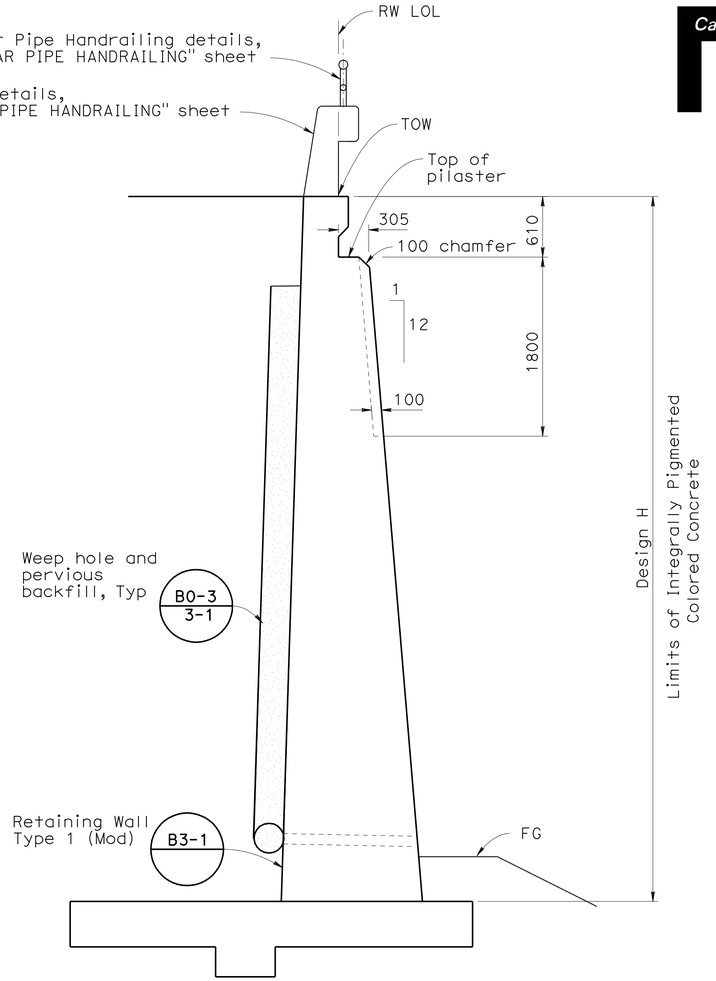
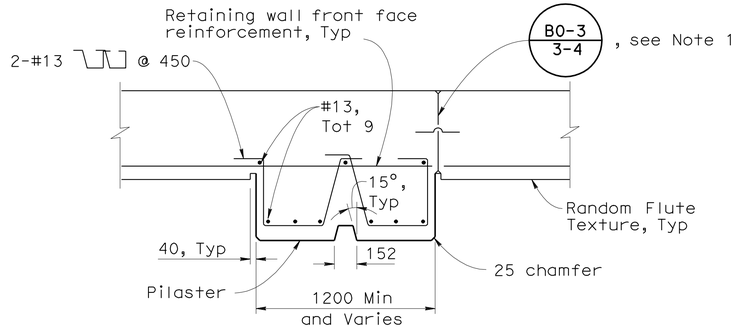


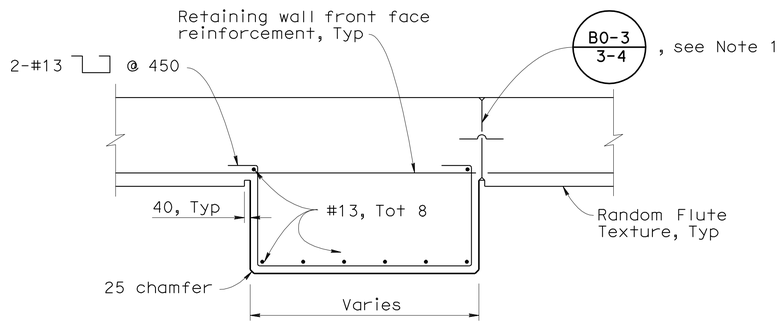
SECTION C-C

1:30



SECTION D-D

1:20



SECTION E-E

1:20

NOTES:

1. Expansion joint to follow edge of pilaster.
2. For details not shown, see B3-1.

ALL DIMENSIONS ARE IN
MILLIMETERS UNLESS OTHERWISE SHOWN

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	840	886

Caltrans Metric

REGISTERED CIVIL ENGINEER — 4-28-09 DATE

9-27-10
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CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Arash Monsefan	Brett Makley
DETAILS	Tatyana Gnip	Arash Monsefan
QUANTITIES	Tatyana Gnip	Arash Monsefan

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 438L
ARCHITECTURAL DETAILS NO. 2

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 12-19-08, 3-9-09, 4-28-09

SHEET 4 OF 10

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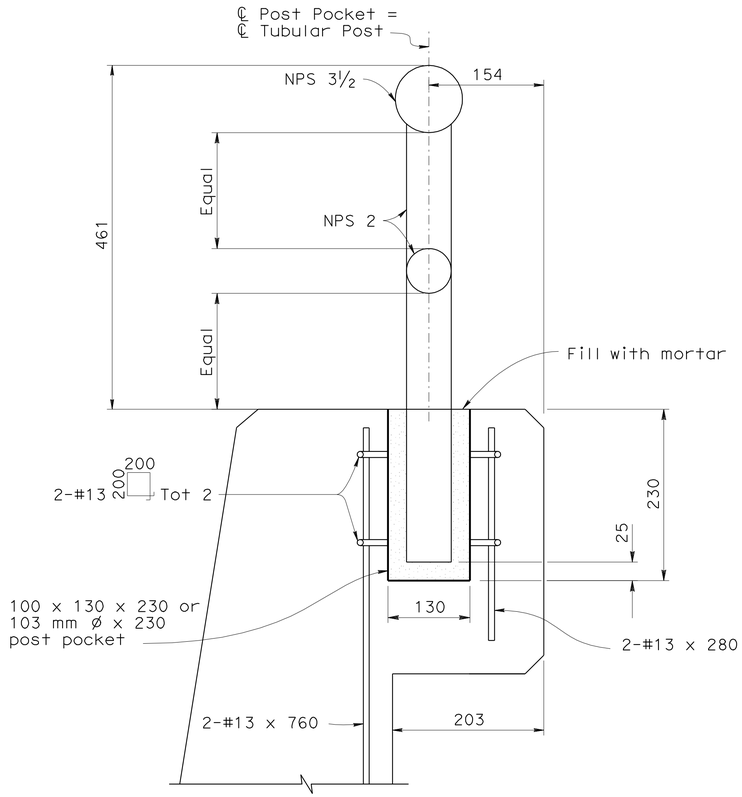
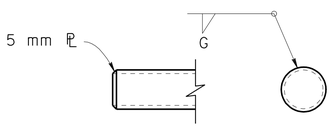


POST ANCHORAGE DETAILS

No Scale



RAIL CAP DETAILS

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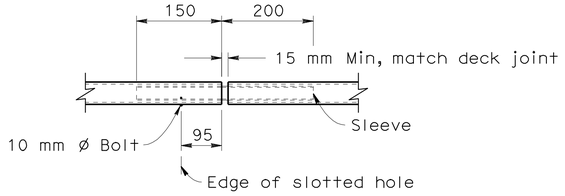
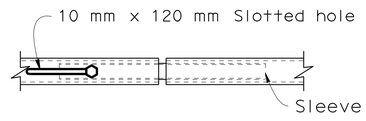
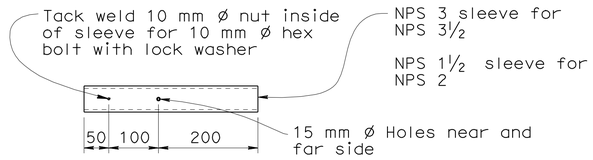


VIEW G-G



VIEW H-H



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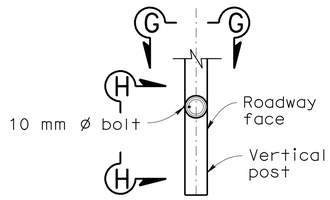
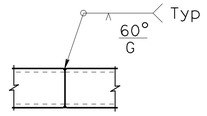


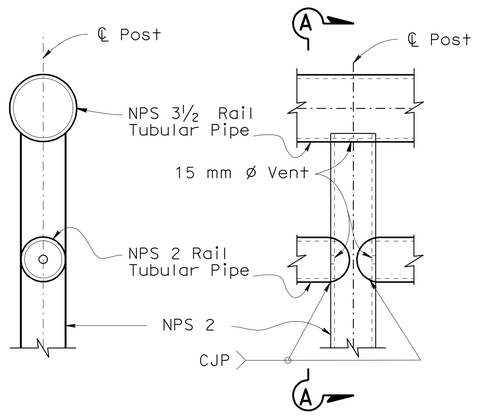
SECTION



TUBE-WELD SPLICE

TUBULAR PIPE SPLICE DETAILS

No Scale

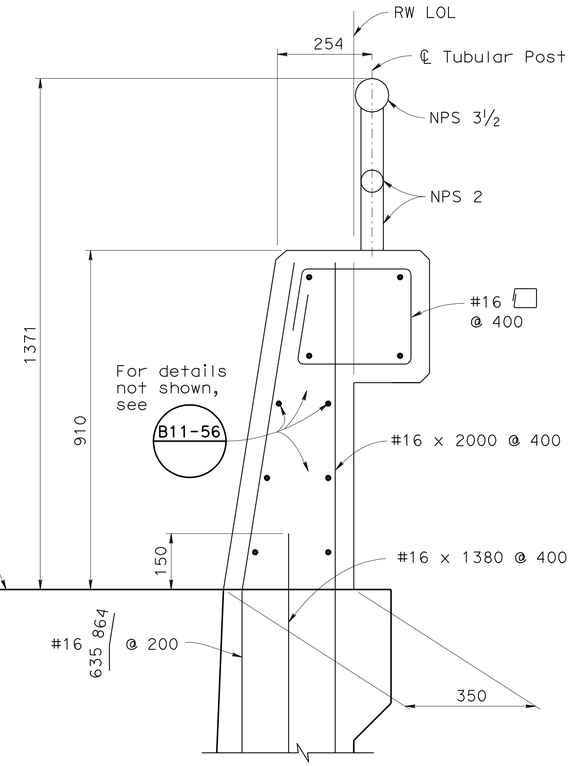


SECTION A-A

1:10

ELEVATION

1:10
For Typ Welded Section



CONCRETE BARRIER TYPE 736A (MOD)

1:8

NOTES:

1. Galvanize rail assembly after fabrication.
2. Post shall be vertical.
3. Tubular pipe splices shall be located in the pipes spanning deck or wall joints. Increase joint width in pipes to match expansion joint width and increase sleeve length accordingly.
4. Top rail tubular pipe shall be continuos over not less than two posts.
5. For details and reinforcement not shown see B11-51 and B11-56.
6. All tubular pipe posts and rails shall be NPS standard weight A53 grade B Type E Pipes.

ALL DIMENSIONS ARE IN
MILLIMETERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Arash Monsefan	Brett Makley
DETAILS	Tatyana Gnip	Arash Monsefan
QUANTITIES	Tatyana Gnip	Arash Monsefan

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 438L
TUBULAR PIPE HANDRAILING

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY): 12-19-08 | 3-9-09 | 4-28-09

SHEET 5 OF 10

FILE => 57-rw438L-q-Arch01.dgn

USERNAME => ttmikesi DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:06

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	842	886

REGISTERED CIVIL ENGINEER — 4-28-09 DATE

9-27-10
PLANS APPROVAL DATE

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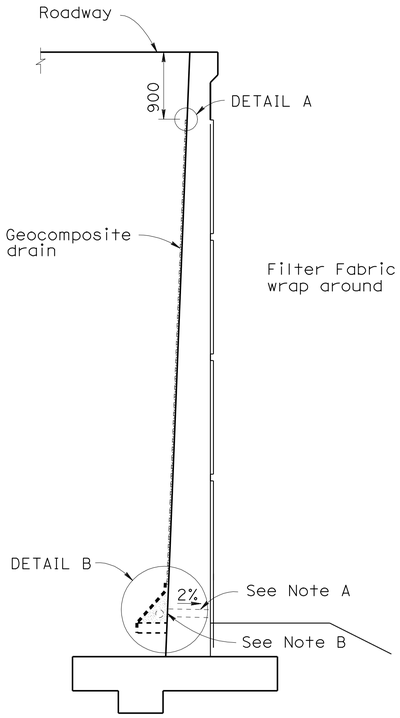
SAN DIEGO, CA 92108



WALL SECTION
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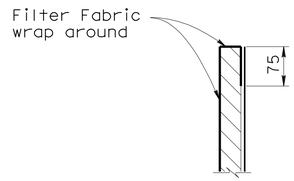

DETAIL A
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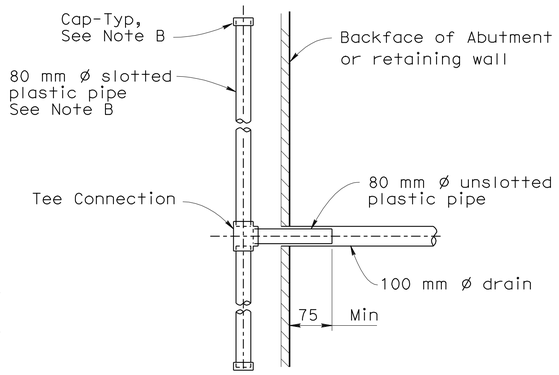
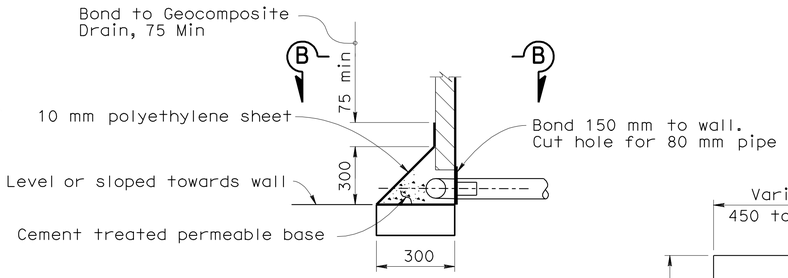


SECTION B-B
No Scale



DETAIL B
No Scale

WEEP HOLE AND GEOCOMPOSITE DRAIN

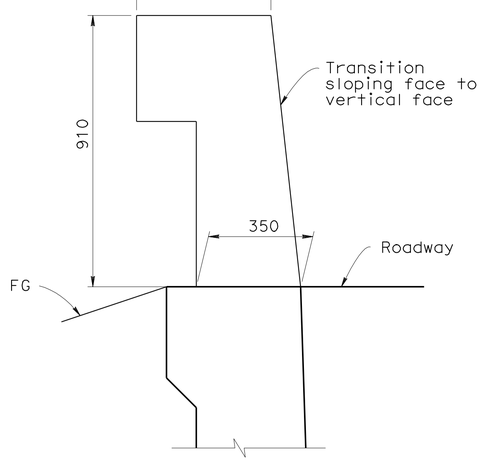
Alternative to Bridge Detail B0-3 / 3-1

NOTES

A. 100 mm ø drains at intermediate sag points and at 7620 mm max. center to center (2743 mm c-c for Type 3 and 2819mm c-c for Type 4 retaining walls). For walls adjacent to sidewalks or curbs, provide 100 mm plastic pipe under sidewalk to discharge through curb face. Exposed wall drains shall be located 75 mm± above finished grade.

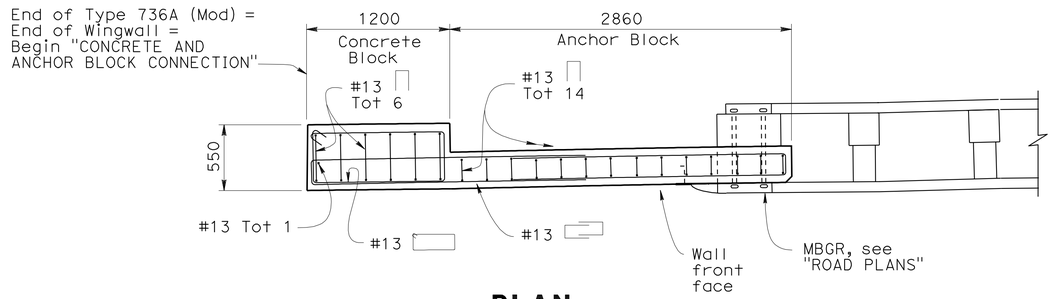
B. Geocomposite drain, cement treated permeable base, and 80 mm ø slotted plastic pipe continuous behind retaining wall or abutment. Cap ends of pipe. Provide "Tee" connection at each 80 mm ø drain.

C. Connect the low end of plastic pipe to the main outlet pipe as applicable.

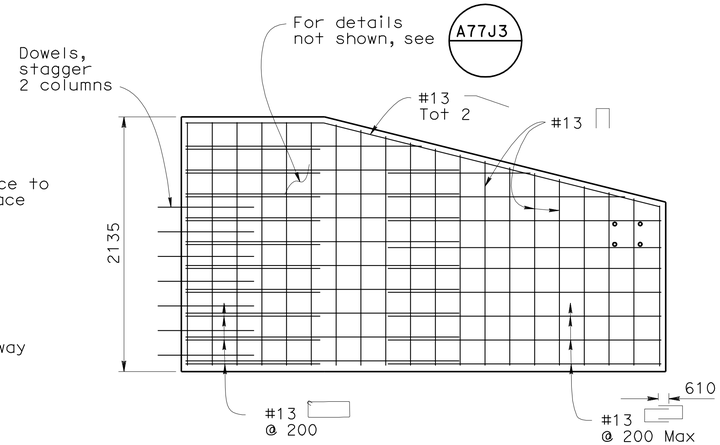


SECTION A-A
1:10

Note: For transition details not shown, see B11-56.



PLAN



ELEVATION

Note: MBGR not shown for clarity.

CONCRETE AND ANCHOR BLOCK CONNECTION
1:25

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

DESIGN	BY Arash Monsefan	CHECKED Brett Makley	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
DETAILS	BY Tatyana Gnip	CHECKED Arash Monsefan	
QUANTITIES	BY Tatyana Gnip	CHECKED Arash Monsefan	

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 438L
MISCELLANEOUS DETAILS

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 12-19-08, 3-9-09, 4-28-09

SHEET 6 OF 10

FILE => 57-rw438L-u-miscdt01.dgn

USERNAME => ttmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:06

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	843	886

16

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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SANDAG
401 B STREET,
SAN DIEGO, CA. 92101

BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111

APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 300 mm)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 300 mm
Cobble		76 mm to 300 mm
Gravel	Coarse	19 mm to 76 mm
	Fine	No. 4 to 19 mm
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

SOIL LEGEND

ENGINEERING SERVICES	GEOTECHNICAL SERVICES			
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN
NAME:	CHECKED BY: G. CUSTENBORDER			DESIGN BRANCH

BRIDGE NO.
POST MILES KP43.2/PM26.8

RETAINING WALL 438L

LOG OF TEST BORINGS SHEET NO. 1 OF 4

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES									SHEET	OF
10/14/08	3/9/09	4/28/09							7	10

FILE => 57-rw438L-z-1otb01.dgn

DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:06
USERNAME => ttmikes1

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5, 805	R49.9/R51.7, 42.6/46.5	844	886

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring
Size	R P	Rotary drilled boring Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (25 mm soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778-95)
⬚	O	Other

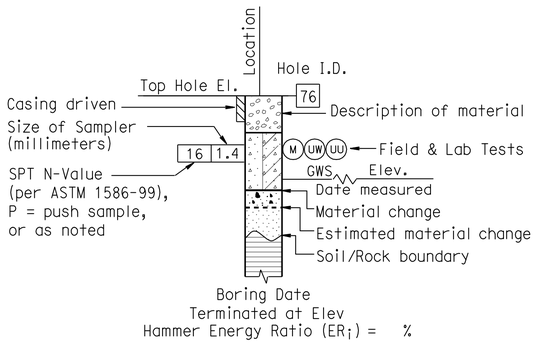
Note: Size in millimeters.

CONSISTENCY OF COHESIVE SOILS

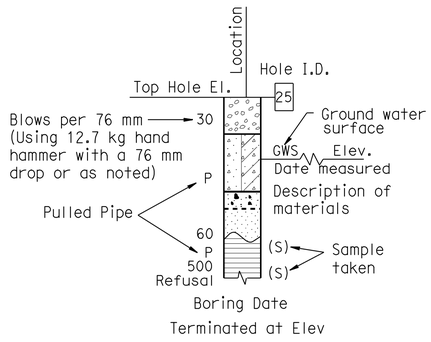
Description	Unconfined Compressive Strength (tsm)	Pocket Penetrometer Measurement (tsm)	Torvane Measurement (tsm)	Field Approximation
Very Soft	< 24	< 24	< 12	Easily penetrated several inches by fist
Soft	24 to 48	24 to 48	12 to 24	Easily penetrated several inches by thumb
Medium Stiff	48 to 96	48 to 96	24 to 48	Penetrated several inches by thumb with moderate effort
Stiff	96 to 192	96 to 192	48 to 96	Readily indented by thumb but penetrated only with great effort
Very Stiff	192 to 383	192 to 383	96 to 192	Readily indented by thumbnail
Hard	> 383	> 383	> 192	Indented by thumbnail with difficulty

PLASTICITY OF FINE-GRAINED SOILS

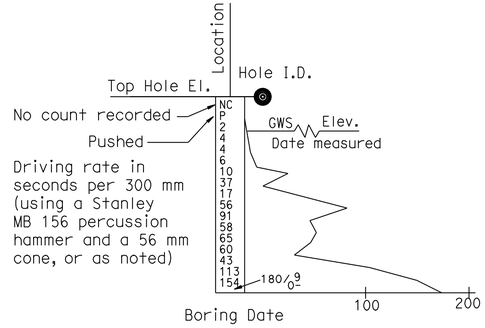
Description	Criteria
Nonplastic	A 3 mm thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.



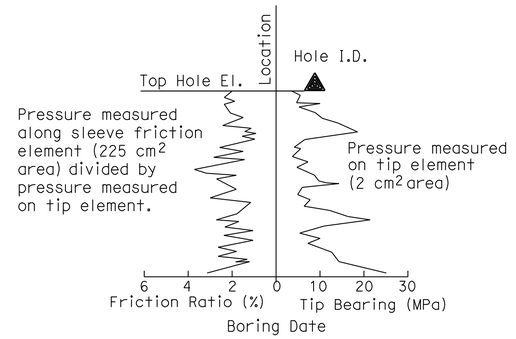
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) SOUNDING

SOIL LEGEND

ENGINEERING SERVICES	GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 438L
FUNCTIONAL SUPERVISOR NAME:	DRAWN BY: J. JOHNS CHECKED BY: G. CUSTENBORDER	FIELD INVESTIGATIONS BY: V. OLIN G. CUSTENBORDER	DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 2 OF 4

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

FILE => 57-rw438L-z-lotb02.dgn

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES								SHEET	OF
10/14/08	3/9/09	4/28/09						8	10

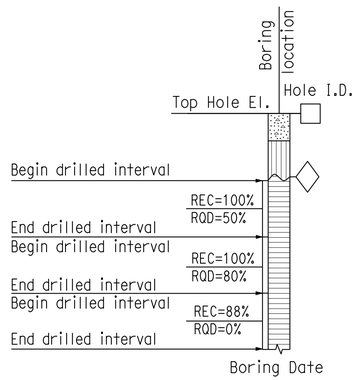
USERNAME => tfmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:07

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

$$REC = \frac{\sum \text{Length of the recovered core pieces}}{\text{Total length of core run}} \times 100\%$$

$$RQD = \frac{\sum \text{Length of intact core pieces} \geq 100\ mm}{\text{Total length of core run}} \times 100\%$$



RELATIVE STRENGTH OF INTACT ROCK

Term	Uniaxial Compressive Strength (MPa)
Extremely Strong	> 207
Very Strong	100 - 207
Strong	49 - 100
Medium Strong	25 - 49
Weak	5 - 25
Very Weak	1 - 5
Extremely Weak	< 1

BEDDING SPACING

Description	Thickness / Spacing
Massive	Greater than 3 m
Very thickly bedded	1 m to 3 m
Thickly bedded	300 mm to 1 m
Moderately bedded	100 mm to 300 mm
Thinly bedded	30 mm to 100 mm
Very thinly bedded	10 mm to 30 mm
Laminated	Less than 10 mm

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	845	886

16

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

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SAN DIEGO, CA. 92111

LEGEND OF ROCK MATERIALS

- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

ROCK HARDNESS

Description	Criteria
Extremely Hard	Specimen cannot be scratched with a pocket knife or sharp pick; can only be chipped with repeated heavy hammer blows.
Very Hard	Specimen cannot be scratched with a pocket knife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Specimen can be scratched with a pocket knife or sharp pick with difficulty (heavy pressure). Heavy hammer blows required to break specimen.
Moderately Hard	Specimen can be scratched with pocket knife or sharp pick with light or moderate pressure. Core breaks with moderate hammer pressure.
Moderately Soft	Specimen can be grooved 5 mm deep with a pocket knife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Specimen can be grooved or gouged easily by a pocket knife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Specimen can be readily indented, grooved or gouged with fingernail, or carved with a pocket knife. Breaks with light manual pressure.

FRACTURE DENSITY

Description	Observed Fracture Density
Unfractured	No fractures.
Very slightly fractured	Lengths greater than 1 m.
Slightly fractured	Lengths from 300 mm to 1000 mm with few lengths less than 300 mm or greater than 1000 mm.
Moderately fractured	Lengths mostly in 100 mm to 300 mm range with most lengths about 200 mm.
Intensely fractured	Lengths average from 30 mm to 100 mm with scattered fragmented intervals with lengths less than 100 mm.
Very intensely fractured	Mostly chips and fragments with a few scattered short core lengths.

Combination descriptors (such as "Very intensely to intensely fractured") are used where equal distribution of both fracture density characteristics is present over a significant interval or exposure, or where characteristics are "in between" the descriptor definitions. Only two adjacent descriptors may be combined.

WEATHERING DESCRIPTORS FOR INTACT ROCK

Description	Diagnostic features: Chemical Weathering-Discoloration and/or oxidation — Body of Rock	Diagnostic features: Chemical Weathering-Discoloration and/or oxidation — Fracture Surfaces	Diagnostic features: Mechanical Weathering-Grain boundary conditions (disaggregation) primarily for granitics and some coarse-grained sediments	Diagnostic features: Texture and Solutioning — Texture	Diagnostic features: Texture and Solutioning — Solutioning	General Characteristics
Fresh	No discoloration, not oxidized.	No discoloration or oxidation.	No separation, intact (tight).	No change.	No solutioning.	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull.	Minor to complete discoloration or oxidation of most surfaces.	No visible separation, intact (tight).	Preserved.	Minor leaching of some soluble minerals may be noted.	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty," feldspar crystals are "cloudy."	All fracture surfaces are discolored or oxidized.	Partial separation of boundaries visible.	Generally preserved.	Soluble minerals may be mostly leached.	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in-situ disaggregation, see grain boundary conditions.	All fracture surfaces are discolored or oxidized, surfaces friable.	Partial separation, rock is friable; in semiarid conditions granitics are disaggregated.	Texture altered by chemical disintegration (hydration, argillation).	Leaching of soluble minerals may be complete.	Dull sound when struck with hammer, usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures, or veinlets. Rock is significantly weakened.
Decomposed	Discolored or oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay.		Complete separation of grain boundaries (disaggregated).	Resembles a soil, partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete.		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes."

Combination descriptors (such as "slightly weathered to fresh") are permissible where equal distribution of both weathering characteristics is present over significant intervals or where characteristics present are "in between" the diagnostic feature. However, combination descriptors should not be used where significant, identifiable zones can be delineated. Only two adjacent descriptors may be combined. "Very intensely weathered" is the combination descriptor for "intensely weathered to decomposed."

ROCK LEGEND

ENGINEERING SERVICES	GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 438L
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS		DESIGN BRANCH	POST MILES	LOG OF TEST BORINGS SHEET NO. 3 OF 4
NAME:	CHECKED BY: G. CUSTENBORDER	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER		KP43.2/PM26.8	

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

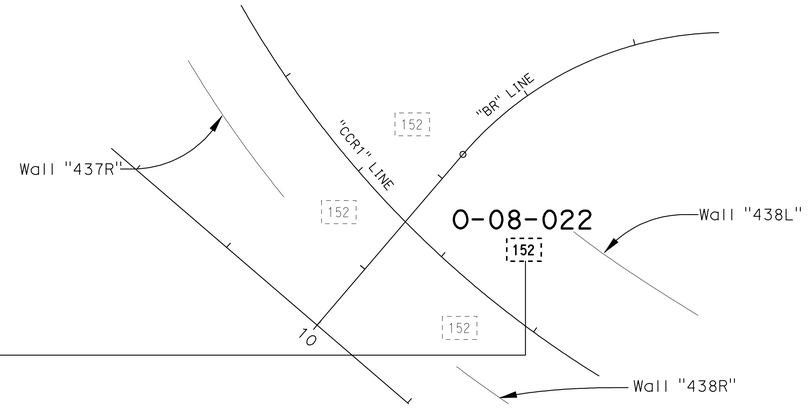
REVISION DATES: 10/14/08 | 3/31/09 | 4/28/09

SHEET 9 OF 10

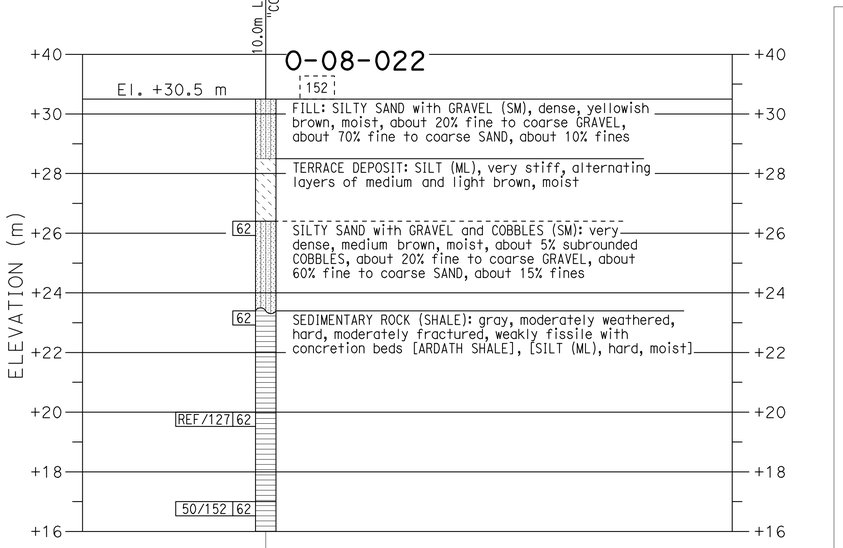
FILE => 57-rw438l-z-lotb03.dgn

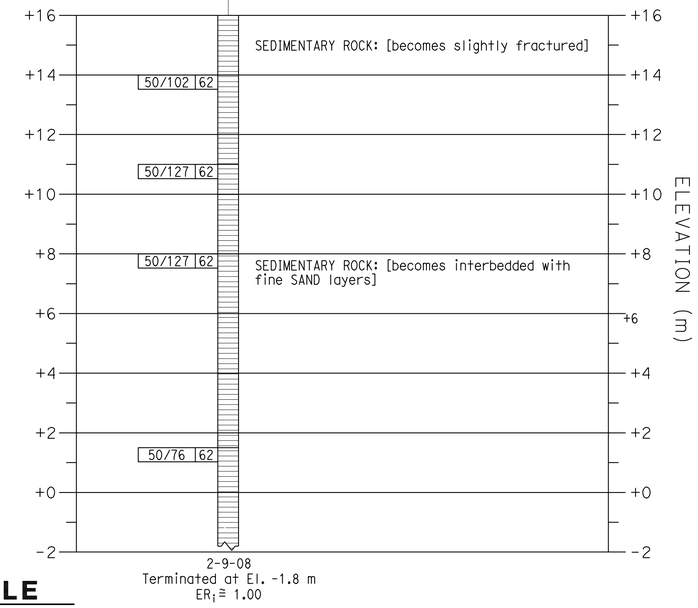
USERNAME => tmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:07

Bench Mark
All elevations shown in the LOTBs are in meters and are referenced to the NGVD 1929 Datum.



PLAN
1 : 500





PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	846	886

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER
VAN OLIN
NO. 2578
EXP. 6-30-10
GEOTECHNICAL
STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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SAN DIEGO, CA. 92111

NOTES:

1. 62 mm diameter samples were taken using a California split-barrel sampler with an inside diameter (I.D.) of 62 mm and an outside diameter (O.D.) of 83 mm.

2. Automatic trip and safety hammer systems consisting of hammer weight of 62.5 kg falling a distance of 762 mm were used to advance the drive samplers in accordance with ASTM D1586.

3. The average hammer energy ratio (ER$_i$) reflects the percentage efficiency of SPT blowcounts (N-value). The estimated ER$_i$ for the various drilling equipment used was as follows:
   Boart Longyear:
   Longyear 1405: ER$_i$≅1.45
   Prosonic Track Mounted: ER$_i$≅1.00
   Prosonic 1: ER$_i$≅1.45
   Minisonic: ER$_i$≅1.00
   Pacific Drilling:
   Unimog: ER$_i$≅1.27
   Mole: ER$_i$≅1.00
   Minimole: ER$_i$≅1.00
   Test America:
   CME 95: ER$_i$≅1.45

4. The sedimentary rock was obtained utilizing a sonic drilling technique; this method resulted in Core Recovery (REC) values of essentially 100%. Also, given the nature of the Sedimentary Rock (ie., friable, highly fractured, decomposed rock) a Rock Quality Designation (RQD) index is not relevant and therefore not reported on LOTBs.

