

**WARNING:** ALL INDIVIDUALS INTERESTED IN BIDDING ON THIS PROJECT MUST OBTAIN THE FINAL PLANS AND SPECIFICATIONS FROM THE DEPARTMENT MANAGING THE PROJECT OR AS OTHERWISE STATED IN THE ADVERTISEMENT FOR BIDS FOR THE PROJECT. DO NOT USE THE PLANS AND SPECIFICATIONS POSTED ON THE CLERK OF THE BOARD'S WEBSITE FOR BIDDING ON THIS PROJECT.

# SAN BERNARDINO COUNTY DEPARTMENT OF PUBLIC WORKS

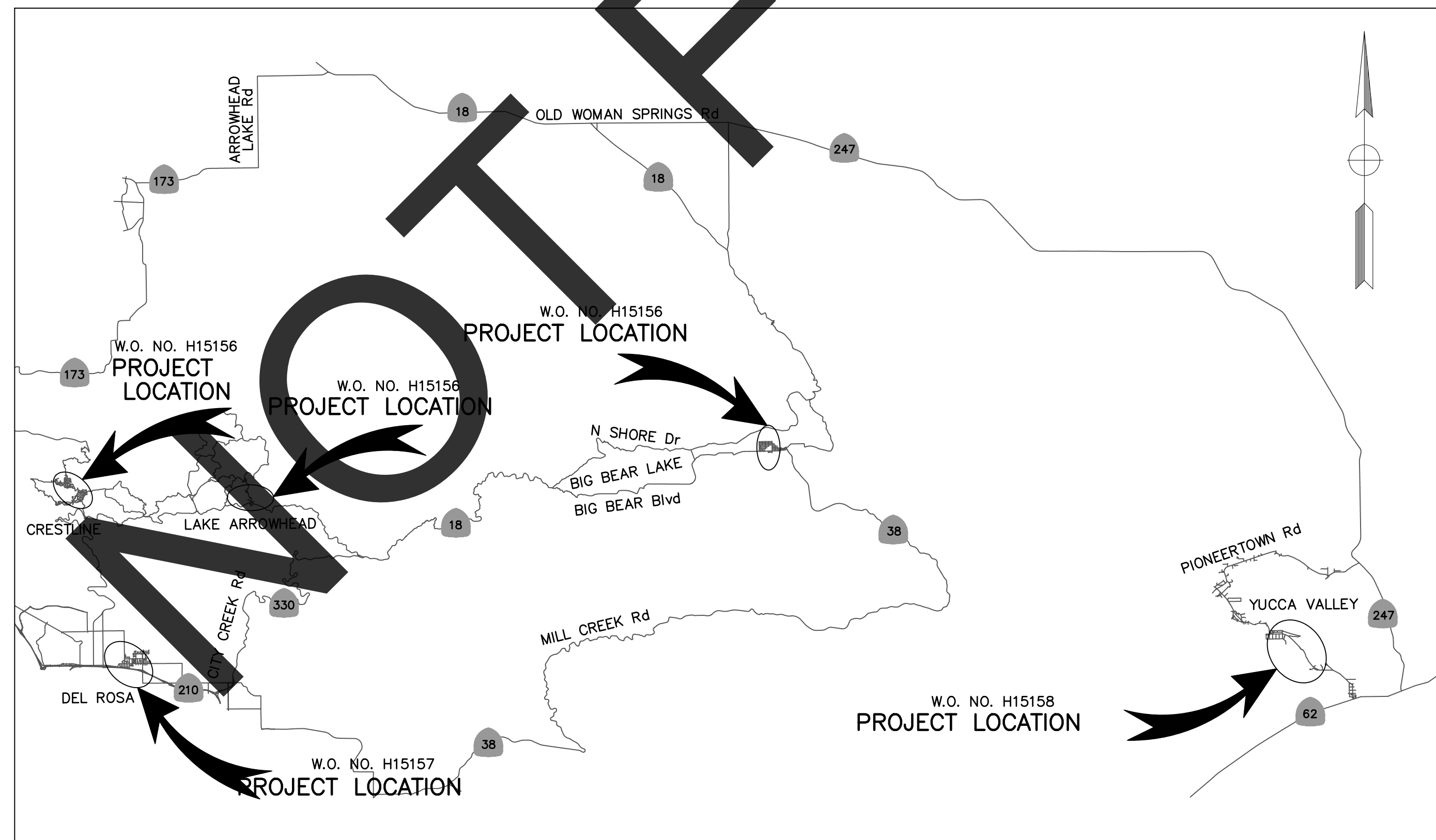


## TRANSPORTATION PLANS FOR CONSTRUCTION ON

# GUARDRAIL REPLACEMENTS AT VARIOUS LOCATIONS SAN BERNARDINO AREA

WORK ORDER NO. H15156, H15157, AND H15158

ROAD NO. 692650-010, 26550-010, 470600-010, 522600-010, 293400-090, & 660700-020



**LOCATION MAP**

NOT TO SCALE

**SAN BERNARDINO COUNTY**

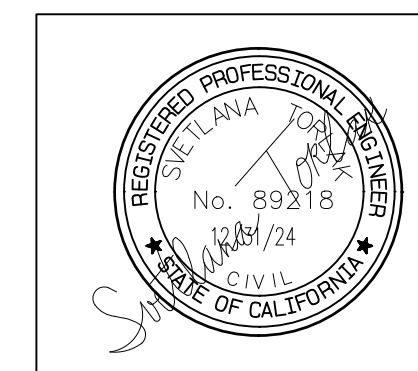
APPROVED BY:

*Noel Castillo*  
NOEL CASTILLO, P.E., DIRECTOR OF PUBLIC WORKS R.C.E. 78044

6/12/24

DATE

**T-1**



MARK	CHANGES	RESIDENT ENGINEER	DATE
	NO CHANGES		
FIELD CHANGES		SHT. NO.	TOT. SHT'S.
		1	15

FILE NO. 692650-010, 26550-010, 470600-010, 522600-010, 293400-090, & 660700-020

FILE NO. 692650-010, 26550-010, 470600-010, 522600-010, 293400-090, & 660700-020

**INDEX OF SHEETS**

1	TITLE SHEET
2	PROJECT NOTES, LEGENDS, INDEX MAP AND INDEX OF SHEETS
3-11	LAYOUT PLANS
12-14	CONSTRUCTION DETAILS
15	SUMMARY OF QUANTITIES

THE FOLLOWING COUNTY STANDARDS ARE ATTACHED TO THE SPECIAL PROVISIONS:

303A 303B

TO BE SUPPLEMENTED BY THE FOLLOWING CALTRANS STANDARD PLANS DATED 2018:

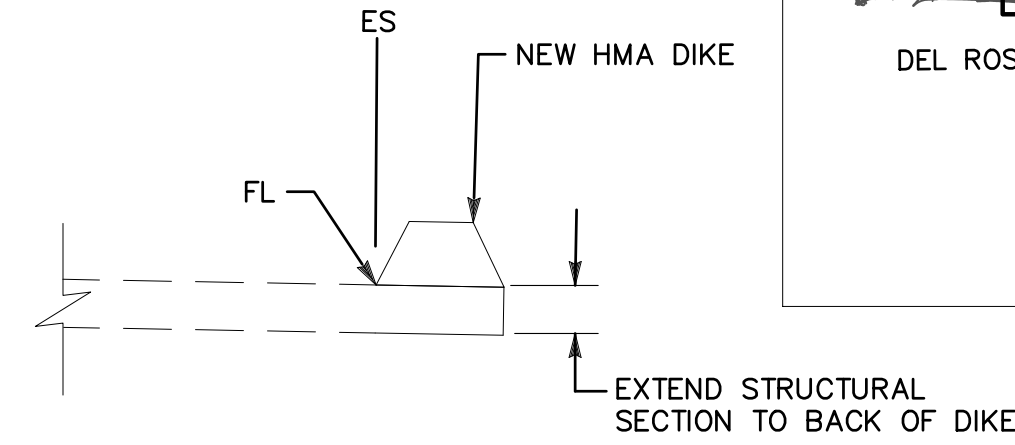
A3A	A3B	A3C	RSP A20B
A87B	RSP A77L2	A77M1	A77N2
RSP A77N4	A77N5	A77N5A	A77N6
RSP A77P1	RSP A77S1	A73C	T9
T3A	T3B	T10	T13
RSP A73B	D87D	RSP A85	A85A
A86B	A77R4		

TO BE SUPPLEMENTED BY THE FOLLOWING CA MUTCD STANDARD PLANS DATED 2014 REV 6:

FIGURE 2A-2 (CA) FIGURE 2C-13 (CA)

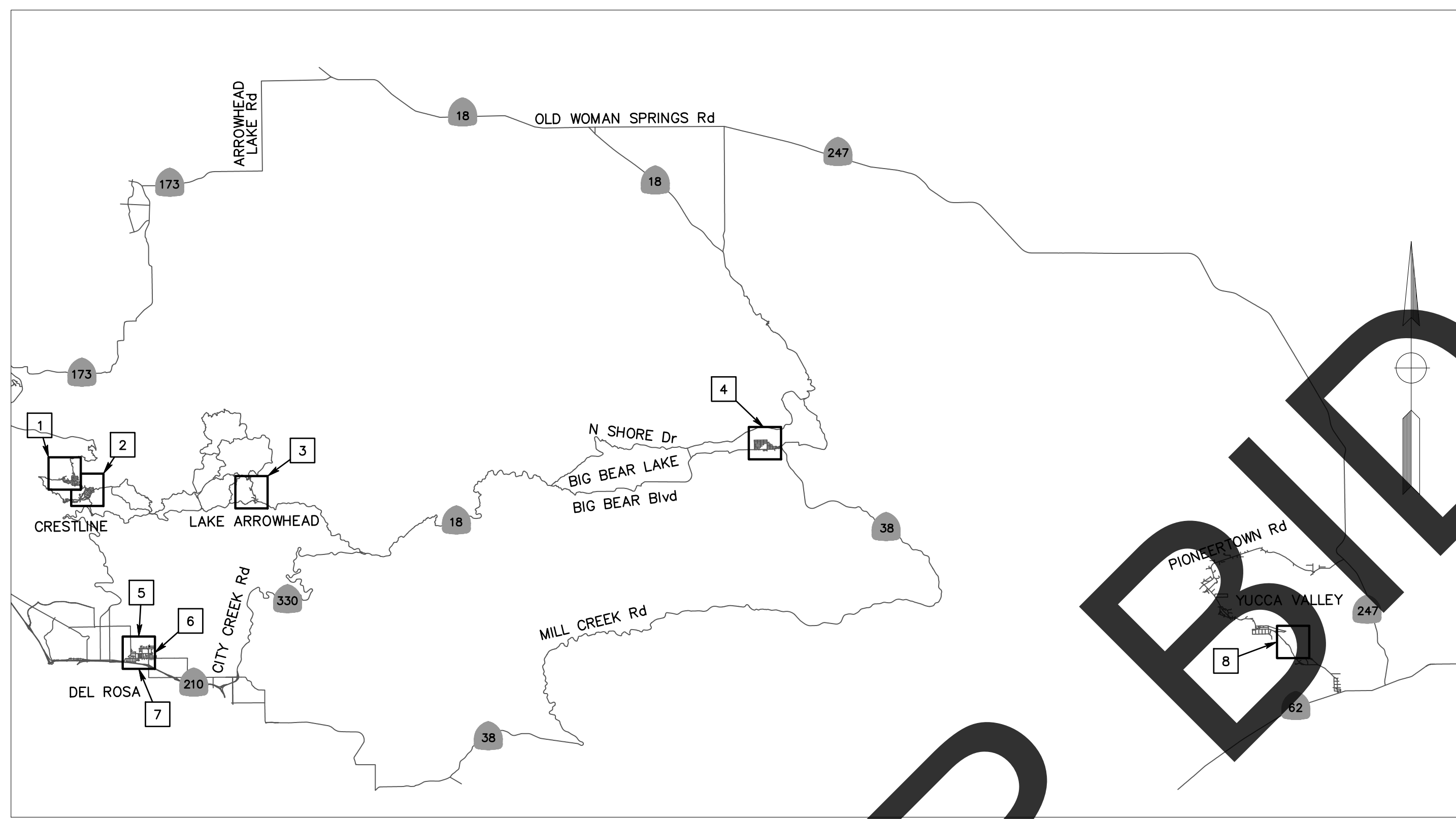
**UNDERGROUND UTILITY LEGEND**

GAS LINE	g g g g g
SEWER MAIN LINE	ss ss ss ss
WATER LINE	w w w w w
ELECTRIC LINE	e e e e e
TELEPHONE LINE	tel tel tel tel
DATA/CABLE LINE	fo fo fo fo



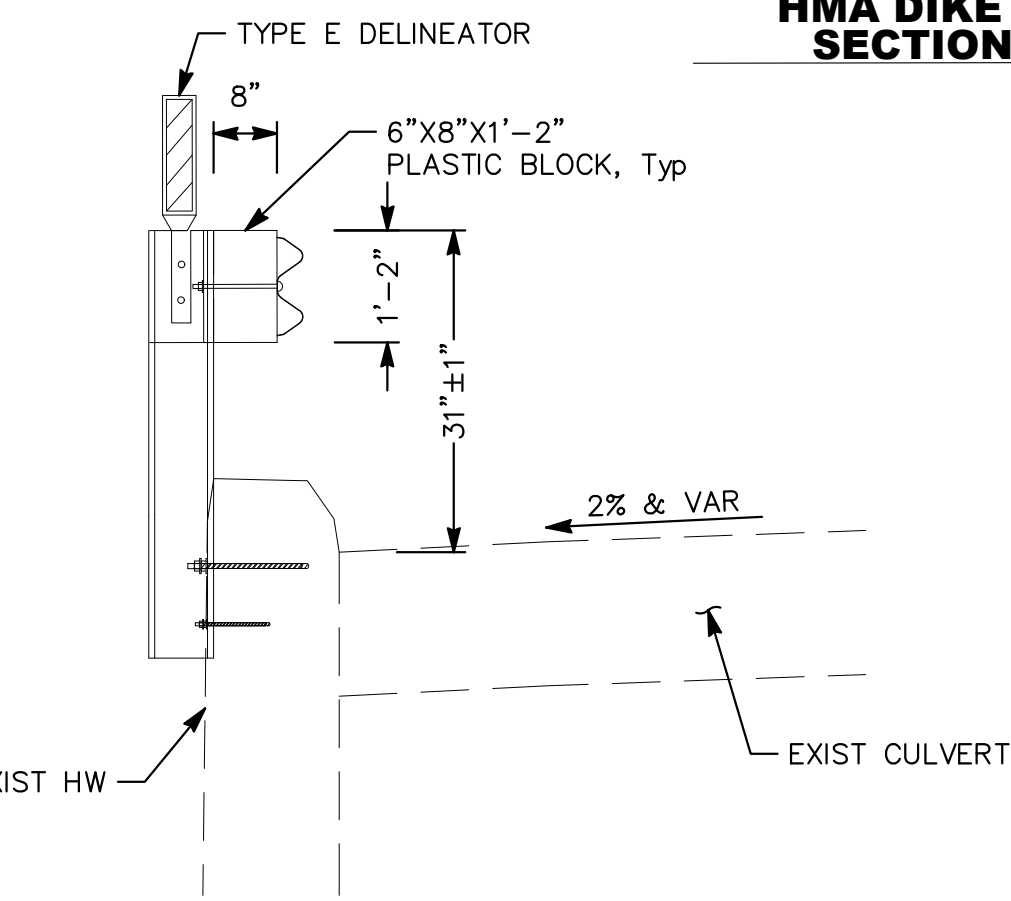
**HMA DIKE STRUCTURAL SECTION**

NTS



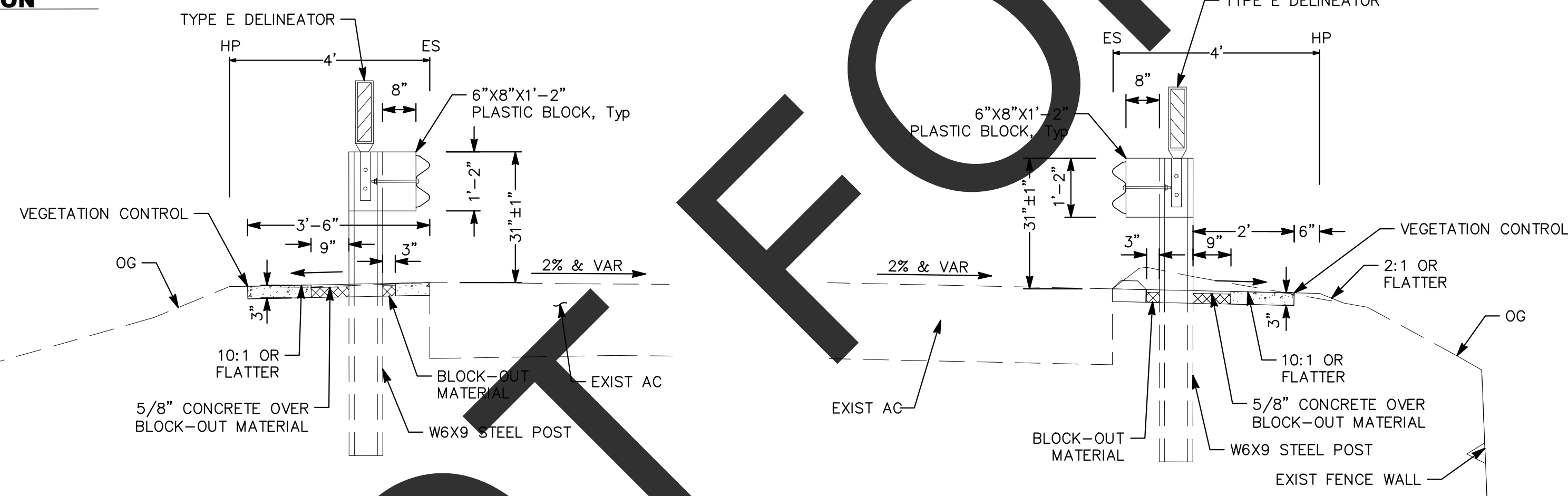
**INDEX MAP**

NTS



**MGS (SPECIAL) INSTALLATION**

NTS



**MIDWEST GUARDRAIL SYSTEM**

NTS

**CONSTRUCTION MATERIALS**

	PORTLAND CEMENT CONCRETE
	BLOCK-OUT MATERIAL
	NATURAL MATERIAL
	EXISTING GUARDRAIL
	MIDWEST GUARDRAIL SYSTEM
	R/W
	EXISTING WALL
	POTHOLE LOCATION
	DIRECTION OF TRAFFIC
	SNOW POLE

AREAS				
LOCATION	GUARDRAIL LOCATION	AREA	JURISDICTION	SHEET
1	REDWOOD WAY & BALSAM LN	CRESTLINE	COUNTY	L-1
2	CRESTLINE RD	CRESTLINE	COUNTY	L-2
5, 6, 7	DEL ROSA AVE	DEL ROSA	COUNTY	L-3 TO L-5
3	KUFFEL CANYON RD	LAKE ARROWHEAD	COUNTY	L-6
4	MALTY BLVD	BIG BEAR LAKE	COUNTY	L-7
8	PIONEERTOWN RD	YUCCA VALLEY	COUNTY	L-8 TO L-9

**SAN BERNARDINO COUNTY TRAFFIC CONTROL GENERAL NOTES :**

- ALL SIGNING, STRIPING AND PAVEMENT MARKINGS SHALL BE IN CONFORMANCE WITH THE CALIFORNIA MUTCD LATEST EDITION.
  - CONSTRUCTION SIGNS SHALL BE OF DIAMOND GRADE (FHWA TYPE IX) FLUORESCENT ORANGE RETRO-REFLECTIVE SHEETING.
- ALL DELINEATORS, CHANNELIZERS, AND OBJECT MARKERS SHALL BE OF (FHWA TYPE VI) RETRO-REFLECTIVE SHEETING.
- SIGNS SHALL BE MOUNTED ON METAL POSTS SIMILAR TO COUNTY STANDARDS 303(a) AND 303(b).
- ALL CONFLICTING STRIPING AND PAVEMENT MARKINGS NOT SHOWN ON PLANS SHALL BE REMOVED BY THE CONTRACTOR. REMOVAL SHALL BE ACCOMPLISHED BY SANDBLASTING, GRINDING, OR AS DIRECTED BY COUNTY REPRESENTATIVE.
- ALL CONFLICTING SIGNS SHALL BE REMOVED, RELOCATED, OR COVERED BY THE CONTRACTOR. RELOCATABLE SIGNS SHALL BE INSTALLED AS SPECIFIED ON THE PLANS OR AS DIRECTED BY COUNTY REPRESENTATIVE.
- ALL UNPROTECTED LOCATIONS RESULTING IN ISOLATED ABRUPT DEPRESSIONS OR ELEVATED OBJECTS (i.e. CATCH BASINS, HEADWALLS, POWER POLES, END TREATMENT OF ASPHALT DIKES AND CONCRETE CURBS) SHALL BE PROTECTED BY DELINEATORS OR BARRIERS PER THE CALIFORNIA MUTCD LATEST EDITION.
- ALL EXISTING SIGNING, STRIPING AND PAVEMENT MARKINGS (i.e. CROSS STREET STOP, STOP LIMIT LINE, AND CROSSWALK PAVEMENT MARKINGS) NOT SHOWN ON PLANS, IF REMOVED/OBLITERATED, SHALL BE REPLACED/RESTORED OF SAME KIND, AND IN CONFORMANCE WITH THE CALIFORNIA MUTCD LATEST EDITION.
- THE CONTRACTOR SHALL NOTIFY COUNTY REPRESENTATIVE TO SCHEDULE A FINAL REVIEW (WALK THROUGH) WITH TRAFFIC DIVISION PERSONNEL FOR APPROVAL OF TRAFFIC CONTROL DEVICES PRIOR TO PROJECT ACCEPTANCE.

