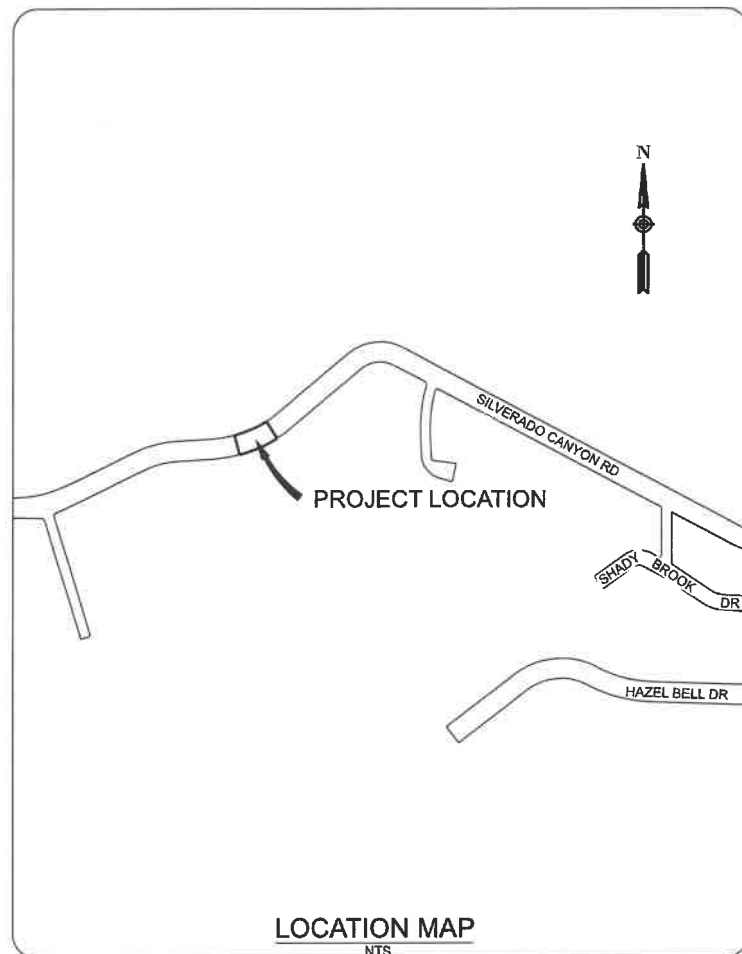
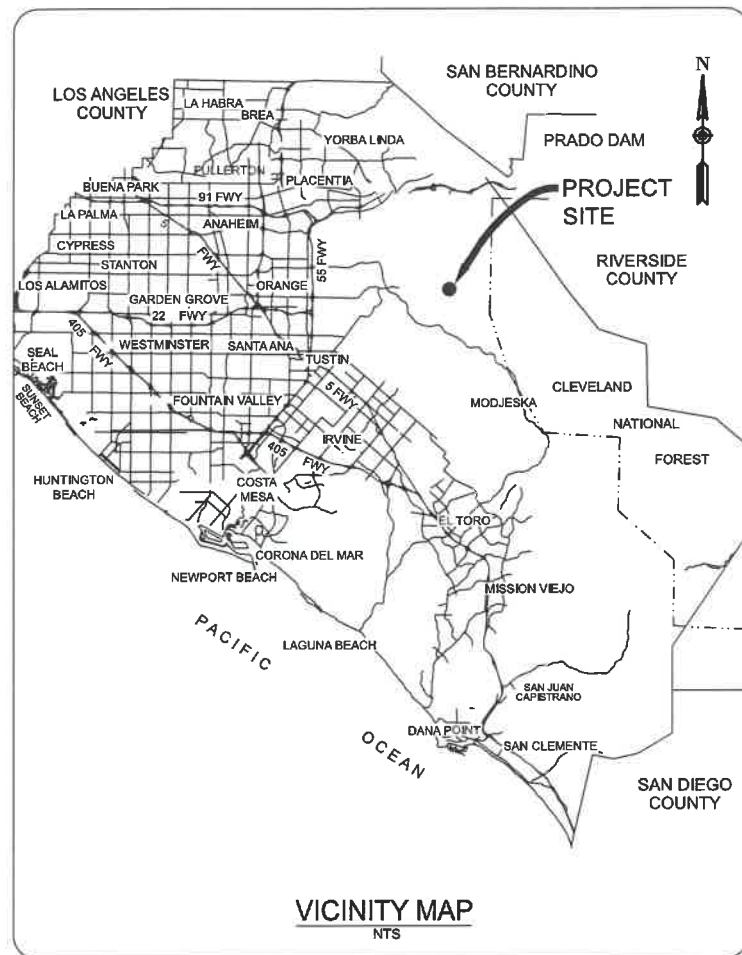




County of Orange

OC Public Works

SANTA ANA, CALIFORNIA
SHANE L. SILSBY, DIRECTOR

PLANS FOR 2018 BRIDGE MAINTENANCE PROJECT SILVERADO CANYON ROAD BRIDGE OVER SILVERADO CREEK BRIDGE NO. 55C0181 WORK ORDER NO ER20544

DECEMBER 2018
BID SET

CALL BEFORE YOU DIG
THE CONTRACTOR SHALL CALL "UNDERGROUND SERVICE
ALERT" (USA) AT 811 AT LEAST 2 WORKING
DAYS PRIOR TO PERFORMING ANY EXCAVATION

FUNDED & MAINTAINED BY: ORANGE COUNTY PUBLIC WORKS

COUNTY OF ORANGE OC PUBLIC WORKS DEPARTMENT

SUBMITTED: *Regina Hu* 12/3/18 DATE

REGINA HU, P.E.
SENIOR CIVIL ENGINEER
OC INFRASTRUCTURE PROGRAMS
ENGINEERING DIVISION

RECOMMENDED: *Paul Jeffery Ernst* 12/3/18 DATE

PAUL JEFFERY ERNST, P.E.
MANAGER
OC INFRASTRUCTURE PROGRAMS
ENGINEERING DIVISION

RECOMMENDED: *Nardy Khan* 12/4/18 DATE

NARDY KHAN, P.E.
DEPUTY DIRECTOR
OC INFRASTRUCTURE PROGRAMS

APPROVED: *Khalid Bazmi* 12/5/18 DATE

KHALID BAZMI, P.E.
ASSISTANT PUBLIC WORKS DIRECTOR
COUNTY ENGINEER

RECORD DRAWING

CONTRACTOR: _____
RESIDENT ENGINEER: _____
INSPECTOR: _____
CONSTRUCTION START DATE: _____
CONSTRUCTION COMPLETION DATE: _____

PREPARED BY

PREPARED UNDER RESPONSIBLE CHARGE OF:
DOKKEN ENGINEERING
110 BLUE RAVINE ROAD, SUITE 200
FOLSOM, CA 95630
TEL. 916 858-0642
FAX 916 858-0643
FORTUNATO ENRIQUEZ, P.E.,
DOKKEN ENGINEERING
12-3-2018 DATE

INDEX OF SHEETS

SHEET	DESCRIPTION
1	TITLE SHEET
2	SITE PLAN
3	DETAILS
4	CA ST-30 BRIDGE RAIL
5	MGS TRANSITION RAILING
6	TL-3 FLEAT-MGS
7	TL-2 FLEAT INSTALATION
8	TL-3 SKT-MGS
9	TL-2 SKT-MGS INSTALATION
10	CRASH CUSHION

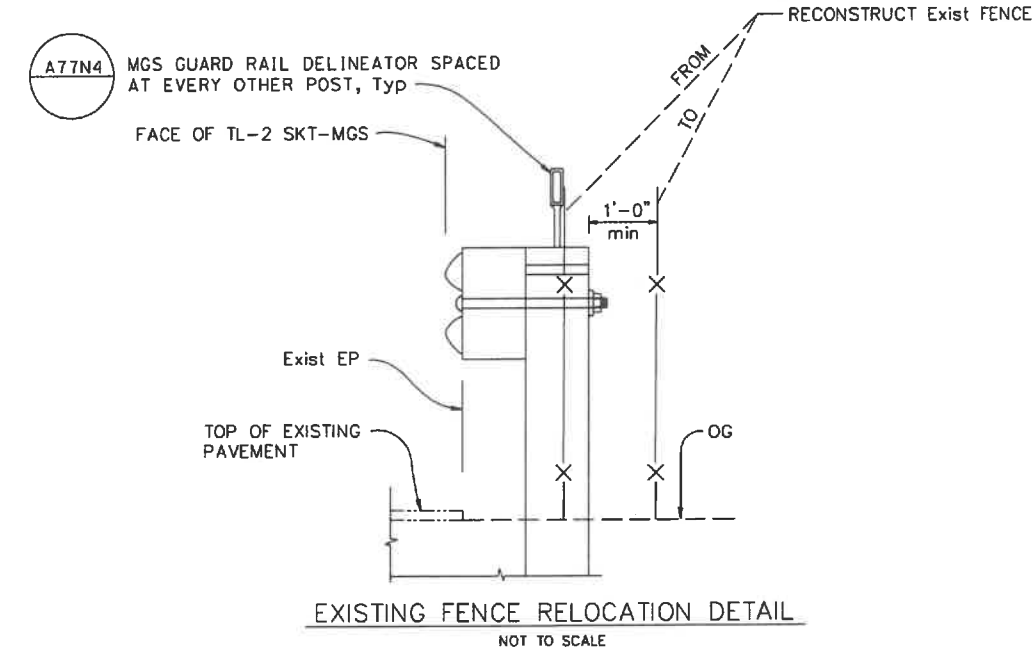
ABBREVIATIONS

AC	asphalt concrete
BB	begin bridge
Conc	concrete
CY	cubic yard
EB	end of bridge
Exist	existing
Exp	expansion
Jt	joint
Lt	left
LF	linear feet
LS	lump sum
MGS	midwest guardrail system
Rt	right
TL-2	test level 2
Typ	typical

