FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	BR 2021 (485)		1
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT
PROJECT NO. BR 2021 (485)

BEXAR COUNTY
SL 368

CSJ: 0016-08-039

LIMITS: AT SALADO CREEK AND IRA LEE ROAD

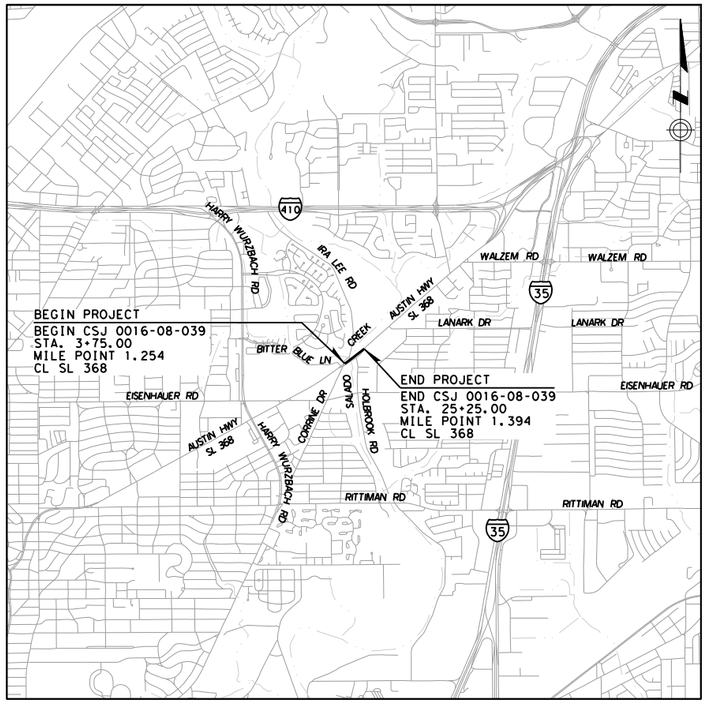
NET LENGTH OF ROADWAY:	1694 FT. = 0.321 MI.
NET LENGTH OF BRIDGE:	456 FT. = 0.086 MI.
TOTAL OF PROJECT:	2150 FT. = 0.407 MI.

FOR WORK CONSISTING OF BRIDGE REPLACEMENT, APPROACHES, GRADING, PAVEMENT, STRUCTURES, DRAINAGE, AND SIDEWALK

FUNCTIONAL CLASSIFICATION = URBAN ARTERIAL STREET
DESIGN SPEED = 45 MPH
AREA OF DISTURBED SOIL = 2.50 AC
A.D.T. (2021) = 24,000
A.D.T. (2041) = 32,900

ACCESSIBILITY STANDARDS = PROWAG

LETTING DATE: _____
DATE CONTRACTOR BEGAN WORK: _____
DATE WORK WAS COMPLETED & ACCEPTED: _____
FINAL CONTRACT COST: $ _____
CONTRACTOR: _____



SCALE: 1" = 1 MILE

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: NONE

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, MAY 1, 2012)

FINAL PLANS STATEMENT

THE CONSTRUCTION WORK WAS PERFORMED IN ACCORDANCE WITH THE PLANS.

P.E. _____
AREA ENGINEER DATE

TEXAS DEPARTMENT OF TRANSPORTATION

ATTACHMENT NO. 7 TO SPECIAL AGREEMENT FOR CONSTRUCTION, MAINTENANCE, AND OPERATION OF HIGHWAY LIGHTING SYSTEMS WITHIN A MUNICIPALITY, DATED JUNE 24, 2014. THE CITY-STATE CONSTRUCTION, MAINTENANCE AND OPERATION RESPONSIBILITIES SHALL BE AS HERETOFORE AGREED TO, ACCEPTED, AND SPECIFIED IN THE AGREEMENT TO WHICH THESE PLANS ARE MADE A PART.

CONCURRENCE 1/22/21
CITY OF SAN ANTONIO

Texas Department of Transportation

RECOMMENDED FOR LETTING: 2/4/2021
DocuSigned by: Lizette J. Collat, P.E.
DF7D99F6319A45A...
DISTRICT SUPPORT DIRECTOR

RECOMMENDED FOR LETTING: 2/5/2021
DocuSigned by: Clayton Ripps, P.E.
74F59AGB69B04CB
DIRECTOR OF TRANSPORTATION PLANNING AND DEVELOPMENT

APPROVED FOR LETTING: 2/4/2021
DocuSigned by: Gina E. Gallegos, P.E.
124372CCDF604F...
DISTRICT ENGINEER

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2 - 3	INDEX OF SHEETS

DATE: 1/27/2021 3:43:04 PM
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COUNTY BEXAR PROJ. NO. BR 2021 (485)
HWY. NO. SL368 LETTING DATE APRIL 2021
DATE ACCEPTED

SHEET NO.	DESCRIPTION
	GENERAL
1	TITLE SHEET
2-3	INDEX OF SHEETS
4	PROJECT LAYOUT
5-9	TYPICAL SECTIONS
10, 10A-10K	GENERAL NOTES
11, 11A-11D	ESTIMATE & QUANTITY SHEETS
12-13	SUMMARY OF QUANTITIES
14-15	SUMMARY OF SMALL SIGNS
	TRAFFIC CONTROL PLAN
16-18	TRAFFIC CONTROL PLAN NARRATIVE
19	TRAFFIC CONTROL PLAN OVERALL PHASING LAYOUT
20-22	ADVANCED WARNING LAYOUT
23	TRAFFIC CONTROL PLAN SCHEDULE OF BARRICADES
24	TRAFFIC CONTROL PLAN - PHASE I - TYPICAL SECTIONS
25-26	TRAFFIC CONTROL PLAN - PHASE I - LAYOUT
27	TRAFFIC CONTROL PLAN - PHASE II - TYPICAL SECTIONS
28-29	TRAFFIC CONTROL PLAN - PHASE II - LAYOUT
30	TRAFFIC CONTROL PLAN - PHASE III - TYPICAL SECTIONS
31-32	TRAFFIC CONTROL PLAN - PHASE III - LAYOUT
33	TRAFFIC CONTROL PLAN - DETOUR - PEDESTRIAN TRAIL
34	TRAFFIC CONTROL PLAN - DETOUR - IRA LEE RD.
35	TRAFFIC CONTROL PLAN - DETOUR - CORRINE DR.
36	TRAFFIC CONTROL PLAN - DETOUR - SL 368 CLOSURE
37	TRAFFIC CONTROL PLAN - PEDESTRIAN - TRAIL CLOSURE
38-39	TEMPORARY SPECIAL SHORING
40	CRASH CUSHION SUMMARY SHEET
41	TMA AND TA SUMMARY SHEET
	TRAFFIC CONTROL STANDARDS
42-53	#BC (1)-14 THRU BC (12)-14
54	#TCP(2-1)-18
55	#TCP(2-4)-18
56	#TCP(3-1)-13
57	#TCP(3-3)-14
58	#TCP(6-2)-12
59	#TCP(6-4)-12
60	#WZ(BRK)-13
61-62	#WZ(BTS)-13
63	#WZ(RCD)-13
64	#WZ(RS)-16
65	#NOT USED
66	#WZ(STPM)-13
67	#WZ(TD)-17
68	#WZ(UL)-13
69-70	#CSB(1)-10
71	#CSB(7)-10
72-73	#LPCB-13
74-75	#FSLP(TR)-10
76	#RW(TEW)
77	#TE(HMAC)-11
	ROADWAY DETAILS
78-79	HORIZONTAL & VERTICAL CONTROL INDEX SHEET
80	HORIZONTAL & VERTICAL CONTROL DATA SHEET
81-82	HORIZONTAL GEOMETRY LAYOUT
83-89	HORIZONTAL & VERTICAL GEOMETRY REPORTS
90-91	REMOVAL LAYOUT
92	CUT AND FILL
93-96	PLAN & PROFILE
97	IRA LEE ROAD PLAN & PROFILE
98	IRA LEE ACCESS ROAD PLAN & PROFILE
99	CORRINE ACCESS ROAD SOUTH PLAN & PROFILE
100	CORRINE ACCESS ROAD NORTH PLAN & PROFILE
101	PEDESTRIAN TRAIL PLAN & PROFILE
102-103	INTERSECTION LAYOUT
104	GRADING PLAN
105	GRADING & PILOT DITCH DETAILS

SHEET NO.	DESCRIPTION
	ROADWAY STANDARDS
106-107	#CRCP(1)-20
108	#JS-14
109-112	#PED-18
113	#QGELITE(M10)(N)-20
113A	#TAU-II-R(N)-16
114	#QGUARD(M10)(N)-20
114A	#TAU(M)(N)-19
115	#GF(31)-19
116	#GF(31)DAT-19
117	#GF(31)MS-19
118-119	#GF(31)TR TL3-20
120-121	#SD-EBR (MOD)
122	#MISCELLANEOUS CURB AND SIDEWALK DETAILS (SAN ANTONIO DISTRICT)
123-124	#SIDEWALK BRIDGE INLET (SAN ANTONIO DISTRICT)
	RETAINING WALL DETAILS
125	RETAINING WALL LAYOUT
126	RETAINING WALL ALIGNMENT DATA
127	RETAINING WALL 1 LAYOUT
128	RETAINING WALL 2 LAYOUT
129	RETAINING WALL 3 LAYOUT
130	RETAINING WALL 4 LAYOUT
	RETAINING WALL STANDARDS
131	*RW(EM)
132-133	*RW(MSE)
134-135	*RW(MSE)DD(MOD)
136	*RW(TRF)(MOD)
	DRAINAGE DETAILS
137-138	STORM SEWER PLAN & PROFILES
139-143	HYDRAULIC DATA SHEETS (5 SHEETS)
	DRAINAGE STANDARDS
144	#PB
145	#PBGC
146-147	#PSL
148	#PAZD
149	#SW-0
	UTILITIES
150	EXISTING UTILITIES LEVEL A LAYOUT
151-158	EXISTING UTILITIES TEST HOLE DATA (8 SHEETS)
	JOINT BID UTILITIES
159	COVER SHEET AND INDEX
160	GENERAL NOTES
161	QUANTITY SUMMARY AND HORIZONTAL ALIGNMENT
162	PROPOSED WATER MAIN IMPROVEMENTS
163	PROPOSED WATER MAIN CONNECTIONS
164	PROPOSED BORE PIT DETAILS
165	PROPOSED RECEIVING PIT DETAILS

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED PROFESSIONAL ENGINEER

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED WITH A NUMBER SIGN (#), HAVE BEEN SELECTED BY ME, OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

_____, P.E. 2/22/2021
GLENN G. GREGORY, JR. DATE

STATE OF TEXAS
Blake W. Staton
121491
LICENSED PROFESSIONAL ENGINEER

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED WITH AN ASTERISK (*), HAVE BEEN SELECTED BY ME, OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

_____, P.E. 2/22/2021
BLAKE W. STATON DATE

STATE OF TEXAS
JAMES K. SCHMITT
125073
LICENSED PROFESSIONAL ENGINEER

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED WITH A DASH (-), HAVE BEEN SELECTED BY ME, OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

_____, P.E. 2/22/2021
JAMES K. SCHMITT DATE

GARVER
3755 S. Capital of Texas Highway
Suite 325
Austin, TX 78704
(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

INDEX OF SHEETS

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		2
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

SHEET NO.	DESCRIPTION
	BRIDGE DETAILS
166-167	BRIDGE LAYOUT
168-169	TEST HOLE DATA
170-171	CONSTRUCTION SEQUENCE
172-174	REMOVAL SEQUENCE
175	ESTIMATED QUANTITIES AND BEARING SEAT ELEVATIONS
176	FOUNDATION LAYOUT
177	ABUTMENT NO. 1 (PHASE I)
178	ABUTMENT NO. 1 (PHASE II)
179	ABUTMENT NO. 7 (PHASE I)
180	ABUTMENT NO. 7 (PHASE II)
181	ABUTMENT DETAILS
182	INTERIOR BENT NOS. 2, 4 - 6 (PHASE I)
183	INTERIOR BENT NOS. 2, 4 - 6 (PHASE II)
184	INTERIOR BENT NO. 3 (PHASE I)
185	INTERIOR BENT NO. 3 (PHASE II)
186	INTERIOR BENT NOS. 2 - 6 DETAILS
187	FOOTING DETAILS BENT NO. 3
188	FRAMING PLAN (SPANS 1 - 3)
189	FRAMING PLAN (SPANS 4 - 6)
190-191	199.500' PRESTRESSED CONCRETE GIRDER UNIT NO. 1 (SPANS 1-3)
192-193	256.500' PRESTRESSED CONCRETE GIRDER UNIT NO. 2 (SPANS 4-6)
194-195	APPROACH SLAB DETAILS
196	GABION MATTRESS LAYOUT
	BRIDGE STANDARDS
197	*IGND
198-200	*BMCS
201-202	*BRSM(MOD)
203	*BS-EJCP
204-207	*TYPE C223 (MOD)
208	*CSAB
209-210	*FD
211	*IGCS
212-213	*IGD
214-216	*IGEB(MOD)
217-218	*IGMS
219	*IGSK
220	*IGTS
221-222	*MEBR(C)
223-226	*PCP
227	*PCP-FAB
228-229	*PMDF
230	*SEJ-M
231	*BRIDGE NBI NUMBER STENCIL (SAN ANTONIO DISTRICT)
	ILLUMINATION
232	ELECTRICAL LEGEND AND NOTES
233	ELECTRICAL KEYED NOTES
234-235	LIGHTING REMOVAL PLAN
236-237	LIGHTING INSTALLATION PLAN
238-240	ELECTRICAL DETAILS
	ILLUMINATION STANDARDS
241	-ED(1)-14
242	-ED(2)-14
243	-ED(3)-14
244	-ED(4)-14
245	-ED(5)-14
246	-ED(6)-14
247	-ED(9)-14
248	-ED(11)-14
249	-RFBA-13
250	-RID(3)-17
	TRAFFIC DETAILS
251-252	SIGNING & PAVEMENT MARKING LAYOUT
253	FLASHING BEACON SIGNAL NOTES
254	FLASHING BEACON MODIFICATION QUANTITIES
255	EXISTING CONDITIONS AND REMOVALS
256	PROPOSED FLASHING BEACON LAYOUT
257	PROPOSED FLASHING BEACON WIRING LAYOUT
258	PROPOSED FLASHING BEACON ELEVATIONS

SHEET NO.	DESCRIPTION
	TRAFFIC STANDARDS
259	#CFA-12
260-265	#D & OM(1)-20 THRU D & OM(6)-20
266	#FBSP-18 (SAN ANTONIO DISTRICT)
267	#FGA-15
268	#LUM-A-12
269	#PM(1)-20
270	#PM(2)-20
271	#PM(3)-20
272	#SMD(GEN)-08
273-275	#SMD(SLIP-1)-08 THRU SMD(SLIP-3)-08
276	#SP-80(1)-12
277	#SP-80(2)-12
278	#TS-FD-12
279	#TSR(4)-13
	ENVIRONMENTAL ISSUES
280	SW3P NARRATIVE
281	EPIC
282-283	SW3P LAYOUT PHASE I
284-285	SW3P LAYOUT PHASE II
286-287	SW3P LAYOUT PHASE III
	ENVIRONMENTAL STANDARDS
288	#EC(1)-16
289	#EC(2)-16
290	#EC(3)-16
291-293	#EC(9)-16

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED PROFESSIONAL ENGINEER

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED WITH A NUMBER SIGN (#), HAVE BEEN SELECTED BY ME, OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

GLENN G. GREGORY, JR., P.E. 2/22/2021
GLENN G. GREGORY, JR. DATE

STATE OF TEXAS
Blake W. Staton
121491
LICENSED PROFESSIONAL ENGINEER

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BLAKE W. STATON, P.E. 2/22/2021
BLAKE W. STATON DATE

STATE OF TEXAS
JAMES K. SCHMITT
125073
LICENSED PROFESSIONAL ENGINEER

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED WITH A DASH (-), HAVE BEEN SELECTED BY ME, OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

JAMES K. SCHMITT, P.E. 2/22/2021
JAMES K. SCHMITT DATE

GARVER
3755 S. Capital of Texas Highway
Suite 325
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(512) 485-0009
TBPELS Firm 5713

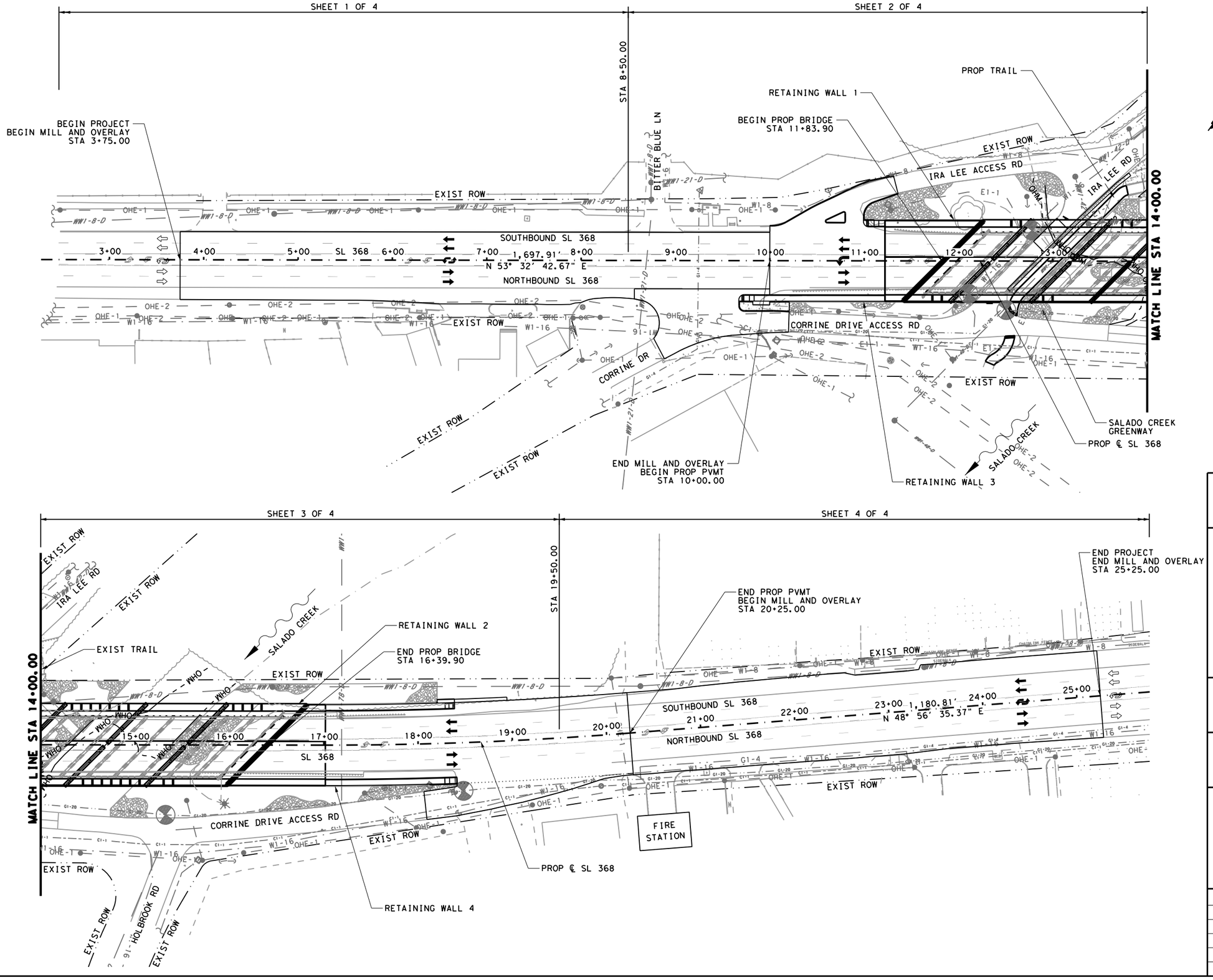
Texas Department of Transportation

SL 368
AT SALADO CREEK

INDEX OF SHEETS

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		3
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368



0 50' 100'

SCALE: 1" = 100'

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED
PROFESSIONAL ENGINEER

1/27/2021

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SL 368
AT SALADO CREEK

PROJECT LAYOUT

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		4
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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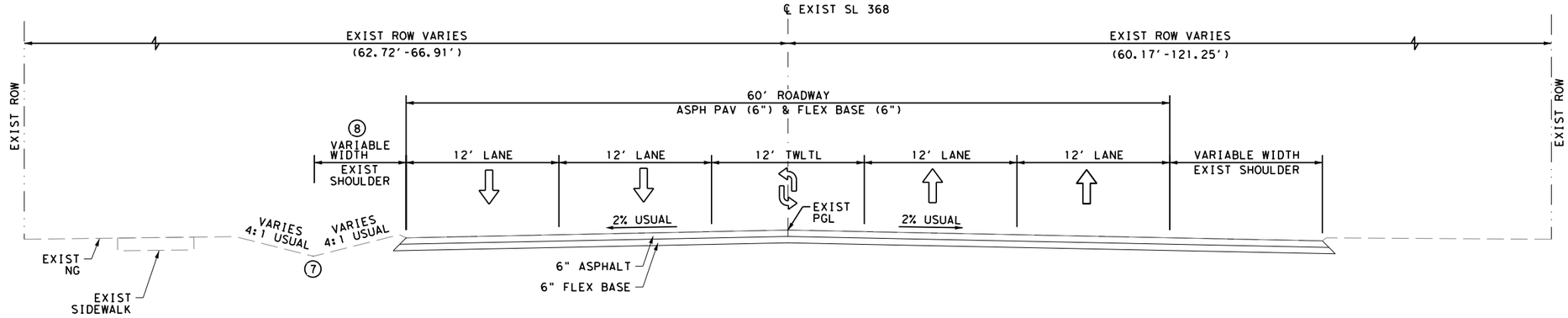
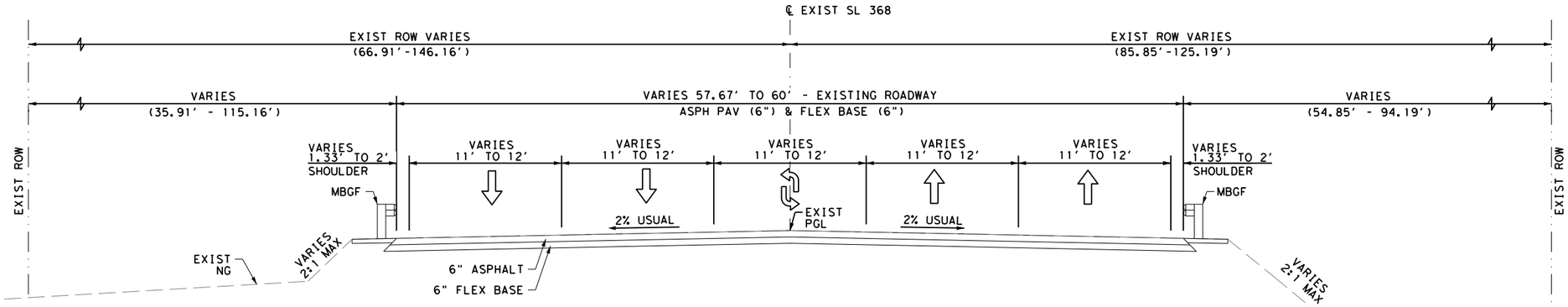


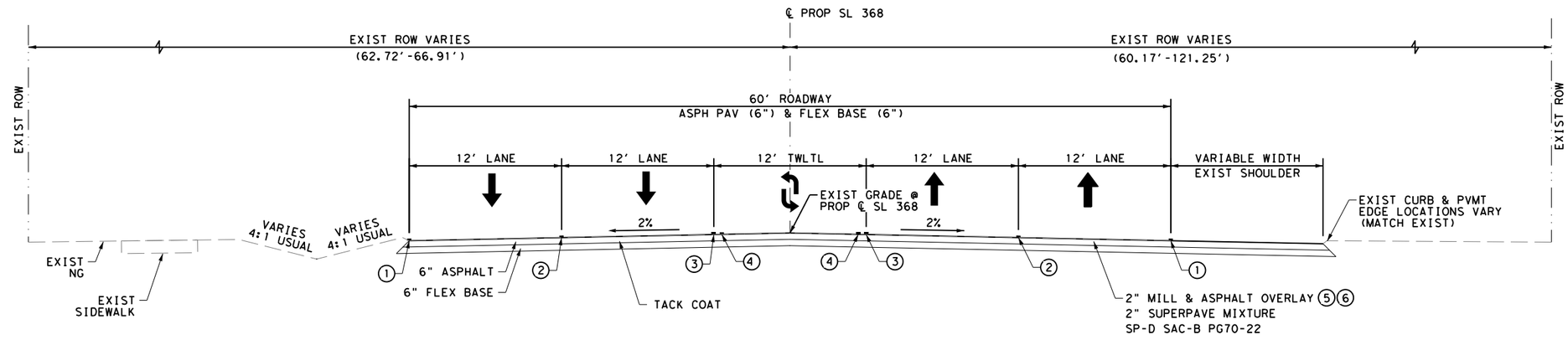
EXISTING TYPICAL SECTION

STA 3+75.00 TO STA 10+00.00
STA 18+40.00 TO STA 25+25.00



EXISTING TYPICAL SECTION

STA 10+00.00 TO 18+40.00
(EXIST BRIDGE STA 11+99.90 TO 16+24.09)



PROPOSED TYPICAL SECTION

STA 3+75.00 TO STA 10+00.00

LEGEND

- EXIST TRAFFIC FLOW
- PROP TRAFFIC FLOW

① RE PM W/RET REQ TY I (W)4"(SLD) (100MIL)
② RE PM W/RET REQ TY I (W)4"(BRK) (100MIL)
③ RE PM W/RET REQ TY I (Y)4"(SLD) (100MIL)
④ RE PM W/RET REQ TY I (Y)4"(BRK) (100MIL)
⑤ SUBSTITUTE PG BINDER IS NOT ALLOWED FOR SURFACE MIXTURE
⑥ APPLY IN PHASE III TCP
⑦ EXISTING NATURAL GROUND UNPAVED SWALE LT. LOCATED FROM STATION 3+75 TO 10+00
⑧ VARIABLE WIDTH EXISTING PAVED SHOULDER LT. LOCATED FROM STATION 18+40 TO 25+25

0 5' 10'
SCALE: 1" = 10'

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED PROFESSIONAL ENGINEER
1/27/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

TYPICAL SECTIONS

SHEET 1 OF 5

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		5
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
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0016	08	039	SL 368

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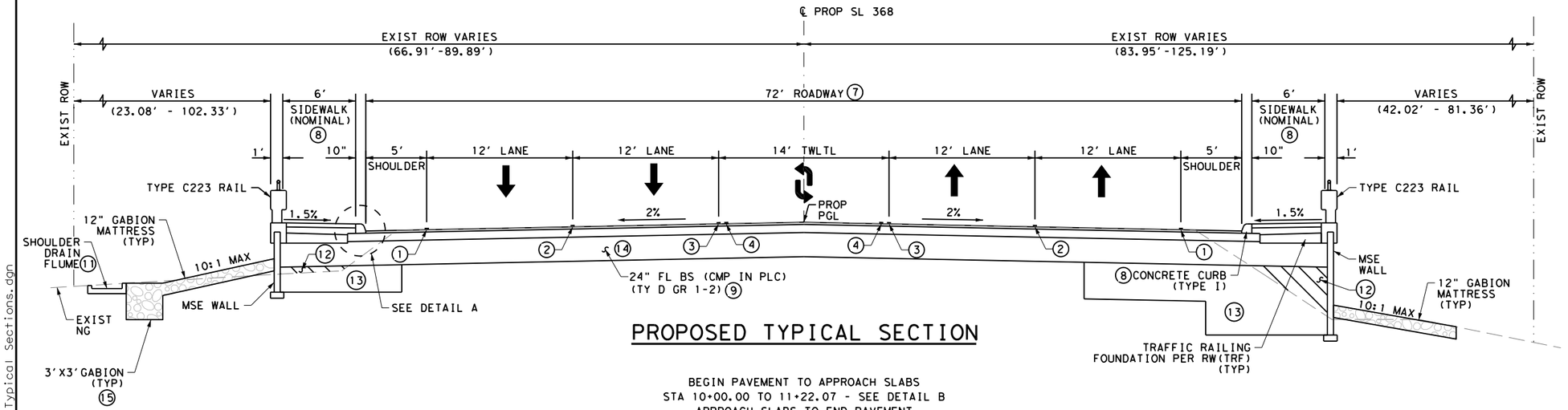
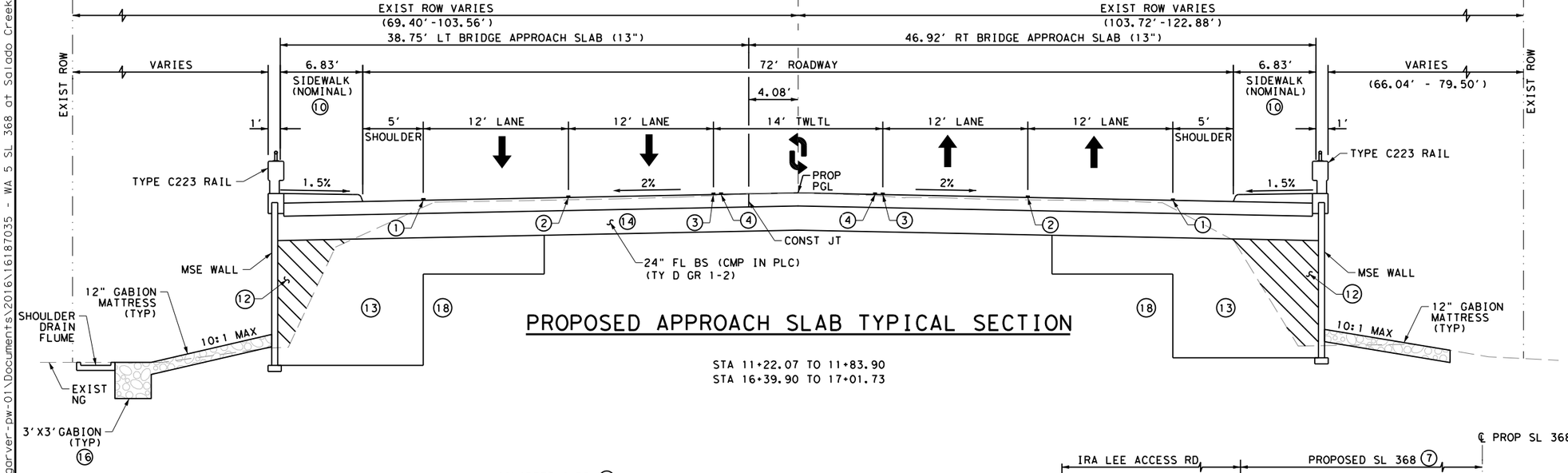


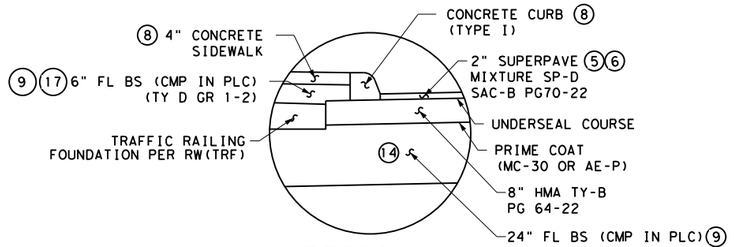
PROPOSED TYPICAL SECTION

BEGIN PAVEMENT TO APPROACH SLABS
STA 10+00.00 TO 11+22.07 - SEE DETAIL B
APPROACH SLABS TO END PAVEMENT
STA 17+01.73 TO 18+40.00



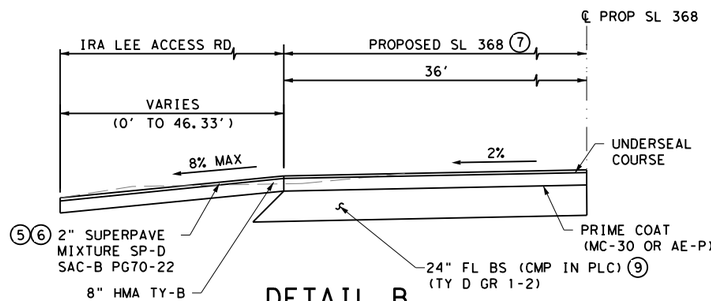
PROPOSED APPROACH SLAB TYPICAL SECTION

STA 11+22.07 TO 11+83.90
STA 16+39.90 TO 17+01.73



DETAIL A

N.T.S.



DETAIL B

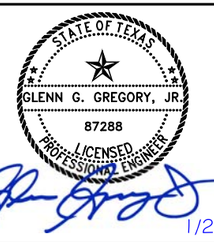
N.T.S.
(STA 10+00.00 TO 11+00.00 LT)

LEGEND

- EXIST TRAFFIC FLOW
- PROP TRAFFIC FLOW

1. RE PM W/RET REQ TY I (W)4"(SLD) (100MIL)
2. RE PM W/RET REQ TY I (W)4"(BRK) (100MIL)
3. RE PM W/RET REQ TY I (Y)4"(SLD) (100MIL)
4. RE PM W/RET REQ TY I (Y)4"(BRK) (100MIL)
5. SUBSTITUTE PG BINDER IS NOT ALLOWED FOR SURFACE MIXTURE
6. APPLY IN PHASE III TCP
7. REFER TO DETAIL A FOR FULL PAVEMENT SECTION
8. REFER TO TxDOT SAN ANTONIO DISTRICT STD DWG
9. FLEX BASE SHALL HAVE A MINIMUM PLASTICITY INDEX (PI) OF 5
10. REFER TO STD DWG BRSM
11. SHOULDER DRAIN FLUME STA 16+14.00 TO 18+40.00
12. LATERAL LIMITS OF MEASUREMENT FOR PAYMENT OF EMBANKMENT (SEE RETAINING WALL STANDARDS FOR DETAILS)
13. REINFORCED ZONE(STRUCTURAL BACKFILL) (SEE RETAINING WALL SHEETS FOR DETAILS)
14. 2' MIN. TYPE C BACKFILL (SEE RETAINING WALL STANDARDS FOR DETAILS)
15. 3X3 GABION STA 17+01.73 TO 18+40.00
16. 3X3 GABION STA 16+39.90 TO 17+01.73
17. FLEX BASE PLACED UNDER SIDEWALK IS SUBSIDIARY TO ITEM 531-6001 CONC SIDEWALKS (4")
18. RETAINED FILL WILL NOT BE MEASURED FOR SEPARATE PAYMENT, BUT SHALL BE SUBSIDIARY TO ITEM 423, "RETAINING WALL (MSE)". ANY CONTRACTOR SUBSTITUITIONS TO THIS MATERIAL SHALL BE APPROVED BY THE ENGINEER AND SHALL BE AT NO ADDITIONAL COST TO THE PROJECT. REFER TO RETAINING WALL STANDARD RW(MSE)(DD)(MOD) FOR LIMITS OF TYP C BACKFILL.

0 5' 10'
SCALE: 1" = 10'



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SL 368
AT SALADO CREEK

TYPICAL SECTIONS

SHEET 2 OF 5

FED. RD. DIV. NO.	FEDERAL AID PROJECT	SHEET NO.
6	SEE TITLE SHEET	6
STATE	DISTRICT	COUNTY
TEXAS	SAT	BEXAR
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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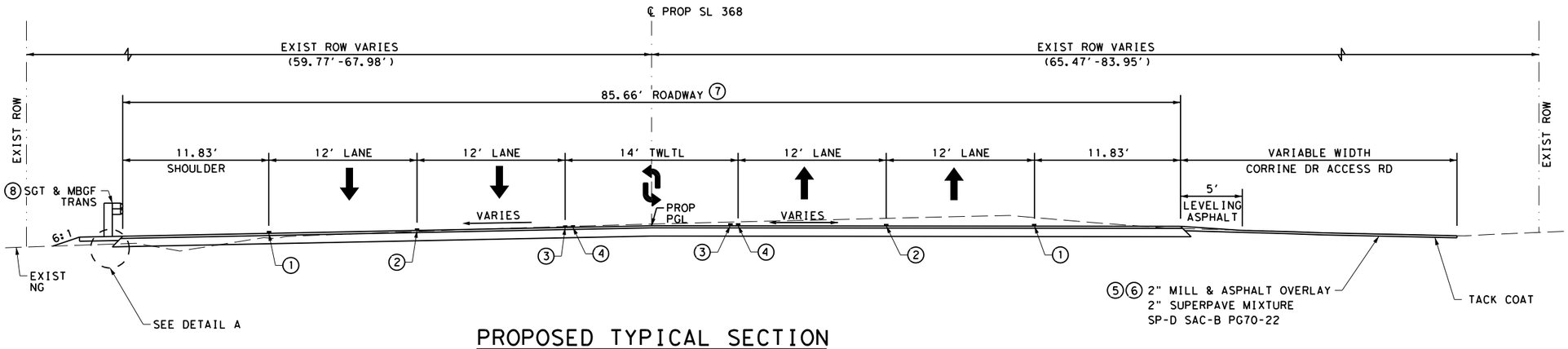


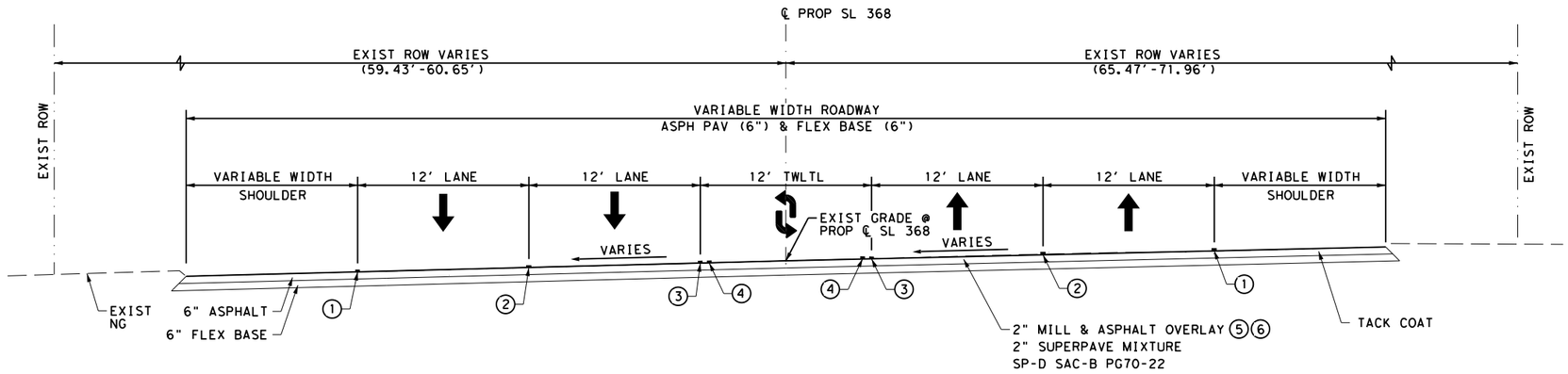
PROPOSED TYPICAL SECTION

STA 18+40.00 TO STA 20+25.00

LEGEND

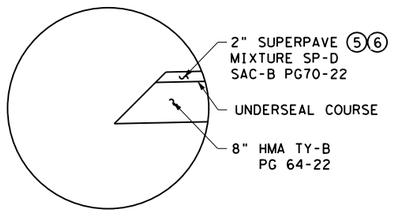
- EXIST TRAFFIC FLOW
- PROP TRAFFIC FLOW

① RE PM W/RET REQ TY I (W)4"(SLD) (100MIL)
② RE PM W/RET REQ TY I (W)4"(BRK) (100MIL)
③ RE PM W/RET REQ TY I (Y)4"(SLD) (100MIL)
④ RE PM W/RET REQ TY I (Y)4"(BRK) (100MIL)
⑤ SUBSTITUTE PG BINDER IS NOT ALLOWED FOR SURFACE MIXTURE
⑥ APPLY IN PHASE III TCP
⑦ REFER TO DETAIL A FOR FULL PAVEMENT SECTION
⑧ SGT & MBGF TRANS
STA 18+20.00 TO 18+96.25



PROPOSED TYPICAL SECTION

STA 20+25.00 TO STA 25+25.00



DETAIL A

N.T.S.

0 5' 10'

SCALE: 1" = 10'

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED
PROFESSIONAL ENGINEER
1/27/2021

GARVER
3755 S. Capital of Texas Highway
Suite 325
Austin, TX 78704
(512) 485-0009
TBPELS Firm 5713

SL 368
AT SALADO CREEK

TYPICAL SECTIONS

SHEET 3 OF 5

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		7
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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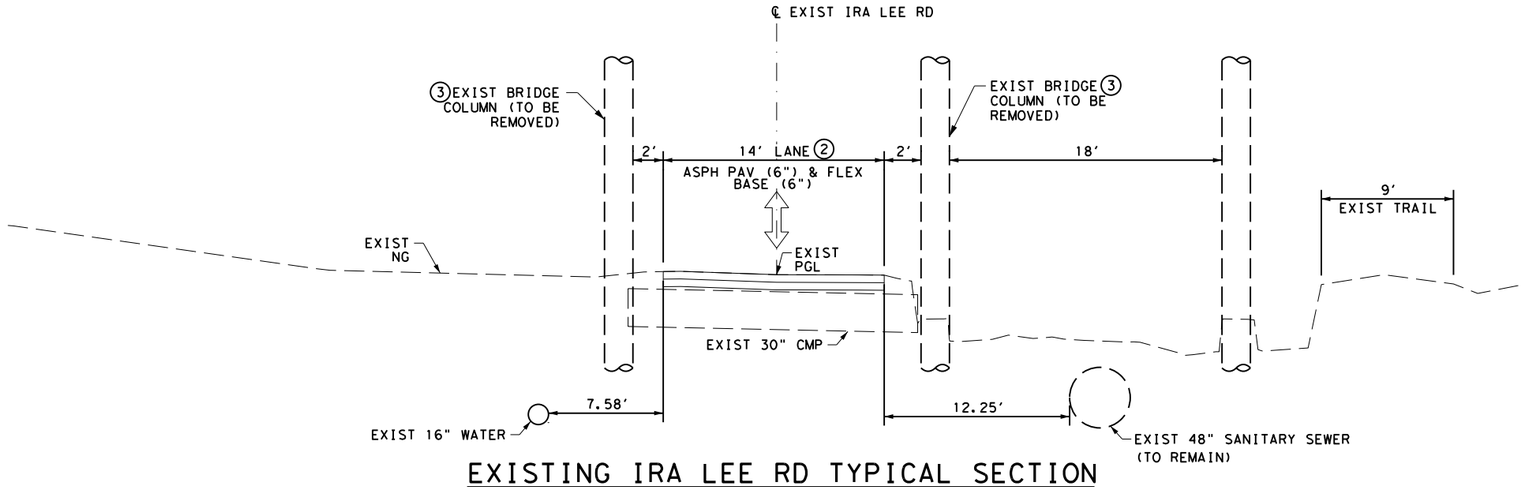
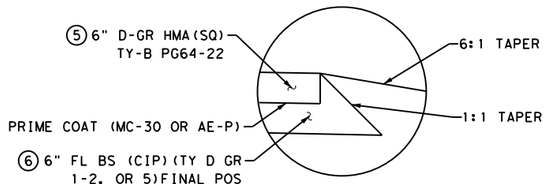


EXISTING IRA LEE RD TYPICAL SECTION

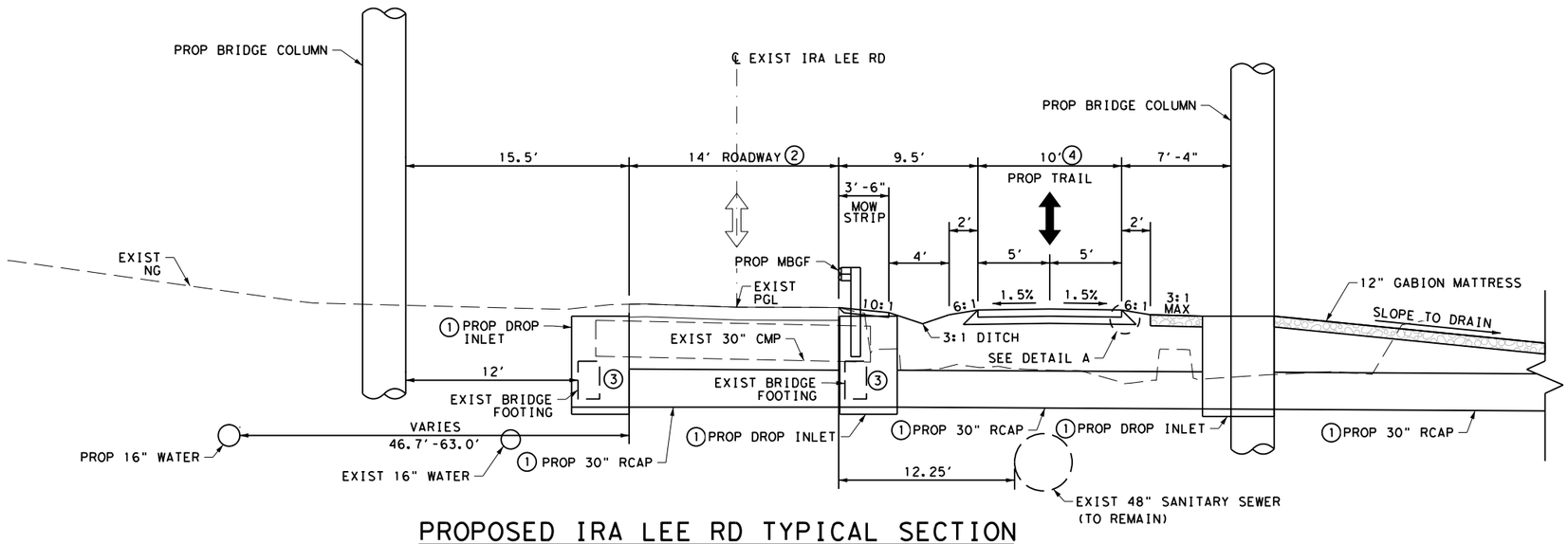
STA 5+00.00 TO 6+63.13

1. SEE STORM SEWER P&P FOR MORE INFORMATION.
2. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING IRA LEE ROAD UNDER SL 368 BRIDGE. EXISTING ROADWAY SHALL BE RESTORED TO MATCH EXISTING WIDTH AND PAVEMENT DEPTH IF DAMAGED.
3. EXISTING BRIDGE FOOTING TO BE REMOVED A MINIMUM OF 2' BELOW GRADE OR TO A DEPTH TO ALLOW GUARDRAIL & DRAINAGE STRUCTURE INSTALLATION ABOVE.
4. REFER TO DETAIL A FOR FULL PAVEMENT SECTION
5. SUBSTITUTE PG BINDER IS NOT ALLOWED FOR SURFACE MIXTURE
6. FLEX BASE SHALL HAVE A MINIMUM PLASTICITY INDEX (PI) OF 5



DETAIL A

N.T.S.