ENGINEERING SERVICES		GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 438L
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN G. CUSTENBORDER		DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 4 OF 4
NAME:	CHECKED BY: G. CUSTENBORDER			CU 11275 EA 2T0401		

OGS CIVIL LOG OF TEST BORINGS SHEET
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: 10/14/08 | 3/9/09 | 4/28/09
SHEET 10 OF 10
FILE => 57-rw438L-z-lotb04.dgn

DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:07
USERNAME => trmikesl

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	847	886

REGISTERED CIVIL ENGINEER — 4-28-09 DATE

9-27-10
PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER — James L. Rucker — No. 47796 — Exp. 12-31-09 — CIVIL — STATE OF CALIFORNIA

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SAN DIEGO, CA 92101

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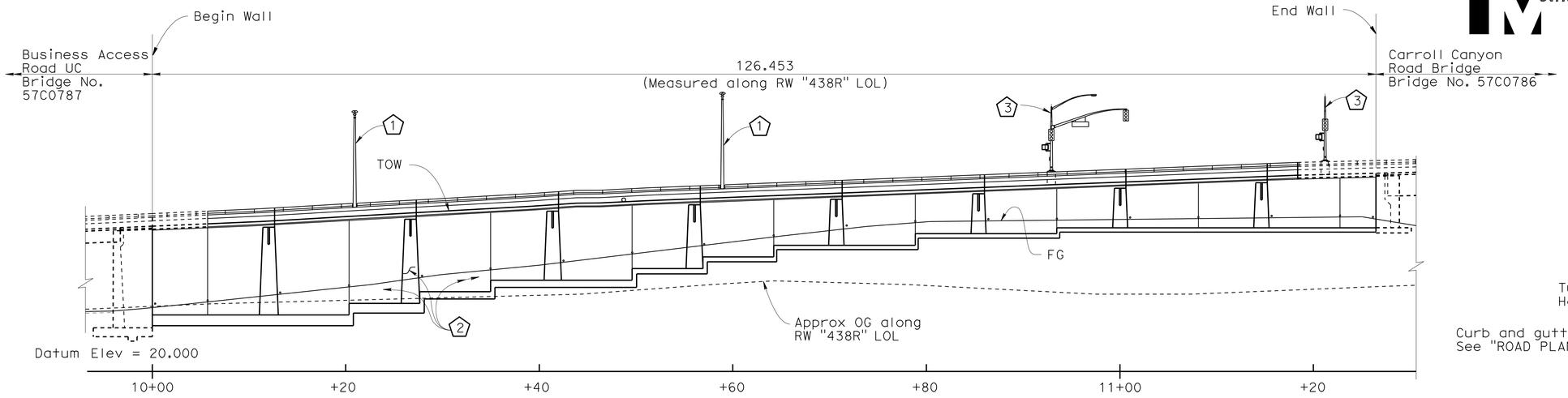
5030 CAMINO DE LA SIESTA, SUITE 204,
SAN DIEGO, CA 92108



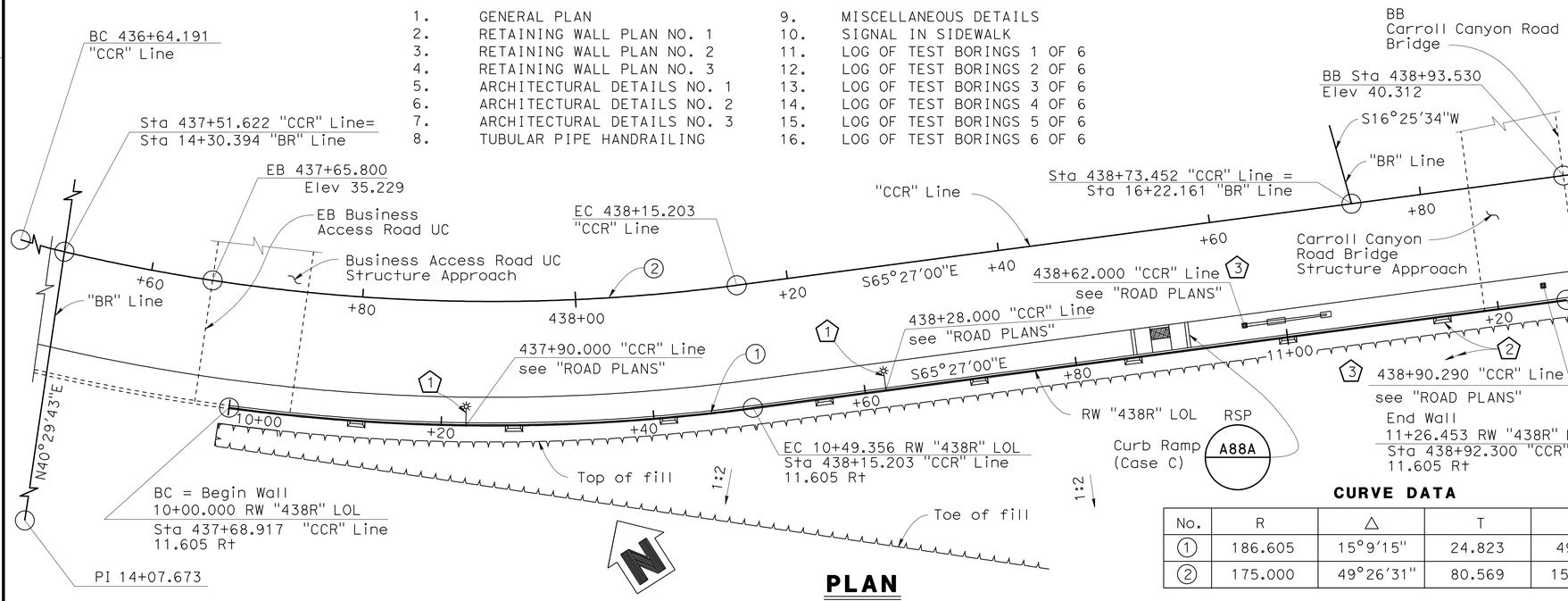
DEVELOPED ELEVATION

1:250

INDEX TO RETAINING WALL PLANS

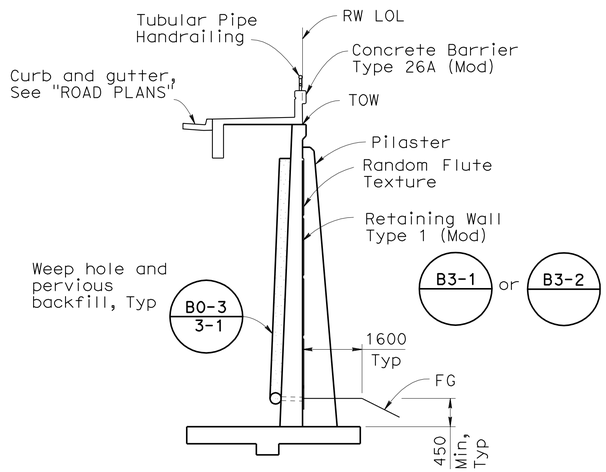
LEGEND

(1) - Electrolier, See "ROAD PLANS"
(2) - Pilaster
(3) - Signal, see "SIGNAL IN SIDEWALK" sheet and "ROAD PLANS".



PLAN

1:250



TYPICAL SECTION

1:80

CURVE DATA

No.	R	△	T	L
(1)	186.605	15°9'15"	24.823	49.356
(2)	175.000	49°26'31"	80.569	151.012

QUANTITIES

STRUCTURE EXCAVATION (RETAINING WALL)	1800	m3
STRUCTURE BACKFILL (RETAINING WALL)	2425	m3
PERVIOUS BACKFILL MATERIAL (RETAINING WALL)	195	m3
STRUCTURAL CONCRETE, RETAINING WALL	955	m3
ARCHITECTURAL TREATMENT (RANDOM FLUTE TEXTURE)	650	m2
BAR REINFORCING STEEL (RETAINING WALL)	122 200	kg
TUBULAR PIPE HANDRAILING	113	m
CONCRETE BARRIER (TYPE 26A MODIFIED)	113	m

Note: For "STANDARD PLANS" list, see "RETAINING WALL PLAN NO. 1" sheet.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED	LOAD FACTOR DESIGN		
DESIGN	Arash Monsefan	Brett Makley			
DETAILS	Tatyana Gnip	Arash Monsefan	LAYOUT	Arash Monsefan	Brett Makley
QUANTITIES	Tatyana Gnip	Arash Monsefan	SPECIFICATIONS	Jeremy LaHaye	PLANS AND SPECS COMPARED Jeremy LaHaye

PREPARED FOR THE STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 438R
GENERAL PLAN

DESIGN GENERAL PLAN SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

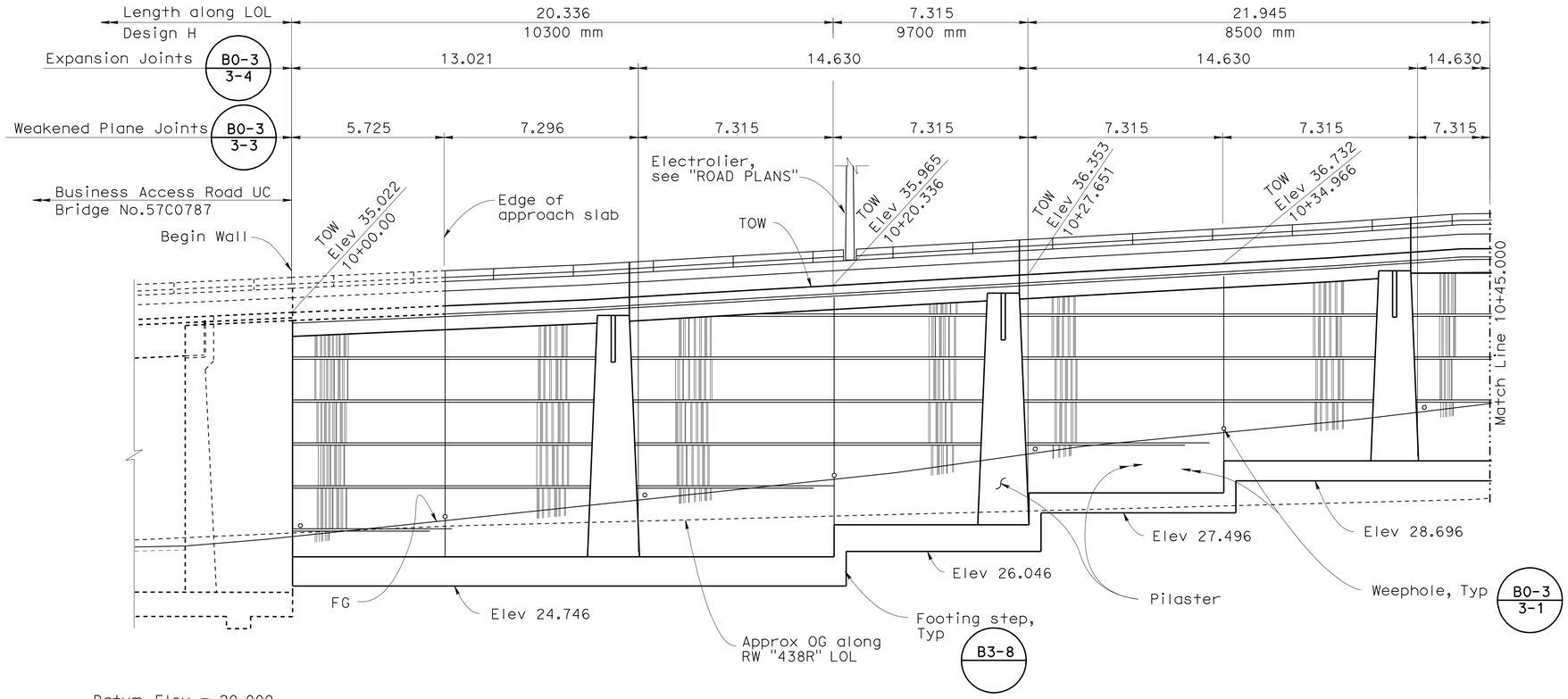
DISREGARD PRINTS BEARING EARLIER REVISION DATES

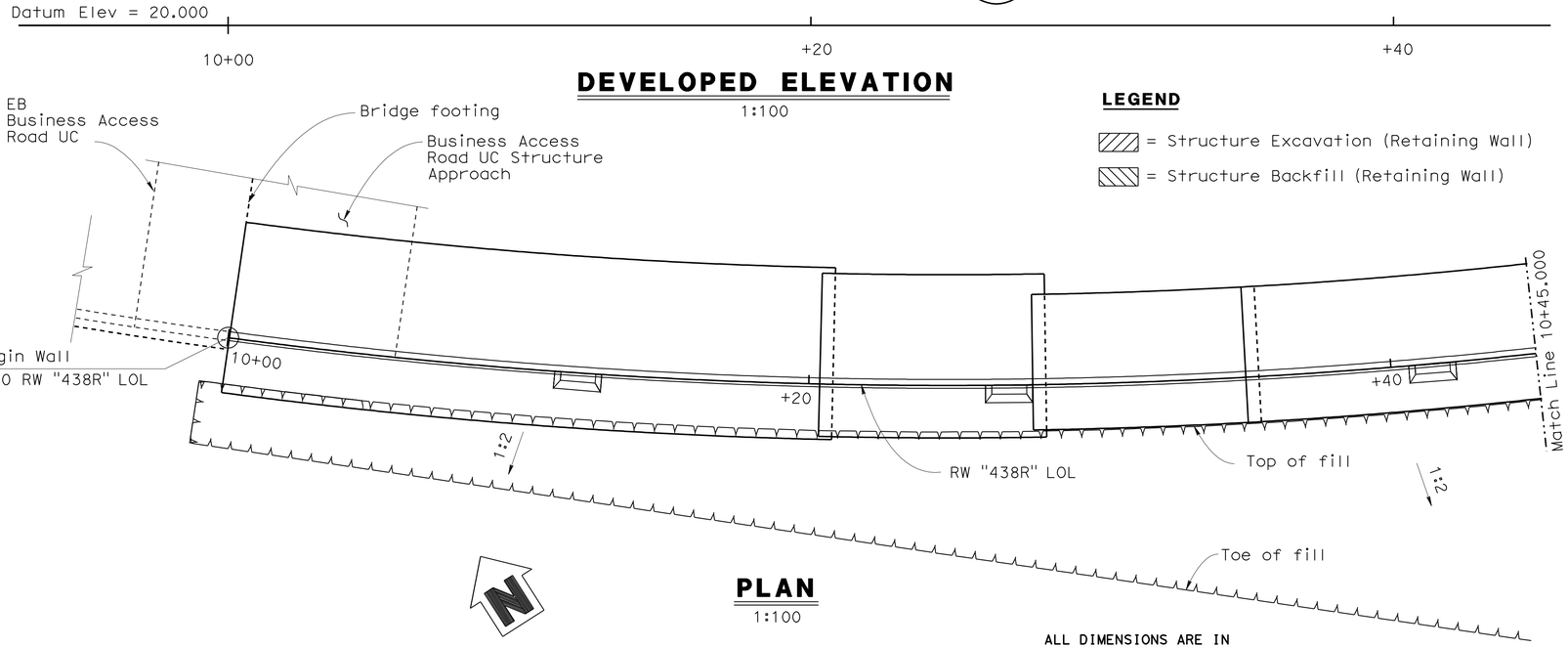
REVISION DATES (PRELIMINARY STAGE ONLY): 1-14-08, 12-18-08, 3-9-09, 4-16-09, 4-28-09

SHEET 1 OF 16

FILE => 57-rw438r-a-gp01.dgn

USERNAME => trmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:08





DEVELOPED ELEVATION
1:100

LEGEND

= Structure Excavation (Retaining Wall)

= Structure Backfill (Retaining Wall)

PLAN
1:100

ALL DIMENSIONS ARE IN
METERS UNLESS OTHERWISE SHOWN

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	848	886

REGISTERED CIVIL ENGINEER — 4-28-09 DATE

James L. Rucker No. 47796 Exp. 12-31-09 CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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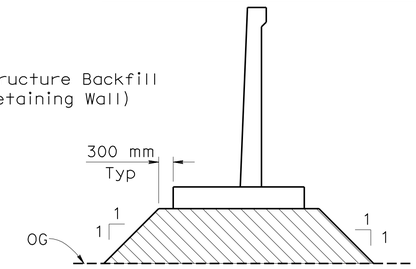
LEGEND

= Structure Backfill
(Retaining Wall)



Approx Station 10+00 to 10+35

LIMITS OF PAYMENT FOR EARTHWORK
N.T.S

Note: Earthwork limits in addition to A62C

STANDARD PLANS (DATED JULY 2004)

A10A	ACRONYMS AND ABBREVIATIONS (A-L)
A10B	ACRONYMS AND ABBREVIATIONS (M-Z)
RSP A88A	CURB RAMP DETAILS
A62C	LIMITS OF PAYMENT FOR EXCAVATION AND BACKFILL BRIDGE
B0-3	BRIDGE DETAILS
B0-13	BRIDGE DETAILS
B3-1	RETAINING WALL TYPE 1 (H=1200 THROUGH 9100 mm)
B3-2	RETAINING WALL TYPE 1 (H=9700 THROUGH 10 900 mm)
B3-8	RETAINING WALL DETAIL NO. 1
B11-51	TUBULAR HAND RAILING
B11-54	CONCRETE BARRIER TYPE 26
RSP ES-2F	ELECTRICAL SYSTEMS (SERVICE EQUIPMENT AND TYPICAL WIRING DIAGRAM TYPE III -C SERIES)
RSP ES-3C	ELECTRICAL SYSTEMS (CONTROLLER CABINET DETAILS)
RSP ES-6A	ELECTRICAL SYSTEMS (LIGHTING STANDARDS TYPE 15 AND 21)
RSP ES-7E	ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARDS CASE 3 ARM LOADING WIND VELOCITY=161 km/h ARM LENGTHS 4.6 m TO 13.7 m)
RSP ES-7F	ELECTRICAL SYSTEM (SIGNAL AND LIGHING STANDARD - CASE 4 ARM LOADING, WIND VELOCITY = 161 km/h, ARM LENGTHS 7.6 m to 13.7 m)
ES-7N	ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARDS-DETAILS NO.1)
RSP ES-11	ELECTRICAL SYSTEMS (FOUNDATION INSTALLATIONS)

STANDARD PLAN SHEET NO.

DETAIL NO.

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

DESIGN	BY Arash Monsefan	CHECKED Brett Makley	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
DETAILS	BY Tatyana Gnip	CHECKED Arash Monsefan	
QUANTITIES	BY Tatyana Gnip	CHECKED Arash Monsefan	

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 438R
RETAINING WALL PLAN NO. 1

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08 | 12-18-08 | 3-9-09 | 4-15-09 | 4-28-09

SHEET 2 OF 16

FILE => 57-rw438r-c-sp01.dgn

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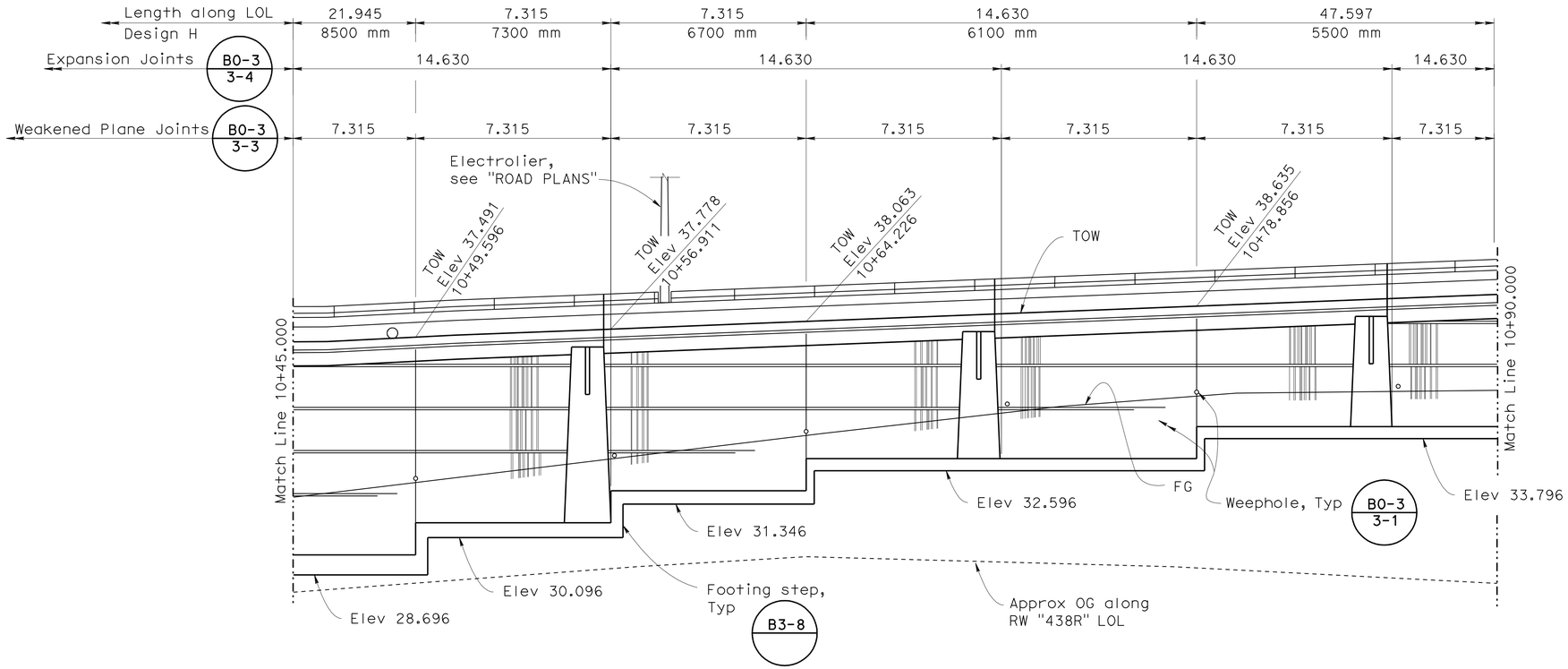

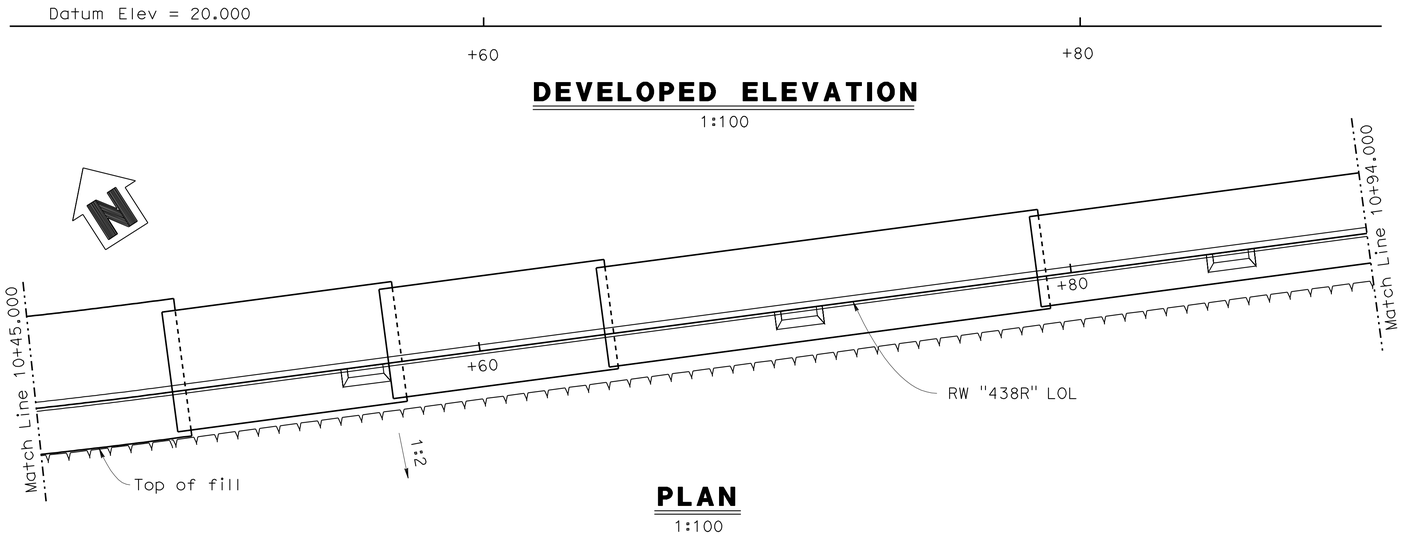

ALL DIMENSIONS ARE IN
METERS UNLESS OTHERWISE SHOWN

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	849	886

4-28-09
REGISTERED CIVIL ENGINEER DATE

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
James L. Rucker
No. 47796
Exp. 12-31-09
CIVIL
STATE OF CALIFORNIA

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SAN DIEGO, CA 92108

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

DESIGN	BY Arash Monsefan	CHECKED Brett Makley
DETAILS	BY Tatyana Gnip	CHECKED Arash Monsefan
QUANTITIES	BY Tatyana Gnip	CHECKED Arash Monsefan

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 438R
RETAINING WALL PLAN NO. 2

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08, 12-19-08, 3-9-09, 4-28-09

SHEET 3 OF 16

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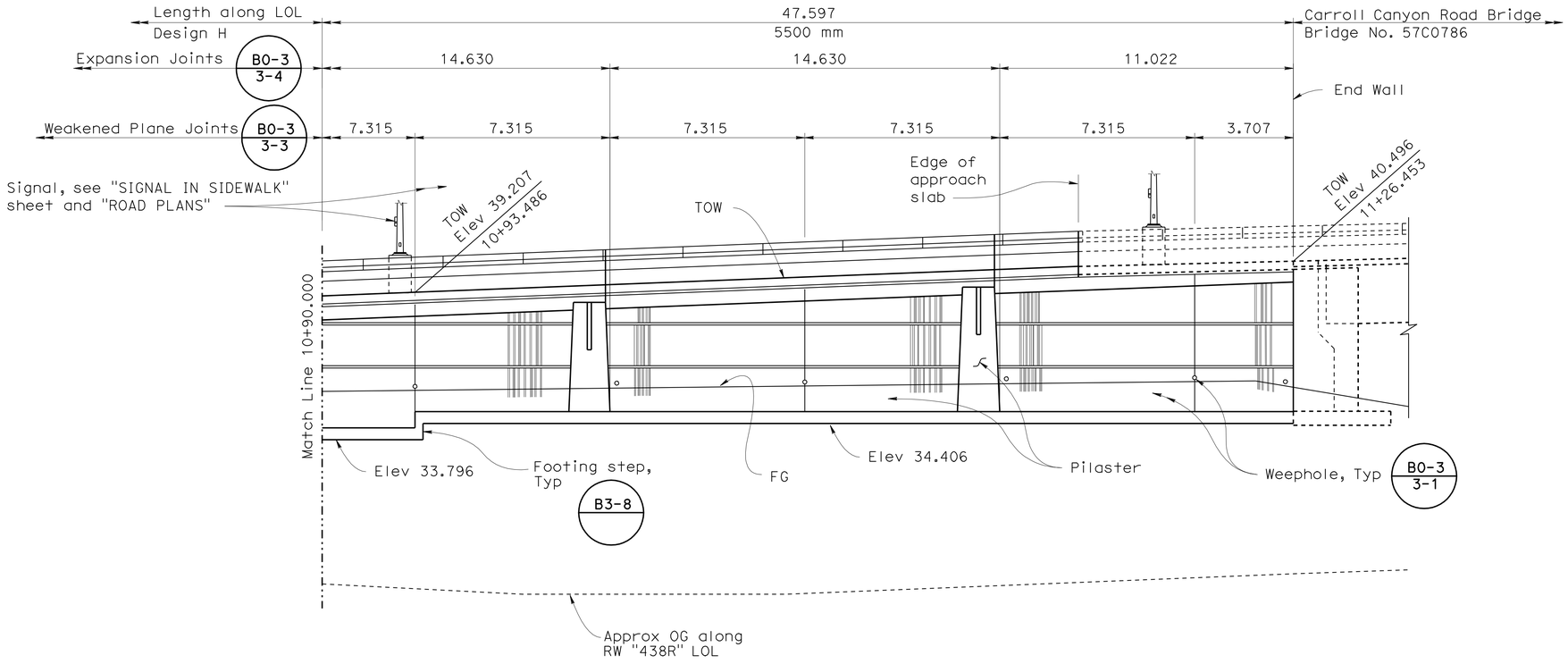

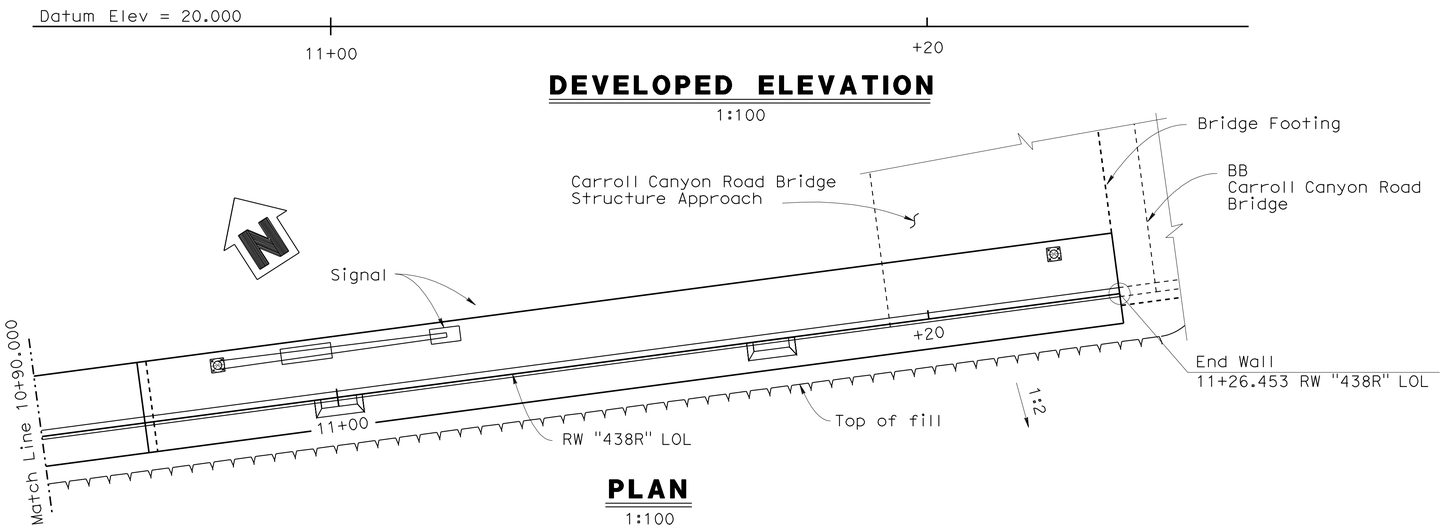

DEVELOPED ELEVATION
1:100

PLAN
1:100

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	850	886

REGISTERED CIVIL ENGINEER — DATE 4-28-09

James L. Rucker, No. 47796, Exp. 12-31-09, CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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5030 CAMINO DE LA SIESTA, SUITE 204,
SAN DIEGO, CA 92108

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Arash Monsefan	Brett Makley
DETAILS	Tatyana Gnip	Arash Monsefan
QUANTITIES	Tatyana Gnip	Arash Monsefan

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 438R
RETAINING WALL PLAN NO. 3

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

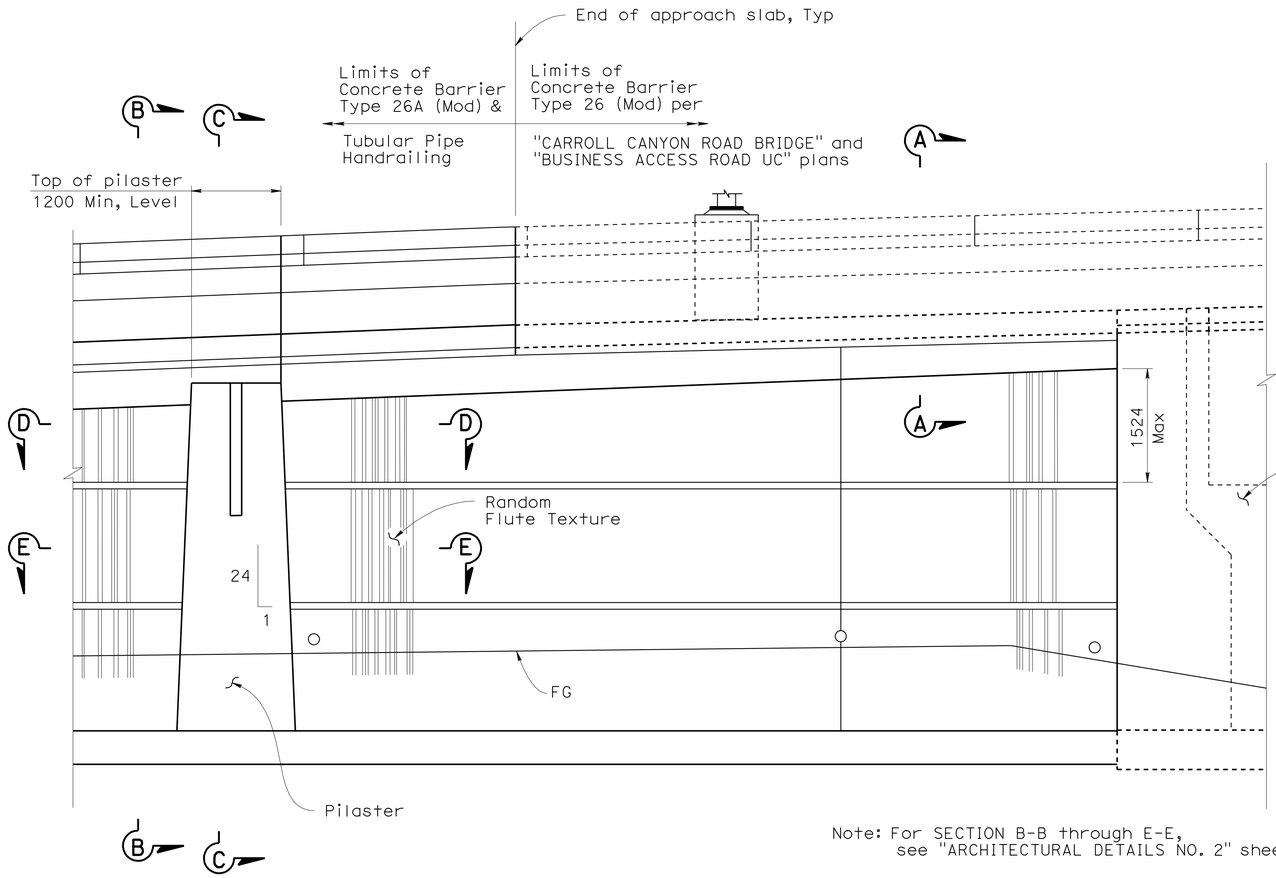
DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08, 12-19-08, 3-9-09, 4-28-09

SHEET 4 OF 16

FILE => 57-rw438r-c-sp03.dgn

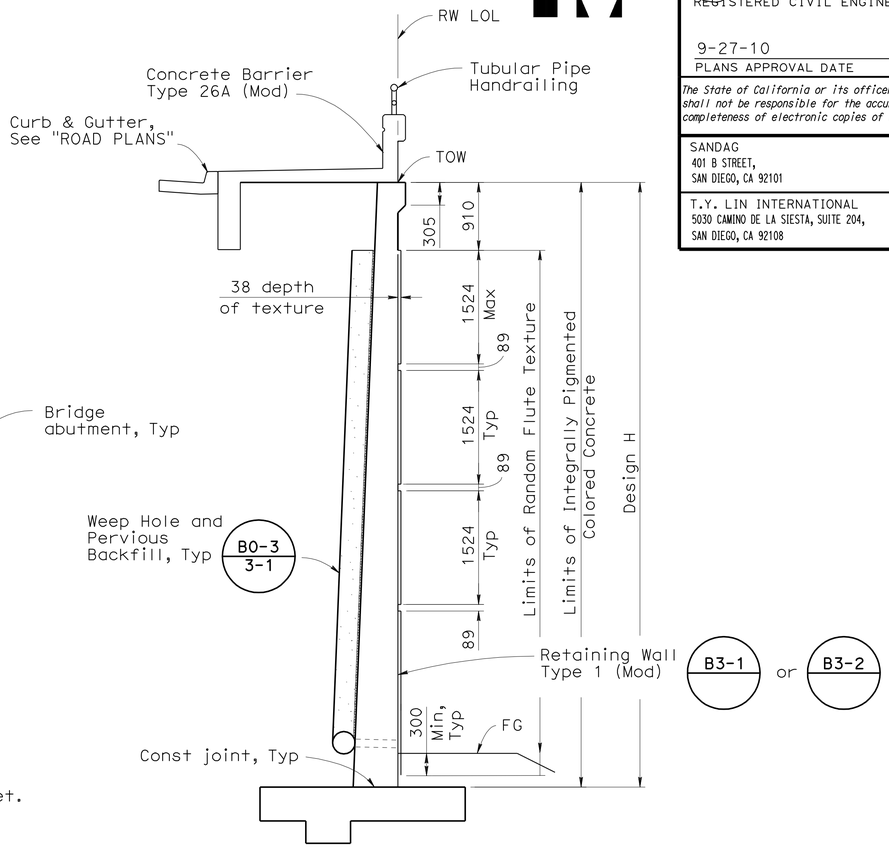
USERNAME => ttmikesi DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:08



Note: For SECTION B-B through E-E, see "ARCHITECTURAL DETAILS NO. 2" sheet.