NO.	DESCRIPTION	SHT.	APPROVED	DATE
REVISIONS				

W.O. NO. ER20544
DWG. NO. G-001

SHEET 1 OF 10

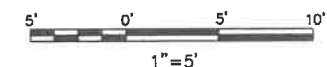


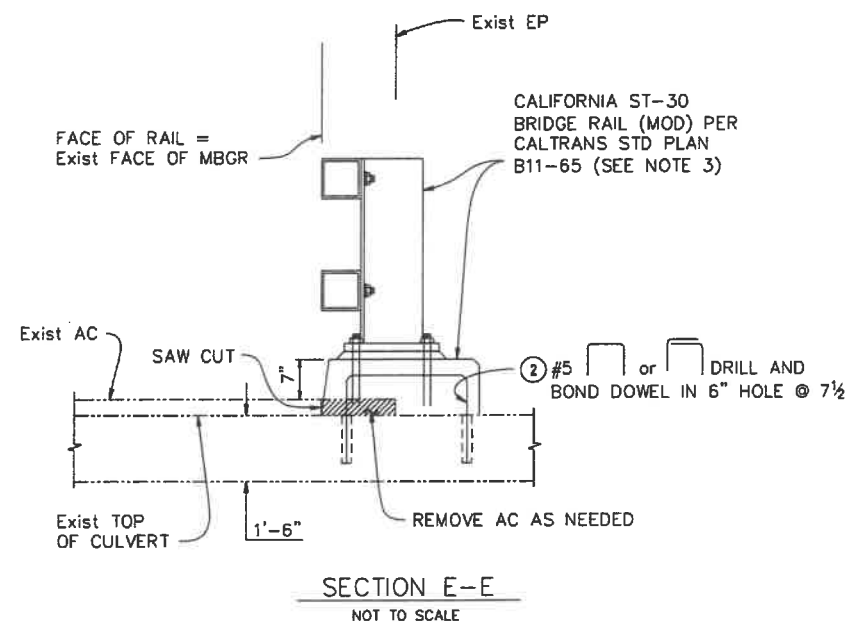
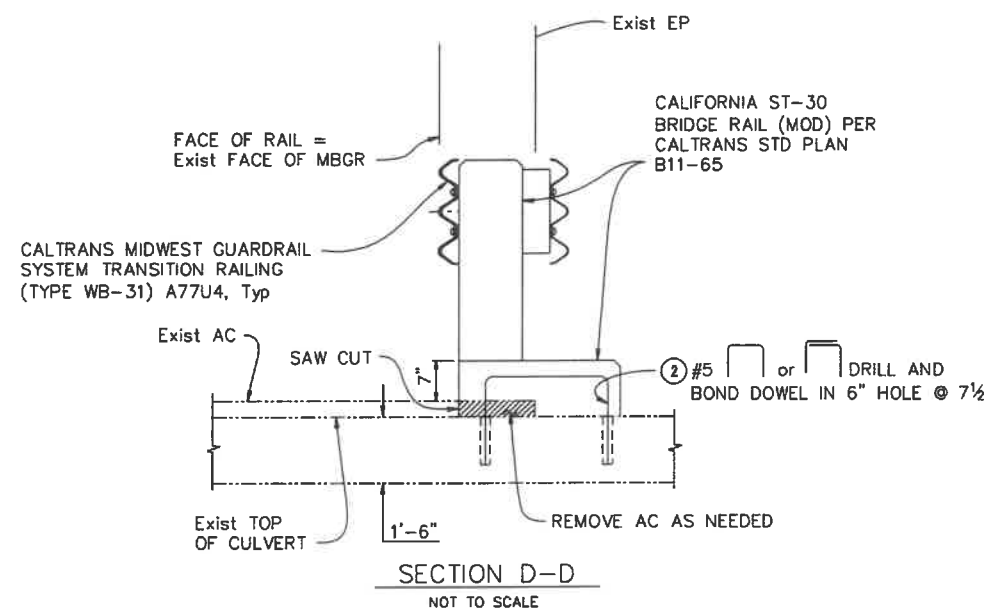
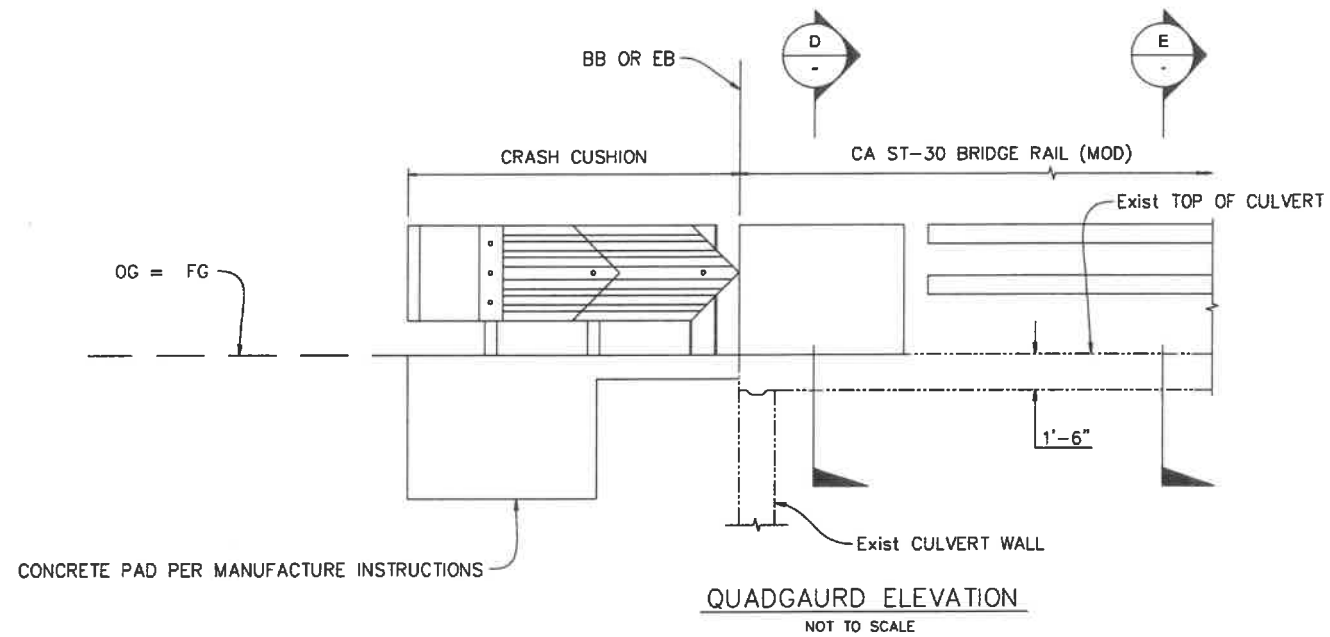
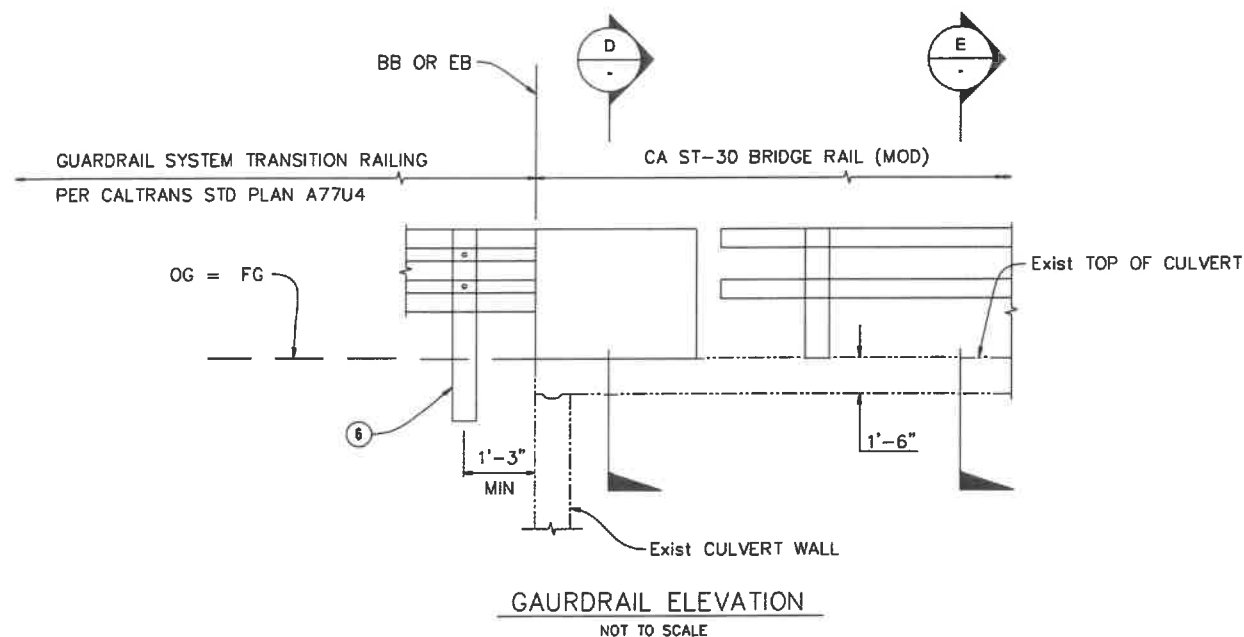
KEY NOTES