PREPARED BY:

FIELD CHANGES		
MARK	CHANGES	DATE
	NO CHANGES	
	RESIDENT ENGINEER	



SAN BERNARDINO COUNTY  
DEPARTMENT OF PUBLIC WORKS

DESIGNED BY: ST    DRAWN BY: MN    CHECKED BY: AOF    RECOMMENDED BY: *Chris Nguyen* 6/6/2024

APPROVED BY: *Eloy Rivalcaba* 6/6/2024    *Mervat N. Mikhail* 06/12/2024

ELOY RIVALCABA, P.E. SUPERVISING ENGINEER    MERVAT N. MIKHAIL, P.E. DEPUTY DIRECTOR

SAN BERNARDINO AREA  
GUARDRAIL REPLACEMENTS  
PROJECT NOTES, LEGENDS, INDEX MAP AND INDEX OF SHEETS  
SAN BERNARDINO AREA

J.L. REF.	W.O. NO.	PLAN SCALE	SHT. NO.	TOT. SHTS.
N/A	Var	N/A	2	15

**ABBREVIATIONS LEGEND:**

AC = ASPHALT CONCRETE	EXIST = EXISTING	P/L = PROPERTY LINE
ADA = AMERICANS WITH DISABILITIES ACT	FD = FOUND	PP = POWER POLE
APN = ASSESSOR'S PARCEL NUMBER	FG = GUARDRAIL	R = RADIUS
ASTM = AMERICAN SOCIETY FOR TESTING AND MATERIALS	FH = FIRE HYDRANT	REV = REVISION
AVE = AVENUE	FHWA = FEDERAL HIGHWAY ADMINISTRATION	Rd = ROAD
BBCCSD = BIG BEAR CITY COMMUNITY SERVICES DISTRICT	GR = GUARDRAIL	RSP = REVISED STANDARD PLAN
BC = BEGIN CURVE	HP = HINGE POINT	RT = RIGHT
BEG = BEGINNING	HW = HEAD WALL	R/W = RIGHT OF WAY
BLVD = BOULEVARD	IN = INCH	S = SPACING, SOUTH
BP = BEGIN POINT	L = LENGTH	SBMWD = SAN BERNARDINO MUNICIPAL WATER DEPARTMENT
CA = CALIFORNIA	LB = POUND	SBSD = SAN BERNARDINO COUNTY SPECIAL DISTRICTS
CSD = COMMUNITY SERVICES DISTRICT	LF = LINEAR FEET	SCE = SOUTHERN CALIFORNIA EDISON
CVWD = CRESTLINE VILLAGE WATER DISTRICT	LL = LIMIT LINE	SCG = SOUTHERN CALIFORNIA GAS
DL = DEPTH	LN = LANE	SFT = SQUARE FEET
DM = DIAMETER	LT = LEFT	SQYD = SQUARE YARD
D = DRIVE	LTG = LIGHT	ST = STREET
DWY = DRIVEWAY	MAG = MAGNETIC	SWG = SOUTHWEST GAS
DYS = DOUBLE YELLOW STRIPE	Max = MAXIMUM	SUR = SURVEY
E = EASTING	MBGR = METAL BEAM GUARD RAILING	STA = STATION
EA = EACH	MGS = MIDWEST GUARDRAIL SYSTEM	T = TANGENT
EC = END CURVE	Min = MINIMUM	TELECOM = TELECOMMUNICATIONS
ELEV = ELEVATION	Mod = MODIFIED	Thru = THROUGH
EP = EDGE OF PAVEMENT, END POINT	MUTCD = MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES	Typ = TYPICAL
ES = EDGE OF SHOULDER	N = NORTHING	UG = UNDERGROUND
ETW = EDGE OF TRAVELED WAY	NAD = NORTH AMERICAN DATUM	Var = VARIES
EWVD = EAST VALLEY WATER DISTRICT	NAVD = NORTH AMERICAN VERTICAL DATUM	VCP = VITRIFIED CLAY PIPE
	No. = NUMBER	VOE = VALLEY OF ENCHANTMENT
	NTS = NOT TO SCALE	W = WEST
	OC = ON CENTER	WS = WHITE STRIPE
	OG = ORIGINAL GROUND	
	OH = OVERHEAD	
	PI = POINT OF INTERSECTION	

**CONSTRUCTION NOTES:**

- REMOVE AND DISPOSE OF EXISTING GUARDRAIL/BARRICADE.
- REMOVE AND DISPOSE OF EXISTING BARRIER RAILING.
- REMOVE ASPHALT CONCRETE DIKE.
- PROTECT IN PLACE.
- INSTALL CALTRANS APPROVED ALTERNATIVE 31" IN-LINE TERMINAL SYSTEM END TREATMENT PER RSI MSKT-SP-MGS TERMINAL (8' BLOCKS) TEST LEVEL 3 PER CALTRANS REVISED STANDARD PLAN A77P1.
- INSTALL MIDWEST GUARDRAIL SYSTEM PER CALTRANS STANDARD PLANS RSP A77L2, A77M1, AND A77N2.
- INSTALL MIDWEST GUARDRAIL SYSTEM (SPECIAL) PER DETAIL ON SHEET C-2.
- CONSTRUCT 3" CONCRETE VEGETATION CONTROL PER CALTRANS STANDARD PLAN A77N5 AND A77N6.
- INSTALL TYPE E GUARDRAIL DELINEATOR PER CALTRANS STANDARD PLAN A77N4 AND A73C.
- INSTALL SNOW POLE PER CALTRANS REVISED STANDARD PLAN RSP A73B.
- INSTALL ASPHALT CONCRETE DIKE (TYPE F) PER CALTRANS STANDARD PLAN A87B AND A77N4.
- INSTALL ASPHALT CONCRETE DIKE (TYPE C) PER CALTRANS STANDARD PLAN A87B AND A77N4.
- INSTALL NEW SIGN(S) AS SHOWN ON PLAN AND PER THE CALIFORNIA MUTCD 2014.
- INSTALL END CAP (TYPE B) AS SHOWN ON SHEET C-1.
- INSTALL RETRO REFLECTIVE MATERIAL TYPE P(CA) (OM-3R) TO IMPACT HEAD PER CA MUTCD 2014, FIGURE 2C-13(CA) AND SECTION 2C.65.
- INSTALL RETRO REFLECTIVE MATERIAL TYPE P(CA) (OM-3L) TO IMPACT HEAD PER CA MUTCD 2014, FIGURE 2C-13(CA) AND SECTION 2C.65.
- INSTALL TYPE L-1 (CA) (OM2-2V) OBJECT MARKER PER CALIFORNIA MUTCD 2014, FIGURE 2C-13(CA) AND SECTION 2C.65.
- PAINT 6" WIDE WHITE EDGE LINE STRIPE PER CALTRANS STANDARD PLAN A20B, DETAIL 27B.
- PAINT CURB (2 COAT) RED PER CALIFORNIA MUTCD 2014, SECTION 3B.23.
- INSTALL CHAIN LINK FENCE (TYPE CL-6) WITH BARBED WIRE PER CALTRANS STANDARD PLANS A85 AND A86.
- INSTALL 5' CHAIN LINK GATE (TYPE CL-6) WITH BARBED WIRE PER CALTRANS STANDARD PLANS A85 AND A86.
- REMOVE AND DISPOSE OF EXISTING OVERSIDE DRAIN.
- INSTALL ASPHALT CONCRETE OVERSIDE DRAIN PER CALTRANS STANDARD PLAN D87D.
- INSTALL STRENGTHENED MIDWEST GUARDRAIL SYSTEM PER CALTRANS STANDARD PLAN A77R4.
- REMOVE AND DISPOSE OF EXISTING STEEL BARRIER.
- REMOVE AND DISPOSE OF EXISTING SIGN.
- INSTALL END ANCHOR ASSEMBLY (TYPE SFT) PER CALTRANS REVISED STANDARD PLAN A77S1.

**GENERAL NOTES**

- THE FACT THAT ANY UTILITY FACILITY IS SHOWN OR NOT SHOWN UPON THE PLANS SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY UNDER SECTION 5-1.36D "NON HIGHWAY FACILITIES" OF THE CALTRANS STANDARD SPECIFICATIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY, PURSUANT THERETO, TO ASCERTAIN THE LOCATION OF ANY UTILITY FACILITY WHICH MAY BE SUBJECT TO DAMAGE BY REASON OF THE CONTRACTOR'S OPERATIONS.
- ALL STATIONING NOTES ON PLAN REFER TO THE CL IMP ROAD OR SIDE STREET.
- DIMENSIONS ARE SUBJECT TO TOLERANCES SPECIFIED IN THE CALTRANS STANDARD SPECIFICATIONS.
- ALL PAVEMENT WIDTH DIMENSIONS SHOWN ON THE PLANS ARE TO THE EDGE OF PAVEMENT OR TO THE TOP OF CURB, UNLESS OTHERWISE NOTED.
- TRANSITIONS AND WARPING SHALL BE AS SHOWN AND AS DETERMINED BY THE ENGINEER.
- ASPHALT CONCRETE OVERLAYS SHALL BE FEATHERED TO MEET EXISTING AS SHOWN ON THE PLANS OR AS DETERMINED BY THE ENGINEER.
- ALL TREES & VEGETATION OUTSIDE THE LIMITS OF EXCAVATION AND EMBANKMENT SLOPE LINES, SHALL BE PROTECTED IN PLACE.

THIS PROJECT REQUIRES A CONTRACTOR'S LICENSE CLASS "A"

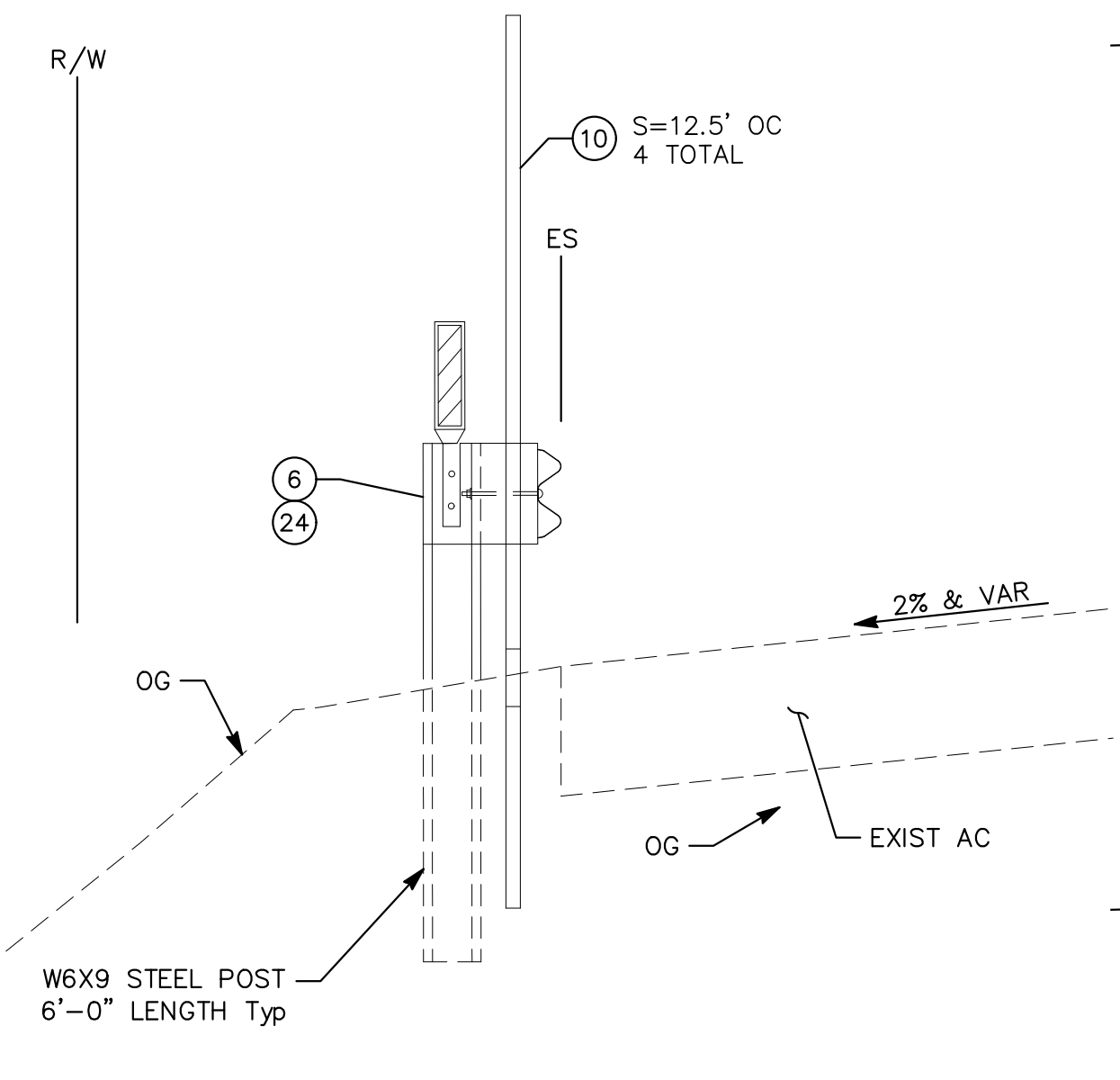
**K-1**

FILE NO. 692650-010, 26550-010, 470600-010, 522600-010, 293400-090, & 660700-020

FILE NO. 692650-010, 26550-010, 470600-010, 522600-010, 293400-090, & 660700-020

- CONSTRUCTION NOTES:**
- 1 REMOVE AND DISPOSE OF EXISTING GUARDRAIL/BARRICADE.
  - 4 PROTECT IN PLACE.
  - 6 INSTALL MIDWEST GUARDRAIL SYSTEM PER CALTRANS STANDARD PLANS RSP A77L2, A77M1, AND A77N2.
  - 9 INSTALL TYPE E GUARDRAIL DELINEATOR PER CALTRANS PLAN A77N4 AND A73C.
  - 10 INSTALL SNOW POLE PER CALTRANS REVISED STANDARD PLAN RSP A73B.
  - 13 INSTALL NEW SIGN(S) AS SHOWN ON PLAN AND PER THE CALIFORNIA MUTCD 2014.
  - 14 INSTALL END CAP (TYPE B) AS SHOWN ON SHEET C-1.
  - 17 INSTALL TYPE L-1 (CA) (OM2-2V) OBJECT MARKER PER CALIFORNIA MUTCD 2014, FIGURE 2C-13(CA) AND SECTION 2C.65.
  - 24 INSTALL STRENGTHENED MIDWEST GUARDRAIL SYSTEM PER CALTRANS STANDARD PLAN A77R4.
  - 25 REMOVE AND DISPOSE OF EXISTING STEEL BARRIER.
  - 26 REMOVE AND DISPOSE OF EXISTING SIGN.

- NOTE:**
- 1- SEE SHEET 2 FOR SAN BERNARDINO COUNTY TRAFFIC CONTROL GENERAL NOTES.
  - 2- EXACT POSITION AND LOCATION OF ALL ROADSIDE SIGNS SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.
  - 3- USE CLASS A, TYPE II, W-BEAM GUARDRAIL FOR W6X9 STEEL POSTS FOR IMPROVEMENTS ON THIS SHEET.
  - 4- IF TERRAIN PROVIDES CHALLENGES FOR POST INSTALLATION, SEE POST EMBEDMENT IN ROCK DETAIL ON SHEET C-3.
  - 5- FOR MGS SECTIONS WITH RADIUS OF CURVATURE LESS THAN 150', THE RAIL ELEMENT MUST BE SHAPED IN THE SHOP.



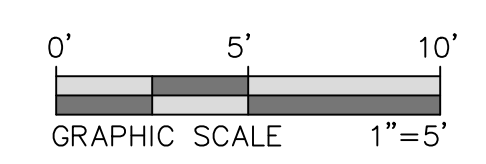
**SECTION A-A**  
NTS  
STA 150+75.97 TO STA 151+11.27

APN: 0343-192-22-0000

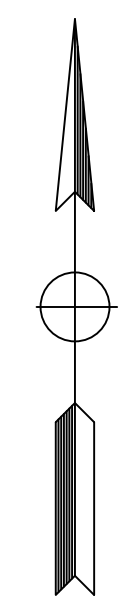
APN: 0343-192-32-0000

**DATUM NOTE**  
HORIZONTAL DATUM: NAD 83 CALIFORNIA ZONE 5  
VERTICAL DATUM: NAVD 88

CONTROL POINTS				
POINT #	ELEVATION	NORTHING	EASTING	DESCRIPTION
400	4537.130	1912141.680	6772892.970	MAG NAIL
401	4515.010	1912278.330	6772898.380	MAG NAIL
450	4528.640	1912031.430	6772842.460	MAG NAIL



GUARDRAIL CURVE DATA				
Curve	Δ	R	L	T
C23	19°14'10"	25.00'	8.39'	4.24'



**L-1**



PREPARED BY:

1450 FRAZEE ROAD SUITE 100, SAN DIEGO CA 92108-514-8377

MARK	CHANGES	RESIDENT ENGINEER	DATE

FIELD CHANGES



SAN BERNARDINO COUNTY  
DEPARTMENT OF PUBLIC WORKS

DESIGNED BY:	DRAWN BY:	CHECKED BY:	RECOMMENDED BY:	DATE
ST	MN	AOJ	<i>Chris Nguyen</i>	6/6/2024
APPROVED BY:			DATE	DATE
<i>Eloy Ruvalcaba</i>			6/6/2024	06/12/2024
ELOY RUVALCABA, P.E. SUPERVISING ENGINEER			MERVAT N. MIKHAIL, P.E. DEPUTY DIRECTOR	

SAN BERNARDINO AREA  
GUARDRAIL REPLACEMENTS

LAYOUT  
FROM STA 150+00 TO 152+75  
CRESTLINE AREA

J.L. REF.	W.O. NO.	PLAN SCALE	SHT. NO.	TOT. SHTS.
N/A	H15156	1" = 5'	3	15

MARK	REVISIONS	DATE	APPR.

DATUM NOTE  
 HORIZONTAL DATUM: NAD 83 CALIFORNIA ZONE 5  
 VERTICAL DATUM: NAVD 88

CONTROL POINTS				
POINT #	ELEVATION	NORTHING	EASTING	DESCRIPTION
301	4859.160	1909633.670	6775692.770	MAG NAIL
305	4882.520	1909639.570	6775491.680	FD IRON PIPE

GUARDRAIL CURVE DATA				
CURVE	Δ	R	L	T
C4	10°25'39"	652.50'	118.75'	59.39'

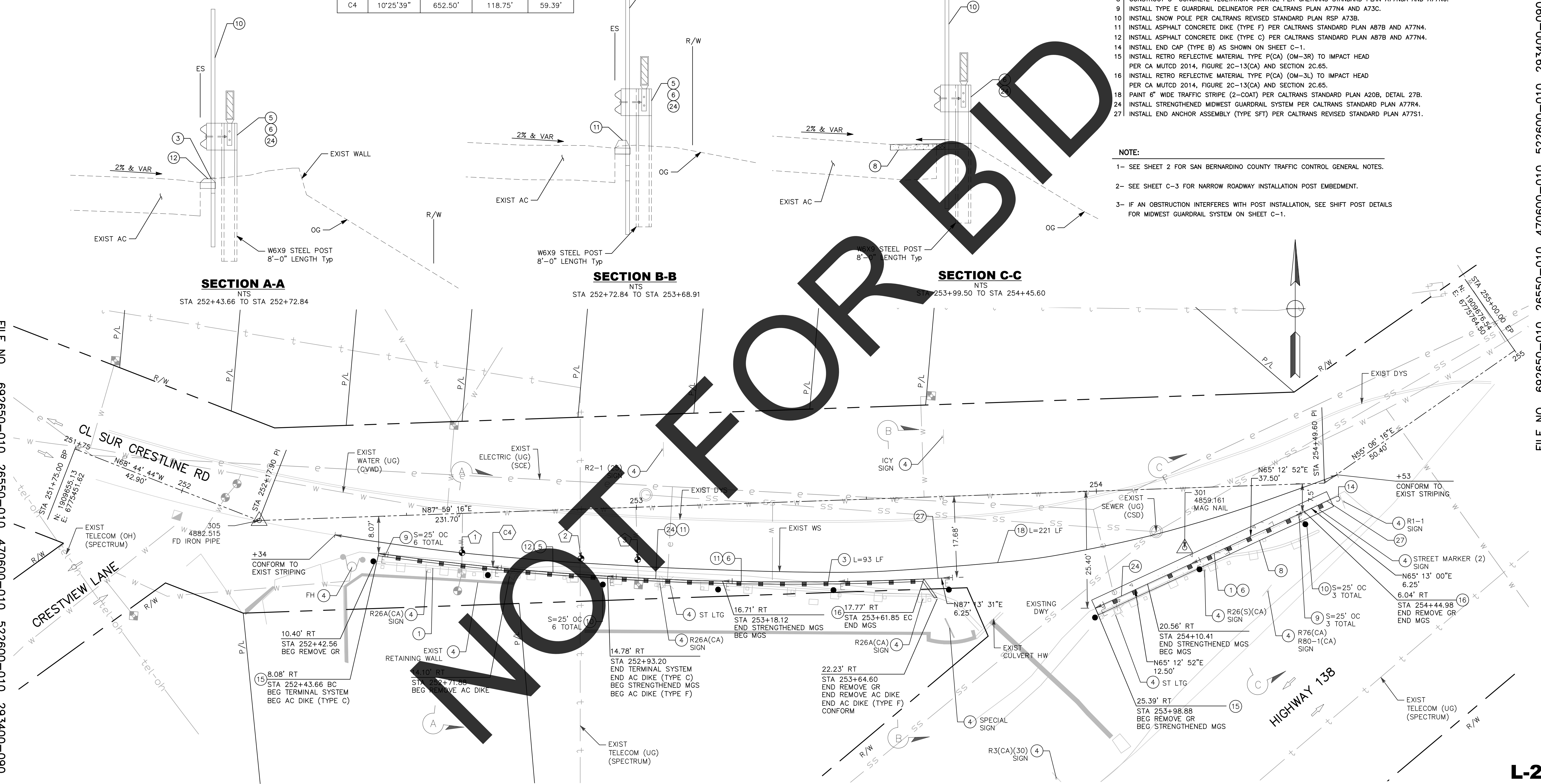
NO.	LOCATION	DEPTH	OG ELEV	METHOD	SIZE & TYPE	OWNER	NORTHING	EASTING
1	8.58' RT 252+61.76	30"	4876.47	POTHOLING	3/4" STEEL WATER	CVWD	1909632.564	6775535.815
2	10.69' RT 252+87.57	40"	4873.42	POTHOLING	4" PLASTIC TELECOM	SPECTRUM	1909631.362	6775561.564
3	11.40' RT 252+99.86	39"	4871.99	POTHOLING	3/4" STEEL WATER	CVWD	1909631.006	6775573.910

CONSTRUCTION NOTES:

- REMOVE AND DISPOSE OF EXISTING GUARDRAIL/BARRICADE
- REMOVE ASPHALT CONCRETE DIKE.
- PROTECT IN PLACE.
- INSTALL CALTRANS APPROVED 31" IN-LINE TERMINAL SYSTEM END TREATMENT PER RSI MSKT-SP-MGS TERMINAL (8" BLOCKS) TEST LEVEL 3 PER CALTRANS REVISED STANDARD PLAN A77P1.
- INSTALL MIDWEST GUARDRAIL SYSTEM PER CALTRANS STANDARD PLANS RSP A77L2, A7M1, AND A77N2.
- CONSTRUCT 3" CONCRETE VEGETATION CONTROL PER CALTRANS STANDARD PLAN A77N5A AND A77N6.
- INSTALL TYPE E GUARDRAIL DELINEATOR PER CALTRANS PLAN A77N4 AND A73C.
- INSTALL SNOW POLE PER CALTRANS REVISED STANDARD PLAN RSP A73B.
- INSTALL ASPHALT CONCRETE DIKE (TYPE F) PER CALTRANS STANDARD PLAN A87B AND A77N4.
- INSTALL ASPHALT CONCRETE DIKE (TYPE C) PER CALTRANS STANDARD PLAN A87B AND A77N4.
- INSTALL END CAP (TYPE B) AS SHOWN ON SHEET C-1.
- INSTALL RETRO REFLECTIVE MATERIAL TYPE P(CA) (OM-3R) TO IMPACT HEAD PER CA MUTCD 2014, FIGURE 2C-13(CA) AND SECTION 2C.65.
- INSTALL RETRO REFLECTIVE MATERIAL TYPE P(CA) (OM-3L) TO IMPACT HEAD PER CA MUTCD 2014, FIGURE 2C-13(CA) AND SECTION 2C.65.
- PAINT 6" WIDE TRAFFIC STRIPE (2-COAT) PER CALTRANS STANDARD PLAN A20B, DETAIL 27B.
- INSTALL STRENGTHENED MIDWEST GUARDRAIL SYSTEM PER CALTRANS STANDARD PLAN A77R4.
- INSTALL END ANCHOR ASSEMBLY (TYPE SFT) PER CALTRANS REVISED STANDARD PLAN A77S1.