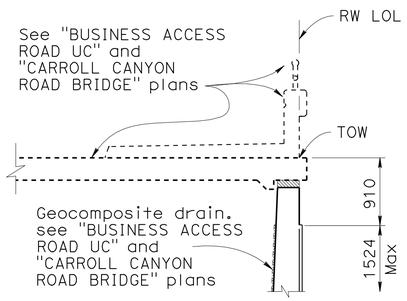
PART ELEVATION

1:40



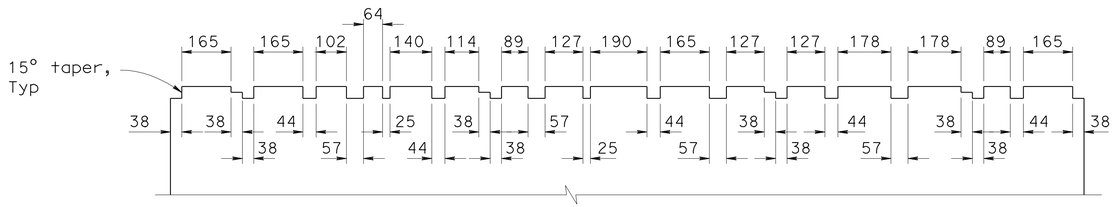
TYPICAL SECTION

N.T.S



SECTION A-A

1:40



RANDOM FLUTE TEXTURE DETAIL

1:10

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	851	886

REGISTERED CIVIL ENGINEER — DATE 4-28-09

PLANS APPROVAL DATE 9-27-10

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James L. Rucker No. 47796 Exp. 12-31-09 CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

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SAN DIEGO, CA 92108

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Arash Monsefan	Brett Makley
DETAILS	Tatyana Gnip	Arash Monsefan
QUANTITIES	Tatyana Gnip	Arash Monsefan

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 438R
ARCHITECTURAL DETAILS NO. 1

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

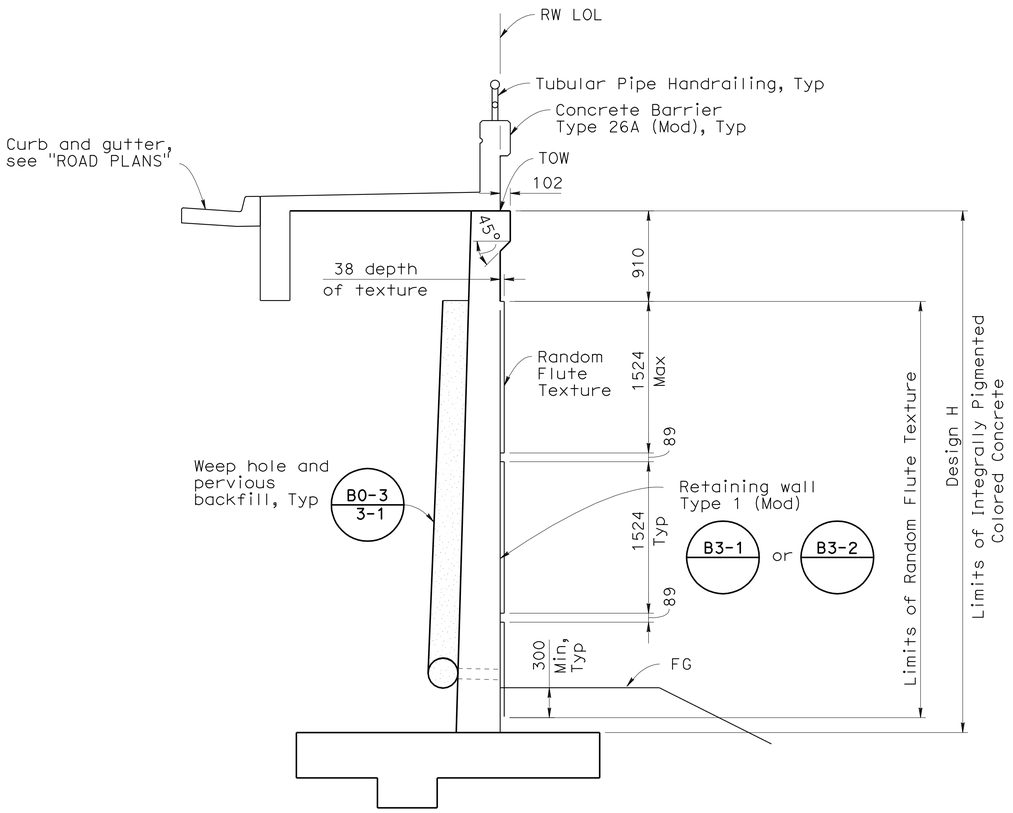
DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08, 12-18-08, 3-9-09, 4-28-09

SHEET 5 OF 16

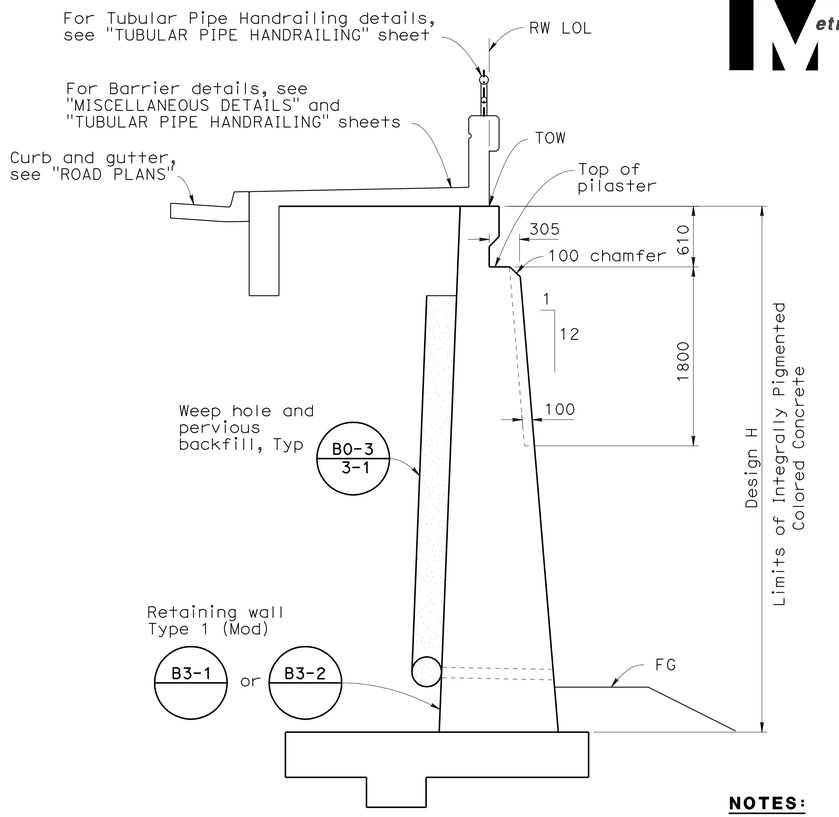
FILE => 57-rw438r-g-rwdt01.dgn

USERNAME => trmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:08



SECTION B-B

1:30

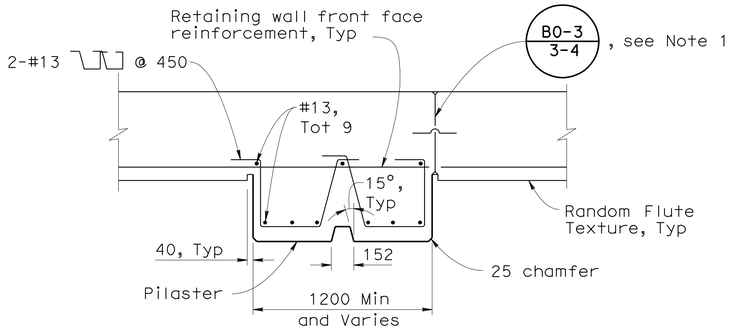


SECTION C-C

1:30

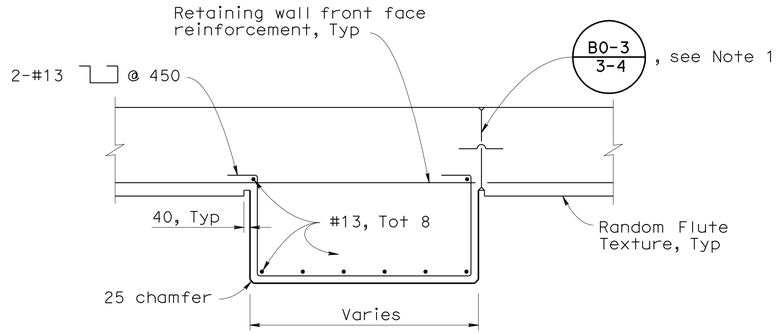
NOTES:

1. Expansion joint to follow edge of pilaster.
2. For details not shown, see B3-1 .



SECTION D-D

1:20



SECTION E-E

1:20

ALL DIMENSIONS ARE IN
MILLIMETERS UNLESS OTHERWISE SHOWN

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	852	886

REGISTERED CIVIL ENGINEER — DATE 4-28-09

James L. Rucker, No. 47796, Exp. 12-31-09, CIVIL, REGISTERED PROFESSIONAL ENGINEER, STATE OF CALIFORNIA

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SAN DIEGO, CA 92108

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Arash Monsefan	Brett Makley
DETAILS	Tatyana Gnip	Arash Monsefan
QUANTITIES	Tatyana Gnip	Arash Monsefan

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 438R

ARCHITECTURAL DETAILS NO. 2

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 1-14-08, 12-19-08, 3-9-09, 4-15-09, 4-28-09

SHEET 6 OF 16

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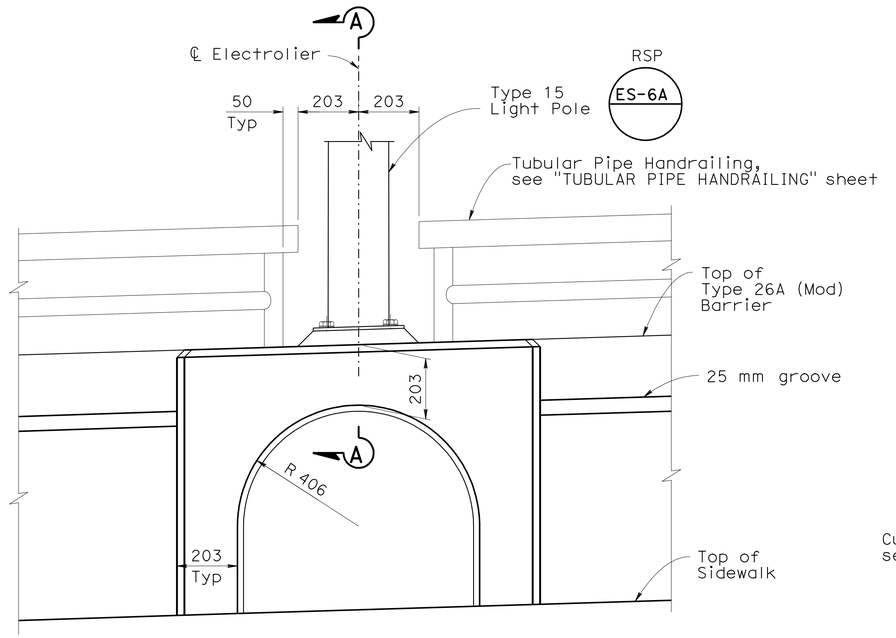
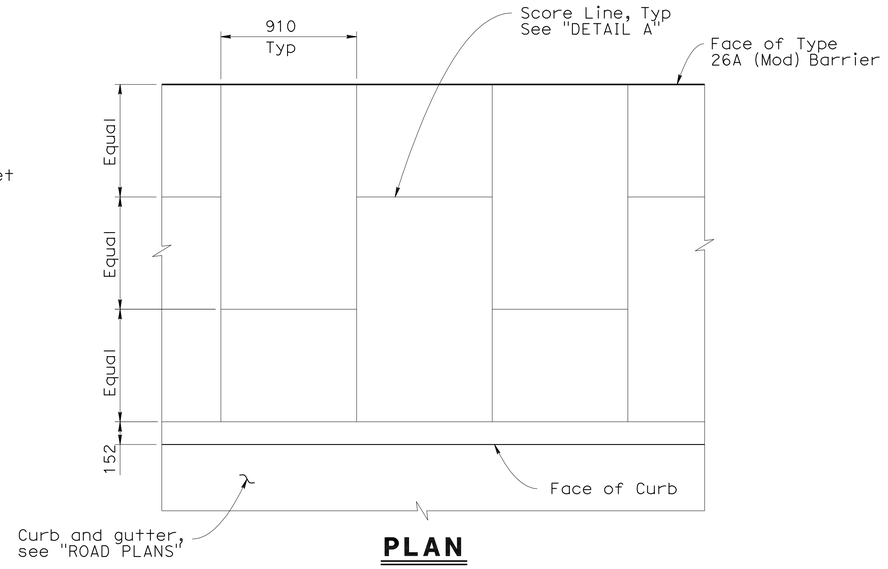
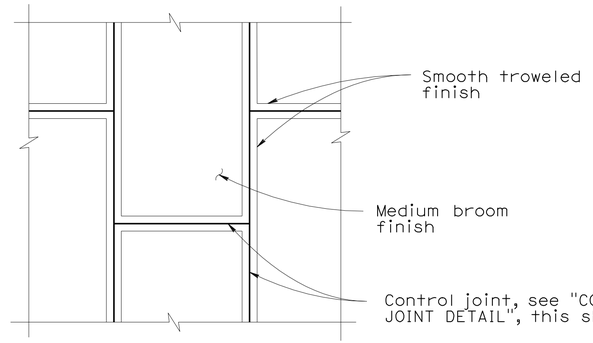


ELEVATION



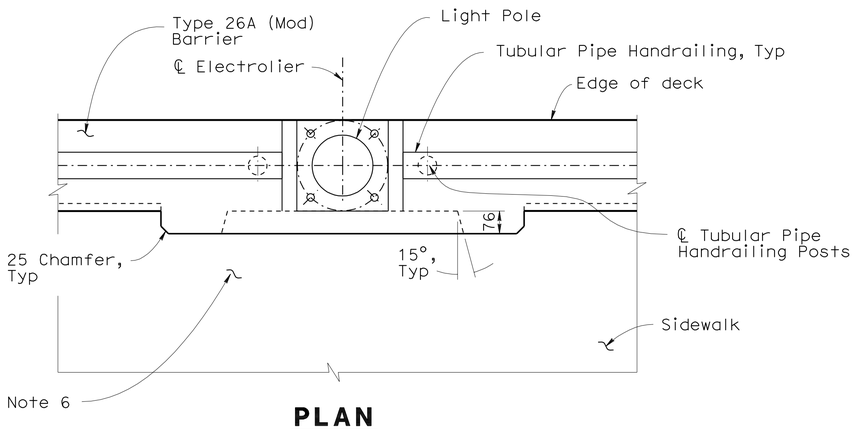
PLAN

1:20



DETAIL A

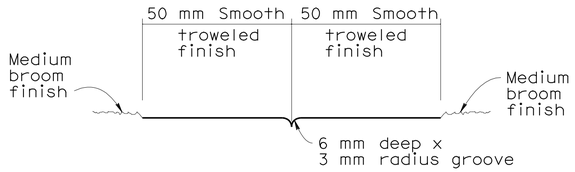
1:20



PLAN

ELECTROLIER BASE DETAIL

1:10



CONTROL JOINT DETAIL

1:1

SECTION A-A

1:4

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	853	886

REGISTERED CIVIL ENGINEER — DATE 4-28-09

James L. Rucker, No. 47796, Exp. 12-31-09, CIVIL, REGISTERED PROFESSIONAL ENGINEER, STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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SAN DIEGO, CA 92101

T.Y. LIN INTERNATIONAL
5030 CAMINO DE LA SIESTA, SUITE 204,
SAN DIEGO, CA 92108

NOTES:

1. Post shall be vertical.
2. Top rail tubular pipe shall be continuous over not less than two posts.
3. BLANK
4. For concrete barrier details and reinforcement not shown, see "TUBULAR PIPE HANDRAILING" and "MISCELLANEOUS DETAILS" sheets.
5. Rails are NPS standard weight A53 grade B Type E Pipes.
6. Scoring detail not shown for clarity.
7. For electrolier locations, see "ROAD PLANS".

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Arash Monsefan	Brett Makley
DETAILS	Tatyana Gnip	Arash Monsefan
QUANTITIES	Tatyana Gnip	Arash Monsefan

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 438R
ARCHITECTURAL DETAILS NO. 3

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

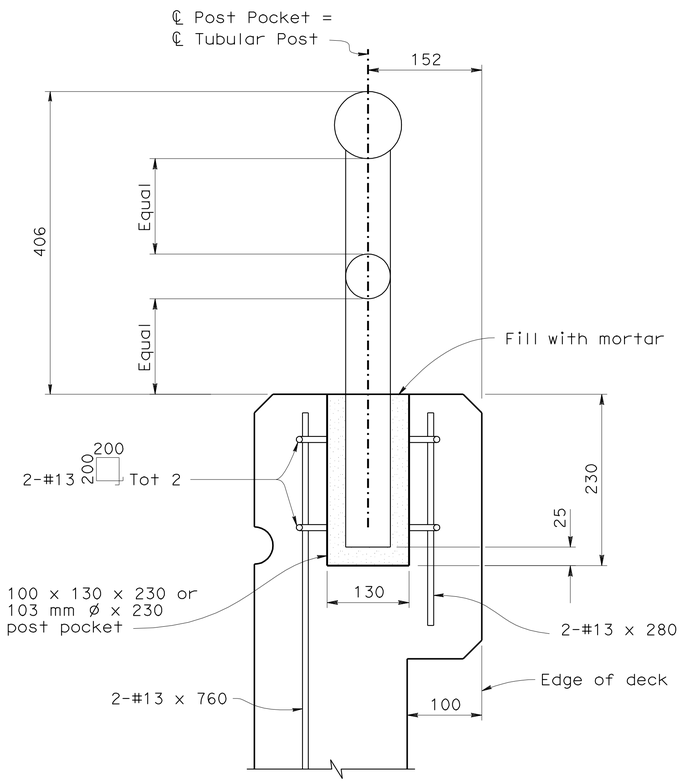
DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08, 12-19-08, 3-9-09, 4-28-09

SHEET 7 OF 16

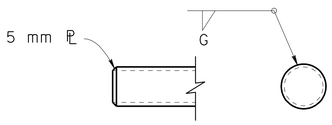
FILE => 57-rw438r-q-Arch01.dgn

USERNAME => tmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:09



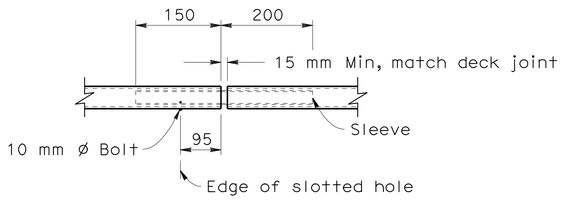
POST ANCHORAGE DETAILS

No Scale

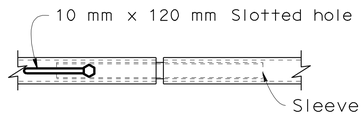


RAIL CAP DETAILS

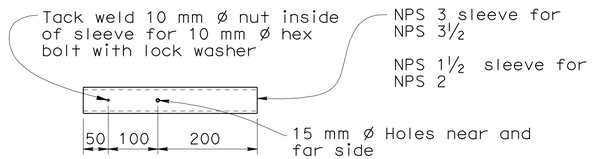
No Scale



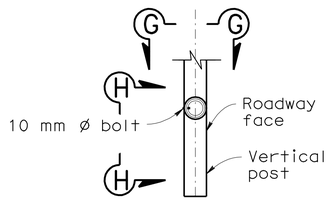
VIEW G-G



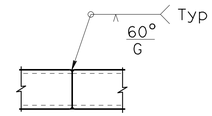
VIEW H-H



SLEEVE



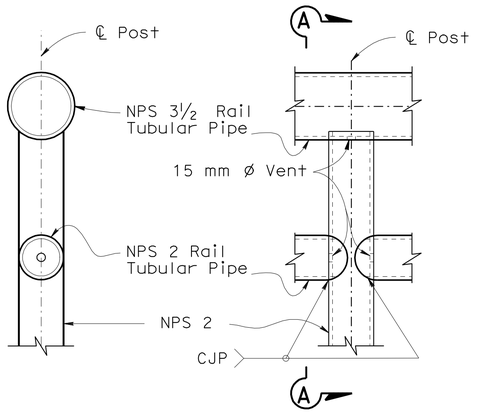
SECTION



TUBE-WELD SPLICE

TUBULAR PIPE SPLICE DETAILS

No Scale



SECTION A-A

1:10

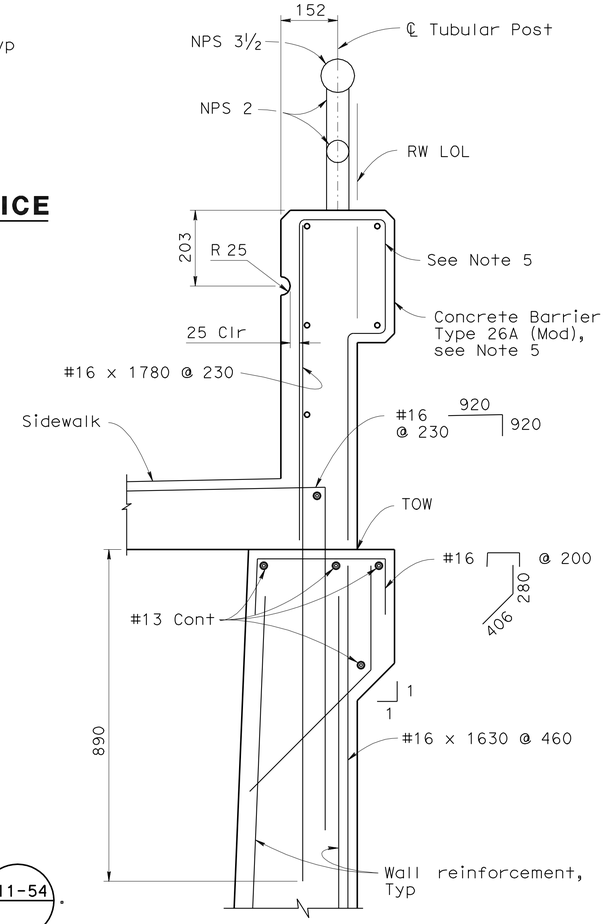
ELEVATION

1:10

For Typ Welded Section

NOTES:

1. Galvanize rail assembly after fabrication.
2. Post shall be vertical.
3. Tubular pipe splices shall be located in the pipes spanning deck or wall joints. Increase joint width in pipes to match expansion joint width and increase sleeve length accordingly.
4. Top rail tubular pipe shall be continuos over not less than two posts.
5. For details and reinforcement not shown see "ARCHITECTURAL DETAILS NO. 3" sheet, B11-51 and B11-54.
6. All tubular pipe posts and rails shall be NPS standard weight A53 grade B Type E Pipes.



CONCRETE BARRIER TYPE 26A (MOD)

No Scale

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	854	886

REGISTERED CIVIL ENGINEER — DATE 4-28-09

PLANS APPROVAL DATE 9-27-10

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REGISTERED PROFESSIONAL ENGINEER — James L. Rucker — No. 47796 — Exp. 12-31-09 — CIVIL — STATE OF CALIFORNIA

SANDAG
401 B STREET,
SAN DIEGO, CA 92101

T.Y. LIN INTERNATIONAL
5030 CAMINO DE LA SIESTA, SUITE 204,
SAN DIEGO, CA 92108

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

DESIGN	BY Arash Monsefan	CHECKED Brett Makley	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
DETAILS	BY Tatyana Gnip	CHECKED Arash Monsefan	
QUANTITIES	BY Tatyana Gnip	CHECKED Arash Monsefan	

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 438R

TUBULAR PIPE HANDRAILING

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

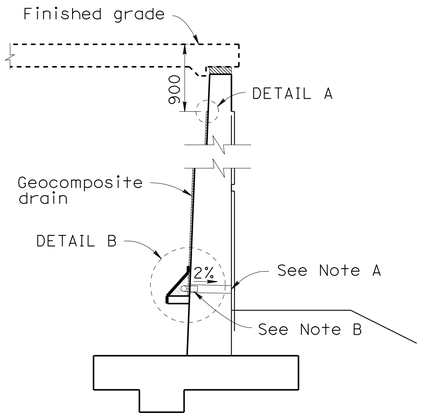
DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08, 12-14-08, 3-9-09, 4-28-09

SHEET 8 OF 16

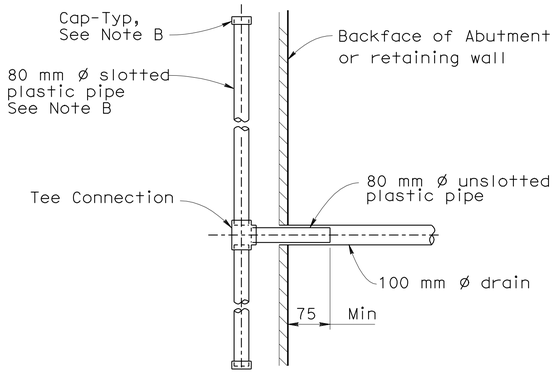
FILE => 57-rw438r-q-Arch02.dgn

USERNAME => rmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:03



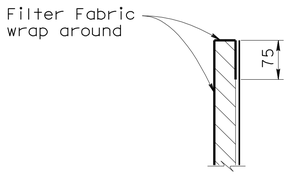
WALL SECTION

No Scale



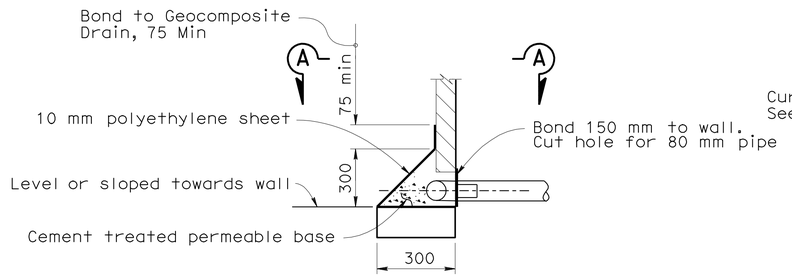
SECTION A-A

No Scale



DETAIL A

No Scale

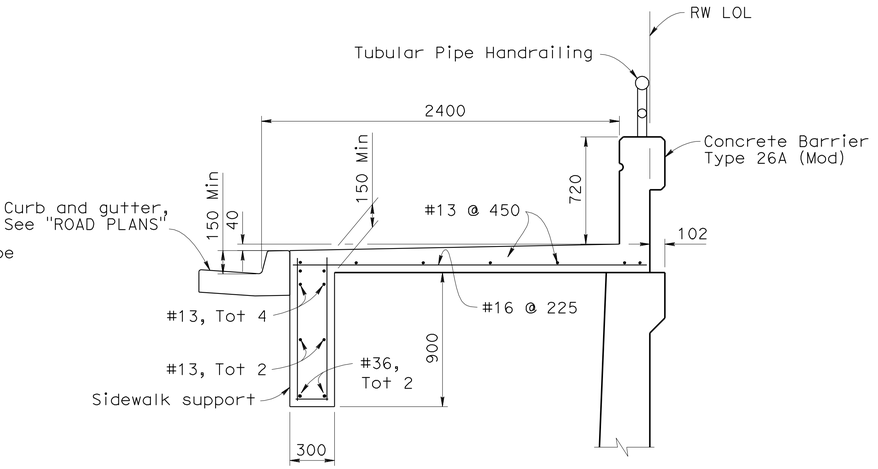


DETAIL B

No Scale

WEEP HOLE AND GEOCOMPOSITE DRAIN

Alternative to Bridge Detail B0-3 / 3-1



Note: Reinforcement shown is in addition to standard reinforcement in sidewalk. For details not shown, see B11-54.

SIDEWALK DETAIL

1:20

NOTES

A. 100 mm ø drains at intermediate sag points and at 7620 mm max. center to center (2743 mm c-c for Type 3 and 2819 mm c-c for Type 4 retaining walls). For walls adjacent to sidewalks or curbs, provide 100 mm plastic pipe under sidewalk to discharge through curb face. Exposed wall drains shall be located 75 mm± above finished grade.

B. Geocomposite drain, cement treated permeable base, and 80 mm ø slotted plastic pipe continuous behind retaining wall or abutment. Cap ends of pipe. Provide "Tee" connection at each 80 mm ø drain.

C. Connect the low end of plastic pipe to the main outlet pipe as applicable.

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

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11	SD	5,805	R49.9/R51.7, 42.6/46.5	855	886

Caltrans Metric

REGISTERED CIVIL ENGINEER — DATE 4-28-09

REGISTERED PROFESSIONAL ENGINEER — James L. Rucker — No. 47796 — Exp. 12-31-09 — CIVIL — STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

SANDAG
401 B STREET,
SAN DIEGO, CA 92101

T.Y. LIN INTERNATIONAL
5030 CAMINO DE LA SIESTA, SUITE 204,
SAN DIEGO, CA 92108

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Arash Monsefan	Brett Makley
DETAILS	Tatyana Gnip	Arash Monsefan
QUANTITIES	Tatyana Gnip	Arash Monsefan

PREPARED FOR THE STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 438R
MISCELLANEOUS DETAILS

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

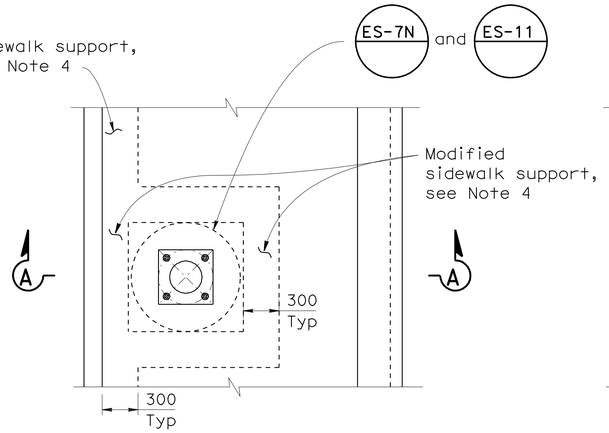
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08, 12-15-08, 3-9-09, 4-16-09, 4-28-09

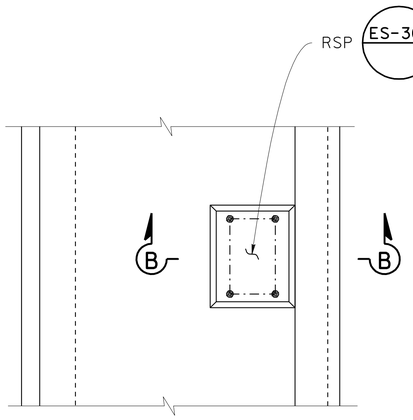
SHEET 9 OF 16

FILE => 57-rw438r-u-miscdt01.dgn

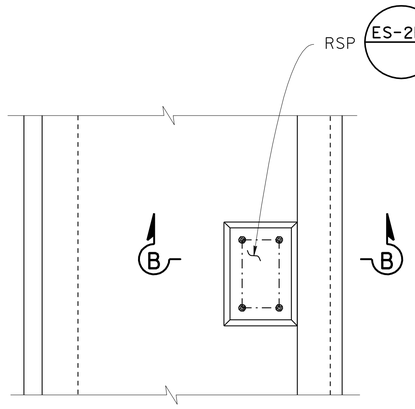
USERNAME => rtmikes DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:09



FOUNDATION FOR SIGNAL (TYPE 26-3-161)

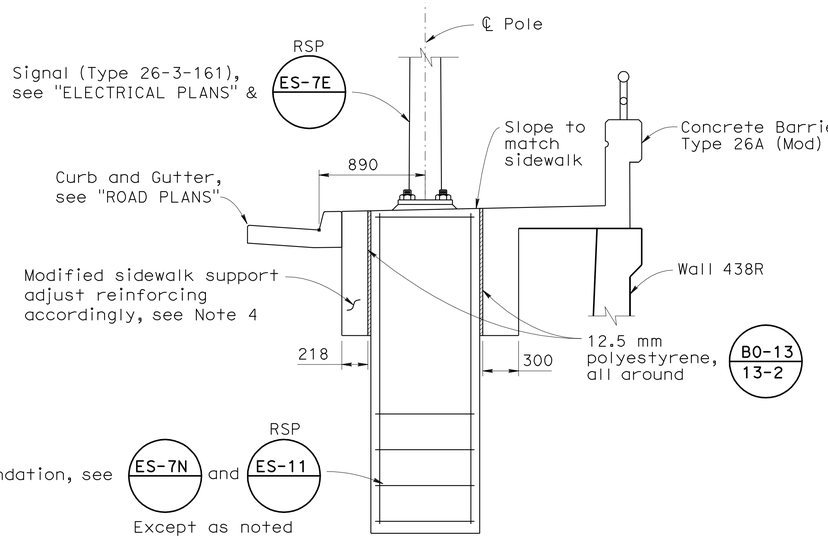


FOUNDATION FOR MODEL 332 CABINET

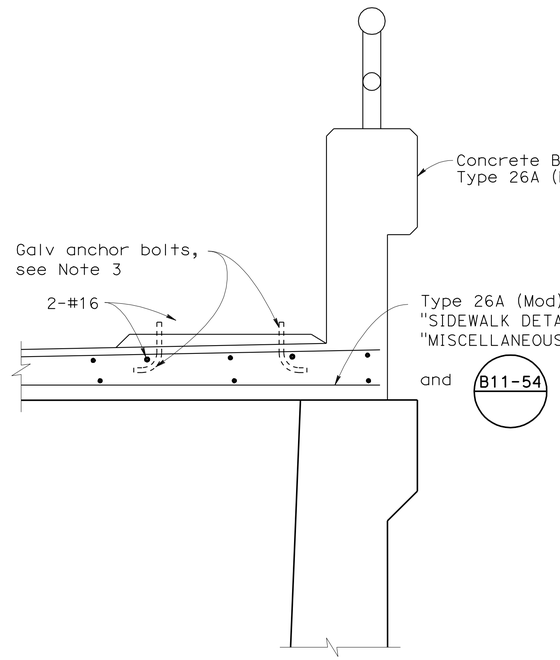


FOUNDATION FOR TYPE III-CF CABINET

PLAN
1:25



SECTION A-A
1:25



SECTION B-B
1:10

NOTES:

1. Install signal foundation after the wall is constructed and backfill is compacted and before Concrete Barrier Type 26 (Mod) is constructed.
2. Install signal pole after Concrete Barrier Type 26 (Mod) is constructed.
3. For Type III-CF cabinet, use 16mm ø $\llcorner_{100}$ anchor bolts.
   For Type 332 cabinet, use 19mm ø $\llcorner_{50}$ anchor bolts.
4. For sidewalk support details not shown, see "SIDEWALK DETAILS" on "MISCELLANEOUS DETAILS" sheet.