- 1 REMOVE GUARDRAIL PER CALTRANS STANDARD SPECIFICATION 83-11.02
- 2 PLACE MIDWEST GUARDRAIL SYSTEM TRANSITION RAILING PER 2015 CALTRANS STANDARD SPECIFICATIONS 83-2.02.
- 3 PLACE CRASH CUSHION PER 2015 CALTRANS SPECIAL PROVISIONS 83-4. CRASH CUSHION TO BE: QUADGUARD NCHRP 350, TL-2, TENSION STRUT BACKUP, 24" NOMINAL WIDTH, WITH 2 BAYS.
- 4 PLACE TERMINAL SYSTEM PER 2015 CALTRANS SPECIAL PROVISION 83-2.04.
- 5 RECONSTRUCT FENCE PER 2015 CALTRANS STANDARD SPECIFICATION 80-15.
- 6 PLACE CA ST-30 BRIDGE RAIL PER 2015 CALTRANS STANDARD SPECIFICATION 83-2.05.
- 7 PLACE GAURD RAIL DELINEATOR PER CALTRANS STANDARD PLAN A77N4 AND PER 2015 CALTRANS STANDARD SPECIFICATION 81-2.

GENERAL NOTES

1. THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIALS.
2. THE CONTRACTOR SHALL PROVIDE A TRAFFIC CONTROL PLAN COMPLYING WITH CURRENT MUTCD REQUIREMENTS AND SIGNED BY A CIVIL ENGINEER REGISTERED IN THE STATE OF CALIFORNIA.
3. BARRIER TO BE WEATHERING STEEL





KEY NOTES

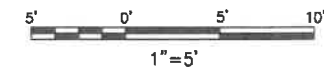
- ① PLACE POST TO MISS WINGWALL AND CULVERT WALLS
- ② BAR REINFORCEMENT PER JOB ORDER CONTRACT SPECIAL PROVISION SECTION F-29

GENERAL NOTES

1. THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIALS.
2. THE CONTRACTOR SHALL PROVIDE A TRAFFIC CONTROL PLAN COMPLYING WITH CURRENT MUTCD REQUIREMENTS AND SIGNED BY A CIVIL ENGINEER REGISTERED IN THE STATE OF CALIFORNIA.
3. CA ST-30 BRIDGE RAIL TO BE WEATHERING STEEL

LEGEND

- DENOTES EXISTING STRUCTURE
- DENOTES AC REMOVAL PAY LIMITS PER 2015 CALTRANS STD SPECIFICATIONS 39-3 AND CALTRANS SPECIAL SECIFICATIONS 39-3.



MARK	DESCRIPTION	DATE	APPR.

PREPARED UNDER THE RESPONSIBLE CHARGE OF:

DEDDOKKEN
ENGINEERING
110 BLUE RAVINE ROAD, SUITE 200
FOLSOM, CA 95630
TEL 916 858-0492
FAX 916 858-0493

Fortunato Enriquez
FORTUNATO ENRIQUEZ P.E.
DONKEN ENGINEERING

DATE: 12.3.2016

DESIGNED BY: FORTUNATO ENRIQUEZ
DRAWN BY: NANCY ORTIZ
CHECKED BY: TM OSTERKAMP
W.O. NO.: E02044
FILE NAME: -
PLOT DATE: AUGUST 13, 2016
SCALE: 1:1 (to SHEET)

County of Orange
Public Works

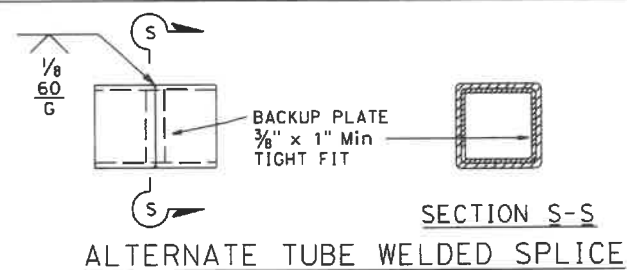
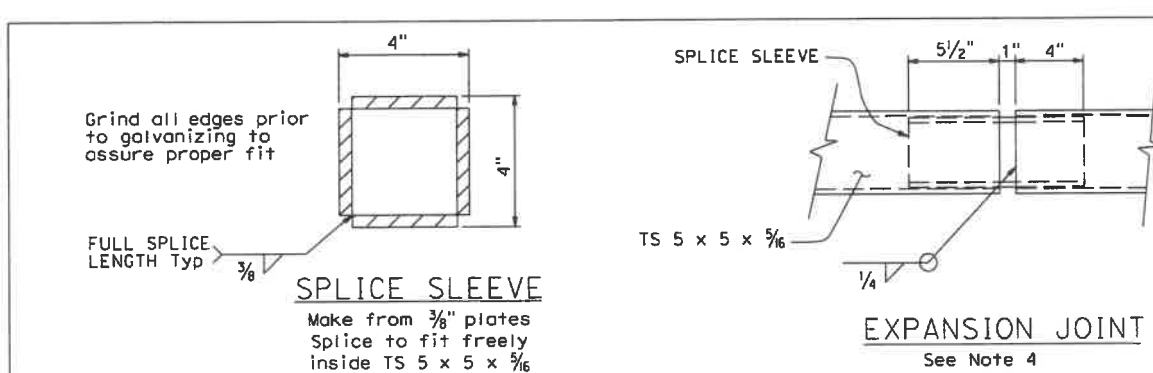
PREPARED BY: **DEDDOKKEN**
ENGINEERING
110 BLUE RAVINE ROAD, SUITE 200
FOLSOM, CA 95630
TEL 916 858-0492
FAX 916 858-0493