NOTE:

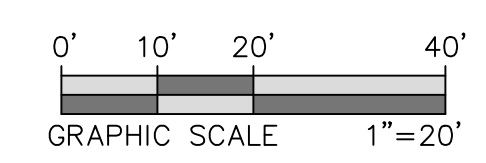
- SEE SHEET 2 FOR SAN BERNARDINO COUNTY TRAFFIC CONTROL GENERAL NOTES.
- SEE SHEET C-3 FOR NARROW ROADWAY INSTALLATION POST EMBEDMENT.
- IF AN OBSTRUCTION INTERFERES WITH POST INSTALLATION, SEE SHIFT POST DETAILS FOR MIDWEST GUARDRAIL SYSTEM ON SHEET C-1.



FILE NO. 692650-010, 26550-010, 470600-010, 522600-010, 293400-090, & 660700-020

FILE NO. 692650-010, 26550-010, 470600-010, 522600-010, 293400-090, & 660700-020

MARK	REVISIONS	DATE



PREPARED BY:

1450 FRAZEE ROAD SUITE 100, SAN DIEGO CA 92111-8377

MARK	CHANGES	RESIDENT ENGINEER	DATE

FIELD CHANGES



SAN BERNARDINO COUNTY  
 DEPARTMENT OF PUBLIC WORKS

DESIGNED BY: ST	DRAWN BY: MN	CHECKED BY: AOF	RECOMMENDED BY: <i>Chris Nguyen</i>	DATE: 6/6/2024
APPROVED BY: <i>Eloy Rivalcaba</i>			DATE: 6/6/2024	DATE: 06/12/2024

ELOY RIVALCABA, P.E. SUPERVISING ENGINEER  
 MERVAT N. MIKHAIL, P.E. DEPUTY DIRECTOR

SAN BERNARDINO AREA  
 GUARDRAIL REPLACEMENTS

LAYOUT  
 FROM STA 250+00 TO 256+00  
 CRESTLINE AREA

J.L. REF. N/A	W.O. NO. H15156	PLAN SCALE 1" = 10'	SHT. NO. 4	TOT. SHTS. 15
---------------	-----------------	---------------------	------------	---------------

L-2

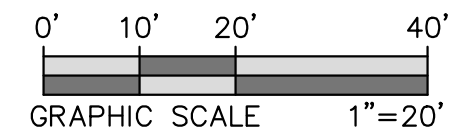
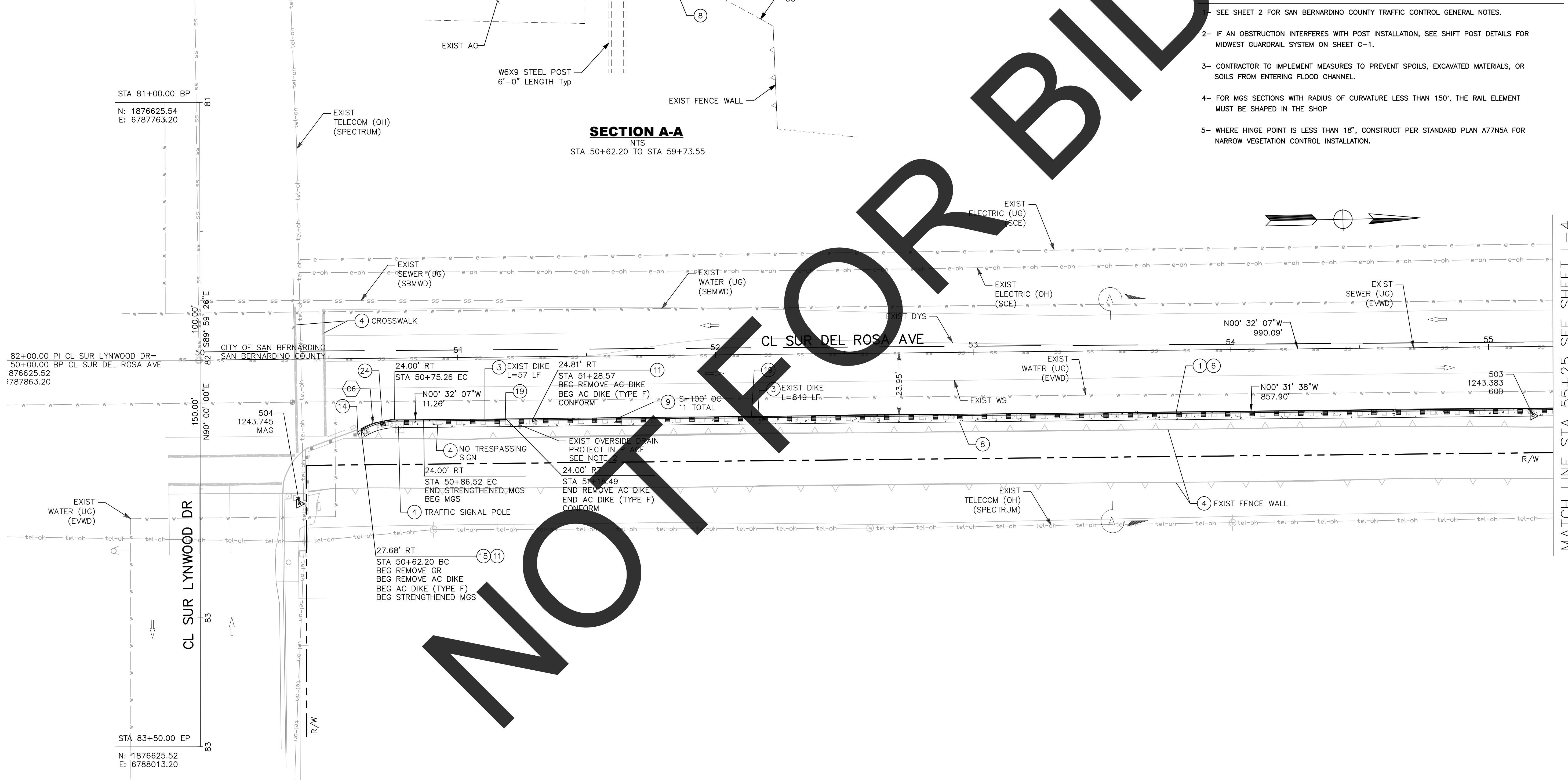
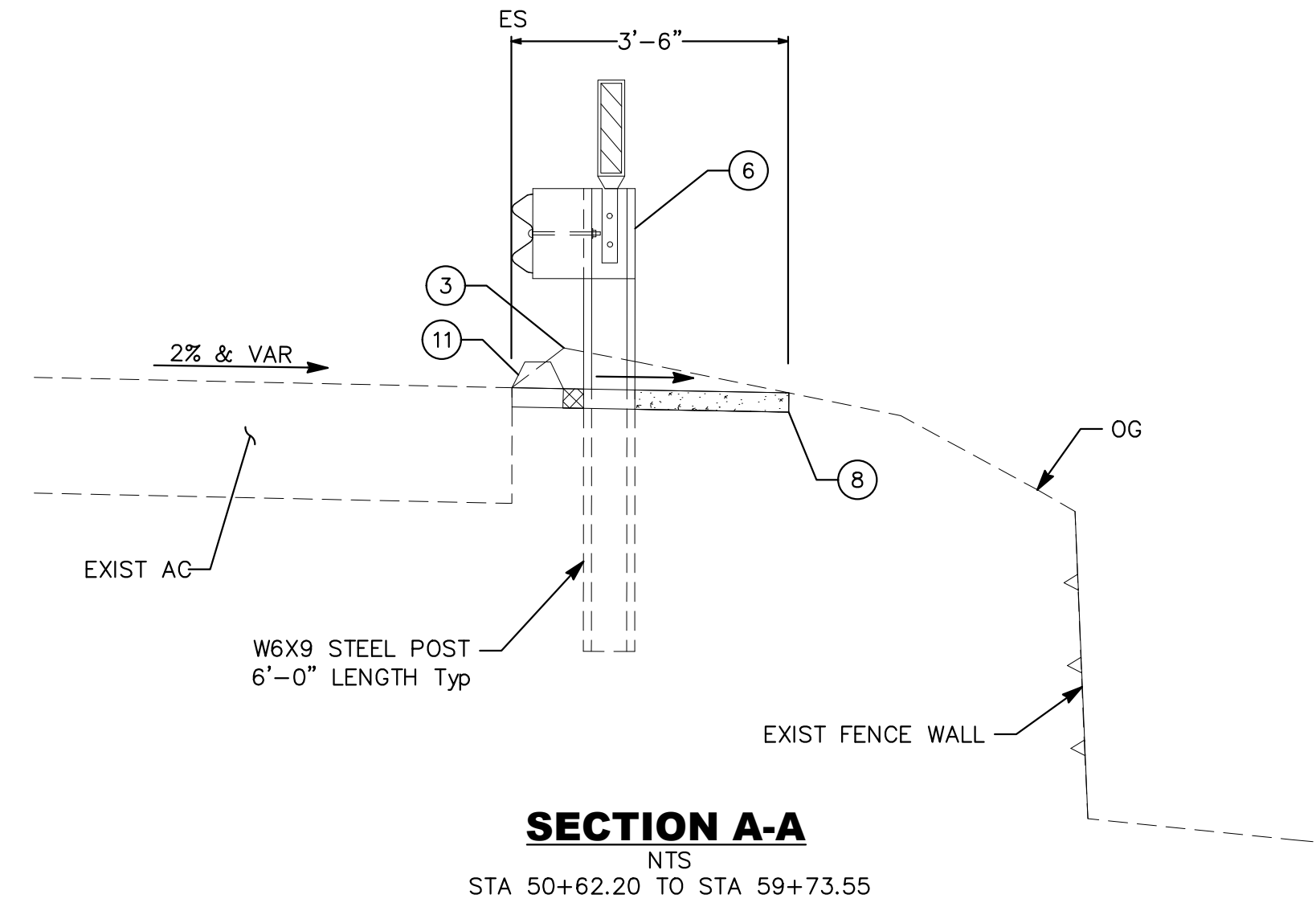
DATUM NOTE  
 HORIZONTAL DATUM: NAD 83 CALIFORNIA ZONE 5  
 VERTICAL DATUM: NAVD 88

CONTROL POINTS				
POINT #	ELEVATION	NORTHING	EASTING	DESCRIPTION
503	1243.380	1877142.770	6787885.290	60D
504	1234.740	1876664.080	6787918.970	MAG

GUARDRAIL CURVE DATA				
C	Δ	R	L	T
C6	31°29'31"	25.00'	13.74'	7.05'

- CONSTRUCTION NOTES:
- REMOVE AND DISPOSE OF EXISTING GUARDRAIL/BARRICADE
  - REMOVE ASPHALT CONCRETE DIKE.
  - PROTECT IN PLACE.
  - INSTALL MIDWEST GUARDRAIL SYSTEM PER CALTRANS STANDARD PLANS RSP A77L2, A77M1, AND A77N2.
  - CONSTRUCT 3" CONCRETE VEGETATION CONTROL PER CALTRANS STANDARD PLAN A77N5 AND A77N6.
  - INSTALL TYPE E GUARDRAIL DELINEATOR PER CALTRANS STANDARD PLAN A77N4 AND A73C.
  - INSTALL ASPHALT CONCRETE DIKE (TYPE F) PER CALTRANS STANDARD PLAN A87B AND A77N4.
  - INSTALL END CAP (TYPE B) AS SHOWN ON SHEET C-1.
  - INSTALL RETRO REFLECTIVE MATERIAL TYPE P(CA) (OM-3R) TO IMPACT HEAD PER CA MUTCD 2014, FIGURE 2C-13(CA) AND SECTION 2C.65.
  - PAINT CURB (2 COAT) RED PER CALIFORNIA MUTCD 2014, SECTION 3B.23.
  - INSTALL STRENGTHENED MIDWEST GUARDRAIL SYSTEM PER CALTRANS STANDARD PLAN A77R4.

- NOTE:
- SEE SHEET 2 FOR SAN BERNARDINO COUNTY TRAFFIC CONTROL GENERAL NOTES.
  - IF AN OBSTRUCTION INTERFERES WITH POST INSTALLATION, SEE SHIFT POST DETAILS FOR MIDWEST GUARDRAIL SYSTEM ON SHEET C-1.
  - CONTRACTOR TO IMPLEMENT MEASURES TO PREVENT SPOILS, EXCAVATED MATERIALS, OR SOILS FROM ENTERING FLOOD CHANNEL.
  - FOR MGS SECTIONS WITH RADIUS OF CURVATURE LESS THAN 150', THE RAIL ELEMENT MUST BE SHAPED IN THE SHOP.
  - WHERE HINGE POINT IS LESS THAN 18', CONSTRUCT PER STANDARD PLAN A77N5A FOR NARROW VEGETATION CONTROL INSTALLATION.



PREPARED BY:

1450 FRAZEE ROAD SUITE 100, SAN DIEGO CA 92108-514-8377

MARK	CHANGES	RESIDENT ENGINEER	DATE

FIELD CHANGES



SAN BERNARDINO COUNTY DEPARTMENT OF PUBLIC WORKS			
DESIGNED BY:	DRAWN BY:	CHECKED BY:	RECOMMENDED BY:
ST	MN	AOF	Chris Nguyen, P.E.
			6/6/2024
			DATE
APPROVED BY:			6/6/2024
ELOY RUIVALCABA, P.E.			DATE
SUPERVISING ENGINEER			
APPROVED BY:			06/12/2024
MERVAT N. MIKHAIL, P.E.			DATE
DEPUTY DIRECTOR			

SAN BERNARDINO AREA GUARDRAIL REPLACEMENTS				
LAYOUT FROM STA. 50+00 TO 55+25 DEL ROSA AREA				
J.L. REF.	W.O. NO.	PLAN SCALE	SHT. NO.	TOT. SHTS.
N/A	H15157	1" = 20'	5	15

FILE NO. 692650-010, 26550-010, 470600-010, 522600-010, 293400-090, & 660700-020

L-3

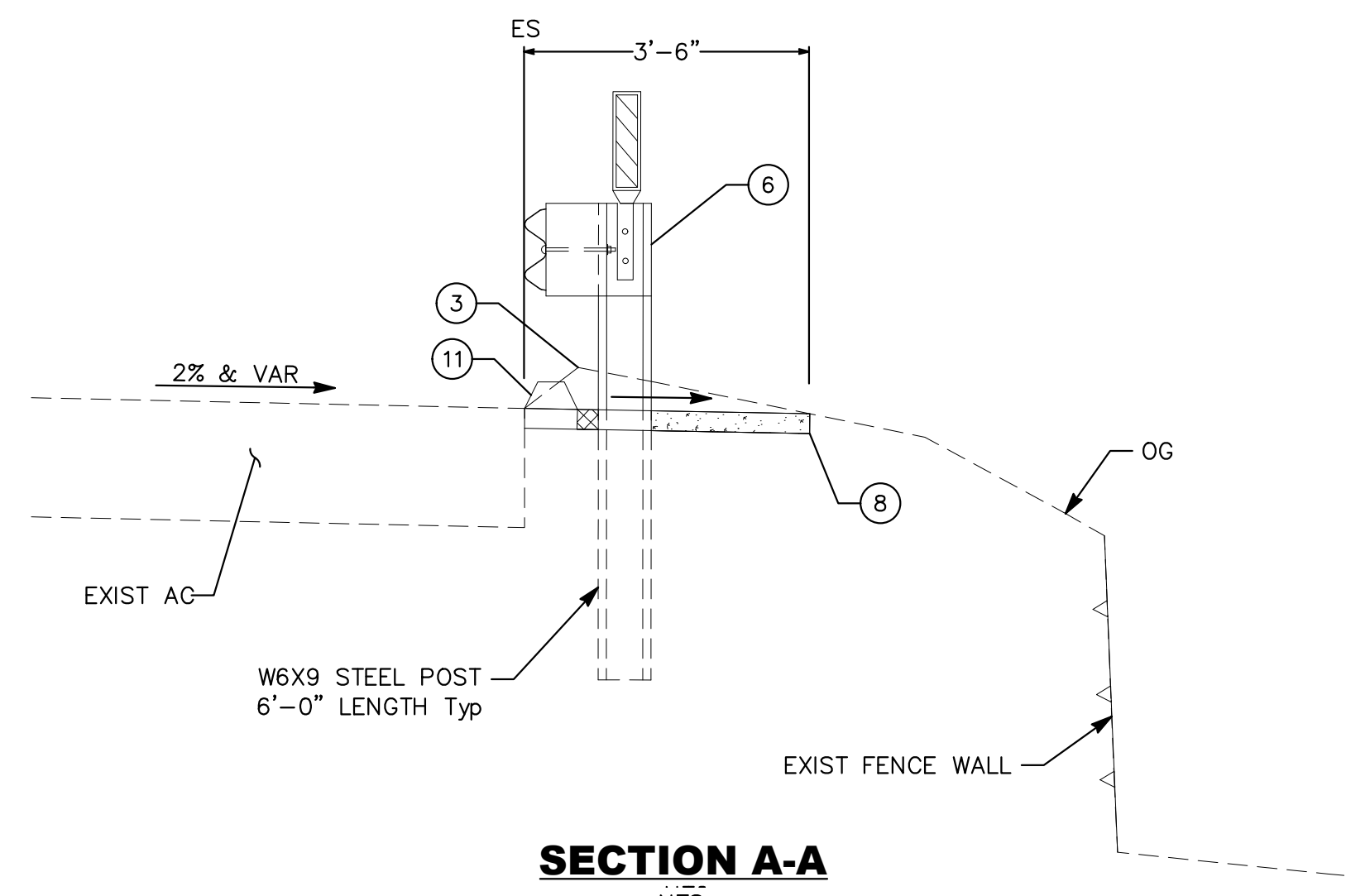
FILE NO. 692650-010, 26550-010, 470600-010, 522600-010, 293400-090, & 660700-020

MATCH LINE STA 55+25 SEE SHEET L-4

GUARDRAIL CURVE DATA				
Symbol	Δ	R	L	T
C7	11'18'29"	150.00'	29.60'	14.85'

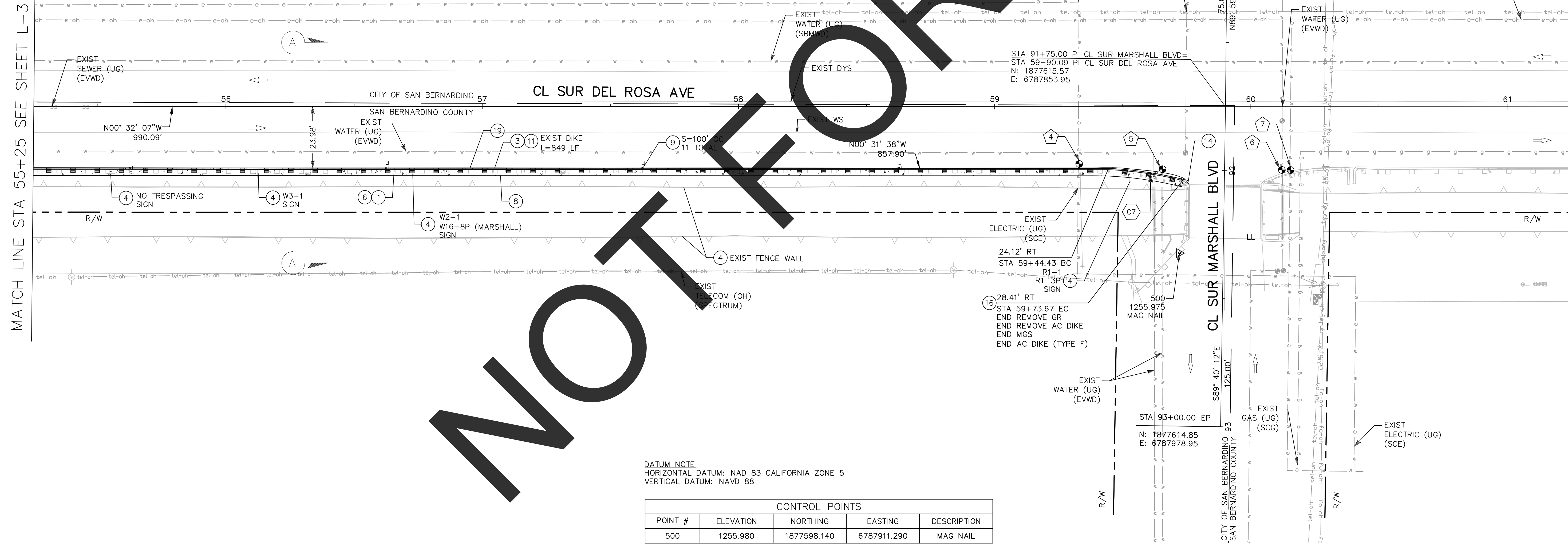
- CONSTRUCTION NOTES:**
- 1 REMOVE AND DISPOSE OF EXISTING GUARDRAIL/BARRICADE
  - 3 REMOVE ASPHALT CONCRETE DIKE.
  - 4 PROTECT IN PLACE
  - 6 INSTALL MIDWEST GUARDRAIL SYSTEM PER CALTRANS STANDARD PLANS RSP A77L2, A77M1, AND A77M2.
  - 8 CONSTRUCT 3" CONCRETE VEGETATION CONTROL PER CALTRANS STANDARD PLAN A77N5 AND A77N6.
  - 9 INSTALL TYPE E GUARDRAIL DELINEATOR PER CALTRANS STANDARD PLAN A77N4 AND A73C.
  - 11 INSTALL ASPHALT CONCRETE DIKE (TYPE F) PER CALTRANS STANDARD PLAN A87B AND A77N4.
  - 14 INSTALL END CAP (TYPE B) AS SHOWN ON SHEET C-1.
  - 16 INSTALL RETRO REFLECTIVE MATERIAL TYPE P(CA) (OM-3L) TO IMPACT HEAD PER CA MUTCD 2014, FIGURE 2C-13(CA) AND SECTION 2C.65.
  - 19 PAINT CURB (2 COAT) RED PER CALIFORNIA MUTCD 2014, SECTION 3B.23.

- NOTE:**
- 1- SEE SHEET 2 FOR SAN BERNARDINO COUNTY TRAFFIC CONTROL GENERAL NOTES.
  - 2- IF AN OBSTRUCTION INTERFERES WITH POST INSTALLATION, SEE SHIFT POST DETAILS FOR MIDWEST GUARDRAIL SYSTEM ON SHEET C-1.
  - 3- WHERE HINGE POINT IS LESS THAN 18", CONSTRUCT PER STANDARD PLAN A77N5A FOR NARROW VEGETATION CONTROL INSTALLATION.
  - 4- CONTRACTOR TO IMPLEMENT MEASURES TO PREVENT SPOILS, EXCAVATED MATERIALS, OR SOILS FROM ENTERING FLOOD CHANNEL.