PROPOSED IRA LEE RD TYPICAL SECTION

STA 5+00.00 TO 6+63.13

0 5' 10'

SCALE: 1" = 10'

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED PROFESSIONAL ENGINEER
1/27/2021

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TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

TYPICAL SECTIONS

SHEET 4 OF 5

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		8
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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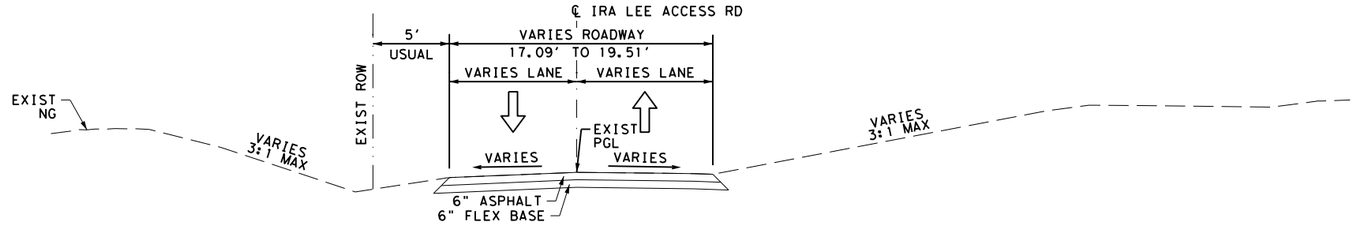
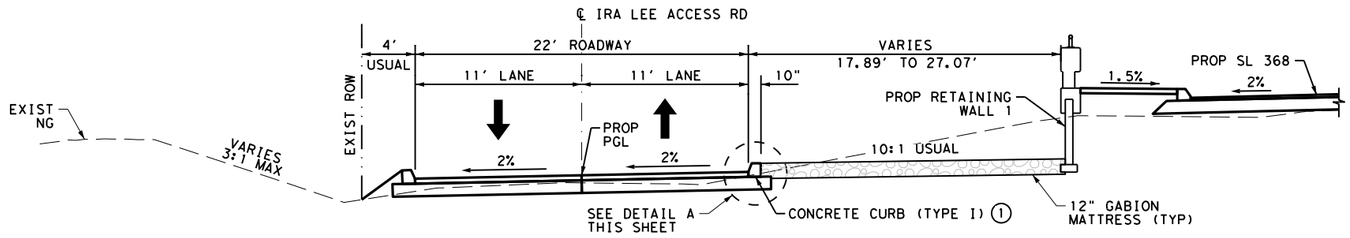


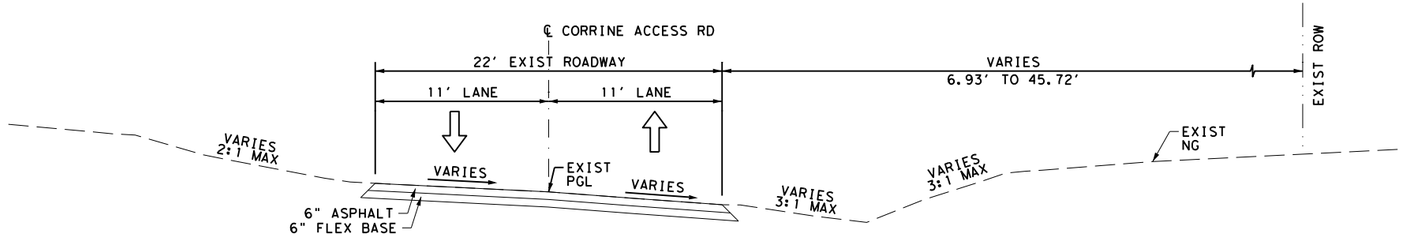
EXISTING IRA LEE ACCESS RD TYPICAL SECTION

STA 0+36.00 TO 1+25.00



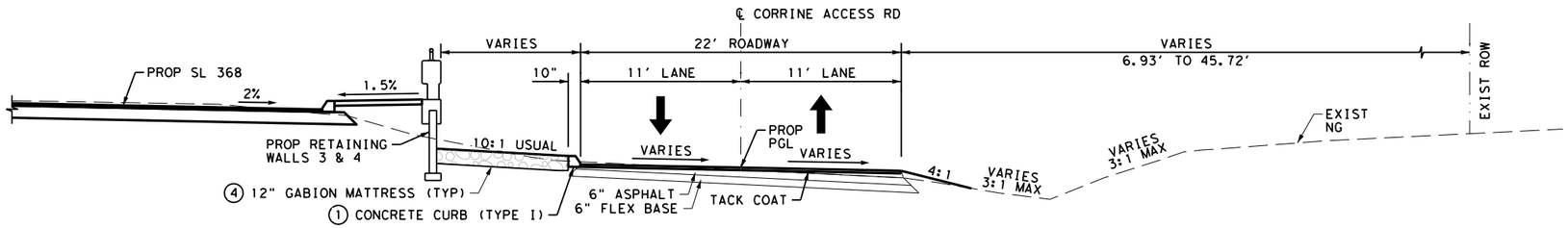
PROPOSED IRA LEE ACCESS RD TYPICAL SECTION

STA 0+36.00 TO 1+25.00



EXISTING CORRINE ACCESS RD TYPICAL SECTION

STA 0+30.00 TO 10+33.86



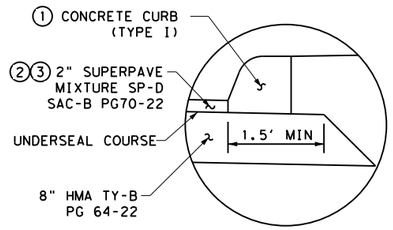
PROPOSED CORRINE ACCESS RD TYPICAL SECTION

STA 0+30.00 TO 1+00.00 (2" MILL, ASPHALT LEVEL UP AND ASPHALT OVERLAY)
STA 1+00.00 TO 1+50.00 (2" MILL, AND ASPHALT OVERLAY)
STA 9+40 TO 10+27.46 (2" MILL, AND ASPHALT OVERLAY) (NO CURB)
STA 10+27.46 TO 10+33.86 (2" MILL, ASPHALT LEVEL UP AND ASPHALT OVERLAY) (NO CURB)

LEGEND

- EXIST TRAFFIC FLOW
- PROP TRAFFIC FLOW

1. REFER TO TxDOT SAN ANTONIO DISTRICT STD DWG
2. SUBSTITUTE PG BINDER IS NOT ALLOWED FOR SURFACE MIXTURE
3. APPLY IN PHASE III TCP
4. CONC RIPRAP AT RETAINING WALL 3 AND GABION MATTRESS AT RETAINING WALL 4



DETAIL A

N. T. S.

0 5' 10'

SCALE: 1" = 10'

STATE OF TEXAS
GLENN G. GREGORY, JR.
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LICENSED PROFESSIONAL ENGINEER

1/27/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

TYPICAL SECTIONS

SHEET 5 OF 5

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		9
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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**********GENERAL NOTES**********
2014 Specification Book

========== **Basis of Estimate** ==========

Item	Description	Rate	Area	Quantity
168	Vegetative Watering	15.6 GAL	7,065 SY	111 MG
310	Asphalt (Prime Coat)	0.30 GAL	3,788 SY	1,137 GAL
3077	Asphalt (Tack Coat)	0.10 GAL	11,124 SY	1,111 GAL
3085	Asphalt (Underseal)	0.20 GAL	3,829 SY	766 GAL

Item	Description	Depth	Area	Quantity
247	Flex Base (ML)	24”	3,546 SY	3,546 SY

========== **Asphalt Concrete Pavement** ==========

Type	Location	Depth	Rate	Area	Quantity
HMA SP-D	(ML, SS)	2”	115 LB/SY-IN	15,291 SY	1,760 TONS
HMA TY-B	(ML)	8”	110 LB/SY-IN	4,256 SY	1,955 TONS
HMA TY-D	(SS)	Varies	110 LB/SY-IN	1,480 SY	36 TONS

The following State, District, Local and/or Utility Standards have been modified: SD-EBR, RW(MSE)DD, RW(TRF), IGEB, BRSM, TYPE C223

Contact the Engineer or the City when construction operations are within 400 feet of a signalized intersection to determine/verify the location of loop detectors, conduit, ground-boxes, etc. Repair or replace any signal equipment damaged by construction operations. The method of repair or replacement shall be pre-approved and inspected. Depending on the type and extent of the damage, the Engineer reserves the right to perform the repair or replacement work and the Contractor will be billed for this work.

City of San Antonio: (210) 207-8642
City of New Braunfels: (830) 221-4049

Remove existing raised pavement markings as the work progresses or as approved. This work is subsidiary to the various bid items. Properly dispose materials removed.

To better fit field conditions, the cross sections may be varied when approved.

If there are waste areas or material source areas, follow the Texas Aggregate Quarry and Pit Safety Act requirements.

Control: 0016-08-039, etc

County: Bexar

Highway: SL 368

Any materials removed and not reused and determined to be salvageable shall be stored within the project limits at an approved location or delivered undamaged to the storage yard as directed. Properly dispose unsalvageable materials in accordance with local, state, and federal regulations. Deface traffic signs so that they will not reappear in public as signs.

Any sign panels that are adjusted or removed and replaced, shall be done the same workday unless otherwise approved. This work shall be considered subsidiary to Item 502.

Notify the Engineer at least two weeks prior to a proposed traffic pattern change(s) that will require a revision to traffic signals.

Locate and reference all manholes and valves within the construction area with station and offset. Each manhole and valve shall be identified by its owner (SAWS, CPS, etc.). No roadwork will begin until this list has been submitted. All valves and manhole covers have to be accessible at all times, therefore; temp. CTB, material stock piles, etc. cannot be placed over these valves or covers.

Adjust or construct all manholes and valves to final pavement elevations prior to the final mat of ACP. If, between the final elevation adjustment and the final mat of ACP, the manholes and valves are going to be exposed to traffic, place temporary asphalt around the manhole and valve to provide a +/- 50:1 taper. The cost of elevation adjustment and the concrete apron around the manhole and valve will be part of the manhole and valve work. The asphalt tapers are part of the ACP work.

Hurricane Evacuation

Hurricane Season is from June 1 thru November 30. As the closest metropolitan city inland from the Texas Coast, the City of San Antonio is a major shelter destination during mandatory hurricane evacuations. As such, planned work zone lane or road closures may be restricted and/or suspended during mandatory hurricane evacuation operations. The District will coordinate these restrictions at a minimum H-120 from any projected impact to the Texas Coast.

No time charges will be made if the Engineer determines that work on the project was impacted by the hurricane.

The Engineer may order changes in the Traffic Control Plan to accommodate evacuation traffic, and may suspend the work, all or in part, to ensure timely completion of this work. All work to implement changes in the Traffic Control Plan will be paid through existing bid prices or through Item 9.5, Force Account. However, the Department will not entertain any request for delay damages, loss of efficiency that may be attributed to the restriction or suspension of road or lane closures, or to changes in the Traffic Control Plan.

If a sanitary sewer overflow (SSO) occurs:

1. Attempt to eliminate the source of the SSO.
2. Contain sewage from the SSO to the extent possible to prevent contamination of waterways.
3. Call SAWS at (210) 233-2015.

The Contractor should be aware that the "San Antonio Water System" (SAWS) will be consulted by the Engineer in matters concerning the execution of the joint bid Water and/or Sanitary work. This may include reviewing material submittals and testing related to this work, as well as inspection and observation of the actual work. As such, a SAWS employee may be reviewing submittals and test results as well as observing the construction and related operations as they progress.

Submit locate request for SAWS water and sewer to TXDOTlocates@saws.org.

Contractor questions on this project are to be addressed to the following individual(s):
Timothy Parker, PE (Area Engineer) Timothy.Parker1@txdot.gov

Contractor questions will be accepted through email, phone, and in person by the above individuals.

All contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address:
https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting Responses/

All questions submitted that generate a response will be posted through this site. The site is organized by District, Project Type (Construction or Maintenance), Letting Date, CCSJ/Project Name.

The Contractor must measure the vertical clearance at each structure after the final surface of the roadway is completed and provide the vertical clearance measurement to the Engineer.

--Item 5--
When a precast or cast-in-place concrete element is included in the plans, a precast concrete alternate may be submitted in accordance with "Standard Operating Procedure for Alternate Precast Proposal Submission" found online at https://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/publications/bridge.html#design. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

Reference all existing striping and other pavement markings to allow these markings to be re-established. Ensure the markings (lane lines, edge lines, ramp gores, etc.) are in line with signs, TMS arrows, etc. located on overhead sign supports.

Taper ACP placed at curb inlets, traffic inlets and slotted drains.

When a bridge deck is milled, seal coated and overlaid, remove excess material. Do not just broom to the sides of the bridge, under guardrail, etc. Cover or protect all sealed expansion joints and rails on bridges and all railroad tracks encountered as approved. Clean all of these features if they weren't properly protected. This work is subsidiary work to applicable bid items. The earthwork information was not developed with computers; therefore, a CD can not be provided. Prior to letting, earthwork cross-sections will be available at the Engineer's office for review by the bidder or for borrowing by copying companies to make copies at the bidder's expense.

When working near aerial electrical lines or utility poles, comply with Federal, State and local regulations. A horizontal boom or equivalent equipment is required for construction in the vicinity of the CPS Energy electric lines in order to provide vertical clearance of equipment during construction. Contact CPS Energy Utility Coordination Group sixteen (16) week in anticipation of pole bracing. The estimated duration for pole bracing is 6 to 10 weeks (or longer if temporary construction easements are required) after invoice is paid. For de-energizing or sleeving of the overhead electrical lines depicted on the plans, please contact CPS Energy Utility Coordination Group sixteen (16) week in anticipation of needed de-energization. The estimated duration for de-energizing is approximately 4 to 6 weeks (after invoice is paid) but could vary on system scenario and backfeed requirements. De-energizing may not be possible in all instances or may be restricted during specific periods of time due to load demand. Contractor will be reimbursed for the invoice cost for pole bracing and/or de-energizing or sleeving through force account "Overhead Utility Pole Bracing/De-energizing".

Prevention of Migratory Bird Nesting

It is anticipated that migratory birds, a protected group of species, may try to nest on bridges, culverts, vegetation, or gravel substrate, at any time of the year. The preferred nesting season for migratory birds is from February 15 through October 1. When practicable, schedule construction operations outside of the preferred nesting season. Otherwise, nests containing migratory birds must be avoided and no work will be performed in the nesting areas until the young birds have fledged.

Structures

Bridge and culvert construction operations cannot begin until swallow nesting prevention is implemented, until after October 1 if it's determined that swallow nesting is actively occurring, or until it's determined swallow nests have been abandoned. If the State installed nesting deterrent on the bridges and culverts, maintain the existing nesting deterrent to prevent swallow nesting until October 1 or completion of the bridge and culvert work, whichever occurs earlier. If new nests are built and occupied after the beginning of the work, do not perform work that can interfere with or discourage swallows from returning to their nests. Prevention of swallow nesting can be performed by one of the following methods:

1. By February 15 begin the removal of any existing mud nests and all other mud placed by swallows for the construction of nests on any portion of the bridge and culverts. The Engineer will inspect the bridges and culverts for nest building activity. If swallows begin nest building, scrape or wash down all nest sites. Perform these activities daily unless the Engineer determines the need to do this work more frequently. Remove nests and mud through October 1 or until bridge and culvert construction operations are completed.

2. By February 15 place a nesting deterrent (which prevents access to the bridge and culvert by swallows) on the entire bridge (except deck and railing) and culverts.

No extension of time or compensation payment will be granted for a delay or suspension of work caused by nesting swallows. This work is subsidiary to the various bid items.

Provide a non-intrusive back-up alarm system on all heavy equipment used in close proximity to residential areas. This item is subsidiary to various bid items.

--Item 6--
Show the stockpile lot and/or sub lot numbers on all tickets for all materials.

Steel Wrapped or Asbestos Utility Lines:

Existing steel wrapped natural gas and/or asbestos cement (AC) water lines that will no longer be in service are usually abandoned in place (AIP). However, if any of these lines have to be removed for whatever reason (in the way of other construction, to make tie-ins, etc.), comply with Item 6.

If removal of AC water lines is included in the construction contract, then notify the Engineer of proposed dates of removal of the AC water lines in accordance to Item 6. Excavate to the top of the AC water line to allow a separate contractor hired by the State to remove the AC water line. The excavation for the AC water line removal is subsidiary to the work that created the need for the removal (excavation for structures, roadway, a new line, tie-ins, etc.).

--Item 7--
The project's total disturbed area is 2.5 acres. The disturbed area in all project locations and Contractor project specific locations (PSL's), within 1/4 mile of the project limits, will further establish the authorization requirements for storm water discharges. The department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. Obtain any required authorization from the TCEQ for any PSL's on or off the ROW. When the total area disturbed on the project and PSL's within 1/4 mile of the project exceeds 5 acres, provide a copy of the Contractor NOI for PSL's to the Engineer (to the appropriate MS4 operator when the project is on an off-state system route).

Notify the Engineer of the disturbed acreage within one (1) mile of the project limits. Obtain authorization from the TCEQ for Contractor PSL's for construction support activities on or off ROW.

No significant traffic generators events identified.

--Item 8--
Working days will be computed and charged in accordance with Article 8.3.1.4 – Standard work week.

Create and maintain a Critical Path Method (CPM) schedule.

The CPM schedule shall be created and maintained using software fully compatible with version 6.1 of Primavera Project Planner.

Provide a Project Schedule Summary Report.

--Item 9--
When approved, provide uniformed, off-duty law enforcement officers with marked vehicles during work that requires a lane closure. The officer in marked vehicles shall be located as approved to monitor or direct traffic during the closure. The method used to direct traffic at signalized intersections shall be as approved. Additional officers and vehicles may be provided when approved or directed.

Complete the daily tracking form provided by the department and submit invoices that agree with the tracking form for payment at the end of each month approved services were provided.

Show proof of certification by the Texas Commission on Law Enforcement Standards.

All law enforcement personnel used in Work Zone Traffic Control shall be trained for performing duties in work zones and are required to take "Safe and Effective Use of Law

Enforcement Personnel in Work Zones" (Course #133119) which can be found online at the following site: www.nhi.fhwa.dot.gov

Certificates of completion should be available to all who finish the course. These should be kept by the officers in order to substantiate completion when reporting to the work site.

Minimums, scheduling fees, etc. will not be paid; TxDOT will consider paying cancellation fees on a case by case basis.

--Item 100--
Begin clearing operations after trees and other areas of vegetation to be protected have been identified and approved. Install fencing around features to be protected as shown in the plans or directed. Coordinate all right of way clearing operations with the SW3P.

Trim and remove brush and trees within the stations noted in the plans and as needed for construction operations. Unless shown otherwise in the plans or a designated non-mow area, perform trimming or removal for areas to the ROW limits. Trim or remove to provide minimum of 5 ft. of horizontal clearance and 7 ft. of vertical clearance for the following: sidewalks, paths, guard fence, rails, signs, object markers, and structures. Trim to provide a minimum of 12 ft. vertical clearance under all trees. This work is subsidiary.

Obtain approval for proposed method of tree and brush trimming and removal. Vertical flailing equipment is not allowed. Treat damaged or cut branches, roots and/or stumps of all oak trees with a commercial tree wound dressing. Disinfect all pruning tools with a solution of 70% alcohol before moving from one tree to another. Unless otherwise approved remove all resulting vegetative debris from the ROW within 24 hours. The Engineer can stop all construction operations if the dressing, cut and removal requirements are not followed.

--Item 110--
Where excavation extends beyond a right of way fence, remove and replace the fence to a comparable condition. This work shall be considered subsidiary to the bid item.

--Item 132--
At no time shall the retaining wall backfill material exceed the adjacent embankment operation by more than one embankment lift. At no time will the embankment adjacent to the retaining wall backfill exceed the wall backfill by any elevation.

--Item 164--
Drill seeding of permanent grasses requires the use of approved grass seeding equipment capable of properly storing and metering the release of small seeds (such as Bermuda grass) separately from fluffy type seeds (such as bluestems). Equipment manufactured for planting grain crops is acceptable for planting temporary cool season seeds, but not for planting the permanent seed mix.

If performing a permanent seeding in an area with established temporary grass cover and mowing is performed instead of tilling, seed and fertilizer may be distributed simultaneously during "Broadcast Seeding" operations, provided each component is applied at the specified rate.

--Item 166--
Use a fertilizer with an analysis of 13-13-13 (50% of the total N must be sulfur coated urea) to apply 60 lbs of actual N per acre. This requires 460 lbs of 13-13-13 per acre or .095 lbs per SY of area.

--Item 168--
Apply vegetative watering as needed to supplement natural rainfall during the vegetation establishment period. Plan quantity of irrigation water is based on the application of a total of 1.3 gal of water each week for each sq. yd. of area that is sodded or seeded. Establishment time is estimated to be 12 weeks for both sod and permanent seed mixes. Temporary seeding will require less time for establishment. Provide a schedule and coordinate watering cycles and rates per cycle with the Engineer. Obtain approval if the quantity of water to be applied is expected to exceed the plan quantity. Adjust the amount of water applied with each cycle and the number of cycles each wk. according to actual site conditions. Drought or other conditions, as determined by the Engineer, may require the application of supplemental irrigation during hours other than normal working hours.

--Item 302--
Previously tested aggregates found to contain excessive quantities of dust (more than 0.5 percent passing the No. 40 sieve) during precoating, stockpiling or hauling operations, may be rejected. Use Test Method Tex-200-F, Part I for testing.

Precoated Aggregate Type PE shall consist of crushed slag, crushed stone or natural limestone rock asphalt.

The Engineer will utilize the Ignition Oven Method (Tex 236-F) for aggregate gradation, with the option of utilizing belt or vacuum extraction gradation in the event the ignition oven malfunctions.

--Item 305--
All reclaimable asphalt pavement (RAP) material will be retained by the Contractor.

--Item 310--
Refinish material that does not receive prime coat within one working day following acceptance of flexible base.

--Item 320--
Construct all longitudinal ACP joints adjacent to a travel lane with a joint maker device that will create a 3:1 to 6:1 taper. For placement of 2 inches or more, the device shall provide a maximum ½ inch vertical edge. Taper outside edges (next to the grass) or backfill (shoulder-up) the same day.

Provide a material transfer device capable of providing a continuous flow of material to the paver. The material transfer device will consist of a windrow elevator or better.

When placing Item 346 mixtures, Use a self-propelled wheel mounted MTV capable of receiving mix from the haul trucks, separate from the paver. It shall have a minimum storage capacity of approximately 25 tons. It shall be equipped with a pivoting discharge conveyor and shall completely and thoroughly remix the material prior to placement. The effectiveness of the MTV's remixing ability is subject to the approval of the Engineer. In addition, the paver shall have a surge storage insert with a minimum capacity of 20 tons.

--Item 330--
The asphalt plant shall have truck scales as defined in Item 520. Give three weight tickets bearing the date, the truck number, and the gross, net & tare weights to the truck driver, for the State inspector at the spreading and finishing operation. Trucks may be required to weigh on public scales or portable platform scales to verify the weight of the ticket.

Use trap rock or crushed slag as the special aggregate for LRA.

If LRA is stockpiled where it might get contaminated with foreign materials, the bottom of the stockpile can not be used. A set of standard truck scales will be used to determine the quantity of contaminated material that will be deducted. Unless approved, do not stockpile LRA more than 10 days prior to lay-down operations.

The fluxing material shall be either an emulsified combination of asphalt and softening agent added individually (the softening agent may also be an emulsion), or a material meeting the requirements of Item "Asphalt's, Oils and Emulsions". The material(s) selected shall be approved.

--Item 340 & 3077--
Table 10, in Item 340, Table 10 in Item 3076 and Table 11in Item 3077, Hamburg Wheel Test Requirements tested in accordance with Tex-242-F are changed for PG 64-22 or lower and PG 70-22. Minimum number of passes at 12.55 mm Rut Depth, Tested at 50 degrees C will be 5,000 and 10,000 respectively.

The asphalt plant shall have truck scales as defined in Item 520. Give three weight tickets bearing the date, ticket number, the truck number, the gross, net & tare weights to the truck driver for the State inspector at the spreading and finishing operation. Trucks may be required to weigh on public scales or portable platform scales to verify the weight of the ticket.

Submit a copy of the Tex 233-F production charts on a weekly basis. At the end of the ACP work, provide all originals.

Crushing of aggregate for hot mix and immediate use for production of the mix is not allowed. Stockpile the aggregate until enough material is available for five days of production unless prior approval is provided

Hold a pre-placement meeting one month prior to the placement of the hot mix.

Do not use diesel or solvents as asphalt release agents in production, transportation, or construction. A list of approved asphalt release agents is available from the District Laboratory.

No more than one hot mix lot will be open for any specific type of hot mix, unless authorized. After a lot is open and the Contractor gets approval to change plants, the previous lot will be closed and a new lot will be opened. The numbering for the lots produced at the new plant will start with No. 1. If allowed to switch back to the original or previous plant, the next lot from that plant will resume numbering sequentially from the last lot produced by that plant.

--Item340--
Binder substitution is not allowed for surface mixtures.

Reference Table 15A and 15B in Item 3076 for Minimum Surface Temperatures.

--Item 401--
A shrinkage compensator is not required when used for backfilling pipes. Strength of the Flowable Backfill will be verified by the District Laboratory. Field testing is not required, unless deemed necessary.

--Item 403--
The Contractor and/or Contractor's Engineer who selects and designs the temporary shoring is responsible for the overall (global) stability calculations as well as internal stability and sliding calculations (including mat and soil nail pullout) as per the TxDOT Bridge Division Geotechnical Manual. If the Contractor chooses a Temporary Earth Retaining Wall for Temporary Shoring, then the Contractor and/or Contractor's Engineer is required also to provide wire struts as shown on these plans. Designs for any type of Retaining Wall used for Temporary Special Shoring shall conform to the TXDOT Geotechnical Manual Chapter 6: Retaining Walls.

The Contractor is responsible for maintaining positive drainage during construction of temp shoring operations and permanent wall structures.

--Item 410 & 411--
Soil Nail and Rock Nail proof and verification testing to be coordinated with TxDOT a minimum of one week prior to the desired testing date. The location of the test nails will be approved by the Engineer. TxDOT personnel may be present during testing, and may choose to monitor the applied test load using their own equipment. Test anchors must project out from the face of the cut enough to accommodate the Contractor's loading and measurement devices, as well as an additional 1 foot for the Department's load cell. Perform testing as specified in the Standard Specification Item 410 "Soil Nail Anchors" and Item 411 “Rock Nail Anchors” to the maximum test load stated.

No less than 10 nails per 50 nails of consistent soil nail lengths may be proof tested. If nail lengths vary, then no less than 5 nails per varying soil nail lengths may be proof tested according to ratios approved by the Engineer. No less than 3 verification test nails may be used for specific soil nail length when variable soil nail lengths are called for in the design. If widely varying soil conditions are encountered, the Engineer may require additional test nails.

Unless contract plans show otherwise, soil nail test loads are as follows for the specific lengths:

Nail Length	Test Load
10’	16 kips
12’	20 kips
14’	23 kips
16’	25 kips
18’	28 kips
20’	34 kips
24’	38 kips
26’	41 kips
30’	46 kips

For varying soil conditions, anchor size and length (especially greater than 30’), Contractor shall submit plans and calculations signed and sealed by a registered professional engineer based on verified and documented geotechnical data. This submittal must be approved by the engineer of record.

Verification test anchors shall be #8 Dywidag or Williams Steel threadbar or equal.
Proof test anchors shall be bar size shown on contract plans.

If test load is not achieved or soil nail fails, Engineer may continue to require additional tests until requirements are satisfied and Engineer gains confidence in the results. All nails that fail in any way, if production nails, are to be supplemented by additional nails and testing to the satisfaction of the Engineer and Owner. Contractor is to provide a summary of test nail results.

This summary is to include the test data in tabular form and a plot of the test data following the guidelines shown in FHWA publication, FHWA-NHI-14-007, FHWA GEC 007, February 2015. Test results are to be provided to the Engineer no more than 48 hours after testing.

The Contractor is responsible for maintaining positive drainage during construction of temp shoring operations and permanent wall structures.

--Item 420--
Mass concrete will be measured in place.

Restrict large aggregate size to ¾” maximum for class “C” concrete used in aesthetic details requiring form liners.

Pier and Bent Concrete will be paid for as “Plans Quantity”.

--Item 421--
Use an automated ticket that contains the same information as TxDOT's ticket. Submit the ticket for approval prior to use. The concrete producer will contact the District Laboratory or the Engineer’s Office (outside the San Antonio area) to inform TxDOT of scheduled structural concrete batching. Structural concrete includes bridge drill shafts, columns, caps, abutments, deck or top slabs of direct traffic culverts.

Entrained air is allowed for Class P and Class HES concrete only. Air content testing is waived for all classes of concrete.

The curing facilities and strength testing equipment is not required for this project.

Poly-fiber reinforced concrete may be used as an option, with the approval by the Engineer, for riprap, sidewalk, curb/gutter, and mow strip. Use a TxDOT approved manufacturer or producer for the poly-fiber. The poly-fibers shall be combined with the concrete in proportions as recommended by the manufacturer. A concrete mix design must be approved by the Engineer.

--Item 422--
For construction of approach slabs, longitudinal joints shall be placed on lane lines. Joints may be either a saw-cut crack control joint or a construction joint. Saw cut joints shall terminate 1’-0” before reaching the edge of the slab, must be saw cut as soon as possible after placement of concrete, and will be cut within 12 hours of concrete placement. Once sawing begins, it should be a continuous operation and should only be stopped if raveling occurs. Saw cut will be to a depth of 1.5” and filled with approved joint sealant.

The bridge approach slab will be poured simultaneously with the bridge deck.

--Item 423--
The backfill material for pre cast retaining walls shall be approved before placement. Build stockpile(s) in lifts not to exceed 2 feet and a minimum working face of not less than 10 feet, but not more than 20 feet.

Use the approved Concrete Block Retaining wall systems listed at:
http://www.txdot.gov/business/resources/approved-systems/retaining-system.html

Use the approved Mechanically Stabilized Earth (MSE) wall systems listed at:
http://www.txdot.gov/business/resources/approved-systems/mse-wall.html

TxDOT does not allow the use of experimental systems on projects with over 50,000 square feet walls over 25 ft. tall, or walls supporting or immediately adjacent to interstate highways.

When proprietary wall systems are used, a qualified representative of the retaining wall manufacturer must be available upon request during wall construction. As requested or required the manufacturer's representative must be on site to assist with the initial stages of wall construction, provide training to the Contractor wall crew and ensure proper interpretation of MSE wall shop drawings and details. Specific attention must be given to nonstandard wall installation details. The Contractor's wall crew foreman must be on site for the duration of wall construction. Any change to the wall crew foreman may require additional training by the wall supplier. The Contractor will ensure that the retaining walls are installed per the details presented in the construction drawings and as per the proprietary wall system requirements. The Engineer reserves the right to suspend wall construction activities due to any construction issue encountered.

Horizontal and vertical nail spacing on temp or permanent soil nail walls shall not exceed 4 ft.

Type DS material will be required on MSE walls in the area of the reinforcement mats.

--Item 425--
Vertical clearance over roadway at the following location(s) is(are) less than or equal to 20 feet. Provide Bars C and CH for the full length of the girder per the IGD standard.

- SL368 over Ira Lee Road

--Item 432--
In all riprap slopes, provide 3 inch diameter weep holes at 10 foot maximum spacing and backed with loose graded gravel or crushed stone and galvanized hardware cloth.

In areas where guard fence posts are to be placed in riprap, the riprap shall have an 18 inch +/- blocked out area (round or square). After the posts are installed, the blocked out area shall be topped off with 4 inches of low strength grout/mortar consisting of about 1 sack of cement per cubic yard of mix.

Match the slope of the Riprap (Mow Strip) to the slope of the adjacent roadway.

--Item 449--
The pipe joint compound used to coat the threads of anchor bolts prior to installation of nuts when erecting a high mast pole shall be an electrically conducting protective thread lubricant compound (Crouse-Hinds TL-2, 0z/Gedney STL, Thomas & Betts Kopr-Shield).

--Item 465--
Concrete Class B invert shaping is required at all inlets, manholes and junction boxes in order to insure positive flow. The material and work performed for the placement of the inverts shall be considered subsidiary to this item.

--Item 496--
The Contractor will submit a demolition plan for all structures to be replaced and/or removed in accordance with Item 496.

The structure(s) to be removed have surface coatings that contain hazardous materials as follows:

- The paint system on the existing bridge metal rails contain lead paint.

Provide for the safety and health of employees and abide by all OSHA Standards and Regulations. All costs incurred for proper management, shall be subsidiary to this Item.

--Item 500--
"Materials on Hand" payments will not be considered in determining percentages for mobilization payments.

--Item 502--
Place standard markings no later than 14 days after surface treatment operations are completed.

When advanced warning flashing arrow panels and/or changeable message sign is specified, have one standby unit in good condition at the job site. Standby time shall be considered subsidiary to the bid item.

Treat the pavement drop-offs as shown in the TCP.

After written notification, the time frame is provided on the Form 599 to provide properly maintained signs and barricades before considered in non-compliance. Failure to make corrections as noted may result in payment for this item being withheld.

There are traffic signals at the intersection of SL368/Eisenhauer Road and SL368/Lanark Drive. Keep the signals in operation at all times except when necessary for specific installation operations, including any modifications to existing signal heads to maintain clear visibility at all times. Adjustment of any signal head will be subsidiary to Item 502. When it is necessary for a signal to be turned off, hire off duty police officers to control the traffic until the signals are back in satisfactory condition.

Moving an existing sign to a temporary location is subsidiary to this Item. Installations with permanent supports at permanent locations will be paid for under the applicable bid item (s).

Mount temporary mailboxes on plastic drum in accordance with Compliant Work Zone Traffic Control Devices, Section K. Mounting and moving the mailbox as needed for the various construction phases is subsidiary to this Item.

Notify the Engineer in writing 10 business days in advance of any temporary or permanent lane, ramp, connector, etc. closures/detours, restrictions to lane widths, alterations to vertical clearances, or modifications to radii. Any other modifications to the roadway that may adversely affect the mobility of oversized/overweight trucks also require 10 business days advance written notice to the Engineer. Unless shown in the TCP, no lane, ramp, connector, etc. closures are allowed during special events. At least one lane has to remain open at all times. Lane closures will not be allowed if this reporting requirement is not met.

Avoid placing stockpiles within the roadway's horizontal clear zone. If a stockpile is placed within the clear zone, address in accordance with the TMUTCD.

Do not place barricades, signs, or any other traffic control devices where they interfere with sight distance at driveways or side streets.

In addition to providing a Contractor's Responsible Person and a phone number for emergency contact, have an employee available to respond on the project for emergencies and for taking corrective measures within 2 hours or within a reasonable time frame as specified by the Engineer.

Moving or adjustment of traffic signal heads, VIVDS, and radar detection for the purpose of alignment with the shifting of lanes in conjunction with the traffic control plan will be subsidiary to various bid items.

If Nighttime work is required and work is not behind positive barrier then full TY 3 reflective gear is required to be worn by all workers, hard hat halos are required to be worn by the flaggers

at flagging stations, TY III barricades are required to be spaced at 500 ft, and a mandatory night work meeting is required.

The Contractor Force Account "Safety Contingency" that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's Responsible Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

--Item 506--
An Inspector will perform a regularly scheduled SWP3 inspection every 7 calendar days.

Failure to address items noted on the SW3P inspection report within two report cycles may result in the Department stopping all construction operations, exclusive of time charges, or withholding that month's estimate until the SW3P deficiencies are corrected unless the Engineer determines that the area is too wet to correct SW3P deficiencies.

Failure to correctly maintain daily monitoring reports and submitting to TxDOT on a daily/weekly basis may result in the monthly estimate being withheld.

--Item 512--
Portable traffic barrier manufactured after December 31, 2019 must have been successfully tested to the 2016 edition of MASH and will be manufactured in accordance with the Standard Sheets in the plans. Portable traffic barrier manufactured on or before this date, and successfully tested to NCHRP Report 350 or the 2009 edition of MASH may continue to be used throughout their normal service lives, but must be the same shape type as shown in the plans.

Only Single Slope shape CTB may be furnished on the inside shoulder/inside median of the Interstate or Freeway Main Lanes.

More than one shape type of CTB may be furnished on a project, although no mixing of CTB shape types will be permitted along a continuous segment of CTB.

--Item 514--
Any permanent CTB requiring conduit for illumination must be cast in place or slip formed.

--Item 529--
Class "C" concrete is required for machine extruded curb.

Curb inlets and extensions are based on an exposed curb height of 7 inches. The roadway curb height and shape will be transitioned to the inlet's curb with a 40: 1 taper.

--Item 531--
The curb ramp locations shown in the plans have taken into account the geometric features of the intersection, traffic signals, and the pavement markings. If anything changes during construction, the location of curb ramps must be adjusted to ensure they meet TAS requirements.

--Item 540--
MBGF posts shall be round with domed tops, and not painted. If 10 or less timber posts are needed, they may be purchased locally and will be accepted by visual inspection.

Guard fence posts placed in proposed and/or existing areas of riprap, sidewalks or other concrete shall have an 18 inch +/- (square or round) block out in the concrete. After the posts are installed, the blocked out area shall be topped off with 4 inches of low strength grout/mortar consisting of about 1 sack of cement per cubic yard of mix.

When connecting a Thrie-Beam to a concrete wingwall, bridge rail, CTB, etc., drill the holes for bolt placement using rotary or core type equipment. Use a core type drill when reinforcing steel is encountered. Do not use percussion or impact drilling. Repair damage to the concrete and spalls exceeding ½" from the edge of the hole.

--Item 542--
Salvage all undamaged/acceptable radius guardrail and deliver to the TxDOT maintenance section yard.

--Item 545--
See the Crash Cushion Summary Sheet.

--Item 556--
Coarse Aggregate Grade 3 meeting requirements of Item 421, Table 4, is acceptable for Filter Material.

--Item 585--
Use Surface Test Type B, pay adjustment schedule 3 to evaluate ride quality of travel lanes.

--Item 610--
Fabricate steel roadway illumination poles in accordance with the RIP standards. Poles fabricated according to RIP require no shop drawings. Alternate designs or the use of aluminum to fabricate poles will require the submission of shop drawings electronically.

For instructions on submitting shop drawings electronically go to:
http://www.txdot.gov/business/resources/specifications/shop-drawings.html File is titled: Guide to Electronic Shop Drawing Submittal.

Provide lamps from the pre-qualified Materials Producers List, Category is "Roadway Illumination and Electrical Supplies" located on the Construction Divisions (CST) web site.

The lamps in light fixtures may contain hazardous levels of mercury, halide, and sodium vapors. Observe and comply with all federal, state and local laws, ordinances and regulations regarding the management of these lamps. Prevent the breakage of the lamps. At a minimum, package all lamps removed from the light fixture(s) in a container that minimizes the breakage of the lamps. Broken lamps shall be collected in a sealed plastic bag (i.e. Ziploc). Broken lamps shall be stored in separate containers from unbroken lamps. Furnish a suitable container and attach a label stating "Universal Waste Lamps" on the container. Write the date the first lamp was placed in the container on the "Universal Waste Lamp" label. Within one (1) week after the first lamp is placed in a container, notify the Engineer. The lamps and PCB containing ballast/capacitors, placed in properly labeled containers, will remain the property of the State. Place the container in an area where it is protected from damage and the elements. The Engineer will make arrangements to collect, transport, and dispose/recycle the container. The ballast/capacitor and lamp's removal and storage is subsidiary to this item.

--Item 618--
It might be necessary to cut concrete for placement of conduit. Saw cut existing concrete, remove the concrete from the steel reinforcement (bars or fabric) and bend the steel to install the conduit. After the conduit has been placed, bend the steel back to its original position and back-fill the trench with an approved concrete. This work is subsidiary to this Item.

The conduit depth for illumination under the City of San Antonio streets is 36 inches.

Use materials from Material Producers list as shown on the Construction Division's (CST) web site. Category is "Roadway Illumination and Electrical Supplies."

--Item 628--
Make all arrangements for electrical service, and compliance with local standards and practices for proper installations.

--Item 644--
The wedge anchor system shown on State Standard Sheet SMD (TWT) is not allowed.

The set screw type for Triangular Slipbase Systems is not allowed. Use the following products for the Triangular Slipbase System.

Triangular Slip Base Systems
(For use with 10 BWG and Schedule 80 Round Posts)

Southern Plains Fabrication	SPF Triangular Slipbase Housing	Info@SouthernPlainsFabrication.com http://SouthernPlainsFabrication.com (806) 241-0060
Structural and Steel Products	Triangular Slipbase Breakaway Support	CustServ@s-steel.com http://s-steelcom (800) 782-5804

--Item 658--
CTB reflectors will not be paid for directly but will be considered subsidiary to the barrier.

--Item 662--
Raised reflective pavement markings are required when using work zone reflective pavement markings for lane lines as shown in the standards. The raised reflective pavement markings must be placed during the same operation for installation of the work zone reflective pavement markings and placed before the roadway is open to traffic. These raised reflective pavement markings will be subsidiary to work zone pavement markings.

--Item 666--
Use TY II material (vs. an acrylic or epoxy) as the sealer for the TY I markings, place the TY II a minimum of 14 calendar days (to provide adequate curing) before placing the TY I markings.

Failure to provide the retroreflectometer testing data within the time specified in the specifications will result in non-payment of the bid item.

--Item 672--
Place all adhesive material directly from the heated dispenser to the pavement. Do not use portable or non-heated containers. Use adhesive of sufficient thickness so that when the marker is pressed into the adhesive, 1/8" or more adhesive will remain under 100% of the marker. The adhesive should extend not less than 1/2" but not more than 1 1/2" beyond the perimeter of the marker.

--Item 677--
Obtain approval before using the mechanical method for the elimination of existing thermoplastic pavement markings.

--Item 680--
Furnish and install all required materials and equipment necessary for the complete and operating traffic signal installation at the following intersections:

- SL 368 at Corrine Drive.

All workers installing electrical materials, including conduit in trenches, service poles and all other system electrical apparatus, will be directly supervised by persons who have completed a TxDOT approved course in electrical underground installations. Furnish evidence of satisfactory completion of the underground electrical installation for roadway illumination and signal control course for all personnel responsible for direct supervision of electrical installation work.

The locations shown on the plans for signal pole foundations, controller foundations, conduit and other items may be adjusted to better fit field conditions as approved.

Once final punch list is complete, contractor is allowed to begin flashing signal operations. Signal shall flash for a minimum of 7 days prior to full operation, unless otherwise approved by the Engineer.

Use LED lamps from the prequalified material producer lists as shown on the Texas Department of Transportation (TxDOT) – Construction Division's (CST) material producer list. Category is "Roadway Illumination and Electrical Supplies." under item 610. No substitutions will be allowed for materials found on this list.

Demonstrate that the field wiring is properly installed, install the controller assembly, connect the wiring and turn on the controller.

The following wiring sequence shall be used when connecting signal sections to the cabinet:

Conductor No.	Base Color	Tracer Color	Signal Face
1	Black		Yellow Ball
2	White		Neutral
3	Red		Red Ball
4	Green		Green Ball
5	Orange		Yellow Arrow
6	Blue		Green Arrow
7	White	Black	Spare

Use qualified personnel to respond to and diagnose all trouble calls during the thirty-day test period. Repair any malfunction to Contractor-supplied signal equipment. Provide to the Engineer a local telephone number, not subject to frequent changes and available on a 24-hour basis, for reporting trouble calls. Response time to reported calls must be less than 2 hours. Make appropriate repairs within 24 hours. Place a logbook in the controller cabinet and keep a record of

each trouble call reported. Notify the Engineer of each trouble call. Do not clear the error log in the conflict monitor or MMU during the thirty-day test period without approval.

Provide a submittal compliance matrix with all traffic signal submittals.

Contractor shall be responsible for field verifying the depths of the drill shafts to meet the minimum clearances specified in the plans before ordering materials.

Damage to existing facilities such as traffic signal equipment, conduit, cables, etc. caused by the contractor during construction will be replaced by the contractor at no cost to TxDOT with equipment as approved by the engineer. Replace all pavements, sidewalk, curb, rip-rap or any item damaged during construction subsidiary to various bid items with no direct payment. Any damage that was not caused by the contractor during operations will be reimbursed for repair of damage caused by: motor vehicle, watercraft, aircraft, or railroad-train incident, vandalism or acts of God, such as earthquake, tidal wave, tornado, hurricane, or other cataclysmic phenomena of nature.

Security against theft and vandalism of all traffic signal equipment is the full responsibility of the contractor until the date of final acceptance of the project by the engineer.

Perform all electrical work in accordance with the National Electrical Code and Texas Department of Transportation Specifications.

In accordance with the Underground Facility Damage Prevention Act (One Call Bill) the phone number for a utility locator is 1-800-545-6005. It is the Contractor's responsibility to make arrangements for utility locators as needed.

Underground utilities owned by the Texas Department of Transportation may be present within the Right-Of-Way. Call the TxDOT offices listed below for locates a minimum of 48 hours in advance of excavation. If city or town owned irrigation facilities are present, call the appropriate department of the local city or town a minimum of 48 hours in advance of excavation. The Contractor is liable for all damages incurred to the above mentioned utilities when working without having the utilities located prior to excavation.

--Item 682--
Provide all signal heads from the same manufacturer. Pedestrian signals may be by a different manufacturer than the vehicle signal heads.

Cover all signal faces until placed in operation.

All pedestrian signal faces shall be single section LED Type. Die cast polycarbonate is acceptable in lieu of die cast aluminum. All mounting attachments shall be constructed of steel pipe and mounted as shown on the plans.

Control: 0016-08-039, etc

County: Bexar

Highway: SL 368

--Item 684--
Provide an extra 10’ for each cable terminating in the controller cabinet. All cables shall be continuous without splices from terminal point to terminal point. All proposed signal cable shall be #12 AWG stranded copper.

--Item 686 & 687--
Provide all signal poles from the same manufacturer. Pedestrian poles may be from a different manufacturer.

--Item 730--
Mow full-width and hand trim the right of way, including newly seeded or sodded areas, when vegetation reaches a height of 16” or when directed. Removal of brush sprouts growing within guardrail, concrete barriers or at other locations where mowing or hand trimming is done within the limits of construction is required and subsidiary to this item. Mowing may be required more often in newly sodded or seeded areas than in other parts of the project because of the supplemental irrigation these areas receive and the resulting weed growth. Coordinate mowing to avoid rutting or compaction of the soil when mowing where supplemental irrigation is being used. Use mowing equipment that will not adversely affect soil retention blankets or mulches that have been applied. Work performed under this item does not replace the mowing required when placing permanent seeding in an area that has established temporary seeding as described in Article 164.3, Construction.