SILVERADO CANYON
ROAD BRIDGE OVER
SILVERADO CREEK
PROJECT
DETAILS

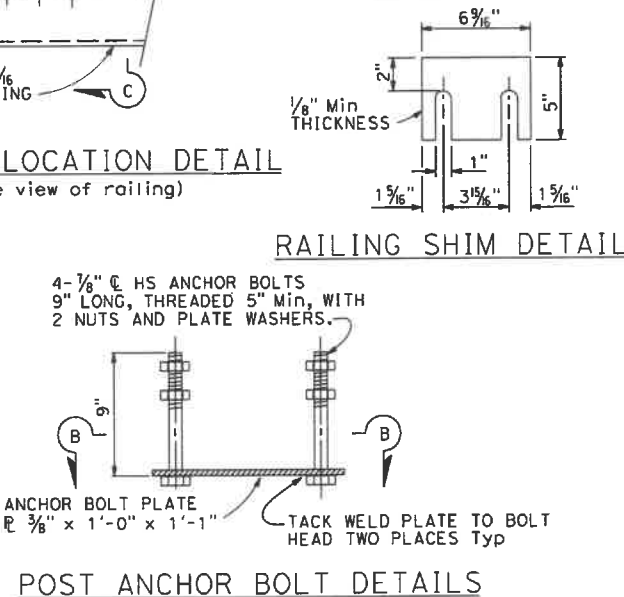
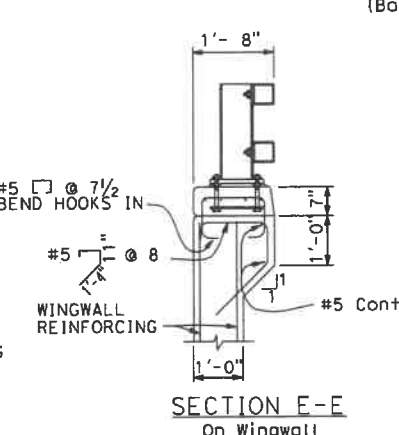
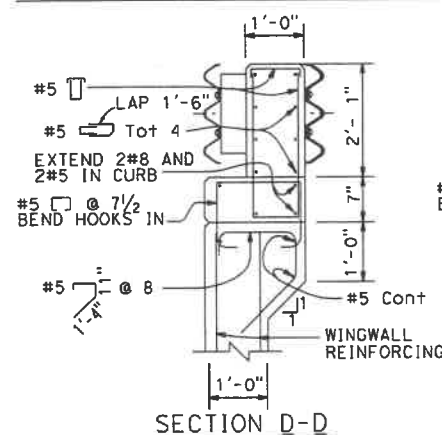
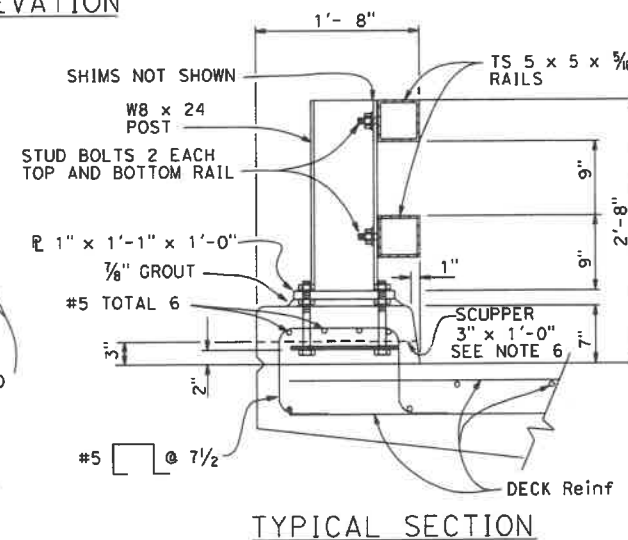
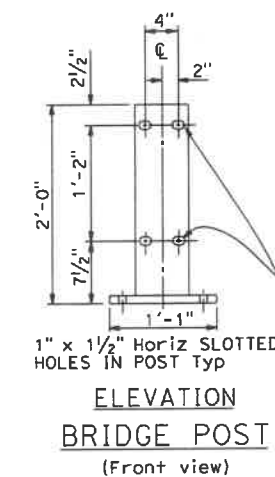
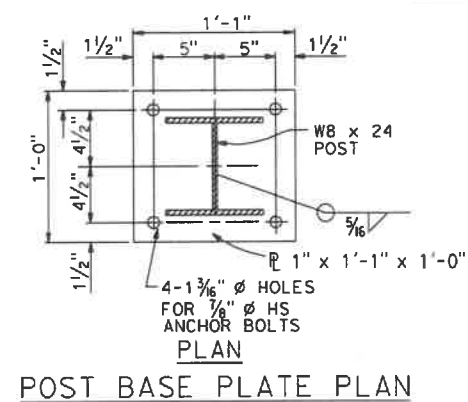
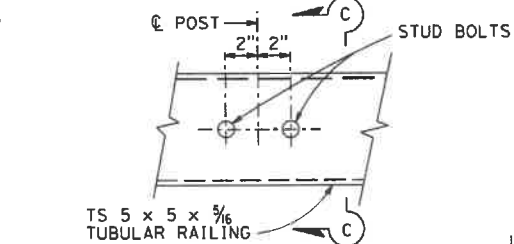
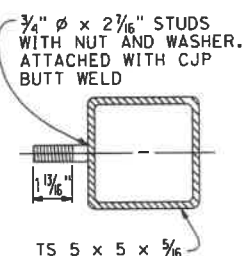
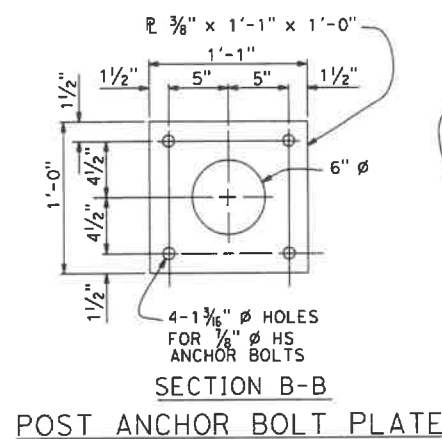
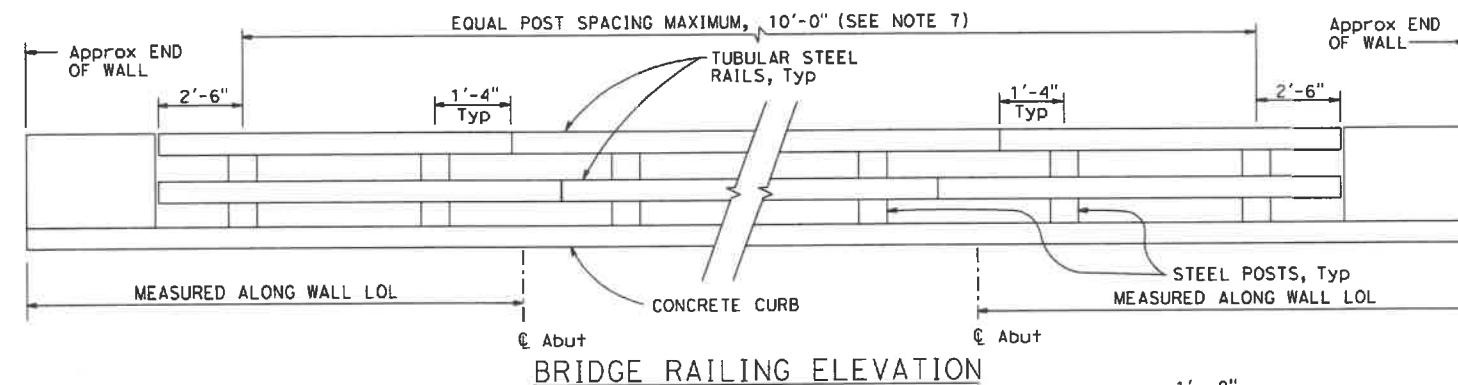
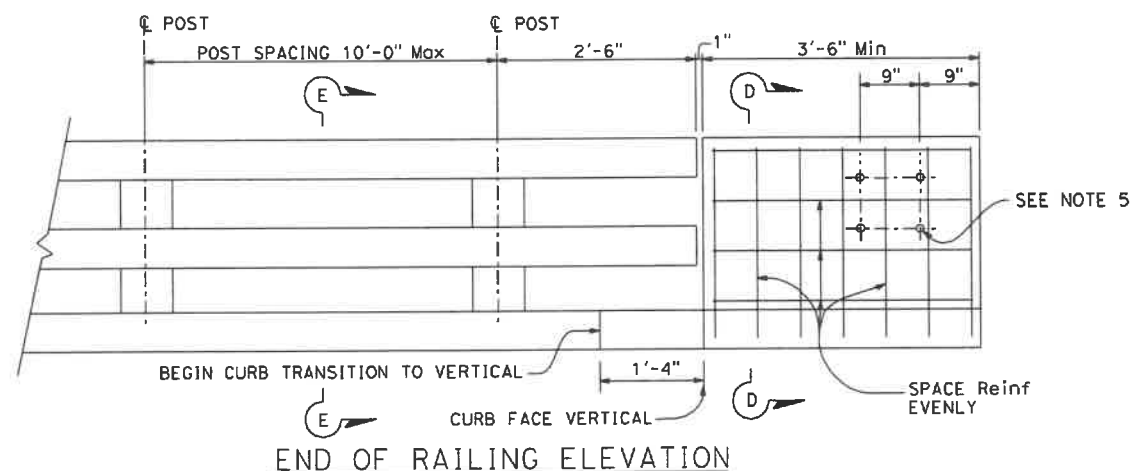
SHEET

G-003

INDEX: 3 OF 10



THE STATE OF CALIFORNIA OR ITS OFFICERS
OR AGENTS SHALL NOT BE RESPONSIBLE FOR
THE ACCURACY OR COMPLETENESS OF SCANNED
COPIES OF THIS PLAN SHEET.



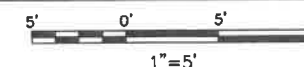
GENERAL NOTES:

1. Post shall be normal to railing.
2. All exposed corners shall be ground smooth.
3. Tubing shall be continuous over not less than 3 intermediate posts.
4. Expansion joints in rail tubes shall match deck expansion joints.
5. For typical metal railing connection details not shown, see Standard Plans A77U1 and A77U2.
6. If required, place scuppers midway between rail posts near centerline spans. Adjust reinforcing spacing to clear openings.
7. Post spacing and/or end block length to be adjusted to fit bridge length or approach slab.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
**CALIFORNIA ST-30
BRIDGE RAIL**

NO SCALE

B11-65

[illegible]

REPAIRED UNDER THE RESPONSIBLE CHARGE OF:

PREPARED UNDER THE RESPONSIBLE CARE OF

Fortunato Enriquez 12-3-2018

DESIGNED BY:

DESIGNED BY:	FORTUNATO ENRIQUEZ	
DRAWN BY:	CHECKED BY:	

FILE NAME:	ENR20544
PLOT DATE:	SCALE:

County of Orange
Public Works

PREPARED BY:
DE DOKKEN
ENGINEERING
110 BLUE RAVINE ROAD, SUITE 200
FOLSOM, CA 95630

**SILVERADO CANYON
ROAD BRIDGE OVER
SILVERADO CREEK
PROJECT**

**CA ST-30
BRIDGE RAIL**

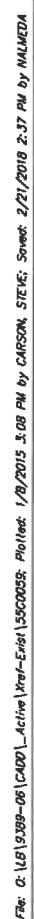
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G-004