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	856	886

REGISTERED CIVIL ENGINEER — DATE 4-28-09

PLANS APPROVAL DATE 9-27-10

James L. Rucker, No. 47796, Exp. 12-31-09, CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

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SAN DIEGO, CA 92101

T.Y. LIN INTERNATIONAL
5030 CAMINO DE LA SIESTA, SUITE 204,
SAN DIEGO, CA 92108

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Brett Makley	Arash Monsefan
DETAILS	Yihong Wang	Brett Makley
QUANTITIES	Arash Monsefan	Tatyana Gnip

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 438R
SIGNAL IN SIDEWALK

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08, 12-15-08, 3-9-09, 4-28-09

SHEET 10 OF 16

FILE => 57-rw438r-u-ssdt01.dgn

USERNAME => tfmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:09

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90)
Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166)
Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	857	886

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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SANDAG
401 B STREET,
SAN DIEGO, CA. 92101

BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111

APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 300 mm)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 300 mm
Cobble		76 mm to 300 mm
Gravel	Coarse	19 mm to 76 mm
	Fine	No. 4 to 19 mm
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

SOIL LEGEND

ENGINEERING SERVICES	GEOTECHNICAL SERVICES	STATE OF CALIFORNIA	DIVISION OF ENGINEERING SERVICES	BRIDGE NO.	RETAINING WALL 438R
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	DEPARTMENT OF TRANSPORTATION	STRUCTURE DESIGN		
NAME:	CHECKED BY: G. CUSTENBORDER	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER	DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 1 OF 6

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES: 10/24/08, 3/26/09, 4/28/09

SHEET 11 OF 16

FILE => 57-rw438r-z-lotb01.dgn

USERNAME => trmikesl
DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:09

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	858	886

16

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

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SAN DIEGO, CA. 92101

BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111

CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring
Size	R P	Rotary drilled boring Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (25 mm soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778-95)
⬚	O	Other

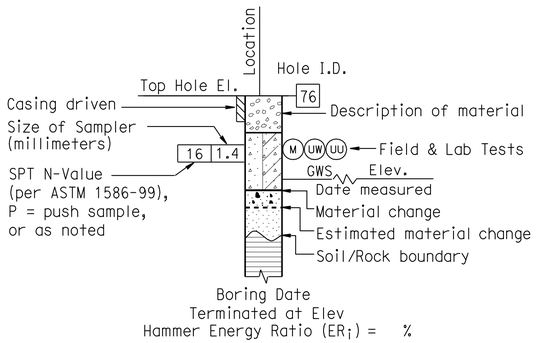
Note: Size in millimeters.

CONSISTENCY OF COHESIVE SOILS

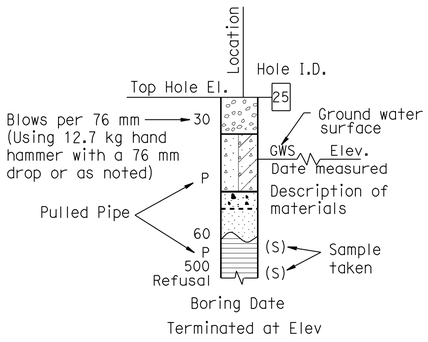
Description	Unconfined Compressive Strength (tsm)	Pocket Penetrometer Measurement (tsm)	Torvane Measurement (tsm)	Field Approximation
Very Soft	< 24	< 24	< 12	Easily penetrated several inches by fist
Soft	24 to 48	24 to 48	12 to 24	Easily penetrated several inches by thumb
Medium Stiff	48 to 96	48 to 96	24 to 48	Penetrated several inches by thumb with moderate effort
Stiff	96 to 192	96 to 192	48 to 96	Readily indented by thumb but penetrated only with great effort
Very Stiff	192 to 383	192 to 383	96 to 192	Readily indented by thumbnail
Hard	> 383	> 383	> 192	Indented by thumbnail with difficulty

PLASTICITY OF FINE-GRAINED SOILS

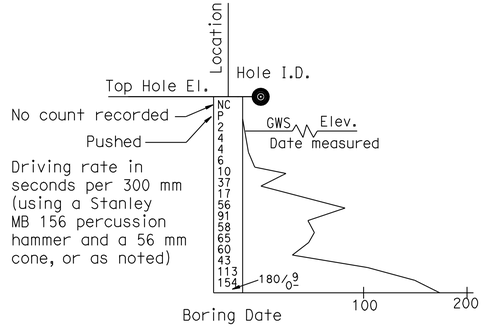
Description	Criteria
Nonplastic	A 3 mm thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.



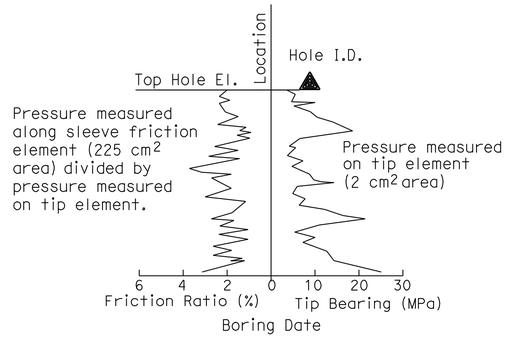
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) SOUNDING

SOIL LEGEND

ENGINEERING SERVICES	GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 438R
FUNCTIONAL SUPERVISOR NAME:	DRAWN BY: J. JOHNS CHECKED BY: G. CUSTENBORDER	FIELD INVESTIGATIONS BY: V. OLIN G. CUSTENBORDER	DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 2 OF 6

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

FILE => 57-rw438r-z-lotb02.dgn

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES										SHEET	OF
10/1/08	3/3/09	4/28/09								12	16

USERNAME => tfmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:10

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	859	886

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

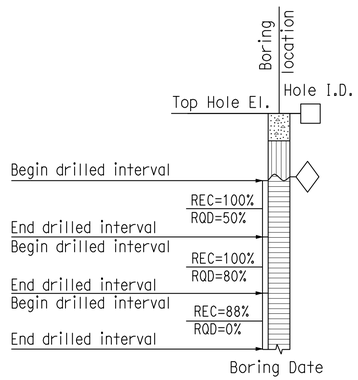
SANDAG
401 B STREET,
SAN DIEGO, CA. 92101

BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

$$REC = \frac{\sum \text{Length of the recovered core pieces}}{\text{Total length of core run}} \times 100\%$$

$$RQD = \frac{\sum \text{Length of intact core pieces} \geq 100\ mm}{\text{Total length of core run}} \times 100\%$$



RELATIVE STRENGTH OF INTACT ROCK

Term	Uniaxial Compressive Strength (MPa)
Extremely Strong	> 207
Very Strong	100 - 207
Strong	49 - 100
Medium Strong	25 - 49
Weak	5 - 25
Very Weak	1 - 5
Extremely Weak	< 1

BEDDING SPACING

Description	Thickness / Spacing
Massive	Greater than 3 m
Very thickly bedded	1 m to 3 m
Thickly bedded	300 mm to 1 m
Moderately bedded	100 mm to 300 mm
Thinly bedded	30 mm to 100 mm
Very thinly bedded	10 mm to 30 mm
Laminated	Less than 10 mm

LEGEND OF ROCK MATERIALS

- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

ROCK HARDNESS

Description	Criteria
Extremely Hard	Specimen cannot be scratched with a pocket knife or sharp pick; can only be chipped with repeated heavy hammer blows.
Very Hard	Specimen cannot be scratched with a pocket knife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Specimen can be scratched with a pocket knife or sharp pick with difficulty (heavy pressure). Heavy hammer blows required to break specimen.
Moderately Hard	Specimen can be scratched with pocket knife or sharp pick with light or moderate pressure. Core breaks with moderate hammer pressure.
Moderately Soft	Specimen can be grooved 5 mm deep with a pocket knife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Specimen can be grooved or gouged easily by a pocket knife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Specimen can be readily indented, grooved or gouged with fingernail, or carved with a pocket knife. Breaks with light manual pressure.

FRACTURE DENSITY

Description	Observed Fracture Density
Unfractured	No fractures.
Very slightly fractured	Lengths greater than 1 m.
Slightly fractured	Lengths from 300 mm to 1000 mm with few lengths less than 300 mm or greater than 1000 mm.
Moderately fractured	Lengths mostly in 100 mm to 300 mm range with most lengths about 200 mm.
Intensely fractured	Lengths average from 30 mm to 100 mm with scattered fragmented intervals with lengths less than 100 mm.
Very intensely fractured	Mostly chips and fragments with a few scattered short core lengths.

Combination descriptors (such as "Very intensely to intensely fractured") are used where equal distribution of both fracture density characteristics is present over a significant interval or exposure, or where characteristics are "in between" the descriptor definitions. Only two adjacent descriptors may be combined.

WEATHERING DESCRIPTORS FOR INTACT ROCK

Description	Diagnostic features: Chemical Weathering-Discoloration and/or oxidation — Body of Rock	Diagnostic features: Chemical Weathering-Discoloration and/or oxidation — Fracture Surfaces	Diagnostic features: Mechanical Weathering-Grain boundary conditions (disaggregation) primarily for granitics and some coarse-grained sediments	Diagnostic features: Texture and Solutioning — Texture	Diagnostic features: Texture and Solutioning — Solutioning	General Characteristics
Fresh	No discoloration, not oxidized.	No discoloration or oxidation.	No separation, intact (tight).	No change.	No solutioning.	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull.	Minor to complete discoloration or oxidation of most surfaces.	No visible separation, intact (tight).	Preserved.	Minor leaching of some soluble minerals may be noted.	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty," feldspar crystals are "cloudy."	All fracture surfaces are discolored or oxidized.	Partial separation of boundaries visible.	Generally preserved.	Soluble minerals may be mostly leached.	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in-situ disaggregation, see grain boundary conditions.	All fracture surfaces are discolored or oxidized, surfaces friable.	Partial separation, rock is friable; in semiarid conditions granitics are disaggregated.	Texture altered by chemical disintegration (hydration, argillation).	Leaching of soluble minerals may be complete.	Dull sound when struck with hammer, usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures, or veinlets. Rock is significantly weakened.
Decomposed	Discolored or oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay.		Complete separation of grain boundaries (disaggregated).	Resembles a soil, partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete.		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes."

Combination descriptors (such as "slightly weathered to fresh") are permissible where equal distribution of both weathering characteristics is present over significant intervals or where characteristics present are "in between" the diagnostic feature. However, combination descriptors should not be used where significant, identifiable zones can be delineated. Only two adjacent descriptors may be combined. "Very intensely weathered" is the combination descriptor for "intensely weathered to decomposed."

ROCK LEGEND

ENGINEERING SERVICES	GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 438R
FUNCTIONAL SUPERVISOR NAME:	DRAWN BY: J. JOHNS CHECKED BY: G. CUSTENBORDER	FIELD INVESTIGATIONS BY: V. OLIN G. CUSTENBORDER	DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 3 OF 6

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

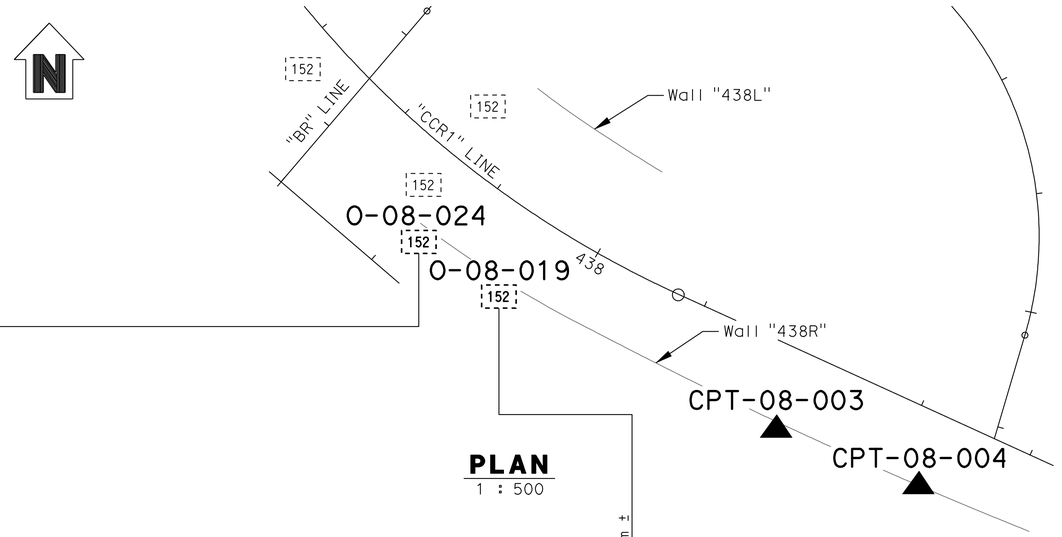
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES							SHEET	OF
10/14/08	3/31/09	4/28/09					13	16

FILE => 57-rw438r-z-lotb03.dgn

USERNAME => tmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:10

Bench Mark
All elevations shown in the LOTBs are in meters and are referenced to the NGVD 1929 Datum.



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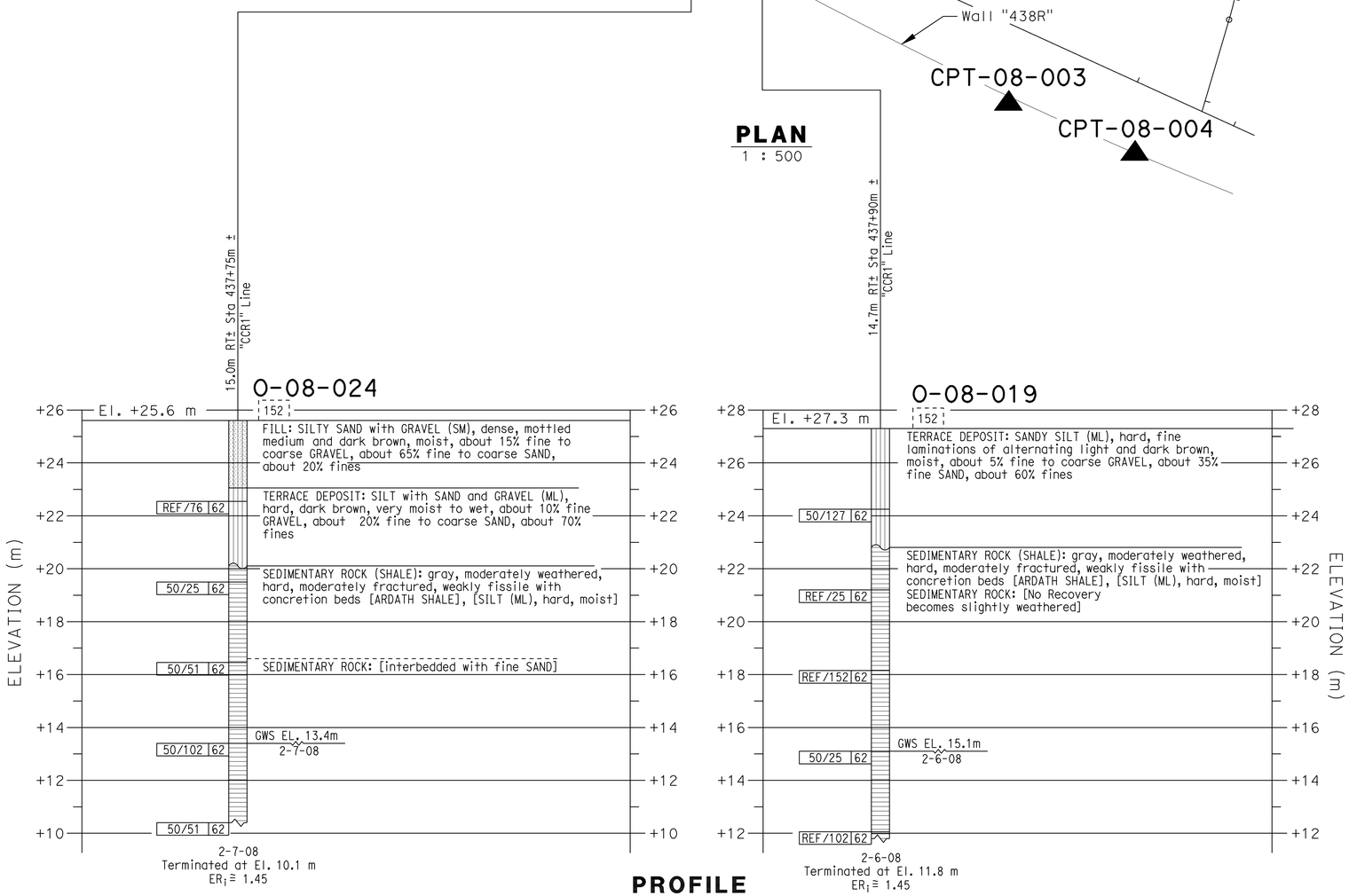

PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	860	886

16
4-28-09
REGISTERED GEOTECHNICAL ENGINEER

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
VAN OLIN
NO. 2578
EXP. 6-30-10
GEOTECHNICAL
STATE OF CALIFORNIA

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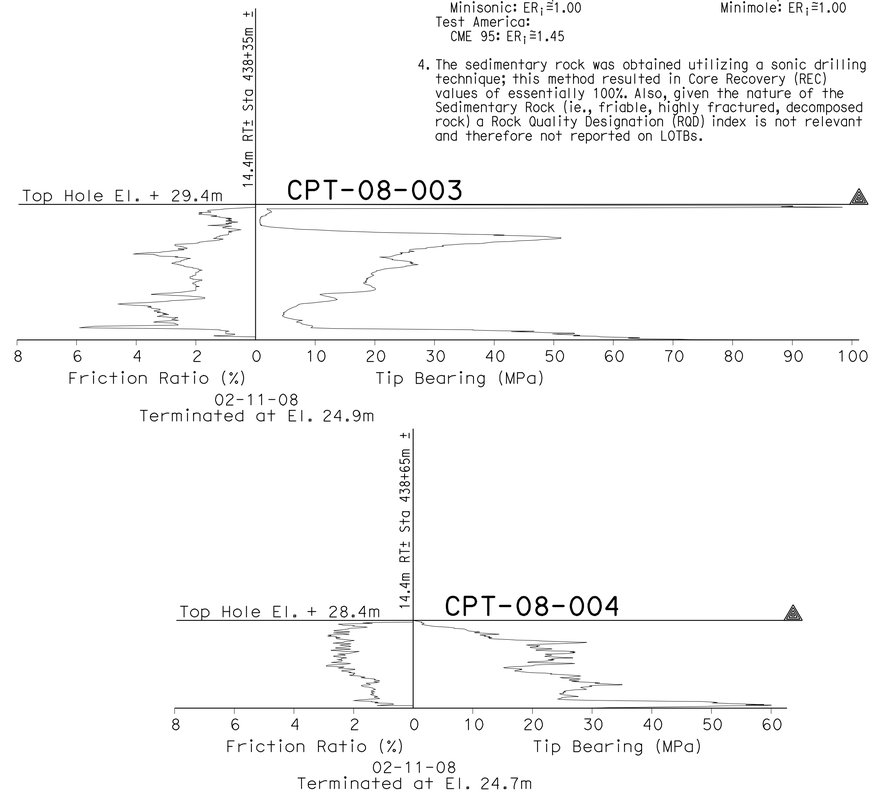
SANDAG
401 B STREET,
SAN DIEGO, CA. 92101

BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111

NOTES:
1. 62 mm diameter samples were taken using a California split-barrel sampler with an inside diameter (I.D.) of 62 mm and an outside diameter (O.D.) of 83 mm.
2. Automatic trip and safety hammer systems consisting of hammer weight of 62.5 kg falling a distance of 762 mm were used to advance the drive samplers in accordance with ASTM D1586.
3. The average hammer energy ratio (ER_i) reflects the percentage efficiency of SPT blowcounts (N-value). The estimated ER_i for the various drilling equipment used was as follows:
   Boart Longyear:
   Longyear 1405: $ER_i \cong 1.45$
   Prosonic Track Mounted: $ER_i \cong 1.00$
   Prosonic 1: $ER_i \cong 1.45$
   Minisonic: $ER_i \cong 1.00$
   Test America:
   CME 95: $ER_i \cong 1.45$
   Pacific Drilling:
   Unimog: $ER_i \cong 1.27$
   Mole: $ER_i \cong 1.00$
   Minimole: $ER_i \cong 1.00$
4. The sedimentary rock was obtained utilizing a sonic drilling technique; this method resulted in Core Recovery (REC) values of essentially 100%. Also, given the nature of the Sedimentary Rock (ie., friable, highly fractured, decomposed rock) a Rock Quality Designation (RQD) index is not relevant and therefore not reported on LOTBs.



CONE PENETRATION TEST (CPT) SOUNDINGS

ENGINEERING SERVICES	GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 438R
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS		DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 4 OF 6
NAME:	CHECKED BY: G. CUSTENBORDER	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER			

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

FILE => 57-rw438r-z-lotb04.dgn

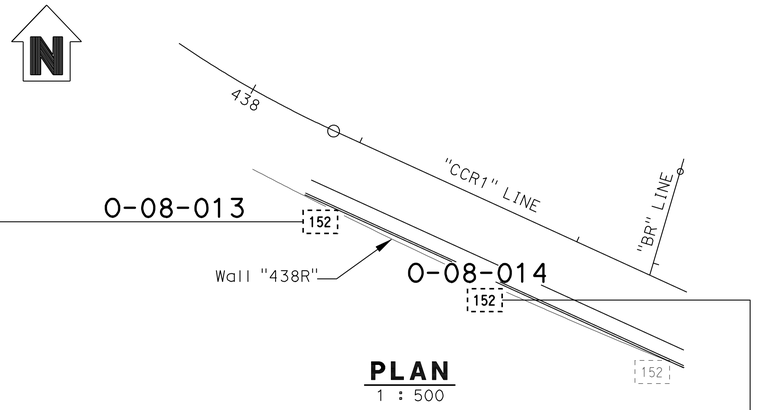
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES: 10/11/08 | 3/9/09 | 4/28/09

SHEET 14 OF 16

USERNAME => ttmikes1
DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:10

Bench Mark
All elevations shown in the LOTBs are in meters and are referenced to the NGVD 1929 Datum.



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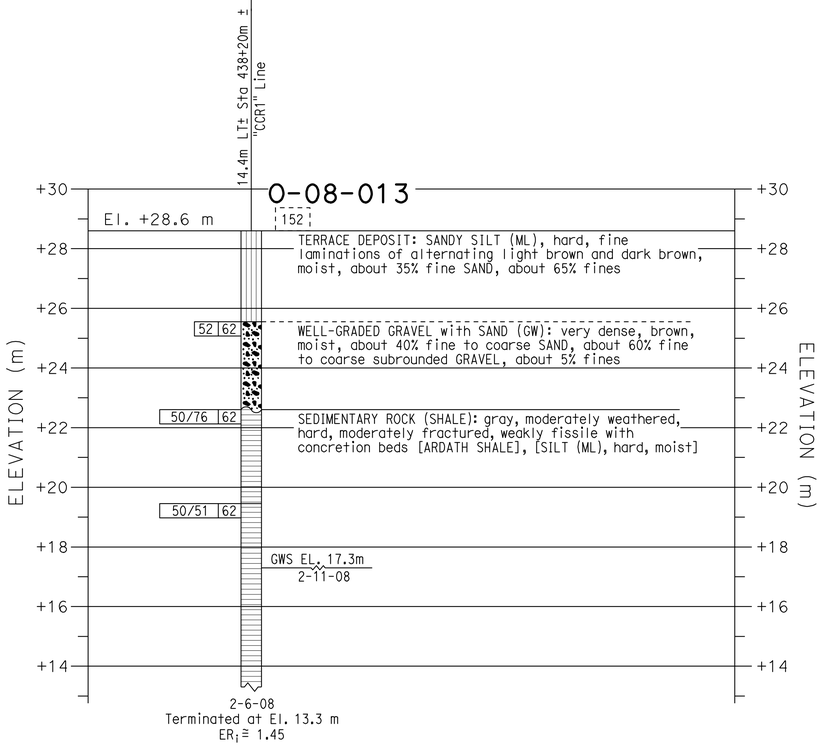

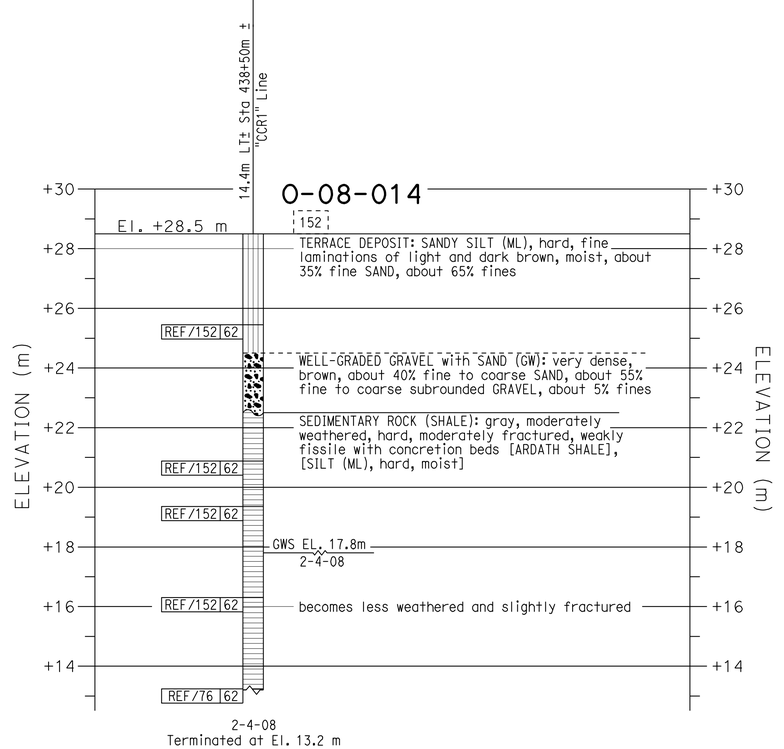

PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	861	886

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER
VAN OLIN
NO. 2578
EXP. 6-30-10
GEOTECHNICAL
STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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SANDAG
401 B STREET,
SAN DIEGO, CA. 92101

BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111

NOTES:

1. 62 mm diameter samples were taken using a California split-barrel sampler with an inside diameter (I.D.) of 62 mm and an outside diameter (O.D.) of 83 mm.

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3. The average hammer energy ratio (ER_i) reflects the percentage efficiency of SPT blowcounts (N-value). The estimated ER_i for the various drilling equipment used was as follows:
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   Longyear 1405: $ER_i \cong 1.45$
   Prosonic Track Mounted: $ER_i \cong 1.00$
   Prosonic 1: $ER_i \cong 1.45$
   Minisonic: $ER_i \cong 1.00$
   Pacific Drilling:
   Unimog: $ER_i \cong 1.27$
   Mole: $ER_i \cong 1.00$
   Minimole: $ER_i \cong 1.00$
   Test America:
   CME 95: $ER_i \cong 1.45$

4. The sedimentary rock was obtained utilizing a sonic drilling technique; this method resulted in Core Recovery (REC) values of essentially 100%. Also, given the nature of the Sedimentary Rock (ie., friable, highly fractured, decomposed rock) a Rock Quality Designation (RQD) index is not relevant and therefore not reported on LOTBs.

ENGINEERING SERVICES		GEOTECHNICAL SERVICES		STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 438R
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER			DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 5 OF 6
NAME:	CHECKED BY: G. CUSTENBORDER						

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

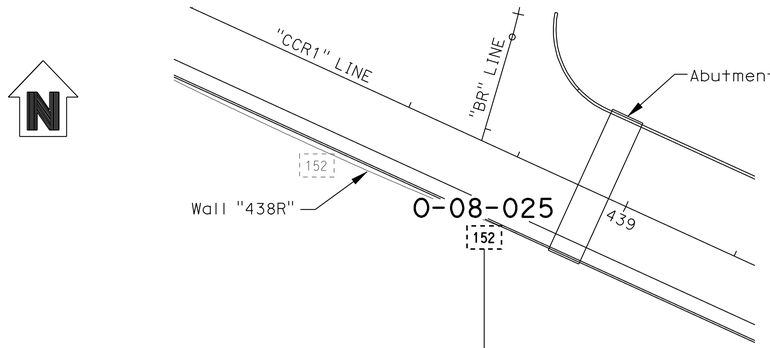
REVISION DATES: 10/14/08 | 3/9/09 | 4/28/09

SHEET 15 OF 16

FILE => 57-rw438r-z-lotb05.dgn

DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:10
USERNAME => trmikesl

Bench Mark
All elevations shown in the LOTBs are in meters and are referenced to the NGVD 1929 Datum.