--Item 734 & 738--
Perform Litter Removal and Cleaning and Sweeping Highways once a month or as directed.

--Item 3085--
The minimum application rates are listed in Table UC. The Engineer may adjust the application rates taking into consideration the existing pavement surface conditions.

Table UC

Material	Minimum Application Rate (gal. per square yard)
TRAIL – Hot Asphalt	0.15
Spray Applied Underseal Membrane	0.20
Seal Coat – Emulsion (CHFRS-2P, CRS-2P)	0.25
Seal Coat – Asphalt (AC-15P, AC-20-5TR, AC-20XP, AC10-2TR)	0.23
Aggregate for Seal Coat Options TY PB GR 4(AC) or TY B GR 4(Emulsion)	1 CY:120 SY

Control: 0016-08-039, etc

County: Bexar

Highway: SL 368

--Item 4171--
Install bridge identification numbers shown below for each of the following listed bridges in accordance to the special specification and San Antonio District Standard. Install the bridge identification number on two locations as shown on the plans, or as directed. For bridges in a two-way condition, install the bridge identification number on each outside beam on the upstream side of traffic. For bridges in a one-way condition, install the bridge identification number on each side, opposite corners on each outside beam. For culverts less than 5 ft. in height, install the bridge identification number on the headwall on upstream and downstream location. For culverts greater than 5 ft. in height, install the bridge identification number inside the first barrel on the upstream side of traffic and inside the last barrel on the opposite corner in the direction of traffic.

- SL 368 at Salado Creek

--Item 6185--
1 shadow vehicle with TMA will be required for this project. The TMA's will be measured and paid for by the DAY for each TMA/TA set up and operational on the worksite. The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMA's needed for the project. See TMA and TA Summary sheet in the plans.

--STATE FORCE ACCOUNT WORK (NON-PARTICIPATING)--
Asbestos Utility Lines:
Existing asbestos cement (AC) water lines that will no longer be in service and crossing the roadway (located under the pavement) are usually abandoned in place (AIP). However, if any of these lines have to be removed for whatever reason (in the way of construction, to make tie-ins, etc.), comply with Item 6.

For removal of AC water lines included in the construction contract, notify the Engineer of the proposed dates of removal of the AC water lines in accordance to Item 6.

--OTHER: STATE FORCE ACCOUNT WORK (NON-PARTICIPATING)--
For removal of a portion of the paint system containing hazardous materials on the existing steel bridge, in accordance with notes on the EPIC sheet.

QUANTITY SHEET

CONTROLLING PROJECT ID 0016-08-039 **DISTRICT** San Antonio **COUNTY** Bexar
HIGHWAY SL 368

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0016-08-039**			
		PROJECT ID		**A00062097**			
		COUNTY		**Bexar**			
		HIGHWAY		**SL 368**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	01	STATE FORCE ACCOUNT WORK (NON-PARTICIPATING)		1.000		1.000	
		OTHER: STATE FORCE ACCOUNT WORK (NON-PARTICIPATING)	LS	1.000		1.000	
	100-6002	PREPARING ROW	STA	21.500		21.500	
	104-6009	REMOVING CONC (RIPRAP)	SY	1,524.000		1,524.000	
	104-6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	279.000		279.000	
	105-6048	REMOVING STAB BASE & ASPH PAV (4"-11")	SY	4,674.000		4,674.000	
	110-6001	EXCAVATION (ROADWAY)	CY	8,051.000		8,051.000	
	132-6002	EMBANKMENT (FINAL)(DENS CONT)(TY A)	CY	696.000		696.000	
	161-6017	COMPOST MANUF TOPSOIL (4")	SY	7,065.000		7,065.000	
	164-6027	CELL FBR MLCH SEED(PERM)(URBAN)(CLAY)	SY	7,065.000		7,065.000	
	164-6029	CELL FBR MLCH SEED(TEMP)(WARM)	SY	3,533.000		3,533.000	
	164-6031	CELL FBR MLCH SEED(TEMP)(COOL)	SY	3,533.000		3,533.000	
	168-6001	VEGETATIVE WATERING	MG	111.000		111.000	
	169-6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	7,065.000		7,065.000	
	216-6001	PROOF ROLLING	HR	85.000		85.000	
	247-6487	FL BS (CMP IN PLC) (TY D GR 1-2) (24")	SY	3,546.000		3,546.000	
	310-6027	PRIME COAT(MC-30 OR AE-P)	GAL	1,137.000		1,137.000	
	340-6011	D-GR HMA(SQ) TY-B PG64-22	TON	1,967.000		1,967.000	
	340-6120	D-GR HMA(SQ) TY-D SAC-B PG70-22	TON	4.000		4.000	
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	TON	36.000		36.000	
	354-6045	PLANE ASPH CONC PAV (2")	SY	11,160.000		11,160.000	
	400-6001	STRUCT EXCAV	CY	193.000		193.000	
	400-6003	STRUCT EXCAV (PIPE)	CY	101.000		101.000	
	400-6004	STRUCT EXCAV (BRIDGE)	CY	57.000		57.000	
	400-6005	CEM STABIL BKFL	CY	100.000		100.000	
	400-6008	CUT & RESTORE ASPH PAVING	SY	116.000		116.000	
	402-6001	TRENCH EXCAVATION PROTECTION	LF	144.000		144.000	
	403-6001	TEMPORARY SPL SHORING	SF	9,078.000		9,078.000	
	416-6004	DRILL SHAFT (36 IN)	LF	3,350.000		3,350.000	
	416-6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	13.000		13.000	
	420-6011	CL B CONC (FLUME)	CY	13.000		13.000	
	420-6013	CL C CONC (ABUT)	CY	111.000		111.000	
	420-6029	CL C CONC (CAP)	CY	276.000		276.000	
	420-6037	CL C CONC (COLUMN)	CY	195.000		195.000	
	420-6043	CL C CONC (FOOTING)	CY	26.000		26.000	
	422-6001	REINF CONC SLAB	SF	39,980.000		39,980.000	

QUANTITY SHEET

CONTROLLING PROJECT ID 0016-08-039 **DISTRICT** San Antonio **COUNTY** Bexar
HIGHWAY SL 368

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0016-08-039**			
		PROJECT ID		**A00062097**			
		COUNTY		**Bexar**			
		HIGHWAY		**SL 368**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	422-6013	BRIDGE SIDEWALK	SF	8,840.000		8,840.000	
	422-6015	APPROACH SLAB	CY	425.100		425.100	
	423-6001	RETAINING WALL (MSE)	SF	8,226.000		8,226.000	
	425-6036	PRESTR CONC GIRDER (TX34)	LF	5,433.600		5,433.600	
	432-6001	RIPRAP (CONC)(4 IN)	CY	39.000		39.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	14.000		14.000	
	442-6007	STR STEEL (MISC NON - BRIDGE)	LB	12,600.000		12,600.000	
	450-6032	RAIL (TY C223)	LF	1,523.000		1,523.000	
	454-6018	SEALED EXPANSION JOINT (4 IN) (SEJ - M)	LF	312.000		312.000	
	459-6007	GABION MATTRESSES (GALV)(12 IN)	SY	5,539.900		5,539.900	
	459-6009	GABIONS (3' X 3')(GALV)	CY	228.200		228.200	
	464-6033	RC PIPE (ARCH)(CL III)(DES 4)	LF	112.000		112.000	
	465-6079	INLET (COMPL)(PSL)(RG)(4FTX4FT)	EA	3.000		3.000	
	465-6082	INLET (COMPL)(PSL)(RG)(5FTX5FT)	EA	1.000		1.000	
	466-6206	WINGWALL (SW - 0) (HW=3 FT)	EA	1.000		1.000	
	496-6007	REMOV STR (PIPE)	LF	68.000		68.000	
	496-6010	REMOV STR (BRIDGE 100 - 499 FT LENGTH)	EA	1.000		1.000	
	496-6065	REMOV STR(LRG PED BRG) 0-50 FT LENGTH	EA	1.000		1.000	
	500-6001	MOBILIZATION	LS	100.00%		100.00%	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	30.000		30.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	448.000		448.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	448.000		448.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	3,320.000		3,320.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	3,320.000		3,320.000	
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	LF	1,082.000		1,082.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	1,082.000		1,082.000	
	506-6047	TEMP SDMT CONT FENCE (INLET PROTECTION)	LF	80.000		80.000	
	508-6001	CONSTRUCTING DETOURS	SY	46.000		46.000	
	512-6005	PORT CTB (FUR & INST)(F-SHAPE)(TY 1)	LF	2,000.000		2,000.000	
	512-6009	PORT CTB (FUR & INST)(LOW PROF)(TY 1)	LF	1,769.000		1,769.000	
	512-6010	PORT CTB (FUR & INST)(LOW PROF)(TY 2)	LF	140.000		140.000	
	512-6033	PORT CTB (MOVE)(LOW PROF)(TY 1)	LF	438.000		438.000	
	512-6034	PORT CTB (MOVE)(LOW PROF)(TY 2)	LF	140.000		140.000	
	512-6053	PORT CTB (REMOVE)(F-SHAPE)(TY 1)	LF	2,020.000		2,020.000	
	512-6057	PORT CTB (REMOVE)(LOW PROF)(TY 1)	LF	1,769.000		1,769.000	
	512-6058	PORT CTB (REMOVE)(LOW PROF)(TY 2)	LF	180.000		180.000	
	512-6099	PCTB(FUR & INST)(F-SHP TO LOW PROF)TY T	LF	40.000		40.000	

QUANTITY SHEET

CONTROLLING PROJECT ID 0016-08-039 **DISTRICT** San Antonio **COUNTY** Bexar
HIGHWAY SL 368

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0016-08-039**			
		PROJECT ID		**A00062097**			
		COUNTY		**Bexar**			
		HIGHWAY		**SL 368**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	529-6001	CONC CURB (TY I)	LF	738.000		738.000	
	531-6001	CONC SIDEWALKS (4")	SY	273.000		273.000	
	531-6004	CURB RAMPS (TY 1)	EA	2.000		2.000	
	531-6013	CURB RAMPS (TY 10)	EA	4.000		4.000	
	540-6002	MTL W-BEAM GD FEN (STEEL POST)	LF	190.500		190.500	
	540-6007	MTL BEAM GD FEN TRANS (TL2)	EA	1.000		1.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	664.000		664.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2.000		2.000	
	545-6026	CRASH CUSHION ATTEN (INSTALL) (QUAD)(N)	EA	1.000		1.000	
	610-6010	REMOVE RD IL ASM (U/P)	EA	5.000		5.000	
	610-6104	IN RD IL (U/P) (TY 1) (150W EQ) LED	EA	8.000		8.000	
	618-6016	CONDT (PVC) (SCH 40) (1")	LF	1,597.000		1,597.000	
	618-6021	CONDT (PVC) (SCH 40) (1 1/2")	LF	436.000		436.000	
	618-6040	CONDT (PVC) (SCH 80) (1")	LF	398.000		398.000	
	618-6064	CONDT (RM) (1")	LF	677.000		677.000	
	618-6068	CONDT (RM) (1 1/2")	LF	1,112.000		1,112.000	
	620-6006	ELEC CONDR (NO.10) INSULATED	LF	17,162.000		17,162.000	
	620-6014	ELEC CONDR (NO.3) INSULATED	LF	98.000		98.000	
	621-6005	TRAY CABLE (4 CONDR) (12 AWG)	LF	435.000		435.000	
	624-6004	GROUND BOX TY B (122322)W/APRON	EA	4.000		4.000	
	624-6010	GROUND BOX TY D (162922)W/APRON	EA	5.000		5.000	
	624-6028	REMOVE GROUND BOX	EA	5.000		5.000	
	625-6004	ZINC-COAT STL WIRE STRAND (5/16")	LF	185.000		185.000	
	627-6001	TIMBER POLE (CL 2) 30 FT	EA	1.000		1.000	
	628-6002	REMOVE ELECTRICAL SERVICES	EA	2.000		2.000	
	628-6237	ELC SRV TY D 120/240 100(NS)SS(E)EX(U)	EA	2.000		2.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	19.000		19.000	
	644-6064	IN BRIDGE MNT CLEARANCE SGN ASSM(TY N)	EA	1.000		1.000	
	644-6065	IN BRIDGE MNT CLEARANCE SGN ASSM(TY S)	EA	1.000		1.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	2.000		2.000	
	658-6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	30.000		30.000	
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	6.000		6.000	
	658-6106	INSTL OM ASSM (OM-3R)(WFLX)GND)GND	EA	1.000		1.000	
	662-6046	WK ZN PAV MRK REMOV (REFL) TY I-A	EA	289.000		289.000	
	662-6048	WK ZN PAV MRK REMOV (REFL) TY I-C	EA	327.000		327.000	
	662-6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	11,476.000		11,476.000	
	662-6080	WK ZN PAV MRK REMOV (W)(ARROW)	EA	5.000		5.000	

QUANTITY SHEET

CONTROLLING PROJECT ID 0016-08-039 **DISTRICT** San Antonio **COUNTY** Bexar
HIGHWAY SL 368

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0016-08-039**			
		PROJECT ID		**A00062097**			
		COUNTY		**Bexar**			
		HIGHWAY		**SL 368**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	662-6093	WK ZN PAV MRK REMOV (Y)4"(BRK)	LF	2,149.000		2,149.000	
	662-6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	13,864.000		13,864.000	
	662-6102	WK ZN PAV MRK REMOV (Y)24"(SLD)	LF	113.000		113.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	245.000		245.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	127.000		127.000	
	666-6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	10.000		10.000	
	666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	2.000		2.000	
	666-6224	PAVEMENT SEALER 4"	LF	15,994.000		15,994.000	
	666-6226	PAVEMENT SEALER 8"	LF	245.000		245.000	
	666-6230	PAVEMENT SEALER 24"	LF	127.000		127.000	
	666-6231	PAVEMENT SEALER (ARROW)	EA	10.000		10.000	
	666-6232	PAVEMENT SEALER (WORD)	EA	2.000		2.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	4,268.000		4,268.000	
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4,114.000		4,114.000	
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	2,297.000		2,297.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	5,070.000		5,070.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	170.000		170.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	160.000		160.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	11,987.000		11,987.000	
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	3.000		3.000	
	678-6033	PAV SURF PREP FOR MRK (RPM)	EA	330.000		330.000	
	680-6002	INSTALL HWY TRF SIG (ISOLATED)	EA	1.000		1.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	4.000		4.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA	8.000		8.000	
	684-6009	TRF SIG CBL (TY A)(12 AWG)(4 CONDR)	LF	865.000		865.000	
	684-6057	TRF SIG CBL (TY A)(18 AWG)(7 CONDR)	LF	5,860.000		5,860.000	
	685-6002	RELOCATE RDSD FLASH BEACON ASSEMBLY	EA	2.000		2.000	
	686-6008	INS TRF SIG PL AM (S)STR(TY B)LUM	EA	1.000		1.000	
	690-6009	REMOVAL OF CABLES	LF	155.000		155.000	
	690-6016	REMOVAL OF SPAN CABLE ASSM	LF	515.000		515.000	
	690-6024	REMOVAL OF SIGNAL HEAD ASSM	EA	6.000		6.000	
	690-6033	REMOVAL OF TRAFFIC SIGNAL POLE FND	LF	26.000		26.000	
	690-6051	REMOVAL OF SIGNAL POLE ASSM	EA	2.000		2.000	
	730-6107	FULL - WIDTH MOWING	CYC	10.000		10.000	
	734-6002	LITTER REMOVAL	CYC	30.000		30.000	
	738-6318	CLEAN/SWEEP AREA 1	CYC	30.000		30.000	
	740-6005	ANTI - GRAFFITI COATNG(PERMNENT-TY III)	SF	6,505.000		6,505.000	

QUANTITY SHEET

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HIGHWAY SL 368

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0016-08-039**			
		PROJECT ID		**A00062097**			
		COUNTY		**Bexar**			
		HIGHWAY		**SL 368**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	752-6007	TREE REMOVAL (18" - 24" DIA)	EA	5.000		5.000	
	752-6008	TREE REMOVAL (24" - 30" DIA)	EA	1.000		1.000	
	752-6009	TREE REMOVAL (30" - 36" DIA)	EA	1.000		1.000	
	3077-6053	SP MIXESSP-DSAC-B PG70-22	TON	1,760.000		1,760.000	
	3077-6075	TACK COAT	GAL	1,111.000		1,111.000	
	3085-6001	UNDERSEAL COURSE	GAL	766.000		766.000	
	4171-6001	INSTALL BRIDGE IDENTIFICATION NUMBERS	EA	2.000		2.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	10.000		10.000	
	6027-6003	CONDUIT (PREPARE)	LF	35.000		35.000	
	6027-6008	GROUND BOX (PREPARE)	EA	2.000		2.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	3.000		3.000	
	7196-6001	TRENCH EXCAVATION PROTECTION	LF	227.000		227.000	
	7196-6002	DUCTILE IRON FITTINGS	TON	2.230		2.230	
	7196-6003	HYDROSTATIC PRESSURE TEST	EA	1.000		1.000	
	7196-6004	TEMPORARY BLOW-OFF(COMPLETE)(2")	EA	3.000		3.000	
	7196-6005	FLOWABLE FILL BACKFILL	CY	11.000		11.000	
	7196-6030	GATE VALVE & BOX (COMPLETE)(16")	EA	1.000		1.000	
	7196-6035	TIE-IN (COMPLETE)(16")	EA	3.000		3.000	
	7196-6037	AIR RELEASE VALVE (COMPLETE)(1")	EA	1.000		1.000	
	7196-6049	PIPE WATER MAIN (PVC) (16")	LF	229.000		229.000	
	7196-6056	STEEL CASING (30") (BORE)	LF	198.000		198.000	
	7196-6057	CARRIER PIPE (PVC)(16")	LF	198.000		198.000	
	7196-6058	WTR(JACK, BORE, OR TUNNEL)(30")	LF	198.000		198.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		Overhead Utility Pole Bracing/De-energizing	LS	1.000		1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	
		LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	

SUMMARY OF ROADWAY ITEMS

LOCATION (STATION TO STATION)	ITEM 100 6002 PREPARING ROW	ITEM 110 6001 EXCAVATION (ROADWAY)	ITEM 132 6002 EMBANKMENT (FINAL)(DENS CONT)(TY A)	ITEM 132 6006 EMBANKMENT (FINAL)(DENS CONT)(TY C) ④	ITEM 216 6001 PROOF ROLLING	ITEM 247 6475 FL BS (CIP)(TY D GR 1-2, OR 5)FINAL POS ①	ITEM 247 6487 FL BS (CMP IN PLC) (TY D GR 1-2) (24")	ITEM 310 6027 PRIME COAT (MC-30 OR AE-P)	ITEM 340 6011 D-GR HMA(SQ) TY-B PG64-22	ITEM 340 6247 D-GR HMA (SQ) TY-D PG 70-22 (LEVEL-UP)	ITEM 420 6011 CL B CONC (FLUME)	ITEM 432 6001 RIPRAP (CONC)(4 IN)	ITEM 432 6045 RIPRAP (MOW STRIP)(4 IN)	ITEM 529 6001 CONC CURB (TY I)	ITEM 531 6001 CONC SIDEWALKS (4")	ITEM 531 6004 CURB RAMPS (TY 1)	ITEM 531 6013 CURB RAMPS (TY 10)	ITEM 540 6002 MTL W-BEAM GD FEN (STEEL POST)	ITEM 540 6007 MTL BEAM GD FEN TRANS (TL2)	ITEM 544 6001 GUARDRAIL END TREATMENT (INSTALL)	ITEM 545 6026 CRASH CUSHION ATTEN (INSTALL)(QUAD)(N)	ITEM 3077 6053 SP MIXES SP-D SAC-B PG70-22	ITEM 3077 6075 TACK COAT	ITEM 3085 6001 UNDERSEAL COURSE
	STA	CY	CY	CY	HR	CY	SY	GAL	TON	TON	CY	CY	CY	LF	SY	EA	EA	LF	EA	EA	EA	TON	GAL	GAL
3+75.00 TO 8+50.00	4.75																					448	389	
8+50.00 TO 14+00.00	5.50	2898	461	3543	30	35	1721	516	465			6	1	155	97		2				1	233	177	344
14+00.00 TO 19+50.00	5.50	4441	227	5601	30	61	1825	548	970		13		5	269	176		2	12.5	1	1		248	42	365
19+50.00 TO 25+25.00	5.75	712	8		15				315													655	503	
IRA LEE RD													8					178		1				
IRA LEE ACCESS RD					4				125			2		252								33		57
CORRINE ACCESS RD SOUTH										22				62								88		
CORRINE ACCESS RD NORTH										14												55		
SALADO CREEK GREENWAY TRAIL					6	52		73	80							2								
PROJECT TOTALS	**21.50**	**8051**	**696**	**9144**	**85**	**148**	**3546**	**1137**	**1955**	**36**	**13**	**8**	**14**	**738**	**273**	**2**	**4**	**190.5**	**1**	**2**	**1**	**1760**	**1111**	**766**

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS

LOCATION (STATION TO STATION)	ITEM 403 6001 TEMPORARY SPL SHORING	ITEM 502 6001 BARRICADES, SIGNS AND TRAFFIC HANDLING	ITEM 508 6001 CONSTRUCTING DETOURS	ITEM 512 6005 PORT CTB (FUR & INST)(F-SHAPE)(TY 1)	ITEM 512 6009 PORT CTB (FUR & INST)(LOW PROF)(TY 1)	ITEM 512 6010 PORT CTB (FUR & INST)(LOW PROF)(TY 2)	ITEM 512 6033 PORT CTB (MOVE)(LOW PROF)(TY 1)	ITEM 512 6034 PORT CTB (MOVE)(LOW PROF)(TY 2)	ITEM 512 6053 PORT CTB (REMOVE)(F-SHAPE)(TY 1)	ITEM 512 6057 PORT CTB (REMOVE)(LOW PROF)(TY 1)	ITEM 512 6058 PORT CTB (REMOVE)(LOW PROF)(TY 2)	ITEM 512 6099 PCTB(FUR & INST)(F-SHP TO LOW PROF)TY T	ITEM 662 6046 WK ZN PAV MRK REMOV (REFL) TY I-A	ITEM 662 6048 WK ZN PAV MRK REMOV (REFL) TY I-C	ITEM 662 6063 WK ZN PAV MRK REMOV (W)4"(SLD)	ITEM 662 6080 WK ZN PAV MRK REMOV (W)(ARROW)	ITEM 662 6093 WK ZN PAV MRK REMOV (Y)4"(BRK)	ITEM 662 6095 WK ZN PAV MRK REMOV (Y)4"(SLD)	ITEM 662 6102 WK ZN PAV MRK REMOV (Y)24"(SLD)	ITEM 677 6001 ELIM EXT PAV MRK & MRKS (4")	ITEM 677 6008 ELIM EXT PAV MRK & MRKS (ARROW)	ITEM 6001 6002 PORTABLE CHANGEABLE MESSAGE SIGN	ITEM 6185 6005 TMA (MOBILE OPERATION)
	SF	MO	SY	LF	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	LF	EA	LF	LF	LF	LF	EA	EA	DAY
PHASE I		16																					
3+75.00 TO 14+50.00	848			② 828	568	120			838			10	69	81	1603			1570		6219	1	5	
14+50.00 TO 25+25.00	3101			② 575	196	20			585			10	75	74	1682	3	74	2483		5768	2	5	
PHASE II		12																					
3+75.00 TO 14+50.00	3187			337	362		263	120	337	930	140	10	64	77	1528			1874	40			③ 5	
14+50.00 TO 25+25.00	1942			260	325		175	20	260	521	40	10	81	95	2125			1620				③ 5	
PHASE III		2																					3
3+75.00 TO 14+50.00															2473	2	983	3276	51			③ 5	
14+50.00 TO 25+25.00															2065		1092	3041	22			③ 5	
PEDESTRIAN TRAIL			46		318					318													
PROJECT TOTALS	**9078**	**30**	**46**	**2000**	**1769**	**140**	**438**	**140**	**2020**	**1769**	**180**	**40**	**289**	**327**	**11476**	**5**	**2149**	**13864**	**113**	**11987**	**3**	**10**	**3**

SUMMARY OF REMOVAL ITEMS

LOCATION (STATION TO STATION)	ITEM 104 6009 REMOVING CONC (RIPRAP)	ITEM 104 6036 REMOVING CONC (SIDEWALK OR RAMP)	ITEM 105 6048 REMOVING STAB BASE & ASPH PAV (4"-11")	ITEM 354 6045 PLANE ASPH CONC PAV (2")	ITEM 496 6007 REMOV STR (PIPE)	ITEM 542 6001 REMOVE METAL BEAM GUARD FENCE	ITEM 644 6076 REMOVE SM RD SN SUP&AM	ITEM 752 6007 TREE REMOVAL (18" - 24" DIA)	ITEM 752 6008 TREE REMOVAL (24" - 30" DIA)	ITEM 752 6009 TREE REMOVAL (30" - 36" DIA)
	SY	SY	SY	SY	LF	LF	EA	EA	EA	EA
3+75.00 TO 15+00.00	1101	279	1728	5711	68	359	1	2	1	1
15+00.00 TO 25+25.00	423		2946	5449		305	1	3		
PROJECT TOTALS	**1524**	**279**	**4674**	**11160**	**68**	**664**	**2**	**5**	**1**	**1**

SUMMARY OF DRAINAGE ITEMS

LOCATION (STATION TO STATION)	ITEM 400 6001 STRUCT EXCAV	ITEM 400 6003 STRUCT EXCAV (PIPE)	ITEM 400 6005 CEM STABIL BKFL	ITEM 400 6008 CUT & RESTORE ASPH PAVING	ITEM 402 6001 TRENCH EXCAVATION PROTECTION	ITEM 432 6001 RIPRAP (CONC)(4 IN)	ITEM 464 6033 RC PIPE (ARCH) (CL III)(DES 4)	ITEM 465 6079 INLET (COMPL)(PSL)(RG) (4FTX4FT)	ITEM 465 6082 INLET (COMPL)(PSL)(RG) (5FTX5FT)	ITEM 466 6206 WINGWALL (SW - 0) (HW=3 FT)
	CY	CY	CY	SY	LF	CY	LF	EA	EA	EA
STORM SEWER P&P SHEET 1		68	34	42	70		62	2		
STORM SEWER P&P SHEET 2	193	33	20	18	74	31	50	1	1	1
PROJECT TOTALS	**193**	**101**	**54**	**60**	**144**	**31**	**112**	**3**	**1**	**1**

SUMMARY OF RETAINING WALL ITEMS

LOCATION (STATION TO STATION)	ITEM 423 6001 RETAINING WALL (MSE) ④ ⑤	ITEM 450 6032 RAIL (TY C223)	ITEM 740 6005 ANTI - GRAFFITI COATNG(PERMNENT-TY III)
	SF	LF	SF
RETAINING WALL 1	1633	116	1268
RETAINING WALL 2	2089	138	1674
RETAINING WALL 3	2009	142	1583
RETAINING WALL 4	2495	215	1980
PROJECT TOTALS	**8226**	**611**	**6505**

① FOR INFORMATIONAL PURPOSES ONLY. SUBSIDIARY TO ITEM 531 6001.

② PHASE I CTB PINNED BARRIERS. FOR CONTRACTOR'S INFORMATION ONLY.

③ ITEMS TO BE REUSED FROM PREVIOUS PHASE.

④ RETAINED FILL BETWEEN REINFORCED ZONE AND TEMPORARY SPECIAL SHORING BELOW EXISTING GROUND LINE WILL NOT BE MEASURED FOR SEPARATE PAYMENT, BUT SHALL BE SUBSIDIARY TO ITEM 423, "RETAINING WALL (MSE)". ANY CONTRACTOR SUBSTITUTIONS TO THIS MATERIAL SHALL BE APPROVED BY THE ENGINEER AND SHALL BE AT NO ADDITIONAL COST TO THE PROJECT.

⑤ ANCHOR SLAB SHALL BE CONSIDERED SUBSIDIARY TO ITEM 423 "RETAINING WALL (MSE)", SEE STANDARD RW(TRF) FOR DETAILS.

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED
PROFESSIONAL ENGINEER
2/3/2021

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Suite 325
Austin, TX 78704
(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

SUMMARY OF QUANTITIES

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT	SHEET NO.
6	SEE TITLE SHEET	12

STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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SUMMARY OF BRIDGE ITEMS

LOCATION (STATION TO STATION)	ITEM 400 6004 STRUCT EXCAV (BRIDGE) CY	ITEM 400 6005 CEM STABIL BKFL CY	ITEM 416 6004 DRILL SHAFT (36 IN) LF	ITEM 420 6013 CL C CONC (ABUT) CY	ITEM 420 6029 CL C CONC (CAP) CY	ITEM 420 6037 CL C CONC (COLUMN) CY	ITEM 420 6043 CL C CONC (FOOTING) CY	ITEM 422 6001 REINF CONC SLAB SF	ITEM 422 6013 BRIDGE SIDEWALK SF	ITEM 422 6015 APPROACH SLAB CY	ITEM 425 6036 PRESTR CONC GIRDER (TX34) LF	ITEM 442 6007 STR STEEL (MISC NON - BRIDGE) LB	ITEM 450 6032 RAIL (TY C223) LF	ITEM 454 6018 SEALED EXPANSION JOINT (4 IN) (SEJ - M) LF	ITEM 459 6007 GABION MATTRESSES (GALV)(12 IN) SY	ITEM 459 6009 GABIONS (3' X 3')(GALV) CY	ITEM 496 6010 REMOV STR (BRIDGE 100 - 499 FT LENGTH) EA	ITEM 496 6065 REMOV STR(LRG PED BRG) 0-50 FT LENGTH EA	ITEM 4171 6001 INSTALL BRIDGE IDENTIFICATION NUMBERS EA
Phase I																			
Abutments		10	600	52.3					846	192.3		252		92					
Bents	38		1100		138.0	97.5	17.2					126		46					
Unit 1								7932	1564		1187.4	1692	199.5						
Unit 2								10197	2010		1529.4	4653	256.5						
Phase II																			
Abutments		36	600	58.3					846.00	232.8		252		116					
Bents	19		1050		138	97.5	8.6					126		58					
Unit 1								9560	1564.00		1187.4	1692	199.5						
Unit 2								12291	2010.00		1529.4	3807	256.5						
All															5539.9	228.2	1	1	2
PROJECT TOTALS	**57**	**46**	**3350**	**110.6**	**276.0**	**195.0**	**25.8**	**39980**	**8840**	**425.1**	**5433.6**	**12600**	**912.0**	**312**	**5539.9**	**228.2**	**1**	**1**	**2**

SUMMARY OF SIGNING AND PAVEMENT MARKING ITEMS

LOCATION (STATION TO STATION)	ITEM 644 6001 IN SM RD SN SUP&AM TY10BWG(1)SA(P) EA	ITEM 644 6064 IN BRIDGE MNT CLEARANCE SGN ASSM(TY N) EA	ITEM 644 6065 IN BRIDGE MNT CLEARANCE SGN ASSM(TY S) EA	ITEM 658 6014 INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI) EA	ITEM 658 6106 INSTL OM ASSM (OM-3R)(WFLX)GND D)GND EA	ITEM 658 6062 INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI) EA	ITEM 666 6036 REFL PAV MRK TY I (W)8"(SLD)(100MIL) LF	ITEM 666 6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL) LF	ITEM 666 6054 REFL PAV MRK TY I (W)(ARROW)(100MIL) EA	ITEM 666 6078 REFL PAV MRK TY I (W)(WORD)(100MIL) EA	ITEM 666 6224 PAVEMENT SEALER 4" LF	ITEM 666 6228 PAVEMENT SEALER 8" LF	ITEM 666 6230 PAVEMENT SEALER 24" LF	ITEM 666 6231 PAVEMENT SEALER (ARROW) EA	ITEM 666 6232 PAVEMENT SEALER (WORD) EA	ITEM 666 6300 RE PM W/RET REQ TY I (W)4"(BRK)(100MIL) LF	ITEM 666 6303 RE PM W/RET REQ TY I (W)4"(SLD)(100MIL) LF	ITEM 666 6312 RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL) LF	ITEM 666 6315 RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL) LF	ITEM 672 6009 REFL PAV MRKR TY II-A-A EA	ITEM 672 6010 REFL PAV MRKR TY II-C-R EA	ITEM 678 6033 PAV SURF PREP FOR MRK (RPM) EA
3+75.00 TO 14+50.00	15	1	1	16		4	245	105	6	2	7650	245	105	6	2	2118	1963	984	2340	85	78	163
14+50.00 TO 25+25.00	4			14	1	2		22	4		8344		22	4		2150	2151	1313	2730	85	82	167
PROJECT TOTALS	**19**	**1**	**1**	**30**	**1**	**6**	**245**	**127**	**10**	**2**	**15994**	**245**	**127**	**10**	**2**	**4268**	**4114**	**2297**	**5070**	**170**	**160**	**330**

SUMMARY OF TRAFFIC SIGNAL ITEMS

LOCATION (STATION)	ITEM 416 6032 DRILL SHAFT (TRF SIG POLE) (36 IN) LF	ITEM 621 6005 TRAY CABLE (4 CONDR) (12 AWG) LF	ITEM 625 6004 ZINC-COAT STL WIRE STRAND (5/16") LF	ITEM 680 6002 INSTALL HWY TRF SIG (ISOLATED) EA	ITEM 682 6003 VEH SIG SEC (12")LED(YEL) EA	ITEM 682 6005 VEH SIG SEC (12")LED(RED) EA	ITEM 684 6009 TRF SIG CBL (TY A)(12 AWG)(4 CONDR) LF	ITEM 686 6008 INS TRF SIG PL AM (S)STR(TY B)LUM EA	ITEM 686 * RDW LUM ON TRAF SIG POLE (LED) EA	ITEM 690 6009 REMOVAL OF CABLES LF	ITEM 690 6016 REMOVAL OF SPAN CABLE ASSM LF	ITEM 690 6024 REMOVAL OF SIGNAL HEAD ASSM EA	ITEM 690 6033 REMOVAL OF TRAFFIC SIGNAL POLE FND LF	ITEM 690 6051 REMOVAL OF SIGNAL POLE ASSM EA	ITEM 6027 6003 CONDUIT (PREPARE) LF	ITEM 6027 6008 GROUND BOX (PREPARE) EA
10+00.00 TO 20+25.00	13	435	185	1	4	8	865	1	1	155	515	6	26	2	35	2
PROJECT TOTALS	**13**	**435**	**185**	**1**	**4**	**8**	**865**	**1**	**1**	**155**	**515**	**6**	**26**	**2**	**35**	**2**

SUMMARY OF ILLUMINATION ITEMS

LOCATION (STATION TO STATION)	ITEM 400 6008 CUT & RESTORE ASPH PAVING SY	ITEM 610 6010 REMOVE RD IL ASM (U/P) EA	ITEM 610 6104 IN RD IL (U/P) (TY 1) (150W EQ) LED EA	ITEM 618 6016 CONDT (PVC) (SCH 40) (1") LF	ITEM 618 6021 CONDT (PVC) (SCH 40) (1 1/2") LF	ITEM 618 6040 CONDT (PVC) (SCH 80) (1") LF	ITEM 618 6064 CONDT (RM) (1") LF	ITEM 618 6068 CONDT (RM) (1 1/2") LF	ITEM 620 6006 ELEC CONDR (NO.10) INSULATED LF	ITEM 620 6014 ELEC CONDR (NO.3) INSULATED LF	ITEM 624 6004 GROUND BOX TY B (122322)W/APRON EA	ITEM 624 6010 GROUND BOX TY D (162922)W/APRON EA	ITEM 624 6028 REMOVE GROUND BOX EA	ITEM 627 6001 TIMBER POLE (CL 2) 30 FT EA	ITEM 628 6002 REMOVE ELECTRICAL SERVICES EA	ITEM 628 6237 ELC SRV TY D 120/240 100(NS)SS(E) EX(U) EA	ITEM 684 6057 TRF SIG CBL (TY A) (18 AWG)(7 CONDR) LF	ITEM 685 6002 RELOCATE RDSD FLASH BEACON ASSEMBLY EA
10+00.00 TO 14+60.00	38	5	8	1042	175	243	677	349	10559	42	3	2	3		1	1	2819	1
14+60.00 TO 20+25.00	18			555	261	155		763	6603	56	1	3	2	1	1	1	3041	1
PROJECT TOTALS	**56**	**5**	**8**	**1597**	**436**	**398**	**677**	**1112**	**17162**	**98**	**4**	**5**	**5**	**1**	**2**	**2**	**5860**	**2**

SUMMARY OF EROSION CONTROL ITEMS

LOCATION (STATION TO STATION)	ITEM 161 6017 COMPOST MANUF TOPSOIL (4") SY	ITEM 164 6027 CELL FBR MLCH SEED(PERM)(URBAN)(CLAY) SY	ITEM 164 6029 CELL FBR MLCH SEED(TEMP)(WARM) SY	ITEM 164 6031 CELL FBR MLCH SEED(TEMP)(COOL) SY	ITEM 166 6001 FERTILIZER ① AC	ITEM 168 6001 VEGETATIVE WATERING MG	ITEM 169 6001 SOIL RETENTION BLANKETS (CL 1) (TY A) SY	ITEM 506 6020 CONSTRUCTION EXITS (INSTALL) (TY 1) SY	ITEM 506 6024 CONSTRUCTION EXITS (REMOVE) SY	ITEM 506 6038 TEMP SEDMT CONT FENCE (INSTALL) LF	ITEM 506 6039 TEMP SEDMT CONT FENCE (REMOVE) LF	ITEM 506 6042 BIODEG EROSN CONT LOGS (INSTL) (18") LF	ITEM 506 6043 BIODEG EROSN CONT LOGS (REMOVE) LF	ITEM 506 6047 TEMP SDMT CONT FENCE (INLET PROTECTION) LF	ITEM 730 6107 FULL - WIDTH MOWING CYC	ITEM 734 6002 LITTER REMOVAL CYC	ITEM 738 5318 CLEAN/SWEEP AREA 1 CYC
10+00.00 TO 14+00.00	1484	1484	742	742	0.3	23	1484	112	112	929		36		80	2	7	7
14+00.00 TO 20+25.00	1958	1958	979	979	0.4	31	1958	112	112	834		552			2	7	7
10+00.00 TO 14+00.00	1961	1961	981	981	0.4	31	1961	112	112	637		115			2	7	7
14+00.00 TO 20+25.00	1662	1662	831	831	0.3	26	1662	112	112	920		379			2	7	7
10+00.00 TO 14+00.00											1566		151		1	1	1
14+00.00 TO 20+25.00											1754		931		1	1	1
PROJECT TOTALS	**7065**	**7065**	**3533**	**3533**	**1.5**	**111**	**7065**	**448**	**448**	**3320**	**3320**	**1082**	**1082**	**80**	**10**	**30**	**30**

* SUBSIDIARY TO PERTINENT ITEM

① FOR INFORMATIONAL PURPOSES ONLY.

STATE OF TEXAS
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Texas Department of Transportation

SL 368
AT SALADO CREEK

SUMMARY OF QUANTITIES

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		13
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

SUMMARY OF SMALL SIGNS

SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
		D3-1	AUSTIN HWY CORRINE	48"X18"								
251	2	D3-1 R1-1	STOP	36"X18" 36"X36"	X		10BWG	1	SA	P		
251	5	R1-1	STOP	36"X36"	X		10BWG	1	SA	P		
251	6	R1-1	STOP	36"X36"	X		10BWG	1	SA	P		
251	7	W11-15 W11-15P W16-7P	TRAIL X-ING	36"X36" 18"X12" 24"X12"	X		10BWG	1	SA	P		
251	8	W11-15 W11-15P W16-7P	TRAIL X-ING	36"X36" 18"X12" 24"X12"	X		10BWG	1	SA	P		
251	9	R1-1	STOP	36"X36"	X		10BWG	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

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STATE OF TEXAS
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87288
LICENSED PROFESSIONAL ENGINEER
1/27/2021

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SL 368
AT SALADO CREEK

SUMMARY OF SMALL SIGNS

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		14
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

SUMMARY OF SMALL SIGNS

SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
251	10	W8-19aTP W8-19		18"X12" 12"X72"	X		10BWG	1	SA	P		
251	11	W8-19aTP W8-19		18"X12" 12"X72"	X		10BWG	1	SA	P		
252	15	R1-1		36"X36"	X		10BWG	1	SA	P		
251	18	W12-2a		84"X24"	X		MOUNT TO BRIDGE STRUCTURE - REFER TO BMCS. SEE NOTE 2.					N
251	19	W12-2a		84"X24"	X		MOUNT TO BRIDGE STRUCTURE - REFER TO BMCS. SEE NOTE 2.					S
251	20	R5-1		30"X30"	X		10BWG	1	SA	P		
251	21	R3-2		30"X30"	X		10BWG	1	SA	P		
252	22	OM-3R		12"X36"	X		FLX	1		GND		

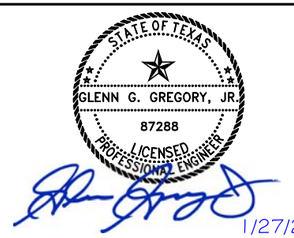
ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).



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SL 368
AT SALADO CREEK

SUMMARY OF SMALL SIGNS

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		15
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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DETOUR, BARRICADES, WARNING SIGNS, SEQUENCE OF WORK, ETC.

THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE REQUIREMENTS OF ITEM 7, "LEGAL RELATIONS AND REPONSIBILITIES", OF THE STANDARD SPECIFICATIONS. IN ADDITION TO THESE REQUIREMENTS, THE FOLLOWING PROVISIONS SHALL ALSO GOVERN ON THIS CONTRACT:

1. GENERAL

(1) TRAFFIC MUST BE HANDLED THROUGHOUT THE PROJECT DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A SAFE AND COMFORTABLE PASSAGE FOR VEHICULAR AND PEDESTRIAN TRAFFIC WITH MINIMAL INCONVENIENCE TO THE PUBLIC, AS SHOWN IN THE PLANS OR AS DIRECTED/APPROVED BY THE ENGINEER.

(2) THE CONTRACTOR MAY PROPOSE/RECOMMEND MODIFICATIONS TO THE SEQUENCE OF WORK FOR CONSIDERATION BY THE ENGINEER. ANY MAJOR RECOMMENDED MODIFICATION BY THE CONTRACTOR SHALL INCLUDE ANY CHANGES TO THE VARIOUS BID ITEMS, IMPACT TO TRAFFIC, EFFECT OF OVERALL PROJECT IN TIME AND COST, ETC. IF THIS PROPOSAL IS IMPLEMENTED, THE CONTRACTOR WILL BE RESPONSIBLE FOR DEVELOPING DETAILED PLAN SHEETS TO BE SEALED BY A LICENSED PROFESSIONAL ENGINEER FOR INCLUSION WITH THE CHANGE ORDER. THE CONTRACTOR CANNOT PROCEED WITH ANY CONSTRUCTION OPERATIONS BASED ON A REVISED PHASE/SEQUENCE UNTIL WRITTEN APPROVAL IS OBTAINED FROM THE ENGINEER. IF AT ANY TIME DURING CONSTRUCTION THE CONTRACTOR'S PROPOSED PLAN OF OPERATION FOR HANDLING TRAFFIC DOES NOT PROVIDE FOR SAFE AND COMFORTABLE MOVEMENT, THE CONTRACTOR WILL IMMEDIATELY CHANGE THEIR OPERATION TO CORRECT THE UNSATISFACTORY CONDITION.

(3) DO NOT STORE ANY CONSTRUCTION MATERIAL OR EQUIPMENT AT ANY LOCATION THAT WILL CONSTITUTE A HAZARD AND WILL ENDANGER TRAFFIC.

(4) THE CONTRACTOR WILL PROVIDE ADVANCE NOTIFICATION TO THE ENGINEER OF IMPENDING / UPCOMING LANE CLOSURES FOR ALL TEMPORARY AND / OR PERMANENT LANE, RAMP, CONNECTOR, FRONTAGE, SHOULDER, ETC. CLOSURES OR DETOURS. SEE GENERAL NOTES FOR NOTIFICATION REQUIREMENTS.

(5) ACCESS TO ADJOINING PROPERTY MUST BE MAINTAINED AT ALL TIMES.

(6) TEMPORARY DRAINAGE IS THE RESPONSIBILITY OF THE CONTRACTOR.

(7) REMOVAL AND DISPOSAL OF EXISTING ABANDONED UTILITIES (EITHER PREVIOUSLY ABANDONED OR ABANDONED DURING THIS PROJECT) REQUIRED TO SUPPORT THIS PROJECT'S CONSTRUCTION SHALL BE PERFORMED UNDER THE OVERALL PREPARE RIGHT-OF-WAY ITEM (ITEM 100).

(8) COORDINATE WITH ADJACENT PROJECTS.

(9) COVER PERMANENT SIGNS IF NOT USED. THIS IS SUBSIDIARY TO ITEM 502.

(10) COORDINATE WITH THE CITY OF SAN ANTONIO OR TXDOT FOR SIGNAL TIMING REVISIONS, AS NECESSARY.

(11) EXCAVATION WITHIN 5 FEET OF AN EXISTING CPS ENERGY POLE WILL REQUIRE POLE BRACING. CONTACT CPS ENERGY UTILTY COORDINATION TO REQUEST POLE BRACING (JENNIFER HENRIQUEZ, (210) 353-2814 OR JHENRIQUEZ@CPSENERGY.COM). THE ESTIMATED DURATION FOR THE POLE BRACING PROCESS IS APPROXIMATELY 6 TO 8 WEEKS.

(12) CITY OF SAN ANTONIO HAS A FLOOD DETECTION DEVICE LOCATED WITHIN THE PROJECT LIMITS. CONTACT CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT (FLOOD MANAGEMENT) (ROBERT ESPARZA, (210) 373-7926 OR ROBERTO.ESPARZA@SANANTONIO.GOV) A MINIMUM OF 2 MONTHS PRIOR TO PLANNED DISCONNECT DATE. ONCE FLOOD DETECTION DEVICES ARE DISCONNECTED OR REMOVED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLOSING ADJACENT ROADS DURING FLOOD EVENTS, HOLIDAYS, AND OVERNIGHT PERIODS. SEE ELECTRICAL SHEETS FOR ADDITIONAL INFORMATION.

(13) THE CITY OF SAN ANTONIO HAS UNDERPASS TRAIL LIGHTING WITHIN THE PROJECT LIMITS. CONTACT CITY OF SAN ANTONIO PARKS AND RECREATION DEPARTMENT (BRANDON ROSS, (210) 207-6101 OR BRANDON.ROSS@SANANTONIO.GOV) A MINIMUM OF 2 MONTHS PRIOR TO PLANNED DISCONNECT DATE. SEE ELECTRICAL SHEETS FOR ADDITIONAL INFORMATION.