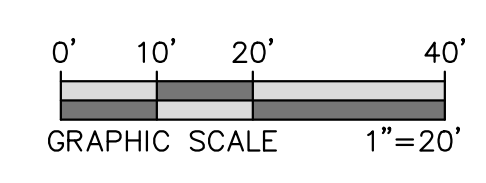
**POSITIVE LOCATION INFORMATION**

NO.	LOCATION	DEPTH	OG ELEV	METHOD	SIZE & TYPE	OWNER	NORTHING	EASTING
4	22.45' RT 59+32.99	172"	1253.07	POTHOLING	ELECTRIC	SCE	1877558.249	6787876.816
5	24.45' RT 59+65.53	31"	1254.81	POTHOLING	12" STEEL WATER	EWVD	1877591.014	6787878.625
6	24.72' RT 60+12.09	42"	1255.64	POTHOLING	12" CONCRETE WATER	EWVD	1877637.763	6787878.518
7	24.77' RT 60+15.50	173"	1255.64	POTHOLING	ELECTRIC	SCE	1877641.125	6787878.435



**DATUM NOTE**  
 HORIZONTAL DATUM: NAD 83 CALIFORNIA ZONE 5  
 VERTICAL DATUM: NAVD 88

CONTROL POINTS				
POINT #	ELEVATION	NORTHING	EASTING	DESCRIPTION
500	1255.980	1877598.140	6787911.290	MAG NAIL



PREPARED BY:

1450 FRAZEE ROAD SUITE 100, SAN DIEGO CA. 92131-8377

FIELD CHANGES		
MARK	CHANGES	DATE
	NO CHANGES	



SAN BERNARDINO COUNTY  
 DEPARTMENT OF PUBLIC WORKS

DESIGNED BY: ST	DRAWN BY: MN	CHECKED BY: AOF	RECOMMENDED BY: <i>Chris Nguyen</i>	DATE: 6/6/2024
APPROVED BY: <i>Eloy Ruvalcaba</i>			DATE: 6/6/2024	DATE: 06/12/2024

ELOY RUVALCABA, P.E. SUPERVISING ENGINEER

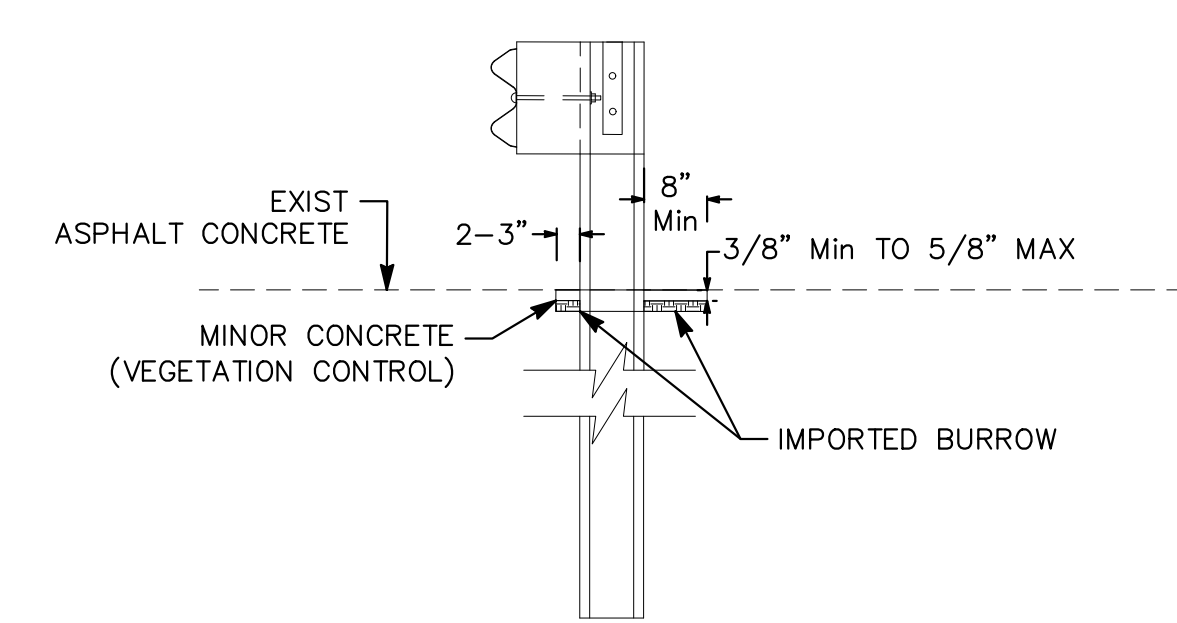
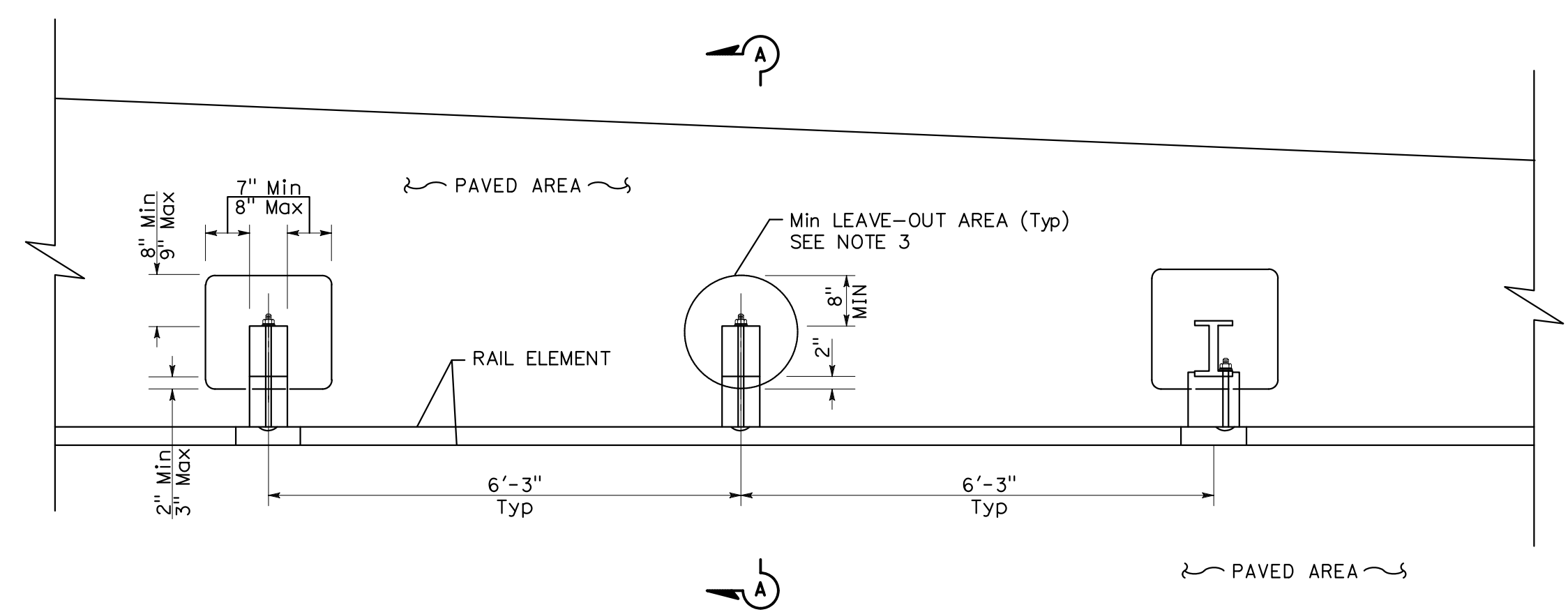
MERVAT N. MIKHAIL, P.E. DEPUTY DIRECTOR

SAN BERNARDINO AREA  
 GUARDRAIL REPLACEMENTS

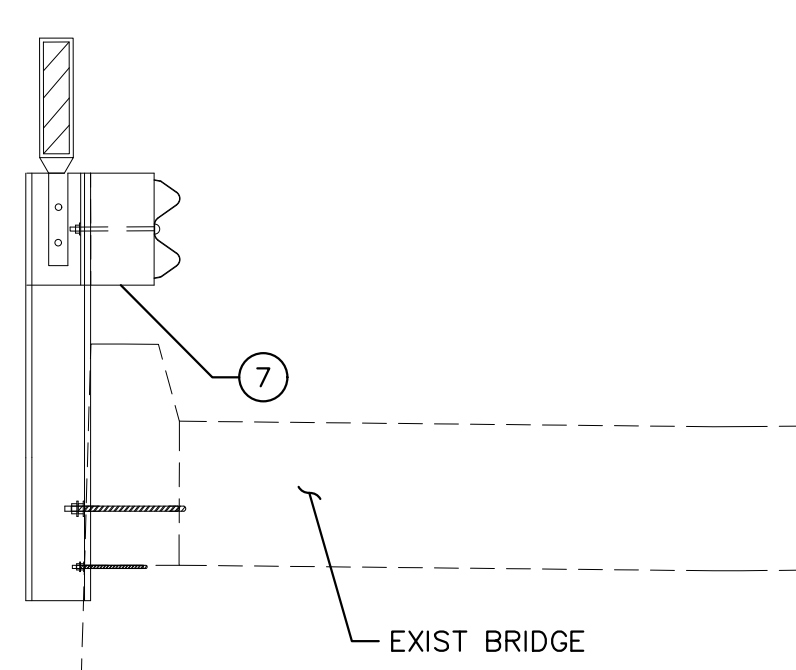
LAYOUT  
 FROM STA 55+25 TO 61+25  
 DEL ROSA AREA

J.L. REF: N/A	W.O. NO: H15157	PLAN SCALE: 1" = 20'	SHT. NO: 6	TOT. SHTS: 15
---------------	-----------------	----------------------	------------	---------------

MARK	REVISIONS	DATE



**SECTION A-A**  
NTS  
TYPICAL LEAVE OUT AREA  
POSTS IN PAVED AREA



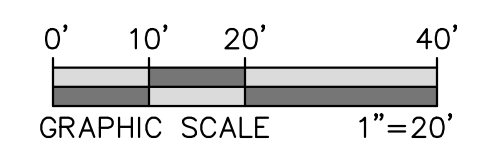
**SECTION B-B**  
NTS  
STA 102+06.14 TO STA 102+26.28

**POSITIVE LOCATION INFORMATION**

NO.	LOCATION	DEPTH	OG ELEV	METHOD	SIZE & TYPE	OWNER	NORTHING	EASTING
8	25.58' RT 69+53.88	112"	1280.65	POTHOLING	8" VCP SEWER	CIVIL	1878579.326	6787871.016

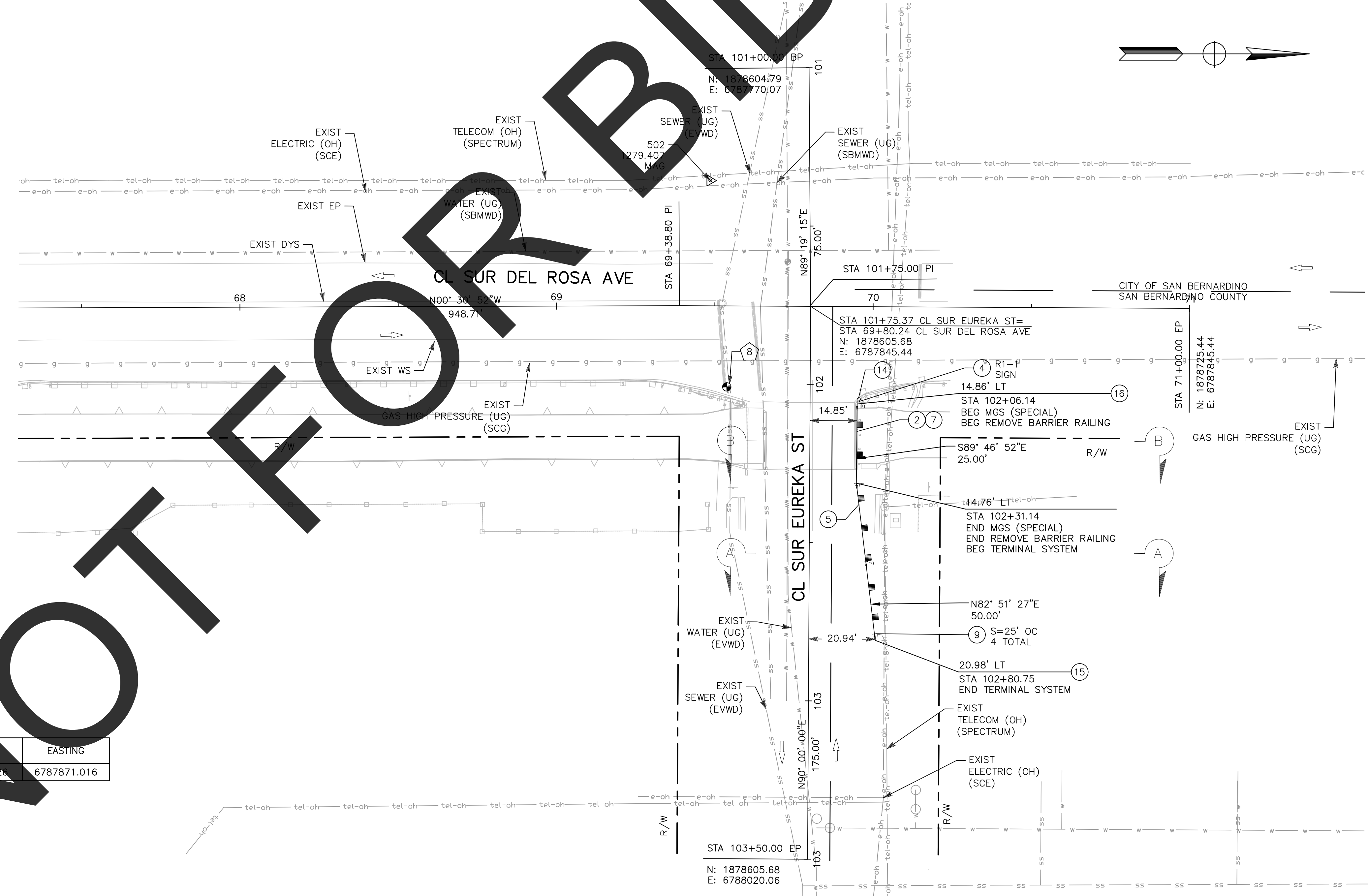
**DATUM NOTE**  
HORIZONTAL DATUM: NAD 83 CALIFORNIA ZONE 5  
VERTICAL DATUM: NAVD 88

CONTROL POINTS				
POINT #	ELEVATION	NORTHING	EASTING	DESCRIPTION
502	1279.410	1878573.820	6787805.860	MAG



- NOTE:**
- SEE SHEET 2 FOR SAN BERNARDINO COUNTY TRAFFIC CONTROL GENERAL NOTES.
  - CONTRACTOR TO IMPLEMENT MEASURES TO PREVENT SPOILS, EXCAVATED MATERIALS, OR SOILS FROM ENTERING FLOOD CHANNEL.
  - LEAVE-OUT AREA MAY BE RECTANGULAR OR ROUND SO LONG AS THE CLEARANCES SHOWN ARE MAINTAINED.

- CONSTRUCTION NOTES:**
- REMOVE AND DISPOSE OF EXISTING BARRIER RAILING
  - PROTECT IN PLACE.
  - INSTALL CALTRANS APPROVED 31" IN-LINE TERMINAL SYSTEM END TREATMENT PER RSI MSKT-SP-MGS TERMINAL (8" BLOCKS) TEST LEVEL 3 PER CALTRANS REVISED STANDARD PLAN A77P1.
  - INSTALL MIDWEST GUARDRAIL SYSTEM (SPECIAL) PER DETAIL ON SHEET C-2.
  - INSTALL TYPE E GUARDRAIL DELINEATOR PER CALTRANS STANDARD PLAN A77N4 AND A73C.
  - INSTALL END CAP (TYPE B) AS SHOWN ON SHEET C-1.
  - INSTALL RETRO REFLECTIVE MATERIAL TYPE P(CA) (OM-3R) TO IMPACT HEAD PER CA MUTCD 2014, FIGURE 2C-13(CA) AND SECTION 2C.65.
  - INSTALL RETRO REFLECTIVE MATERIAL TYPE P(CA) (OM-3L) TO IMPACT HEAD PER CA MUTCD 2014, FIGURE 2C-13(CA) AND SECTION 2C.65.



FILE NO. 692650-010, 26550-010, 470600-010, 522600-010, 293400-090, & 660700-020

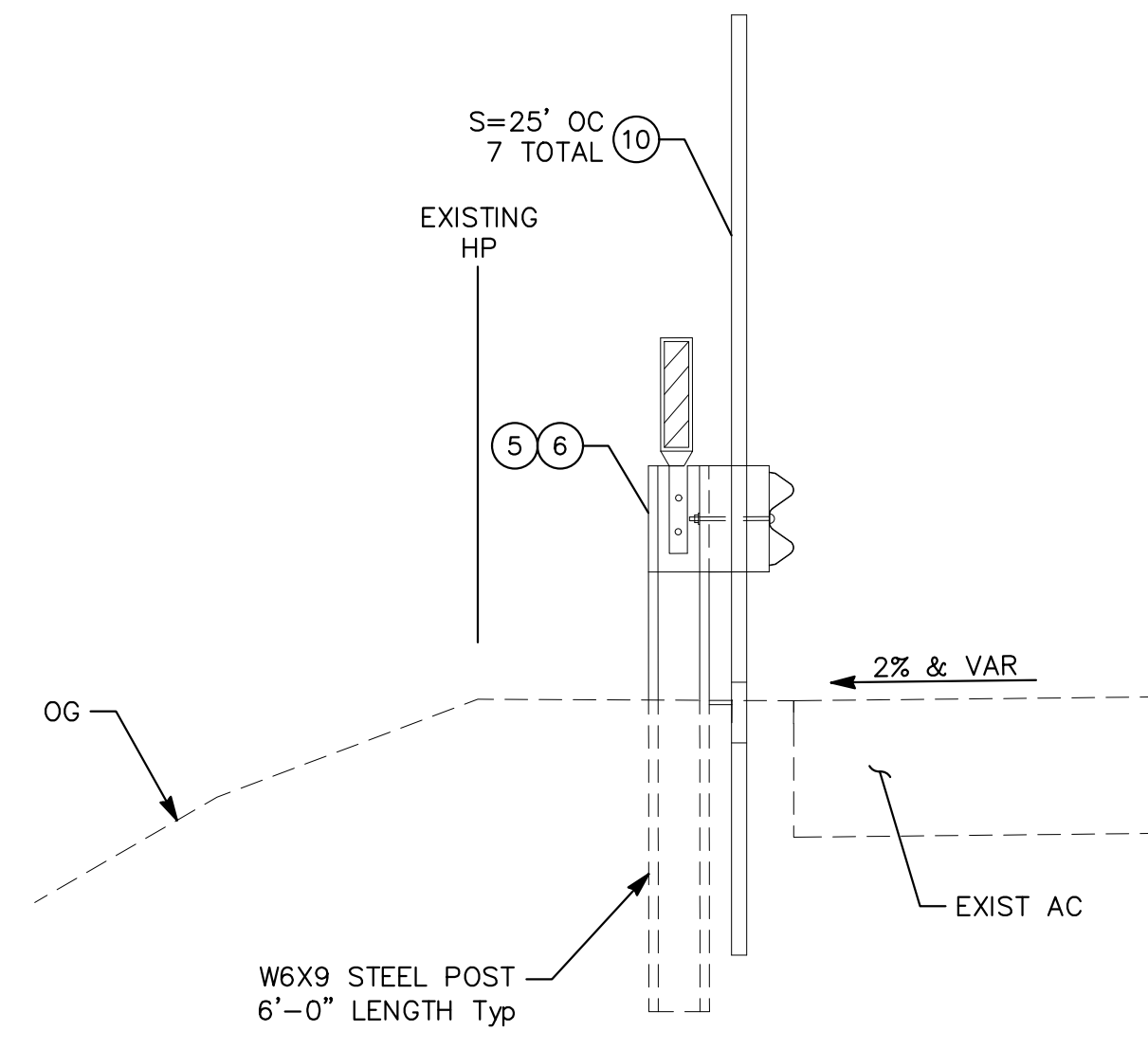
FILE NO. 692650-010, 26550-010, 470600-010, 522600-010, 293400-090, & 660700-020

**L-5**

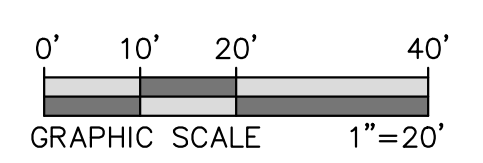
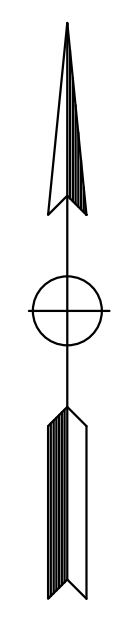
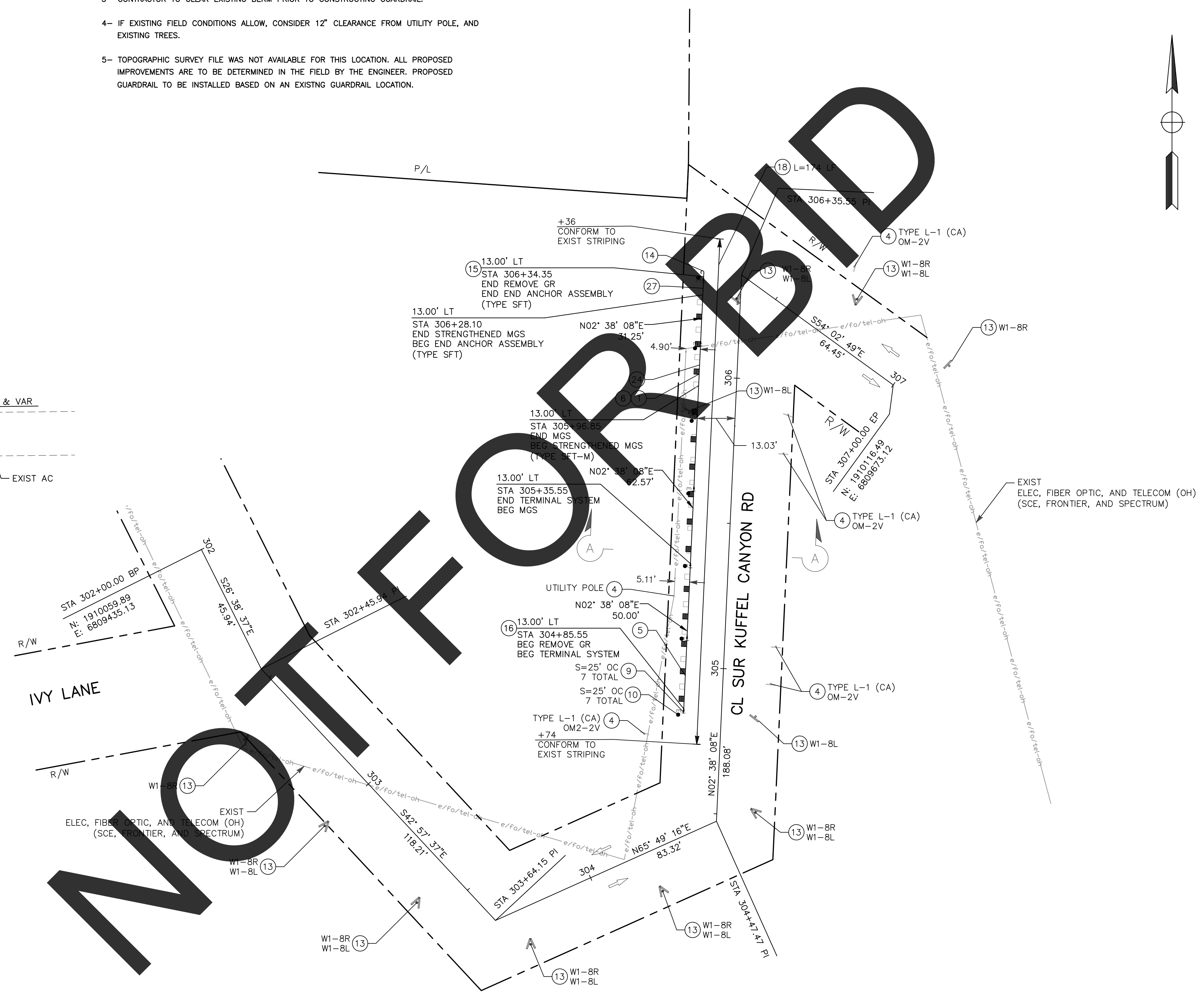
PREPARED BY:  1450 FRAZEE ROAD SUITE 100, SAN DIEGO CA 92131-8377		SAN BERNARDINO COUNTY DEPARTMENT OF PUBLIC WORKS		SAN BERNARDINO AREA GUARDRAIL REPLACEMENTS LAYOUT FROM STA 67+25 TO 71+00 DEL ROSA AVE	
DESIGNED BY:	DRAWN BY:	CHECKED BY:	RECOMMENDED BY:	DATE:	DATE:
ST	MN	AOF	Chris Nguyen, P.E. ENGINEERING MANAGER	6/6/2024	DATE
APPROVED BY:  ELOY RUVALCABA, P.E. SUPERVISING ENGINEER			APPROVED BY:  MERVAT N. MIKHAIL, P.E. DEPUTY DIRECTOR		
DATE: 6/6/2024			DATE: 06/12/2024		
J.L. REF.	W.O. NO.	PLAN SCALE	SHT. NO.	TOT. SHTS.	
N/A	H15157	1" = 20'	7	15	