PLAN
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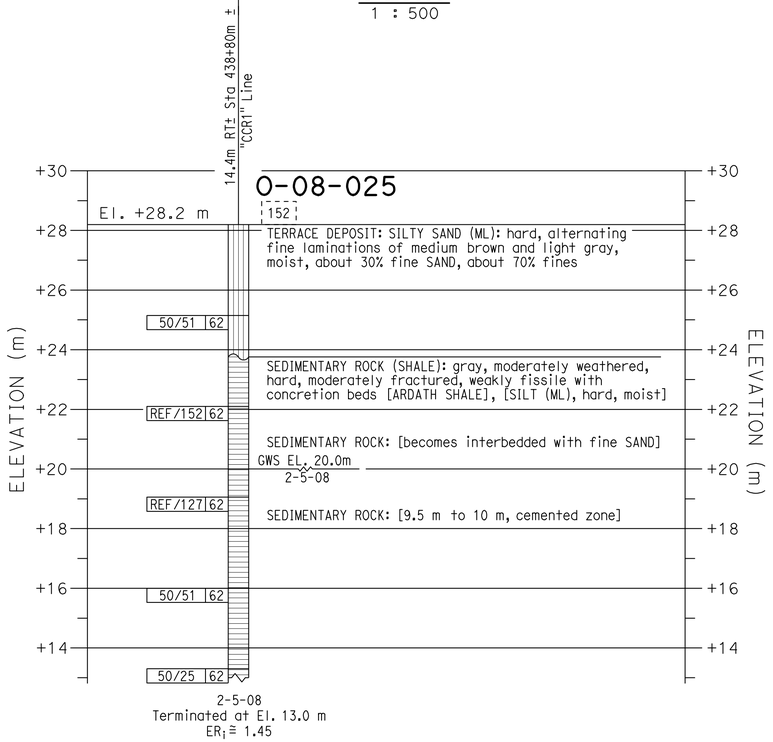

PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	862	886

16
4-28-09
REGISTERED GEOTECHNICAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER
VAN OLIN
NO. 2578
EXP. 6-30-10
GEOTECHNICAL
STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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401 B STREET,
SAN DIEGO, CA. 92101

BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111

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   Minisonic: ER$_i$ ≅ 1.00
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   Unimog: ER$_i$ ≅ 1.27
   Mole: ER$_i$ ≅ 1.00
   Minimole: ER$_i$ ≅ 1.00
   Test America:
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ENGINEERING SERVICES		GEOTECHNICAL SERVICES				
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 438R
NAME:	CHECKED BY: G. CUSTENBORDER			DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 6 OF 6

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES										SHEET	OF
10/14/08	4/28/09									16	16

FILE => 57-rw438r-z-lotb06.dgn

USERNAME => tmirkes
DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:10

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	863	886

GEOTECHNICAL PROFESSIONAL — 4-28-09 DATE

REGISTERED PROFESSIONAL ENGINEER — Van Olin — No. G.E. 2578 — Exp. 06-07-09 GEOTECHNICAL — STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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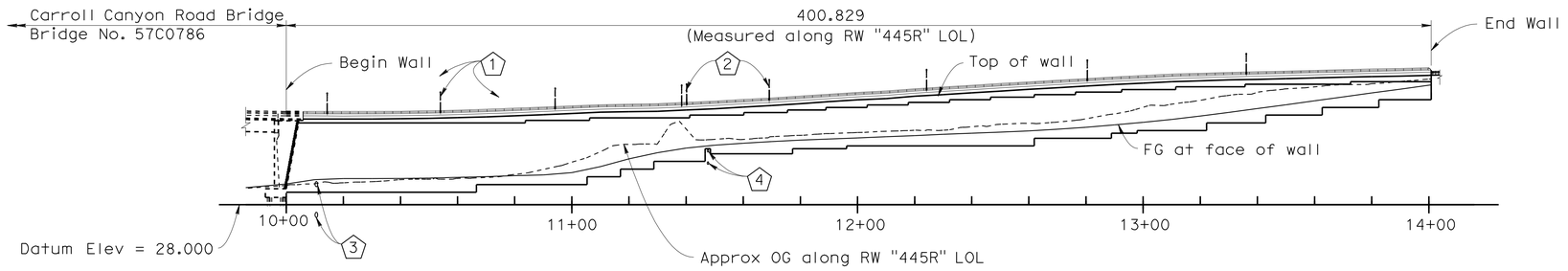
SANDAG
401 B STREET,
SAN DIEGO, CA 92101

BUREAU VERITAS NORTH AMERICA, INC.
TESTING ENGINEERS SAN DIEGO
7895 CONVOY COURT, SUITE 18
SAN DIEGO, CA 92111



DEVELOPED ELEVATION

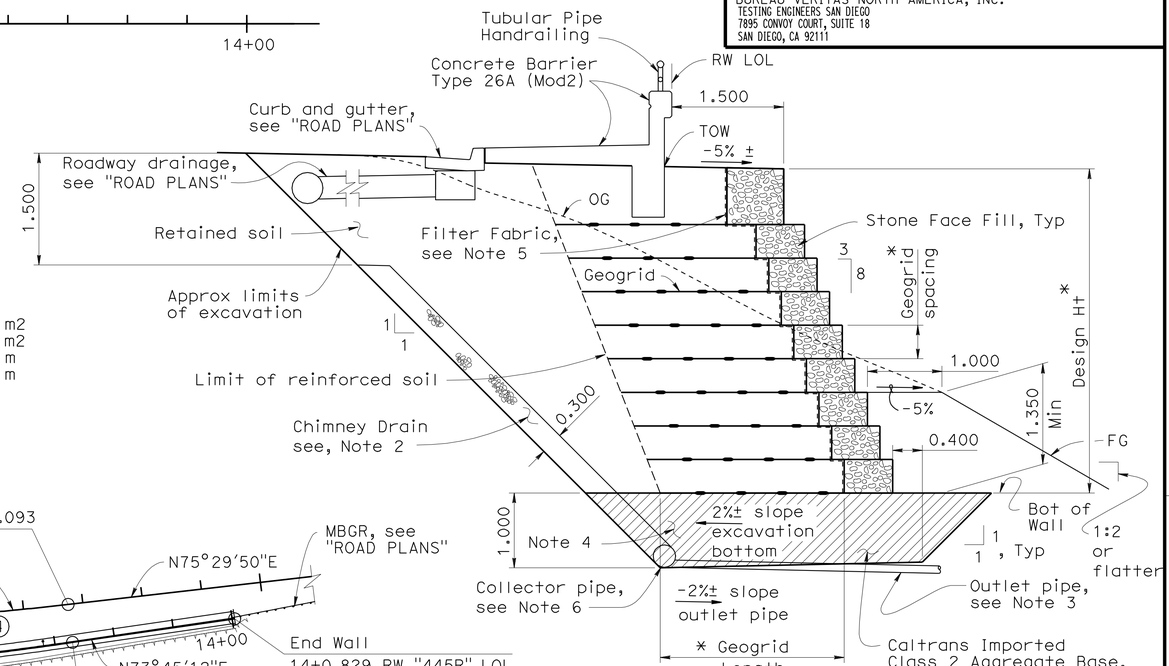
Horz = 1:1000
Vert = 1:500

CURVE DATA

No.	R	△	T	L
①	245.631	12°27'54"	26.825	53.438
②	244.695	16°54'35"	36.373	72.217
③	1115.306	02°35'49"	25.280	50.552
④	1113.515	03°54'57"	38.066	76.102
⑤	260.000	29°19'28"	68.026	133.070
⑥	1100.001	06°30'30"	62.543	124.951

QUANTITIES

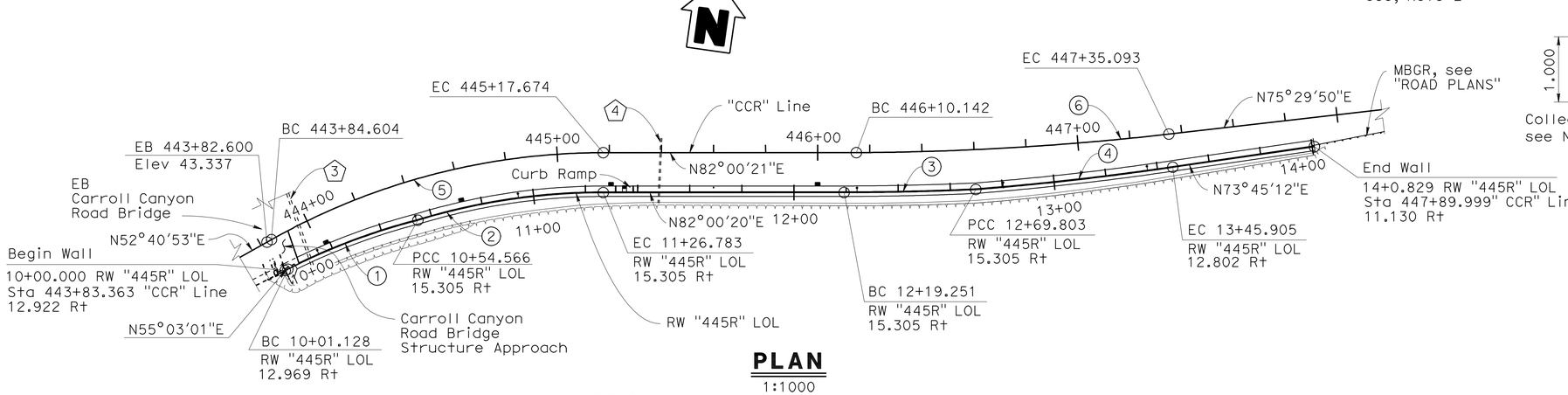
GEOSYNTHETIC REINFORCED EMBANKMENT	3700	m2
STAIN ROCK	4550	m2
TUBULAR PIPE HANDRAILING	395	m
CONCRETE BARRIER (TYPE 26A MODIFIED 2)	395	m



* See "GEOGRID TABLE" on "INDEX TO PLANS" sheet.

TYPICAL SECTION

1:40



PLAN

1:1000

LEGEND:

1. Electroliers, see "ROAD PLANS"
2. Signals, see "ROAD PLANS"
3. 460 mm PVC sanitary sewer system with 914 mm steel casing, see "ROAD PLANS"
4. 460 mm DR-18 sanitary sewer system, see "ROAD PLANS"

NOTES:

1. For "GENERAL NOTES", "STANDARD PLANS" list and "INDEX TO PLANS" see "INDEX TO PLANS sheet.
2. Place Chimney Drain @ 10 m on center. Drain to be 1 m wide x 0.3 m deep. Backfill with Caltrans Class 2 permeable material.
3. 100 mm ø outlet pipe @ 30 m Max spacing between outlets. Minimum cross slope of 2% from back of wall. Discharge outlet pipe to Bioswale or Graded Ditch, see "ROAD PLANS".
4. Rip and recompact upper 0.2 m to minimum 95% relative density at bottom of excavation.
5. Filter Fabric to be placed at all Stone Face Fill baskets.
6. 100 mm ø Collector Pipe placed at excavation bottom, or at lowest elevation required to discharge outlet pipe to Bioswale or Graded Ditch, see "ROAD PLANS".
7. Bottom of imported aggregate base shall be sloped at 2% towards back of wall.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN — DESIGN OVERSIGHT — 4-28-09 — SIGN OFF DATE	DESIGN	BY Van Olin	CHECKED Brian Hinman	LOAD FACTOR DESIGN			
	DETAILS	BY Yihong Wang	CHECKED Brett Makley	LAYOUT	BY Arash Monsefan	CHECKED Brett Makley	
	QUANTITIES	BY Arash Monsefan	CHECKED Brett Makley	SPECIFICATIONS	BY Jeremy LaHaye	PLANS AND SPECS COMPARED Jeremy LaHaye	

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley — PROJECT ENGINEER

BRIDGE NO.

KILOMETER POST KP43.2

RETAINING WALL 445R

GENERAL PLAN

DESIGN GENERAL PLAN SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

FILE => 57-rw445r-a-gp01.dgn

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08 | 4-16-09 | 5-21-09 | 6-23-09

SHEET 1 OF 24

USERNAME => trmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:11

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	864	886

4-28-09
GEOTECHNICAL PROFESSIONAL DATE

REGISTERED PROFESSIONAL ENGINEER — Van Olin — No. G.E. 2578 — Exp. 06-07-09 GEOTECHNICAL — STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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SAN DIEGO, CA 92111

GENERAL NOTES

Live loading: Surcharge = 5.7 KN/m^2

Design of reinforced soil structure is based on the following parameters:

WALL SEGMENTED	FRICTION ANGLE	COHESION	UNIT WEIGHT
Reinf Backfill	28°	14.36 kN/m^2	19.16 kN/m^3
Ret. Backfill	28°	14.36 kN/m^2	19.16 kN/m^3
Foundation	36°	0.0 kN/m^2	19.63 kN/m^3

Horizontal seismic coefficient = 0.17g

Geotechnical parameters used for design shall be confirmed by Geotechnical Engineer prior to wall construction.

Internal stability of walls
Minimum factor of safety on geogrid strength = 1.5
Minimum factor of safety on geogrid pullout = 1.5
Percent coverage of geogrid = 100%

External Stability
Minimum factor of safety against base sliding = 1.5
Minimum factor of safety against overturning = 2.0
Minimum factor of safety against soil bearing overstress = 2.0
Uniform surcharge = As shown on the structural calculations
Backfill Slope = As shown on site plan and structural calculations

Global stability (To be confirmed by Geotechnical Engineer)
Minimum factor of safety against static global stability= 1.5
Minimum factor of safety against seismic global stability= 1.1

Hydrostatic Loading - None

STANDARD PLANS (DATED JULY 2004)

A10A	ACRONYMS AND ABBREVIATIONS (A-L)
A10B	ACRONYMS AND ABBREVIATIONS (M-Z)
RSP A88A	CURB RAMP DETAILS
B11-51	TUBULAR HAND RAILING
B11-54	CONCRETE BARRIER TYPE 26
RSP ES-6A	ELECTRICAL SYSTEMS (LIGHTING STANDARDS TYPE 15 AND 21)
ES-6B	ELECTRICAL SYSTEMS (LIGHTING STANDARDS TYPE 15 AND 21 BARRIER RAIL MOUNTED DETAILS)
RSP ES-7E	ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARDS CASE 3 ARM LOADING, WIND VELOCITY=161 km/h, ARM LENGTHS 4.6 m TO 13.7 m)
RSP ES-7F	ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARDS CASE 4 ARM LOADING, WIND VELOCITY=161 km/h, ARM LENGTHS 7.6 m TO 13.7 m)
ES-7N	ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARDS DETAILS No. 2)
RSP ES-11	ELECTRICAL SYSTEMS (FOUNDATION INSTALLATIONS)

INDEX TO RETAINING WALL PLANS

GEOGRID TABLE

DESIGN HEIGHT (m)	GEOGRID LENGTH (m)	GEOGRID SPACING (m)	LTDS (kN/m)	GRID PULLOUT ADHESION(kN/m^2)
0-3	2.4	0.45	35	5
3-6	4.8	0.45	60	5
6-9	7.2	0.45	60	5
9-12	9.6	0.45	60	5
>12	10.0	0.45	60	5

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Van Olin	Brian Hinman
DETAILS	Yihong Wang	Brett Makley
QUANTITIES	Arash Monsefan	Brett Makley

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 445R
INDEX TO PLANS

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

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REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08, 4-16-09, 4-28-09

SHEET 2 OF 24

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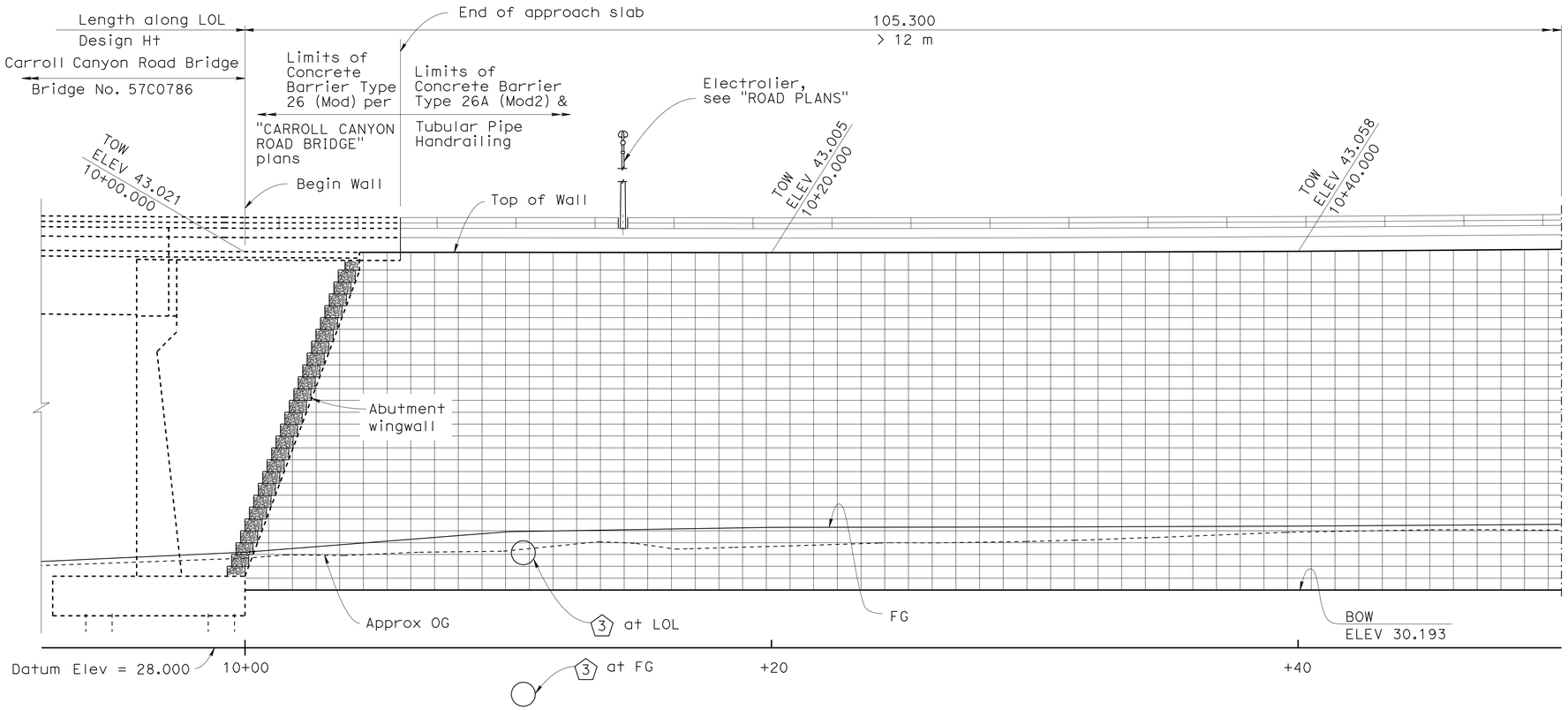

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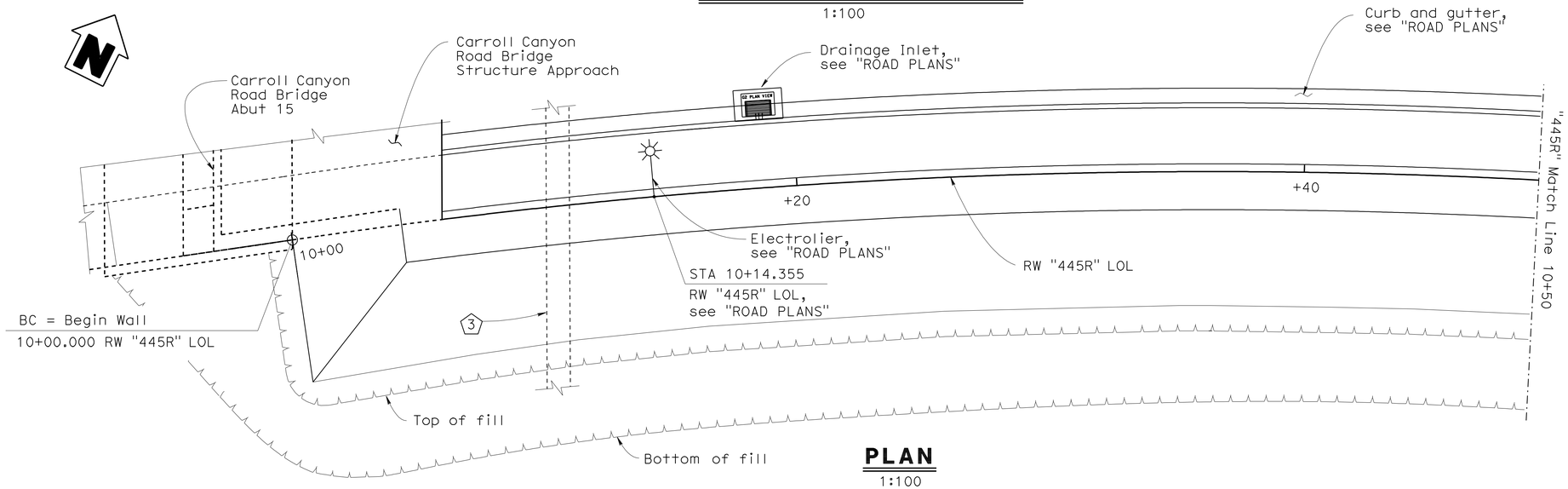

PLAN

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Note: For utility (3), see "GENERAL PLAN" sheet

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	865	886

GEOTECHNICAL PROFESSIONAL — DATE 4-28-09

9-27-10
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SAN DIEGO, CA 92111

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

DESIGN	BY Van Olin	CHECKED Brian Hinman	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
DETAILS	BY Yihong Wang	CHECKED Brett Makley	
QUANTITIES	BY Arash Monsefan	CHECKED Brett Makley	

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 445R

RETAINING WALL PLAN NO. 1

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

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REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08, 4-16-09, 5-21-09

SHEET 3 OF 24

FILE => 57-rw445r-c-sp01.dgn

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
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9-27-10
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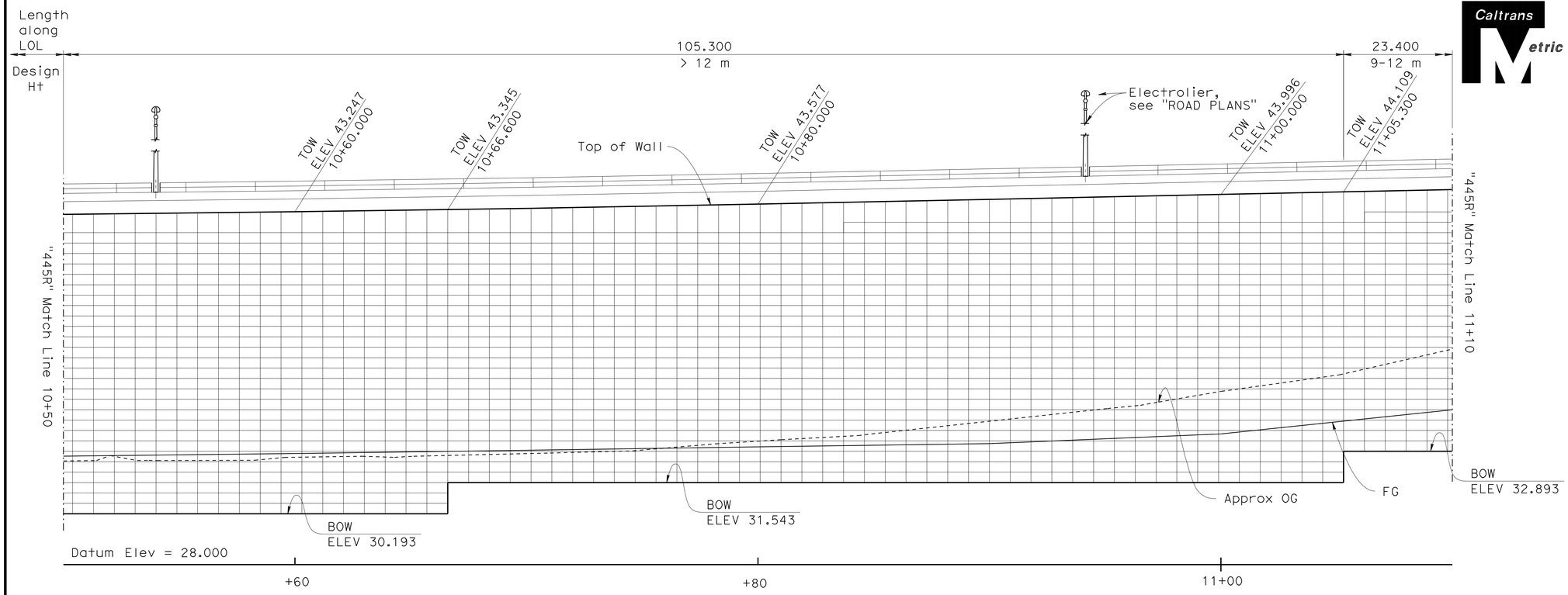

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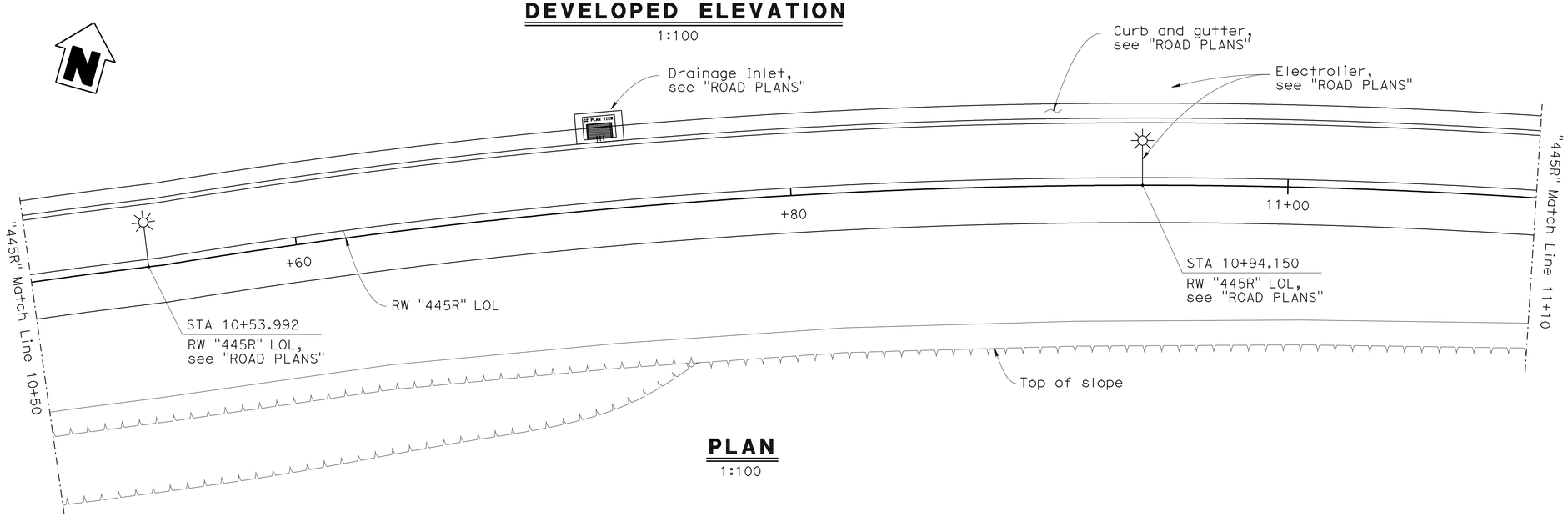

PLAN

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CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

DESIGN	BY Van Olin	CHECKED Brian Hinman	
DETAILS	BY Yihong Wang	CHECKED Brett Makley	
QUANTITIES	BY Arash Monsefan	CHECKED Brett Makley	

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 445R

RETAINING WALL PLAN NO. 2

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
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SHEET 4 OF 24

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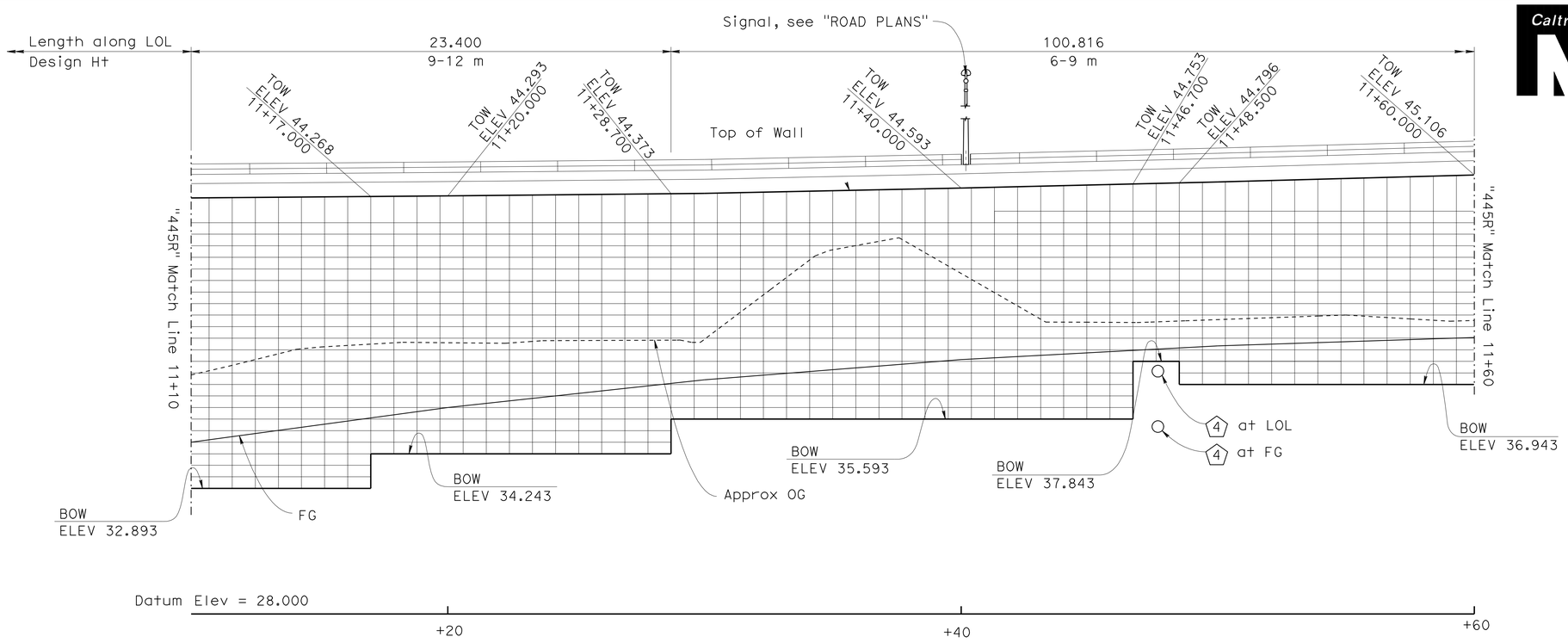

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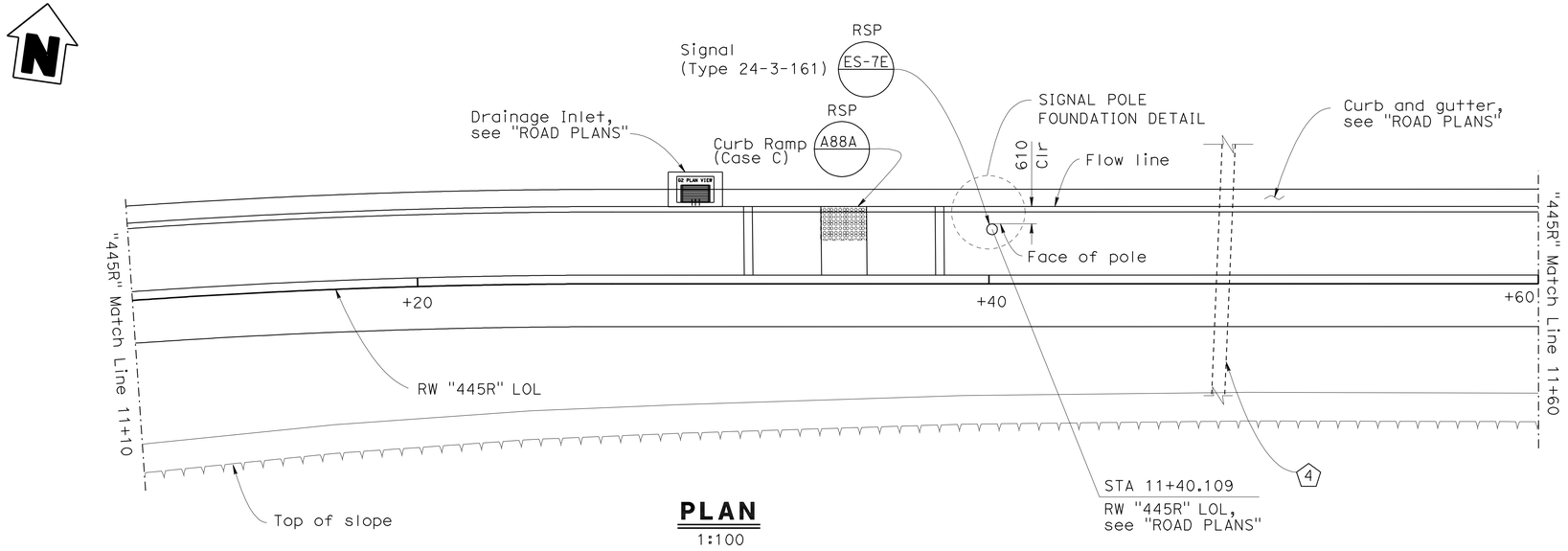

PLAN

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NOTES:

1. For utility (4), see "GENERAL PLAN" sheet.
2. For "SIGNAL POLE FOUNDATION DETAIL" see "RETAINING WALL PLAN NO. 8" sheet.

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	867	886

GEOTECHNICAL PROFESSIONAL — DATE 4-28-09

PLANS APPROVAL DATE 9-27-10

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CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Van Olin	Brian Hinman
DETAILS	Yihong Wang	Brett Makley
QUANTITIES	Arash Monsefan	Brett Makley

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 445R
RETAINING WALL PLAN NO. 3

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08, 4-16-09, 4-28-09, 5-21-09

SHEET 5 OF 24

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Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	868	886

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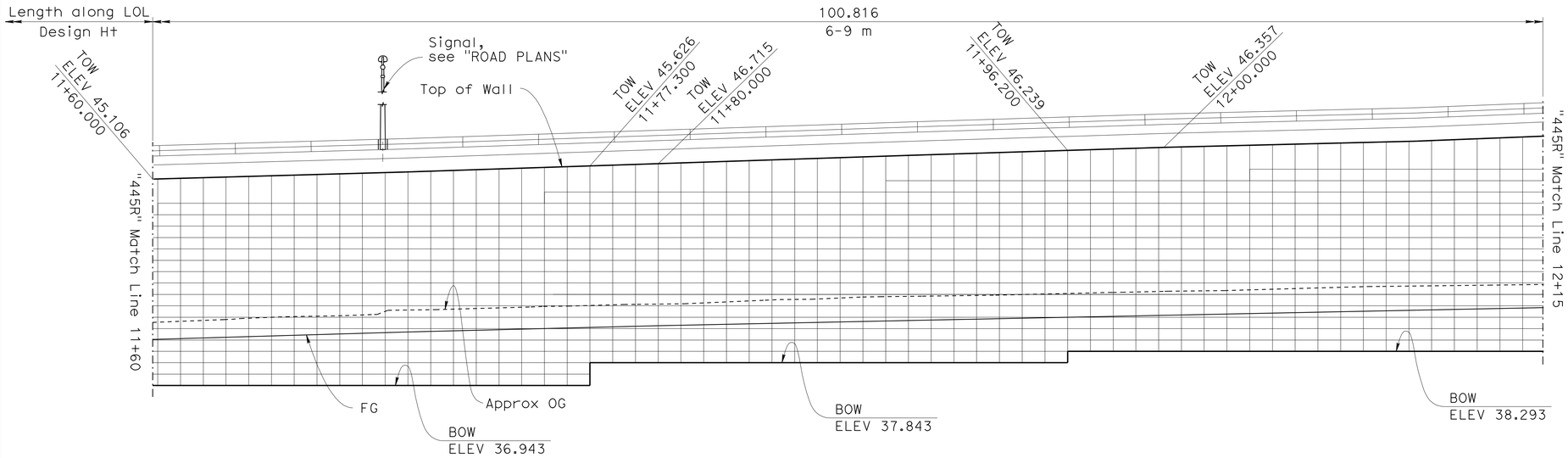

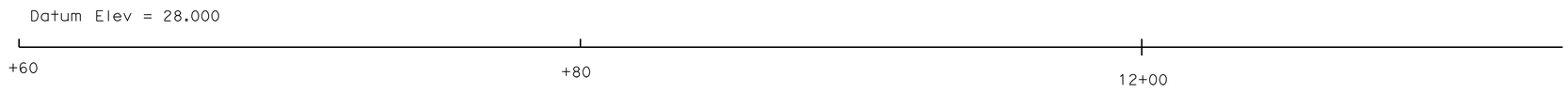

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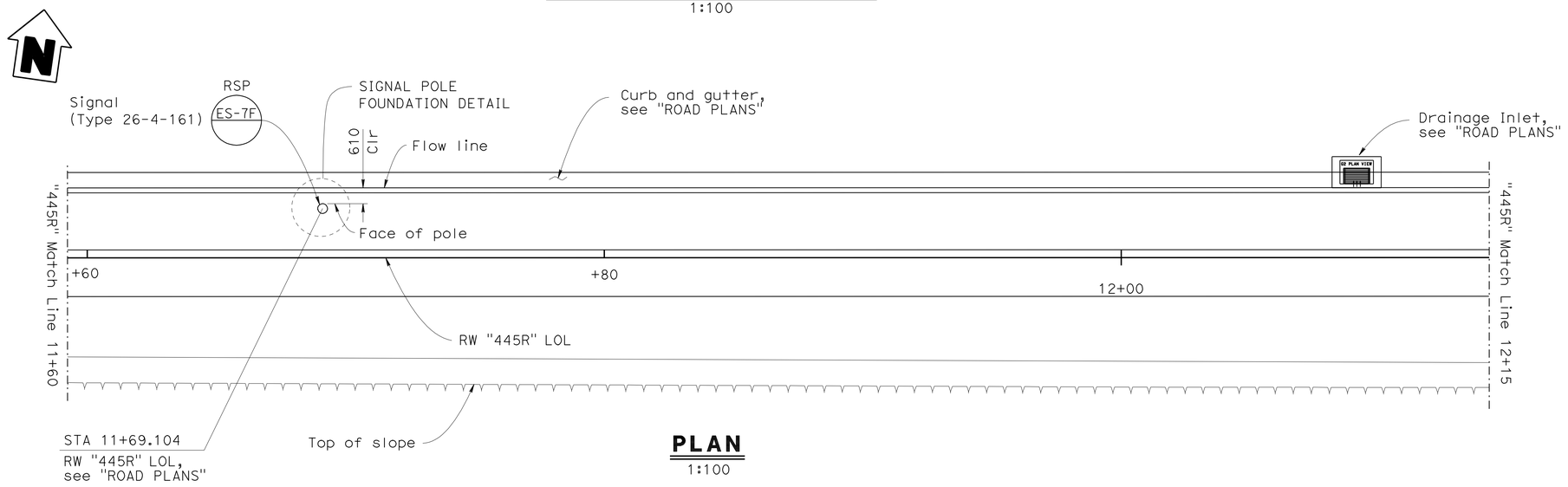

PLAN
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Note: For "SIGNAL POLE FOUNDATION DETAIL" see "RETAINING WALL PLAN NO. 8" sheet.