(14) SAWS WATER AND SANITARY SEWER LINES ARE LOCATED IN THE VICINITY OF THIS PROJECT. CONTACT SAWS UTILTY COORDINATION (LUIS RODARTE, (210) 233-3507 OR LUIS.RODARTE@SAWS.ORG) A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION.

(15) CPS GAS LINES ARE LOCATED IN THE VICINITY OF THIS PROJECT. CONTACT CPS ENERGY UTILTY COORDINATION (JENNIFER HENRIQUEZ, (210) 353-2814 OR JHENRIQUEZ@CPSENERGY.COM) A MINIMUM OF 10 DAYS PRIOR TO CONSTRUCTION.

(16) AT&T HAS UNDERGROUND TELEPHONE LINES ARE LOCATED IN THE VICINITY OF THIS PROJECT. CONTACT AT&T UTILTY COORDINATION (PHILIP AUSTIN, (210) 283-1839 OR PA1657@ATT.COM) A MINIMUM OF 48 HOURS PRIOR TO USE OF OVERHEAD LIFTING EQUIPMENT OR CRANES.

(17) NOTIFY AND INCLUDE COPIES OF THE DETOUR MAP AND APPROXIMATE CONSTRUCTION SCHEDULE TO THE LOCAL FIRE DEPARTMENT, EMERGENCY MEDICAL SERVICES, SHERIFF, DEPARTMENT OF PUBLIC SERVICES, AND THE SCHOOL DISTRICT SO ROUTES CAN BE ADJUSTED AS NEEDED.

(18) COORDINATE ALL TRAFFIC CONTROL OPERATION WITH THE FIRE STATION LOCATED NORTH OF SL 368 BRIDGE.

(19) PRIOR TO ANY ROAD CLOSURES, THE CONTRACTOR SHOULD REACH OUT TO THE FOLLOWING INDIVIDUAL TO OBTAIN A ROADWAY PERMIT TO CLOSE THE ROAD AND INSTALL TEMPORARY SIGNAGE:
RUBEN ABREGO
CITY OF SAN ANTONIO, CIP
210-542-8921 OR 210-207-6949

(20) THE CONTRACTOR SHALL RESTORE ALL PAVEMENT DAMAGED DUE TO CONSTRUCTION ACTIVITIES OR REMOVED AS A RESULT OF UTILITY INSTALLATIONS ALONG CORRINE DRIVE ACCESS, IRA LEE ACCESS, AND IRA LEE ROADS AT NO ADDITIONAL COST TO THE PROJECT.

(21) VIA METROPOLITAN TRANSIT HAS BUS SERVICES WITHIN THE PROJECT LIMIT. CONTACT VIA (ERNEST SWEET, ERNEST.SWEET@VIAINFO.NET; ABIGAIL RODRIGUEZ, ABIGAIL.RODRIGUEZ@VIAINFO.NET; MICHAEL LEDESMA, MICHAEL.LEDESMA@VIAINFO.NET OR VIA MAIN OFFICE, (210) 362-2389) A MINIMUM OF 2 MONTHS PRIOR TO ANY BUS STOP CLOSURE.

2. SEQUENCE OF WORK

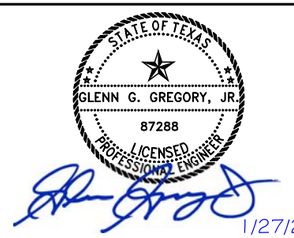
(1) THIS PROJECT WILL BE CONSTRUCTED IN 3 PHASES. BEFORE THE COMMENCEMENT OF EACH PHASE, INSTALL ADVANCE WARNING SIGNS, TEMPORARY SIGNS, BARRICADES AND TEMPORARY PAVEMENT MARKING AS SHOWN ON THE PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER. DAILY LANE CLOSURES WILL BE USED IN ACCORDANCE WITH STATE TCP STANDARDS. DROP OFF CONDITIONS OF GREATER THAN 2' MUST HAVE A 3:1 SLOPE AT THE END OF EACH DAY, AS WELL AS THROUGHOUT THE PROJECT WHERE ACCESS TO ADJACENT PROPERTIES IS ALLOWED TO DRIVEWAYS AND SIDE STREETS.

(2) PREPARING ROW/REMOVAL OF EXISTING ITEMS TO BE DONE ONLY IN AREAS WHERE WORK IS OCCURRING, AS PER THE PHASES NOTED BELOW.

(3) CRANES AND HEAVY CONSTRUCTION EQUIPMENT WILL NOT BE ALLOWED ON THE EXISTING BRIDGE STRUCTURE.

(4) PLANING, SURFACE TREATMENTS AND INLAYS SHALL BE PERFORMED IN THE DIRECTION OF TRAFFIC.

(5) REFER TO TCP TYPICAL SECTIONS, TCP LAYOUTS, AND TCP STANDARDS FOR ADDITIONAL DETAILS. A BRIEF DESCRIPTION OF THESE PHASES ARE AS FOLLOWS:



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Texas Department of Transportation

SL 368
AT SALADO CREEK

TRAFFIC CONTROL PLAN NARRATIVE

SHEET 1 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		16
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

2. SEQUENCE OF WORK (CONT.)

PHASE I, STEP 1

(1) MOBILIZATION.

(2) CONTRACTOR TO COORDINATE WITH CPS TO SCHEDULE PHASE II POLE & LUMINAIRE INSTALLATION.

(3) CONTRACTOR TO COORDINATE WITH VIA TO SCHEDULE BUS STOP CLOSURE.

(4) SET UP PROJECT BARRICADES AND SIGNS:

A) PLACE ADVANCE WARNING SIGNS.

B) PLACE PORTABLE CONCRETE TRAFFIC BARRIER.

(5) PLACE STORM WATER POLLUTION PREVENTION MEASURES ALONG CONSTRUCTION ZONE AS SHOWN ON SW3P LAYOUT SHEETS.

(6) PREPARE ROW REMOVE EXIST ITEMS.

(7) INSTALL IRA LEE DETOUR SIGNING. CONVERT IRA LEE ACCESS RD TO 1 LANE SB. CLOSE IRA LEE ROAD UNDER BRIDGE @ IRA LEE ACCESS ROAD. INSTALL CORRINE DRIVE ACCESS ROAD DETOUR PLAN. CLOSE CORRINE DRIVE ACCESS ROAD.

(8) CONSTRUCT JOINT BID WATER LINE.

(9) REMOVE CORRINE DRIVE ACCESS ROAD DETOUR & REOPEN CORRINE DRIVE ACCESS ROAD.

(10) CONSTRUCT SALDO CREEK GREENWAY TRAIL DETOUR ON IRA LEE ROAD AND CLOSE EXISTING GREENWAY TRAIL UNDER BRIDGE.

(11) REMOVE EXISTING TRAFFIC SIGNAL POLES WHERE DESIGNATED IN THE PLANS.

PHASE I, STEP 2

(1) INSTALL SL 368 CLOSURE DETOUR SIGNING.

(2) CLOSE SL 368 DURING OFF PEAK HOURS TO INSTALL PHASE I TRAFFIC CONTROL PLAN.

(3) UTILIZE SL 368 CLOSURE DETOUR PLAN.

(4) INSTALL CONCRETE SAFETY BARRIERS, PHASE I WORK ZONE STRIPING & SIGNING.

(5) REMOVE SL 368 CLOSURE DETOUR & SHIFT SL 368 TRAFFIC TO RIGHT SIDE OF THE BRIDGE. SEE PHASE I TCP TYPICAL SECTIONS AND LAYOUTS FOR PROPOSED REMOVAL AND CONSTRUCTION.

(6) DEMO EXISTING BRIDGES PER PHASE I BRIDGE CONSTRUCTION SEQUENCE SHEETS.

(7) DEMO EXISTING SALADO CREEK GREENWAY BRIDGE AND TRAIL.

(8) EXCAVATE PHASE I ROADWAY AND INSTALL TEMPORARY SPECIAL SHORING.

(9) INSTALL PROPOSED TRAFFIC SIGNAL POLE FOUNDATION.

(10) CONSTRUCT PROPOSED PHASE I BRIDGE BENTS AND FOUNDATIONS.

(11) CONSTRUCT PHASE I RETAINING WALLS.

(12) INSTALL DRAIN LINE "A", PARTIAL DRAIN LINE "B" AND PILOT DITCH "B".

(13) PERFORM PHASE I GRADING.

(14) INSTALL GABION AT PHASE I ABUTMENT SLOPES.

(15) SET PROPOSED PHASE I BEAMS.

(16) INSTALL GABIONS IN FRONT OF PHASE I RETAINING WALLS AND CONCRETE DRAINAGE DITCH.

(17) CPS TO INSTALL PROP LUMINAIRES WHERE INDICATED ON ELECTRICAL PLANS. SEE REQUIRED ADVANCE NOTIFICATION NOTES.

PHASE I, STEP 3

(1) INSTALL BRIDGE BACKFILL.

(2) CONSTRUCT PHASE I ROADWAY EMBANKMENT.

(3) CONSTRUCT PHASE I BRIDGE DECK AND APPROACH SLAB.

(4) INSTALL PHASE I BRIDGE SIDEWALK.

(5) INSTALL TRAFFIC RAIL FOUNDATIONS.

(6) INSTALL ASPHALT BASE.

(7) INSTALL ROADWAY CURB & SIDEWALK.

(8) INSTALL BRIDGE AND APPROACH RAIL.

(9) INSTALL METAL BEAM GUARD FENCE.

(10) CONSTRUCT IRA LEE ACCESS ROAD INTERSECTION & IMPLEMENT IRA LEE DETOUR PER TCP IRA LEE DETOUR.

(11) OPEN IRA LEE ACCESS ROAD TO TRAFFIC.

(12) CONSTRUCT ASPHALT WEDGES AT BRIDGE APPROACH SLAB AND ROADWAY APPROACHES.

(13) INSTALL PHASE II TEMPORARY TRAFFIC CONTROL SIGNING AND PAVEMENT MARKINGS WITHIN PHASE I CONSTRUCTION AREA.

PHASE II, STEP 1

(1) INSTALL TCP SIGNAGE.

(2) INSTALL PHASE II SW3P PLAN.

(3) INSTALL SL 368 CLOSURE DETOUR SIGNING.

(4) CLOSE SL 368 DURING OFF PEAK HOURS TO INSTALL REMAINING PHASE II SIGNING AND PAVEMENT MARKINGS.

(5) INSTALL CONCRETE SAFETY BARRIERS, PHASE II WORK ZONE STRIPING & SIGNING.

(6) REMOVE SL 368 CLOSURE DETOUR & SHIFT SL 368 TRAFFIC TO LEFT SIDE OF THE BRIDGE. SEE PHASE II TCP TYPICAL SECTIONS AND LAYOUTS FOR PROPOSED REMOVAL AND CONSTRUCTION.

(7) CPS TO REMOVE EXISTING LUMINAIRES WHERE INDICATED ON ELECTRICAL PLANS. SEE REQUIRED ADVANCE NOTIFICATION NOTES.

(8) DEMO EXISTING BRIDGES PER PHASE II BRIDGE CONSTRUCTION SEQUENCE SHEETS.

(9) EXCAVATE PHASE II ROADWAY AND INSTALL TEMPORARY SPECIAL SHORING.

(10) CONSTRUCT PROPOSED PHASE II BRIDGE BENTS AND FOUNDATIONS.

(11) CONSTRUCT PHASE II RETAINING WALLS.

(12) INSTALL GABION AT PHASE II ABUTMENT SLOPES.

(13) CONSTRUCT REMAINING DRAIN LINE "B" AND PILOT DITCH "A" DRAINAGE SYSTEM UNDER BRIDGE.

(14) PERFORM PHASE II GRADING.

(15) SET PROPOSED PHASE II BEAMS.

(16) INSTALL GABIONS IN FRONT OF PHASE II RETAINING WALLS.

PHASE II, STEP 2

(1) INSTALL BRIDGE BACKFILL.

(2) CONSTRUCT PHASE II ROADWAY EMBANKMENT.

(3) CONSTRUCT PHASE II BRIDGE DECK AND APPROACH SLAB.

(4) INSTALL PHASE II BRIDGE SIDEWALK.

(5) INSTALL TRAFFIC RAIL FOUNDATIONS.

(6) INSTALL ASPHALT BASE.

(7) INSTALL ROADWAY CURB & SIDEWALK.

(8) INSTALL BRIDGE AND APPROACH RAIL.

(9) INSTALL ATTENUATOR.

(10) CLOSE CORRINE DRIVE ACCESS ROAD & IMPLEMENT CORRINE DRIVE ACCESS ROAD DETOURS.

(11) PERFORM MILL AND OVERLAY ON CORRINE DRIVE ACCESS ROAD & CONSTRUCT CORRINE DRIVE ACCESS ROAD NORTH INTERSECTION.

(12) OPEN CORRINE DRIVE ACCESS ROAD TO TRAFFIC.

(13) CONSTRUCT ASPHALT WEDGES AT BRIDGE APPROACH SLAB AND ROADWAY APPROACHES.

(14) INSTALL PHASE III TEMPORARY TRAFFIC CONTROL SIGNING AND PAVEMENT MARKINGS WITHIN PHASE I CONSTRUCTION AREA.

(15) INSTALL TRAIL ILLUMINATION UNDER BRIDGE.

(16) INSTALL FLOOD DETECTION POLES, DEVICES AND SIGNS. COORDINATE WITH COSA. REFER TO ELECTRICAL PLANS FOR ADDITIONAL INFORMATION AND COORDINATION NOTES.

(17) INSTALL TRAFFIC SIGNAL POLES AND FLASHING BEACONS. COORDINATE WITH TxDOT.

STATE OF TEXAS
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87288
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PROFESSIONAL ENGINEER
1/27/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

TRAFFIC CONTROL PLAN NARRATIVE

SHEET 2 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		17
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

2. SEQUENCE OF WORK (CONT.)

PHASE III

(1) INSTALL PHASE III SW3P PLAN.

(2) INSTALL SL 368 CLOSURE DETOUR SIGNING.

(3) CLOSE SL 368 DURING OFF PEAK HOURS TO REMOVE SL 368 PHASE II DETOUR & BARRICADES.

(4) PERFORM MILL & OVERLAY.

(5) INSTALL PERMANENT SIGNS AND PAVEMENT MARKINGS.

(6) OPEN SL 368 TO TRAFFIC IN FINAL LANE CONFIGURATIONS.

(7) CONSTRUCT SALADO CREEK GREENWAY TRAIL ON NEW ALIGNMENT.

(8) REMOVE IRA LEE ROAD DETOUR PLAN AND OPEN IRA LEE ROAD TO TRAFFIC.

(9) REMOVE SW3P DEVICES.

(10) PERFORM FINAL CLEANUP.

(11) PERFORM PUNCH LIST AND REMOVE ALL CONSTRUCTION DEVICES AND ITEMS.

(12) REMOVE ANY REMAINING DETOURS SIGNS AND BARRICADES.

3. SAFETY

(1) THE CONTRACTOR WILL PROVIDE, CONSTRUCT AND MAINTAIN BARRICADES AND SIGNS IN ACCORDANCE WITH STATE STANDARDS BC(1-12)-14. ANY SIGNS REQUIRED THAT ARE NOT DETAILED IN THE STANDARD SHEETS SHALL BE IN CONFORMANCE WITH THE "TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES" AND THE "STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS."

(2) BARRICADES AND WARNING SIGNS SHALL BE PLACED AS INDICATED ON THE PLANS. THIS SHALL BE CONSIDERED THE MINIMUM REQUIRED TO PROVIDE FOR THE SAFETY OF TRAFFIC DURING CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN OTHER SUCH BARRICADES AND SIGNS DEEMED NECESSARY BY THE ENGINEER OR AS DIRECTED BY FIELD CONDITIONS, TO PROVIDE FOR THE PASSAGE OF TRAFFIC IN SAFETY AT ALL TIMES.

(3) THE CONTRACTOR SHALL KEEP THE ROADWAY CLEAN AND FREE OF DIRT OR OTHER MATERIALS DURING HAULING OPERATIONS. IF THE CONTRACTOR DOES NOT MAINTAIN A CLEAN ROADWAY, THEY SHALL CEASE ALL CONSTRUCTION OPERATIONS, WHEN DIRECTED BY THE ENGINEER, TO CLEAN THE ROADWAY TO THE SATISFACTION OF THE ENGINEER.

4. HAULING EQUIPMENT

(1) THE USE OF RUBBER-TIRED EQUIPMENT WILL BE REQUIRED FOR MOVING DIRT OR OTHER MATERIALS ALONG OR ACROSS PAVEMENT SURFACES. WHERE THE CONTRACTOR DESIRES TO MOVE ANY EQUIPMENT NOT LICENSED FOR OPERATION ON PUBLIC HIGHWAYS, ON OR ACROSS PAVEMENT, THEY SHALL PROTECT THE PAVEMENT FROM DAMAGE AS DIRECTED/APPROVED BY THE ENGINEER.

(2) THROUGHOUT THE CONSTRUCTION OPERATIONS, THE CONTRACTOR WILL BE REQUIRED TO CONDUCT THEIR HAULING OPERATIONS IN A MANNER SUCH THAT VEHICLES WILL NOT HAUL OVER PREVIOUSLY RECOMPACTED SUBGRADE OR COMPACTED BASE MATERIAL, EXCEPT IN SHORT SECTIONS FOR DUMPING MANIPULATIONS.

5. FINAL CLEANUP

UPON COMPLETION OF THE WORK AND BEFORE FINAL ACCEPTANCE AND FINAL PAYMENT IS MADE, THE CONTRACTOR SHALL CLEAN AND REMOVE FROM THE SITE ALL SURPLUS AND DISCARDED MATERIALS AND DEBRIS OF EVERY KIND AND LEAVE THE ENTIRE PROJECT IN A SMOOTH, NEAT AND SIGHTLY CONDITION.

6. PAYMENT

ALL BARRICADES, SIGNS, AND FLAGGERS SHALL BE SUBSIDIARY TO ITEM 502 BARRICADES, SIGNS AND TRAFFIC HANDLING. ALL EROSION AND SEDIMENT CONTROL DEVICES WILL BE PAID UNDER ITEM 506 TEMPORARY EROSION, SEDIMENTATION AND ENVIRONMENTAL CONTROLS. ALL WORK ZONE PAVEMENT MARKINGS WILL BE PAID FOR UNDER ITEM 662 WORK ZONE PAVEMENT MARKINGS. ALL OTHER WORK AND MATERIALS SHALL BE SUBSIDIARY TO THE VARIOUS BID ITEMS UNLESS OTHERWISE INDICATED IN THE PLANS.

7. UTILITY RESTRICTIONS

1. AS PER SPECIAL PROVISION 000-1011 THE PROJECT HAS UNCLEAR UTILITY RELOCATIONS.
2. THE CONTRACTOR WILL NEED TO COORDINATE ACCESS AND TCP TO ALLOW THE UTILITY COMPANIES TO COMPLETE RELOCATIONS.
3. THE CONTRACTOR IS RESTRICTED WORKING IN LOCATIONS AFFECTED BY RELOCATIONS UNTIL THE UTILITY RELOCATIONS ARE COMPLETED.

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3/4/2021

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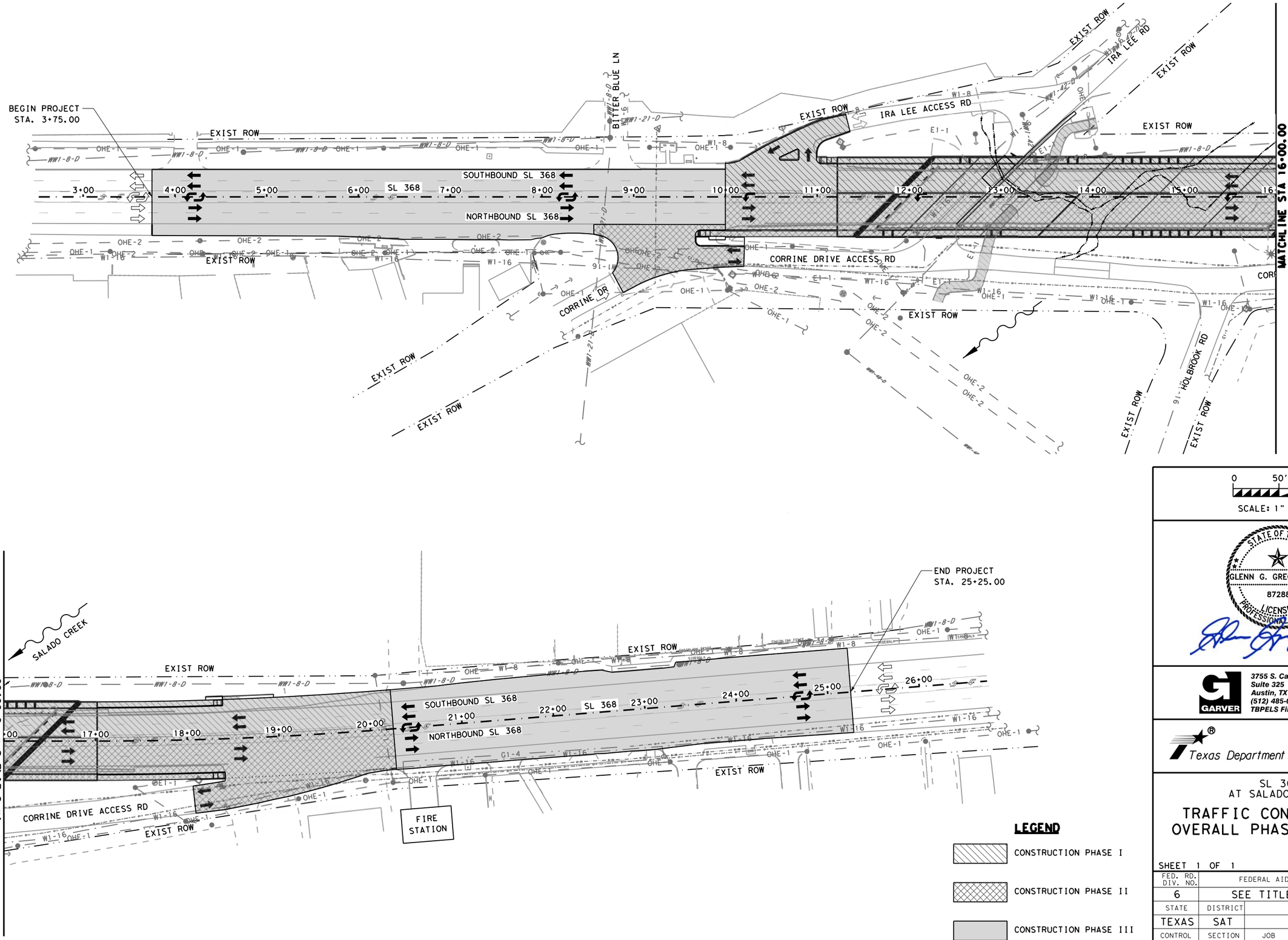
Texas Department of Transportation

SL 368
AT SALADO CREEK

TRAFFIC CONTROL PLAN NARRATIVE

SHEET 3 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		18
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368



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SCALE: 1" = 100'

STATE OF TEXAS
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1/27/2021

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SL 368
AT SALADO CREEK

TRAFFIC CONTROL PLAN
OVERALL PHASING LAYOUT

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		19
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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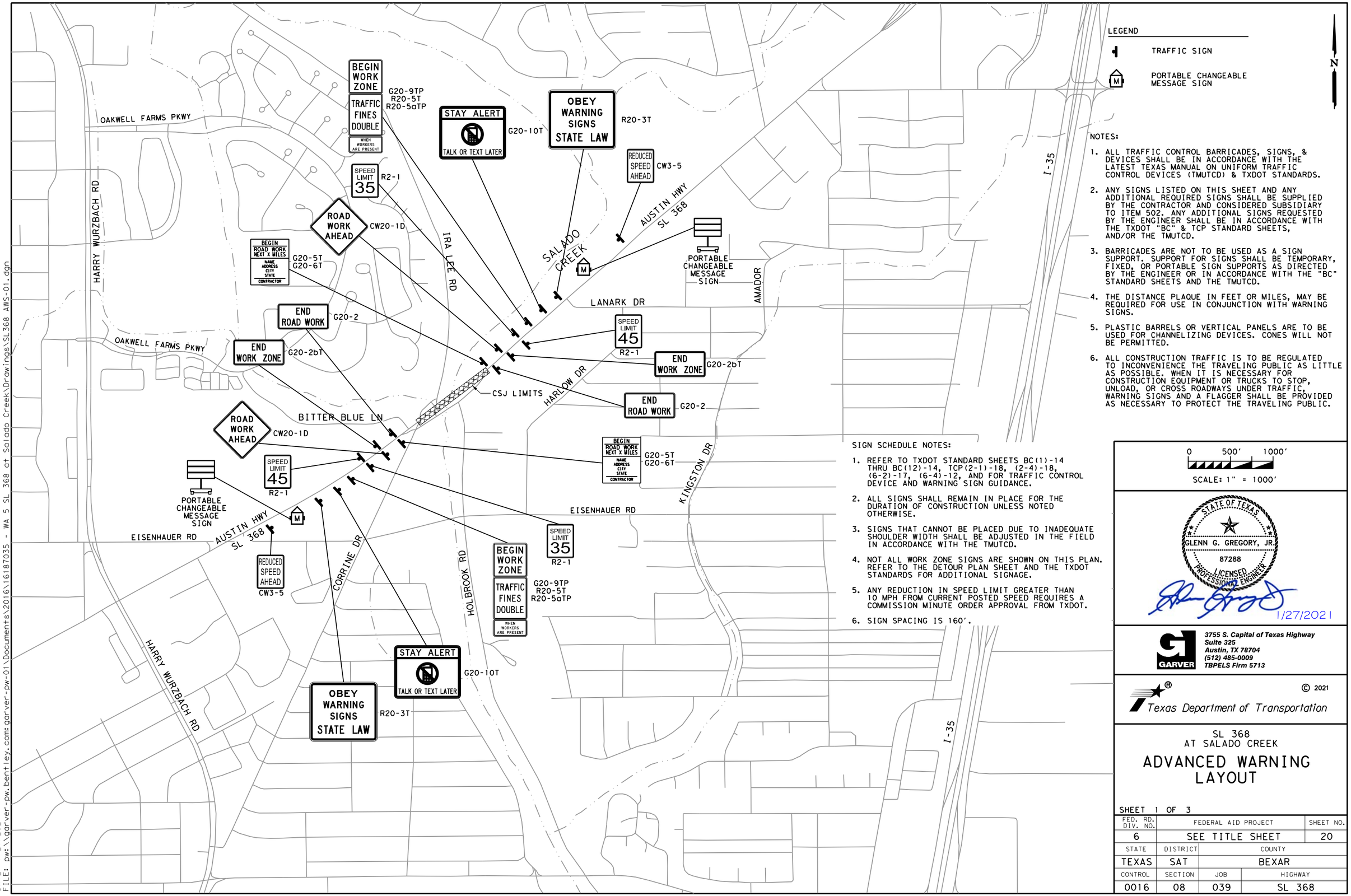

LEGEND

- TRAFFIC SIGN
- PORTABLE CHANGEABLE MESSAGE SIGN

NOTES:

1. ALL TRAFFIC CONTROL BARRICADES, SIGNS, & DEVICES SHALL BE IN ACCORDANCE WITH THE LATEST TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD) & TXDOT STANDARDS.
2. ANY SIGNS LISTED ON THIS SHEET AND ANY ADDITIONAL REQUIRED SIGNS SHALL BE SUPPLIED BY THE CONTRACTOR AND CONSIDERED SUBSIDIARY TO ITEM 502. ANY ADDITIONAL SIGNS REQUESTED BY THE ENGINEER SHALL BE IN ACCORDANCE WITH THE TXDOT "BC" & TCP STANDARD SHEETS, AND/OR THE TMUTCD.
3. BARRICADES ARE NOT TO BE USED AS A SIGN SUPPORT. SUPPORT FOR SIGNS SHALL BE TEMPORARY, FIXED, OR PORTABLE SIGN SUPPORTS AS DIRECTED BY THE ENGINEER OR IN ACCORDANCE WITH THE "BC" STANDARD SHEETS AND THE TMUTCD.
4. THE DISTANCE PLAQUE IN FEET OR MILES, MAY BE REQUIRED FOR USE IN CONJUNCTION WITH WARNING SIGNS.
5. PLASTIC BARRELS OR VERTICAL PANELS ARE TO BE USED FOR CHANNELIZING DEVICES. CONES WILL NOT BE PERMITTED.
6. ALL CONSTRUCTION TRAFFIC IS TO BE REGULATED TO INCONVENIENCE THE TRAVELING PUBLIC AS LITTLE AS POSSIBLE. WHEN IT IS NECESSARY FOR CONSTRUCTION EQUIPMENT OR TRUCKS TO STOP, UNLOAD, OR CROSS ROADWAYS UNDER TRAFFIC, WARNING SIGNS AND A FLAGGER SHALL BE PROVIDED AS NECESSARY TO PROTECT THE TRAVELING PUBLIC.

SIGN SCHEDULE NOTES:

1. REFER TO TXDOT STANDARD SHEETS BC(1)-14 THRU BC(12)-14, TCP(2-1)-18, (2-4)-18, (6-2)-17, (6-4)-12, AND FOR TRAFFIC CONTROL DEVICE AND WARNING SIGN GUIDANCE.
2. ALL SIGNS SHALL REMAIN IN PLACE FOR THE DURATION OF CONSTRUCTION UNLESS NOTED OTHERWISE.
3. SIGNS THAT CANNOT BE PLACED DUE TO INADEQUATE SHOULDER WIDTH SHALL BE ADJUSTED IN THE FIELD IN ACCORDANCE WITH THE TMUTCD.
4. NOT ALL WORK ZONE SIGNS ARE SHOWN ON THIS PLAN. REFER TO THE DETOUR PLAN SHEET AND THE TXDOT STANDARDS FOR ADDITIONAL SIGNAGE.
5. ANY REDUCTION IN SPEED LIMIT GREATER THAN 10 MPH FROM CURRENT POSTED SPEED REQUIRES A COMMISSION MINUTE ORDER APPROVAL FROM TXDOT.
6. SIGN SPACING IS 160'.

0 500' 1000'

SCALE: 1" = 1000'

STATE OF TEXAS
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1/27/2021

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SL 368
AT SALADO CREEK

ADVANCED WARNING LAYOUT

SHEET 1 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		20
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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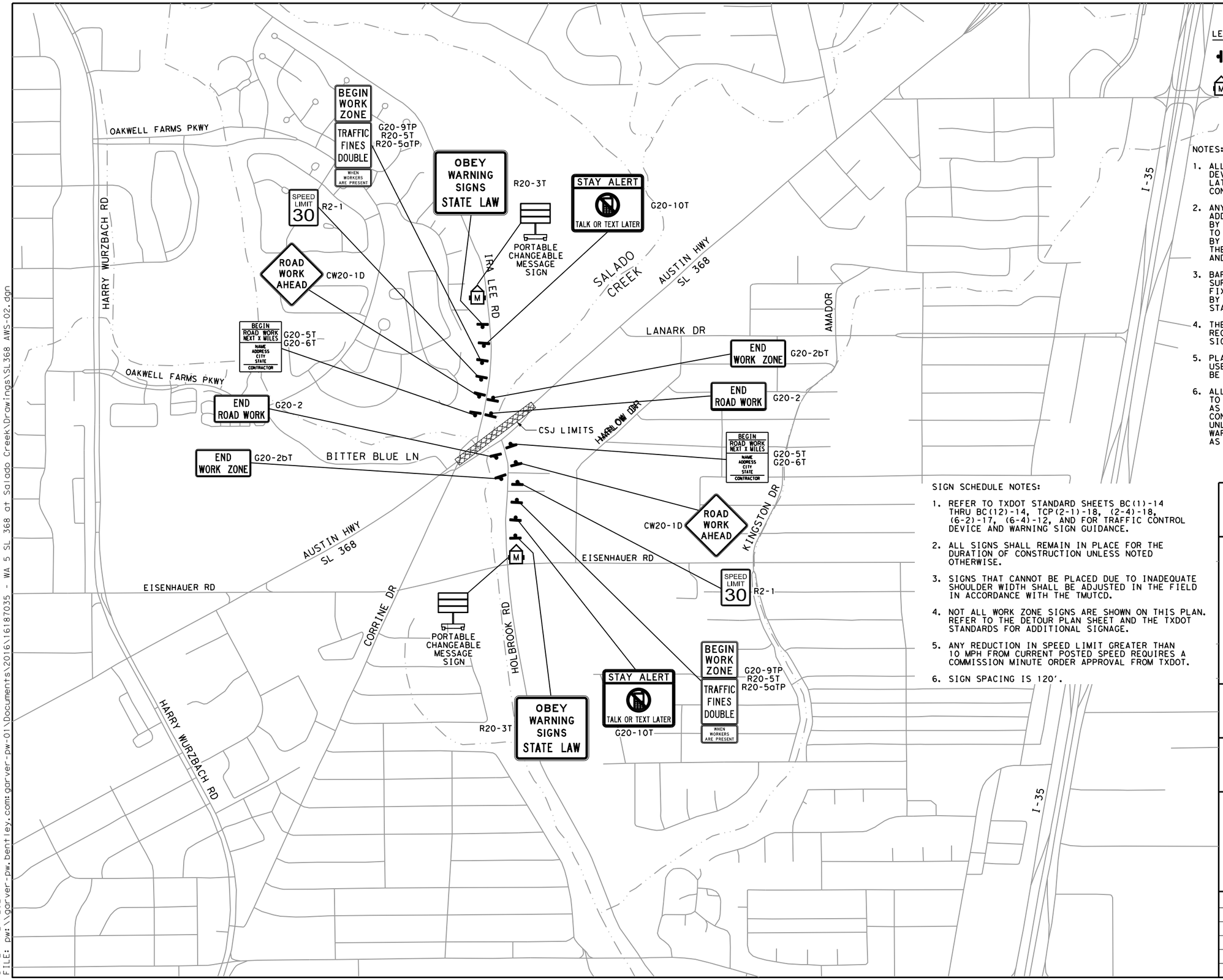

LEGEND

- TRAFFIC SIGN
- PORTABLE CHANGEABLE MESSAGE SIGN

NOTES:

1. ALL TRAFFIC CONTROL BARRICADES, SIGNS, & DEVICES SHALL BE IN ACCORDANCE WITH THE LATEST TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD) & TXDOT STANDARDS.
2. ANY SIGNS LISTED ON THIS SHEET AND ANY ADDITIONAL REQUIRED SIGNS SHALL BE SUPPLIED BY THE CONTRACTOR AND CONSIDERED SUBSIDIARY TO ITEM 502. ANY ADDITIONAL SIGNS REQUESTED BY THE ENGINEER SHALL BE IN ACCORDANCE WITH THE TXDOT "BC" & TCP STANDARD SHEETS, AND/OR THE TMUTCD.
3. BARRICADES ARE NOT TO BE USED AS A SIGN SUPPORT. SUPPORT FOR SIGNS SHALL BE TEMPORARY, FIXED, OR PORTABLE SIGN SUPPORTS AS DIRECTED BY THE ENGINEER OR IN ACCORDANCE WITH THE "BC" STANDARD SHEETS AND THE TMUTCD.
4. THE DISTANCE PLAQUE IN FEET OR MILES, MAY BE REQUIRED FOR USE IN CONJUNCTION WITH WARNING SIGNS.
5. PLASTIC BARRELS OR VERTICAL PANELS ARE TO BE USED FOR CHANNELIZING DEVICES. CONES WILL NOT BE PERMITTED.
6. ALL CONSTRUCTION TRAFFIC IS TO BE REGULATED TO INCONVENIENCE THE TRAVILING PUBLIC AS LITTLE AS POSSIBLE. WHEN IT IS NECESSARY FOR CONSTRUCTION EQUIPMENT OR TRUCKS TO STOP, UNLOAD, OR CROSS ROADWAYS UNDER TRAFFIC, WARNING SIGNS AND A FLAGGER SHALL BE PROVIDED AS NECESSARY TO PROTECT THE TRAVELING PUBLIC.

SIGN SCHEDULE NOTES:

1. REFER TO TXDOT STANDARD SHEETS BC(1)-14 THRU BC(12)-14, TCP(2-1)-18, (2-4)-18, (6-2)-17, (6-4)-12, AND FOR TRAFFIC CONTROL DEVICE AND WARNING SIGN GUIDANCE.
2. ALL SIGNS SHALL REMAIN IN PLACE FOR THE DURATION OF CONSTRUCTION UNLESS NOTED OTHERWISE.
3. SIGNS THAT CANNOT BE PLACED DUE TO INADEQUATE SHOULDER WIDTH SHALL BE ADJUSTED IN THE FIELD IN ACCORDANCE WITH THE TMUTCD.
4. NOT ALL WORK ZONE SIGNS ARE SHOWN ON THIS PLAN. REFER TO THE DETOUR PLAN SHEET AND THE TXDOT STANDARDS FOR ADDITIONAL SIGNAGE.
5. ANY REDUCTION IN SPEED LIMIT GREATER THAN 10 MPH FROM CURRENT POSTED SPEED REQUIRES A COMMISSION MINUTE ORDER APPROVAL FROM TXDOT.
6. SIGN SPACING IS 120'.

0 500' 1000'

SCALE: 1" = 1000'

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1/27/2021

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SL 368
AT SALADO CREEK

ADVANCED WARNING LAYOUT

SHEET 2 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		21
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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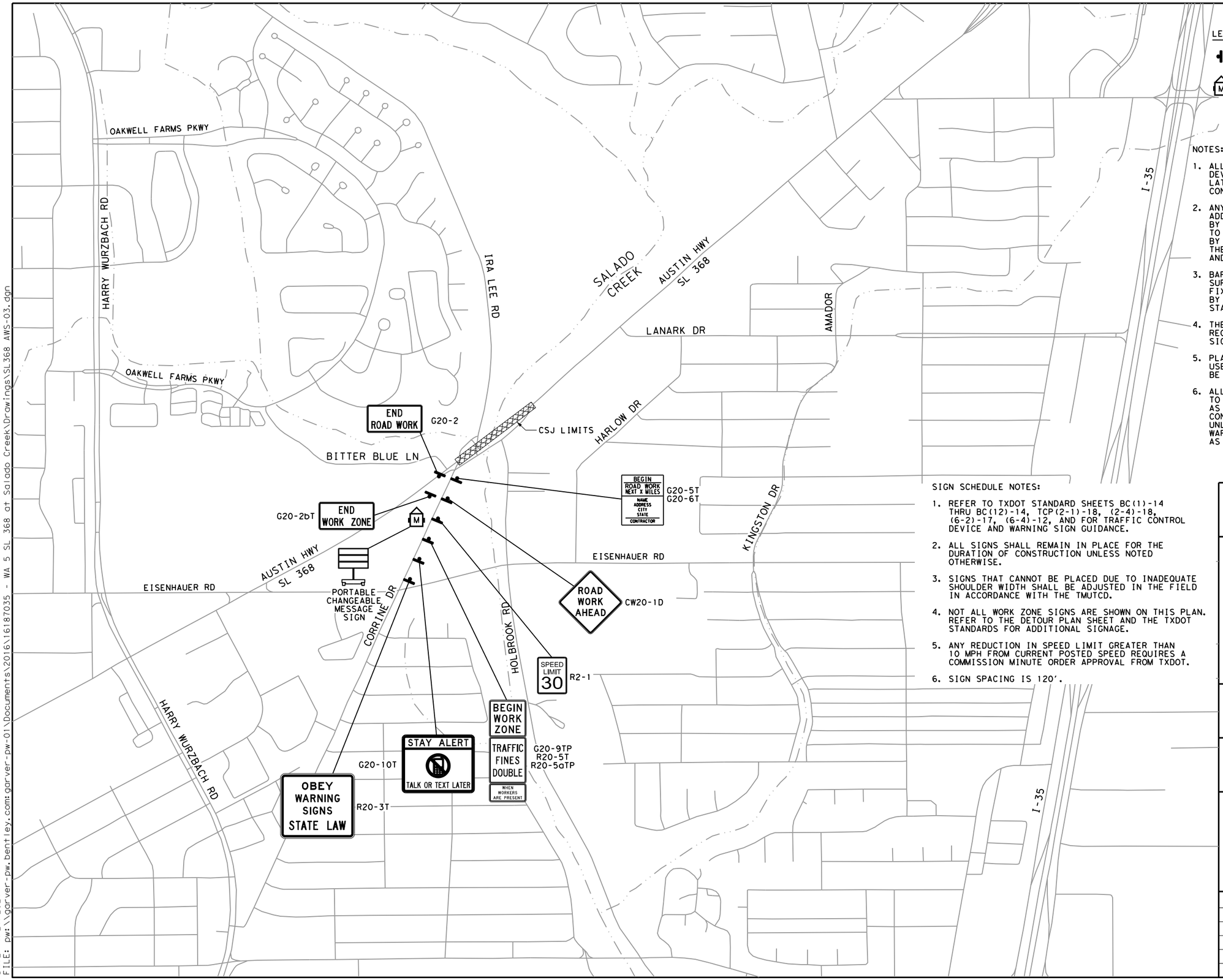

LEGEND

TRAFFIC SIGN

PORTABLE CHANGEABLE MESSAGE SIGN

N

NOTES:

1. ALL TRAFFIC CONTROL BARRICADES, SIGNS, & DEVICES SHALL BE IN ACCORDANCE WITH THE LATEST TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD) & TXDOT STANDARDS.
2. ANY SIGNS LISTED ON THIS SHEET AND ANY ADDITIONAL REQUIRED SIGNS SHALL BE SUPPLIED BY THE CONTRACTOR AND CONSIDERED SUBSIDIARY TO ITEM 502. ANY ADDITIONAL SIGNS REQUESTED BY THE ENGINEER SHALL BE IN ACCORDANCE WITH THE TXDOT "BC" & TCP STANDARD SHEETS, AND/OR THE TMUTCD.
3. BARRICADES ARE NOT TO BE USED AS A SIGN SUPPORT. SUPPORT FOR SIGNS SHALL BE TEMPORARY, FIXED, OR PORTABLE SIGN SUPPORTS AS DIRECTED BY THE ENGINEER OR IN ACCORDANCE WITH THE "BC" STANDARD SHEETS AND THE TMUTCD.
4. THE DISTANCE PLAQUE IN FEET OR MILES, MAY BE REQUIRED FOR USE IN CONJUNCTION WITH WARNING SIGNS.
5. PLASTIC BARRELS OR VERTICAL PANELS ARE TO BE USED FOR CHANNELIZING DEVICES. CONES WILL NOT BE PERMITTED.
6. ALL CONSTRUCTION TRAFFIC IS TO BE REGULATED TO INCONVENIENCE THE TRAVILING PUBLIC AS LITTLE AS POSSIBLE. WHEN IT IS NECESSARY FOR CONSTRUCTION EQUIPMENT OR TRUCKS TO STOP, UNLOAD, OR CROSS ROADWAYS UNDER TRAFFIC, WARNING SIGNS AND A FLAGGER SHALL BE PROVIDED AS NECESSARY TO PROTECT THE TRAVELING PUBLIC.

SIGN SCHEDULE NOTES:

1. REFER TO TXDOT STANDARD SHEETS BC(1)-14 THRU BC(12)-14, TCP(2-1)-18, (2-4)-18, (6-2)-17, (6-4)-12, AND FOR TRAFFIC CONTROL DEVICE AND WARNING SIGN GUIDANCE.
2. ALL SIGNS SHALL REMAIN IN PLACE FOR THE DURATION OF CONSTRUCTION UNLESS NOTED OTHERWISE.
3. SIGNS THAT CANNOT BE PLACED DUE TO INADEQUATE SHOULDER WIDTH SHALL BE ADJUSTED IN THE FIELD IN ACCORDANCE WITH THE TMUTCD.
4. NOT ALL WORK ZONE SIGNS ARE SHOWN ON THIS PLAN. REFER TO THE DETOUR PLAN SHEET AND THE TXDOT STANDARDS FOR ADDITIONAL SIGNAGE.
5. ANY REDUCTION IN SPEED LIMIT GREATER THAN 10 MPH FROM CURRENT POSTED SPEED REQUIRES A COMMISSION MINUTE ORDER APPROVAL FROM TXDOT.
6. SIGN SPACING IS 120'.

0 500' 1000'

SCALE: 1" = 1000'

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SL 368
AT SALADO CREEK

ADVANCED WARNING LAYOUT

SHEET 3 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		22
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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TRAFFIC CONTROL DEVICES

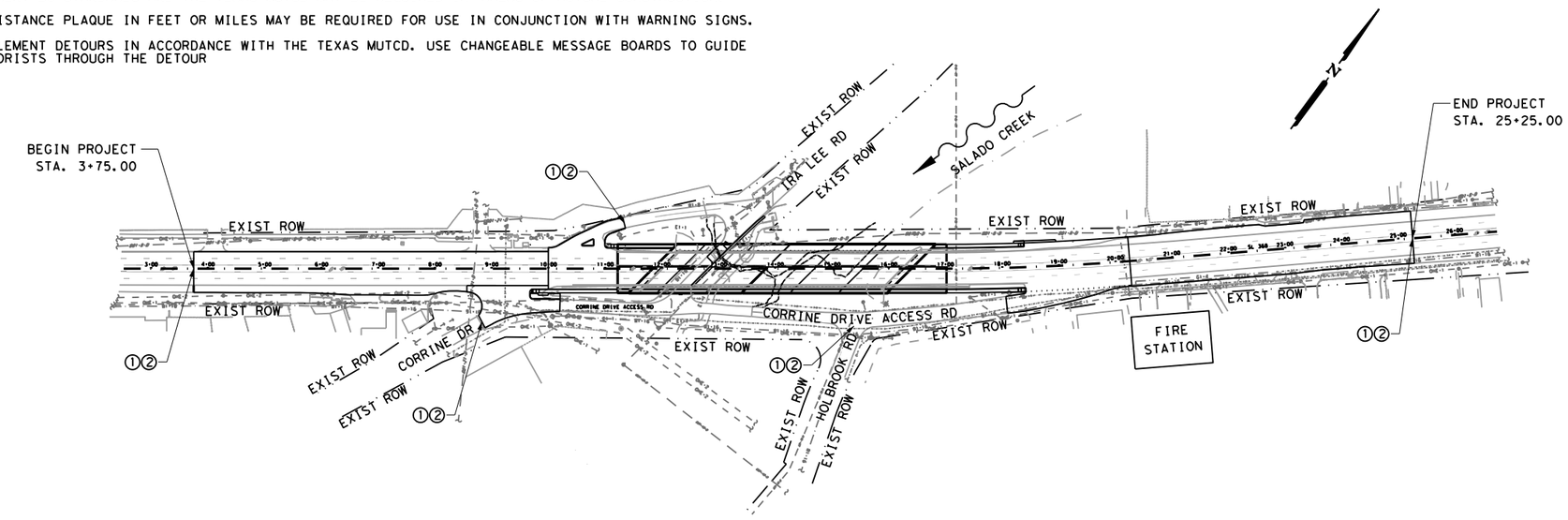
LOCATION	G20-2bT	G20-2a	G20-5T G20-6T	CW20-10	R2-1	R2-1	R2-1	G20-9TP R20-5T R20-5aTP	G20-10T	R20-3T	PORTABLE CHANGEABLE MESSAGE SIGN	TYPE III BARRICADE	CW3-5	CW20-5TR	R11-2	CW5-1	CW6-3
1			X	X	X	X		X	X	X	X		X				
2	X	X															
3							X					X		X	X	X	X

TRAFFIC CONTROL DEVICES CONT.