- CONSTRUCTION NOTES:**
- REMOVE AND DISPOSE OF EXISTING GUARDRAIL/BARRICADE.
  - PROTECT IN PLACE.
  - INSTALL CALTRANS APPROVED 31" IN-LINE TERMINAL SYSTEM END TREATMENT PER RSI MSKT-SP-MGS TERMINAL (8" BLOCKS) TEST LEVEL 3 PER CALTRANS REVISED STANDARD PLAN A77P1.
  - INSTALL MIDWEST GUARDRAIL SYSTEM PER CALTRANS STANDARD PLANS RSP A77L2, A77M1, AND A77N2.
  - INSTALL TYPE E GUARDRAIL DELINEATOR PER CALTRANS STANDARD PLAN A77N4 AND A73C.
  - INSTALL SNOW POLE PER CALTRANS REVISED STANDARD PLAN RSP A73B.
  - INSTALL NEW SIGN(S) AS SHOWN ON PLAN, AND PER THE CALIFORNIA MUTCD 2014.
  - INSTALL END CAP (TYPE B) AS SHOWN ON SHEET C-1.
  - INSTALL RETRO REFLECTIVE MATERIAL TYPE P(CA) (OM-3R) TO IMPACT HEAD PER CA MUTCD 2014, FIGURE 2C-13(CA) AND SECTION 2C.65.
  - INSTALL RETRO REFLECTIVE MATERIAL TYPE P(CA) (OM-3L) TO IMPACT HEAD PER CA MUTCD 2014, FIGURE 2C-13(CA) AND SECTION 2C.65.
  - PAINT 6" WIDE TRAFFIC STRIPE (2-COAT) PER CALTRANS STANDARD PLAN A20B, DETAIL 27B.
  - INSTALL STRENGTHENED MIDWEST GUARDRAIL SYSTEM PER CALTRANS STANDARD PLAN A77R4.
  - INSTALL END ANCHOR ASSEMBLY (TYPE SFT) PER CALTRANS REVISED STANDARD PLAN A77S1.

- NOTE:**
- SEE SHEET 2 FOR SAN BERNARDINO COUNTY TRAFFIC CONTROL GENERAL NOTES.
  - EXACT POSITION AND LOCATION OF ALL ROADSIDE SIGNS SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.
  - CONTRACTOR TO CLEAR EXISTING BERM PRIOR TO CONSTRUCTING GUARDRAIL.
  - IF EXISTING FIELD CONDITIONS ALLOW, CONSIDER 12" CLEARANCE FROM UTILITY POLE, AND EXISTING TREES.
  - TOPOGRAPHIC SURVEY FILE WAS NOT AVAILABLE FOR THIS LOCATION. ALL PROPOSED IMPROVEMENTS ARE TO BE DETERMINED IN THE FIELD BY THE ENGINEER. PROPOSED GUARDRAIL TO BE INSTALLED BASED ON AN EXISTING GUARDRAIL LOCATION.



**SECTION A-A**  
NTS  
STA 304+85.55 TO STA 306+35.55



PREPARED BY:  
**DE DOKKEN ENGINEERING**  
1450 FRAZEE ROAD SUITE 100, SAN DIEGO CA 92111-5177

MARK	CHANGES	RESIDENT ENGINEER	DATE
	NO CHANGES		

**FIELD CHANGES**



SAN BERNARDINO COUNTY  
**DEPARTMENT OF PUBLIC WORKS**

DESIGNED BY: ST	DRAWN BY: MN	CHECKED BY: AOF	RECOMMENDED BY: Chris Nguyen, P.E. ENGINEERING MANAGER	DATE: 6/6/2024	
APPROVED BY: Eloy Ruvalcaba, P.E. SUPERVISING ENGINEER			DATE: 6/6/2024	APPROVED BY: Mervat N. Mikhail, P.E. DEPUTY DIRECTOR	DATE: 06/12/2024

**SAN BERNARDINO AREA GUARDRAIL REPLACEMENTS**  
LAYOUT  
FROM STA 301+75 TO 307+00  
LAKE ARROWHEAD AREA

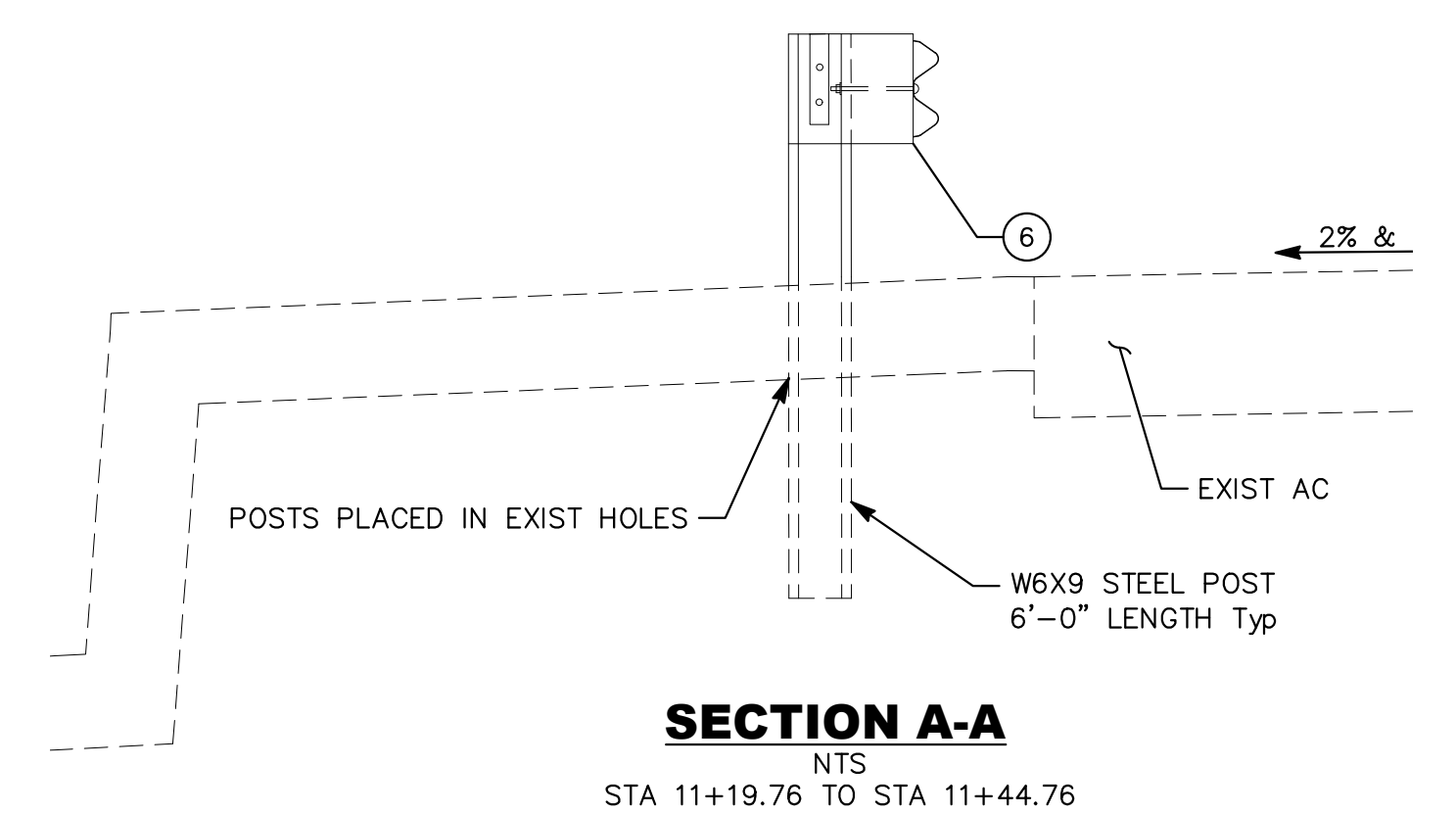
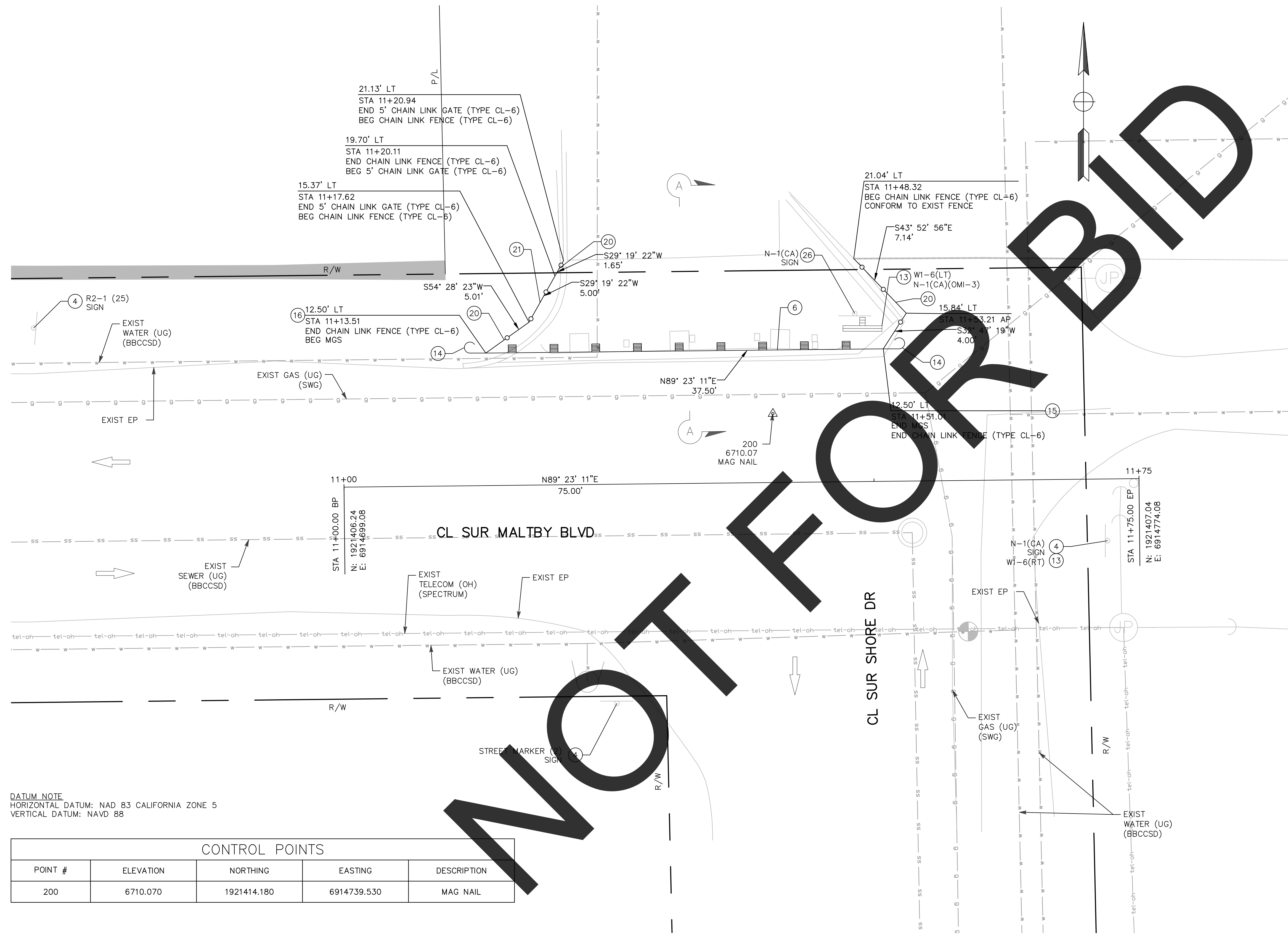
J.L. REF.:	W.O. NO.:	PLAN SCALE:	SHT. NO.:	TOT. SHTS.:
N/A	H15156	1" = 20'	8	15

FILE NO. 692650-010, 26550-010, 470600-010, 522600-010, 293400-090, & 660700-020

**L-6**

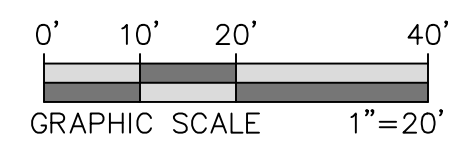
FILE NO. 692650-010, 26550-010, 470600-010, 522600-010, 293400-090, & 660700-020

- CONSTRUCTION NOTES:**
- 4 PROTECT IN PLACE
  - 6 INSTALL MIDWEST GUARDRAIL SYSTEM PER CALTRANS STANDARD PLANS RSP A77L2, A77M1, AND A77N2.
  - 13 INSTALL NEW SIGN(S) AS SHOWN ON PLAN AND PER THE CALIFORNIA MUTCD 2014.
  - 14 INSTALL END CAP (TYPE B) AS SHOWN ON SHEET C-1.
  - 15 INSTALL RETRO REFLECTIVE MATERIAL TYPE P(CA) (OM-3R) TO IMPACT HEAD PER CA MUTCD 2014, FIGURE 2C-13(CA) AND SECTION 2C.65.
  - 16 INSTALL RETRO REFLECTIVE MATERIAL TYPE P(CA) (OM-3L) TO IMPACT HEAD PER CA MUTCD 2014, FIGURE 2C-13(CA) AND SECTION 2C.65.
  - 20 INSTALL CHAIN LINK FENCE (TYPE CL-6) WITH BARBED WIRE PER CALTRANS STANDARD PLANS A85 AND A86.
  - 21 INSTALL 5' CHAIN LINK GATE (TYPE CL-6) WITH BARBED WIRE PER CALTRANS STANDARD PLANS A85 AND A86.
  - 26 REMOVE AND DISPOSE OF EXISTING SIGN.
- NOTE:**
- 1- SEE SHEET 2 FOR SAN BERNARDINO COUNTY TRAFFIC CONTROL GENERAL NOTES.
  - 2- IF AN OBSTRUCTION INTERFERES WITH POST INSTALLATION, SEE SHIFT POST DETAILS FOR MIDWEST GUARDRAIL SYSTEM ON SHEET C-1.



**DATUM NOTE**  
 HORIZONTAL DATUM: NAD 83 CALIFORNIA ZONE 5  
 VERTICAL DATUM: NAVD 88

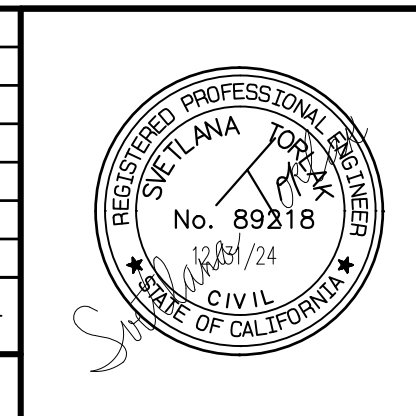
CONTROL POINTS				
POINT #	ELEVATION	NORTHING	EASTING	DESCRIPTION
200	6710.070	1921414.180	6914739.530	MAG NAIL



PREPARED BY:

1450 FRAZEE ROAD SUITE 100, SAN DIEGO CA 92111-8377

FIELD CHANGES		
MARK	CHANGES	DATE



SAN BERNARDINO COUNTY  
 DEPARTMENT OF PUBLIC WORKS

DESIGNED BY:	DRAWN BY:	CHECKED BY:	RECOMMENDED BY:	DATE
ST	MN	AOF	<i>Chris Nguyen</i>	6/6/2024
APPROVED BY:			MERVIAT N. MIKHAIL, P.E.	06/12/2024
ELOY RUVALCABA, P.E.			DEPUTY DIRECTOR	DATE

SAN BERNARDINO AREA  
 GUARDRAIL REPLACEMENTS  
 LAYOUT  
 FROM STA 10+00 TO 12+00  
 BIG BEAR LAKE AREA

J.L. REF.	W.O. NO.	PLAN SCALE	SHT. NO.	TOT. SHTS.
N/A	H15156	1" = 5'	9	15

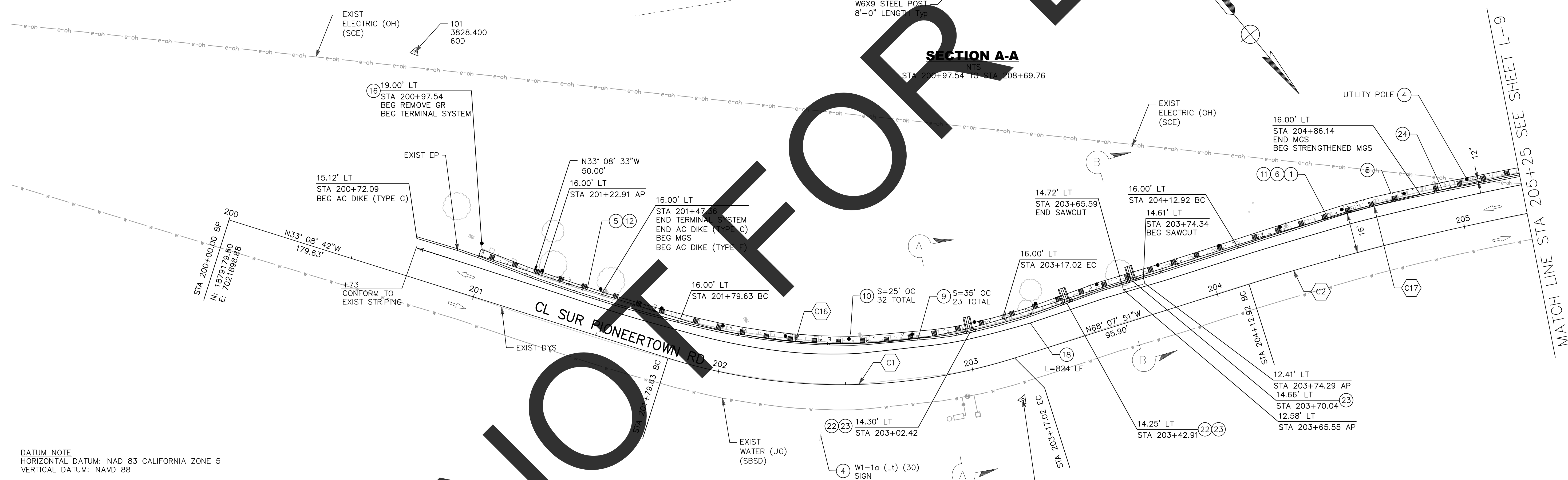
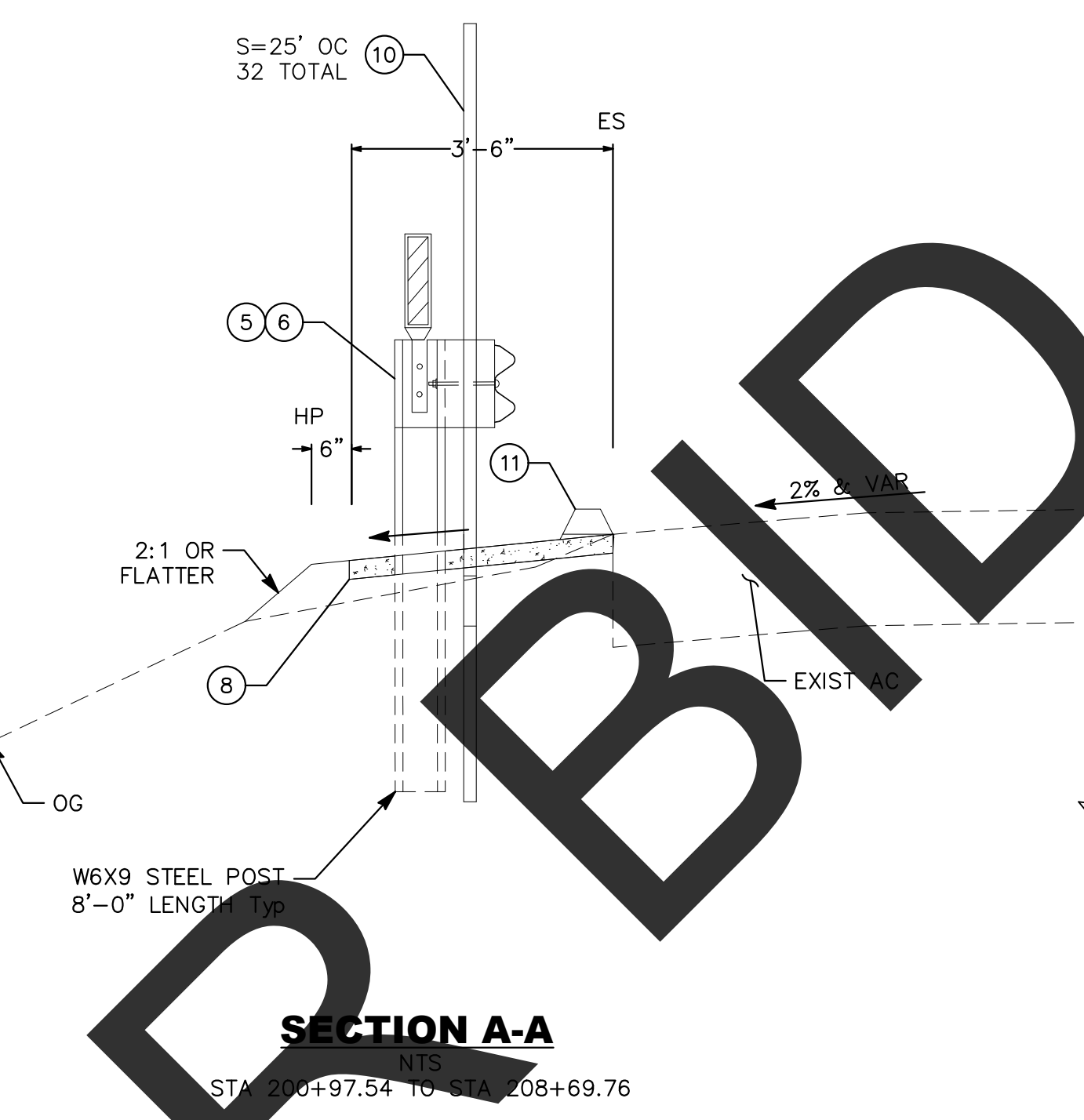
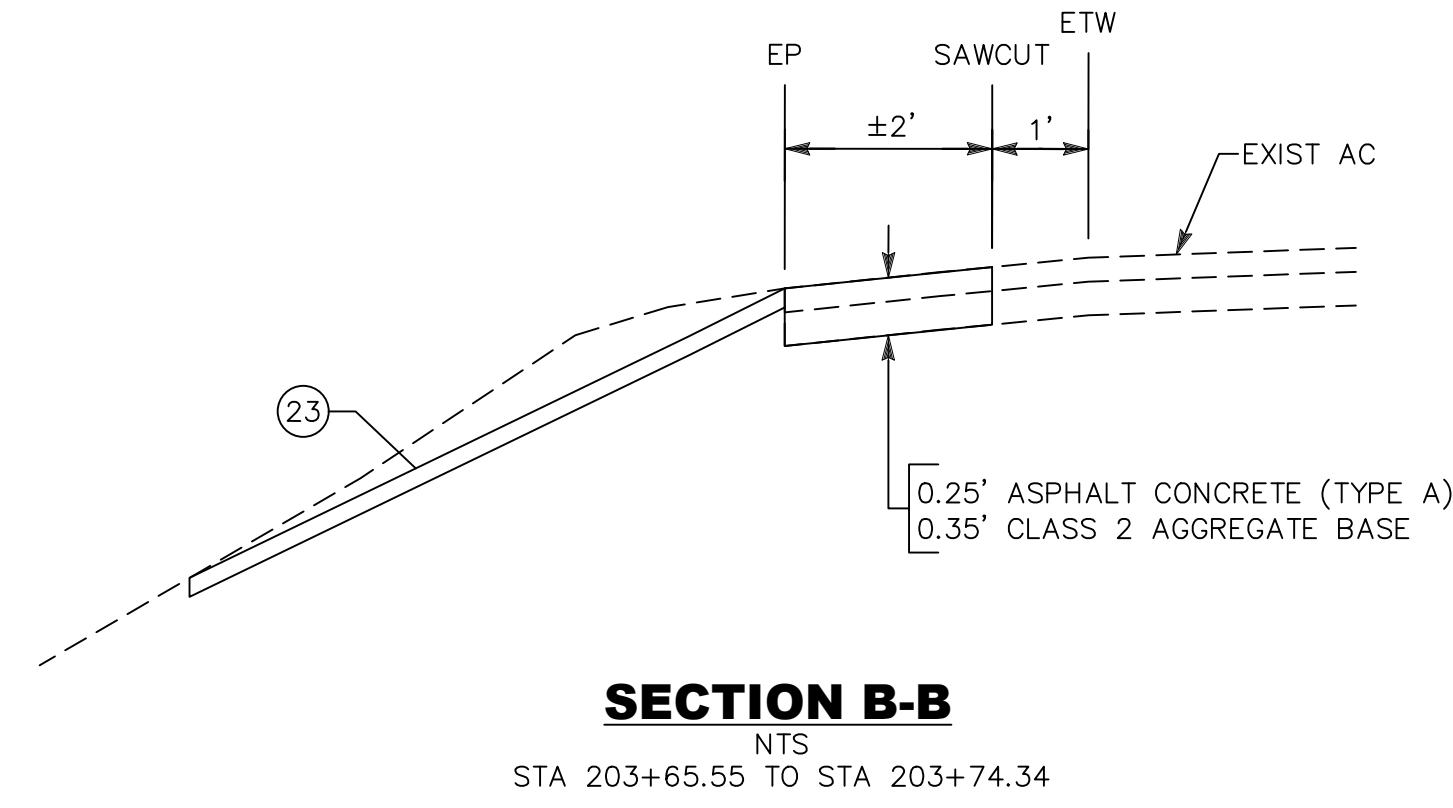
FILE NO. 692650-010, 26550-010, 470600-010, 522600-010, 293400-090, & 660700-020