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CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Van Olin	Brian Hinman
DETAILS	Yihong Wang	Brett Makley
QUANTITIES	Arash Monsefan	Brett Makley

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Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 445R
RETAINING WALL PLAN NO. 4

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

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SHEET 6 OF 24

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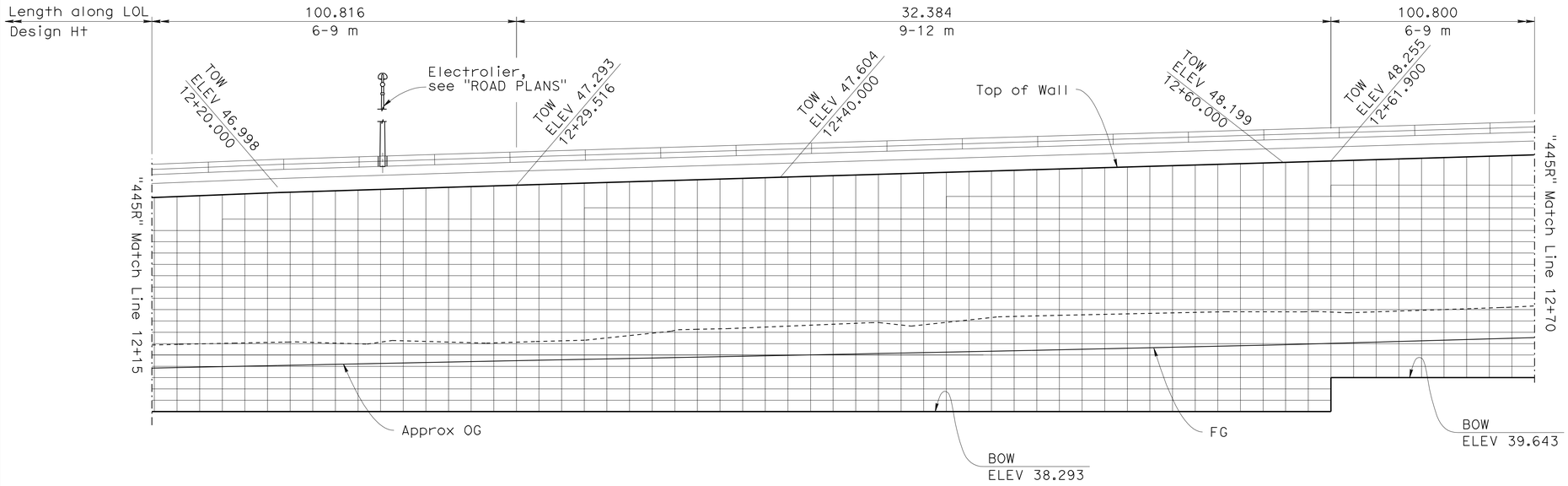

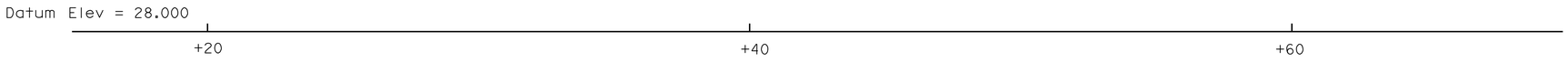

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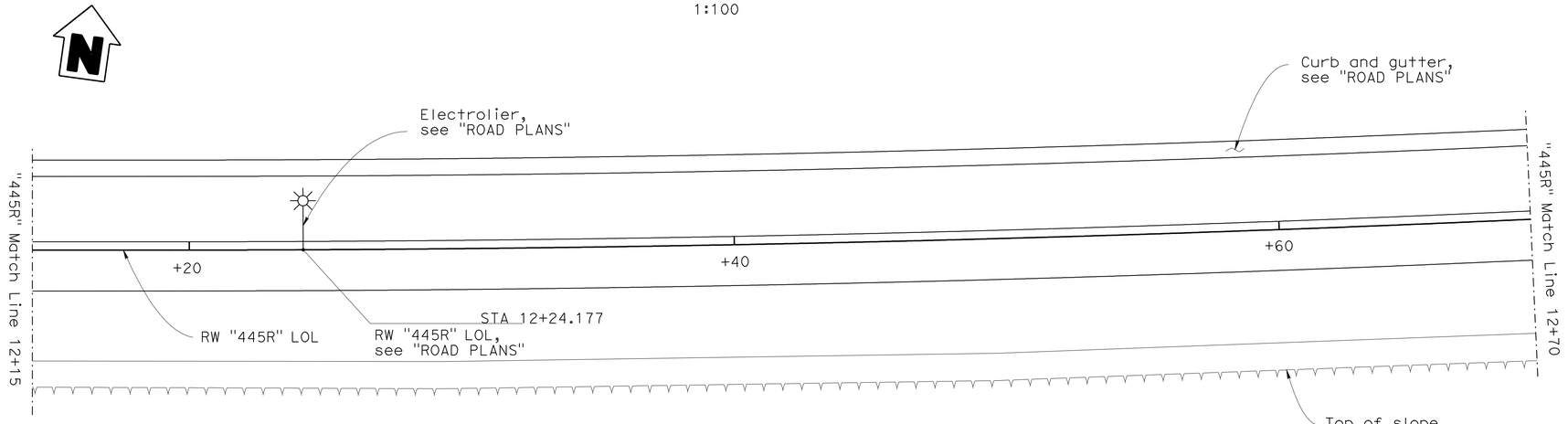

PLAN

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	869	886

GEOTECHNICAL PROFESSIONAL — DATE 4-28-09

PLANS APPROVAL DATE 9-27-10

REGISTERED PROFESSIONAL ENGINEER — Van Olin — No. G.E. 2578 — Exp. 06-07-09 GEOTECHNICAL — STATE OF CALIFORNIA

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SAN DIEGO, CA 92111

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

	BY	CHECKED
DESIGN	Van Olin	Brian Hinman
DETAILS	Yihong Wang	Brett Makley
QUANTITIES	Arash Monsefan	Brett Makley

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

CU 11275
EA 2T0401

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 445R

RETAINING WALL PLAN NO. 5

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

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08 | 4-16-09 | 5-21-09

SHEET 7 OF 24

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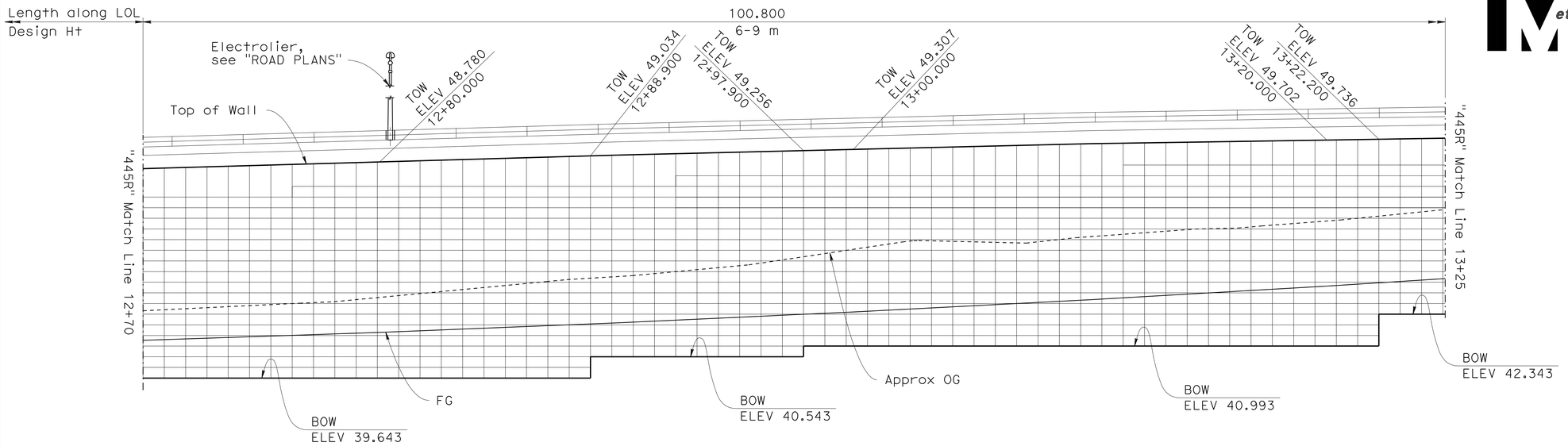

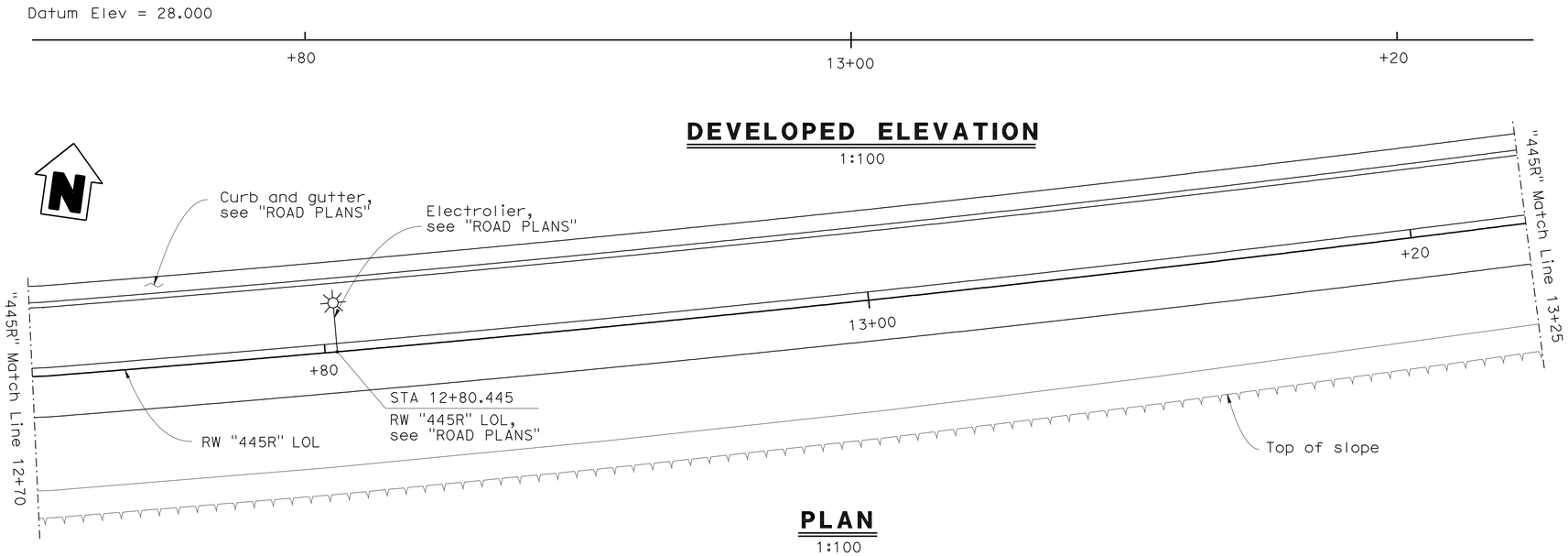

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	870	886

GEOTECHNICAL PROFESSIONAL — 4-28-09 DATE

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ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

DESIGN	BY Van Olin	CHECKED Brian Hinman	
DETAILS	BY Yihong Wang	CHECKED Brett Makley	
QUANTITIES	BY Arash Monsefan	CHECKED Brett Makley	

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 445R
RETAINING WALL PLAN NO. 6

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

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SHEET 8 OF 24

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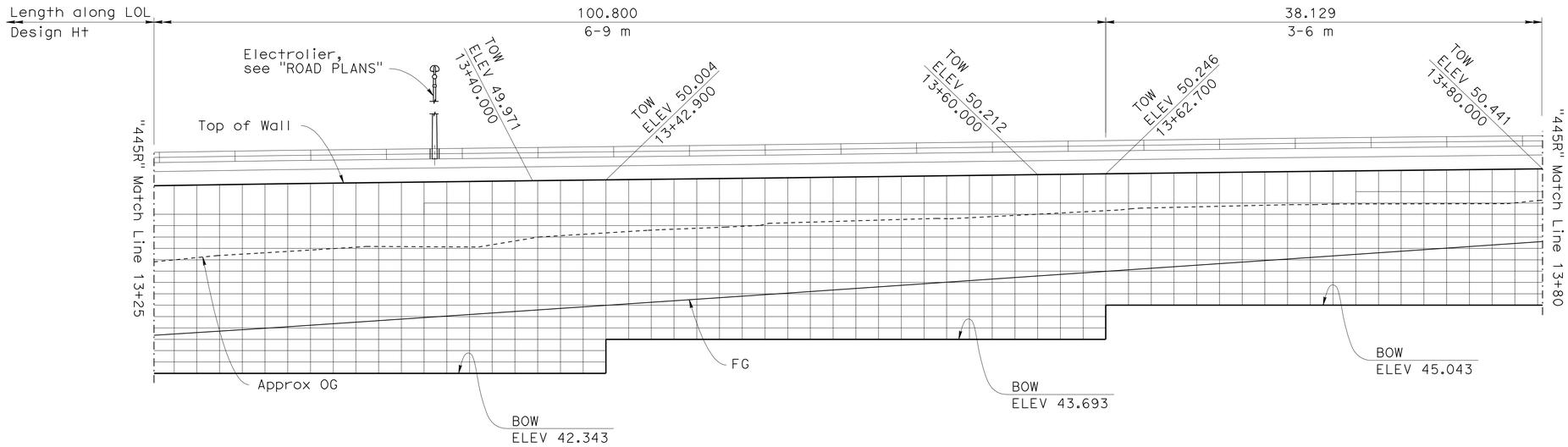

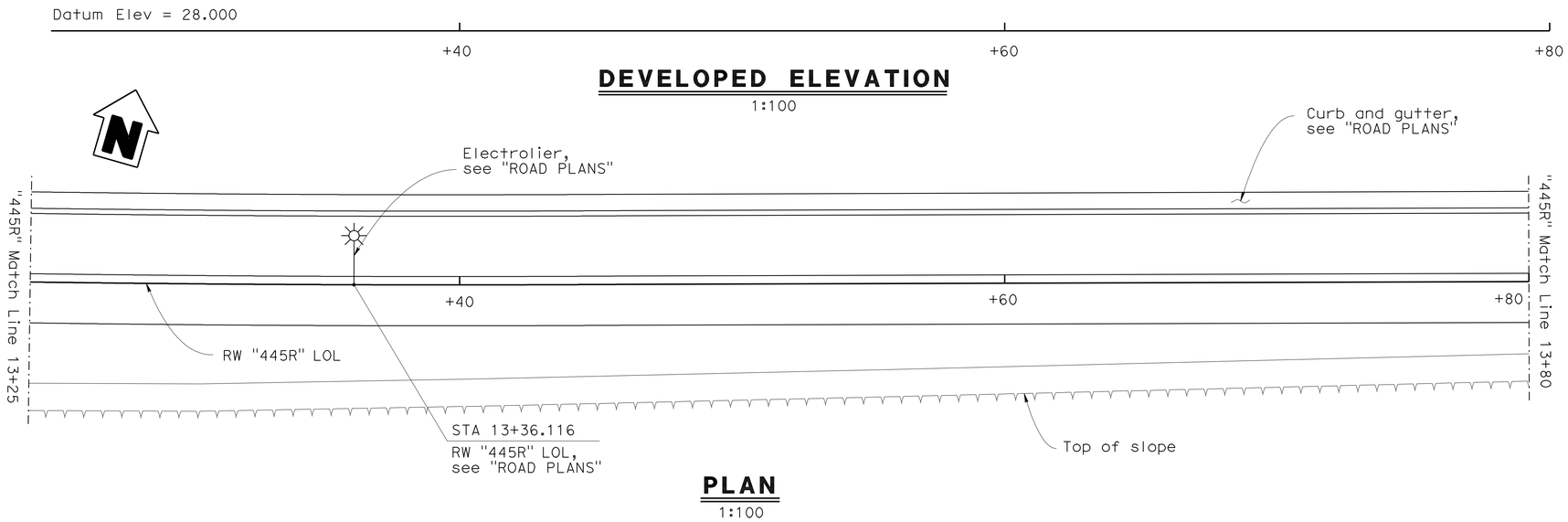

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	871	886

GEOTECHNICAL PROFESSIONAL — 4-28-09 DATE

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Van Olin — No. G.E. 2578 — Exp. 06-07-09 GEOTECHNICAL — STATE OF CALIFORNIA

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SAN DIEGO, CA 92101

BUREAU VERITAS NORTH AMERICA, INC.
TESTING ENGINEERS SAN DIEGO
7895 CONVOY COURT, SUITE 18
SAN DIEGO, CA 92111

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

DESIGN	BY Van Olin	CHECKED Brian Hinman	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
DETAILS	BY Yihong Wang	CHECKED Brett Makley	
QUANTITIES	BY Arash Monsefan	CHECKED Brett Makley	

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 445R
RETAINING WALL PLAN NO. 7

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

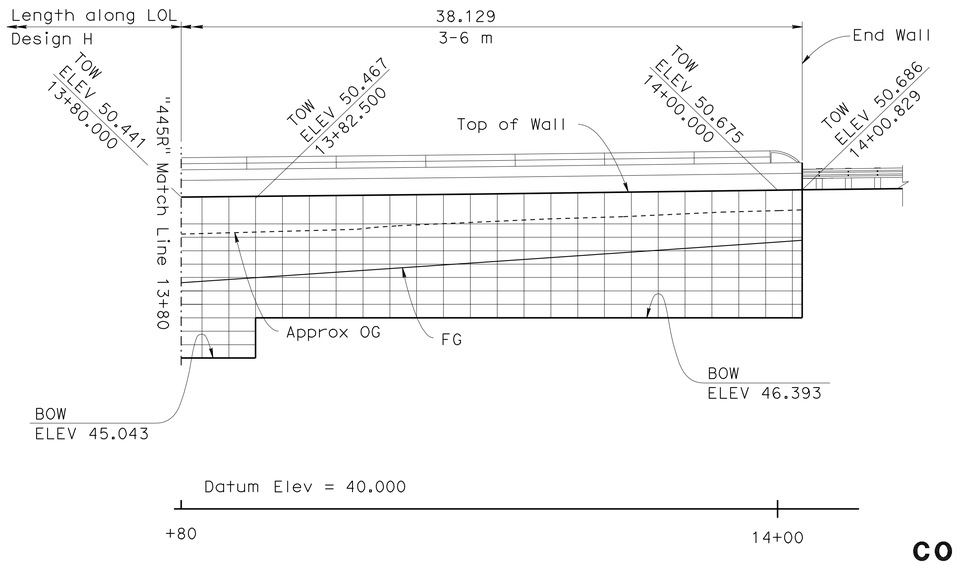
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08, 4-16-09, 5-21-09

SHEET 9 OF 24

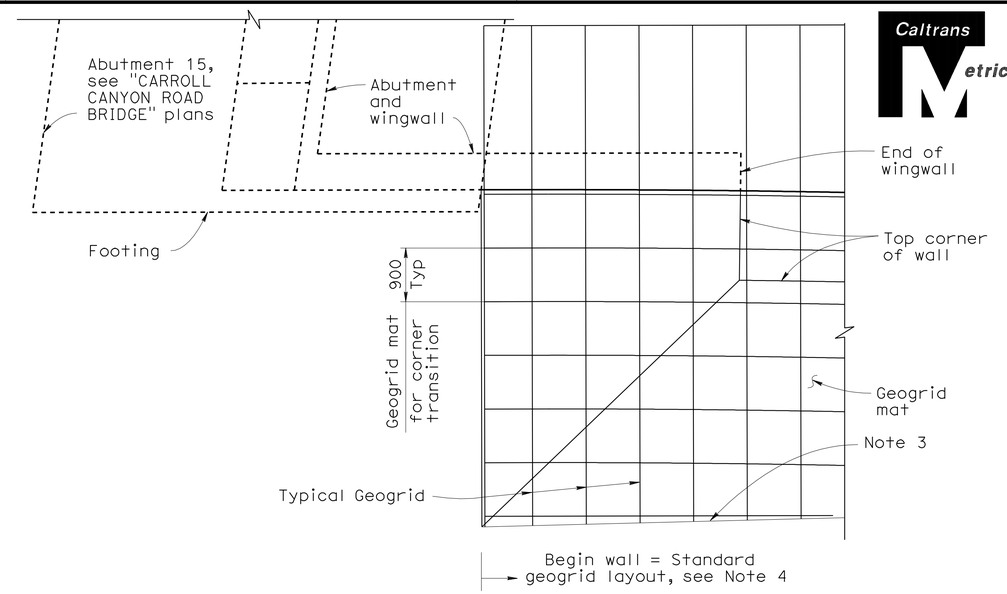
FILE => 57-rw445r-c-sp07.dgn

USERNAME => ttimkes\ DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:12



DEVELOPED ELEVATION

1:100



CORNER TRANSITION DETAIL AT CCR BRIDGE ABUTMENT

No Scale

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	872	886

GEOTECHNICAL PROFESSIONAL — 4-28-09 DATE

9-27-10
PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER — Van Olin — No. G.E. 2578 — Exp. 06-07-09 GEOTECHNICAL — STATE OF CALIFORNIA

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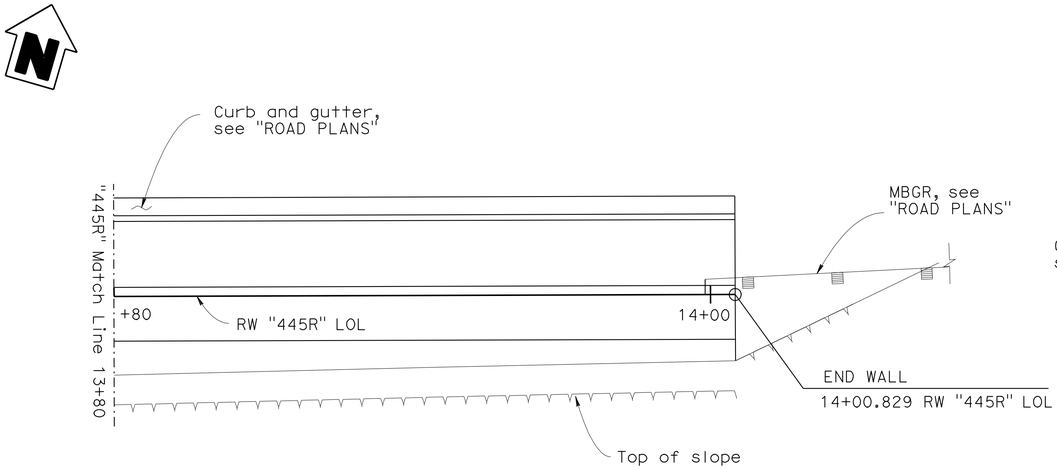
BUREAU VERITAS NORTH AMERICA, INC.
TESTING ENGINEERS SAN DIEGO
7895 CONVOY COURT, SUITE 18
SAN DIEGO, CA 92111

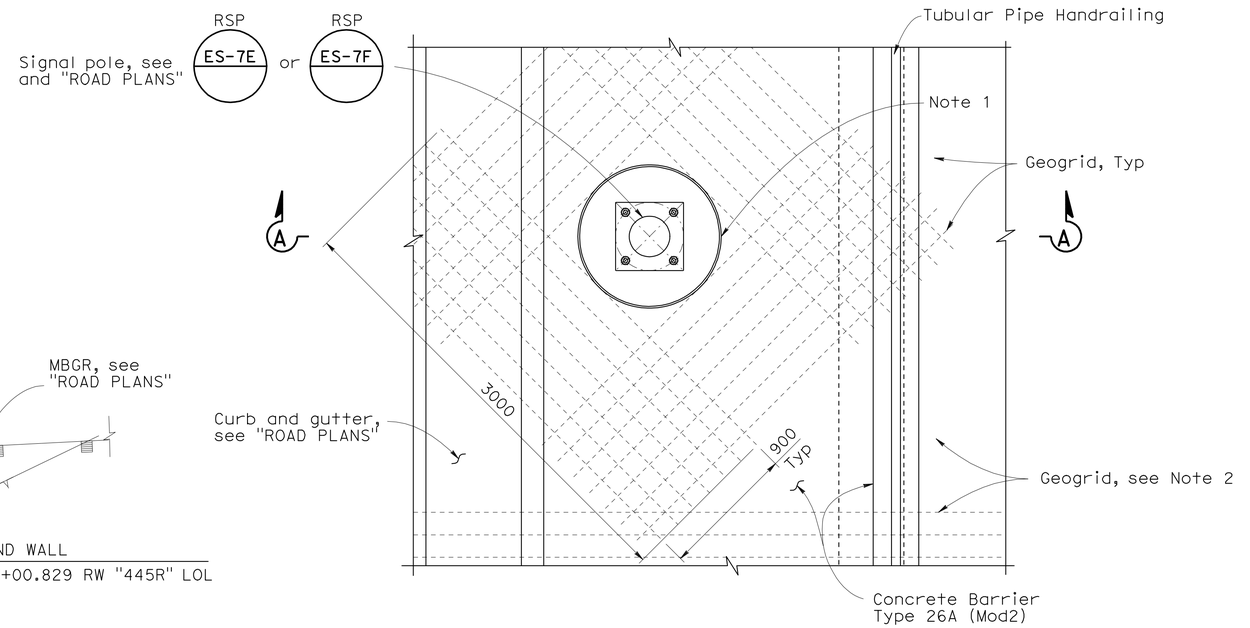
NOTES:

1. Place 12 mm Hardboard all around base.
2. All geogrid details not shown for clarity.
3. Facing details not shown for clarity.
4. Stone face fill and wire facing baskets to be used at corner transition. Standard facing details apply beyond standard geogrid layout.



PLAN

1:100



Note: For "SECTION A-A", see "MISCELLANEOUS DETAILS" sheet.

PLAN

SIGNAL POLE FOUNDATION DETAIL

1:20

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

DESIGN	BY Van Olin	CHECKED Brian Hinman	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
DETAILS	BY Yihong Wang	CHECKED Brett Makley	
QUANTITIES	BY Arash Monsefan	CHECKED Brett Makley	

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 445R

RETAINING WALL PLAN NO. 8

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08, 5-16-09, 5-21-09

SHEET 10 OF 24

FILE => 57-rw445r-c-sp08.dgn

USERNAME => trmikesl DATE PLOTTED => 23-SEP-2010 TIME PLOTTED => 12:12

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	873	886

REGISTERED CIVIL ENGINEER — DATE 4-28-09

James L. Rucker, No. 47796, Exp. 12-31-09, CIVIL, REGISTERED PROFESSIONAL ENGINEER, STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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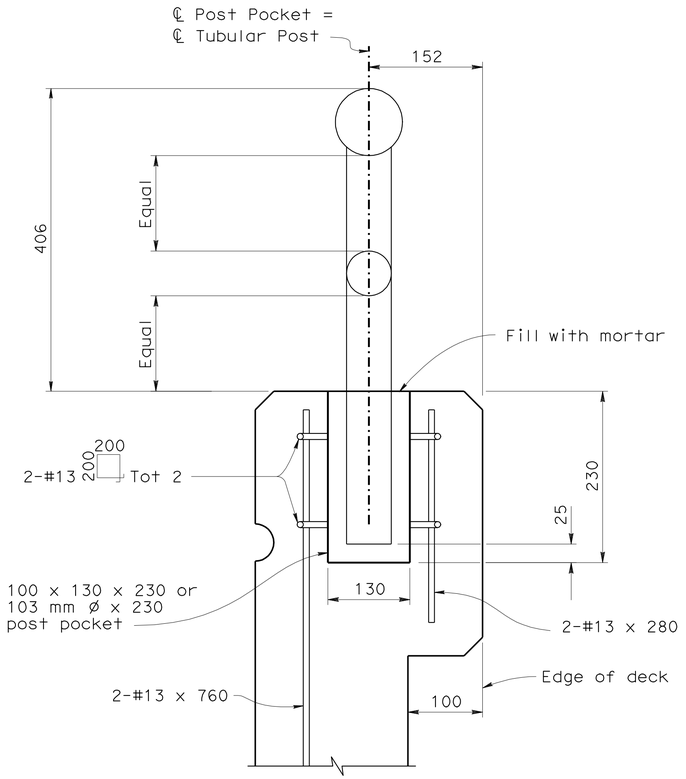
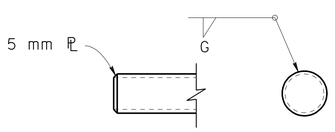
5030 CAMINO DE LA SIESTA, SUITE 204,
SAN DIEGO, CA 92108



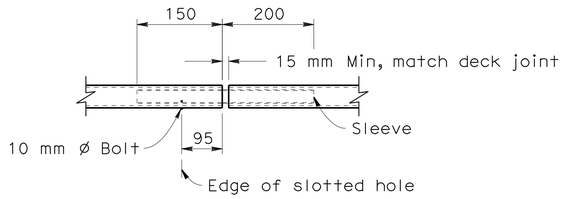
POST ANCHORAGE DETAILS

No Scale

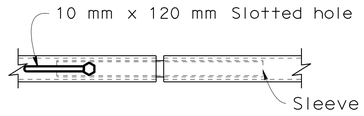


RAIL CAP DETAILS

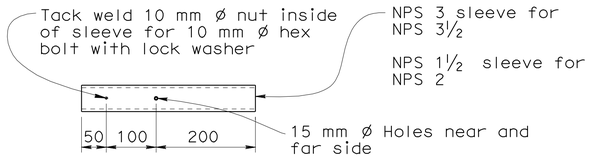
No Scale



VIEW G-G



VIEW H-H



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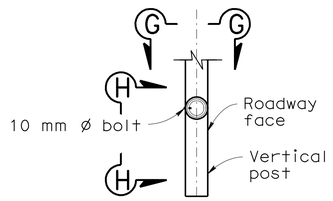
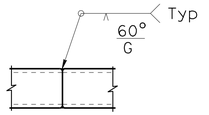


SECTION

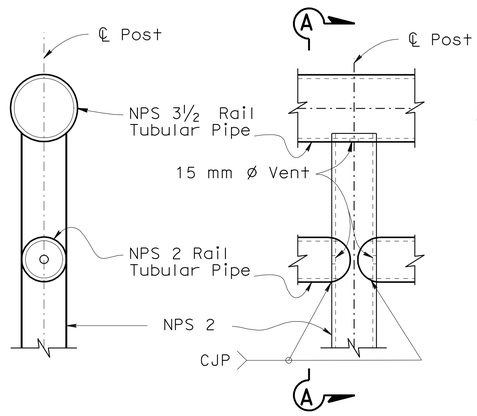


TUBE-WELD SPLICE

No Scale

TUBULAR PIPE SPLICE DETAILS

No Scale



SECTION A-A

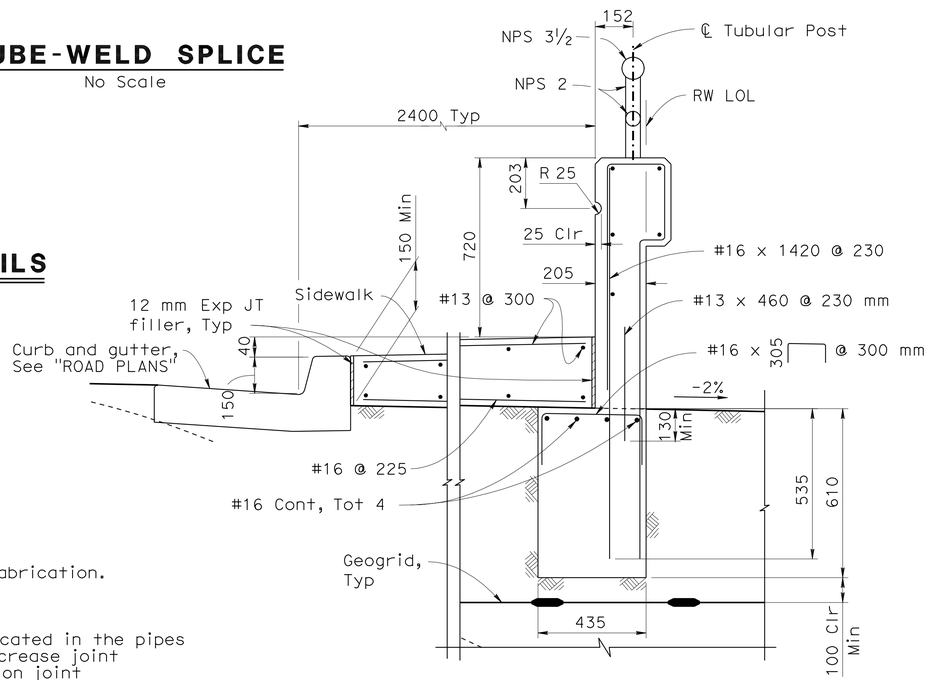
1:10

ELEVATION

1:10
For Typ Welded Section

NOTES:

1. Galvanize rail assembly after fabrication.
2. Post shall be vertical.
3. Tubular pipe splices shall be located in the pipes spanning deck or wall joints. Increase joint width in pipes to match expansion joint width and increase sleeve length accordingly.
4. Top rail tubular pipe shall be continuous over not less than two posts.
5. For barrier details and reinforcement not shown, see (B11-51) and (B11-54).
6. All tubular pipe posts and rails shall be NPS standard weight A53 grade B Type E Pipes.