LOCATION	CW4-2R	R1-2	CW1-4R CW13-1P	R3-2	R3-1	CW1-4L CW13-1P	R1-1 R3-2	CSB	CSB (PINNED)	VERTICAL PANELS & OTLD'S	CHANNELIZING DEVICES	LOW PROF BARRIER	R5-1
1													
2													
3	X	X	X	X	X	X	X	X	X	X	X	X	X

GENERAL NOTES - BARRICADES:
LOCATION NO. 1 TO BE USED AT BEGINNING OF THE PROJECT AND ENTERING SIDE STREETS.
LOCATION NO. 2 TO BE USED AT THE END OF THE PROJECT AND EXITING SIDE STREETS.
LOCATION NO. 3 TO BE USED THROUGHOUT THE COURSE OF THE PROJECT AS DIRECTED BY THE ENGINEER

NOTE:
1. CERTAIN SIGNS MUST BE USED IN CONJUNCTION WITH OTHER SIGNS. EXAMPLE: "ROAD CLOSED" MUST HAVE A "TURN ARROW".
2. BARRICADES AND WARNING SIGNS ON THIS SHEET ARE THE MINIMUM. CONSTRUCTION ZONE SIGNING, ADDITIONAL BARRICADES, WARNING SIGNS, ARROW PANELS, CONES, ETC. REQUIRED IN ACCORDANCE WITH CURRENT BC STANDARDS AND THE TEXAS MUTCD MAY BE REQUIRED IN AREAS OF ACTUAL CONSTRUCTION.
3. A DISTANCE PLAQUE IN FEET OR MILES MAY BE REQUIRED FOR USE IN CONJUNCTION WITH WARNING SIGNS.
4. IMPLEMENT DETOURS IN ACCORDANCE WITH THE TEXAS MUTCD. USE CHANGEABLE MESSAGE BOARDS TO GUIDE MOTORISTS THROUGH THE DETOUR



0 125' 250'
SCALE: 1" = 250'

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED PROFESSIONAL ENGINEER
1/27/2021

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(512) 485-0009
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Texas Department of Transportation

SL 368
AT SALADO CREEK

TRAFFIC CONTROL PLAN SCHEDULE OF BARRICADES

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		23
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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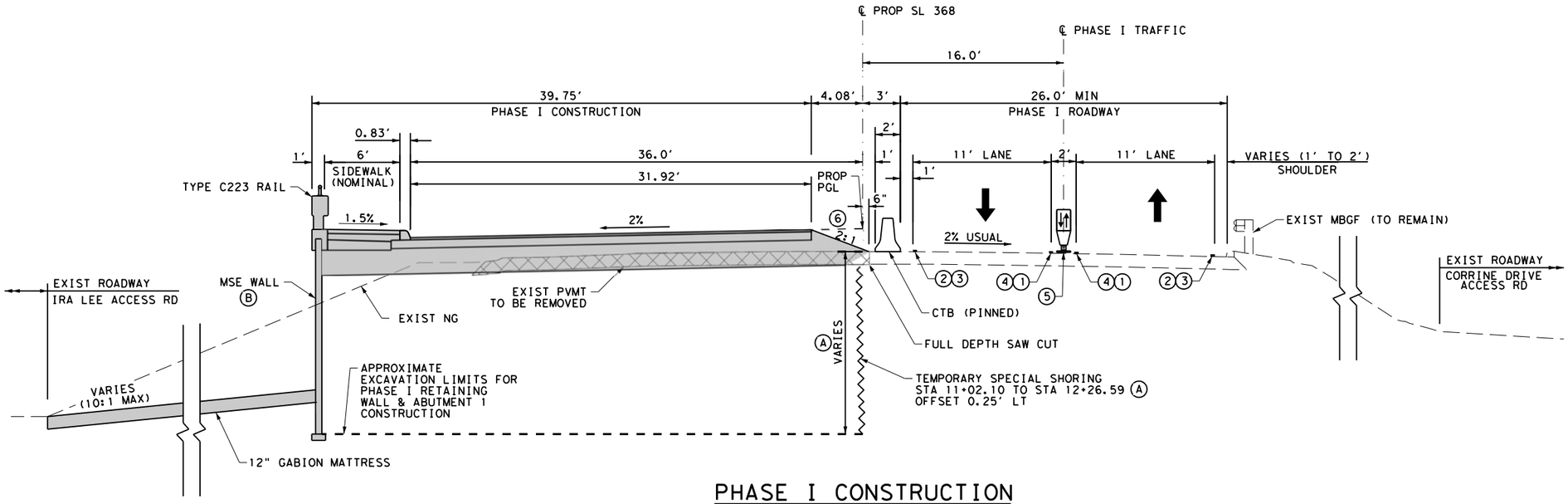
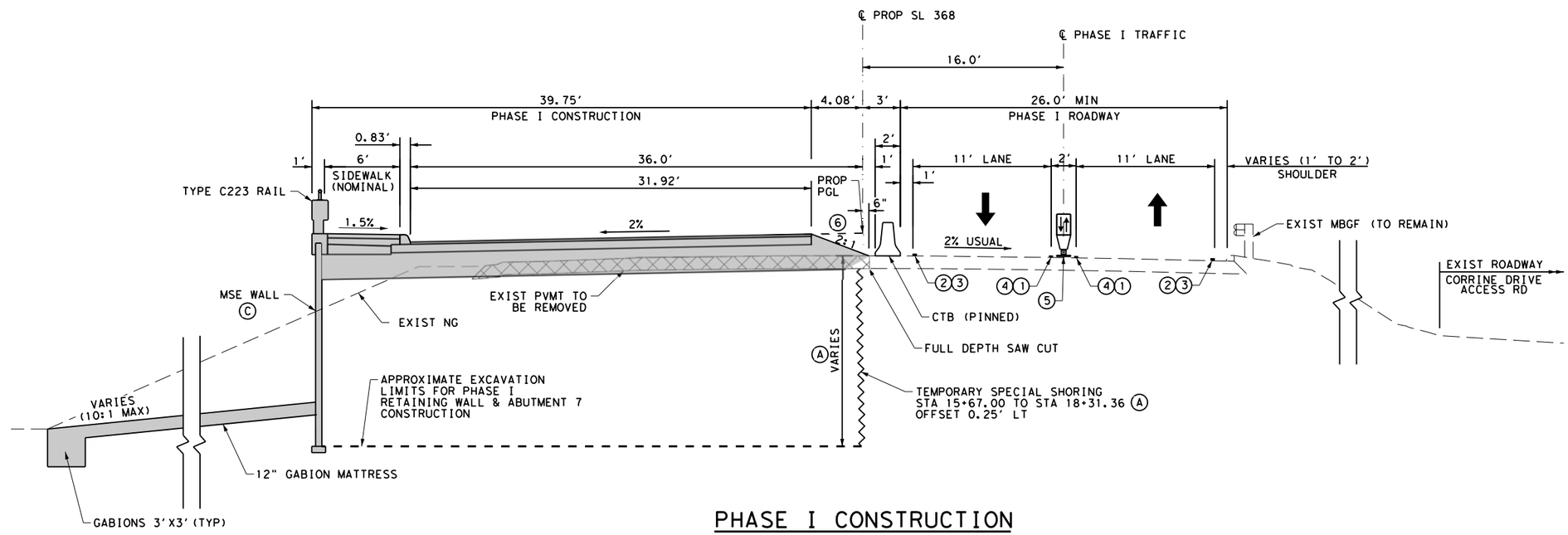


PHASE I CONSTRUCTION

STA 11+02.10 TO 12+26.59



PHASE I CONSTRUCTION

STA 15+67.00 TO 18+31.36

1. WK ZN PAV MRK REMOV (REFL) TY-I-A
2. WK ZN PAV MRK REMOV (REFL) TY-I-C
3. WK ZN PAV MRK REMOV (W) 4" (SLD)
4. WK ZN PAV MRK REMOV (Y) 4" (SLD)
5. VERTICAL PANELS & OTLD'S
6. TEMPORARY CONSTRUCTION SLOPE (VARIES) 1.8:1 MAX

NOTE:

A. SEE TEMPORARY SPECIAL SHORING DETAILS SHEET FOR TEMPORARY SPECIAL SHORING DETAILS AND NOTES.

B. MSE WALL LIMITS
STA 11+10.00 TO 12+82.00

C. MSE WALL LIMITS
STA 16+31.00 TO 18+20.00

LEGEND

- PROP TRAFFIC FLOW
- EXISTING TO REMAIN THIS PHASE
- DEMOLITION THIS PHASE
- CONSTRUCTION THIS PHASE
- CONSTRUCTED PREVIOUS PHASE

0 5' 10'

SCALE: 1" = 10'

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SL 368
AT SALADO CREEK

TRAFFIC CONTROL PLAN PHASE I TYPICAL SECTIONS

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		24
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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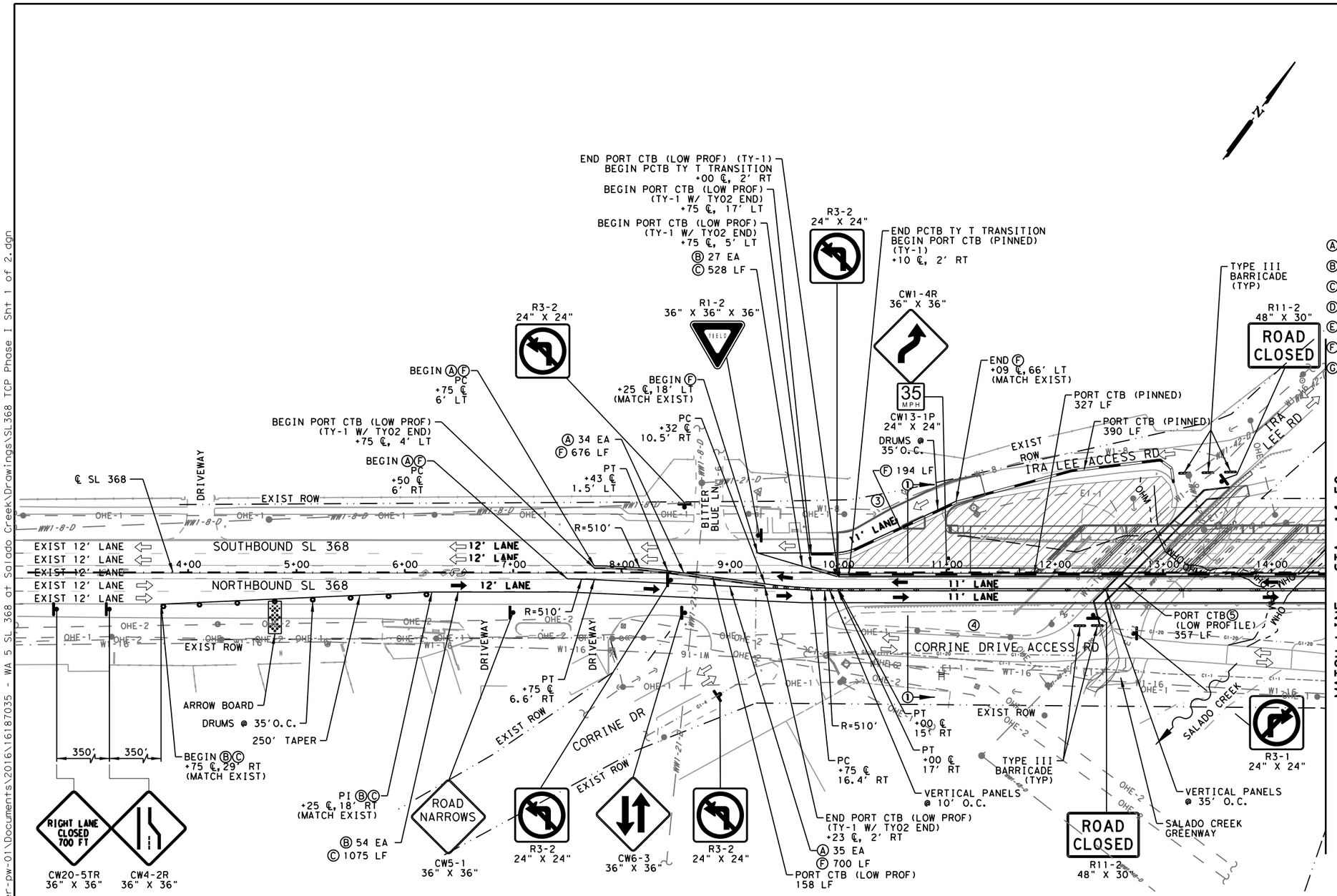

ITEM NO.	DESCRIPTION	UNIT	QTY
502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	16
512 6005	PORT CTB (FUR & INST) (F-SHAPE) (TY1)	LF	828
512 6009	PORT CTB (FUR & INST) (LOW PROF) (TY1)	LF	568
512 6010	PORT CTB (FUR & INST) (LOW PROF) (TY2)	LF	120
512 6033	PORT CTB (MOVE) (LOW PROF) (TY1)	LF	
512 6034	PORT CTB (MOVE) (LOW PROF) (TY2)	LF	
512 6053	PORT CTB (REMOVE) (F-SHAPE) (TY1)	LF	838
512 6057	PORT CTB (REMOVE) (LOW PROF) (TY1)	LF	
512 6058	PORT CTB (REMOVE) (LOW PROF) (TY2)	LF	
512 6099	PCTB (FUR & INST) (F-SHP TO LOW PROF) TY T	LF	10
Ⓐ 662 6046	WK ZN PAV MRK REMOV (REFL) TY-I-A	EA	69
Ⓑ 662 6048	WK ZN PAV MRK REMOV (REFL) TY-I-C	EA	81
Ⓒ 662 6063	WK ZN PAV MRK REMOV (W) 4" (SLD)	LF	1603
Ⓓ 662 6080	WK ZN PAV MRK REMOV (W) (ARROW)	EA	
Ⓔ 662 6093	WK ZN PAV MRK REMOV (Y) 4" (BRK)	LF	
Ⓕ 662 6095	WK ZN PAV MRK REMOV (Y) 4" (SLD)	LF	1570
Ⓖ 662 6102	WK ZN PAV MRK REMOV (Y) 24" (SLD)	LF	
677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	6219
677 6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	1
60016002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	5

① LOCATION OF TYPICAL SECTION
② REUSE SIGN FROM PHASE I
③ COVER EXISTING STOP SIGN AT IRA LEE RD DURING PHASE I CONSTRUCTION
④ CORRINE DRIVE ACCESS ROAD TO BE CLOSED DURING INSTALLATION OF JOINT BID WATER LINE. SEE DETOUR PLAN.
⑤ TEMPORARY CSB (LOW PROFILE) FOR PEDESTRIAN TRAIL.

0 50' 100'
SCALE: 1" = 100'

LEGEND

- EXIST TRAFFIC FLOW
- PROP TRAFFIC FLOW
- WORK ZONE THIS PHASE
- TRAFFIC AREA THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- EXISTING STRIPING
- STRIPING THIS PHASE
- CONSTRUCTION WARNING SIGN
- CHANNELIZING DEVICES
- CRASH CUSHION ATTENUATOR
- CONCRETE SAFETY BARRIER (LOW PROFILE)
- CONCRETE SAFETY BARRIER
- TYPE III BARRICADE
- VERTICAL PANELS

NOTES

1. REFER TO TRAFFIC CONTROL TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.
2. ALL BARRIERS ARE 1' OFFSET TO ADJACENT STRIPING UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS AND CALLOUTS ARE TO STRIPE UNLESS OTHERWISE NOTED. ALL STATION AND OFFSETS ARE DIMENSIONED FROM SL 368 CENTERLINE.
4. SEE TXDOT STANDARDS BC(1)-14 THRU BC(12)-14 FOR PAVEMENT MARKINGS, TRAFFIC DEVICES, BARRICADE AND SIGN PLACEMENT INFORMATION.
5. DRIVEWAYS TO REMAIN OPEN AT ALL TIMES DURING CONSTRUCTION.
6. CONTRACTOR TO TRANSITION PAVEMENT TO PROVIDE ADEQUATE DRIVEABILITY THROUGHOUT THE CONSTRUCTION PROCESS.

STATE OF TEXAS
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Texas Department of Transportation

SL 368
AT SALADO CREEK

TRAFFIC CONTROL PLAN
PHASE I LAYOUT

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		25
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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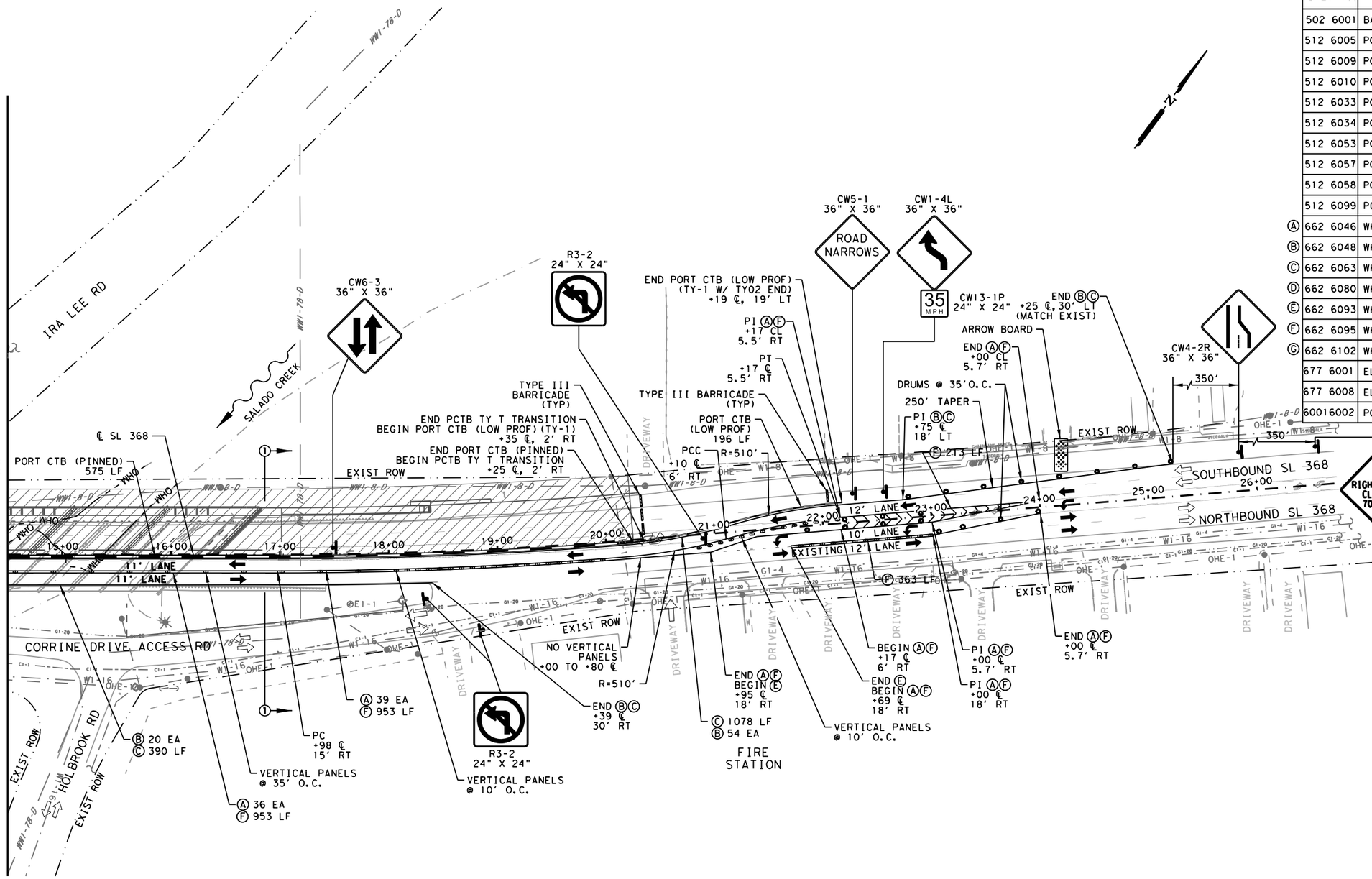

① LOCATION OF TYPICAL SECTION
② REUSE SIGN FROM PHASE I

0 50' 100'
SCALE: 1" = 100'

ITEM NO.	DESCRIPTION	UNIT	QTY
502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	
512 6005	PORT CTB (FUR & INST) (F-SHAPE) (TY1)	LF	575
512 6009	PORT CTB (FUR & INST) (LOW PROF) (TY1)	LF	196
512 6010	PORT CTB (FUR & INST) (LOW PROF) (TY2)	LF	20
512 6033	PORT CTB (MOVE) (LOW PROF) (TY1)	LF	
512 6034	PORT CTB (MOVE) (LOW PROF) (TY2)	LF	
512 6053	PORT CTB (REMOVE) (F-SHAPE) (TY1)	LF	585
512 6057	PORT CTB (REMOVE) (LOW PROF) (TY1)	LF	
512 6058	PORT CTB (REMOVE) (LOW PROF) (TY2)	LF	
512 6099	PCTB (FUR & INST) (F-SHP TO LOW PROF) TY T	LF	10
Ⓐ 662 6046	WK ZN PAV MRK REMOV (REFL) TY-I-A	EA	75
Ⓑ 662 6048	WK ZN PAV MRK REMOV (REFL) TY-I-C	EA	74
Ⓒ 662 6063	WK ZN PAV MRK REMOV (W) 4" (SLD)	LF	1682
Ⓓ 662 6080	WK ZN PAV MRK REMOV (W) (ARROW)	EA	3
Ⓔ 662 6093	WK ZN PAV MRK REMOV (Y) 4" (BRK)	LF	74
Ⓕ 662 6095	WK ZN PAV MRK REMOV (Y) 4" (SLD)	LF	2483
Ⓖ 662 6102	WK ZN PAV MRK REMOV (Y) 24" (SLD)	LF	
677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	5768
677 6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	2
60016002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	5

LEGEND

- EXIST TRAFFIC FLOW
- PROP TRAFFIC FLOW
- WORK ZONE THIS PHASE
- TRAFFIC AREA THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- EXISTING STRIPING
- STRIPING THIS PHASE
- CONSTRUCTION WARNING SIGN
- CHANNELIZING DEVICES
- CRASH CUSHION ATTENUATOR
- CONCRETE SAFETY BARRIER (LOW PROFILE)
- CONCRETE SAFETY BARRIER
- TYPE III BARRICADE
- VERTICAL PANELS

NOTES

1. REFER TO TRAFFIC CONTROL TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.
2. ALL BARRIERS ARE 1' OFFSET TO ADJACENT STRIPING UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS AND CALLOUTS ARE TO STRIPE UNLESS OTHERWISE NOTED. ALL STATION AND OFFSETS ARE DIMENSIONED FROM SL 368 CENTERLINE.
4. SEE TXDOT STANDARDS BC(1)-14 THRU BC(12)-14 FOR PAVEMENT MARKINGS, TRAFFIC DEVICES, BARRICADE AND SIGN PLACEMENT INFORMATION.
5. DRIVEWAYS TO REMAIN OPEN AT ALL TIMES DURING CONSTRUCTION.
6. CONTRACTOR TO TRANSITION PAVEMENT TO PROVIDE ADEQUATE DRIVEABILITY THROUGHOUT THE CONSTRUCTION PROCESS.

STATE OF TEXAS
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1/27/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

TRAFFIC CONTROL PLAN
PHASE I LAYOUT

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		26
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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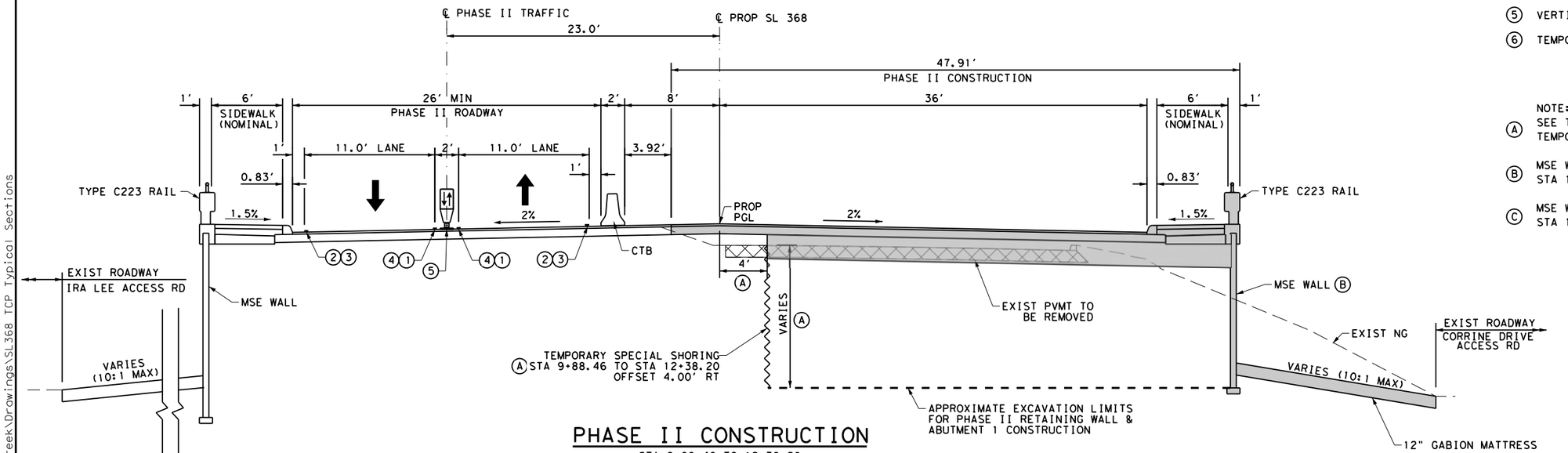
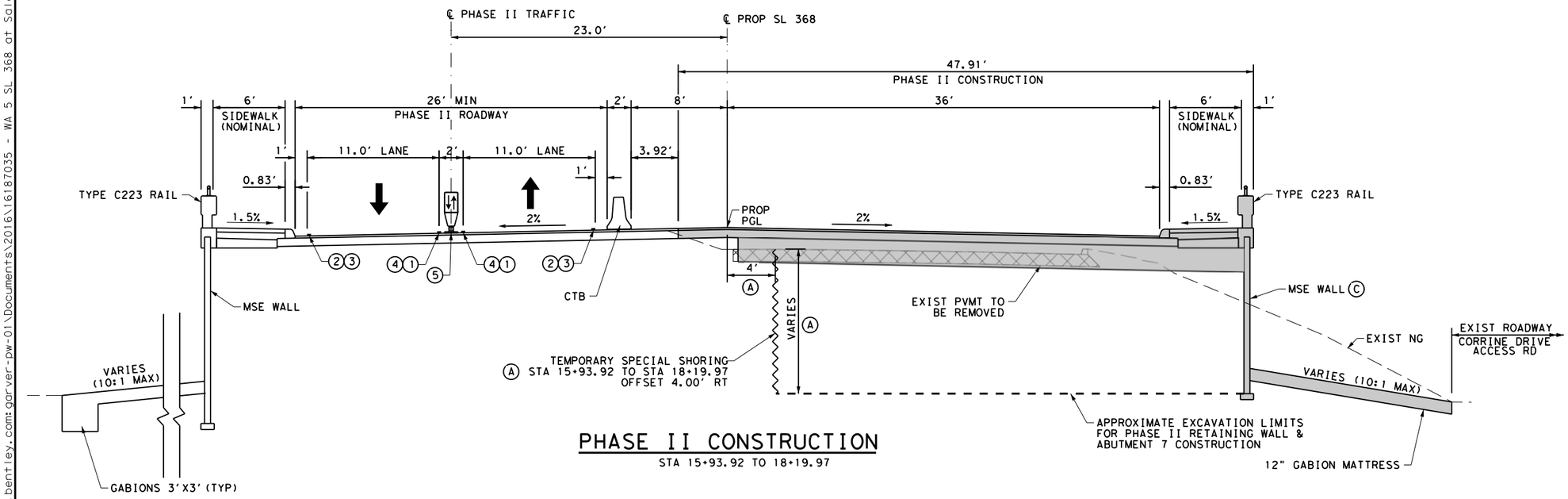


PHASE II CONSTRUCTION

STA 9+88.46 TO 12+38.20



PHASE II CONSTRUCTION

STA 15+93.92 TO 18+19.97

① WK ZN PAV MRK REMOV (REFL) TY-I-A
② WK ZN PAV MRK REMOV (REFL) TY-I-C
③ WK ZN PAV MRK REMOV (W) 4" (SLD)
④ WK ZN PAV MRK REMOV (Y) 4" (SLD)
⑤ VERTICAL PANELS
⑥ TEMPORARY CONSTRUCTION SLOPE (VARIES) 1.8:1 MAX

Ⓐ NOTE:
SEE TEMPORARY SPECIAL SHORING DETAILS SHEET FOR TEMPORARY SPECIAL SHORING DETAILS AND NOTES.

Ⓑ MSE WALL LIMITS
STA 10+00.00 TO 11+95.00

Ⓒ MSE WALL LIMITS
STA 15+58.64 TO 18+12.00

LEGEND

- PROP TRAFFIC FLOW
- EXISTING TO REMAIN THIS PHASE
- DEMOLITION THIS PHASE
- CONSTRUCTION THIS PHASE
- CONSTRUCTED PREVIOUS PHASE

0 5′ 10′
SCALE: 1" = 10′

STATE OF TEXAS
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87288
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1/27/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

TRAFFIC CONTROL PLAN PHASE II TYPICAL SECTIONS

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		27
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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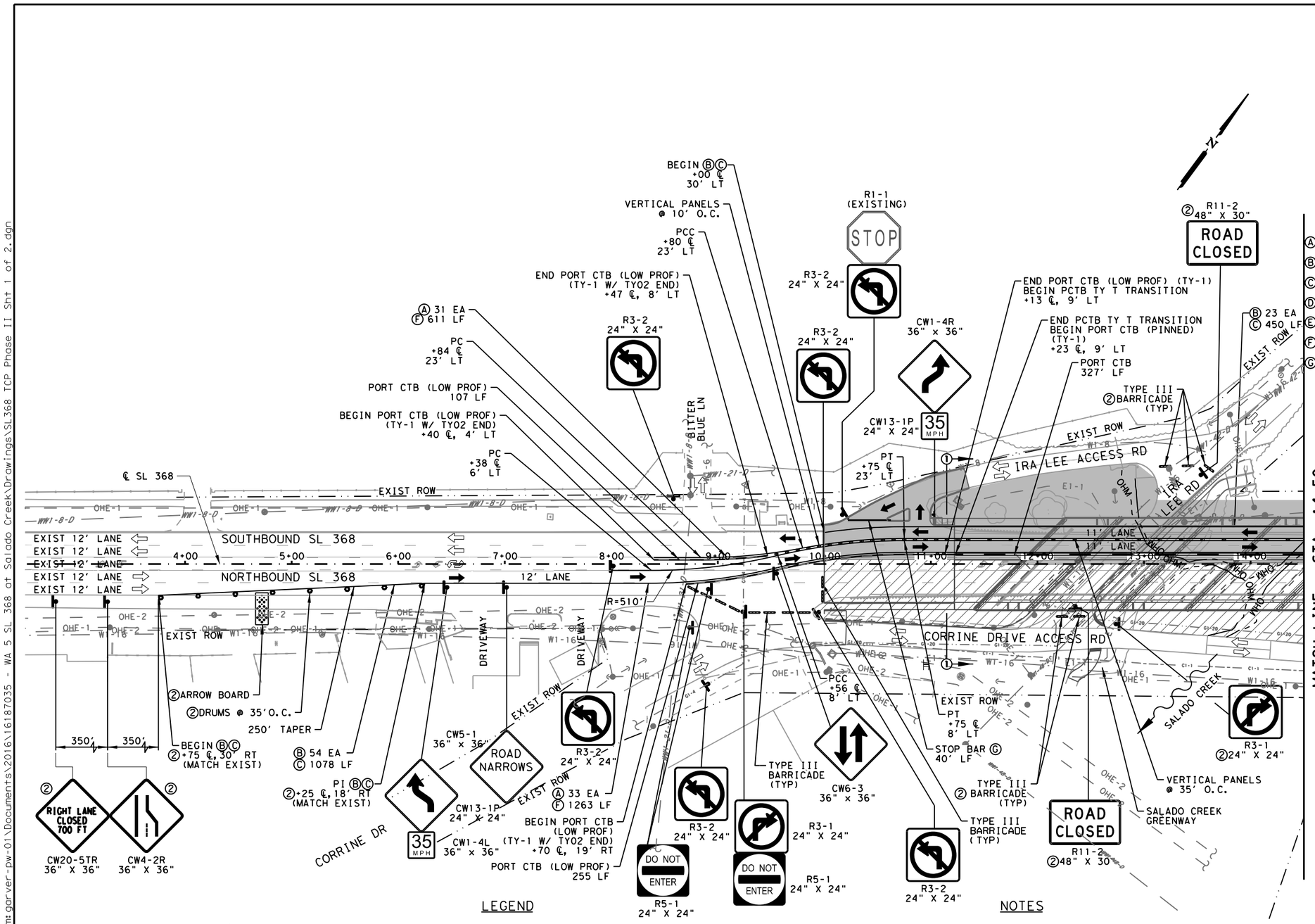

ITEM NO.	DESCRIPTION	UNIT	QTY
502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	12
512 6005	PORT CTB (FUR & INST) (F-SHAPE) (TY1)	LF	327
512 6009	PORT CTB (FUR & INST) (LOW PROF) (TY1)	LF	362
512 6010	PORT CTB (FUR & INST) (LOW PROF) (TY2)	LF	
512 6033	PORT CTB (MOVE) (LOW PROF) (TY1)	LF	263
512 6034	PORT CTB (MOVE) (LOW PROF) (TY2)	LF	120
512 6053	PORT CTB (REMOVE) (F-SHAPE) (TY1)	LF	337
512 6057	PORT CTB (REMOVE) (LOW PROF) (TY1)	LF	930
512 6058	PORT CTB (REMOVE) (LOW PROF) (TY2)	LF	140
512 6099	PCTB (FUR & INST) (F-SHP TO LOW PROF) TY T	LF	10
Ⓐ 662 6046	WK ZN PAV MRK REMOV (REFL) TY-I-A	EA	64
Ⓑ 662 6048	WK ZN PAV MRK REMOV (REFL) TY-I-C	EA	77
Ⓒ 662 6063	WK ZN PAV MRK REMOV (W) 4" (SLD)	LF	1528
Ⓓ 662 6080	WK ZN PAV MRK REMOV (W) (ARROW)	EA	
Ⓔ 662 6093	WK ZN PAV MRK REMOV (Y) 4" (BRK)	LF	
Ⓕ 662 6095	WK ZN PAV MRK REMOV (Y) 4" (SLD)	LF	1874
Ⓖ 662 6102	WK ZN PAV MRK REMOV (Y) 24" (SLD)	LF	40
677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	
677 6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	
60016002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	5

① LOCATION OF TYPICAL SECTION
② REUSE SIGN FROM PHASE I

LEGEND

- EXIST TRAFFIC FLOW
- PROP TRAFFIC FLOW
- WORK ZONE THIS PHASE
- TRAFFIC AREA THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- EXISTING STRIPING
- STRIPING THIS PHASE
- CONSTRUCTION WARNING SIGN
- CHANNELIZING DEVICES
- CRASH CUSHION ATTENUATOR
- CONCRETE SAFETY BARRIER (LOW PROFILE)
- CONCRETE SAFETY BARRIER
- TYPE III BARRICADE
- VERTICAL PANELS

NOTES

1. REFER TO TRAFFIC CONTROL TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.
2. ALL BARRIERS ARE 1' OFFSET TO ADJACENT STRIPING UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS AND CALLOUTS ARE TO STRIPE UNLESS OTHERWISE NOTED. ALL STATION AND OFFSETS ARE DIMENSIONED FROM SL 368 CENTERLINE.
4. SEE TXDOT STANDARDS BC(1)-14 THRU BC(12)-14 FOR PAVEMENT MARKINGS, TRAFFIC DEVICES, BARRICADE AND SIGN PLACEMENT INFORMATION.
5. DRIVEWAYS TO REMAIN OPEN AT ALL TIMES DURING CONSTRUCTION.
6. CONTRACTOR TO TRANSITION PAVEMENT TO PROVIDE ADEQUATE DRIVEABILITY THROUGHOUT THE CONSTRUCTION PROCESS.

0 50' 100'
SCALE: 1" = 100'

STATE OF TEXAS
GLENN G. GREGORY, JR.
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2/3/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

TRAFFIC CONTROL PLAN
PHASE II LAYOUT

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		28
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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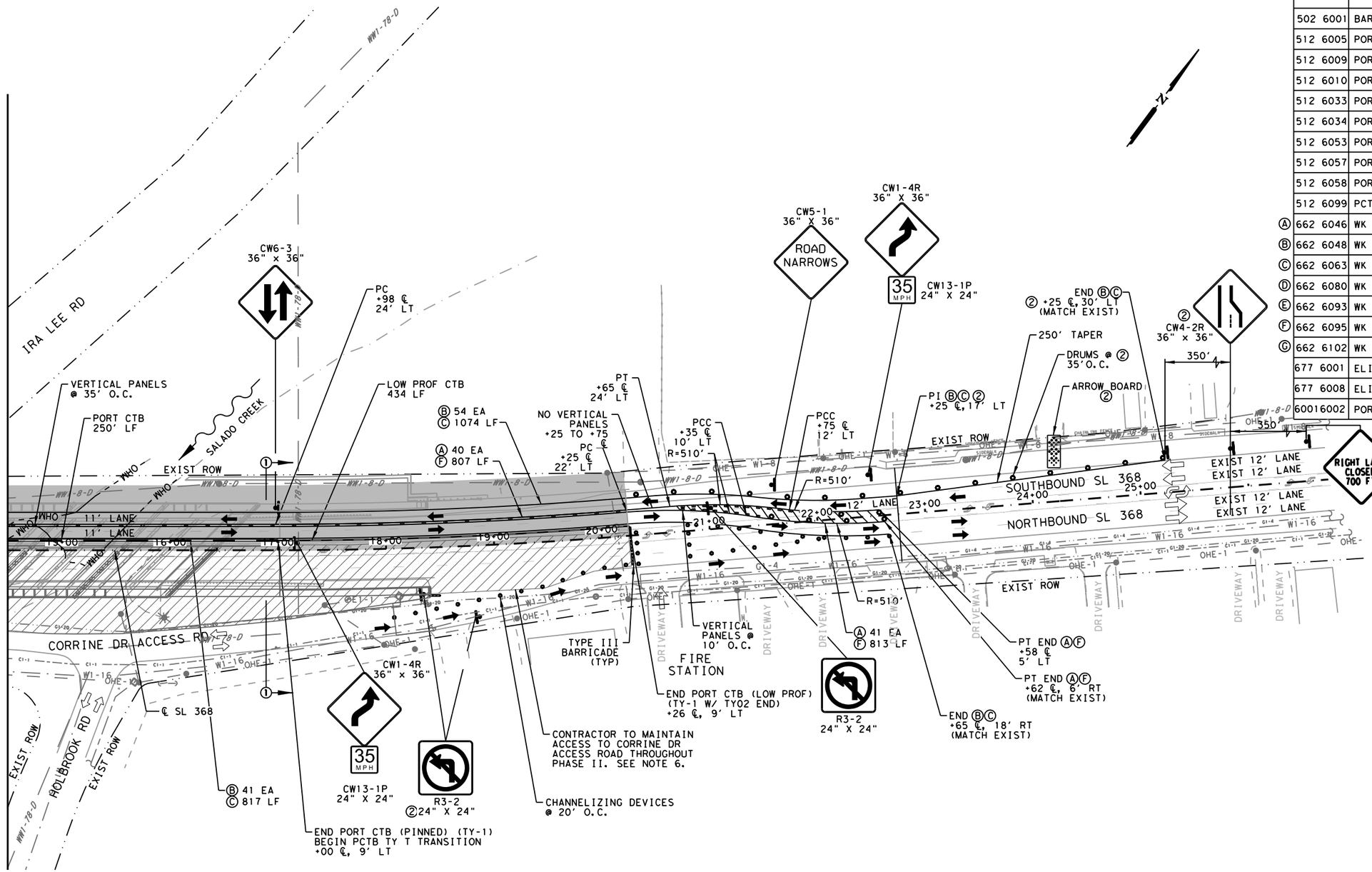

ITEM NO.	DESCRIPTION	UNIT	QTY
502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	
512 6005	PORT CTB (FUR & INST) (F-SHAPE) (TY1)	LF	260
512 6009	PORT CTB (FUR & INST) (LOW PROF) (TY1)	LF	325
512 6010	PORT CTB (FUR & INST) (LOW PROF) (TY2)	LF	
512 6033	PORT CTB (MOVE) (LOW PROF) (TY1)	LF	175
512 6034	PORT CTB (MOVE) (LOW PROF) (TY2)	LF	20
512 6053	PORT CTB (REMOVE) (F-SHAPE) (TY1)	LF	260
512 6057	PORT CTB (REMOVE) (LOW PROF) (TY1)	LF	521
512 6058	PORT CTB (REMOVE) (LOW PROF) (TY2)	LF	40
512 6099	PCTB (FUR & INST) (F-SHP TO LOW PROF) TY T	LF	10
Ⓐ 662 6046	WK ZN PAV MRK REMOV (REFL) TY-I-A	EA	81
Ⓑ 662 6048	WK ZN PAV MRK REMOV (REFL) TY-I-C	EA	95
Ⓒ 662 6063	WK ZN PAV MRK REMOV (W) 4" (SLD)	LF	2125
Ⓓ 662 6080	WK ZN PAV MRK REMOV (W) (ARROW)	EA	
Ⓔ 662 6093	WK ZN PAV MRK REMOV (Y) 4" (BRK)	LF	
Ⓕ 662 6095	WK ZN PAV MRK REMOV (Y) 4" (SLD)	LF	1620
Ⓖ 662 6102	WK ZN PAV MRK REMOV (Y) 24" (SLD)	LF	
677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	
677 6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	
60016002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	5

LEGEND

- EXIST TRAFFIC FLOW
- PROP TRAFFIC FLOW
- WORK ZONE THIS PHASE
- TRAFFIC AREA THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- EXISTING STRIPING
- STRIPING THIS PHASE
- CONSTRUCTION WARNING SIGN
- CHANNELIZING DEVICES
- CRASH CUSHION ATTENUATOR
- CONCRETE SAFETY BARRIER (LOW PROFILE)
- CONCRETE SAFETY BARRIER
- TYPE III BARRICADE
- VERTICAL PANELS

NOTES

1. REFER TO TRAFFIC CONTROL TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.
2. ALL BARRIERS ARE 1' OFFSET TO ADJACENT STRIPING UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS AND CALLOUTS ARE TO STRIPE UNLESS OTHERWISE NOTED. ALL STATION AND OFFSETS ARE DIMENSIONED FROM SL 368 CENTERLINE.
4. SEE TXDOT STANDARDS BC(1)-14 THRU BC(12)-14 FOR PAVEMENT MARKINGS, TRAFFIC DEVICES, BARRICADE AND SIGN PLACEMENT INFORMATION.
5. DRIVEWAYS TO REMAIN OPEN AT ALL TIMES DURING CONSTRUCTION.
6. CONTRACTOR TO TRANSITION PAVEMENT TO PROVIDE ADEQUATE DRIVEABILITY THROUGHOUT THE CONSTRUCTION PROCESS.

0 50' 100'

SCALE: 1" = 100'

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED
PROFESSIONAL ENGINEER

2/3/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

TRAFFIC CONTROL PLAN
PHASE II LAYOUT

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		29
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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(1) RE PM W/RET REQ TY I (W)4"(SLD) (100MIL)

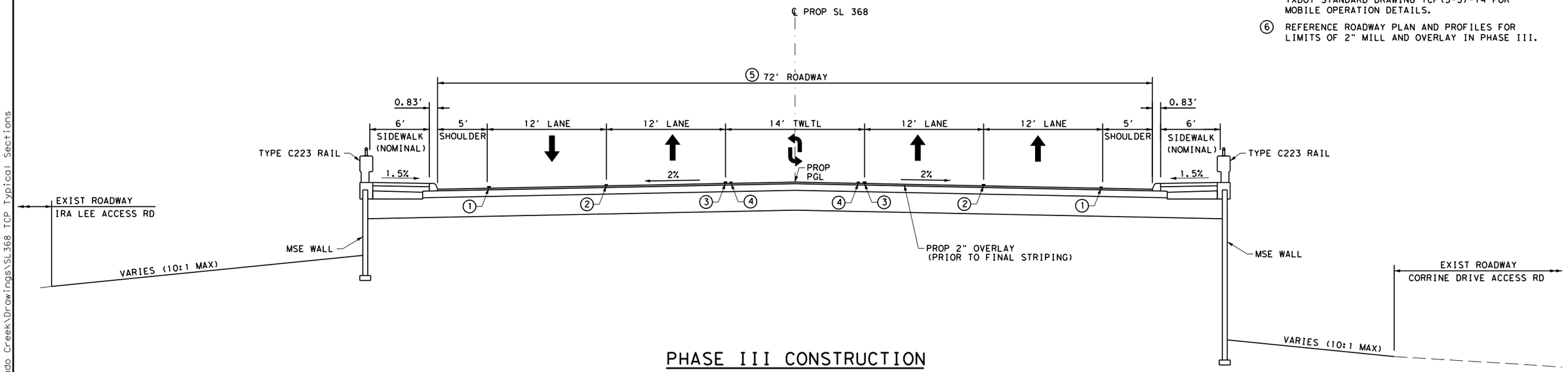
(2) RE PM W/RET REQ TY I (W)4"(BRK) (100MIL)

(3) RE PM W/RET REQ TY I (Y)4"(SLD) (100MIL)

(4) RE PM W/RET REQ TY I (Y)4"(BRK) (100MIL)

(5) PROPOSED 2" OVERLAY AND PERMANENT STRIPING TO BE INSTALLED UNDER TRAFFIC. REFERENCE TXDOT STANDARD DRAWING TCP(3-3)-14 FOR MOBILE OPERATION DETAILS.