GUARDRAIL CURVE DATA				
Curve	Δ	R	L	T
C16	34°59'10"	209.00'	127.62'	65.87'
C17	08°13'19"	1016.00'	145.80'	73.02'

CL CURVE DATA				
Curve	Δ	R	L	T
C1	34°59'10"	225.00'	137.39'	70.91'
C2	08°13'20"	1000.00'	143.50'	71.87'

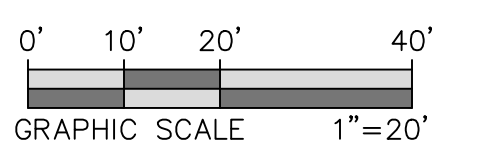
- CONSTRUCTION NOTES:**
- 1 REMOVE AND DISPOSE OF EXISTING GUARDRAIL/BARRICADE.
  - 4 PROTECT IN PLACE.
  - 5 INSTALL CALTRANS APPROVED 31" IN-LINE TERMINAL SYSTEM END TREATMENT PER RSI MSKT-SP-MGS TERMINAL (8" BLOCKS) TEST LEVEL 3 PER CALTRANS REVISED STANDARD PLAN A77P1.
  - 6 INSTALL MIDWEST GUARDRAIL SYSTEM PER CALTRANS STANDARD PLANS RSP A77L2, A77M1, AND A77N2.
  - 8 CONSTRUCT 3" CONCRETE VEGETATION CONTROL PER CALTRANS STANDARD PLAN A77N5 AND A77N6.
  - 9 INSTALL TYPE E GUARDRAIL DELINEATOR PER CALTRANS STANDARD PLAN A77N4 AND A73C.
  - 10 INSTALL SNOW POLE PER CALTRANS REVISED STANDARD PLAN RSP A73B.
  - 11 INSTALL ASPHALT CONCRETE DIKE (TYPE F) PER CALTRANS STANDARD PLAN A87B AND N77N4.
  - 12 INSTALL ASPHALT CONCRETE DIKE (TYPE C) PER CALTRANS STANDARD PLAN A87B AND A77N4.
  - 16 INSTALL RETRO REFLECTIVE MATERIAL TYPE P(CA) (OM-3L) TO IMPACT HEAD PER CA MUTCD 2014, FIGURE 2C-13(CA) AND SECTION 2C.65.
  - 18 PAINT 6" WIDE TRAFFIC STRIPE (2-COAT) PER CALTRANS STANDARD PLAN A20B DETAIL 27B.
  - 22 REMOVE AND DISPOSE OF EXISTING OVERSIDE DRAIN.
  - 23 INSTALL ASPHALT CONCRETE OVERSIDE DRAIN PER CALTRANS STANDARD PLAN B87D.
  - 24 INSTALL STRENGTHENED MIDWEST GUARDRAIL SYSTEM PER CALTRANS STANDARD PLAN A77R4.

- NOTE:**
- 1- SEE SHEET 2 FOR SAN BERNARDINO COUNTY TRAFFIC CONTROL GENERAL NOTES.
  - 2- IF AN OBSTRUCTION INTERFERES WITH POST INSTALLATION, SEE SHIFT POST DETAILS FOR MIDWEST GUARDRAIL SYSTEM ON SHEET C-1.
  - 3- CONTRACTOR TO CLEAR EXISTING BERM PRIOR TO CONSTRUCTING GUARDRAIL AND VEGETATION CONTROL.
  - 4- WHERE THE EXISTING GUARDRAIL IS AT 6" OR LESS FROM THE HINGE POINT, CONSTRUCT MGS PER NARROW ROADWAY INSTALLATION POST EMBEDMENT. SEE DETAIL ON SHEET C-3.



DATUM NOTE  
 HORIZONTAL DATUM: NAD 83 CALIFORNIA ZONE 5  
 VERTICAL DATUM: NAVD 88

CONTROL POINTS				
POINT #	ELEVATION	NORTHING	EASTING	DESCRIPTION
100	3850.970	1879430.330	7021703.900	60D
101	3828.400	1879174.830	7021801.130	60D



PREPARED BY:  1450 FRAZEE ROAD SUITE 100, SAN DIEGO CA. 92111-8377	SAN BERNARDINO COUNTY DEPARTMENT OF PUBLIC WORKS				SAN BERNARDINO AREA GUARDRAIL REPLACEMENTS	
	DESIGNED BY: ST DRAWN BY: MN CHECKED BY: AOF RECOMMENDED BY: CHRIS NGUYEN, P.E. ENGINEERING MANAGER DATE: 6/6/2024		APPROVED BY: ELOY RUIVALCABA, P.E. SUPERVISING ENGINEER DATE: 6/6/2024		APPROVED BY: MERVAT N. MIKHAIL, P.E. DEPUTY DIRECTOR DATE: 06/12/2024	
FIELD CHANGES MARK CHANGES NO CHANGES RESIDENT ENGINEER DATE		J.L. REF. N/A W.O. NO. H15158 PLAN SCALE 1" = 20' SHT. NO. 10 TOT. SHTS. 15				

NOT FOR BIDD

FILE NO. 692650-010, 26550-010, 470600-010, 522600-010, 293400-090, & 660700-020

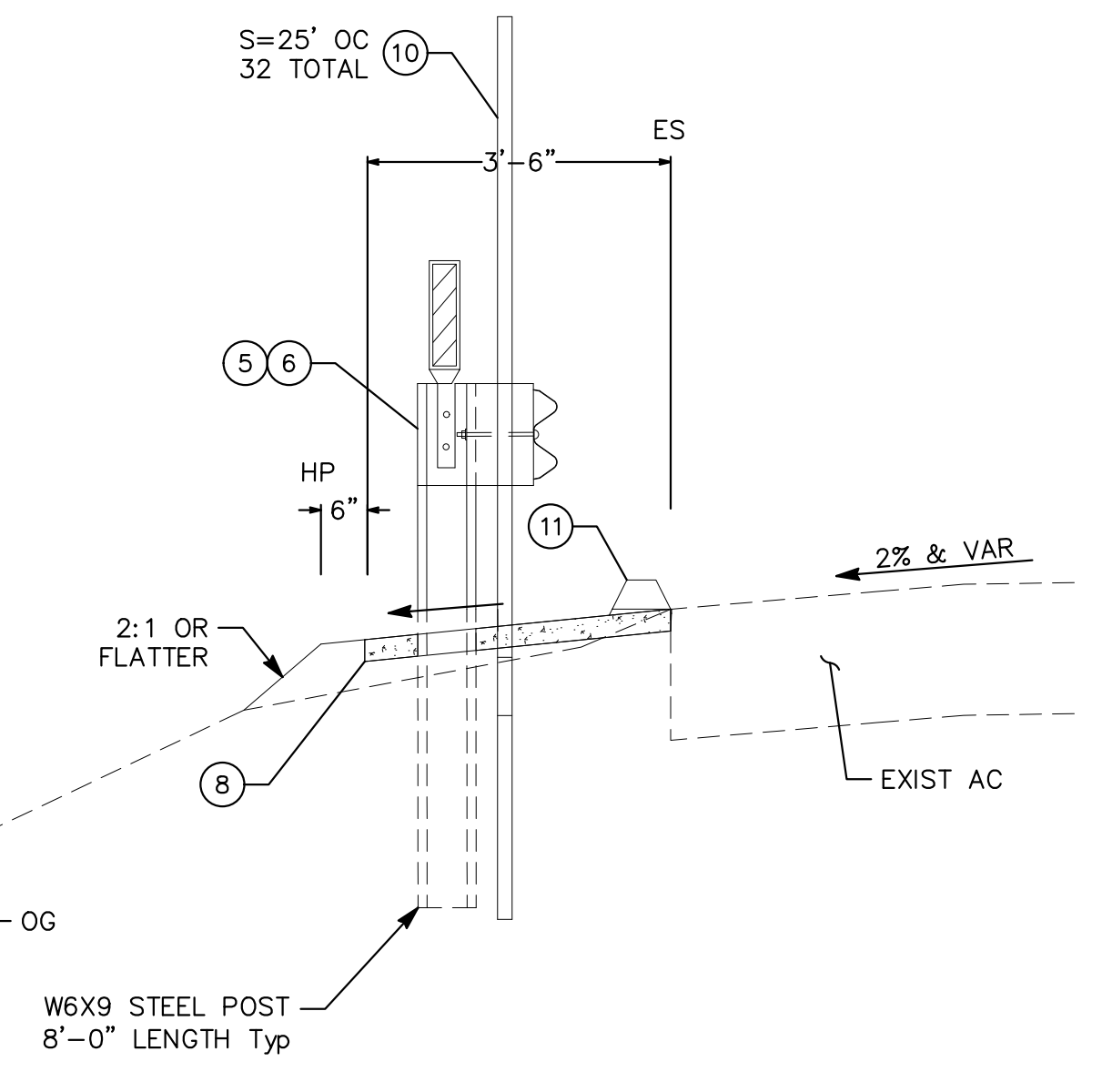
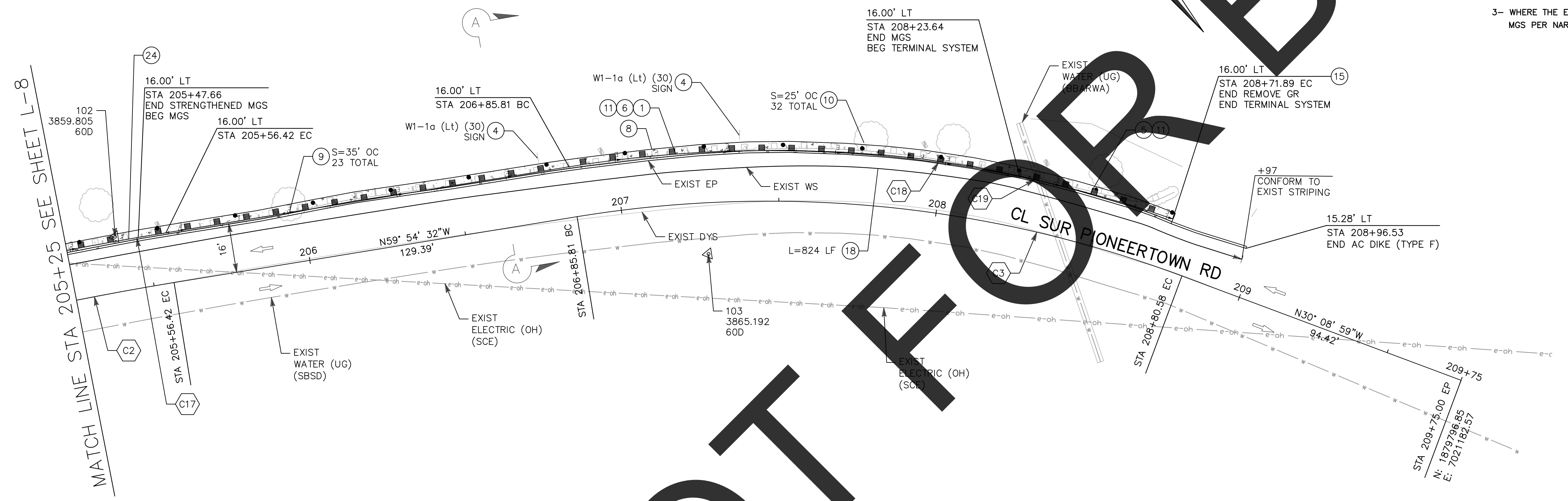
FILE NO. 692650-010, 26550-010, 470600-010, 522600-010, 293400-090, & 660700-020

GUARDRAIL CURVE DATA				
Curve	Δ	R	L	T
C17	08°13'19"	1016.00'	145.80'	73.02'
C18	028°25'53"	391.00'	194.02'	97.87'

CL CURVE DATA				
Curve	Δ	R	L	T
C2	08°13'20"	1000.00'	143.50'	71.87'
C3	29°45'33"	375.00'	194.77'	99.64'

- CONSTRUCTION NOTES:**
- REMOVE AND DISPOSE OF EXISTING GUARDRAIL/BARRICADE
  - PROTECT IN PLACE
  - INSTALL CALTRANS APPROVED 31" IN-LINE TERMINAL SYSTEM END TREATMENT PER RSI MSKT-SP-MGS TERMINAL (6' BLOCKS) TEST LEVEL 3 PER CALTRANS REVISED STANDARD PLAN A77P1.
  - INSTALL MIDWEST GUARDRAIL SYSTEM PER CALTRANS STANDARD PLANS RSP A77L2, A77M1, AND A77N2.
  - CONSTRUCT 3" CONCRETE VEGETATION CONTROL PER CALTRANS STANDARD PLAN A77N5 AND A77N6.
  - INSTALL TYPE E GUARDRAIL DELINEATOR PER CALTRANS STANDARD PLAN A77N4 AND A73C.
  - INSTALL SNOW POLE PER CALTRANS REVISED STANDARD PLAN RSP A73B.
  - INSTALL ASPHALT CONCRETE DIKE (TYPE F) PER CALTRANS STANDARD PLAN A87B AND N77N4.
  - INSTALL RETRO REFLECTIVE MATERIAL TYPE P(CA) (OM-3R) TO IMPACT HEAD PER CA MUTCD 2014, FIGURE 2C-13(CA) AND SECTION 2C.65.
  - PAINT 6" WIDE TRAFFIC STRIPE (2-COAT) PER CALTRANS STANDARD PLAN A20B DETAIL 27B.
  - INSTALL STRENGTHENED MIDWEST GUARDRAIL SYSTEM PER CALTRANS STANDARD PLAN A77R4.

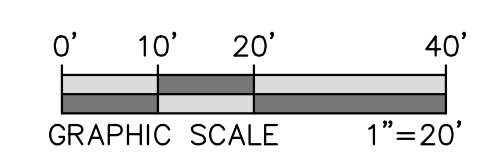
- NOTE:**
- SEE SHEET 2 FOR SAN BERNARDINO COUNTY TRAFFIC CONTROL GENERAL NOTES.
  - CONTRACTOR TO CLEAR EXISTING BERM PRIOR TO CONSTRUCTING GUARDRAIL AND VEGETATION CONTROL.
  - WHERE THE EXISTING GUARDRAIL IS AT 6" OR LESS FROM THE HINGE POINT, CONSTRUCT MGS PER NARROW ROADWAY INSTALLATION POST EMBEDMENT. SEE DETAIL ON SHEET C-3.



**SECTION A-A**  
NTS  
STA 200+97.54 TO STA 208+69.76

DATUM NOTE:  
HORIZONTAL DATUM: NAD 83 CALIFORNIA ZONE 5  
VERTICAL DATUM: NAVD 88

CONTROL POINTS				
POINT #	ELEVATION	NORTHING	EASTING	DESCRIPTION
102	3859.810	1879491.160	7021483.510	60D
103	3865.190	1879614.600	7021341.580	60D



NOT FOR BID

PREPARED BY:  1450 FRAZEE ROAD SUITE 100, SAN DIEGO CA 92111-8377	FIELD CHANGES MARK CHANGES NO CHANGES RESIDENT ENGINEER DATE		SAN BERNARDINO COUNTY DEPARTMENT OF PUBLIC WORKS				SAN BERNARDINO AREA GUARDRAIL REPLACEMENTS LAYOUT FROM STA 205+25 TO 209+76 PIONEERTOWN AREA					
			DESIGNED BY:	DRAWN BY:	CHECKED BY:	RECOMMENDED BY:		DATE:				
			ST	MN	AOF	 CHRIS NGUYEN, P.E. ENGINEERING MANAGER		6/6/2024				
ELOY RUVALCABA, P.E. SUPERVISING ENGINEER			6/6/2024	DATE	APPROVED BY:  MERVAT N. MIKHAIL, P.E. DEPUTY DIRECTOR	06/12/2024	DATE	J.L. REF. N/A	W.O. NO. H15158	PLAN SCALE 1" = 20'	SHT. NO. 11	TOT. SHTS. 15

FILE NO. 692650-010, 26550-010, 470600-010, 522600-010, 293400-090, & 660700-020  
 REVISIONS  
 MARK DATE  
 REVISIONS  
 MARK DATE