CONCRETE BARRIER TYPE 26A (MOD2)

No Scale

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Arash Monsefan	Brett Makley
DETAILS	Yihong Wang	Arash Monsefan
QUANTITIES	Arash Monsefan	Brett Makley

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 445R

TUBULAR PIPE HANDRAILING

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

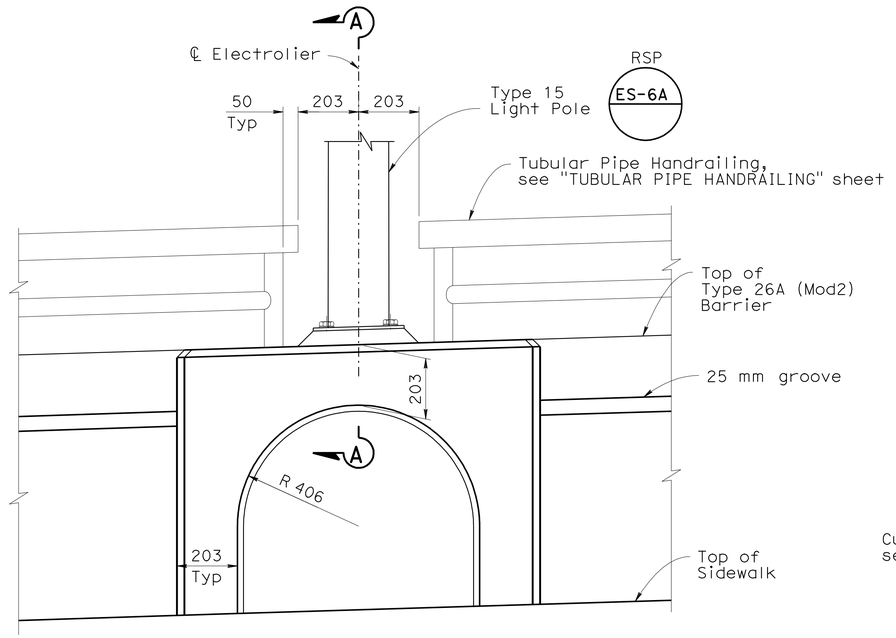
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08, 5-16-09, 4-28-09, 5-21-09

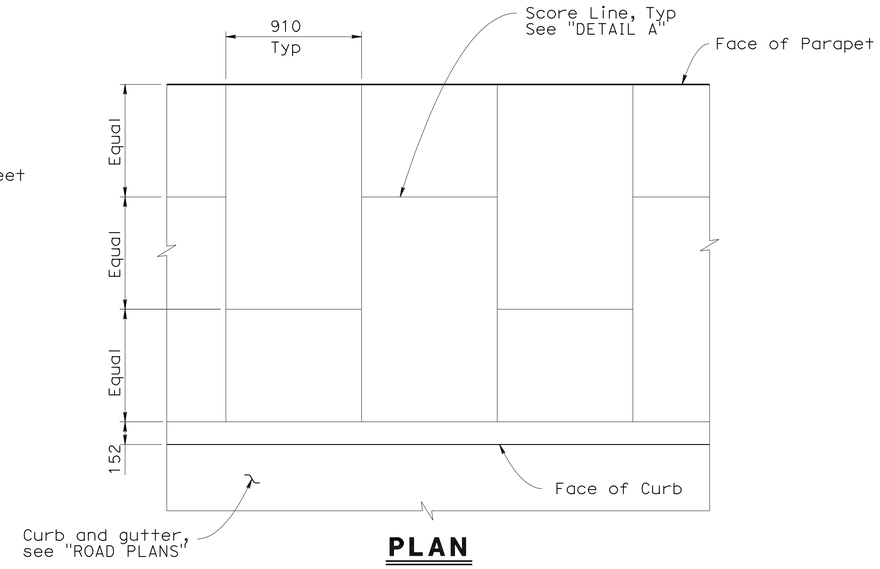
SHEET 11 OF 24

FILE => 57-rw445r-q-Arch01.dgn

USERNAME => trmikesl DATE PLOTTED => 23-SEP-2010 TIME PLOTTED => 12:12

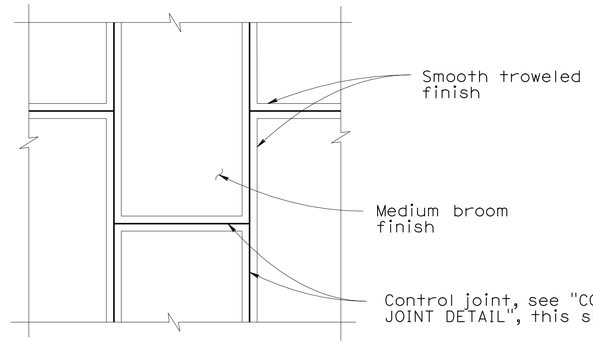


ELEVATION



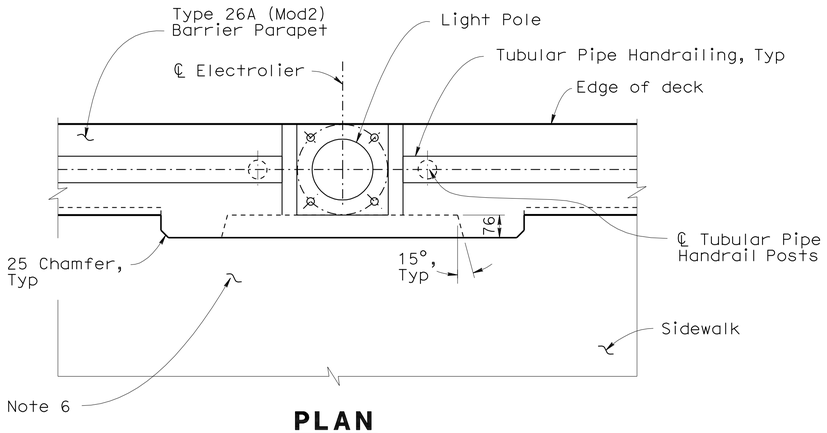
PLAN

1:20



DETAIL A

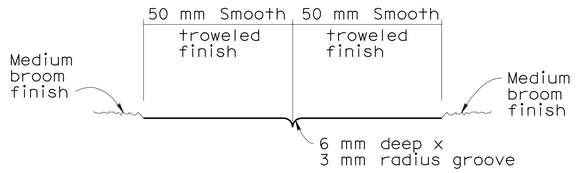
1:20



PLAN

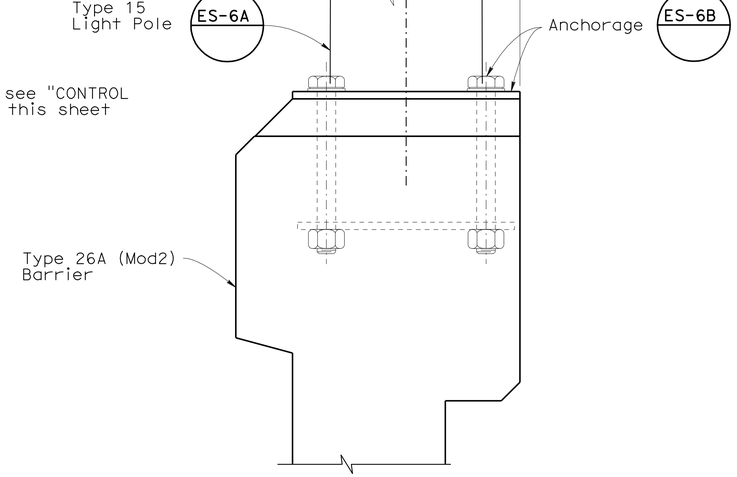
ELECTROLIER BASE DETAIL

1:10



CONTROL JOINT DETAIL

1:1



SECTION A-A

1:4

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	874	886

REGISTERED CIVIL ENGINEER — 4-28-09 DATE

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — James L. Rucker No. 47796 Exp. 12-31-09 CIVIL STATE OF CALIFORNIA

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SAN DIEGO, CA 92108

NOTES:

1. Post shall be vertical.
2. Top rail tubular pipe shall be continuous over not less than two posts.
3. Alternative details may be submitted by Contractor for Engineer's approval.
4. For concrete barrier details and reinforcement not shown, see "TUBULAR PIPE HANDRAILING" and "MISCELLANEOUS BRIDGE DETAILS" sheets.
5. Rails are NPS standard weight A53 grade B Type E Pipes.
6. Scoring detail not shown for clarity.
7. For electrolier locations, see "ROAD PLANS".

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Arash Monsefan	Brett Makley
DETAILS	Yihong Wang	Arash Monsefan
QUANTITIES	Arash Monsefan	Brett Makley

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 445R
ARCHITECTURAL DETAILS

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08 4-16-09 5-21-09

SHEET 12 OF 24

FILE => 57-rw445r-q-Arch02.dgn

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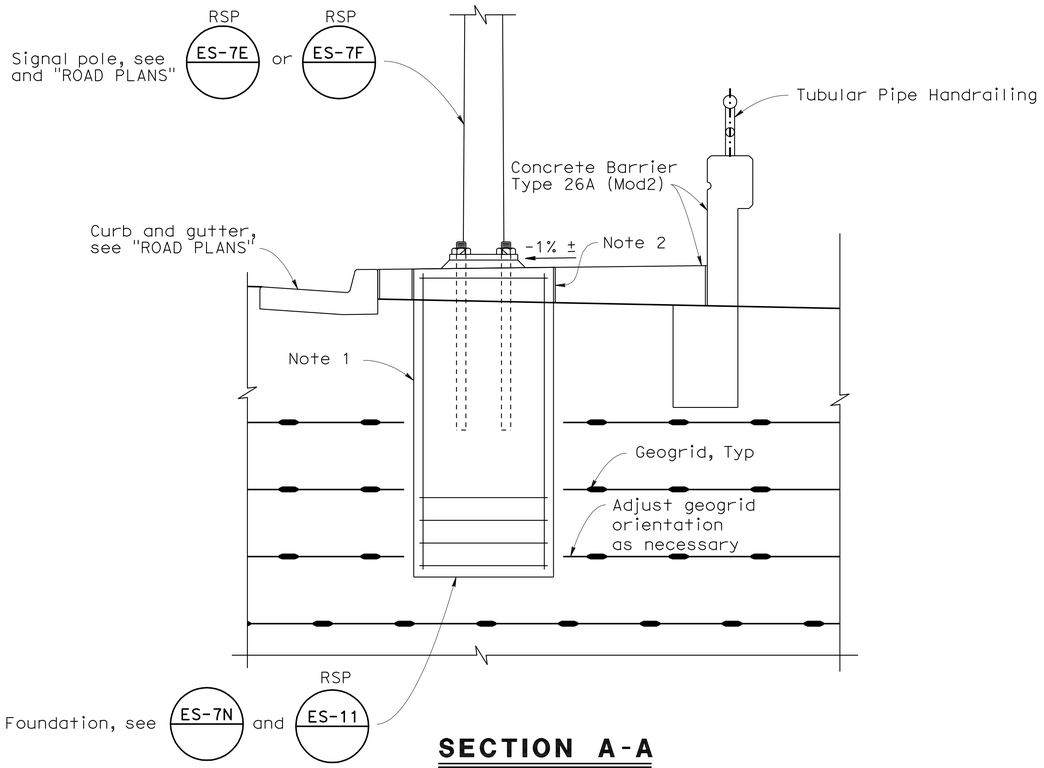
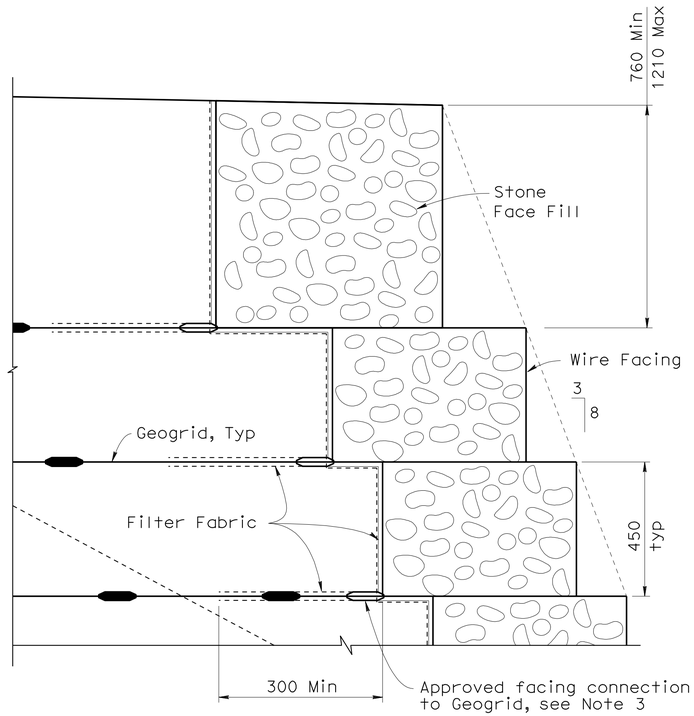


SECTION A-A

1:20



FACING DETAIL

1:10

NOTES:

1. Place 937 mm ø casing and adjust geogrid reinforcement per "SIGNAL POLE FOUNDATION" detail on "RETAINING WALL PLAN NO. 8" sheet.
2. Place 12 mm Hardboard all around base in sidewalk.
3. Connection shall be corrosion resistant.

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	875	886

REGISTERED CIVIL ENGINEER — 4-28-09 DATE

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — James L. Rucker — No. 47796 — Exp. 12-31-09 — CIVIL — STATE OF CALIFORNIA

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5030 CAMINO DE LA SIESTA, SUITE 204,
SAN DIEGO, CA 92108

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CHUNG-YUAN WEN
DESIGN OVERSIGHT
4-28-09
SIGN OFF DATE

	BY	CHECKED
DESIGN	Arash Monsefan	Brett Makley
DETAILS	Yihong Wang	Arash Monsefan
QUANTITIES	Arash Monsefan	Brett Makley

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

Brett Makley
PROJECT ENGINEER

BRIDGE NO.
KILOMETER POST KP43.2

RETAINING WALL 445R

MISCELLANEOUS DETAILS

DESIGN DETAIL SHEET (METRIC) (REV. 10/27/05)

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3-14-08, 6-16-09

SHEET 13 OF 24

FILE => 57-rw445r-q-Miscdt01.dgn

USERNAME => rtmikes DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:12

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	876	886

16

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER ☆ VAN OLIN NO. 2578 EXP. 6-30-10 ☆ GEOTECHNICAL STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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SANDAG
401 B STREET,
SAN DIEGO, CA. 92101

BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111

APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 300 mm)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 300 mm
Cobble		76 mm to 300 mm
Gravel	Coarse	19 mm to 76 mm
	Fine	No. 4 to 19 mm
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

SOIL LEGEND

ENGINEERING SERVICES	GEOTECHNICAL SERVICES	STATE OF CALIFORNIA	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 445R
FUNCTIONAL SUPERVISOR NAME:	DRAWN BY: J. JOHNS CHECKED BY: G. CUSTENBORDER	FIELD INVESTIGATIONS BY: V. OLIN G. CUSTENBORDER	DEPARTMENT OF TRANSPORTATION DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 1 OF 11

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

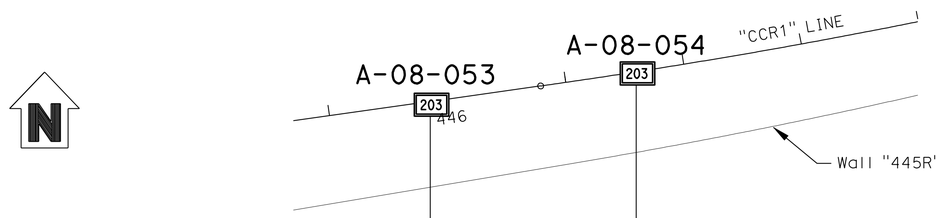
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES									SHEET	OF
10/24/08	3/9/09	4/16/09							14	24

FILE => 57-rw445r-z-1otb01.dgn

USERNAME => tmikesl
DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:13

Bench Mark
All elevations shown in the LOTBs are in meters and are referenced to the NGVD 1929 Datum.



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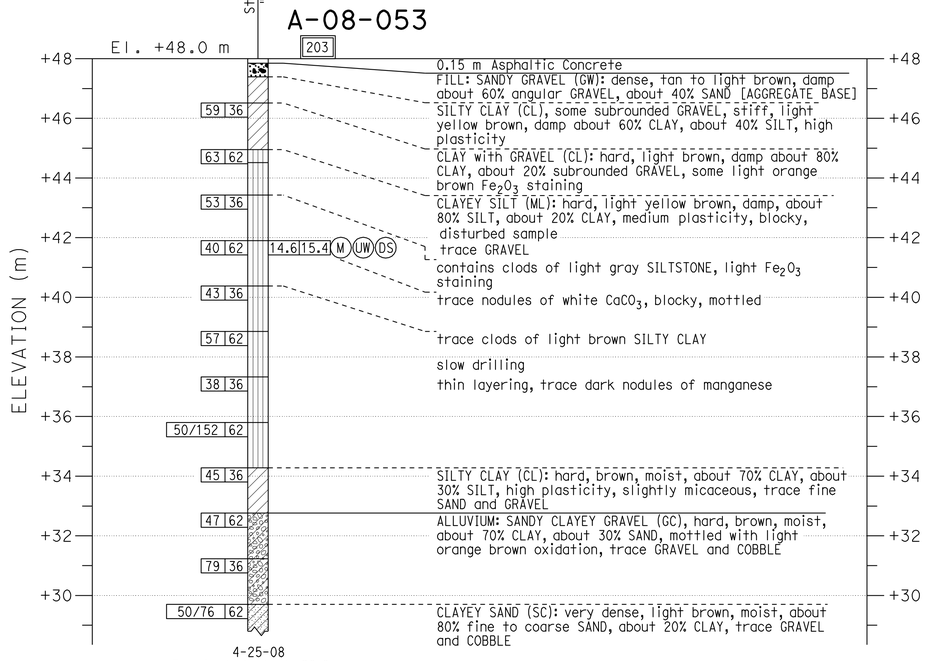

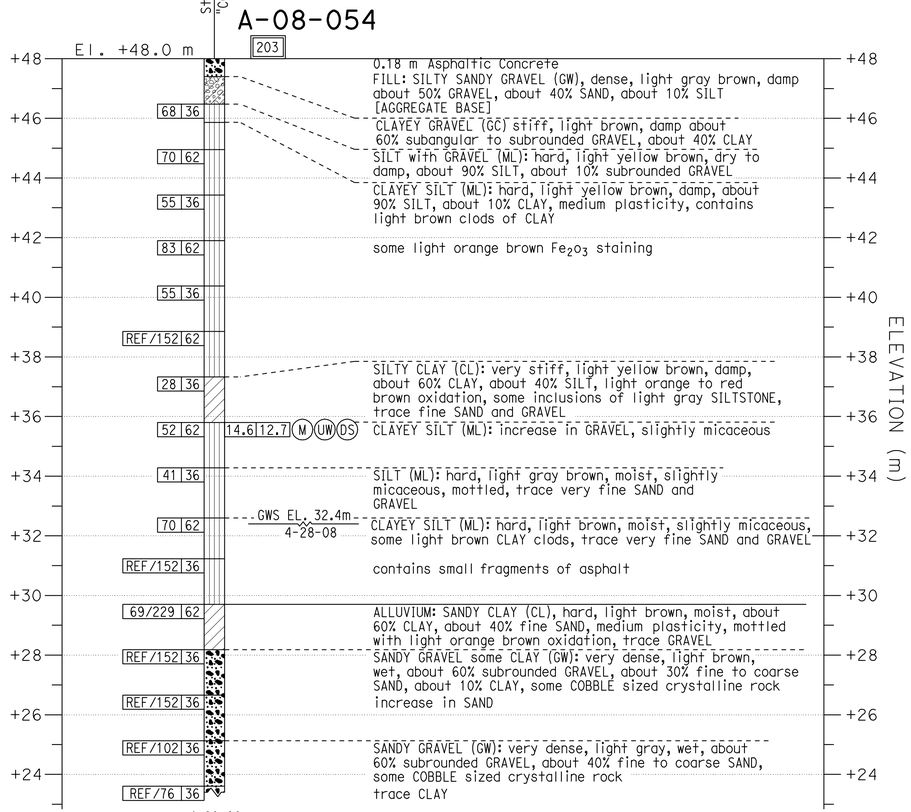

PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	877	886

REGISTERED GEOTECHNICAL ENGINEER — 4-28-09

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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NOTES:
1. 62 mm diameter samples were taken using a California split-barrel sampler with an inside diameter (I.D.) of 62 mm and an outside diameter (O.D.) of 83 mm.
2. Automatic trip and safety hammer systems consisting of hammer weight of 62.5 kg falling a distance of 762 mm were used to advance the drive samplers in accordance with ASTM D1586.
3. The average hammer energy ratio (ER_i) reflects the percentage efficiency of SPT blowcounts (N-value). The estimated ER_i for the various drilling equipment used was as follows:
   Boart Longyear:
   Longyear 1405: $ER_i \cong 1.45$
   Prosonic Track Mounted: $ER_i \cong 1.00$
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   Test America:
   CME 95: $ER_i \cong 1.45$
   Pacific Drilling:
   Unimog: $ER_i \cong 1.27$
   Mole: $ER_i \cong 1.00$
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4. The sedimentary rock was obtained utilizing a sonic drilling technique; this method resulted in Core Recovery (REC) values of essentially 100%. Also, given the nature of the Sedimentary Rock (ie., friable, highly fractured, decomposed rock) a Rock Quality Designation (RQD) index is not relevant and therefore not reported on LOTBs.

ENGINEERING SERVICES		GEOTECHNICAL SERVICES		STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 445R
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER			DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 10 OF 11
NAME:	CHECKED BY: G. CUSTENBORDER						

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES									SHEET	OF
10/14/08	3/9/09	4/16/09							23	24

FILE => 57-rw445r-z-1otb010.dgn

DATE PLOTTED => 23-SEP-2010 TIME PLOTTED => 12:13
USERNAME => rmikesell

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	878	886

16

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring
Size	R	Rotary drilled boring
Size	P	Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD	Hand driven (25 mm soil tube)
Size	HA	Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778-95)
□	O	Other

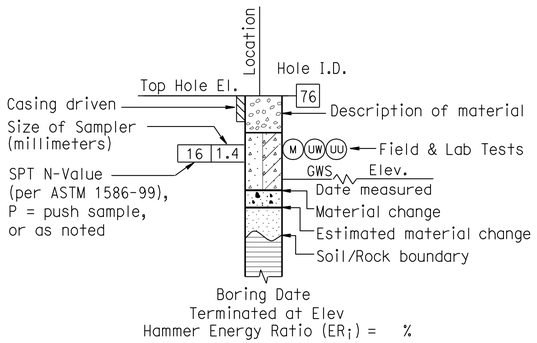
Note: Size in millimeters.

CONSISTENCY OF COHESIVE SOILS

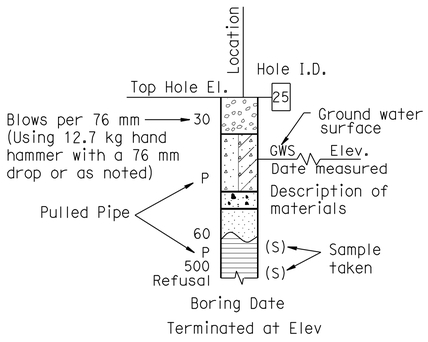
Description	Unconfined Compressive Strength (tsm)	Pocket Penetrometer Measurement (tsm)	Torvane Measurement (tsm)	Field Approximation
Very Soft	< 24	< 24	< 12	Easily penetrated several inches by fist
Soft	24 to 48	24 to 48	12 to 24	Easily penetrated several inches by thumb
Medium Stiff	48 to 96	48 to 96	24 to 48	Penetrated several inches by thumb with moderate effort
Stiff	96 to 192	96 to 192	48 to 96	Readily indented by thumb but penetrated only with great effort
Very Stiff	192 to 383	192 to 383	96 to 192	Readily indented by thumbnail
Hard	> 383	> 383	> 192	Indented by thumbnail with difficulty

PLASTICITY OF FINE-GRAINED SOILS

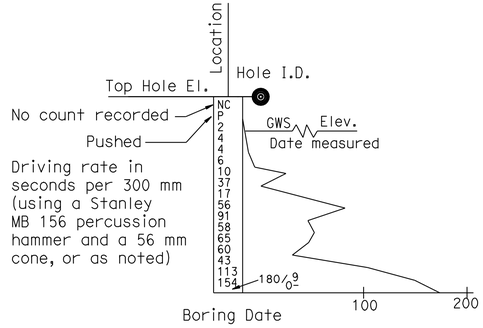
Description	Criteria
Nonplastic	A 3 mm thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.



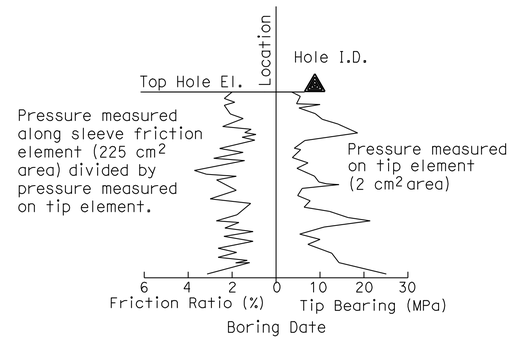
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) SOUNDING

SOIL LEGEND

ENGINEERING SERVICES	GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 445R
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS		DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 2 OF 11
NAME:	CHECKED BY: G. CUSTENBORDER	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER			

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

FILE => 57-rw445r-z-lotb02.dgn

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES										SHEET	OF
10/14/08	3/9/09	4/16/09								15	24

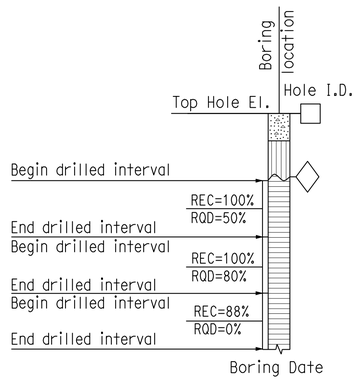
USERNAME => tfmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:13

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

$$REC = \frac{\sum \text{Length of the recovered core pieces}}{\text{Total length of core run}} \times 100\%$$

$$RQD = \frac{\sum \text{Length of intact core pieces} \geq 100\ mm}{\text{Total length of core run}} \times 100\%$$



RELATIVE STRENGTH OF INTACT ROCK

Term	Uniaxial Compressive Strength (MPa)
Extremely Strong	> 207
Very Strong	100 - 207
Strong	49 - 100
Medium Strong	25 - 49
Weak	5 - 25
Very Weak	1 - 5
Extremely Weak	< 1

BEDDING SPACING

Description	Thickness / Spacing
Massive	Greater than 3 m
Very thickly bedded	1 m to 3 m
Thickly bedded	300 mm to 1 m
Moderately bedded	100 mm to 300 mm
Thinly bedded	30 mm to 100 mm
Very thinly bedded	10 mm to 30 mm
Laminated	Less than 10 mm

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	879	886

16

4-28-09
REGISTERED GEOTECHNICAL ENGINEER

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

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LEGEND OF ROCK MATERIALS

- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

ROCK HARDNESS

Description	Criteria
Extremely Hard	Specimen cannot be scratched with a pocket knife or sharp pick; can only be chipped with repeated heavy hammer blows.
Very Hard	Specimen cannot be scratched with a pocket knife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Specimen can be scratched with a pocket knife or sharp pick with difficulty (heavy pressure). Heavy hammer blows required to break specimen.
Moderately Hard	Specimen can be scratched with pocket knife or sharp pick with light or moderate pressure. Core breaks with moderate hammer pressure.
Moderately Soft	Specimen can be grooved 5 mm deep with a pocket knife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Specimen can be grooved or gouged easily by a pocket knife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Specimen can be readily indented, grooved or gouged with fingernail, or carved with a pocket knife. Breaks with light manual pressure.

FRACTURE DENSITY

Description	Observed Fracture Density
Unfractured	No fractures.
Very slightly fractured	Lengths greater than 1 m.
Slightly fractured	Lengths from 300 mm to 1000 mm with few lengths less than 300 mm or greater than 1000 mm.
Moderately fractured	Lengths mostly in 100 mm to 300 mm range with most lengths about 200 mm.
Intensely fractured	Lengths average from 30 mm to 100 mm with scattered fragmented intervals with lengths less than 100 mm.
Very intensely fractured	Mostly chips and fragments with a few scattered short core lengths.

Combination descriptors (such as "Very intensely to intensely fractured") are used where equal distribution of both fracture density characteristics is present over a significant interval or exposure, or where characteristics are "in between" the descriptor definitions. Only two adjacent descriptors may be combined.

WEATHERING DESCRIPTORS FOR INTACT ROCK

Description	Diagnostic features: Chemical Weathering-Discoloration and/or oxidation — Body of Rock	Diagnostic features: Chemical Weathering-Discoloration and/or oxidation — Fracture Surfaces	Diagnostic features: Mechanical Weathering-Grain boundary conditions (disaggregation) primarily for granitics and some coarse-grained sediments	Diagnostic features: Texture and Solutioning — Texture	Diagnostic features: Texture and Solutioning — Solutioning	General Characteristics
Fresh	No discoloration, not oxidized.	No discoloration or oxidation.	No separation, intact (tight).	No change.	No solutioning.	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull.	Minor to complete discoloration or oxidation of most surfaces.	No visible separation, intact (tight).	Preserved.	Minor leaching of some soluble minerals may be noted.	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty," feldspar crystals are "cloudy."	All fracture surfaces are discolored or oxidized.	Partial separation of boundaries visible.	Generally preserved.	Soluble minerals may be mostly leached.	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in-situ disaggregation, see grain boundary conditions.	All fracture surfaces are discolored or oxidized, surfaces friable.	Partial separation, rock is friable; in semiarid conditions granitics are disaggregated.	Texture altered by chemical disintegration (hydration, argillation).	Leaching of soluble minerals may be complete.	Dull sound when struck with hammer, usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures, or veinlets. Rock is significantly weakened.
Decomposed	Discolored or oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay.		Complete separation of grain boundaries (disaggregated).	Resembles a soil, partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete.		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes."

Combination descriptors (such as "slightly weathered to fresh") are permissible where equal distribution of both weathering characteristics is present over significant intervals or where characteristics present are "in between" the diagnostic feature. However, combination descriptors should not be used where significant, identifiable zones can be delineated. Only two adjacent descriptors may be combined. "Very intensely weathered" is the combination descriptor for "intensely weathered to decomposed."

ROCK LEGEND

ENGINEERING SERVICES	GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 445R
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS		DESIGN BRANCH	POST MILES	LOG OF TEST BORINGS SHEET NO. 3 OF 11
NAME:	CHECKED BY: G. CUSTENBORDER	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER		KP43.2/PM26.8	

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

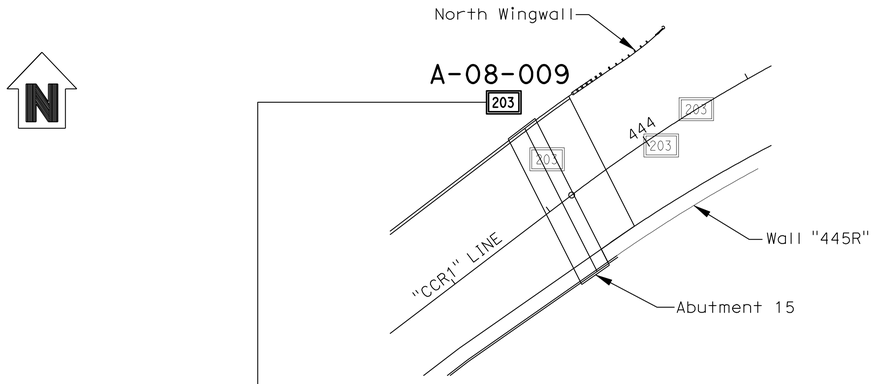
REVISION DATES: 10/14/08 | 3/31/09 | 4/16/09

SHEET 16 OF 24

FILE => 57-rw445r-z-lotb03.dgn

USERNAME => tmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:13

Bench Mark
All elevations shown in the LOTBs are in meters and are referenced to the NGVD 1929 Datum.