(6) REFERENCE ROADWAY PLAN AND PROFILES FOR LIMITS OF 2" MILL AND OVERLAY IN PHASE III.



PHASE III CONSTRUCTION

(6) STA 10+00.00 TO 11+83.90
(6) STA 16+39.90 TO 20+25.00

LEGEND

- PROP TRAFFIC FLOW
- EXISTING TO REMAIN THIS PHASE
- DEMOLITION THIS PHASE
- CONSTRUCTION THIS PHASE
- CONSTRUCTED PREVIOUS PHASE

0 5' 10'

SCALE: 1" = 10'

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SL 368
AT SALADO CREEK

TRAFFIC CONTROL PLAN PHASE III TYPICAL SECTIONS

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		30
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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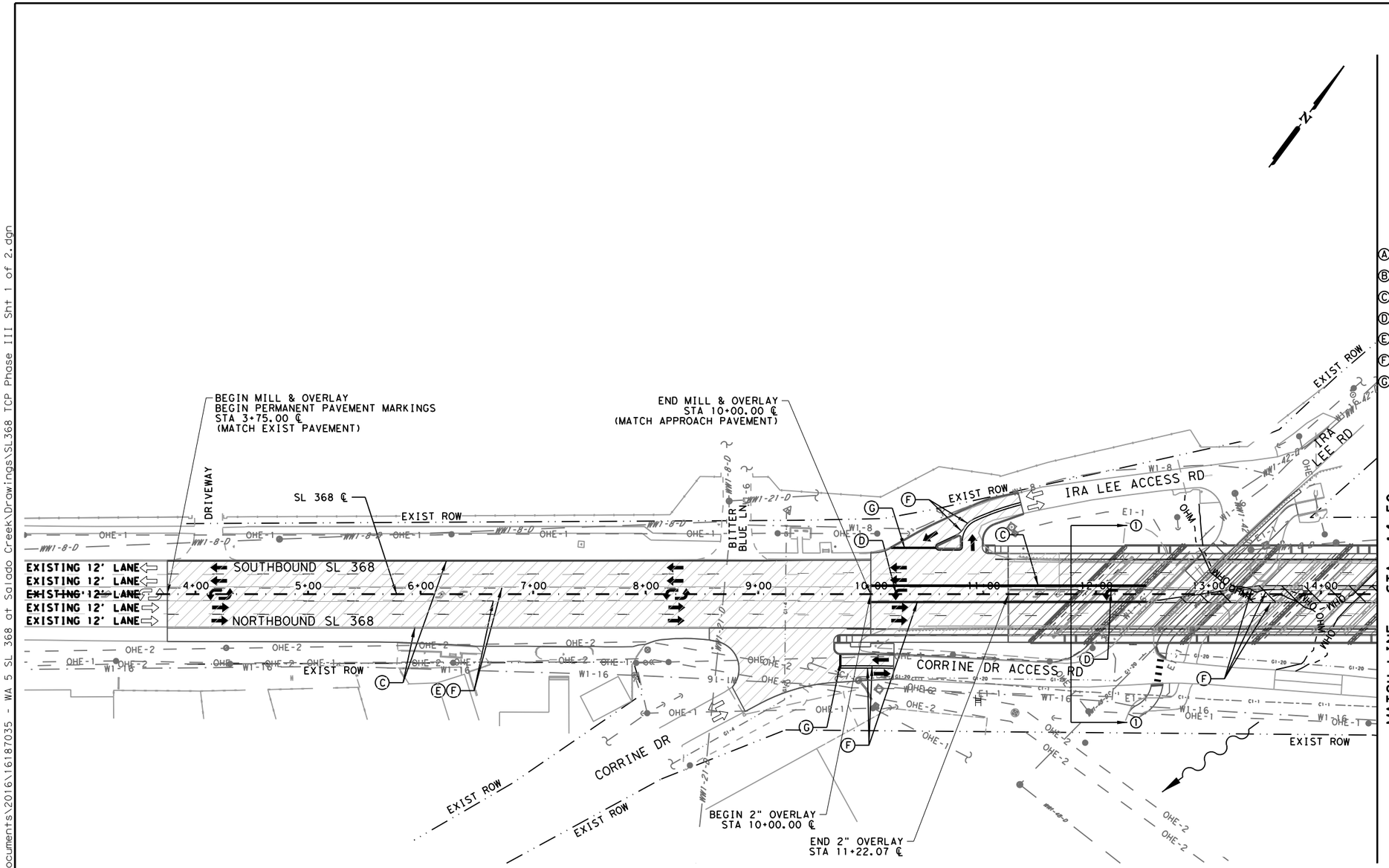

ITEM NO.	DESCRIPTION	UNIT	QTY
502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	2
512 6005	PORT CTB (FUR & INST) (F-SHAPE) (TY1)	LF	
512 6009	PORT CTB (FUR & INST) (LOW PROF) (TY1)	LF	
512 6010	PORT CTB (FUR & INST) (LOW PROF) (TY2)	LF	
512 6033	PORT CTB (MOVE) (LOW PROF) (TY1)	LF	
512 6034	PORT CTB (MOVE) (LOW PROF) (TY2)	LF	
512 6053	PORT CTB (REMOVE) (F-SHAPE) (TY1)	LF	
512 6057	PORT CTB (REMOVE) (LOW PROF) (TY1)	LF	
512 6058	PORT CTB (REMOVE) (LOW PROF) (TY2)	LF	
512 6099	PCTB (FUR & INST) (F-SHP TO LOW PROF) TY T	LF	
Ⓐ 662 6046	WK ZN PAV MRK REMOV (REFL) TY-I-A	EA	
Ⓑ 662 6048	WK ZN PAV MRK REMOV (REFL) TY-I-C	EA	
Ⓒ 662 6063	WK ZN PAV MRK REMOV (W) 4" (SLD)	LF	2473
Ⓓ 662 6080	WK ZN PAV MRK REMOV (W) (ARROW)	EA	2
Ⓔ 662 6093	WK ZN PAV MRK REMOV (Y) 4" (BRK)	LF	983
Ⓕ 662 6095	WK ZN PAV MRK REMOV (Y) 4" (SLD)	LF	3276
Ⓖ 662 6102	WK ZN PAV MRK REMOV (Y) 24" (SLD)	LF	51
677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	
677 6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	
60016002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	5
61856002	TMA (STATIONARY)	DAY	3

① LOCATION OF TYPICAL SECTION
② REUSE SIGN FROM PHASE I

LEGEND

- EXIST TRAFFIC FLOW
- PROP TRAFFIC FLOW
- WORK ZONE THIS PHASE
- TRAFFIC AREA THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- EXISTING STRIPING
- STRIPING THIS PHASE
- CONSTRUCTION WARNING SIGN
- CHANNELIZING DEVICES
- CRASH CUSHION ATTENUATOR
- CONCRETE SAFETY BARRIER (LOW PROFILE)
- CONCRETE SAFETY BARRIER
- TYPE III BARRICADE
- VERTICAL PANELS

NOTES

1. REFER TO TRAFFIC CONTROL TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.
2. ALL BARRIERS ARE 1' OFFSET TO ADJACENT STRIPING UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS AND CALLOUTS ARE TO STRIPE UNLESS OTHERWISE NOTED. ALL STATION AND OFFSETS ARE DIMENSIONED FROM SL 368 CENTERLINE.
4. SEE TXDOT STANDARDS BC(1)-14 THRU BC(12)-14 FOR PAVEMENT MARKINGS, TRAFFIC DEVICES, BARRICADE AND SIGN PLACEMENT INFORMATION.
5. DRIVEWAYS TO REMAIN OPEN AT ALL TIMES DURING CONSTRUCTION.
6. CONTRACTOR TO TRANSITION PAVEMENT TO PROVIDE ADEQUATE DRIVEABILITY THROUGHOUT THE CONSTRUCTION PROCESS.

0 50' 100'
SCALE: 1" = 100'

STATE OF TEXAS
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2/2/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

TRAFFIC CONTROL PLAN PHASE III LAYOUT

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		31
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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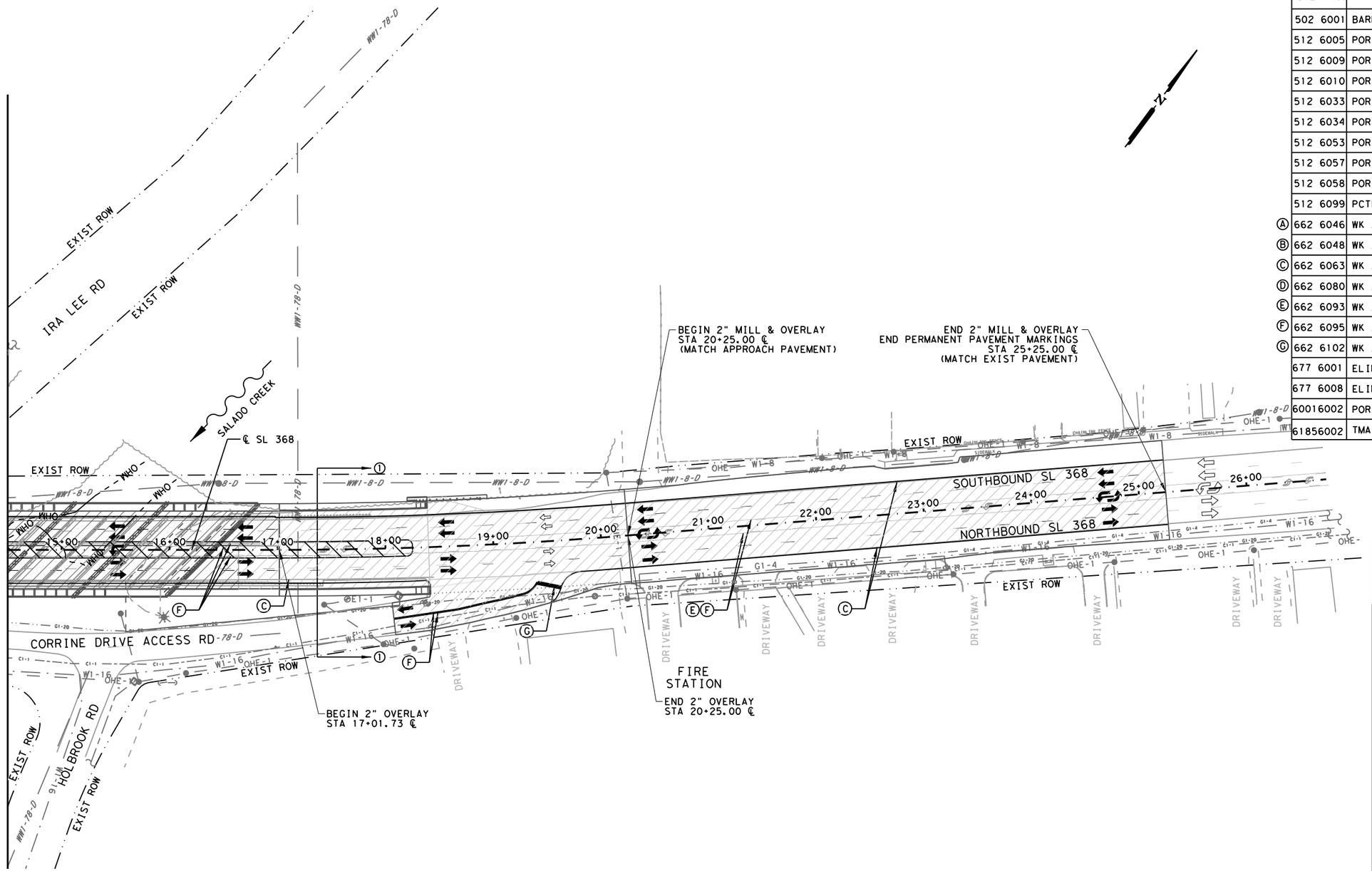

ITEM NO.	DESCRIPTION	UNIT	QTY
502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	
512 6005	PORT CTB (FUR & INST) (F-SHAPE) (TY1)	LF	
512 6009	PORT CTB (FUR & INST) (LOW PROF) (TY1)	LF	
512 6010	PORT CTB (FUR & INST) (LOW PROF) (TY2)	LF	
512 6033	PORT CTB (MOVE) (LOW PROF) (TY1)	LF	
512 6034	PORT CTB (MOVE) (LOW PROF) (TY2)	LF	
512 6053	PORT CTB (REMOVE) (F-SHAPE) (TY1)	LF	
512 6057	PORT CTB (REMOVE) (LOW PROF) (TY1)	LF	
512 6058	PORT CTB (REMOVE) (LOW PROF) (TY2)	LF	
512 6099	PCTB (FUR & INST) (F-SHP TO LOW PROF) TY T	LF	
Ⓐ 662 6046	WK ZN PAV MRK REMOV (REFL) TY-I-A	EA	
Ⓑ 662 6048	WK ZN PAV MRK REMOV (REFL) TY-I-C	EA	
Ⓒ 662 6063	WK ZN PAV MRK REMOV (W) 4" (SLD)	LF	2065
Ⓓ 662 6080	WK ZN PAV MRK REMOV (W) (ARROW)	EA	
Ⓔ 662 6093	WK ZN PAV MRK REMOV (Y) 4" (BRK)	LF	1092
Ⓕ 662 6095	WK ZN PAV MRK REMOV (Y) 4" (SLD)	LF	3041
Ⓖ 662 6102	WK ZN PAV MRK REMOV (Y) 24" (SLD)	LF	22
677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	
677 6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	
60016002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	5
61856002	TMA (STATIONARY)	DAY	

① LOCATION OF TYPICAL SECTION
② REUSE SIGN FROM PHASE I

0 50′ 100′
SCALE: 1" = 100′

LEGEND

- EXIST TRAFFIC FLOW
- PROP TRAFFIC FLOW
- WORK ZONE THIS PHASE
- TRAFFIC AREA THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- EXISTING STRIPING
- STRIPING THIS PHASE
- CONSTRUCTION WARNING SIGN
- CHANNELIZING DEVICES
- CRASH CUSHION ATTENUATOR
- CONCRETE SAFETY BARRIER (LOW PROFILE)
- CONCRETE SAFETY BARRIER
- TYPE III BARRICADE
- VERTICAL PANELS

NOTES

1. REFER TO TRAFFIC CONTROL TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.
2. ALL BARRIERS ARE 1′ OFFSET TO ADJACENT STRIPING UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS AND CALLOUTS ARE TO STRIPE UNLESS OTHERWISE NOTED. ALL STATION AND OFFSETS ARE DIMENSIONED FROM SL 368 CENTERLINE.
4. SEE TXDOT STANDARDS BC(1)-14 THRU BC(12)-14 FOR PAVEMENT MARKINGS, TRAFFIC DEVICES, BARRICADE AND SIGN PLACEMENT INFORMATION.
5. DRIVEWAYS TO REMAIN OPEN AT ALL TIMES DURING CONSTRUCTION.
6. CONTRACTOR TO TRANSITION PAVEMENT TO PROVIDE ADEQUATE DRIVEABILITY THROUGHOUT THE CONSTRUCTION PROCESS.

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED
PROFESSIONAL ENGINEER
2/2/2021

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TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

TRAFFIC CONTROL PLAN
PHASE III LAYOUT

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		32
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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① THE CONTRACTOR SHALL INSTALL BARRICADES AND SIGNAGE INDICATING THAT THE TRAIL IS CLOSED. BARRICADES AND SIGNAGE SHALL BE PLACED AT END OF THE TRAIL WHERE IT INTERSECTS PEDESTRIAN ROUTES. PEDESTRIANS SHALL BE DETOURED TO THE TEMPORARY PEDESTRIAN TRAIL LOCATED ON THE CLOSED PORTION OF IRA LEE ROAD AS INDICATED BY PLANS. OTHER PORTIONS OF THE TRAIL OUTSIDE OF THESE LIMITS SHALL REMAIN OPEN AND UNOBSTRUCTED OF CONSTRUCTION EQUIPMENT AND MATERIALS. THIS WORK AND MATERIALS SHALL BE INCIDENTAL TO OTHER ITEMS. ANY DAMAGE MADE TO OPEN TRAILS SHALL BE IMMEDIATELY REPAIRED TO THE SATISFACTION OF THE ENGINEER AT NO ADDITIONAL COST TO THE PROJECT.

② TEMPORARY DETOUR CROSSOVERS SHALL BE CONSTRUCTED AND PAID UNDER ITEM 508 6001 CONSTRUCTION DETOUR. ALL PAVEMENT & MATERIALS ARE SUBSIDIARY TO ITEM 508 6001 CONSTRUCTION DETOUR.

ITEM NO.	DESCRIPTION	UNIT	QTY
508 6001	CONSTRUCTING DETOURS	SY	46
512 6009	PORT CTB (FUR & INST)(LOW PROF)(TY 1)	LF	318
512 6057	PORT CTB (REMOVE)(LOW PROF)(TY 1)	LF	318

LEGEND

- TRAFFIC SIGN
- PORTABLE CHANGEABLE MESSAGE SIGN
- X-X-X CLOSED ROUTE
- TYPE III BARRICADE

N

TOBIN PARK

DETOUR 1000 FT CW20-2B

CW20-2C DETOUR 500 FT

AUSTIN HWY SL 368

SALADO CREEK

IRA LEE RD

EXIST SALADO CREEK GREENWAY TRAIL

END PROJECT STA 25+25.00

ACCESS RD

CSJ LIMITS

DETOUR M4-10R

8′

TYPE III BARRICADE

M4-10R DETOUR

M4-10L DETOUR

① 30

DETOUR M4-10L

8′

TYPE III BARRICADE

BITTER BLUE LN

BEGIN PROJECT STA 3+75.00

DETOUR M4-10L

DETOUR M4-10R

CORRINE DR

HOLBROOK RD

HARLOW DR

CW20-2C DETOUR 500 FT

AUSTIN HWY SL 368

CW20-2B DETOUR 1000 FT

8′

TYPE III BARRICADE

PORT CTB 318 LF

CONSTRUCTING DETOUR ② 31 SY

②CONSTRUCTING DETOUR 15 SY

CONSTRUCT IN PHASE I

M4-10L DETOUR

8′

TYPE III BARRICADE

② TYPICAL SECTION
TEMPORARY PEDESTRIAN DETOUR

10′ (2′ 5′ 5′ 2′)
1.5% 1.5% 6:1
6" D-GR HMA(SQ) TY-B PG64-22
PRIME COAT (MC-30 OR AE-P)
6:1
6" FL BS (CIP)(TY D GR 1-2, OR 5)FINAL POS

℄ EXIST IRA LEE RD

EXIST BRIDGE COLUMN (TO BE REMOVED) (TYP)

14′ LANE

10′ (TYP)

CSB

TYPICAL SECTION
TEMPORARY PEDESTRIAN ACCESS ON IRA LEE RD UNDER BRIDGE

0 100′ 200′
SCALE: 1" = 200′

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Texas Department of Transportation

SL 368
AT SALADO CREEK
TRAFFIC CONTROL PLAN DETOUR PEDESTRIAN TRAIL

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		33
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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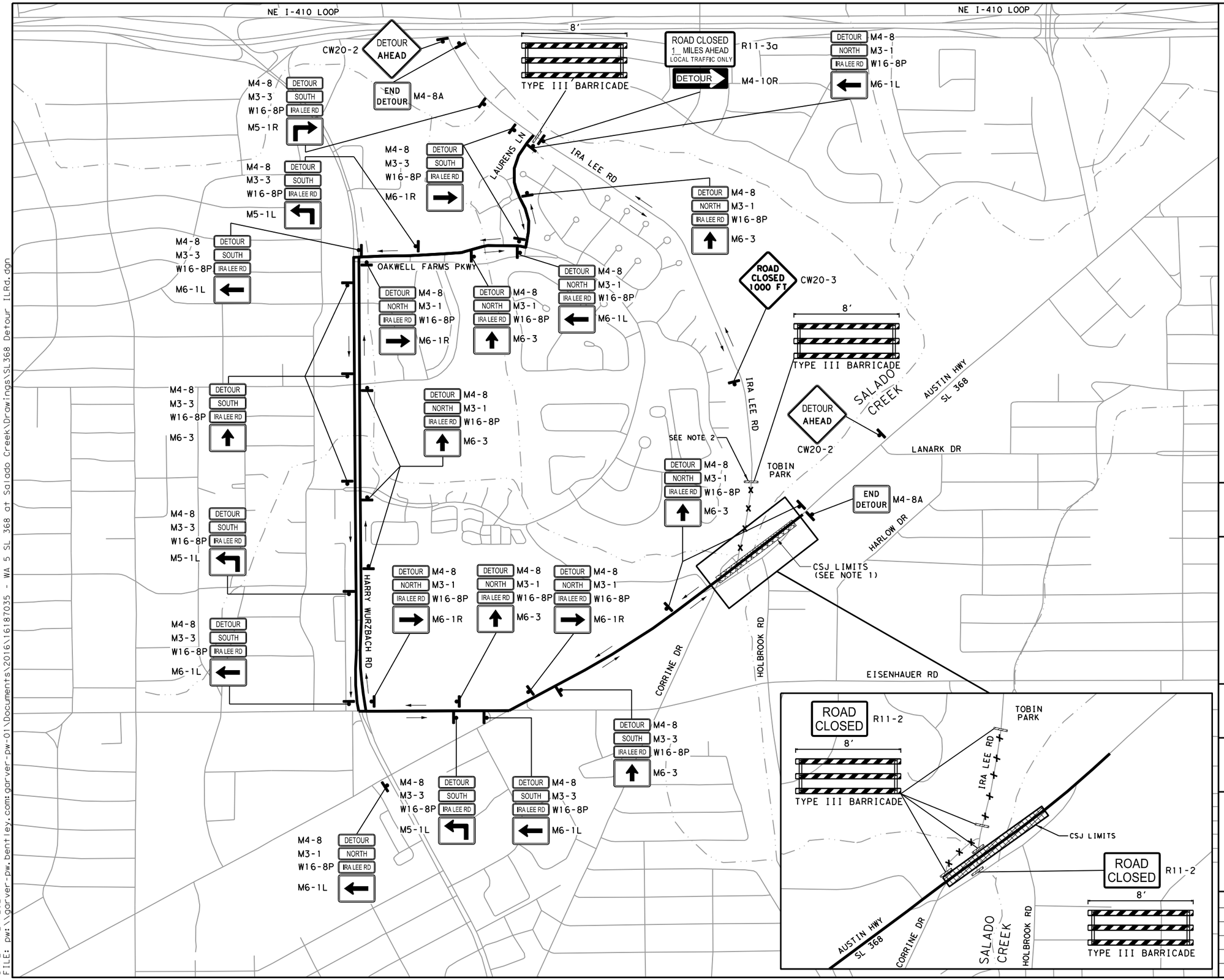

LEGEND

- TRAFFIC SIGN
- CLOSED ROUTE
- TYPE III BARRICADE

N

NOTE:
1. SEE DETAIL ON NORTHBOUND DETOUR FOR SIGNING NEAR BRIDGE.
2. PLACE BARRICADE SO THAT ACCESS TO TOBIN PARK IS RETAINED.

0 500' 1000'

SCALE: 1" = 1000'

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1/27/2021

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SL 368
AT SALADO CREEK

TRAFFIC CONTROL PLAN DETOUR IRA LEE RD.

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		34
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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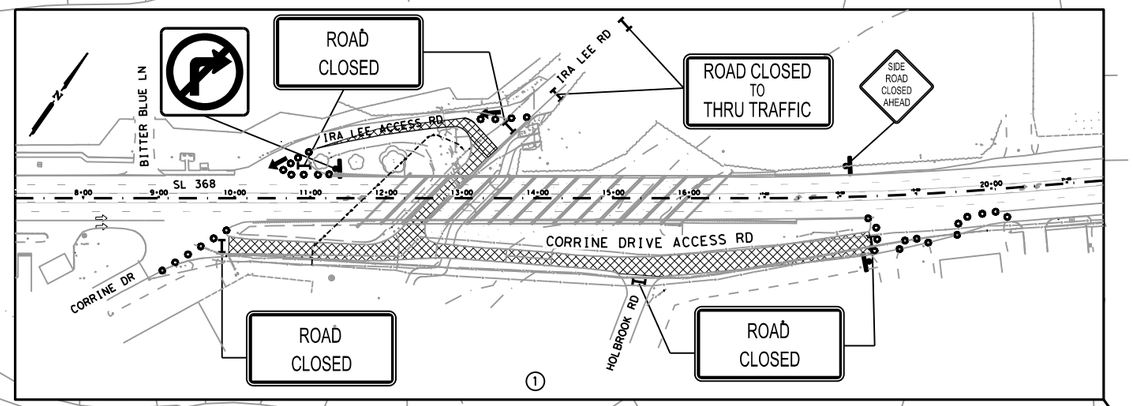

LEGEND

- TRAFFIC SIGN
- PORTABLE CHANGEABLE MESSAGE SIGN
- X-X-X CLOSED ROUTE
- TYPE III BARRICADE

1. THIS CLOSURE PLAN IS INTENDED TO BE USED WHEN CORRINE DRIVE ACCESS ROAD MUST BE CLOSED DURING PHASE 1 JOINT BID WATERLINE INSTALLATION OR ANY OTHER APPROVED CLOSURE TIME.
2. THIS DETOUR IS INTENDED TO DETOUR TRAFFIC ORIGINATING FROM BUSINESSES ALONG CORRINE DR AWAY FROM CONSTRUCTION ZONE WHEN THEY CANNOT MAKE A RIGHT TURN ONTO SL 368 DURING PHASE 2 TRAFFIC CONTROL PLAN.

0 500' 1000'

SCALE: 1" = 1000'

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SL 368
AT SALADO CREEK

TRAFFIC CONTROL PLAN DETOUR CORRINE DR

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		35
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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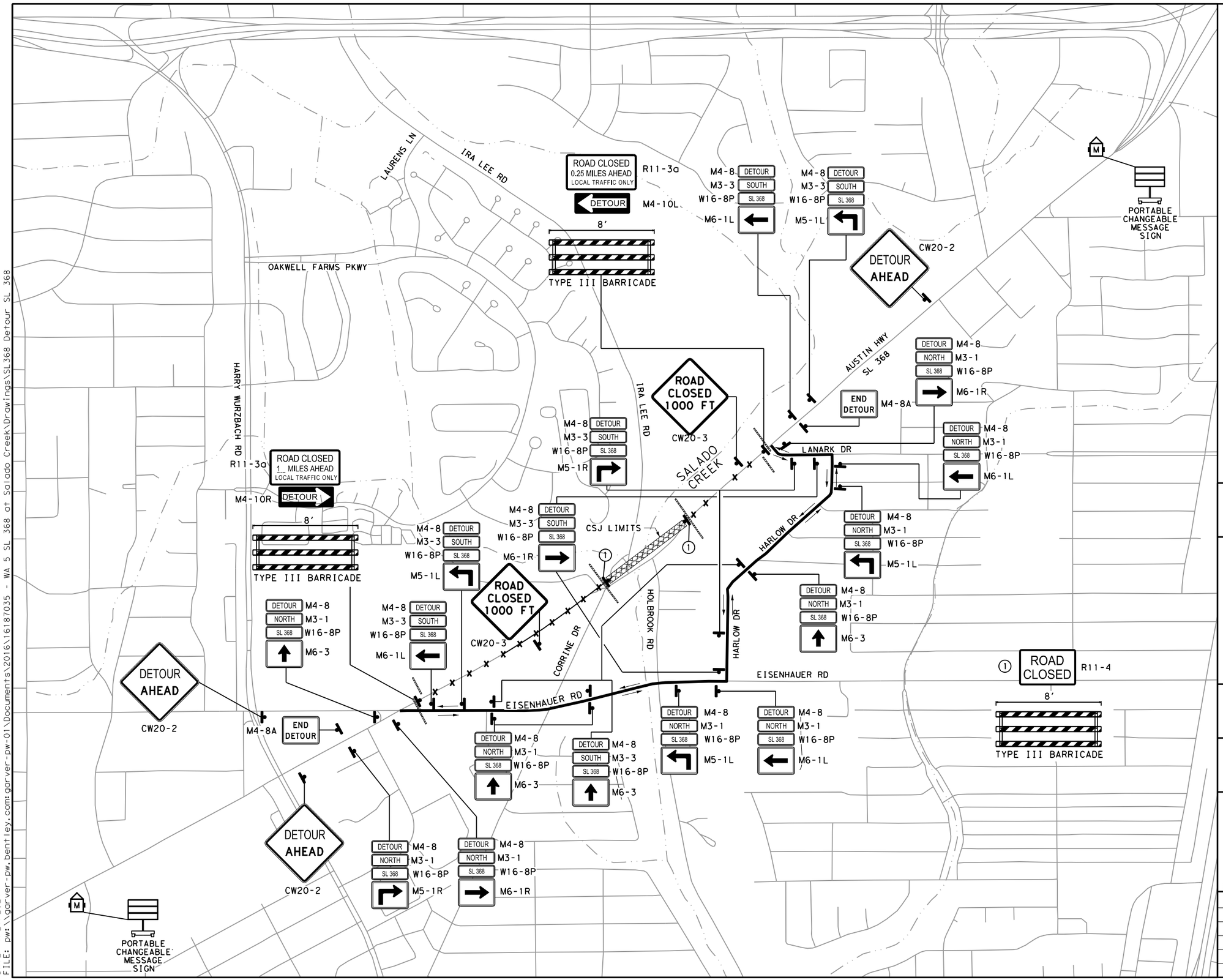

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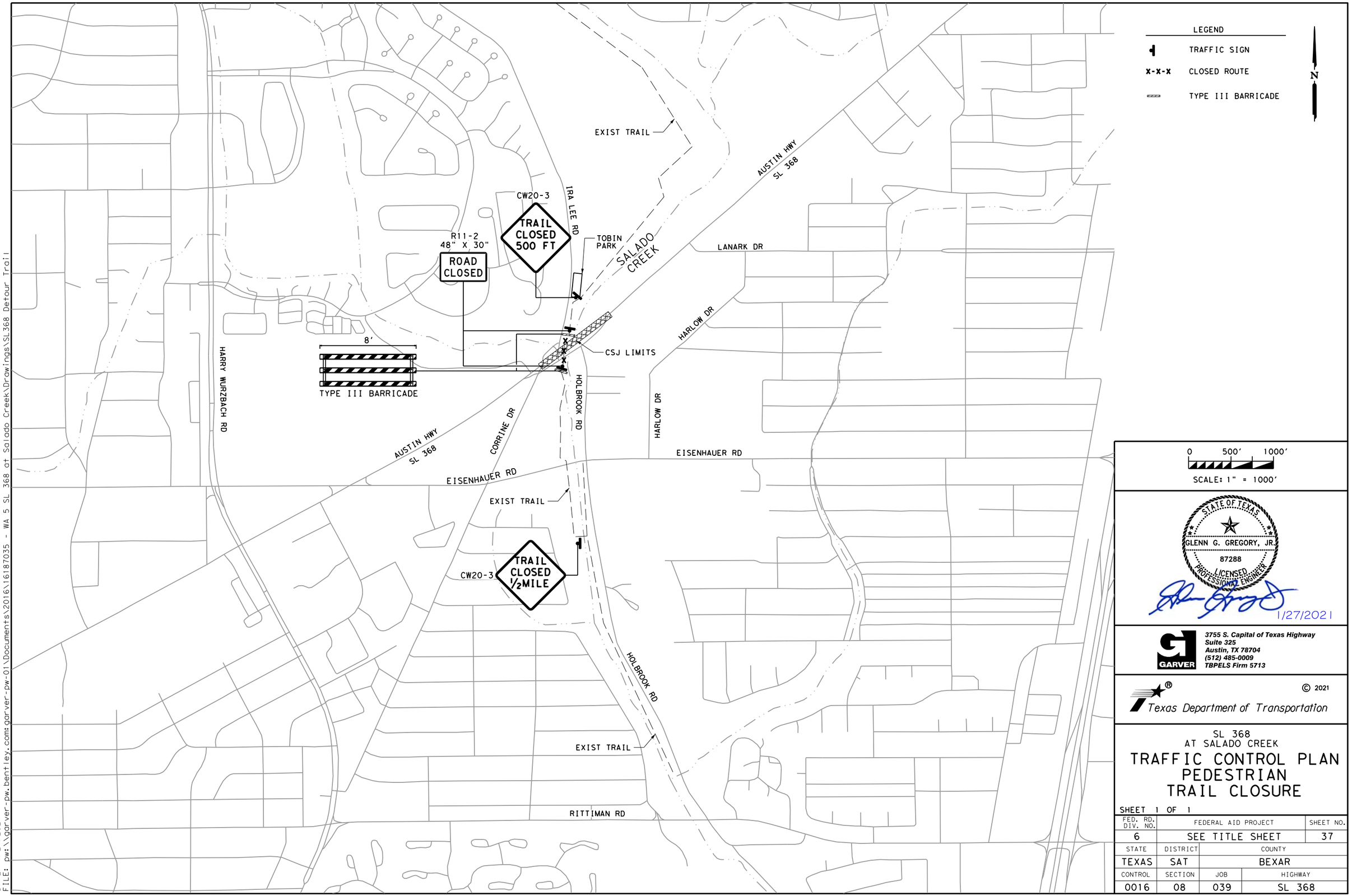
SL 368
AT SALADO CREEK

TRAFFIC CONTROL PLAN
DETOUR
SL 368 CLOSURE

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		36
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368



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SL 368
AT SALADO CREEK

TRAFFIC CONTROL PLAN
PEDESTRIAN
TRAIL CLOSURE

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		37
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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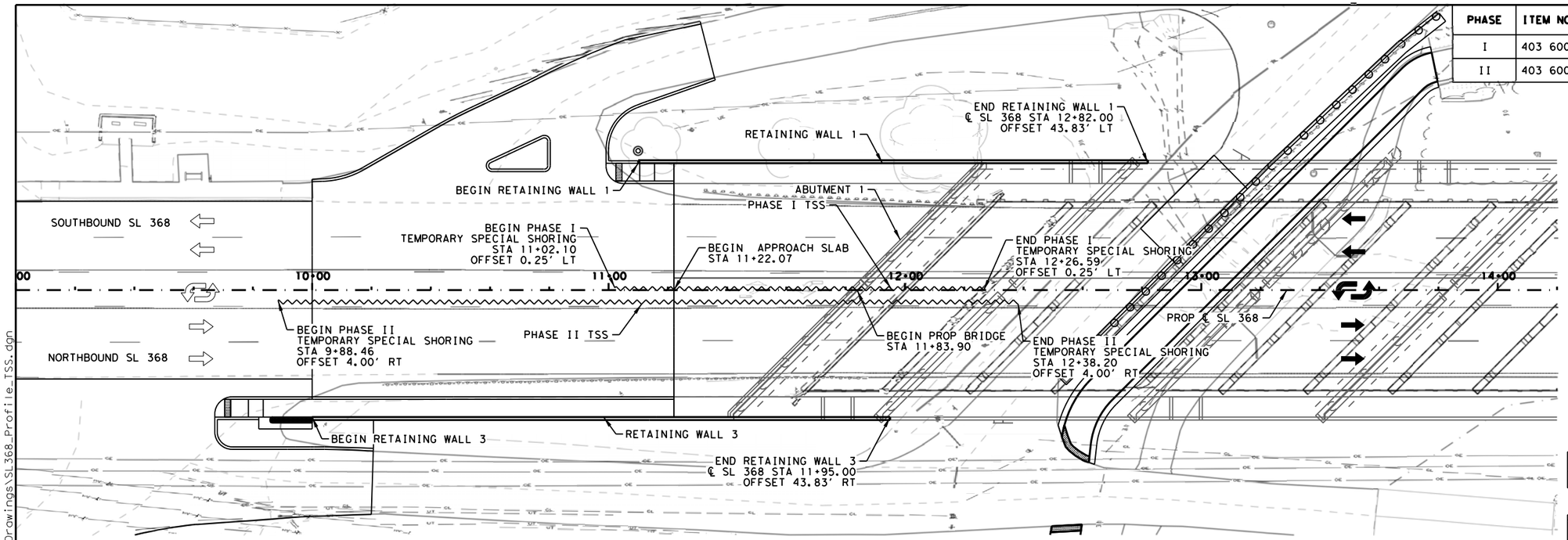
PHASE	ITEM NO.	DESCRIPTION	UNIT	QTY
I	403 6001	TEMPORARY SPL SHORING	SF	848
II	403 6001	TEMPORARY SPL SHORING	SF	3101

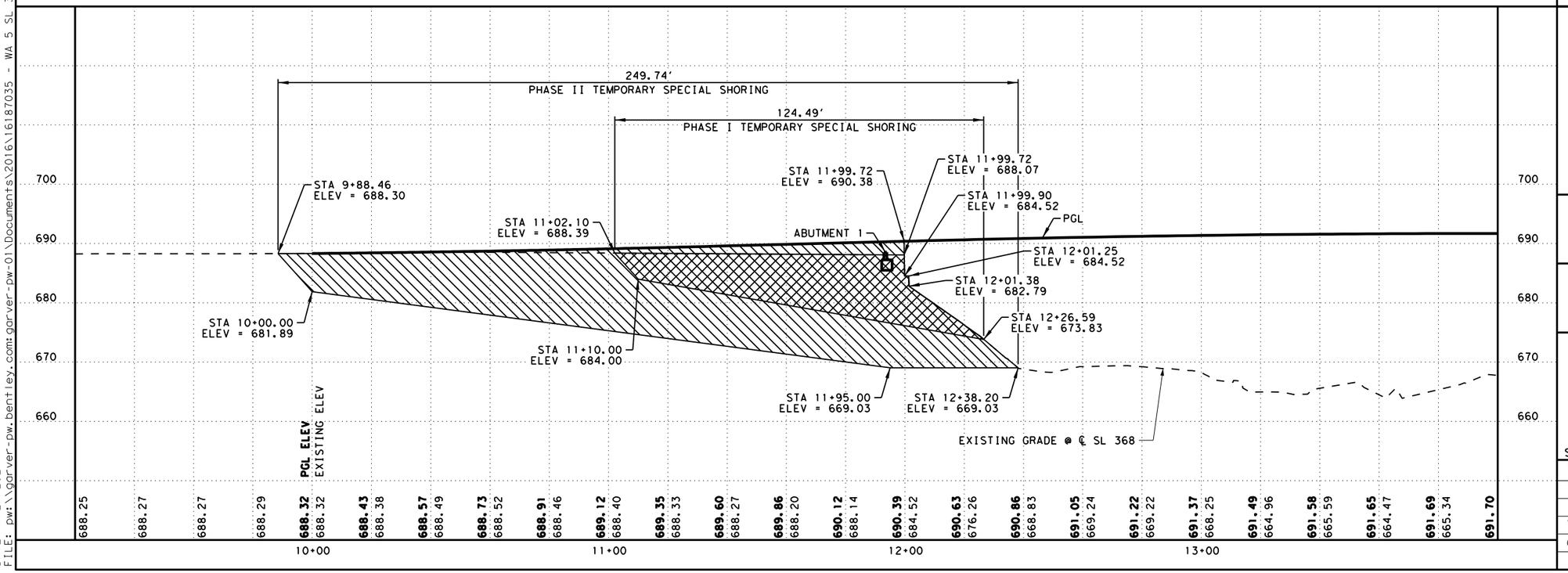


LEGEND

PHASE I TEMPORARY SPECIAL SHORING (IN PROFILE)

PHASE II TEMPORARY SPECIAL SHORING (IN PROFILE)

1. THE CONTRACTOR SHALL PROVIDE TEMPORARY SPECIAL SHORING IN ACCORDANCE WITH ITEM NO. 403.
2. THE TYPE AND SIZE OF TEMPORARY SPECIAL SHORING SHALL BE DETERMINED BY THE CONTRACTOR. DETAILS SHOWN IN THE PLANS ARE FOR INFORMATIONAL PURPOSES AND DO NOT PRECLUDE THE CONTRACTOR FROM PROPOSING AN ALTERNATIVE DESIGN. NOTE THAT THE DEPARTMENT RESERVES THE RIGHT TO REJECT DESIGNS.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY SPECIAL SHORING DESIGN. REFER TO ITEM NO. 403 FOR DESIGN AND SUBMITTAL REQUIREMENTS NOT STIPULATED IN THE PLANS.
4. THE EFFECTS OF THE IN SITU SOIL CONDITIONS, WATER TABLE, BACKFILL, CONSTRUCTION AND TRAFFIC LOADS SHALL BE CONSIDERED IN THE DESIGN OF THE TEMPORARY SPECIAL SHORING WALL AND ACCOUNTED FOR IN THE CONTRACTORS PRICE FOR PAY ITEM NO. 403 6001.
5. ALL COSTS FOR TEMPORARY SPECIAL SHORING DESCRIBED IN ITEM NO. 403, AS WELL AS DESIGN AND SUBGRADE IMPROVEMENT, SHALL BE INCLUDED IN THE PRICE FOR PAY ITEM NO. 403 6001.



HL 93 LOADING

0 20' 40'

SCALE: 1" = 40' HORZ
1" = 20' VERT

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SL 368
AT SALADO CREEK

TEMPORARY SPECIAL SHORING

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		38
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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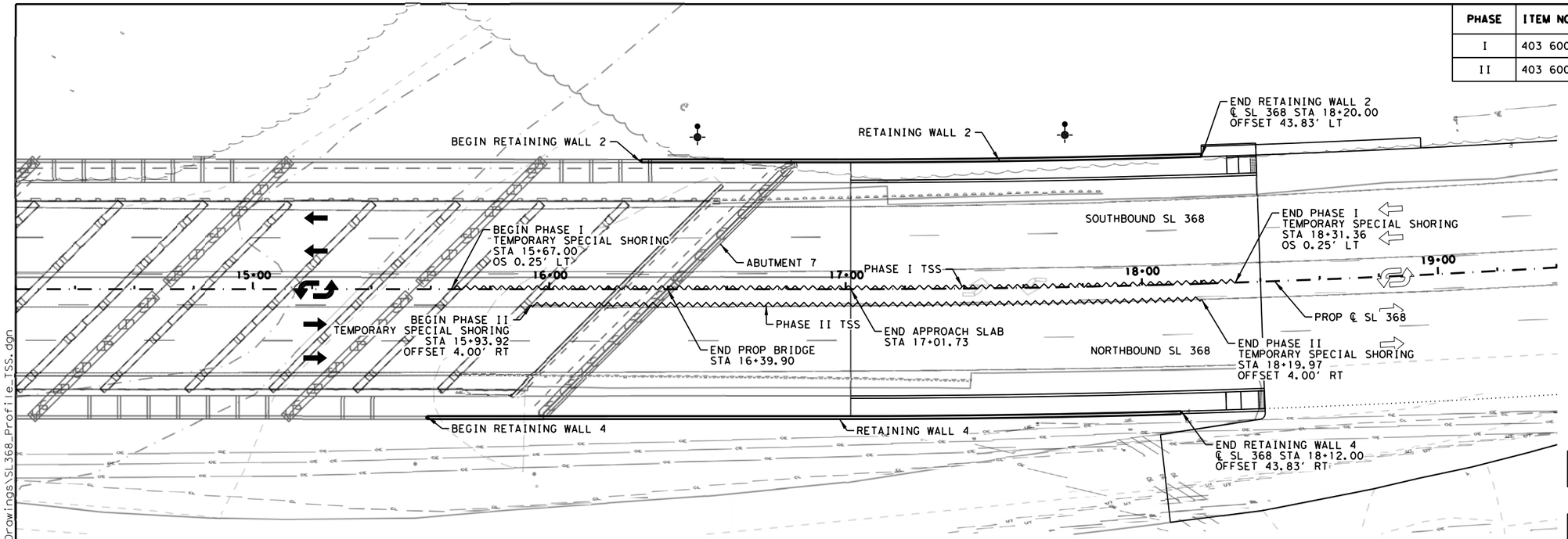
PHASE	ITEM NO.	DESCRIPTION	UNIT	QTY
I	403 6001	TEMPORARY SPL SHORING	SF	3187
II	403 6001	TEMPORARY SPL SHORING	SF	1942



LEGEND

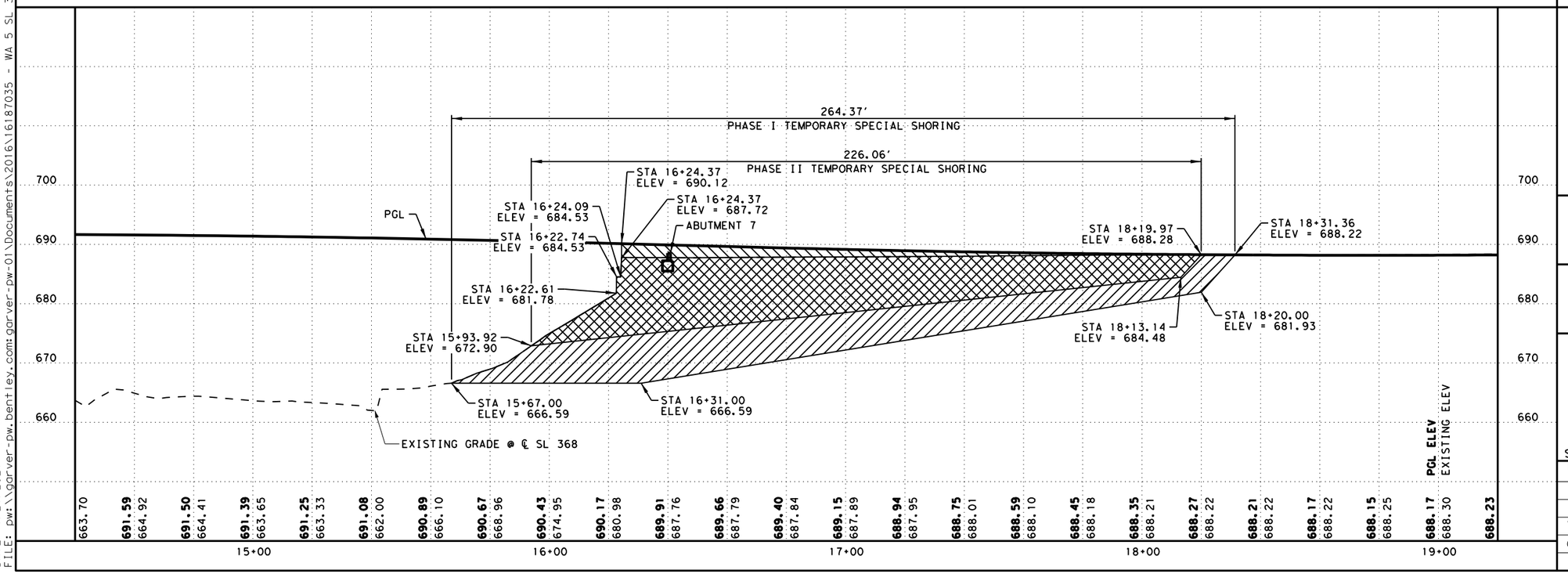
PHASE I TEMPORARY SPECIAL SHORING (IN PROFILE)

PHASE II TEMPORARY SPECIAL SHORING (IN PROFILE)

1. THE CONTRACTOR SHALL PROVIDE TEMPORARY SPECIAL SHORING IN ACCORDANCE WITH ITEM NO. 403.
2. THE TYPE AND SIZE OF TEMPORARY SPECIAL SHORING SHALL BE DETERMINED BY THE CONTRACTOR. DETAILS SHOWN IN THE PLANS ARE FOR INFORMATIONAL PURPOSES AND DO NOT PRECLUDE THE CONTRACTOR FROM PROPOSING AN ALTERNATIVE DESIGN. NOTE THAT THE DEPARTMENT RESERVES THE RIGHT TO REJECT DESIGNS.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY SPECIAL SHORING DESIGN. REFER TO ITEM NO. 403 FOR DESIGN AND SUBMITTAL REQUIREMENTS NOT STIPULATED IN THE PLANS.
4. THE EFFECTS OF THE IN SITU SOIL CONDITIONS, WATER TABLE, BACKFILL, CONSTRUCTION AND TRAFFIC LOADS SHALL BE CONSIDERED IN THE DESIGN OF THE TEMPORARY SPECIAL SHORING WALL AND ACCOUNTED FOR IN THE CONTRACTORS PRICE FOR PAY ITEM NO. 403 6001.
5. ALL COSTS FOR TEMPORARY SPECIAL SHORING DESCRIBED IN ITEM NO. 403, AS WELL AS DESIGN AND SUBGRADE IMPROVEMENT, SHALL BE INCLUDED IN THE PRICE FOR PAY ITEM NO. 403 6001.