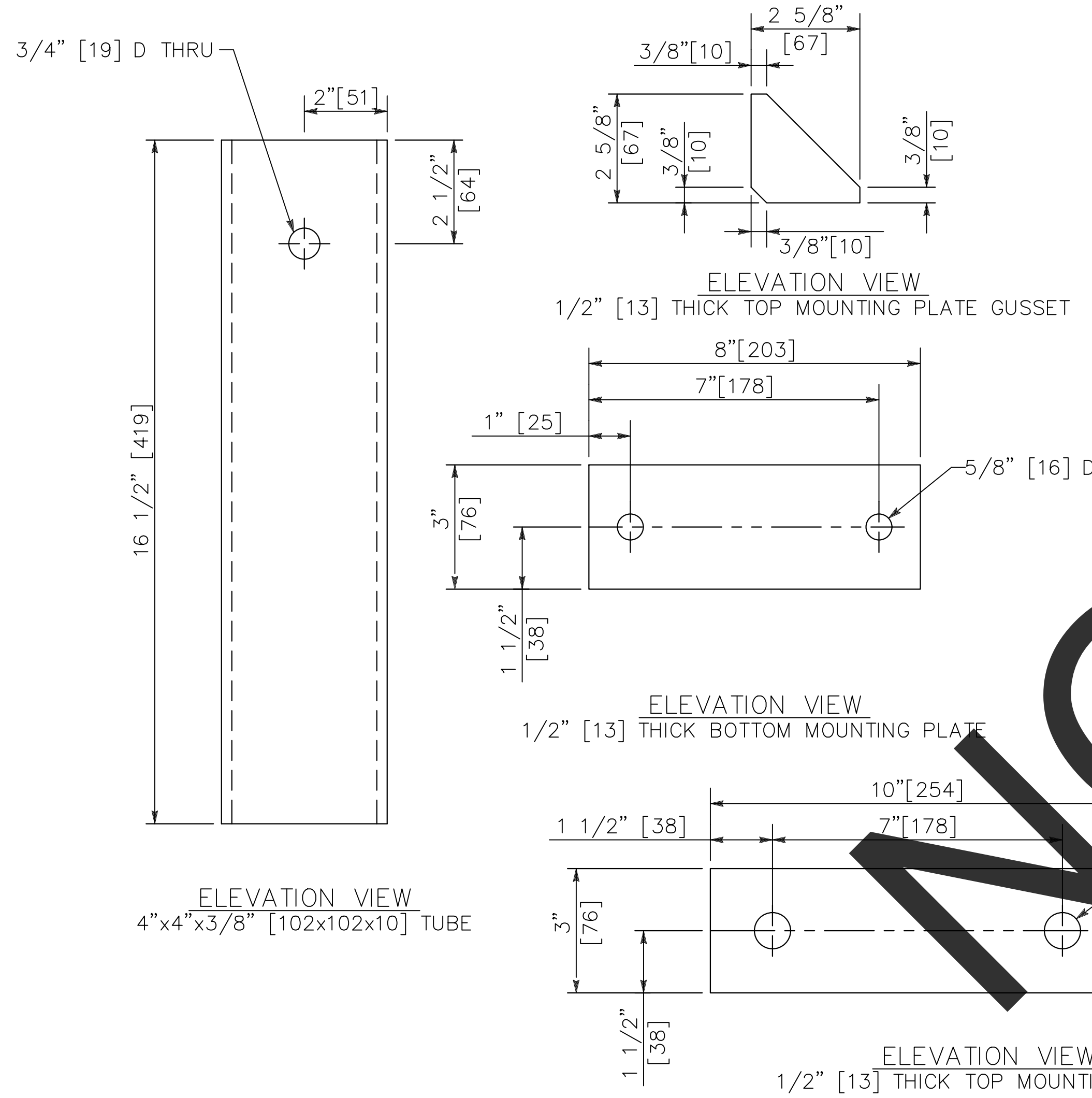
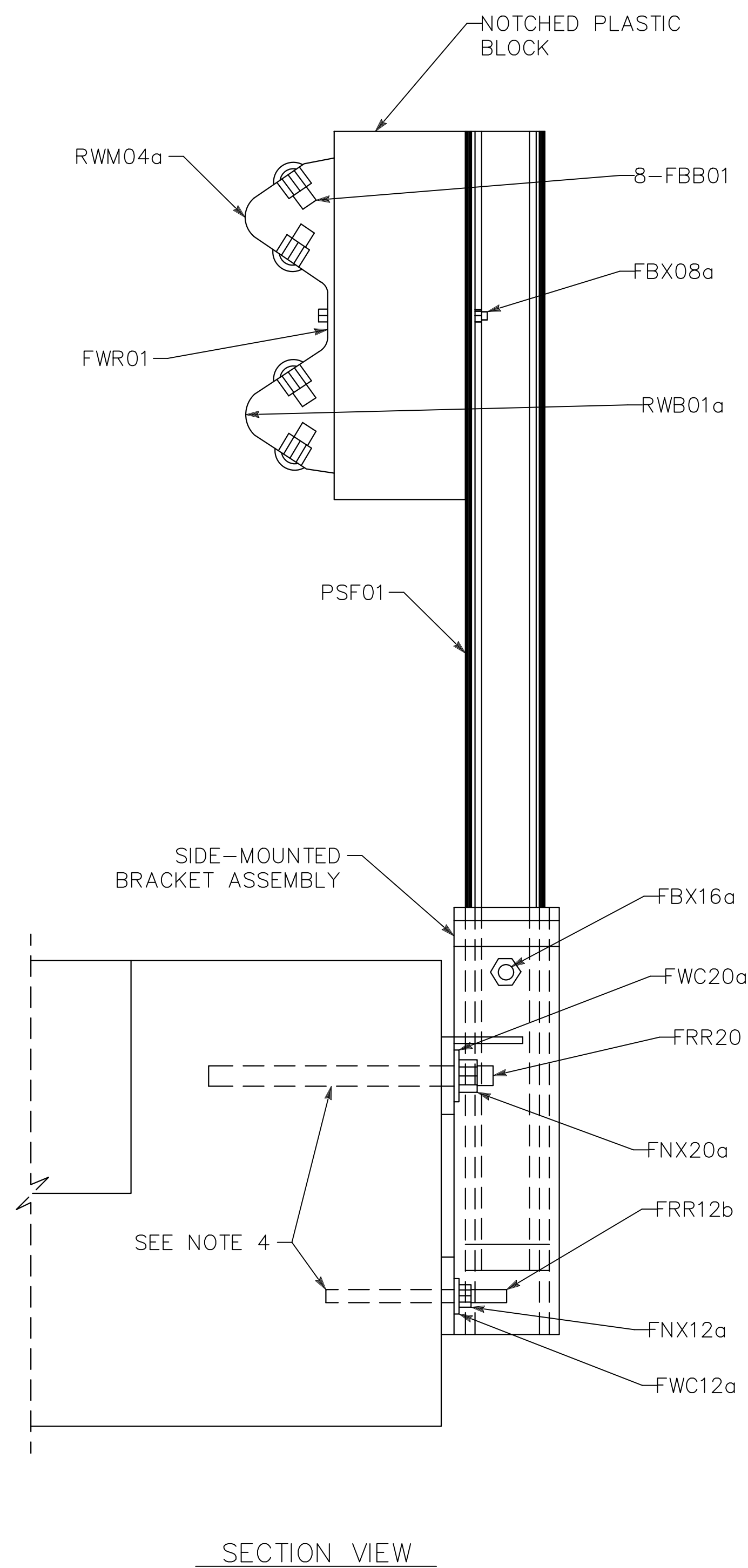
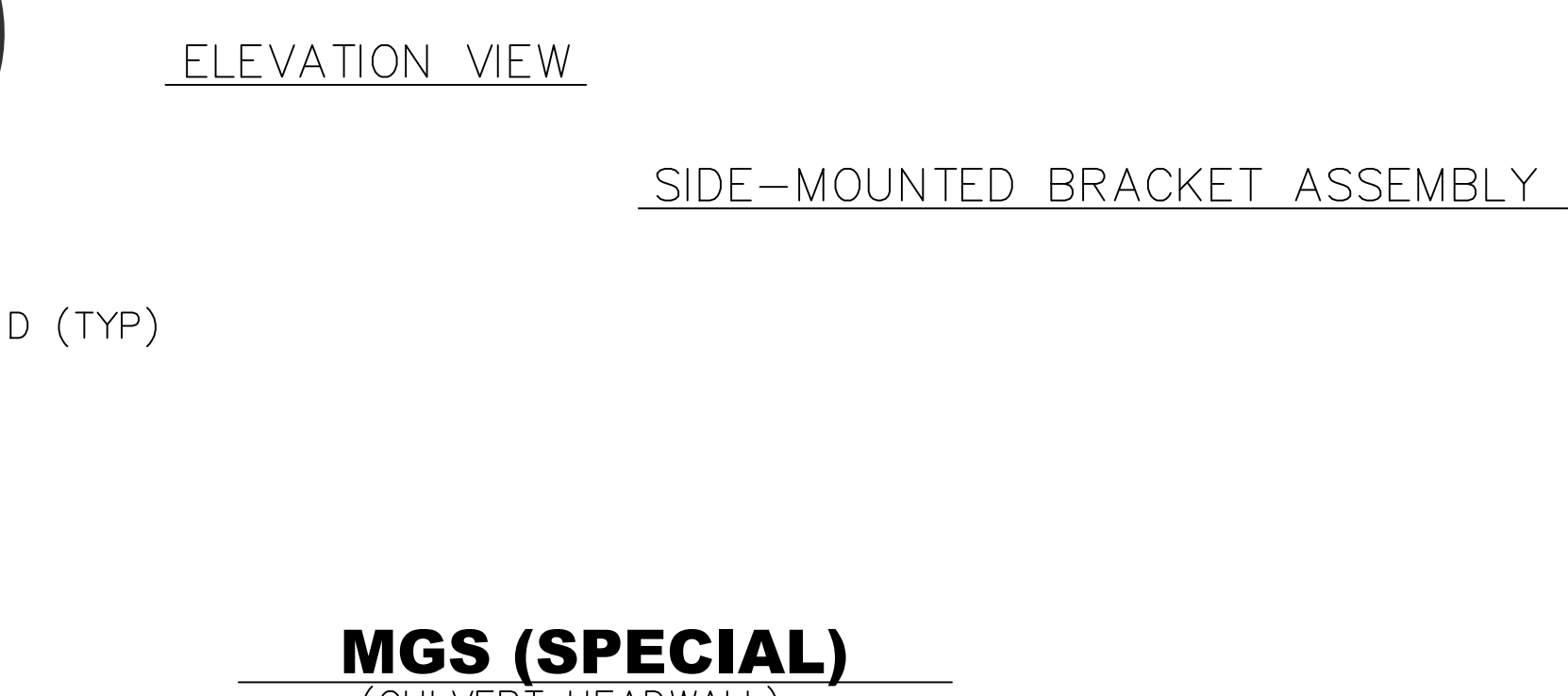
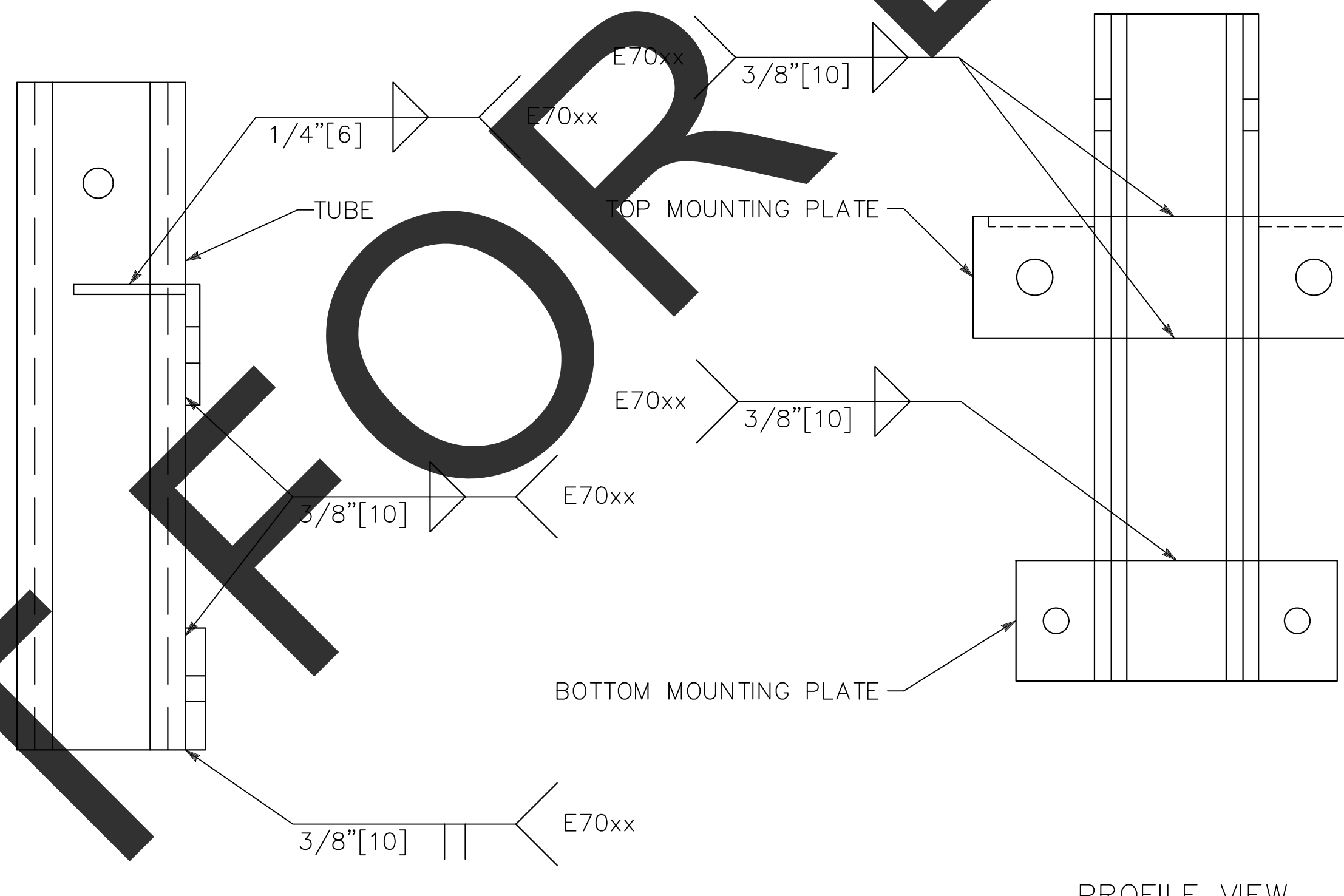
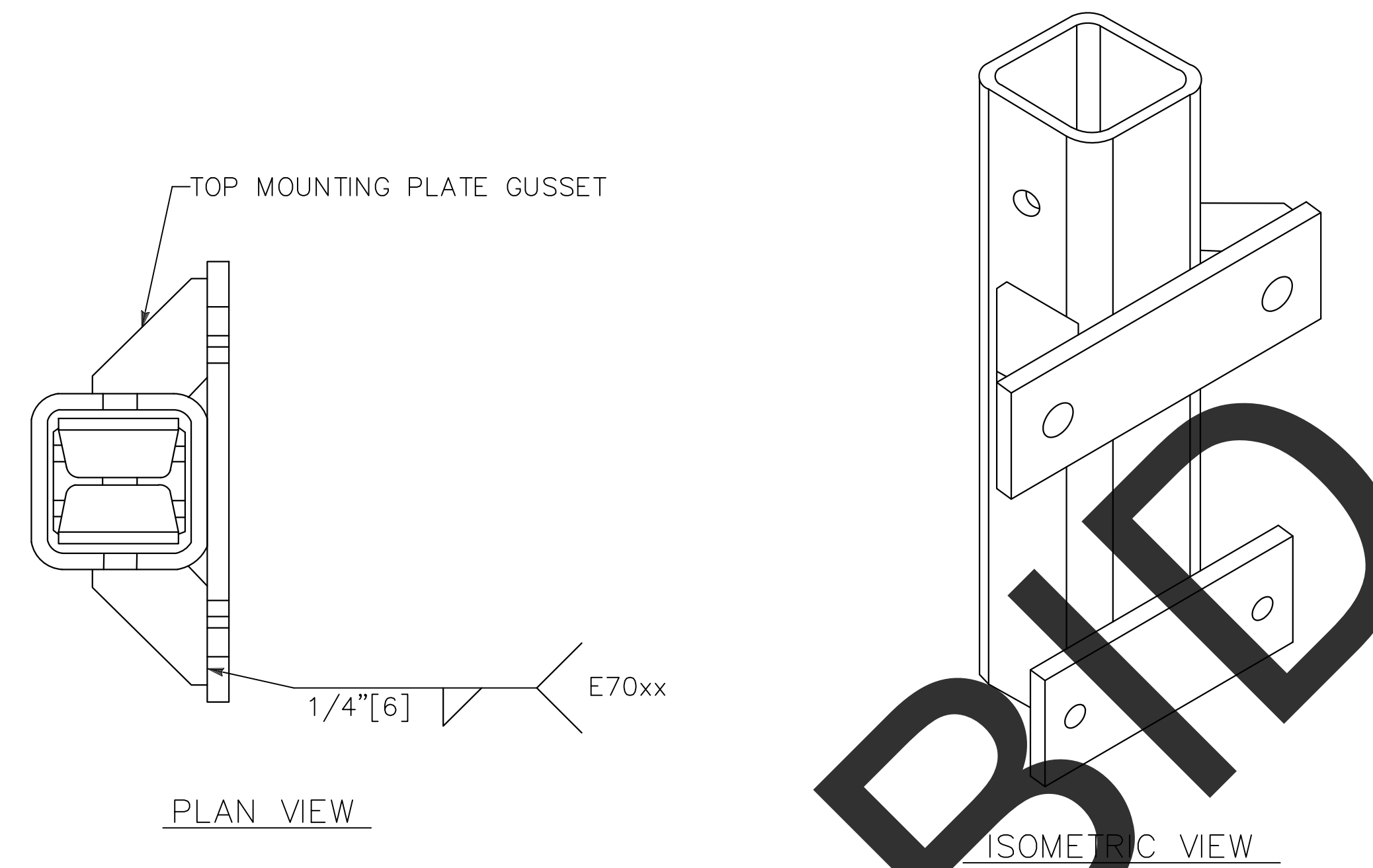


NOTES:

1. BOLT PATTERN VARIES. FIT AND DRILL IN FIELD.
2. FOR POST AND BLOCK DETAILS SEE STANDARD PLAN A77N2. FOR RAIL ELEMENT AND HARDWARE DETAILS, USE DETAILS SHOWN FOR MGS ON A77L2 AND A77M1. STEEL POST ARE TO BE W6X8.5 OR W6X9 UNLESS OTHERWISE SHOWN.
3. FILL EXISTING HOLES FROM REMOVED RAILING WITH NON-SHRINK GROUT.
4. DRILL AND BOND THREADED RODS INTO THE EXISTING CONCRETE PER CALTRANS STANDARD SPECIFICATIONS.

**COMPONENTS**  
UNIT LENGTH=150" [3810]

DESIGNATOR	COMPONENT	NUMBER
PSF01	S3x5.7 BY 44" LONG POST AND STANDOFF	4
RWM04a	12"-6" W-BEAM MGS SECTION 1/2 POST SPACING	1
RWB01a	12" W-BEAM BACKUP PLATE	4
FBX08a	HEX BOLT 5/16"-18x1 1/4"x1 1/4" AND NUT	4
RWR01	1 3/4"x1 3/4"x1/8" SQUARE GUARDRAIL WASHER	4
FBB01	5/8" DIA., 1 1/2" LONG GUARDRAIL BOLT AND NUT	8
FBX16a	HEX BOLT 5/8"-11x5"x1 1/4" AND NUT	4
-----	SIDE-MOUNTED BRACKET ASSEMBLY	4
FWC20a	3/4" PLAIN ROUND WASHER	8
FWC12a	1/2" PLAIN ROUND WASHER	8
FRR20b	3/4" DIA., 11" LONG THREADED ROD	8
FNX20a	3/4" DIA., HEX NUT	8
FRR12b	1/2" DIA., 7" LONG THREADED ROD	8
FNX12a	1/2" DIA., HEX NUT	8



NOT FOR BID

**MGS (SPECIAL)**  
(CULVERT HEADWALL)

PREPARED BY:  
**DOKKEN ENGINEERING**  
1450 FRAZEE ROAD SUITE 100, SAN DIEGO CA 92131-8377

MARK	CHANGES	RESIDENT ENGINEER	DATE
	NO CHANGES		

FIELD CHANGES



SAN BERNARDINO COUNTY  
DEPARTMENT OF PUBLIC WORKS

DESIGNED BY: ST	DRAWN BY: MN	CHECKED BY: AOF	RECOMMENDED BY: Chris Nguyen, P.E. ENGINEERING MANAGER	6/6/2024 DATE
APPROVED BY: Eloy Ruvalcaba, P.E. SUPERVISING ENGINEER			Mervat N. Mikhail, P.E. DEPUTY DIRECTOR	06/12/2024 DATE

SAN BERNARDINO AREA  
GUARDRAIL REPLACEMENTS

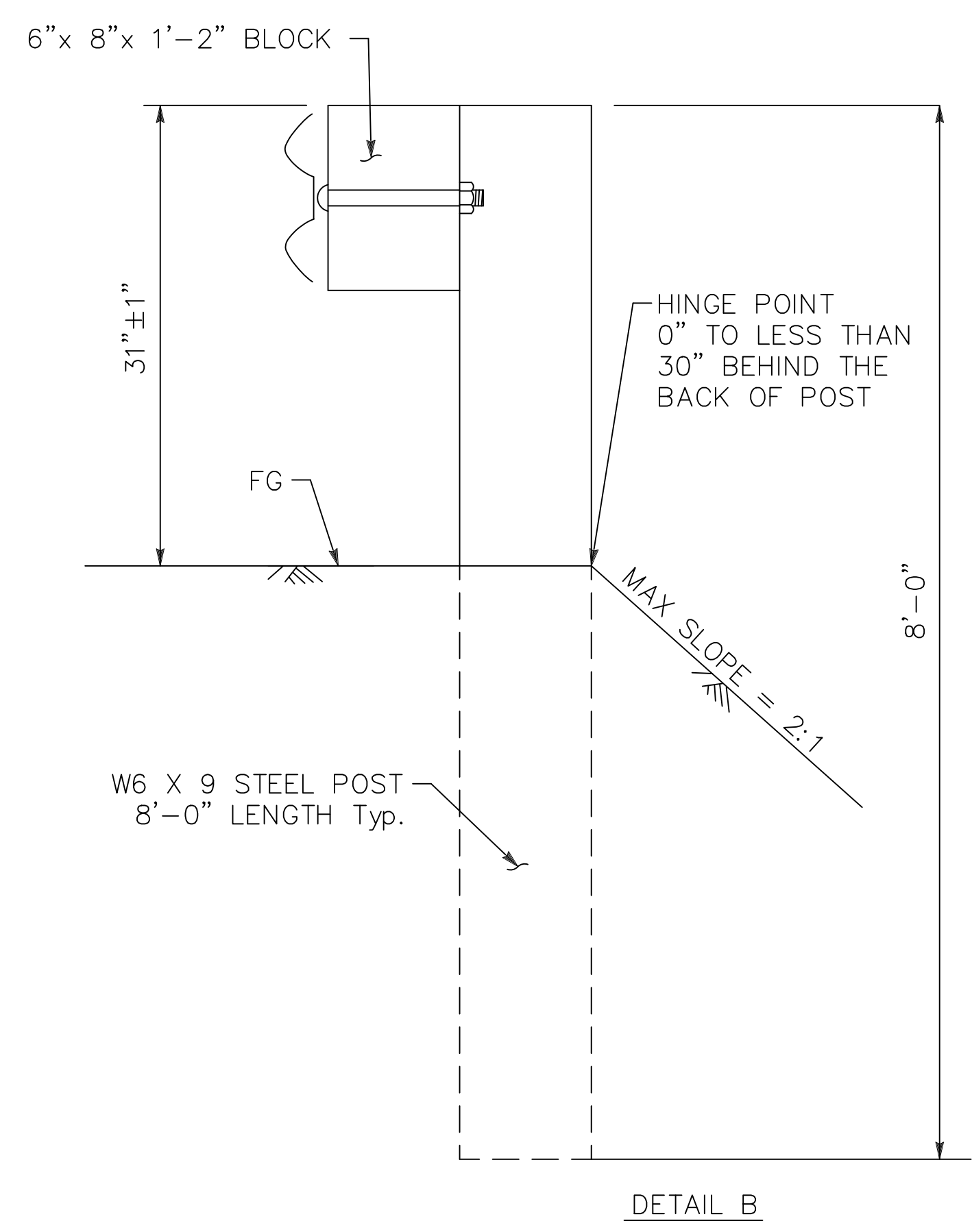
CONSTRUCTION DETAILS

J.L. REF.	W.O. NO.	PLAN SCALE	SHT. NO.	TOT. SHTS.
N/A	N/A	N/A	13	15

FILE NO. 692650-010, 26550-010, 470600-010, 522600-010, 293400-090, & 660700-020

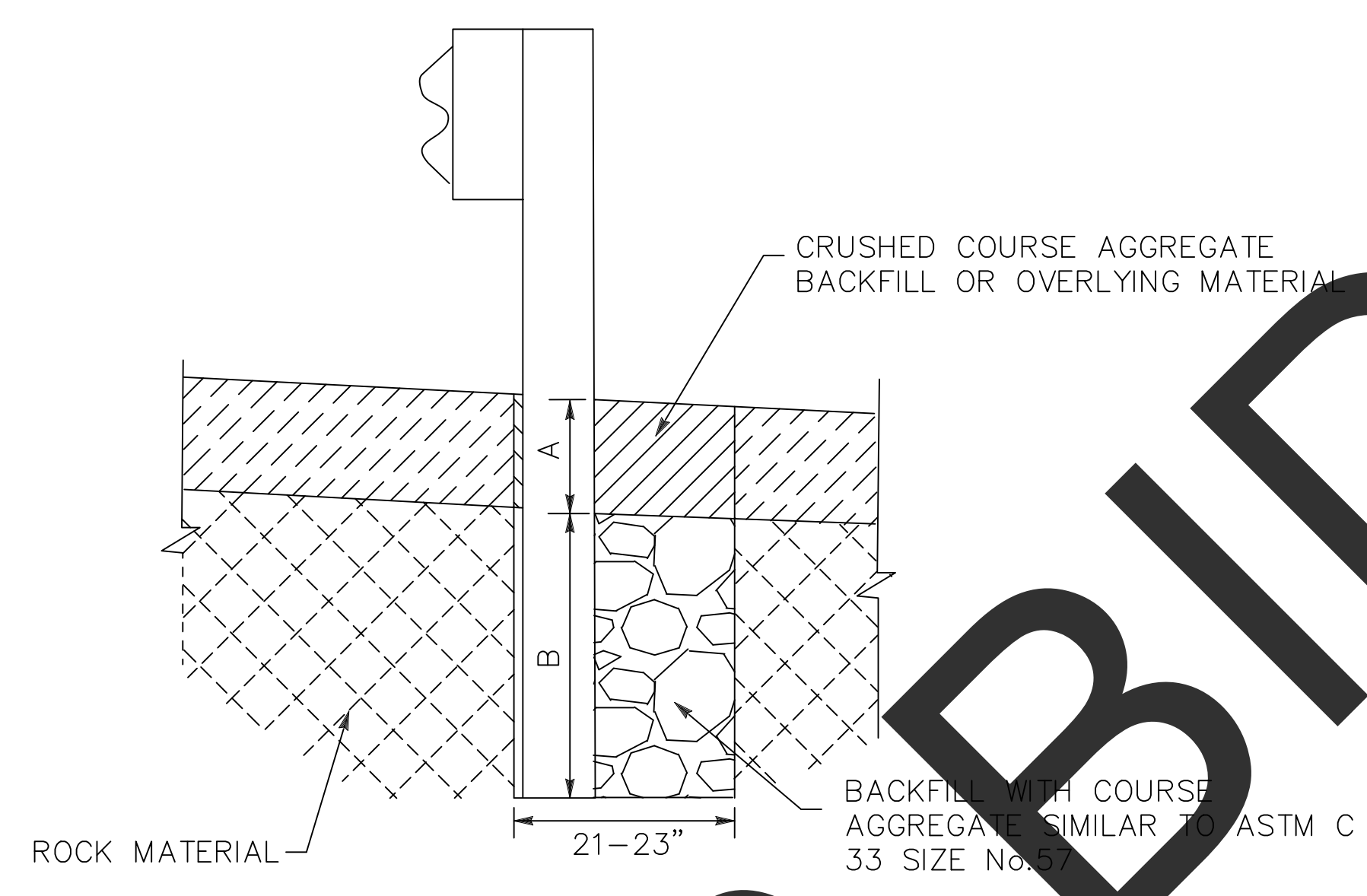
FILE NO. 692650-010, 26550-010, 470600-010, 522600-010, 293400-090, & 660700-020

NOTE:  
 1. FOR ADDITIONAL INSTALLATION DETAILS, SEE STANDARD PLANS A77L2.