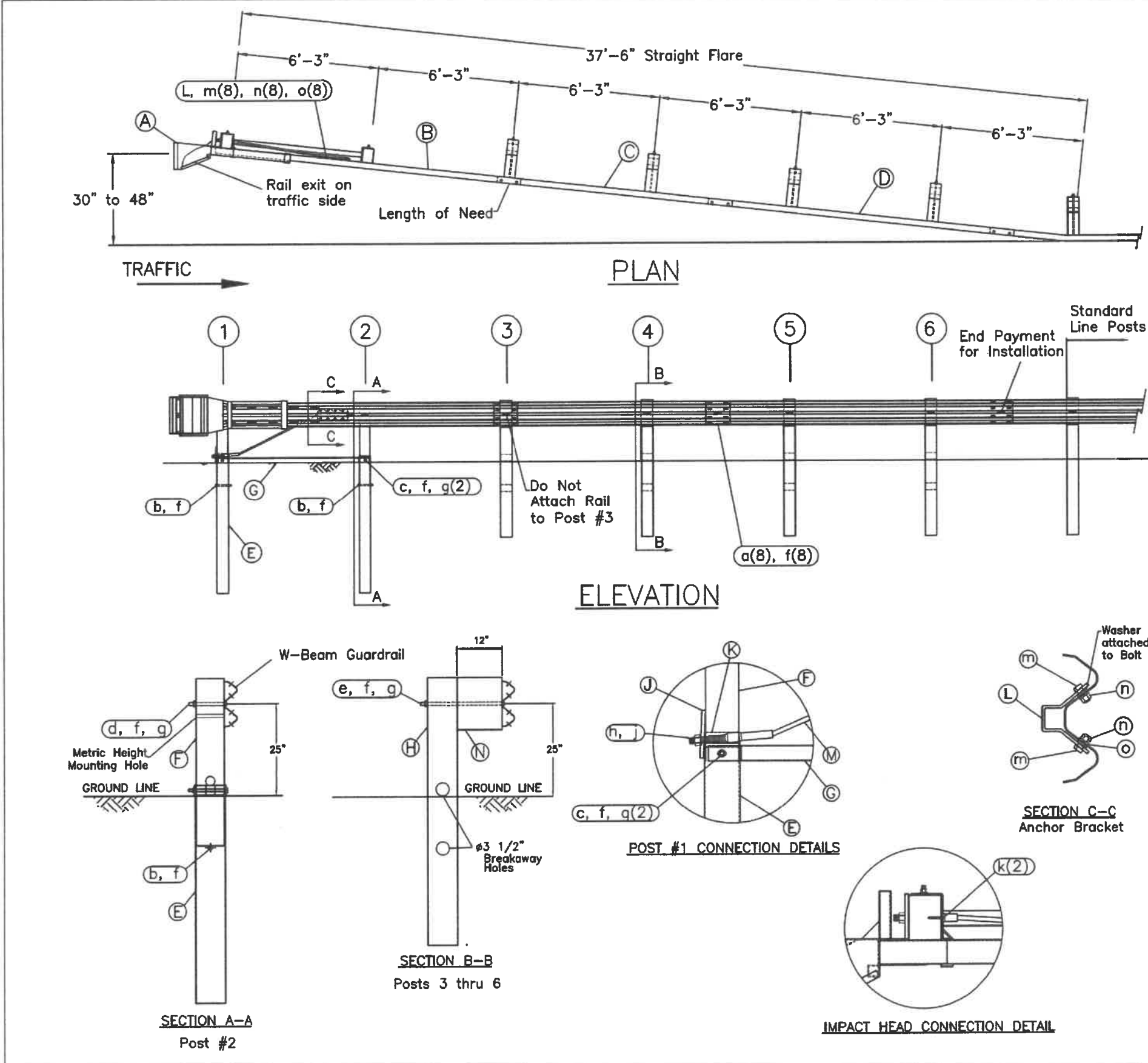
INDEX: 4 OF 10

A77U4

A77U4



NOTE:
1. THIS DETAIL IS FOR REFERENCE ONLY.



ITEM	QTY	BILL OF MATERIALS	ITEM NO.
A	1	IMPACT HEAD	F3000
B	1	W-BEAM END SECTION, 12 Ga.	SF1303
C	1	W-BEAM MGS 9'-4 1/2", 12 Ga.*	G12025
D	1	W-BEAM GUARDRAIL, 12 Ga.	G1203A
E	2	FOUNDATION TUBE 6'-0"***	S730
F	2	UNIVERSAL BCT WOOD POST	UP650
G	1	GROUND STRUT	E780
H	4	UNIVERSAL CRT WOOD POST	UP671
J	1	BEARING PLATE	E750
K	1	PIPE SLEEVE	E740
L	1	CABLE ANCHOR BOX	S760
M	1	BCT CABLE ANCHOR ASSEMBLY	E770
N	4	MGS TIMBER BLOCKOUT OR RECYC. EQUIV.	P677
HARDWARE (ALL DIMENSIONS IN INCHES)			
a	16	5/8" x 1 1/4" SPLICE BOLT	B580122
b	2	5/8" x 7 1/2" HEX BOLT	B580754
c	2	5/8" x 9 1/2" HEX BOLT	B580954
d	1	5/8" x 10 H.G.R. BOLT	B581002
e	4	5/8" x 22 H.G.R. BOLT	B582202
f	25	5/8" H.G.R. NUT	N050
g	9	H.G.R. WASHER	W050
h	2	1 ANCHOR CABLE HEX NUT	N100
j	2	1 ANCHOR CABLE WASHER	W100
k	2	3/8 x 3 LAG SCREW	E350
m	8	1/2 RSI SHOULDER BOLT W/WASHER	SB12A
n	8	1/2 STRUCTURAL NUT	N012A
o	8	1/2 STRUCTURAL WASHER	W012A

PARTS NOTES:
* A 15'-7 1/2" Panel (Part G1507) may be utilized in place of the 9'-4 1/2" Panel.
** 4'-6" Foundation Tubes (S735) w/Soil Plate (SP600) may be utilized in place of 6'-0" Foundation Tubes at Posts #1 & #2.

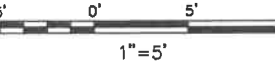
- GENERAL NOTES:
1. Breakaway posts are required with the FLEAT.
 2. All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
 3. The foundation tubes shall not protrude more than 4 in above the ground (measured along a 5' cord). Site grading may be necessary to meet this requirement.
 4. When rock is encountered, a 12" Ø post hole, 20 in into the rock surface may be used if approved by the engineer. Granular material will be placed in the bottom of the hole, approximately 2.5' deep to provide drainage. The soil tubes can be field cut to length, placed in the hole and backfilled with adequately compacted material excavated from the hole.
 5. The breakaway cable assembly must be taut. A locking device (vice grips or channel lock pliers) should be used to prevent the cable from twisting when tightening nuts.
 6. The soil tubes may be driven with an approved driving head. They shall not be driven with the post in the tube.
 7. The wood blockouts should be "toe-nailed" to the rectangular wood posts to prevent them from turning when the wood shrinks. The bearing plate should be "toe-nailed" to post #1 to prevent rotation.

Big Spring, TX
Phone: 432-263-2435
or Phone: 330-346-0721

FLEAT Terminal
Midwest Guardrail System
Universal Wood Posts

Drawing Name: FLT-W-MGS
Scale: NONE
By: JRR
Rev: 0

Sheet: **1**
Date: 05/08/13



DATE	APPR.
DATE	DESCRIPTION
DATE	MARK

PREPARED UNDER THE RESPONSIBLE CHARGE OF:

DEKOKEN ENGINEERING
110 BLUE DAVINE ROAD, SUITE 200
FARMINGTON, CT 06030
TEL: 860-686-9843 FAX: 860-686-9843

12-3-2018
DATE
J. J. Jorgensen
FORNATO ENRIQUEZ, P.E.
DEKOKEN ENGINEERING

DESIGNED BY: FORNATO ENRIQUEZ
CHECKED BY: TM OSTERKAMP
DRAWN BY: NANCY ORTEGA
DRAWING NUMBER: W.D. NO. EX2044

FILE NAME:
PLOT DATE: AUGUST 13, 2018
SCALE: 1" = 10'

County of Orange
Public Works
DEKOKEN ENGINEERING
110 BLUE DAVINE ROAD, SUITE 200
FARMINGTON, CT 06030
TEL: 860-686-9843 FAX: 860-686-9843