HL 93 LOADING

SCALE: 1" = 40' HORZ
1" = 20' VERT



GLENN G. GREGORY, JR.
87288
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
1/27/2021

GARVER
3755 S. Capital of Texas Highway
Suite 325
Austin, TX 78704
(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

TEMPORARY SPECIAL SHORING

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		39
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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LOC NO.	TCP PHASE	PLAN SHEET NUMBER	LOCATION	STA	TEST LEVEL	DIRECTION OF TRAFFIC (UNI/BI)	FOUNDATION PAD		BACKUP SUPPORT			AVAILABLE SITE LENGTH	CRASH CUSHION									
															MOVE / RESET		L	L	R	R	S	S
							PROPOSED MATERIAL	PROPOSED THICKNESS	DESCRIPTION	WIDTH	HEIGHT		INSTALL	REMOVE	MOVE/ RESET	FROM LOC.#	N	W	N	W	N	W
1	FINAL	94	SEE PLAN SHEET	SEE PLAN SHEET	TL-2	SEE STANDARD	SEE STANDARD		TYPE C223 (MOD) RAIL	SEE STANDARD	32"	1										
												TOTALS	1									

LEGEND:
L=LOW MAINTENANCE
R=REUSABLE
S=SACRIFICIAL
N=NARROW
W=WIDE

FOR DEFINITIONS SEE THE "CRASH CUSHION CATEGORIZATION CHART.PDF" AT THE DESIGN DIVISION (ROADWAY STANDARDS) WEBSITE. USE QUICK LINKS TO ACCESS ATTENUATORS / CRASH CUSHIONS SECTION.
http://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/rdwyise.htm

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED PROFESSIONAL ENGINEER
1/27/2021

CRASH CUSHION SUMMARY SHEET

FILE: ccss.dgn	DN: TxDOT	CK:		CK:
© TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		
	SAT	BEXAR		
	FEDERAL AID PROJECT			SHEET NO.
	SEE TITLE SHEET			40

LOC NO.	TCP PHASE	SPECIFIC TCP PLAN SHEET OR TCP STANDARD SHEET	FURNISH TMA/TA	RELOCATE/REUSE TMA/TA	TOTAL TMA/TA PER SET UP	DURATION OF TMA/TA SET UP	6185 6002 TMA (STATIONARY)	6185 6005 TMA (MOBILE OPERATION)
		SHEET NUMBER	EA	EA	EA	DAYS PER TMA/TA USE	DAY	DAY
	III	TCP(3-1)-13	2		2	2		2
	III	TCP(3-3)-14	2		2	1		1
		TOTALS	4		4	3		3

NOTE.
FURNISH TMA/TA - THE NUMBER OF ATTENUATORS BEING FURNISHED FOR THE SPECIFIC TCP.
RELOCATE/REUSE TMA/TA - THE NUMBER OF ATTENUATORS BEING REUSED FROM A PREVIOUS TCP FOR THE SPECIFIC TCP.
TOTAL TMA/TA PER SET UP = (FURNISH TMA/TA) + (RELOCATE/REUSE TMA/TA)
DURATION OF TMA/TA SET UP - THE NUMBER OF DAYS THE ATTENTUATORS WILL BE USED FOR THE SPECIFIC TCP.
TMA/TA (STATIONARY) = (TOTAL TMA/TA PER SET UP) X (THE DURATION OF TMA/TA SET UP)
TMA/TA (MOBILE OPERATION) = (TOTAL TMA/TA PER SET UP) X (THE DURATION OF TMA/TA SET UP)

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GLENN G. GREGORY, JR.
87288

1/27/2021

TRUCK MOUNTED ATTENUATOR (TMA) AND TRAILER ATTENUATOR (TA) SUMMARY SHEET

FILE: tma.dgn	DN: TxDOT	CK:	DW:	CK:
© TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS 3/2018	0016	08	039	SL 368
	DIST		COUNTY	
	SAT		BEXAR	
	FEDERAL AID PROJECT			SHEET NO.
				41

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).

2. The development and design of the Traffic Control Plan (TCP)is the responsibility of the Engineer.

3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.

4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.

5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.

6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.

7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.

8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.

10. As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER (see Sign Detail G20-10T) and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. However, the TRAFFIC FINES DOUBLE sign will not be required on projects consisting solely of mobile operation work, such as striping or milling edgeline rumble strips. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits.

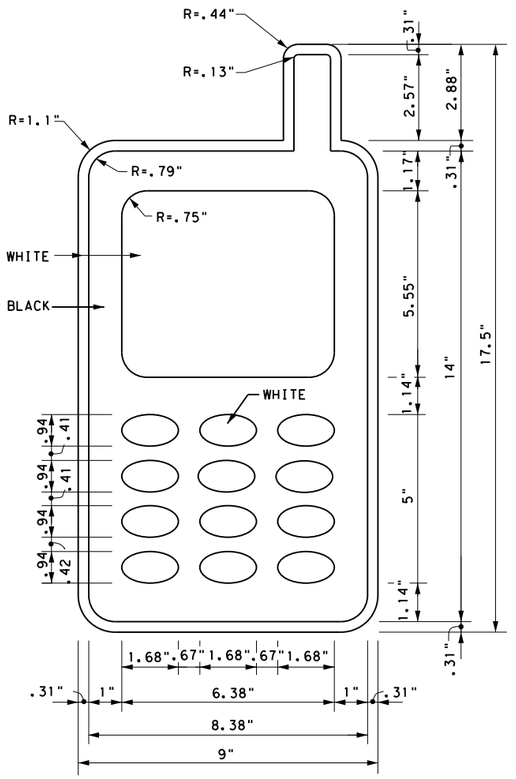
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.

12. The Engineer has the final decision on the location of all traffic control devices.

13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY APPAREL NOTES:

1. Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel," or equivalent revisions, and labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.



SIGN DETAIL (G20-10T)

3.0" Radius, 1.25" Border, 0.75" Indent, Black on Yellow;
[STAY ALERT] Font: D
3.0" Radius, 1.25" Border, 0.75" Indent, Black on Orange;
[TALK OR TEXT LATER] Font: C specified length;

Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found on-line at the web address given below or by contacting:

Texas Department of Transportation
Traffic Operations Division - TE
Phone (512) 416-3118

THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)
TRAFFIC ENGINEERING STANDARD SHEETS

Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
4-03 5-10 8-14 9-07 7-13	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		42

DATE: 1/27/2021 3:48:06 PM
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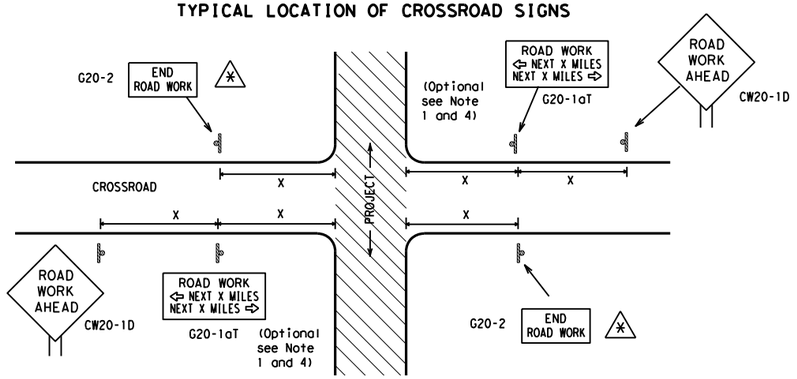
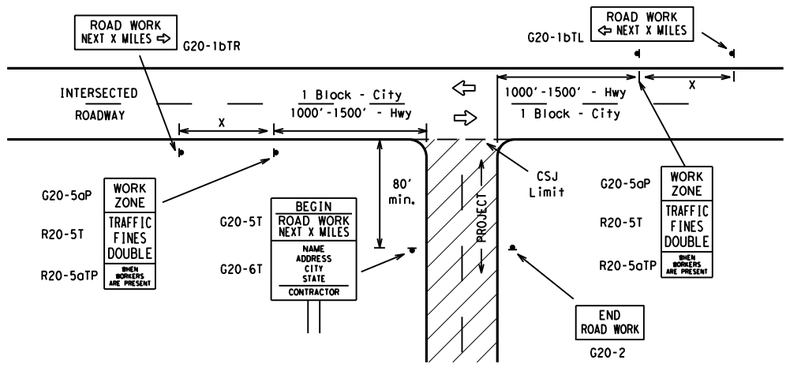
TYPICAL LOCATION OF CROSSROAD SIGNS



✱ May be mounted on back of "ROAD WORK AHEAD"(CW20-1D) sign with approval of Engineer. (See note 2 below)

1. The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-1D)sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
2. The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK"(G20-2) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume. This information shall be shown in the plans.
3. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
4. The "ROAD WORK NEXT X MILES"(G20-1aT)sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
5. Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
6. When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

1. The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
2. If construction closes the road at a T-intersection the Contractor shall place the "CONTRACTOR NAME"(G20-6T) sign behind the Type 3 Barricades for the road closure (see BC(10) also). The "ROAD WORK NEXT X MILES" left arrow(G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR)" signs shall be replaced by the detour signing called for in the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING[1,5,6]

SIZE

Sign Number or Series	Conventional Road	Expressway/ Freeway
CW20[4] CW21 CW22 CW23 CW25	48" x 48"	48" x 48"
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"

SPACING

Posted Speed	Sign Spacing "X" △
MPH	Feet (Apprx.)
30	120
35	160
40	240
45	320
50	400
55	500[2]
60	600[2]
65	700[2]
70	800[2]
75	900[2]
80	1000[2]
✱	✱[3]

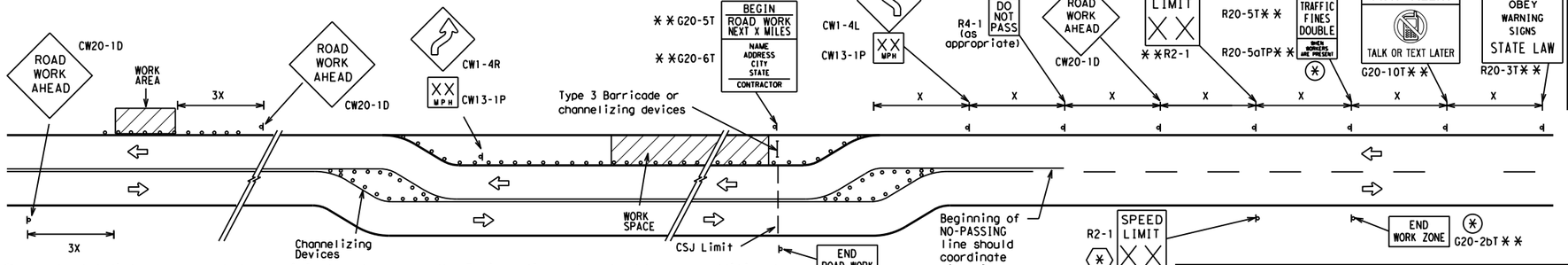
✱ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

GENERAL NOTES

1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may be used on low volume crossroads at the discretion of the Engineer. See Note 2 under "Typical Location of Crossroad Signs".
5. Only diamond shaped warning sign sizes are indicated.
6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

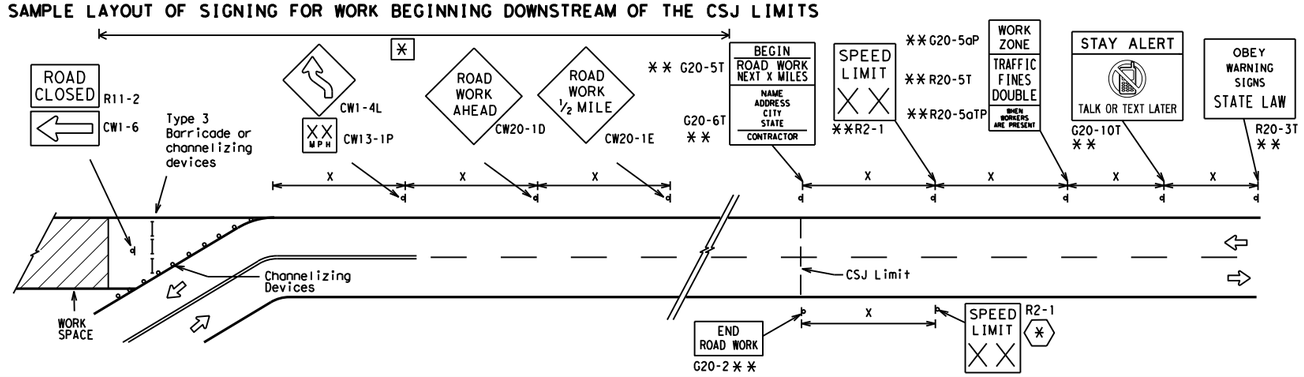
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing of signs and channelizing devices.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING DOWNSTREAM OF THE CSJ LIMITS



NOTES

The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES"(G20-5T)sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.

(✱) The "BEGIN WORK ZONE"(G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.

✱✱ Required CSJ Limit signing. See Note 10 on BC(1). TRAFFIC FINES DOUBLE signs will not be required on projects consisting solely of mobile operations work.

[✱] Area for placement of "ROAD WORK AHEAD" (CW20-1D)sign and other signs or devices as called for on the Traffic Control Plan.

(✱) Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND

⊢⊣	Type 3 Barricade
○ ○ ○	Channelizing Devices
▬	Sign
X	See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.

SHEET 2 OF 12

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0016	08	039	SL 368
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	SAT	BEXAR		43

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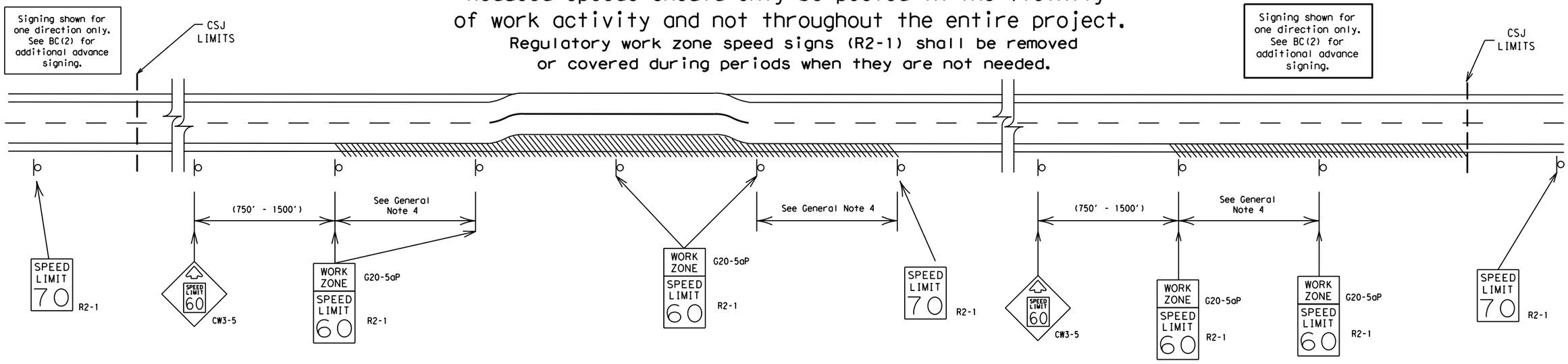
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

Work zone speed limits shall be regulatory, established in accordance with the "Procedures for Establishing Speed Zones," and approved by the Texas Transportation Commission, or by City Ordinance when within Incorporated City Limits.

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project.

Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when restricted geometrics with a lower design speed are present in the work zone and modification of the geometrics to a higher design speed is not feasible.

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present. Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:

a) rough road or damaged pavement surface
b) substantial alteration of roadway geometrics (diversions)
c) construction detours
d) grade
e) width
f) other conditions readily apparent to the driver

As long as any of these conditions exist, the work zone speed limit signs should remain in place.

SHORT TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit may be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 10 feet of the traveled way or actually in the travelled way.

Short Term Work Zone Speed Limit signs should be posted and visible to the motorists only when work activity is present. When work activity is not present, signs shall be removed or covered.
(See Removing or Covering on BC(4)).

GENERAL NOTES

1. Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
2. Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
3. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
4. Frequency of work zone speed limit signs should be:
   40 mph and greater 0.2 to 2 miles
   35 mph and less 0.2 to 1 mile
5. Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
6. Fabrication, erection and maintenance of the"ADVANCE SPEED LIMIT"(CW3-5)sign, "WORK ZONE"(G20-5aP) plaque and the "SPEED LIMIT"(R2-1)signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
7. Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
8. Techniques that may help reduce traffic speeds include but are not limited to:
   A. Law enforcement.
   B. Flagger stationed next to sign.
   C. Portable changeable message sign (PCMS).
   D. Low-power (drone) radar transmitter.
   E. Speed monitor trailers or signs.
9. Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
10. For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

Texas Department of Transportation | Traffic Operations Division Standard

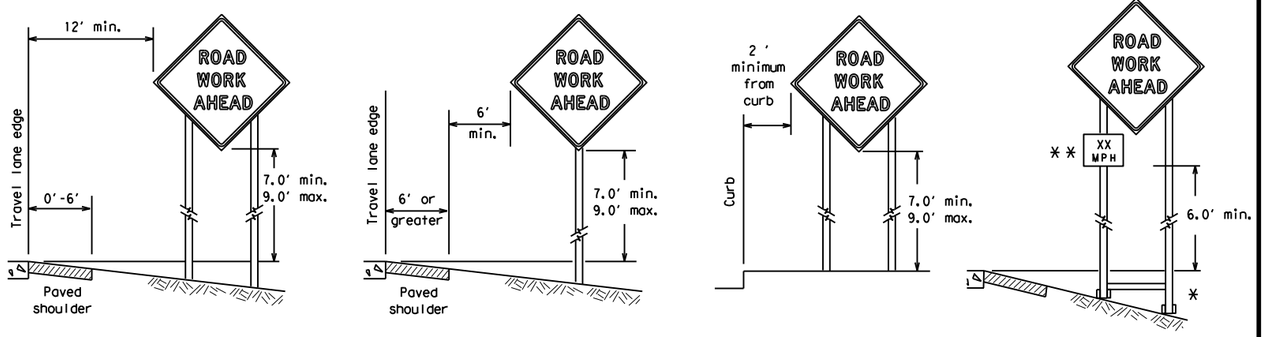
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		44

DATE: 1/27/2021 3:48:08 PM
FILE: pw:\\garver-pw.bentley.com:garver-pw-01\Documents\2016\16187035 - WA 5 SL 368 at Salado Creek\Drawings\STANDARDS\Traffic Control\bc-14.dgn

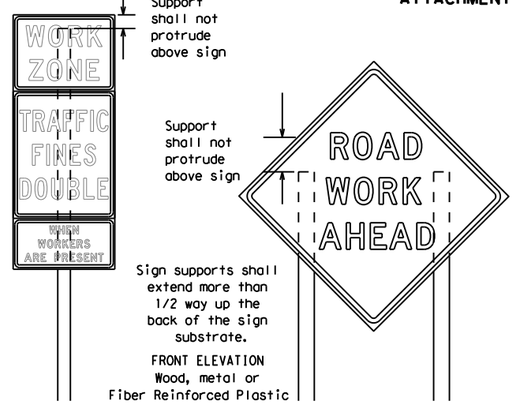
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



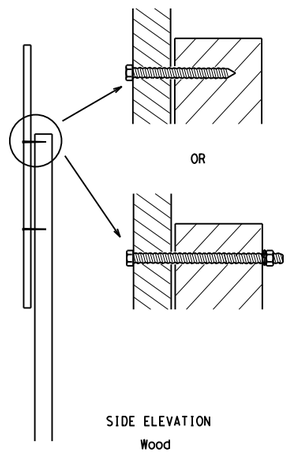
* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS



Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the spice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

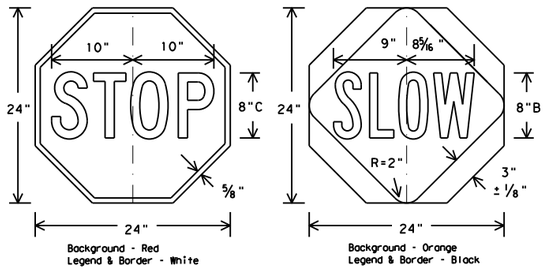


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

Nails shall NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

STOP/SLOW PADDLES

1. STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24" as detailed below.
2. When used at night, the STOP/SLOW paddle shall be retroreflectorized.
3. STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
4. Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

1. Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
2. When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition.
3. When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
4. If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
5. If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC sheets or the CWZTCD. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
6. Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
5. The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
6. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD). The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
7. The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
8. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
9. The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)

1. The types of sign supports, sign mounting height, the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
   a. Long-term stationary - work that occupies a location more than 3 days.
   b. Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
   c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
   d. Short, duration - work that occupies a location up to 1 hour.
   e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

1. The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
2. The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
3. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
4. Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
5. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

1. The Contractor shall furnish the sign sizes shown on BC (2) unless otherwise shown in the plans or as directed by the Engineer.

SIGN SUBSTRATES

1. The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CWZTCD lists each substrate that can be used on the different types and models of sign supports.
2. "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
3. All wooden individual sign panels fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood screws that do not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6" centers. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
2. White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type B_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

1. All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
2. Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
3. Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
4. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
5. Burlap shall NOT be used to cover signs.
6. Duct tape or other adhesive material shall NOT be affixed to a sign face.
7. Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

1. Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

1. Flags may be used to draw attention to warning signs. When used the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-14

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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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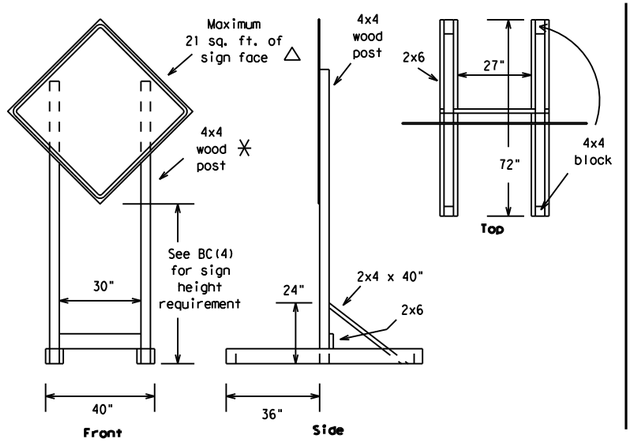
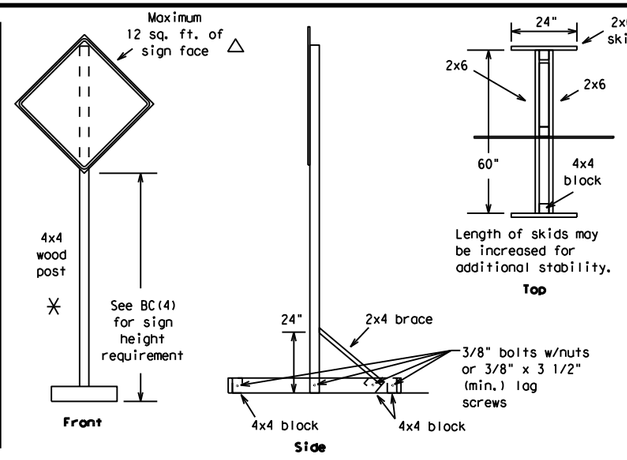
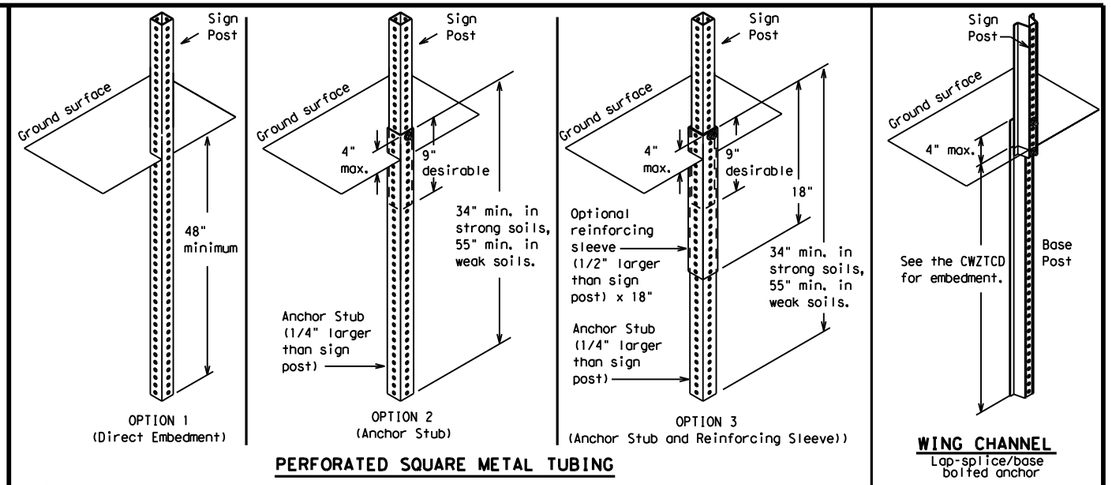




SKID MOUNTED WOOD SIGN SUPPORTS

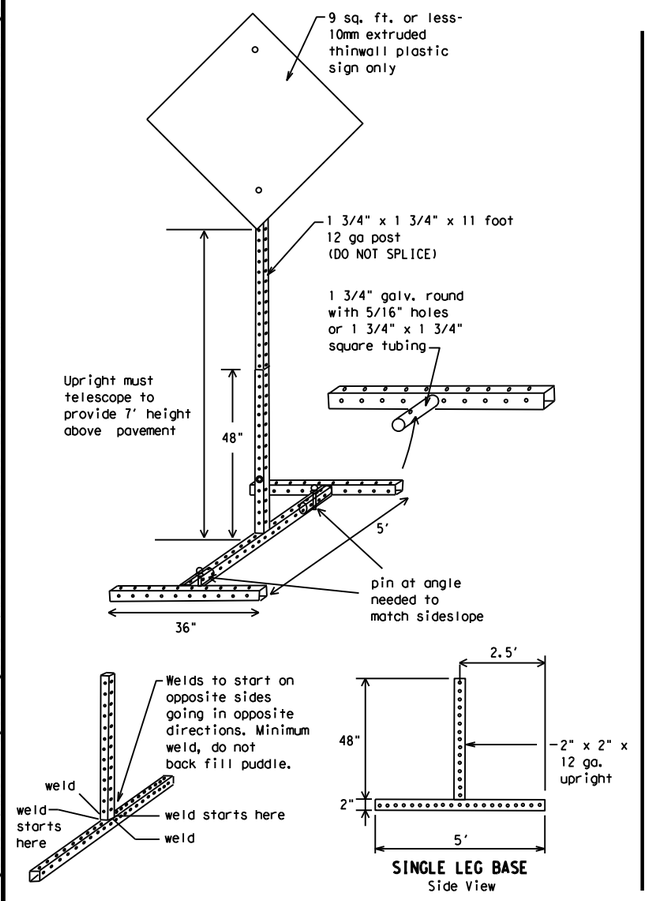
LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □

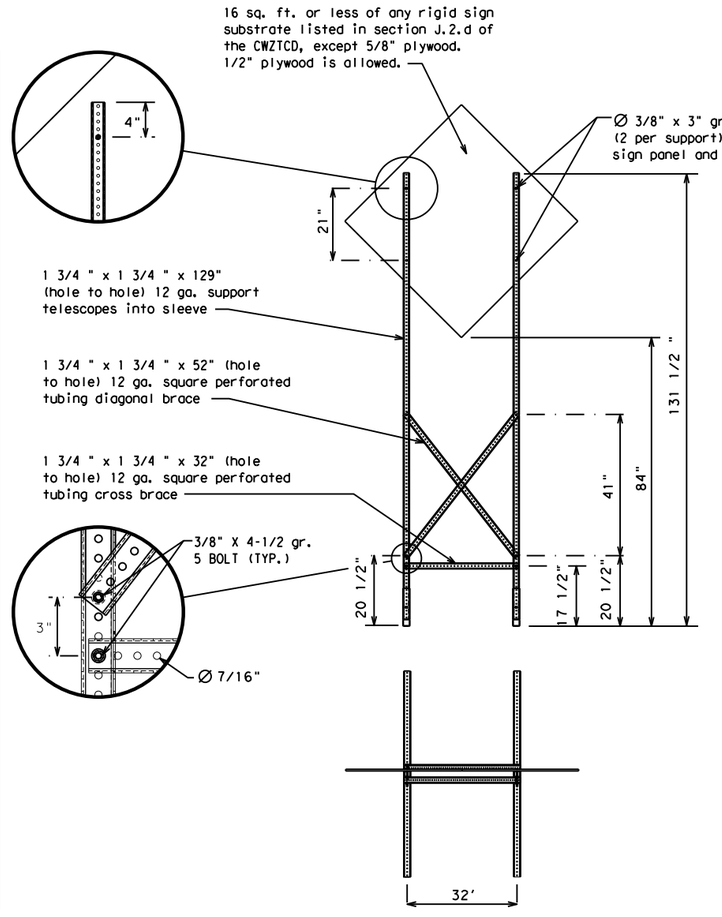


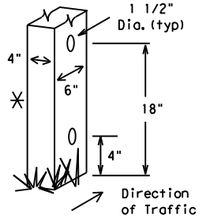
PERFORATED SQUARE METAL TUBING

GROUND MOUNTED SIGN SUPPORTS

Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support.
The maximum sign square footage shall adhere to the manufacturer's recommendation.
Two post installations can be used for larger signs.

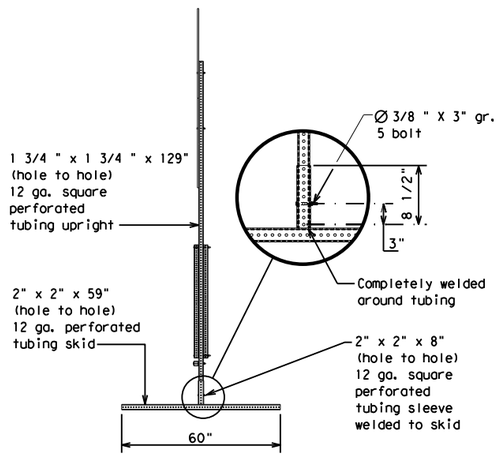






Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS



WEDGE ANCHORS

Both steel and plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(1)).

OTHER DESIGNS

MORE DETAILS OF APPROVED LONG/INTERMEDIATE AND SHORT TERM SUPPORTS CAN BE FOUND ON THE CWZTCD LIST. SEE BC(1) FOR WEBSITE LOCATION.

GENERAL NOTES

1. Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
2. No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
3. When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

□ See BC(4) for definition of "Work Duration."

✳ Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.

△ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

SHEET 5 OF 12

Texas Department of Transportation — Traffic Operations Division Standard

SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-14

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	SAT	BEXAR		46

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WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

PORTABLE CHANGEABLE MESSAGE SIGNS

1. The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
2. Messages on PCMS should contain no more than 8 words (about four to eight characters per word), not including simple words such as "TO," "FOR," "AT," etc.
3. Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by itself.
4. Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
5. Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
6. When in use the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
7. The message term "WEEKEND" should be used only if the work is to start on Saturday morning and end by Sunday evening at midnight. Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.
8. The Engineer/Inspector may select one of two options which are available for displaying a two-phase message on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
9. Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
10. Do not present redundant information on a two-phase message; i.e., keeping two lines of the message the same and changing the third line.
11. Do not use the word "Danger" in message.
12. Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
13. Do not display messages that scroll horizontally or vertically across the face of the sign.
14. The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together. Words or phrases not on this list should not be abbreviated, unless shown in the TMUTCD.
15. PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 600 feet at night and 800 feet in daylight. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
16. Each line of text should be centered on the message board rather than left or right justified.
17. If disabled, the PCMS should default to an illegible display that will not alarm motorists and will only be used to alert workers that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD
Alternate	ALT
Avenue	AVE
Best Route	BEST RTE
Boulevard	BLVD
Bridge	BRDG
Cannot	CANT
Center	CTR
Construction Ahead	CONST AHD
CROSSING	XING
Detour Route	DETOUR RTE
Do Not	DONT
East	E
Eastbound	(route) E
Emergency	EMER
Emergency Vehicle	EMER VEH
Entrance, Enter	ENT
Express Lane	EXP LN
Expressway	EXPWY
XXXX Feet	XXXX FT
Fog Ahead	FOG AHD
Freeway	FRWY, FWY
Freeway Blocked	FWY BLKD
Friday	FRI
Hazardous Driving	HAZ DRIVING
Hazardous Material	HAZMAT
High-Occupancy	HOV
Vehicle Highway	HWY
Hour(s)	HR, HRS
Information	INFO
It Is	ITS
Junction	JCT
Left	LFT
Left Lane	LFT LN
Lane Closed	LN CLOSED
Lower Level	LWR LEVEL
Maintenance	MAINT

WORD OR PHRASE	ABBREVIATION
Major	MAJ
Miles	MI
Miles Per Hour	MPH
Minor	MNR
Monday	MON
Normal	NORM
North	N
Northbound	(route) N
Parking	PKING
Road	RD
Right Lane	RT LN
Saturday	SAT
Service Road	SERV RD
Shoulder	SHLDR
Slippery	SLIP
South	S
Southbound	(route) S
Speed	SPD
Street	ST
Sunday	SUN
Telephone	PHONE
Temporary	TEMP
Thursday	THURS
To Downtown	TO DWNTN
Traffic	TRAF
Travelers	TRVLRS
Tuesday	TUES
Time Minutes	TIME MIN
Upper Level	UPR LEVEL
Vehicles (s)	VEH, VEHS
Warning	WARN
Wednesday	WED
Weight Limit	WT LIMIT
West	W
Westbound	(route) W
Wet Pavement	WET PVMT
Will Not	WONT

Roadway designation # IH-number, US-number, SH-number, FM-number

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

(The Engineer may approve other messages not specifically covered here.)

Phase 1: Condition Lists

Road/Lane/Ramp Closure List		Other Condition List		
FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED	ROADWORK XXX FT	ROAD REPAIRS XXXX FT	
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT	FLAGGER XXXX FT	LANE NARROWS XXXX FT	
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT	RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE	
RIGHT X LANES CLOSED	RIGHT X LANES OPEN	MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT	
CENTER LANE CLOSED	DAYTIME LANE CLOSURES	LOOSE GRAVEL XXXX FT	UNEVEN LANES XXXX FT	
NIGHT LANE CLOSURES	I-XX SOUTH EXIT CLOSED	DETOUR X MILE	ROUGH ROAD XXXX FT	
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE	ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN	
EXIT CLOSED	RIGHT LN TO BE CLOSED	BUMP XXXX FT	US XXX EXIT X MILES	
MALL DRIVEWAY CLOSED	X LANES CLOSED TUE - FRI	TRAFFIC SIGNAL XXXX FT	LANES SHIFT *	
XXXXXXXX BLVD CLOSED				

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List		Location List	Warning List	** Advance Notice List
MERGE RIGHT	FORM X LINES RIGHT	AT FM XXXX	SPEED LIMIT XX MPH	TUE-FRI XX AM- X PM
DETOUR NEXT X EXITS	USE XXXXX RD EXIT	BEFORE RAILROAD CROSSING	MAXIMUM SPEED XX MPH	APR XX-XX X PM-X AM
USE EXIT XXX	USE EXIT I-XX NORTH	NEXT X MILES	MINIMUM SPEED XX MPH	BEGINS MONDAY
STAY ON US XXX SOUTH	USE I-XX E TO I-XX N	PAST US XXX EXIT	ADVISORY SPEED XX MPH	BEGINS MAY XX
TRUCKS USE US XXX N	WATCH FOR TRUCKS	XXXXXXX TO XXXXXXX	RIGHT LANE EXIT	MAY X-X XX PM - XX AM
WATCH FOR TRUCKS	EXPECT DELAYS	US XXX TO FM XXXX	USE CAUTION	NEXT FRI-SUN
EXPECT DELAYS	PREPARE TO STOP		DRIVE SAFELY	XX AM TO XX PM
REDUCE SPEED XXX FT	END SHOULDER USE		DRIVE WITH CARE	NEXT TUE AUG XX
USE OTHER ROUTES	WATCH FOR WORKERS			TONIGHT XX PM- XX AM
STAY IN LANE *				

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

1. Only 1 or 2 phases are to be used on a PCMS.
2. The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
3. A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
4. A Location Phase is necessary only if a distance or location is not included in the first phase selected.
5. If two PCMS are used in sequence, they must be separated by a minimum of 1000 ft. Each PCMS shall be limited to two phases, and should be understandable by themselves.
6. For advance notice, when the current date is within seven days of the actual work date, calendar days should be replaced with days of the week. Advance notification should typically be for no more than one week prior to the work.

WORDING ALTERNATIVES

1. The words RIGHT, LEFT and ALL can be interchanged as appropriate.
2. Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
3. EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
4. Highway names and numbers replaced as appropriate.
5. ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
6. AHEAD may be used instead of distances if necessary.
7. FT and MI, MILE and MILES interchanged as appropriate.
8. AT, BEFORE and PAST interchanged as needed.
9. Distances or AHEAD can be eliminated from the message if a location phase is used.

PCMS SIGNS WITHIN THE R.O.W. SHALL BE BEHIND GUARDRAIL OR CONCRETE BARRIER OR SHALL HAVE A MINIMUM OF FOUR (4) PLASTIC DRUMS PLACED PERPENDICULAR TO TRAFFIC ON THE UPSTREAM SIDE OF THE PCMS, WHEN EXPOSED TO ONE DIRECTION OF TRAFFIC. WHEN EXPOSED TO TWO WAY TRAFFIC, THE FOUR DRUMS SHOULD BE PLACED WITH ONE DRUM AT EACH OF THE FOUR CORNERS OF THE UNIT.

FULL MATRIX PCMS SIGNS

1. When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
2. When symbol signs, such as the "Flagger Symbol"(CW20-7) are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it shall maintain the legibility/visibility requirement listed above.
3. When symbol signs are represented graphically on the Full Matrix PCMS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.
4. A full matrix PCMS may be used to simulate a flashing arrow board provided it meets the visibility, flash rate and dimming requirements on BC(7), for the same size arrow.

Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-14

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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	SAT	BEXAR		47

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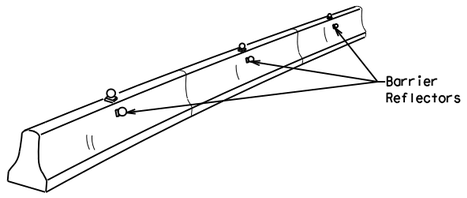
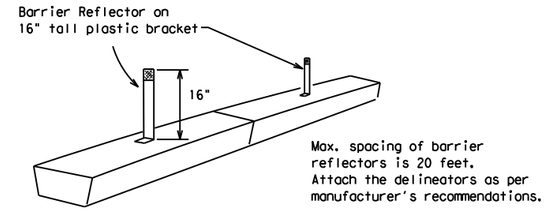
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.

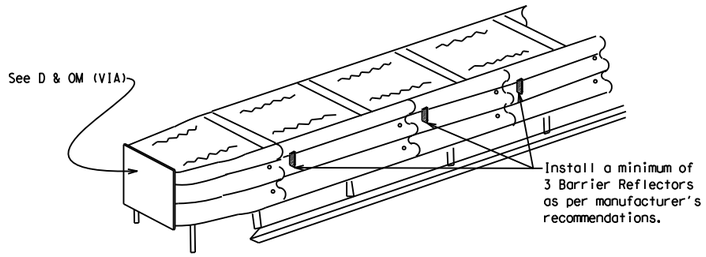


CONCRETE TRAFFIC BARRIER (CTB)

3. Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. The Barrier Reflector mounted on the side of the CTB shall be located directly below the reflector mounted on top of the barrier, as shown in the detail above.
4. Where CTB separates two-way traffic, three barrier reflectors shall be mounted on each section of CTB. The reflector unit on top shall have two yellow reflective faces (Bi-Directional)while the reflectors on each side of the barrier shall have one yellow reflective face, as shown in the detail above.
5. When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
6. Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
7. Maximum spacing of Barrier Reflectors is forty (40) feet.
8. Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
9. Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
10. Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
11. Single slope barriers shall be delineated as shown on the above detail.



LOW PROFILE CONCRETE BARRIER (LPCB)

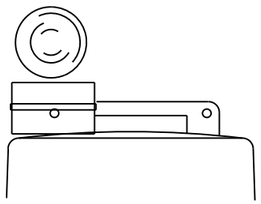


DELINEATION OF END TREATMENTS

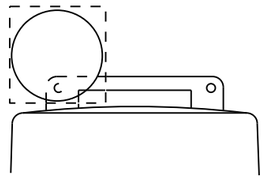
END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet crashworthy standards as defined in the National Cooperative Highway Research Report 350. Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



Warning reflector may be round or square.Must have a yellow reflective surface area of at least 30 square inches

WARNING LIGHTS

1. Warning lights shall meet the requirements of the TMUTCD.
2. Warning lights shall NOT be installed on barricades.
3. Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "FL". The Type A Warning Lights shall not be used with signs manufactured with Type B_{FL} or C_{FL} Sheeting meeting the requirements of Departmental Material Specification DMS-8300.
4. Type-C and Type D 360 degree Steady Burn Lights are intended to be used in a series for delineation to supplement other traffic control devices. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "SB".
5. The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
6. When required by the Engineer, the Contractor shall furnish a copy of the warning lights certification. The warning light manufacturer will certify the warning lights meet the requirements of the latest ITE Purchase Specifications for Flashing and Steady-Burn Warning Lights.
7. When used to delineate curves, Type-C and Type D Steady Burn Lights should only be placed on the outside of the curve, not the inside.
8. The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

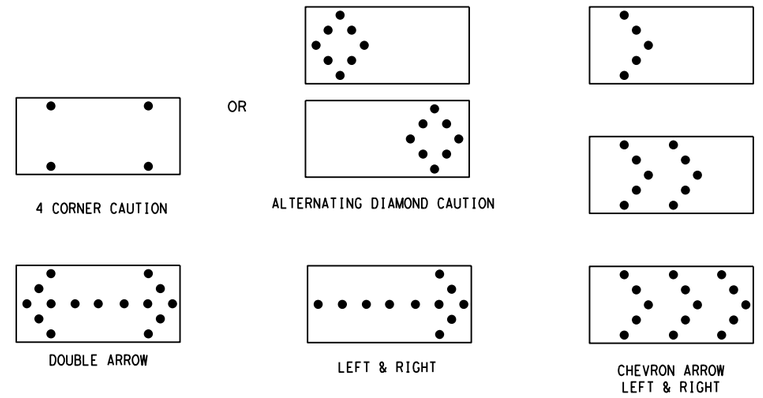
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing devices to form a merging taper may be used for delineation. If used, the successive flashing of the sequential warning lights should occur from the beginning of the taper to the end of the merging taper in order to identify the desired vehicle path. The rate of flashing for each light shall be 65 flashes per minute, plus or minus 10 flashes.
4. Type C and D steady-burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, and on other similar conditions.
5. Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
6. Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
7. The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

WARNING REFLECTORS MOUNTED ON PLASTIC DRUMS AS A SUBSTITUTE FOR TYPE C (STEADY BURN) WARNING LIGHTS

1. A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light at the discretion of the Contractor unless otherwise noted in the plans.
2. The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed on the CWZTCD.
3. The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
4. Round reflectors shall be fully reflectorized, including the area where attached to the drum.
5. Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it attaches to the drum.
6. The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retroreflectivity requirements for DMS 8300-Type B or Type C.
7. When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
8. The warning reflector should be mounted on the side of the handle nearest approaching traffic.
9. The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.

Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

1. The Flashing Arrow Board should be used for all lane closures on multi-lane roadways, or slow moving maintenance or construction activities on the travel lanes.
2. Flashing Arrow Boards should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
3. The Engineer/Inspector shall choose all appropriate signs, barricades and/or other traffic control devices that should be used in conjunction with the Flashing Arrow Board.
4. The Flashing Arrow Board should be able to display the following symbols:



5. The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
6. The straight line caution display is NOT ALLOWED.
7. The Flashing Arrow Board shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
8. Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.
9. The sequential arrow display is NOT ALLOWED.
10. The flashing arrow display is the TxDOT standard; however, the sequential Chevron display may be used during daylight operations.
11. The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
12. A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
13. A full matrix PCMS may be used to simulate a Flashing Arrow Board provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
14. Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

REQUIREMENTS			
TYPE	MINIMUM SIZE	MINIMUM NUMBER OF PANEL LAMPS	MINIMUM VISIBILITY DISTANCE
B	30 x 60	13	3/4 mile
C	48 x 96	15	1 mile

ATTENTION
Flashing Arrow Boards shall be equipped with automatic dimming devices.

WHEN NOT IN USE, REMOVE THE ARROW BOARD FROM THE RIGHT-OF-WAY OR PLACE THE ARROW BOARD BEHIND CONCRETE TRAFFIC BARRIER OR GUARDRAIL.