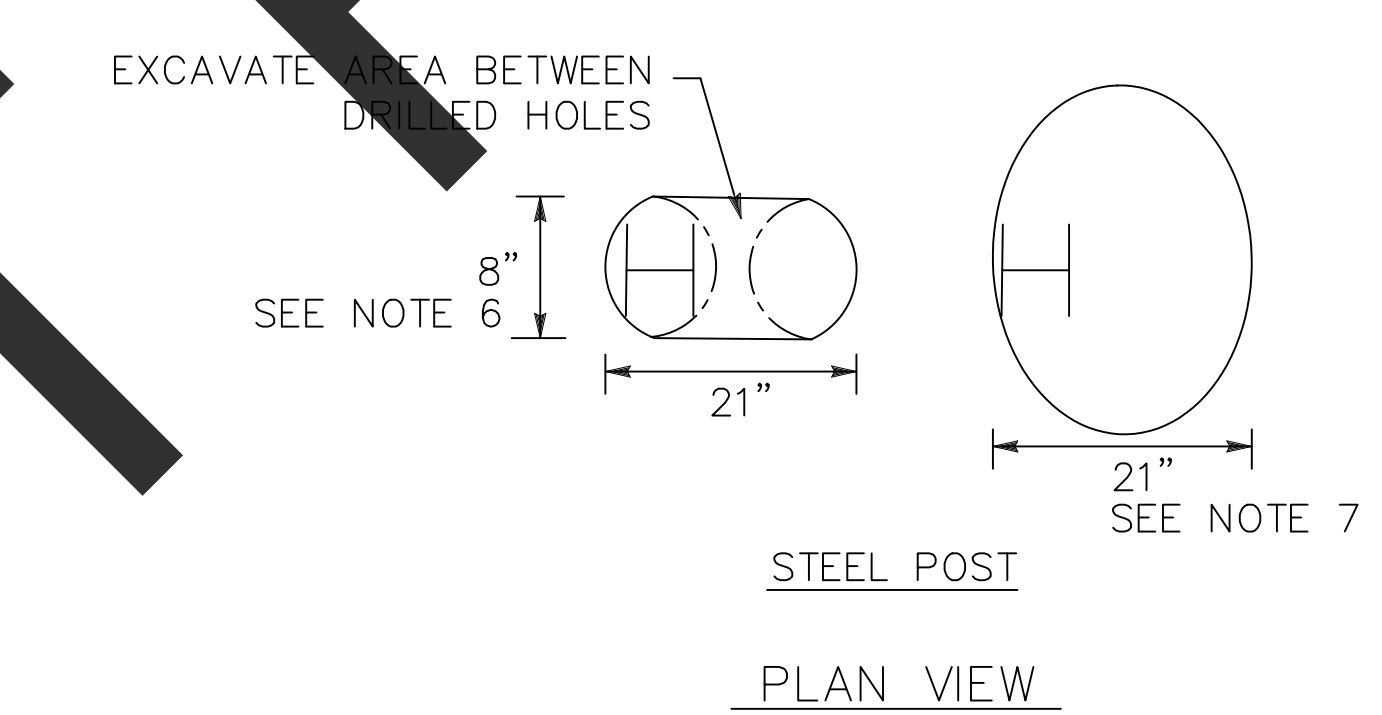
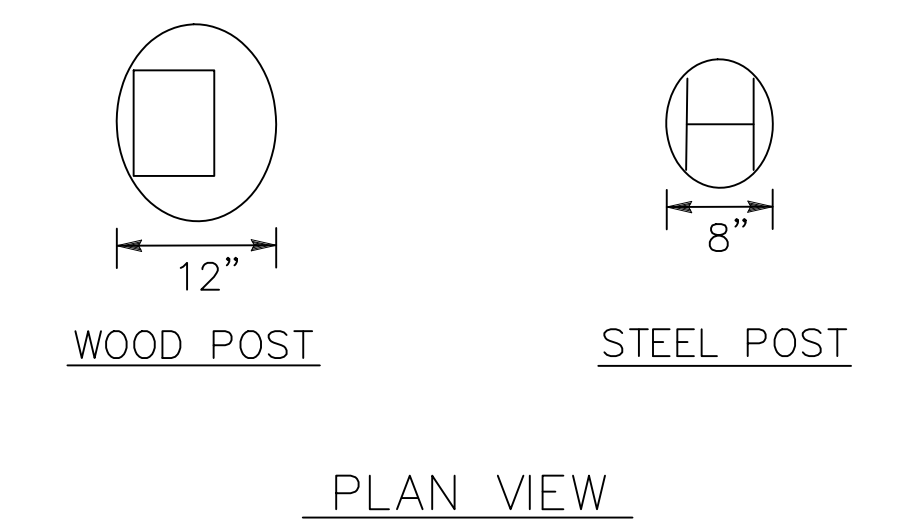
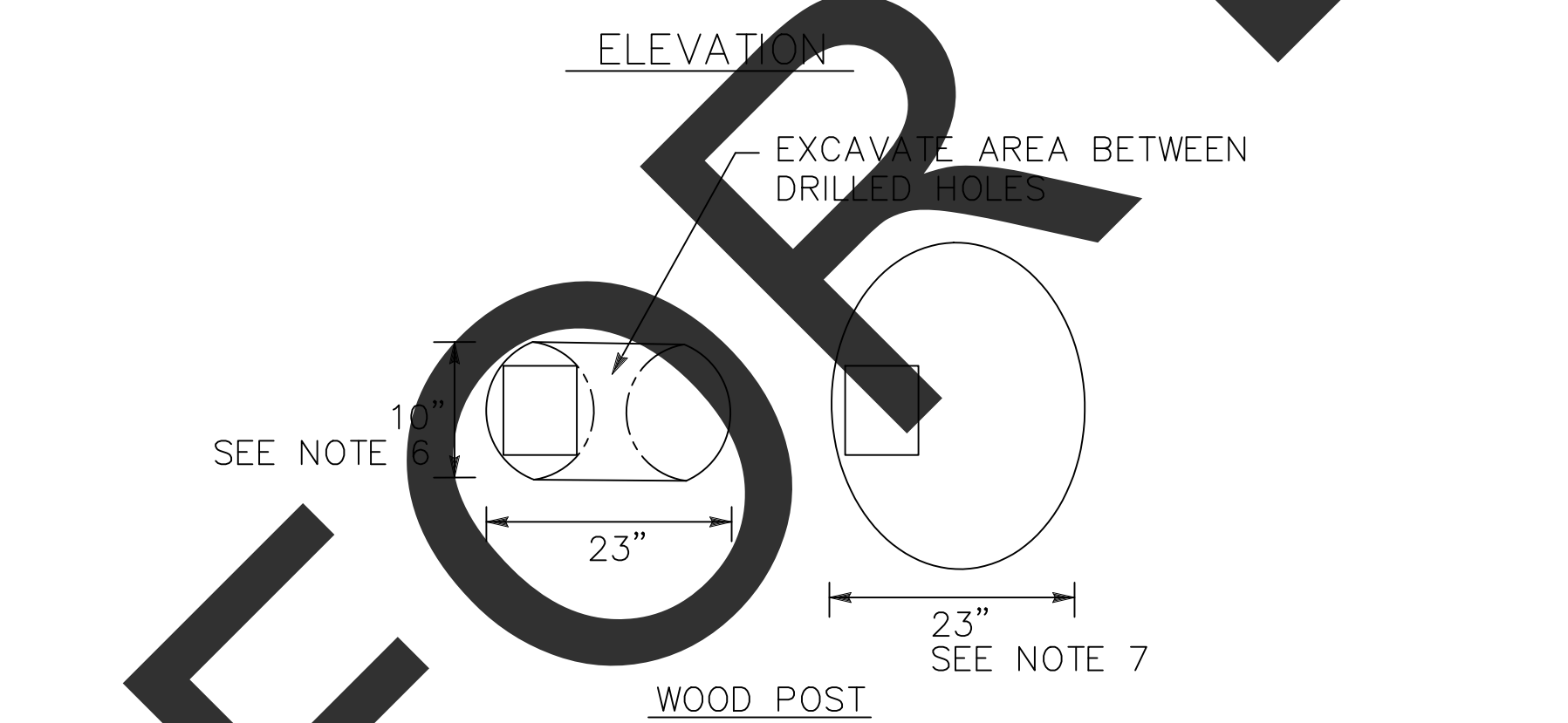
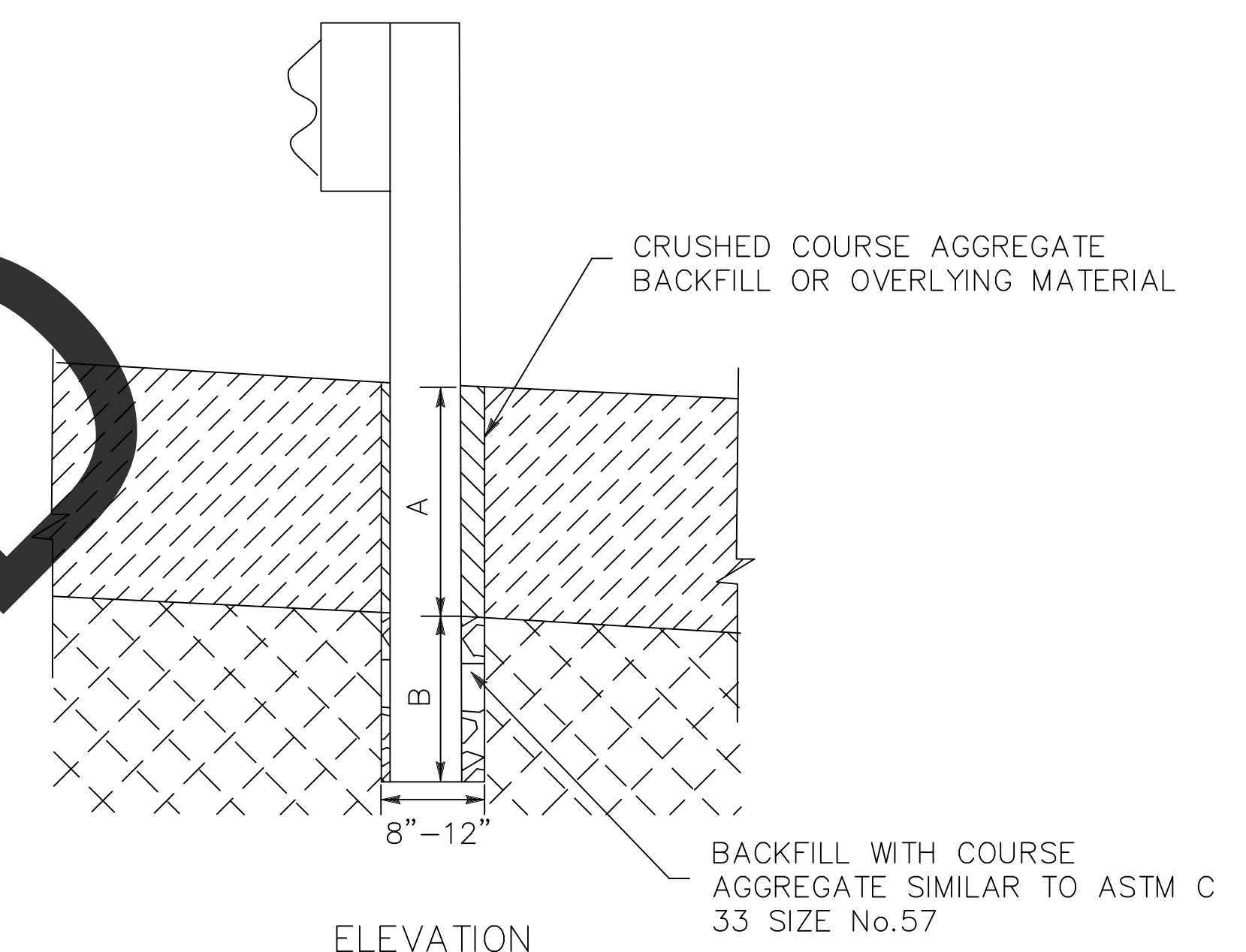


**DETAIL B**  
**NARROW ROADWAY INSTALLATION**  
 SEE NOTE 8  
**POST EMBEDMENT**  
 (NO SCALE)

CASE 1  
 OVERLYING MATERIAL DEPTH (A) IS 18" OR LESS.



CASE 2  
 OVERLYING MATERIAL DEPTH (A) IS GREATER THAN 18".



**POST EMBEDMENT IN ROCK**  
 (NO SCALE)

- NOTES:
1. A = DEPTH OF SOIL OVER ROCK FORMATION.  
 B = DEPTH OF EMBEDMENT INTO ROCK FORMATION.
  2. USE THIS DETAIL WHEN POSTS CANNOT BE EMBEDDED TO THE MINIMUM DEPTH SHOWN ON CALTRANS STANDARD PLAN A77L1 AND A77L2.
  3. UNLESS OTHERWISE SPECIFIED USE EITHER THE CIRCULAR OR THE OBLONG HOLE CONFIGURATION FOR CASE 1 CONDITIONS.
  4. CRUSHED COURSE AGGREGATE BACKFILL CONFORMS TO COURSE AGGREGATE FOR CONCRETE.
  5. PLACE CRUSHED COURSE AGGREGATE ACCORDING TO THE POST REQUIREMENTS.
  6. THIS WIDTH MAY BE INCREASED TO 15" TO ACCOMMODATE CONSTRUCTION TOLERANCES.
  7. 2' DIAMETER HOLE MAY BE USED.
  8. STANDARD POST EMBEDMENT IS:  
 42" FOR MBGR AT 29"  
 43" FOR MBGR AT 27-3/4"  
 40" FOR MGS

NOT FOR BID

PREPARED BY:  
  
 1450 FRAZEE ROAD SUITE 100, SAN DIEGO CA. 92111-8377

MARK	CHANGES	RESIDENT ENGINEER	DATE
	NO CHANGES		
FIELD CHANGES			



SAN BERNARDINO COUNTY DEPARTMENT OF PUBLIC WORKS			
DESIGNED BY:	DRAWN BY:	CHECKED BY:	RECOMMENDED BY:
ST	MN	AOF	Chris Nguyen, B.E. ENGINEERING MANAGER
			6/6/2024 DATE
APPROVED BY:		6/6/2024	
ELOY RUVALCABA, P.E. SUPERVISING ENGINEER		MERVIAT N. MIKHAIL, P.E. DEPUTY DIRECTOR	

SAN BERNARDINO AREA GUARDRAIL REPLACEMENTS				
CONSTRUCTION DETAILS				
J.L. REF.	W.O. NO.	PLAN SCALE	SHT. NO.	TOT. SHTS.
N/A		N/A	14	15

MARK	REVISIONS	DATE	APPR.
MARK	REVISIONS	DATE	APPR.



**QUANTITIES**

SHEET No.	SEGMENT NUMBER	AREA	ROAD	FROM STA TO STA		MGS (STEEL POST)	MGS (SPECIAL)	STRENGTHENED MGS (STEEL POST)	IN-LINE TERMINAL SYSTEM	END CAP (TYPE B)	MINOR CONCRETE (VEGETATION CONTROL)	REMOVE BARRIER RAILING	REMOVE GUARDRAIL	TREATED WOOD WASTE	ASPHALT CONCRETE DIKE (TYPE C)	ASPHALT CONCRETE DIKE (TYPE F)	REMOVE AC DIKE	SNOW POLE MARKER	ASPHALT CONCRETE (MISCELLANEOUS AREA)	CHAIN LINK FENCE (TYPE CL-6)	5' CHAIN LINK GATE (TYPE CL-6)
				STA	STA	LF	LF	LF	EA	EA	SQYD	LF	LF	LB	LF	LF	EA	SQYD	LF	EA	
L-1	1	CRESTLINE	REDWOOD WAY	150+50	151+50	6.25		25		2		17	211					4			
L-2	2	CRESTLINE	CRESTLINE ROAD	250+00	256+00	81.25		37.50	1	1	23	174	2291	50	74	93		9			
L-3	3	DEL ROSA	DEL ROSA AVE	50+00	55+25	438.25		25		1	153	47	5989		57	453					
L-4	4	DEL ROSA	DEL ROSA AVE	55+25	61+25	449.25				1	145	451	706		396	453					
L-5	5	DEL ROSA	DEL ROSA AVE	67+25	71+00		25		1	1	20				449						
L-6	6	LAKE ARROWHEAD	KUFFEL CANYON RD	301+75	307+00	62.50		31.25	1	1		150	1898					7			
L-7	7	BIG BEAR LAKE	MALTBY BLVD	10+00	12+00	37.50				2										23	1
L-8	8	YUCCA VALLEY	PIONEERTOWN RD	200+00	205+25	330.50		39.50	1		176	420	5310	50	370			17	50		
L-9	9	YUCCA VALLEY	PIONEERTOWN RD	205+25	209+75	282.00		23	1		142	356	4501		380			15	25		
<b>TOTAL</b>						1687	25	181.25	5	9	639	20	2039	25786	100	1726	999	52	75	23	1

**TRAFFIC STRIPE**

SHEET No.	SEGMENT NUMBER	AREA	ROAD	FROM STA TO STA		TRAFFIC STRIPE	
				STA	STA	PAINT	DELINEATOR
						6 IN 27B	TYPE E
L-1	1	CRESTLINE	REDWOOD WAY	150+50	151+50		4
L-2	2	CRESTLINE	CRESTLINE ROAD	250+00	256+00	221	9
L-3	3	DEL ROSA	DEL ROSA AVE	50+00	55+25		5
L-4	4	DEL ROSA	DEL ROSA AVE	55+25	61+25		6
L-5	5	DEL ROSA	DEL ROSA AVE	67+25	71+00		4
L-6	6	LAKE ARROWHEAD	KUFFEL CANYON RD	301+75	307+00	174	7
L-7	7	BIG BEAR LAKE	MALTBY BLVD	10+00	12+00		
L-8	8	YUCCA VALLEY	PIONEERTOWN RD	200+00	205+25	461	12
L-9	9	YUCCA VALLEY	PIONEERTOWN RD	205+25	209+75	378	11
<b>TOTAL</b>						1234	58

NOT FOR BIDD

<p>PREPARED BY:</p>  <p>1450 FRAZEE ROAD SUITE 100, SAN DIEGO CA 92131-8377</p>	<p>MARK CHANGES</p> <p>NO CHANGES</p> <p>RESIDENT ENGINEER</p> <p>DATE</p> <p style="text-align: center;"><b>FIELD CHANGES</b></p>		<p>SAN BERNARDINO COUNTY <b>DEPARTMENT OF PUBLIC WORKS</b></p> <p>DESIGNED BY: ST    DRAWN BY: MN    CHECKED BY: AOF    RECOMMENDED BY: <i>Chris Nguyen</i>    6/6/2024</p> <p>DATE</p> <p>APPROVED BY: <i>Eloy Ruvalcaba</i>    6/6/2024    DATE</p> <p>ELOY RUVALCABA, P.E.    SUPERVISING ENGINEER    MERVAT N. MIKHAIL, P.E.    DEPUTY DIRECTOR</p>	<p><b>SAN BERNARDINO AREA GUARDRAIL REPLACEMENTS</b></p> <p>SUMMARY OF QUANTITIES</p>	<p><b>Q-1</b></p> <table border="1" style="font-size: 8px;"> <tr> <td>J.L. REF.</td> <td>W.O. NO.</td> <td>PLAN SCALE</td> <td>SHT. NO.</td> <td>TOT. SHTS.</td> </tr> <tr> <td>N/A</td> <td>Var</td> <td>N/A</td> <td>15</td> <td>15</td> </tr> </table>	J.L. REF.	W.O. NO.	PLAN SCALE	SHT. NO.	TOT. SHTS.	N/A	Var	N/A	15	15
J.L. REF.	W.O. NO.	PLAN SCALE	SHT. NO.	TOT. SHTS.											
N/A	Var	N/A	15	15											