SILVERADO CANYON ROAD BRIDGE OVER SILVERADO CREEK PROJECT

TL-3 FLEAT-MGS

SHEET

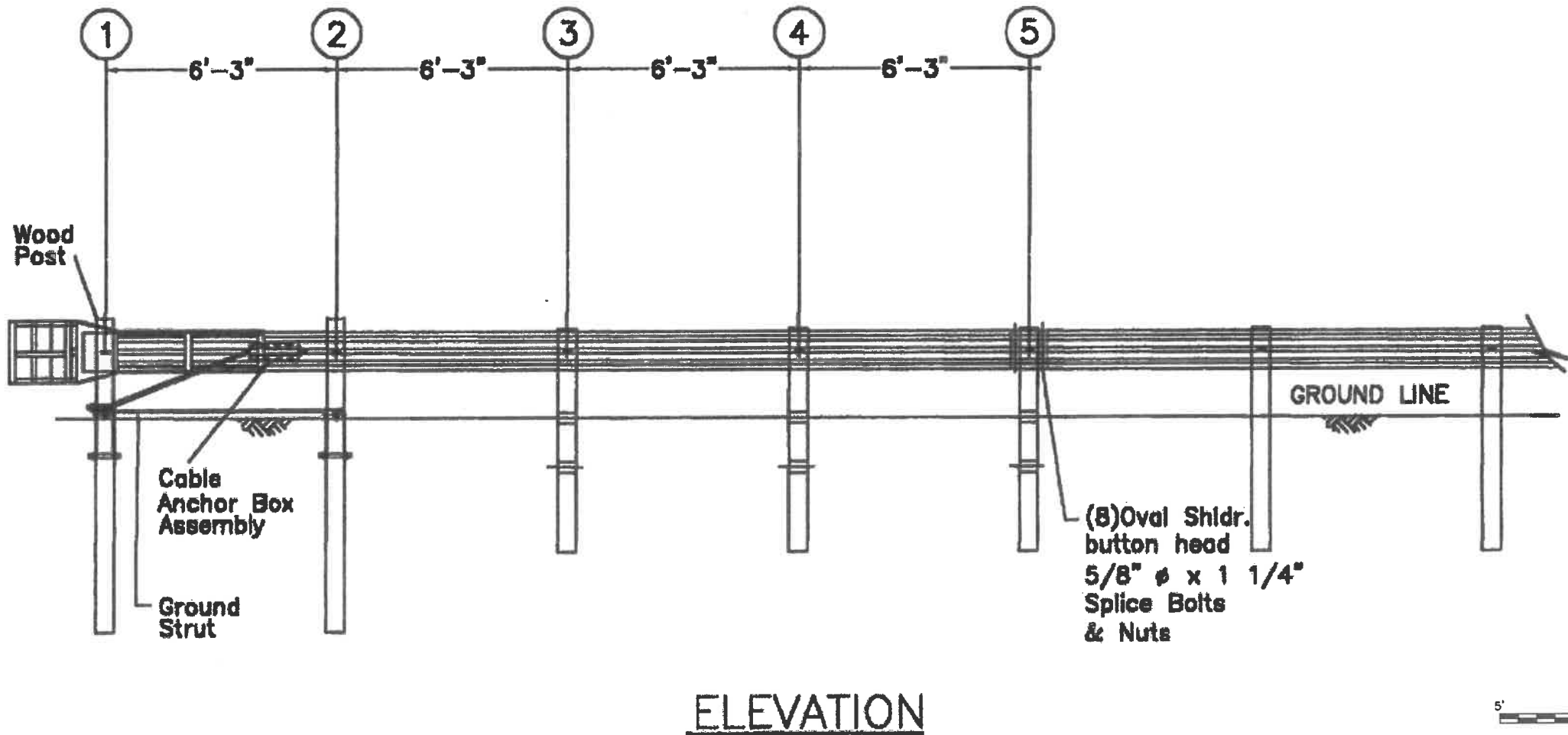
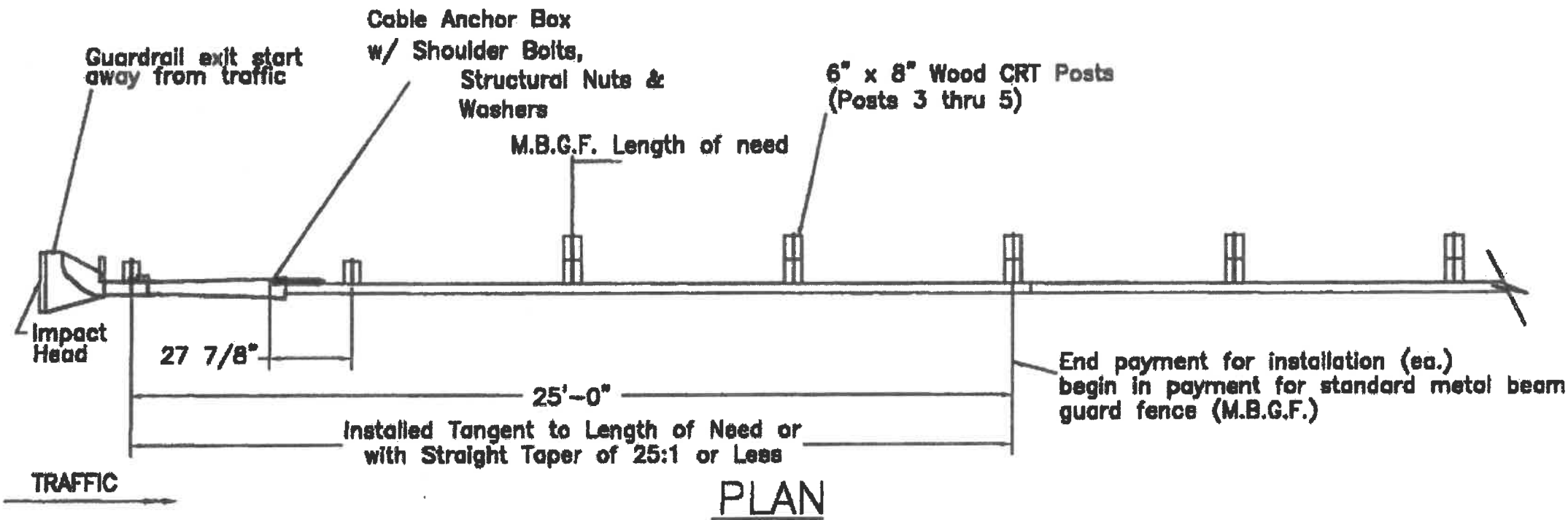
G-006

INDEX: 6 OF 10

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NOTE:
1. THIS DETAIL IS FOR REFERENCE ONLY.

(Wood Post System Shown. Steel Post System Similar.)
TWO Foundation Tube Option Shown
Figure 1. Plan and Elevation View of Test Level 2 SKT System



5' 0' 5' 10'
1"=5'



MARK	DESCRIPTION	DATE	APPR.

PREPARED UNDER THE RESPONSIBLE CHARGE OF:
DEDDOKKEN
ENGINEERING
110 BLUE HAVEN ROAD, SUITE 200
FOLSOM, CA 95630
TEL. 916 834-0642
FAX 916 834-0643
John J. Deddokken
12-3-2018
DATE
FORTUNATO ENRIQUEZ, P.E.
COUNTY ENGINEER

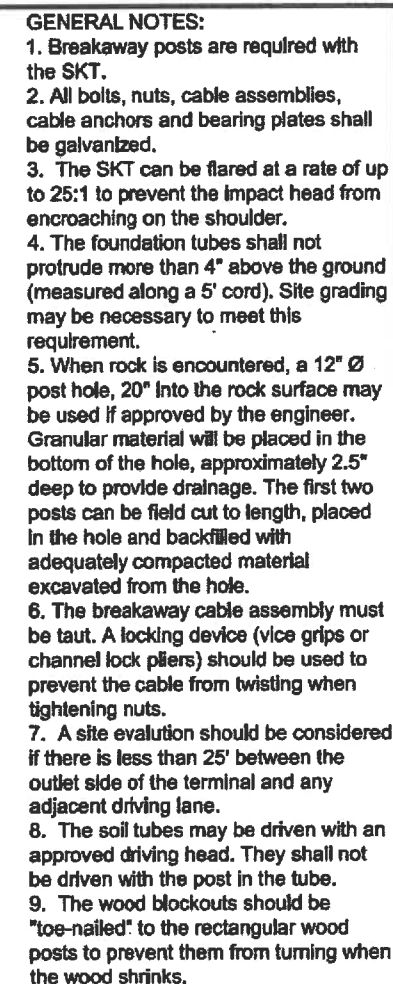
DESIGNED BY: FORTUNATO ENRIQUEZ
DRAWN BY: NANCY ORTIGOSA
CHECKED BY: TIM OSTERKAMP
DRAWING NUMBER: W.O. NO. E202544
FILE NAME:
PLOT DATE: AUGUST 13, 2018
SCALE: 1:1 (0 SHEET)

County of Orange
OC Public Works
PREPARED BY:
DEDDOKKEN
ENGINEERING
110 BLUE HAVEN ROAD, SUITE 200
FOLSOM, CA 95630
TEL. 916 834-0642
FAX 916 834-0643