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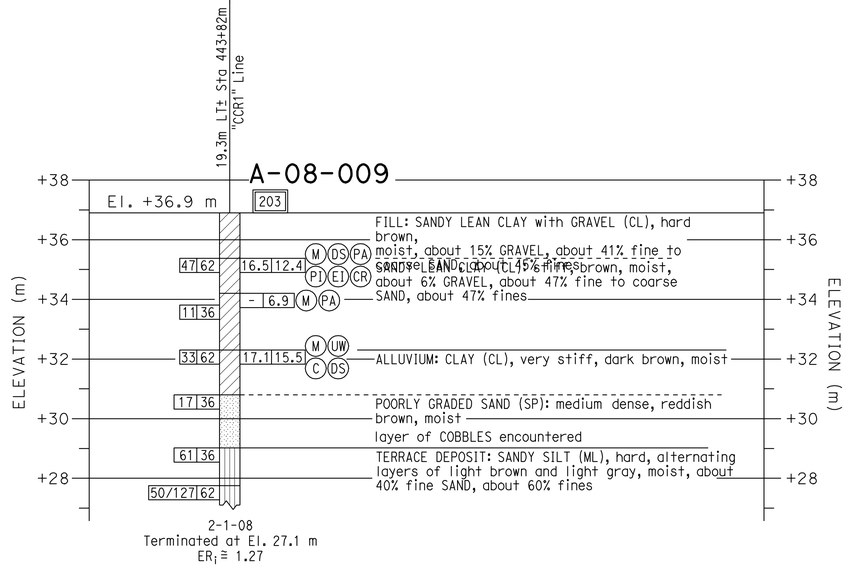

PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	880	886

REGISTERED GEOTECHNICAL ENGINEER — 4-28-09

9-27-10
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REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

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NOTES:

1. 62 mm diameter samples were taken using a California split-barrel sampler with an inside diameter (I.D.) of 62 mm and an outside diameter (O.D.) of 83 mm.
2. Automatic trip and safety hammer systems consisting of hammer weight of 62.5 kg falling a distance of 762 mm were used to advance the drive samplers in accordance with ASTM D1586.
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FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER	DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 4 OR 11
NAME:	CHECKED BY: G. CUSTENBORDER				

OGS CIVIL LOG OF TEST BORINGS SHEET

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

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REVISION DATES									SHEET	OF
10/14/08	3/3/09	4/16/09							17	24

FILE => 57-rw445r-z-1otb04.dgn

DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:14
USERNAME => ttmikes1

Bench Mark
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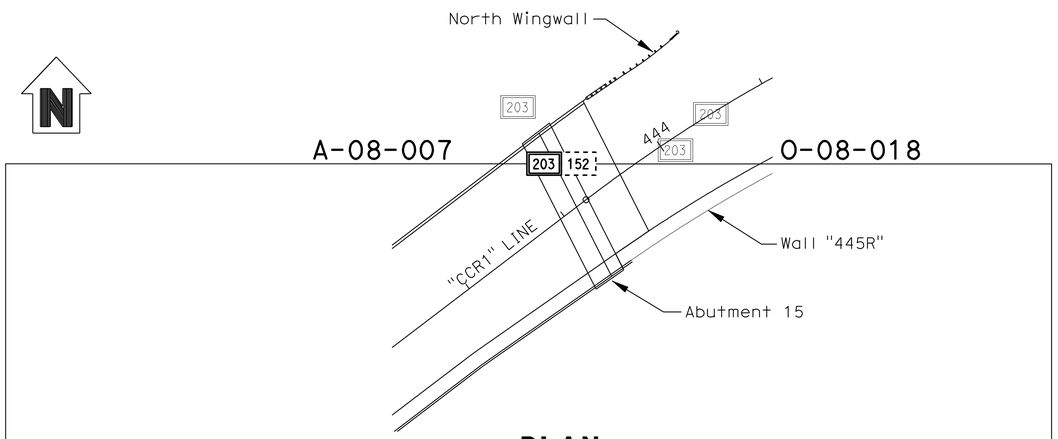

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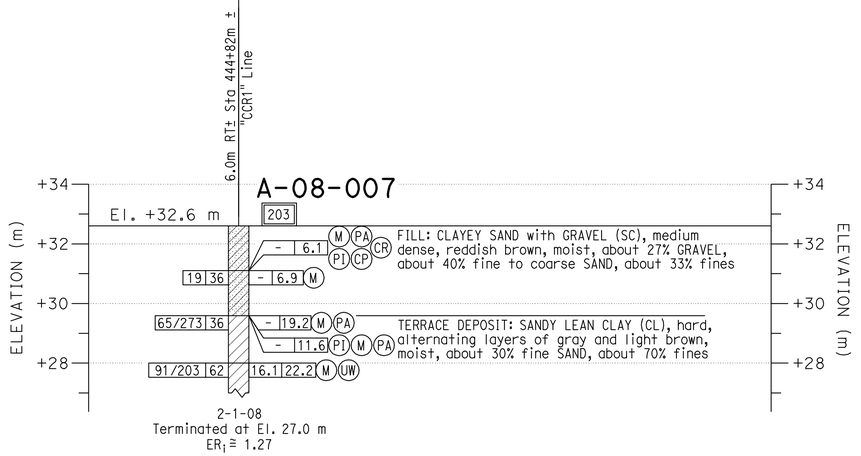

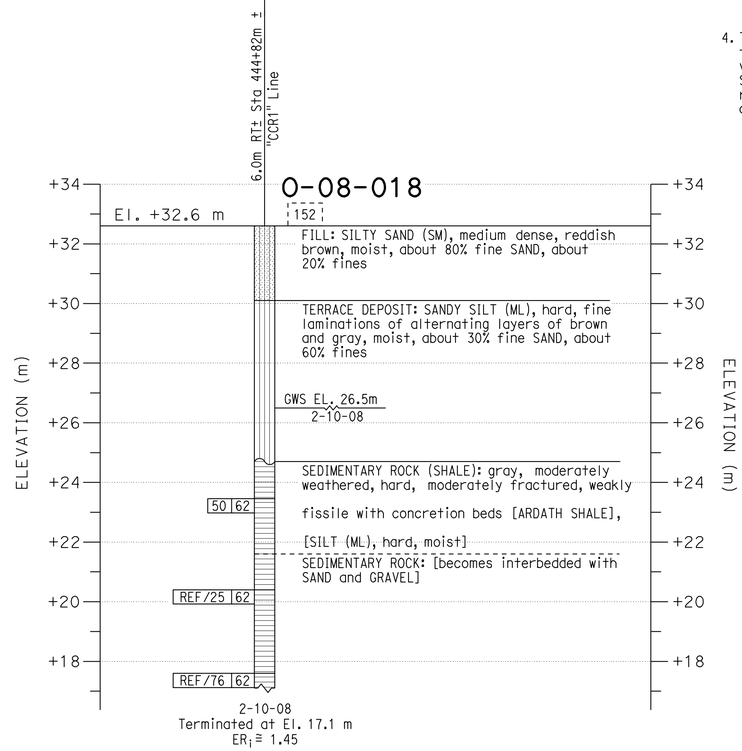

PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
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REGISTERED GEOTECHNICAL ENGINEER — 4-28-09

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

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   CME 95: ER$_i$≅1.45
   Pacific Drilling:
   Unimog: ER$_i$≅1.27
   Mole: ER$_i$≅1.00
   Minimole: ER$_i$≅1.00
4. The sedimentary rock was obtained utilizing a sonic drilling technique; this method resulted in Core Recovery (REC) values of essentially 100%. Also, given the nature of the Sedimentary Rock (ie., friable, highly fractured, decomposed rock) a Rock Quality Designation (RQD) index is not relevant and therefore not reported on LOTBs.

ENGINEERING SERVICES		GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 445R
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER		DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 5 OF 11
NAME:	CHECKED BY: G. CUSTENBORDER					

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES: 10/14/08 | 3/9/09 | 4/16/09

SHEET 18 OF 24

FILE => 57-rw445r-z-lotb05.dgn

DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:14
USERNAME => ttimkes1

Bench Mark
All elevations shown in the LOTBs are in meters and are referenced to the NGVD 1929 Datum.

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	882	886

REGISTERED GEOTECHNICAL ENGINEER — 4-28-09

VAN OLIN NO. 2578 EXP. 6-30-10 REGISTERED PROFESSIONAL ENGINEER GEOTECHNICAL STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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SANDAG
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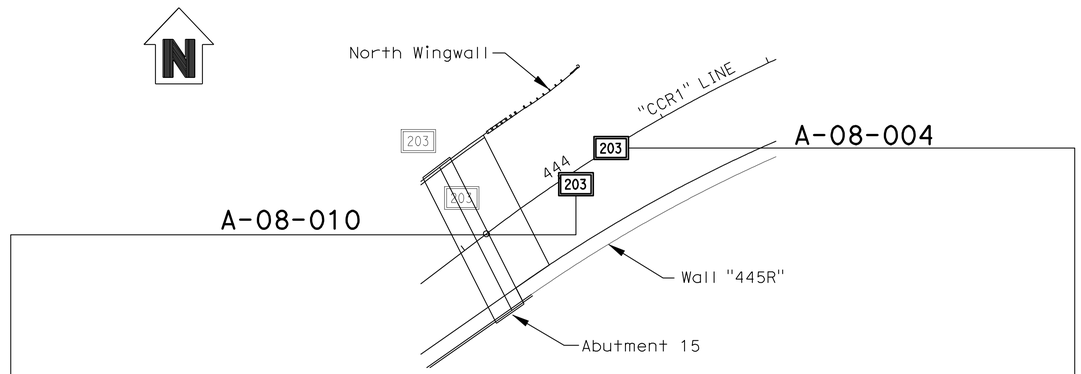
SAN DIEGO, CA. 92101

BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111



PLAN
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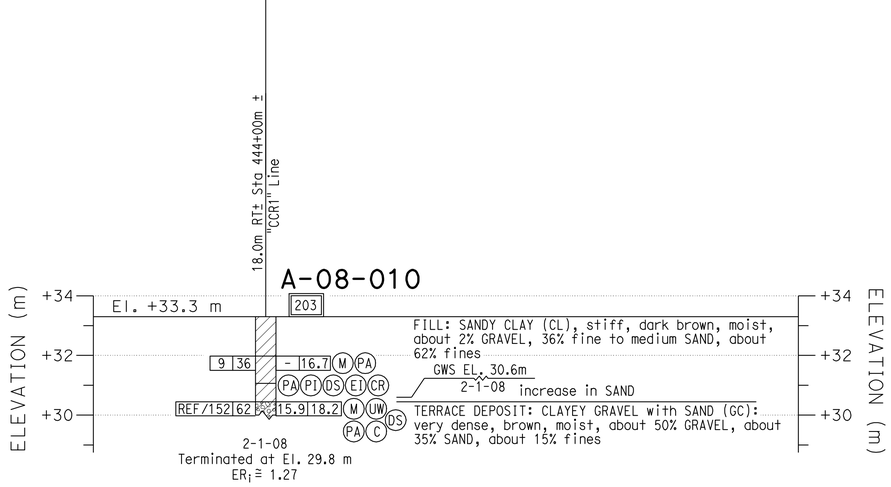
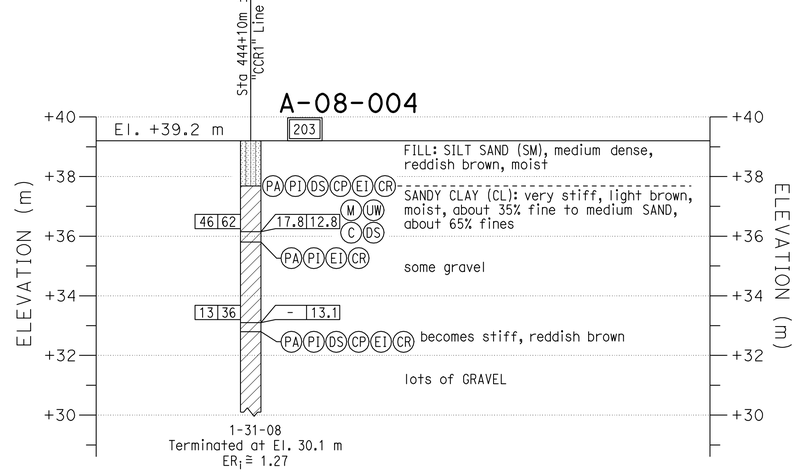




PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

NOTES:
1. 62 mm diameter samples were taken using a California split-barrel sampler with an inside diameter (I.D.) of 62 mm and an outside diameter (O.D.) of 83 mm.
2. Automatic trip and safety hammer systems consisting of hammer weight of 62.5 kg falling a distance of 762 mm were used to advance the drive samplers in accordance with ASTM D1586.
3. The average hammer energy ratio (ER_i) reflects the percentage efficiency of SPT blowcounts (N-value). The estimated ER_i for the various drilling equipment used was as follows:
   Boart Longyear:
   Longyear 1405: $ER_i \cong 1.45$
   Prosonic Track Mounted: $ER_i \cong 1.00$
   Prosonic 1: $ER_i \cong 1.45$
   Minisonic: $ER_i \cong 1.00$
   Pacific Drilling:
   Unimog: $ER_i \cong 1.27$
   Mole: $ER_i \cong 1.00$
   Minimole: $ER_i \cong 1.00$
   Test America:
   CME 95: $ER_i \cong 1.45$
4. The sedimentary rock was obtained utilizing a sonic drilling technique; this method resulted in Core Recovery (REC) values of essentially 100%. Also, given the nature of the Sedimentary Rock (ie., friable, highly fractured, decomposed rock) a Rock Quality Designation (RQD) index is not relevant and therefore not reported on LOTBs.

ENGINEERING SERVICES		GEOTECHNICAL SERVICES		STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 445R
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN G. CUSTENBORDER			DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 6 OF 11
NAME:	CHECKED BY: G. CUSTENBORDER						

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

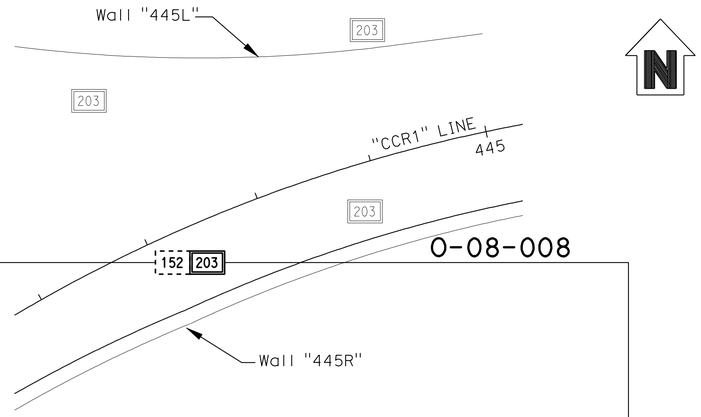
FILE => 57-rw445r-z-lotb06.dgn

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES										SHEET	OF
10/14/08	3/9/09	4/16/09								19	24

USERNAME => tmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:14

Bench Mark
All elevations shown in the LOTBs are in meters and are referenced to the NGVD 1929 Datum.



PLAN
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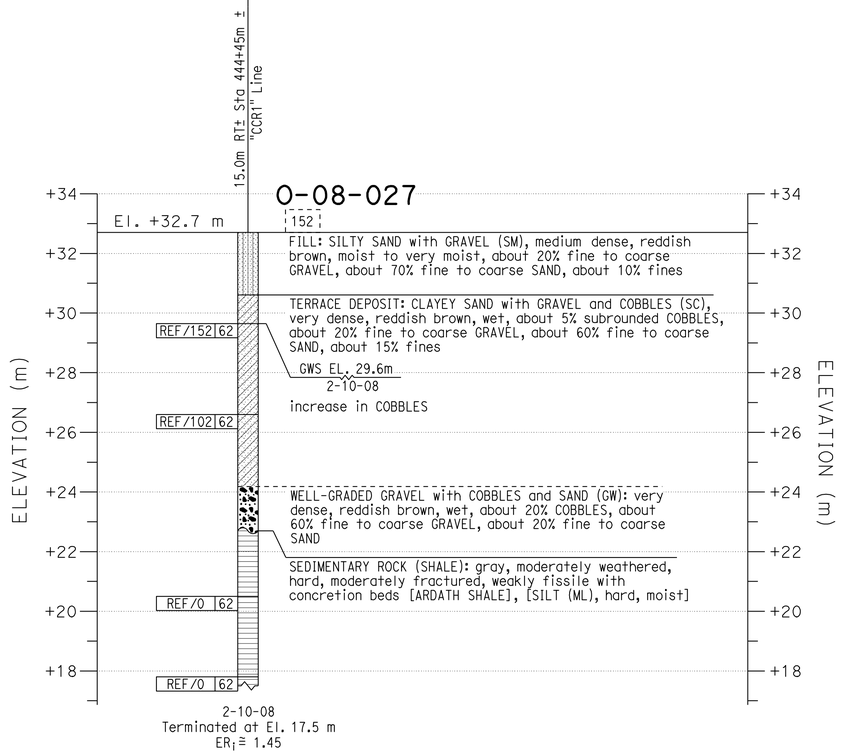

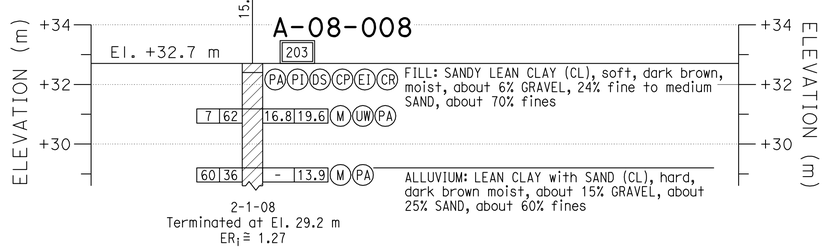

PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	883	886

REGISTERED GEOTECHNICAL ENGINEER 4-28-09

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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SANDAG
401 B STREET,
SAN DIEGO, CA. 92101

BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111

NOTES:

1. 62 mm diameter samples were taken using a California split-barrel sampler with an inside diameter (I.D.) of 62 mm and an outside diameter (O.D.) of 83 mm.
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   Longyear 1405: $ER_i \cong 1.45$
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   Unimog: $ER_i \cong 1.27$
   Mole: $ER_i \cong 1.00$
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   CME 95: $ER_i \cong 1.45$
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ENGINEERING SERVICES		GEOTECHNICAL SERVICES				
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 445R
NAME:	CHECKED BY: G. CUSTENBORDER			DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 7 OF 11

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

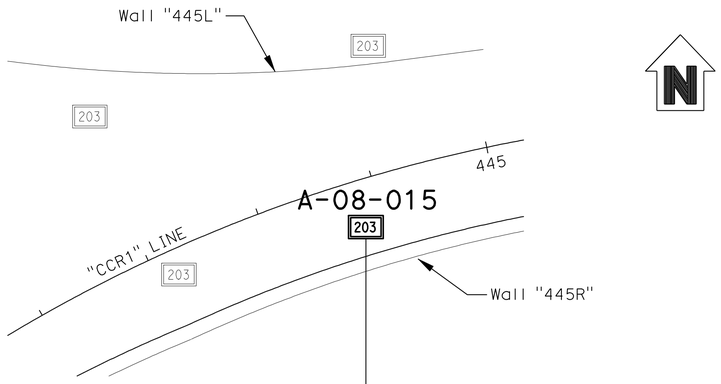
FILE => 57-rw445r-z-lotb07.dgn

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

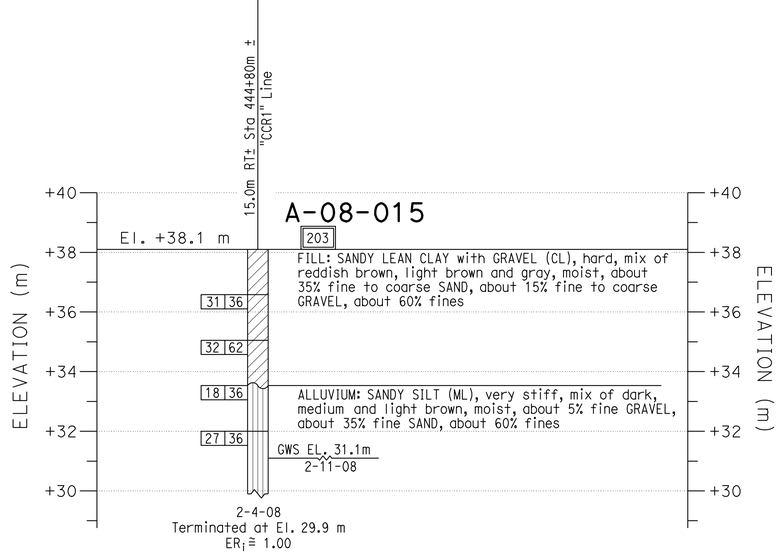
REVISION DATES										SHEET	OF
10/14/08	3/3/09	4/16/09								20	24

DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:14
USERNAME => tmikesl

Bench Mark
All elevations shown in the LOTBs are in meters and are referenced to the NGVD 1929 Datum.



PLAN
1 : 500



PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5,805	R49.9/R51.7, 42.6/46.5	884	886

REGISTERED GEOTECHNICAL ENGINEER — 4-28-09

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

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SAN DIEGO, CA. 92101

BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111

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   Test America:
   CME 95: $ER_i \cong 1.45$
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FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN G. CUSTENBORDER		DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 8 OF 11
NAME:	CHECKED BY: G. CUSTENBORDER					

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

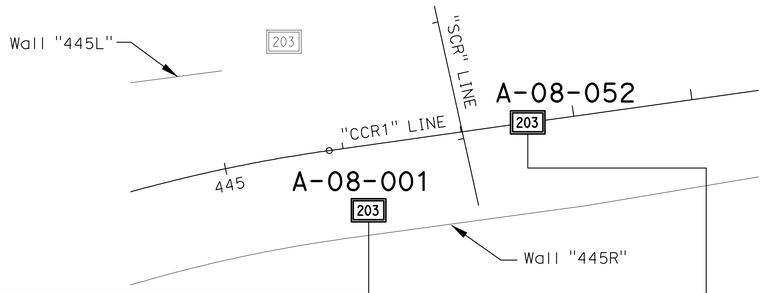
REVISION DATES: 10/24/08 | 3/9/09 | 4/16/09

SHEET 21 OF 24

FILE => 57-rw445r-z-lotb08.dgn

USERNAME => trmikesl DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:14

Bench Mark
All elevations shown in the LOTBs are in meters and are referenced to the NGVD 1929 Datum.



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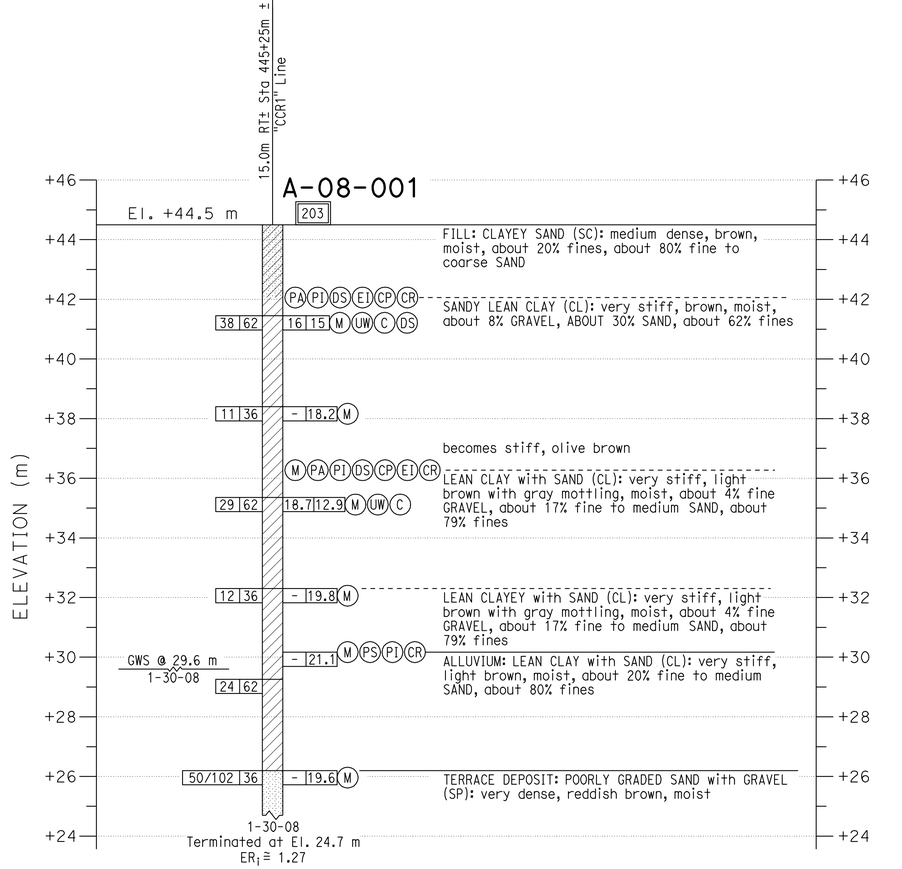

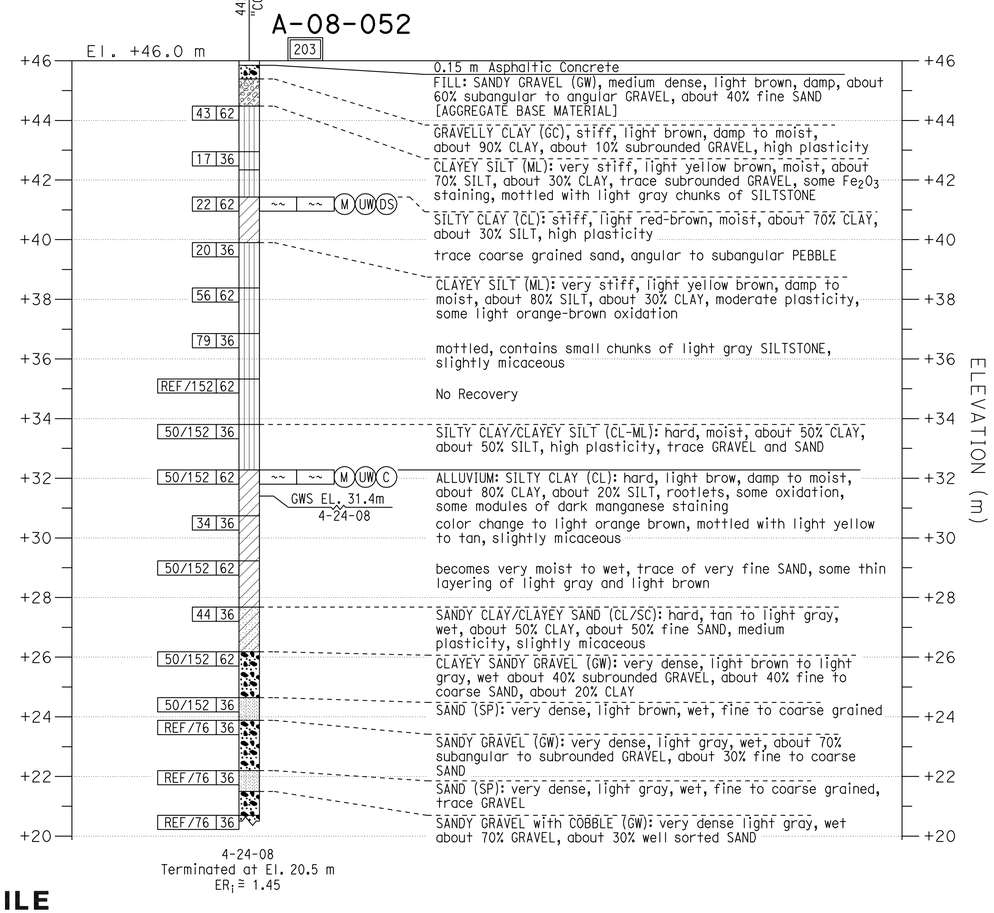

PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	885	886

REGISTERED GEOTECHNICAL ENGINEER — 4-28-09

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

9-27-10
PLANS APPROVAL DATE

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SANDAG
401 B STREET,
SAN DIEGO, CA. 92101

BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111

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   CME 95: $ER_i \cong 1.45$
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   Unimog: $ER_i \cong 1.27$
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ENGINEERING SERVICES		GEOTECHNICAL SERVICES		STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 445R
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER			DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 9 OF 11
NAME:	CHECKED BY: G. CUSTENBORDER						

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES: 10/14/08 | 3/3/09 | 4/16/09

SHEET 22 OF 24

FILE => 57-rw445r-z-lotb09.dgn

DATE PLOTTED => 29-SEP-2010 TIME PLOTTED => 12:15
USERNAME => rmikesell

Bench Mark
All elevations shown in the LOTBs are in meters
and are referenced to the NGVD 1929 Datum.

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	5.805	R49.9/R51.7, 42.6/46.5	886	886

REGISTERED GEOTECHNICAL ENGINEER — 4-28-09

9-27-10
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — VAN OLIN NO. 2578 EXP. 6-30-10 — GEOTECHNICAL — STATE OF CALIFORNIA

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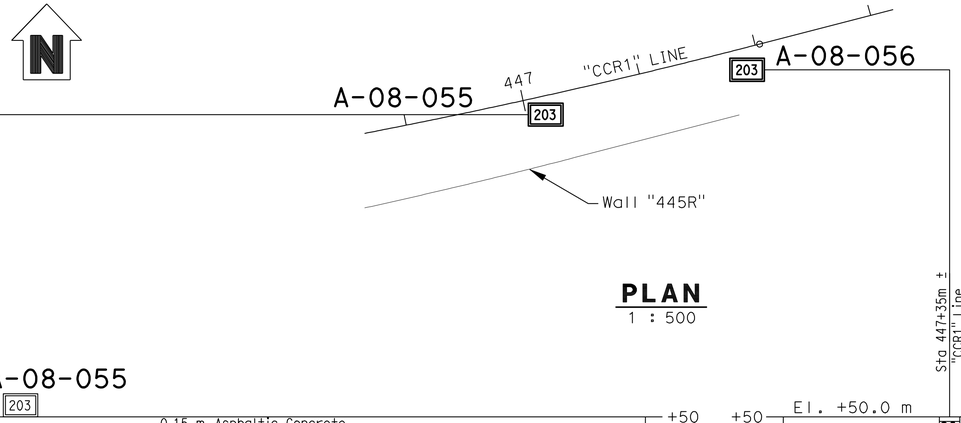
401 B STREET,
SAN DIEGO, CA. 92101

BUREAU VERITAS NORTH AMERICA, INC.
7895 CONVOY CT.
SAN DIEGO, CA. 92111



PLAN
1 : 500

A-08-055

El. +50.0 m — 203

50/152	62	15.1	13.2	M UW DS	0.15 m Asphaltic Concrete FILL: SILTY SAND GRAVEL (GM), dense, light brown, damp, 0.38 m thick, Base Material
					GRAVELLY SILT (ML): stiff to very stiff, light yellow brown, damp, about 30% subrounded GRAVEL, about 70% SILT
37	36				Contains clods of brown CLAY (CL), some inclusions of light gray SILTSTONE
					CLAYEY SILT with GRAVEL (ML): very stiff, light yellow brown, damp, mottled with light orange brown to light red brown colors, about 90% SILT, about 10% CLAY
REF/152	62				becomes dry to damp, blocky
50/152	36				GRAVELLY SILT with COBBLES (ML): very stiff yellow brown, damp, some light orange brown Fe_2O_3 staining, about 20% subrounded GRAVEL, about 80% SILT
80	62				slow drilling
50/76	36				CLAYEY SILT some GRAVEL (ML): very stiff to hard, light yellow brown, damp, mottled with light orange brown Fe_2O_3, contains inclusions of light gray SILTSTONE, about 90% SILT, about 10% CLAY
50/152	62				blocky
REF/152	36				slightly micaceous
67	62				
44	36				SILTY CLAY (CL): trace very fine SAND, some subrounded GRAVEL, stiff to very stiff, light brown, moist, mottled with light orange brown and light gray green colors, slightly micaceous, about 40% SILT, about 60% CLAY
REF/152	62				slow drilling Interlayered with light green fine SANDY SILT, color change to gray brown, increase in CLAY content, high plasticity, trace pebble size SILTSTONE
48	36				

4-29-08
Terminated at El. 32.3 m
$ER_i \cong 1.45$

A-08-056

El. +50.0 m — 203

43	36				0.18 m Asphaltic Concrete FILL: SILTY SANDY GRAVEL (GW), dense, tan, damp, about 50% angular to subangular GRAVEL, about 40% fine SAND, about 10% SILT [AGGREGATE BASE]
50/152	62				SILT with GRAVEL (ML), very stiff to hard, light yellow brown, damp, about 90% SILT, about 10% subrounded GRAVEL, medium plasticity becomes blocky, encountered cobble-sized rock
68	36				contains clods of light gray SILTSTONE, some light orange brown oxidation, trace of nodules of white CaCo
50/152	62				
30	36				
50/152	62				interlayered with brown SILTY CLAY (CL), very stiff
69	36				SILTY CLAY (CL): hard, light brown, damp, about 60% CLAY, about 40% SILT, high plasticity, mottled with light orange brown to brown colors, trace GRAVEL and SAND
62	36				GRAVELLY CLAY (GC): hard, light brown to brown, damp, about 80% CLAY, about 20% subrounded CLAY, high plasticity, mottled with light orange brown to brown colors, trace SAND and COBBLE
55	62				mottled with light yellow brown, light red brown to dark brown, trace manganese staining, GRAVEL becomes angular to rounded
44	36				SILTY CLAY (CL): hard, brown to gray brown, moist, about 70% CLAY, about 30% SILT, high plasticity, highly mottled, trace GRAVEL
85	62	115	13.0	M UW DS	ALLUVIUM: SANDY CLAY (CL), hard, gray brown, moist, about 90% CLAY, about 10% fine SAND, high plasticity, weakly layered, mottled with dark manganese staining, some light orange brown oxidation
REF/152	36				SILTY SAND (SM): very dense, light brown, moist, about 90% very fine SAND, about 10% SILT, some light orange-brown oxidation
50/76	62				CLAYEY SAND/SANDY CLAY (SC/CL): very dense, light brown, moist, to very moist, about 50% fine SAND, about 50% CLAY
REF/152	36				GRAVELLY SILTY SAND (SM): very dense, light brown, moist, about 70% fine SAND, about 20% SILT, about 10% rounded GRAVEL
REF/152	36				interlayered with light gray SANDS (SP): becomes wet and GRAVEL becomes subrounded to rounded
REF/152	36				SEDIMENTARY ROCK (SHALE): gray, moderately weathered, hard, moderately fractured,weakly fissile with concretion beds [ARDATH SHALE], [SILT (ML), hard, moist]
REF/152	36				

4-8-08
Terminated at El. 23.9 m
$ER_i \cong 1.45$

ELEVATION (m): +50, +48, +46, +44, +42, +40, +38, +36, +34, +32, +30, +28, +26, +24

PROFILE
VERTICAL 1 : 100
HORIZONTAL 1 : 500

NOTES:

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ENGINEERING SERVICES	GEOTECHNICAL SERVICES	STATE OF CALIFORNIA	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL 445R
FUNCTIONAL SUPERVISOR	DRAWN BY: J. JOHNS	DEPARTMENT OF TRANSPORTATION	DESIGN BRANCH	POST MILES KP43.2/PM26.8	LOG OF TEST BORINGS SHEET NO. 11 OF 11
NAME:	CHECKED BY: G. CUSTENBORDER	FIELD INVESTIGATIONS BY: V. OLIN, G. CUSTENBORDER			

OGS CIVIL LOG OF TEST BORINGS SHEET

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

CU 11275
EA 2T0401

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES									SHEET	OF
10/14/08	3/9/09	4/16/09							24	24