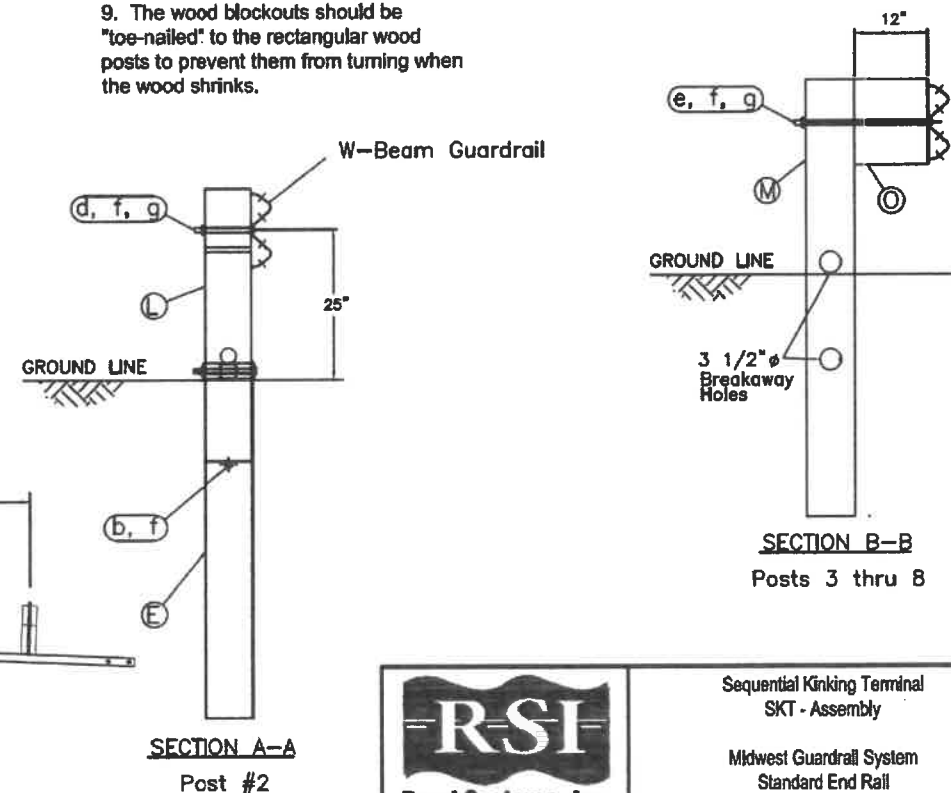
SILVERADO CANYON
ROAD BRIDGE OVER
SILVERADO CREEK
PROJECT
TL-2 FLEAT-MGS
INSTALLATION

SHEET
G-007
INDEX: 7 OF 10

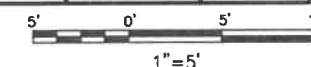
1. THIS DETAIL IS FOR REFERENCE ONLY.



ITEM	QTY	BILL OF MATERIALS	ITEM NO.
A	1	IMPACT HEAD	S3000
B	1	W-BEAM END SECTION, 12'-6", 12 Ga.	S1303
C	1	W-BEAM MGS, 15'-7 1/2", 12 Ga.	G1507
D	2	W-BEAM MGS, 12'-6", 12 Ga.	G1203A
E	2	FOUNDATION TUBE	S730
F	1	GROUND STRUT	E780
G	1	BEARING PLATE	E750
H	1	PIPE SLEEVE	E740
J	1	CABLE ANCHOR BOX	S760
K	1	BCT CABLE ANCHOR ASSEMBLY	E770
L	2	BCT WOOD POST	UP650
M	6	CRT WOOD POST	UP671
O	6	MGS TIMBER BLOCKOUT OR EQUIV.	P676
		HARDWARE (ALL DIMENSIONS IN INCHES)	
a	24	5/8" x 1 1/4" SPLICE BOLT	B580122
b	2	5/8" x 7 1/2" HEX BOLT	B580754
c	2	5/8" x 10" HEX BOLT	B581004
d	1	5/8" x 10" H.G.R. BOLT	B581002
e	6	5/8" x 22" H.G.R. BOLT	B582202
f	35	5/8" H.G.R. NUT	N050
g	7	H.G.R. WASHER	W050
h	2	1" ANCHOR CABLE HEX NUT	N100
j	2	1" ANCHOR CABLE WASHER	W100
k	2	3/8 x 3" LAG SCREW	E350
m	8	CABLE ANCHOR BOX SHOULDER BOLT	SB58A
n	8	1/2" A325 STRUCTURAL NUT	N055A
o	16	1 1/16" OD x 9/16" ID A325 STR. WASHER	W050A



Sequential Kinking Terminal SKT - Assembly Midwest Guardrail System Standard End Rail Wood Post System		Sheet:	A1
		Date:	05/19/1
		By:	JRR
		Drawing Name:	Scale:
SKT-MGS-W-ST-END		NONE	0

[illegible]

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ENGINEERING
110 BLUE RAINNE ROAD, SUITE 200
FOLSOM, CA 95630
TEL. 916 858-0942
FAX 916 858-1643
Tortato Fraguera
12-2018

DESIGNED BY:	FORTUNATO ENRIQUEZ	
DRAWN BY:	JOHANN	CHECKED BY:
DRAWING NUMBER:	NANCY ORTIGOZA	TIM OSTERKAMP
FILE NAME:	-	W.O. NO. E920544
PLOT DATE:	-	SCALE:

County of Orange
Public Works



**SILVERADO CANYON
ROAD BRIDGE OVER
SILVERADO CREEK
PROJECT**

TL-3 SKT-MGS

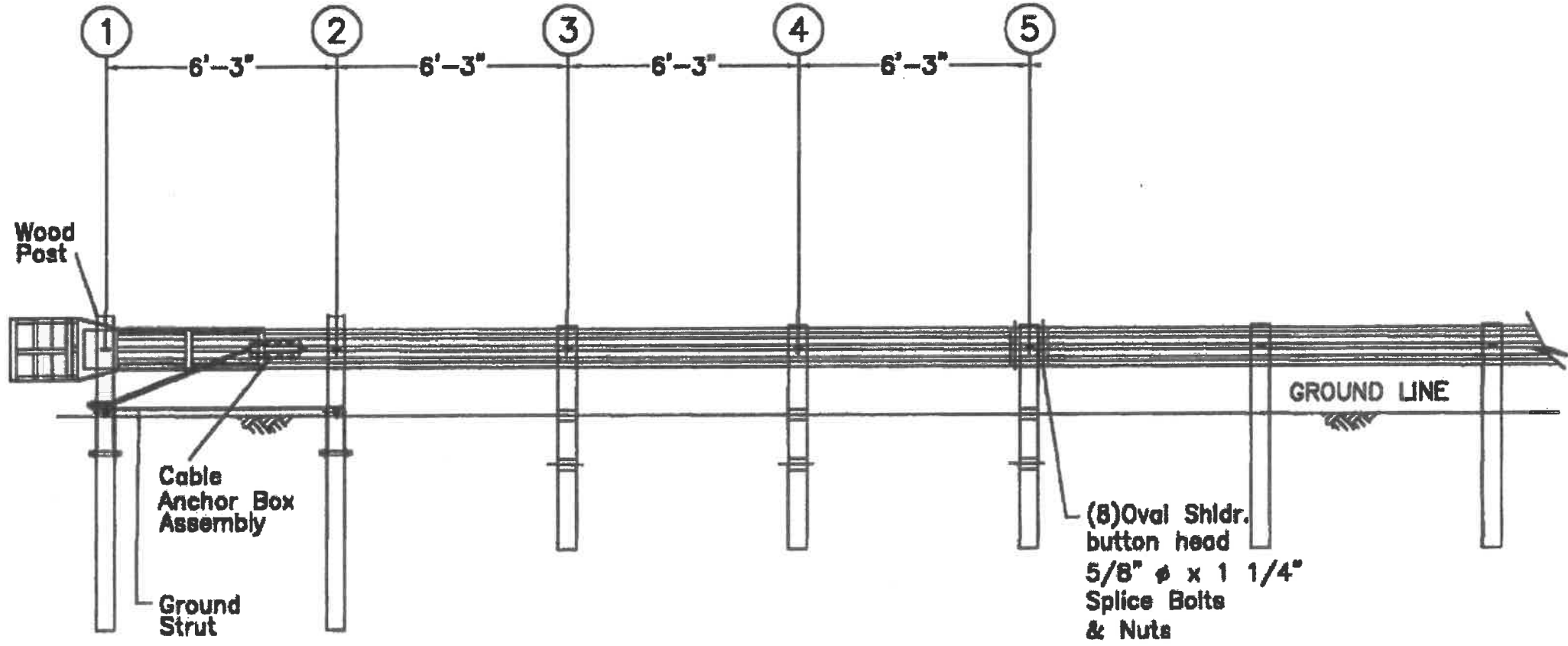
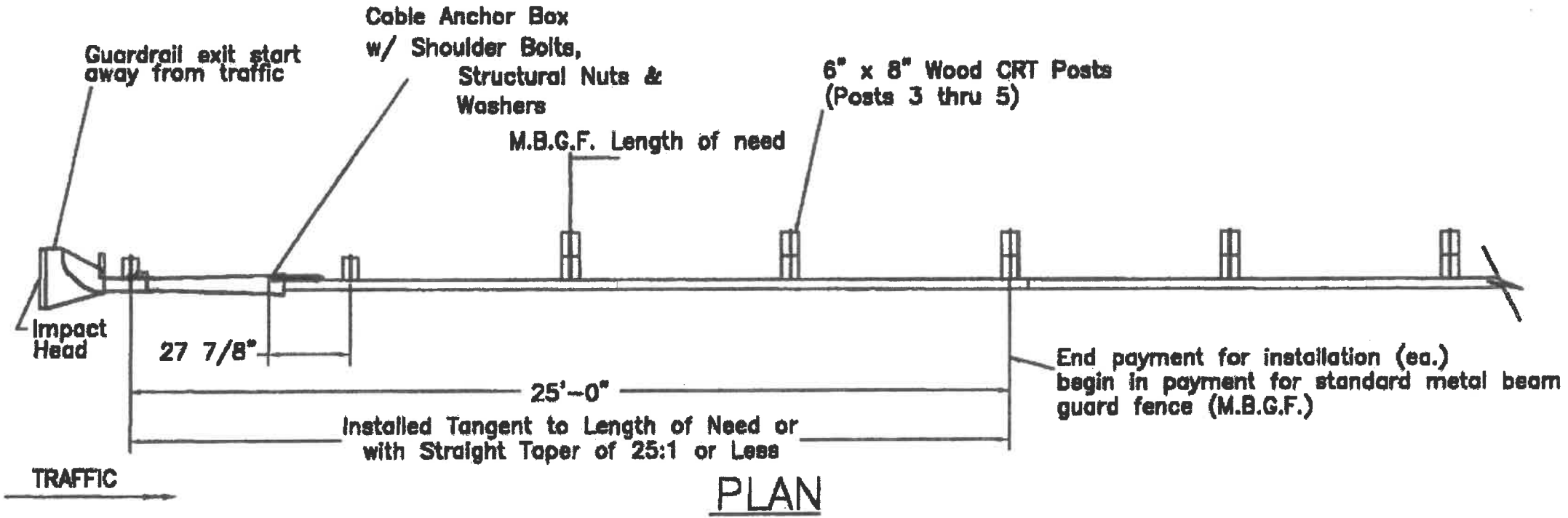
SHEET

G-008

INDEX: 8 OF 10

NOTE:
1. THIS DETAIL IS FOR REFERENCE ONLY.

Figure 1. Plan and Elevation View of Test Level 2 SKT System
(Wood Post System Shown. Steel Post System Similar.)
TWO Foundation Tube Option Shown



ELEVATION

5' 0' 5' 10'
1"=5'



MARK	DESCRIPTION	DATE	APPR.

PREPARED UNDER THE RESPONSIBLE CHARGE OF:

DEDOKKEN
ENGINEERING
110 BLUE BAYVIEW ROAD, SUITE 200
FOLSOM, CA 95630
TEL: 916 856-0642
FAX: 916 856-0643

Tatiana Gregory
CONSULTING ENGINEER P.E.
CONV. NO. 123456
DATE: 12-3-2018

DESIGNED BY: FORTUNATO ENRIQUEZ
DRAWN BY: NANCY ORTIZ
CHECKED BY: TM OSTERKAMP
DRAWING NUMBER: W.O. NO. B20544
FILE NAME: -
PLOT DATE: AUGUST 13, 2018
SCALE: 1"=5' (10 SHEET)

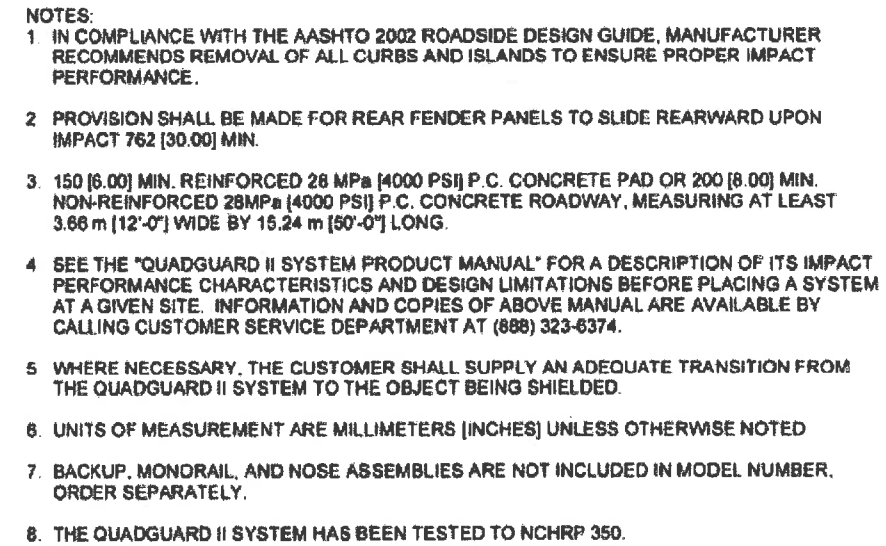
County of Orange
OC Public Works

PREPARED BY: **DEDOKKEN**
ENGINEERING
110 BLUE BAYVIEW ROAD, SUITE 200
FOLSOM, CA 95630
TEL: 916 856-0642
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SILVERADO CANYON
ROAD BRIDGE OVER
SILVERADO CREEK
PROJECT
TL-2 SKT MGS
INSTALLATION

SHEET
G-009
INDEX: 9 OF 10

1. THIS DETAIL IS FOR REFERENCE ONLY.



BAYS	610 [24"] WIDTH	762 [30"] WIDTH	914 [36"] WIDTH	1220 [48"] WIDTH	SYSTEM LENGTH		EFFECTIVE LENGTH		PAD LENGTH		MAX DESIGN SPEED Km/h [MPH]	NO. OF CARTRIDGES		
	MODEL NO.	MODEL NO.	MODEL NO.	MODEL NO.	m	ft-in	m	ft-in	m	ft-in		TYPE I	TYPE II	
1	QG24024	QG24030	QG24036	QG24048	2.13	[7'-0"]	1.73	[5'-8"]	2.74	[9'-0"]	40	[25]	2	0
2	QG27024	QG27030	QG27036	QG27048	3.05	[10'-0"]	2.64	[8'-6"]	2.74	[9'-0"]	70	[43]	2	1
3	QG28024	QG28030	QG28036	QG28048	3.96	[13'-0"]	3.56	[11'-6"]	3.66	[12'-0"]	80	[50]	2	2
4	QG29024	QG29030	QG29036	QG29048	4.87	[16'-0"]	4.47	[14'-8"]	4.57	[15'-0"]	90	[56]	3	2
5	QG210024	QG210030	QG210036	QG210048	5.79	[19'-0"]	5.38	[17'-8"]	5.49	[18'-0"]	100	[62]	3	3
6	QG210524	QG210530	QG210536	QG210548	6.71	[22'-0"]	6.30	[20'-8"]	6.40	[21'-0"]	105	[65]	4	3
7	QG211024	QG211030	QG211036	QG211048	7.63	[25'-0"]	7.21	[23'-8"]	7.32	[24'-0"]	110	[68]	4	4
8	QG211524	QG211530	QG211536	QG211548	8.53	[28'-0"]	8.13	[26'-8"]	8.23	[27'-0"]	115	[71]	4	5
9	QG212024	QG212030	QG212036	QG212048	9.45	[31'-0"]	9.04	[29'-8"]	9.14	[30'-0"]	120	[75]	4	6

KEY	① CARTRIDGE	④ MONORAIL
	② DIAPHRAGM	⑤ NOSE ASSEMBLY
	③ FENDER PANEL	⑥ BACKUP

REFERENCES

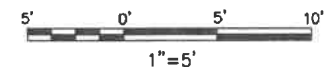
	DIAPHRAGM ASSY.	607113
SERIAL NO.	SHIM KIT, DIAPHRAGM	614050
SALES ORDER	NOSE ASSY.	611680
EH PROJECT	FENDER PANEL ASSY.	608238
NO. OF UNITS	BACKUP ASSY.	35-40-03
	MONORAIL ASSY.	35-40-75
	CONCRETE PAD	35-40-76

DATE	DATE
D. Kohfeld	2/25/2008
DISCALLED	DATE
M. Buehler	12/30/2008
RECEIVED	DATE
JME	3/4/2008
RECORDED	DATE
MJB	3/19/2008
FILE	
QG2TSCVR-U.idw	
SUBMIT	

ENERGY ABSORPTION SYSTEMS, INC.
ENGINEERING AND RESEARCH DEPARTMENT

QUADGUARD® II SYSTEM
WITH TENSION STRUT BACKUP

REF	FRANCIS QGZTSCVR-U	PAGE 1 of 1	REV D
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[illegible]

PREPARED UNDER THE RESPONSIBLE CHARGE OF:



TEL. 918 6360692
FAX 918 8561063

Fernando Enríquez

12-3-2018

DATE

FORTUNATO ENRIQUEZ, P.E.,
COOKKEN ENGINEERING

DESIGNED BY:		FORTUNATO ENRIQUEZ	
DRAWN BY:	NANCY ORTIGOZA	CHECKED BY:	TM OSTERKAMP
DRAWING NUMBER:	-	W.O. NO.	EX20544
FILE NAME:		-	
PLOT DATE:		SCALE:	
AUGUST 13, 2018		1:1 (D SHEET)	

County of Orange
Public Works



**SILVERADO CANYON
ROAD BRIDGE OVER
SILVERADO CREEK
PROJECT**

CRASH CUSHION

SHEET

G-010

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