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No. 350 (NCHRP 350) or the Manual for Assessing Safety Hardware (MASH).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CWZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION ARROW PANEL, REFLECTORS, WARNING LIGHTS & ATTENUATOR

BC(7)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	SAT	BEXAR		48

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GENERAL NOTES

1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece cones. In tangent sections one-piece cones may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the cones in proper position and location.
3. For short term stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones or one-piece cones as approved by the Engineer.
4. Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
5. Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
6. The Contractor shall have a maximum of 24 hours to replace any plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

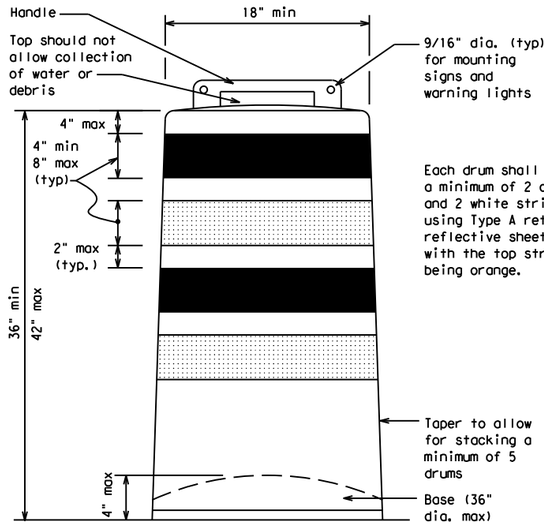
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
5. The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
6. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflectorized space between any two adjacent stripes shall not exceed 2 inches in width.
7. Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a maximum unballasted weight of 11 lbs.
10. Drum and base shall be marked with manufacturer's name and model number.

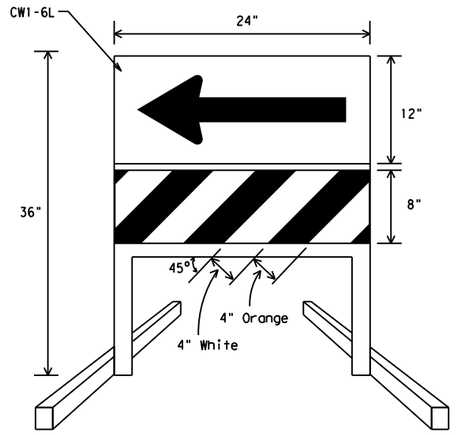
RETROREFLECTIVE SHEETING

1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

BALLAST

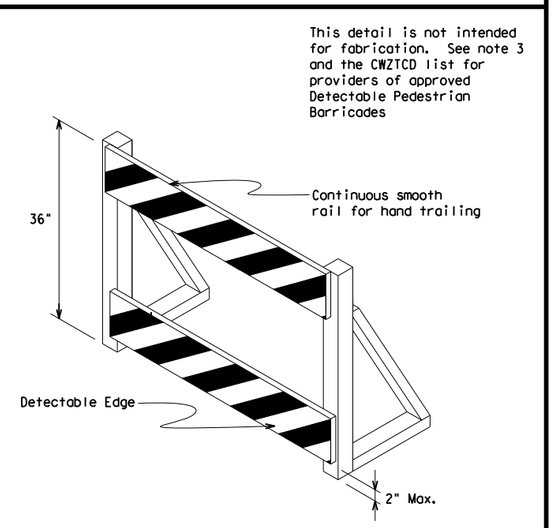
1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
3. Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
4. The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
5. When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
6. Ballast shall not be placed on top of drums.
7. Adhesives may be used to secure base of drums to pavement.





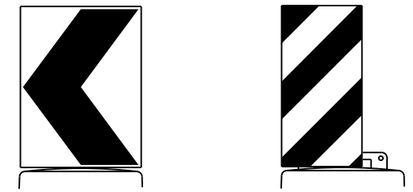
DIRECTION INDICATOR BARRICADE

1. The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
2. If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
3. The Direction Indicator Barricade shall consist of One-Direction Large Arrow (CW1-6) sign in the size shown with a black arrow on a background of Type B_{FL} or Type C_{FL} Orange retroreflective sheeting above a rail with Type A retroreflective sheeting in alternating 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Sheeting types shall be as per DMS 8300.
4. Double arrows on the Direction Indicator Barricade will not be allowed.
5. Approved manufacturers are shown on the CWZTCD List. Ballast shall be as approved by the manufacturers instructions.



DETECTABLE PEDESTRIAN BARRICADES

1. When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a device that is detectable by a person with a visual disability traveling with the aid of a long cane shall be placed across the full width of the closed sidewalk.
3. Detectable pedestrian barricades similar to the one pictured above, longitudinal channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.
4. Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)" and should not be used as a control for pedestrian movements.
5. Warning lights shall not be attached to detectable pedestrian barricades.
6. Detectable pedestrian barricades may use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



18" x 24" Sign
(Maximum Sign Dimension)
Chevron CW1-8, Opposing Traffic Lane Divider, Driveway sign D70a, Keep Right R4 series or other signs as approved by Engineer

12" x 24"
Vertical Panel
mount with diagonals sloping down towards travel way

Plywood, Aluminum or Metal sign substrates shall NOT be used on plastic drums

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type B_{FL} or Type C_{FL} Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
3. Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
4. Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height, except for the R9 series signs discussed in note 8 below.
5. Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
6. Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
7. Chevrons may be placed on drums on the outside of curves, on merging tapers or on shifting tapers. When used in these locations they may be placed on every drum or spaced not more than on every third drum. A minimum of three (3) should be used at each location called for in the plans.
8. R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-14

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9-07 8-14	SAT	BEXAR		49

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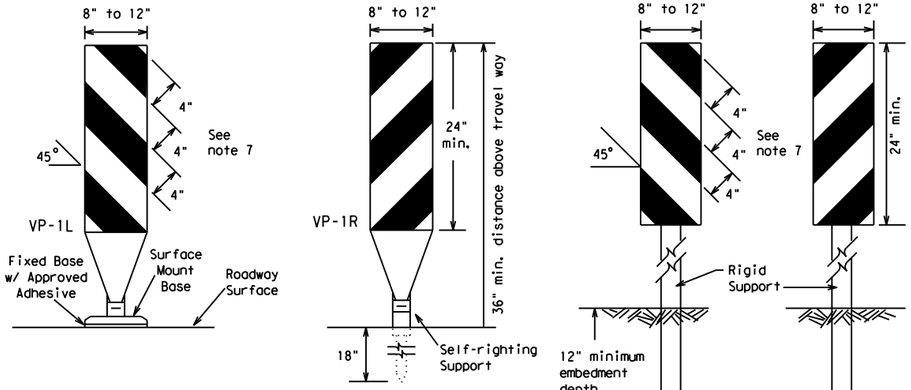
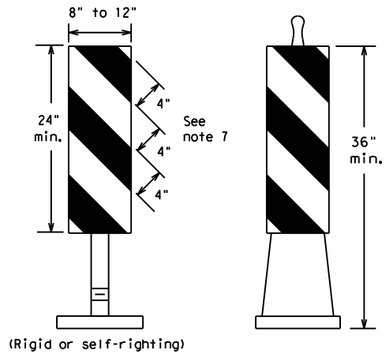


FIXED
(Rigid or self-righting)

DRIVEABLE

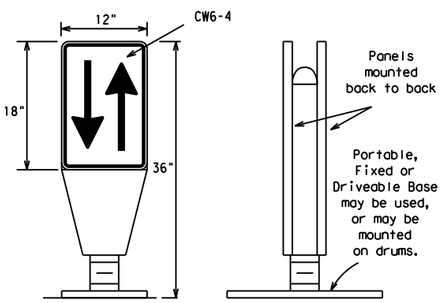


(Rigid or self-righting)

PORTABLE

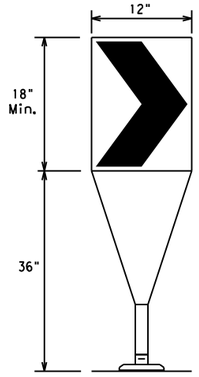
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of VP's for drop-offs.
3. VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
4. VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
5. Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
6. Sheeting for the VP's shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.

VERTICAL PANELS (VPs)



1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
2. The OTLD may be used in combination with 42" cones or VPs.
3. Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
4. The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



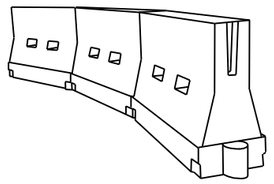
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
4. To be effective, the chevron should be visible for at least 500 feet.
5. Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
6. For Long Term Stationary use on tapers or transitions on freeways and divided highways self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

CHEVRONS

GENERAL NOTES

1. Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
6. Pavement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
7. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

1. LCDs are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
2. LCDs may be used instead of a line of cones or drums.
3. LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
6. LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on BC(10) placed near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long canes and the top of the unit shall not be less than 32 inches in height.

HOLLOW OR WATER BALLASTED SYSTEMS USED AS LONGITUDINAL CHANNELIZING DEVICES OR BARRIERS

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'
35		205'	225'	245'	35'	70'
40		265'	295'	320'	40'	80'
45	L = WS	450'	495'	540'	45'	90'
50		500'	550'	600'	50'	100'
55		550'	605'	660'	55'	110'
60		600'	660'	720'	60'	120'
65		650'	715'	780'	65'	130'
70		700'	770'	840'	70'	140'
75		750'	825'	900'	75'	150'
80		800'	880'	960'	80'	160'

** Taper lengths have been rounded off.
L=Length of Taper (FT.) W=Width of Offset (FT.)
S=Posted Speed (MPH)

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-14

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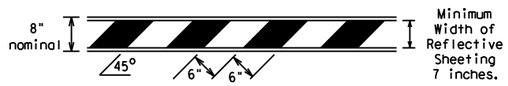
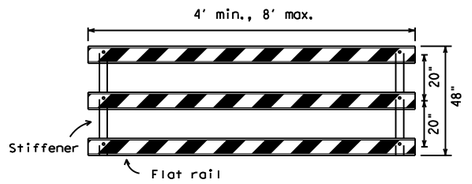
TYPE 3 BARRICADES

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



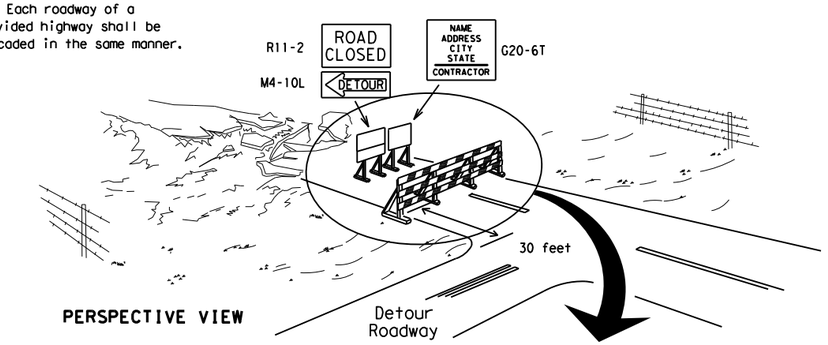
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

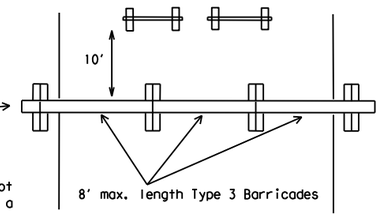
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

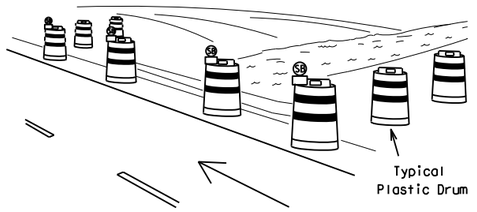
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

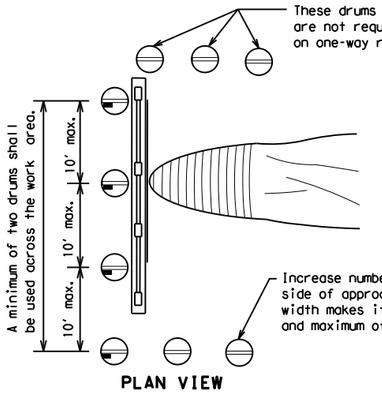
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

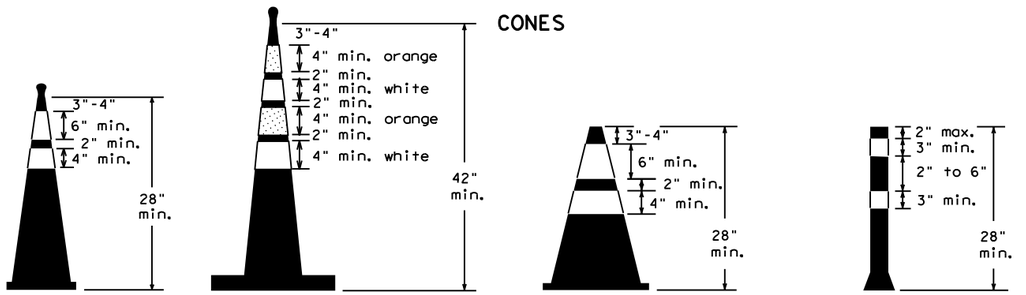
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder width is greater than 12 feet, steady-burn lights may be omitted if drums are used.
5. Drums must extend the length of the culvert widening.



LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
SB	Steady burn warning light or yellow warning reflector

PLAN VIEW

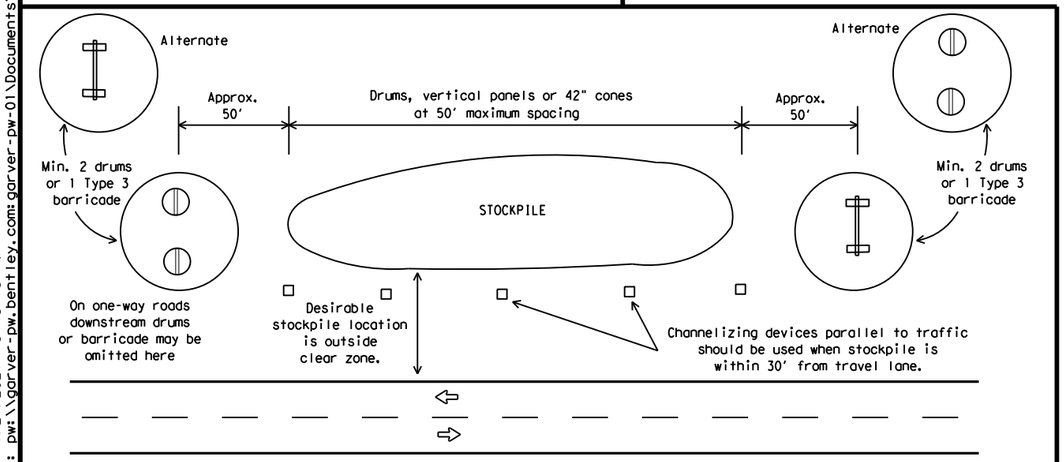
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



28" Cones shall have a minimum weight of 9 1/2 lbs.

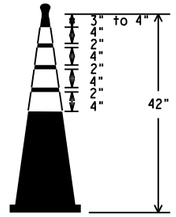
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

1. Traffic cones and tubular markers shall be predominantly orange, and meet the height and weight requirements shown above.
2. One-piece cones have the body and base of the cone molded in one consolidated unit. Two-piece cones have a cone shaped body and a separate rubber base, or ballast, that is added to keep the device upright and in place.
3. Two-piece cones may have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.
4. Cones or tubular markers used at night shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

THIS DEVICE SHALL NOT BE USED ON PROJECTS LET AFTER MARCH 2014.



EDGELINE CHANNELIZER

1. This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane. It is not intended to be used in transitions or tapers.
2. This device shall not be used to separate lanes of traffic (opposing or otherwise) or warn of objects.
3. This device is based on a 42 inch, two-piece cone with an alternate striping pattern: four 4 inch retroreflective bands, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the edgeline (yellow for left edgeline, white for right edgeline) for which the device is substituted or for which it supplements. The reflectorized bands shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
4. The base must weigh a minimum of 30 lbs.

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-14

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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	SAT	BEXAR		51

WORK ZONE PAVEMENT MARKINGS

GENERAL

1. The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CSJ limits unless otherwise stated in the plans.
2. Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
3. Additional supplemental pavement marking details may be found in the plans or specifications.
4. Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
5. When short term markings are required on the plans, short term markings shall conform with the TMUTCD, the plans and details as shown on the Standard Plan Sheet WZ(STPM).
6. When standard pavement markings are not in place and the roadway is opened to traffic, DO NOT PASS signs shall be erected to mark the beginning of the sections where passing is prohibited and PASS WITH CARE signs at the beginning of sections where passing is permitted.
7. All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

1. Raised pavement markers are to be placed according to the patterns on BC(12).
2. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

1. Removable prefabricated pavement markings shall meet the requirements of DMS-8241.
2. Non-removable prefabricated pavement markings (foil back) shall meet the requirements of DMS-8240.

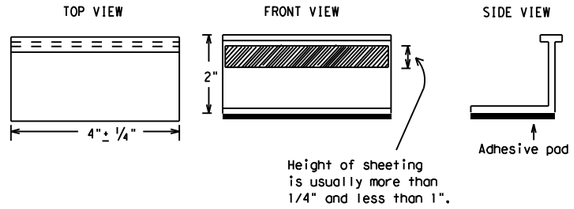
MAINTAINING WORK ZONE PAVEMENT MARKINGS

1. The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
2. Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 599.
3. The markings should provide a visible reference for a minimum distance of 300 feet during normal daylight hours and 160 feet when illuminated by automobile low-beam headlights at night, unless sight distance is restricted by roadway geometrics.
4. Markings failing to meet this criteria within the first 30 days after placement shall be replaced at the expense of the Contractor as per Specification Item 662.

REMOVAL OF PAVEMENT MARKINGS

1. Pavement markings that are no longer applicable, could create confusion or direct a motorist toward or into the closed portion of the roadway shall be removed or obliterated before the roadway is opened to traffic.
2. The above shall not apply to detours in place for less than three days, where flaggers and/or sufficient channelizing devices are used in lieu of markings to outline the detour route.
3. Pavement markings shall be removed to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by TxDOT Specification Item 677 for "Eliminating Existing Pavement Markings and Markers".
4. The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
5. Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
6. Blast cleaning may be used but will not be required unless specifically shown in the plans.
7. Over-painting of the markings SHALL NOT BE permitted.
8. Removal of raised pavement markers shall be as directed by the Engineer.
9. Removal of existing pavement markings and markers will be paid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
10. Black-out marking tape may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roadway Marker Tabs



STAPLES OR NAILS SHALL NOT BE USED TO SECURE TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS TO THE PAVEMENT SURFACE

1. Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
2. Tabs detailed on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the option of the Engineer, either "A" or "B" below may be imposed to assure quality before placement on the roadway.
   A. Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
   B. Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. No more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
3. Small design variances may be noted between tab manufacturers.
4. See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

1. Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
2. All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
3. Adhesive for guidemarks shall be bituminous material hot applied or butyl rubber pad for all surfaces, or thermoplastic for concrete surfaces.

Guidemarks shall be designated as:
YELLOW - (two amber reflective surfaces with yellow body).
WHITE - (one silver reflective surface with white body).

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY REMOVABLE, PREFABRICATED PAVEMENT MARKINGS	DMS-8241
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS	DMS-8242

A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(1).

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-14

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105

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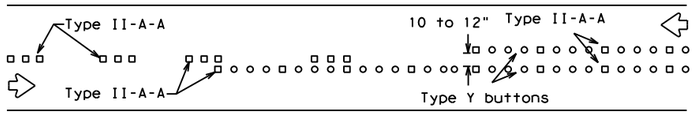
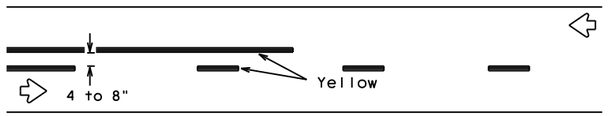
PAVEMENT MARKING PATTERNS

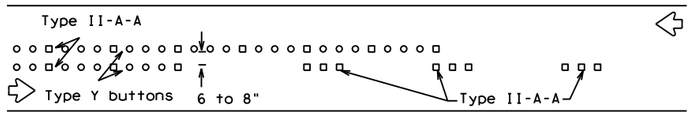
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



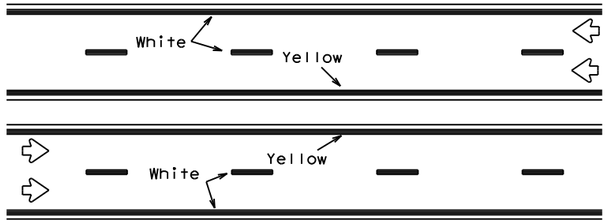
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



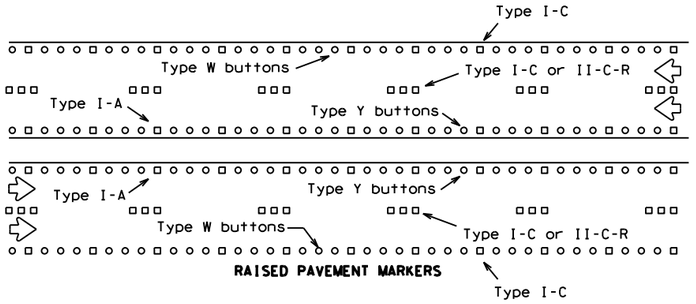
RAISED PAVEMENT MARKERS - PATTERN B

Pattern A is the TXDOT Standard, however Pattern B may be used if approved by the Engineer.
Prefabricated markings may be substituted for reflectorized pavement markings.

CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



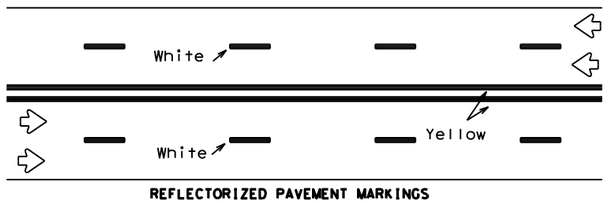
REFLECTORIZED PAVEMENT MARKINGS



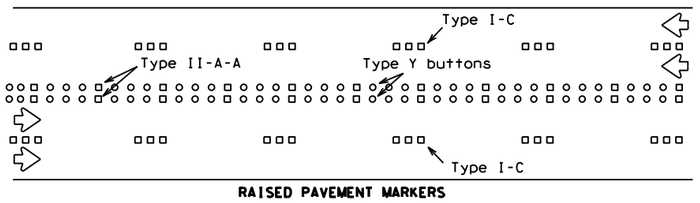
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



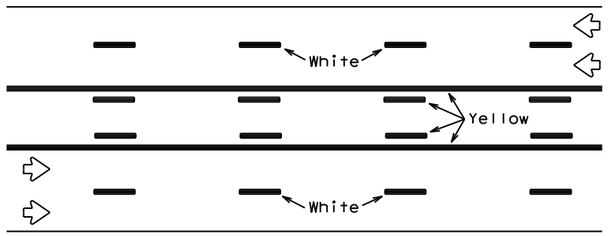
REFLECTORIZED PAVEMENT MARKINGS



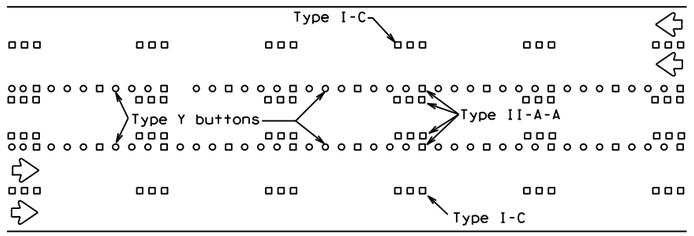
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

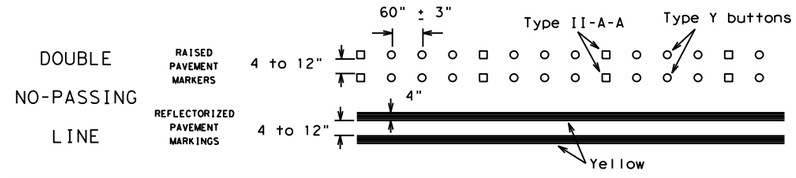
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

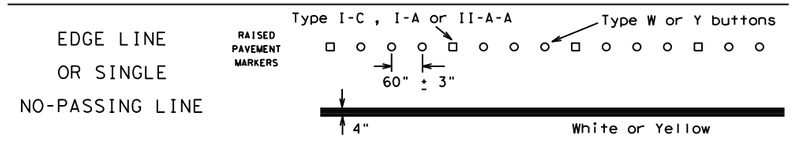
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

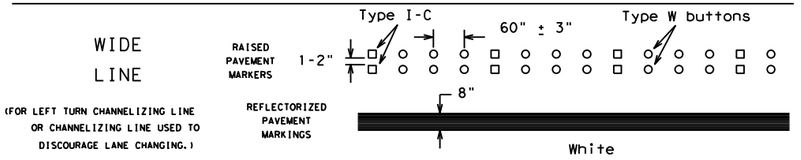


EDGE LINE OR SINGLE NO-PASSING LINE



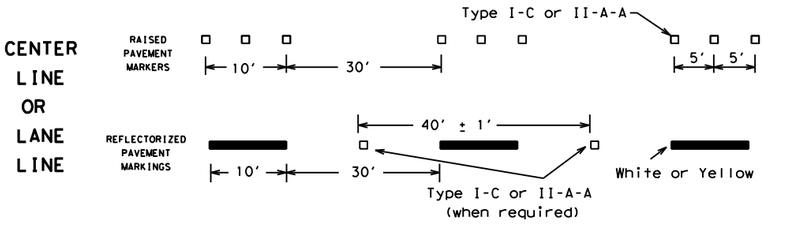
WIDE LINE

(FOR LEFT TURN CHANNELIZING LINE OR CHANNELIZING LINE USED TO DISCOURAGE LANE CHANGING.)

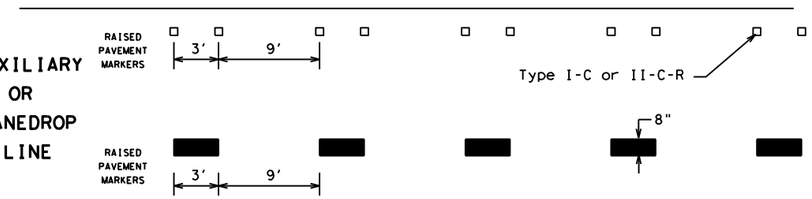


BROKEN LINES

CENTER LINE OR LANE LINE

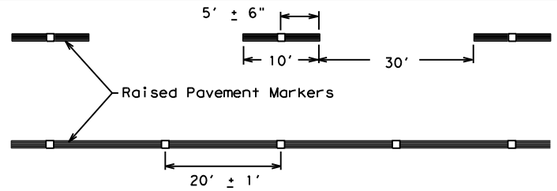


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.



Centerline only - not to be used on edge lines

Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

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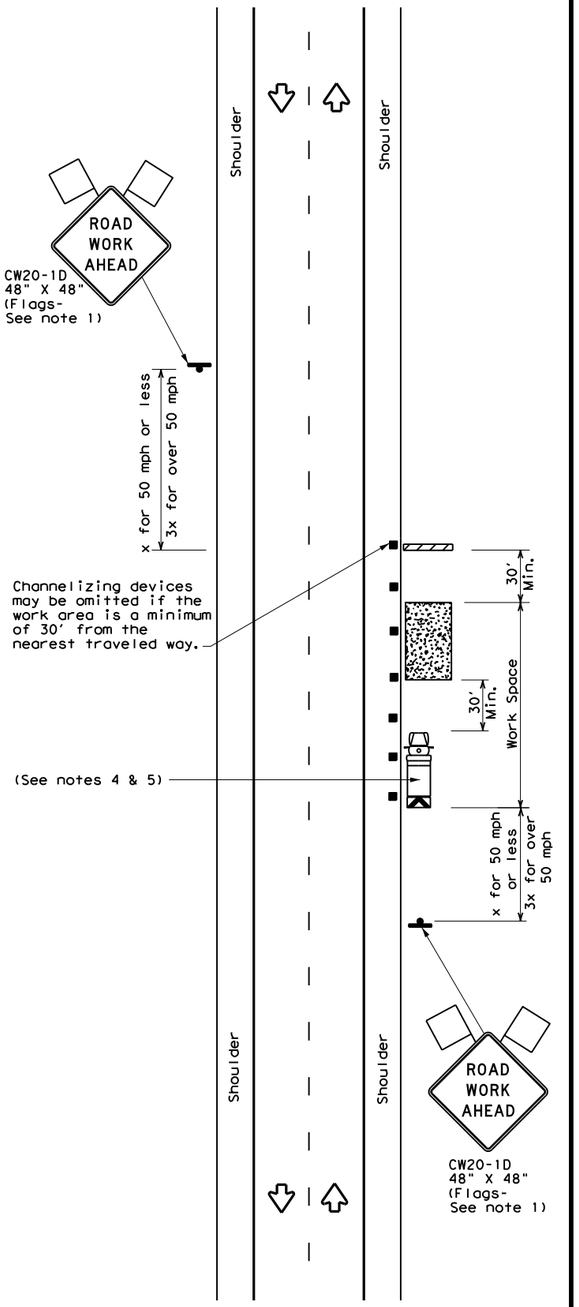
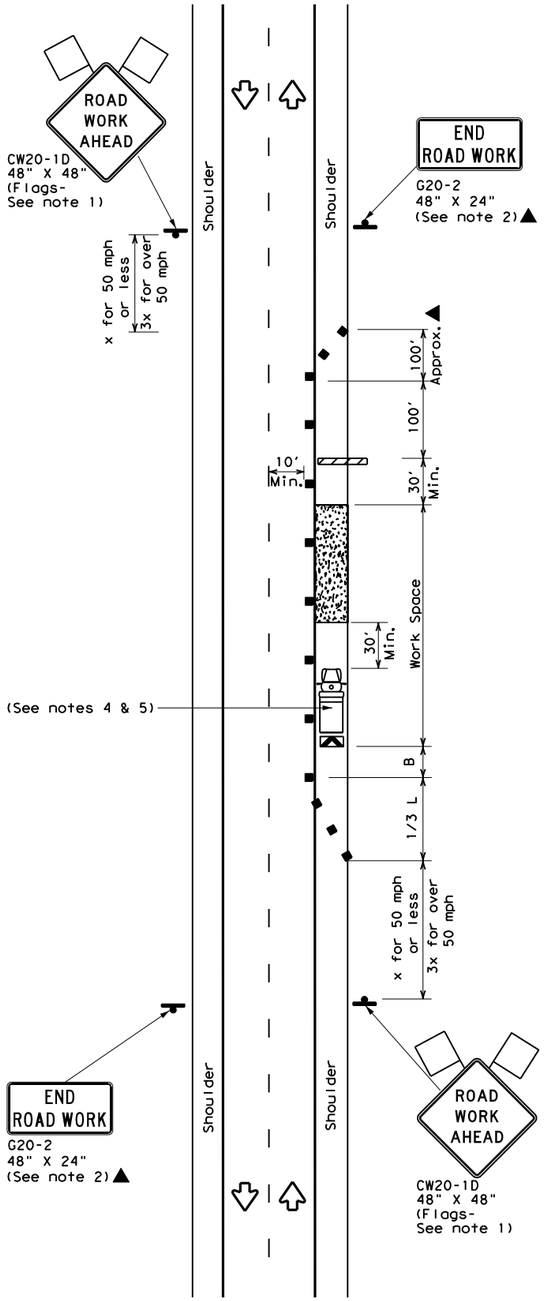


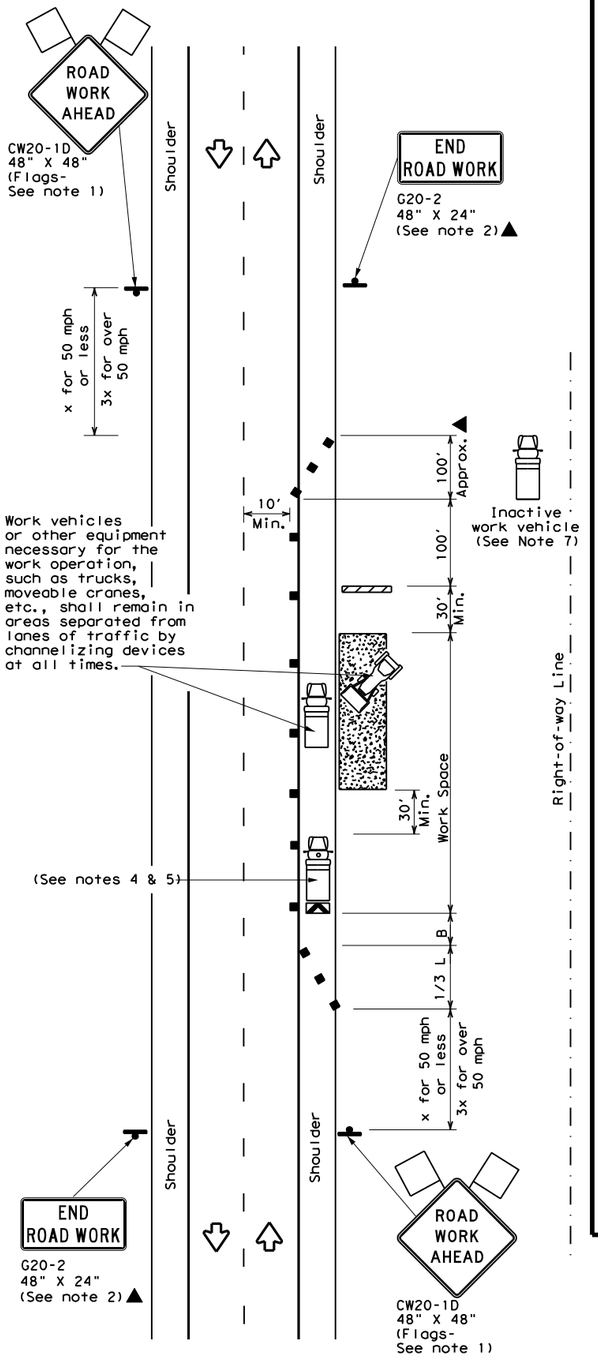
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

LEGEND

	Type 3 Barricade	■ ■	Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE

MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓	✓	✓

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
3. Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
4. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
6. See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
7. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
8. CW21-5 "SHOULDER WORK" signs may be used in place of CW21-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	SAT	BEXAR		54
1-97 2-18				

161

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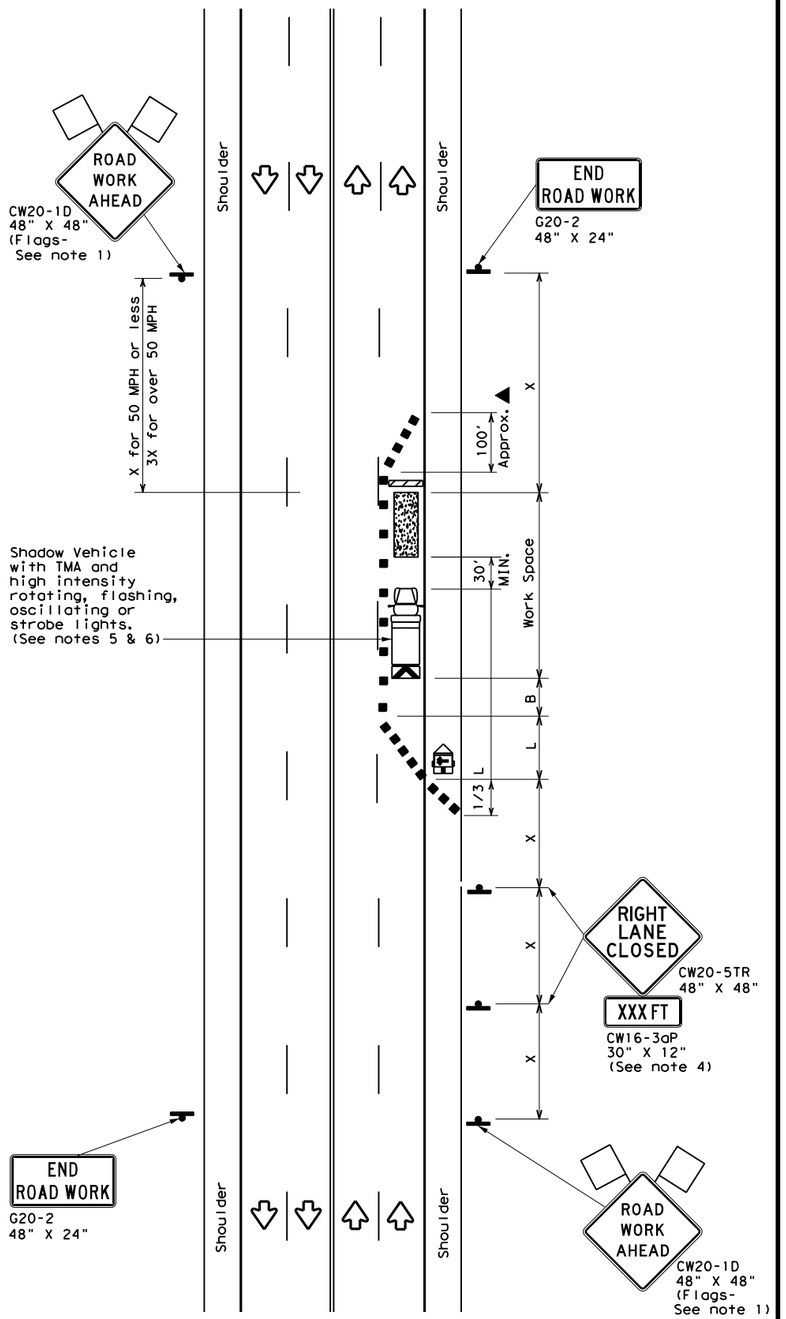
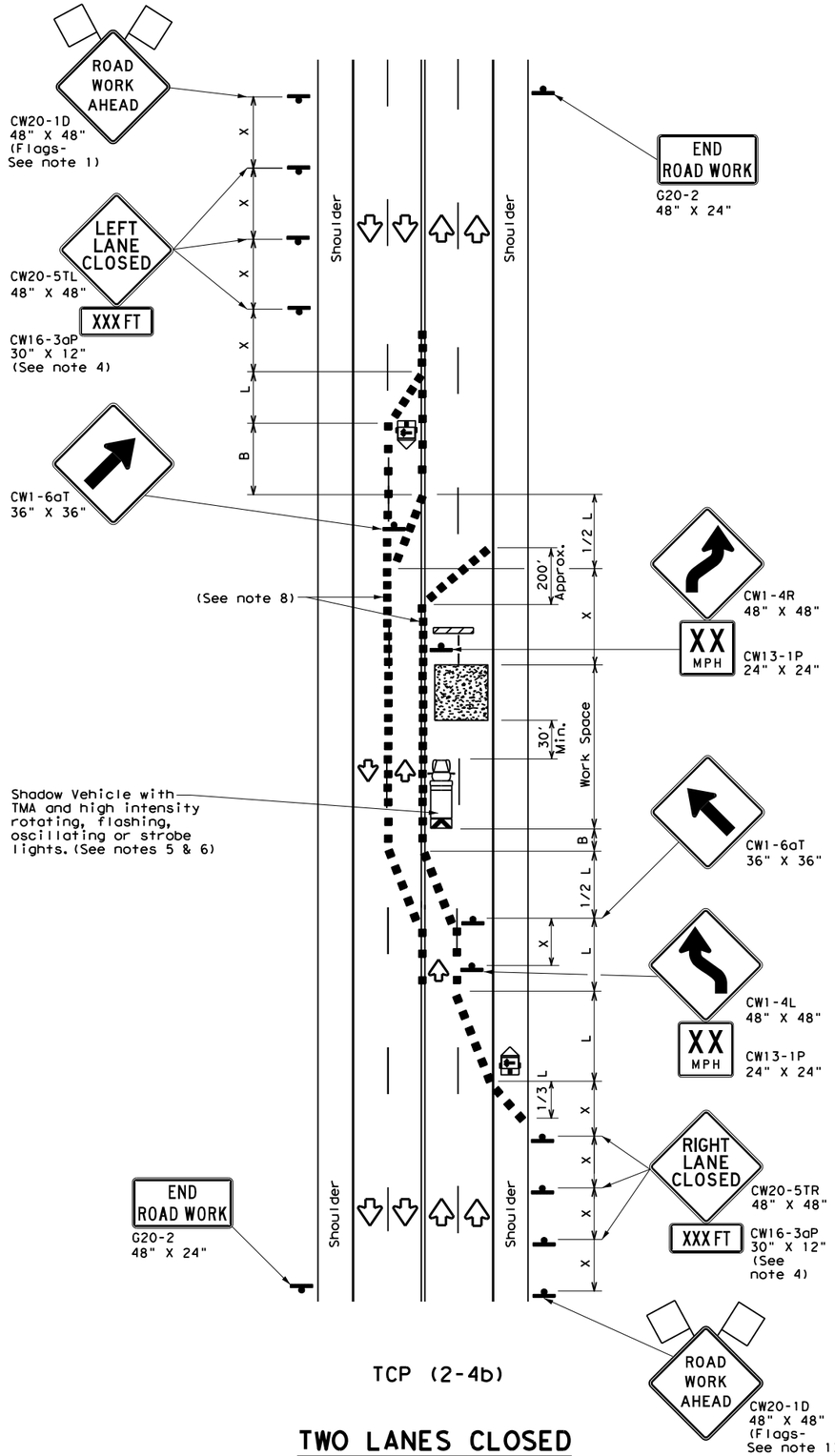


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
		✓	✓	

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
4. For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-4a)

7. If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED"signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic with the arrow board placed in the closed lane near the end of the merging taper.

TCP (2-4b)

8. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter devices spacing is intended for the area of conflicting markings, not the entire work zone.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	SAT	BEXAR		55

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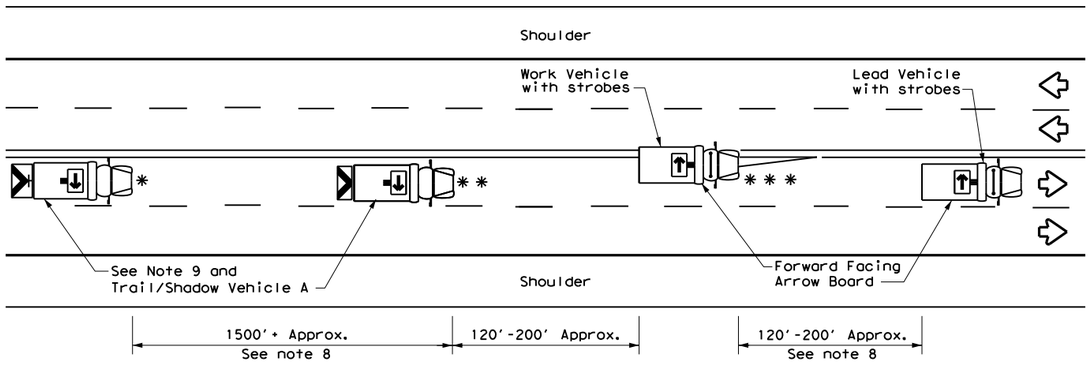
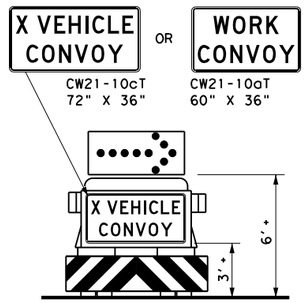


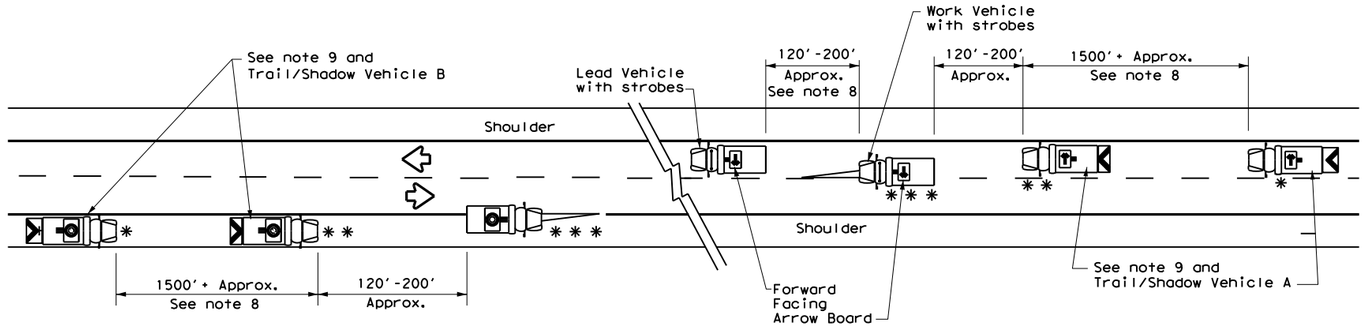
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

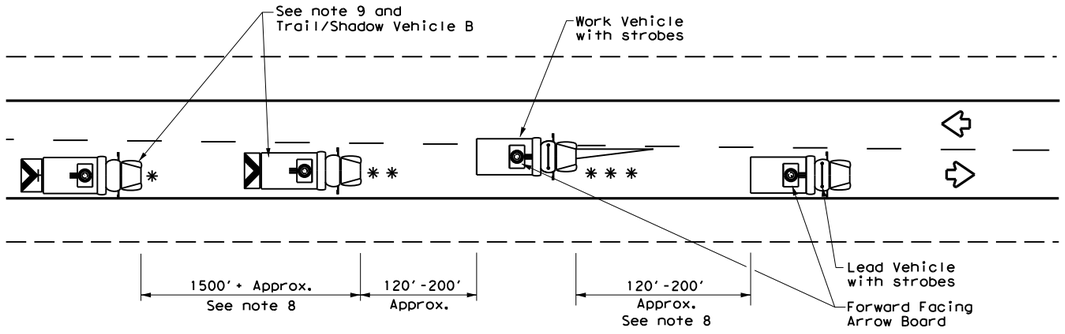
with RIGHT Directional display Flashing Arrow Board



WORK ON SHOULDER — WORK ON TRAVEL LANE

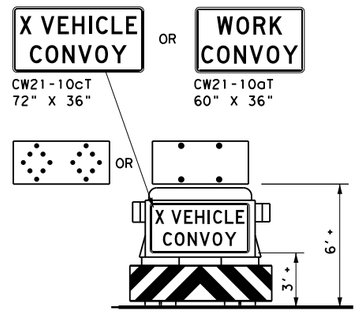
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

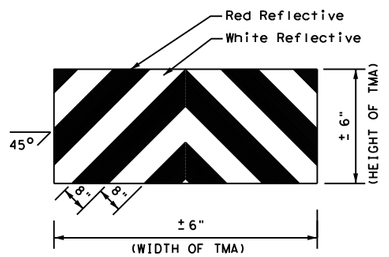
with Flashing Arrow Board in CAUTION display

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
✓				

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. "X VEHICLE CONVOY" (CW21-10cT) or "WORK CONVOY" (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" X 48" diamond shaped "WORK CONVOY"(CW21-10T) or "X VEHICLE CONVOY" (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The "X VEHICLE CONVOY" sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a "DO NOT PASS" (R4-1) sign should be placed on the back of the rearmost protection vehicle.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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	SAT	BEXAR		56

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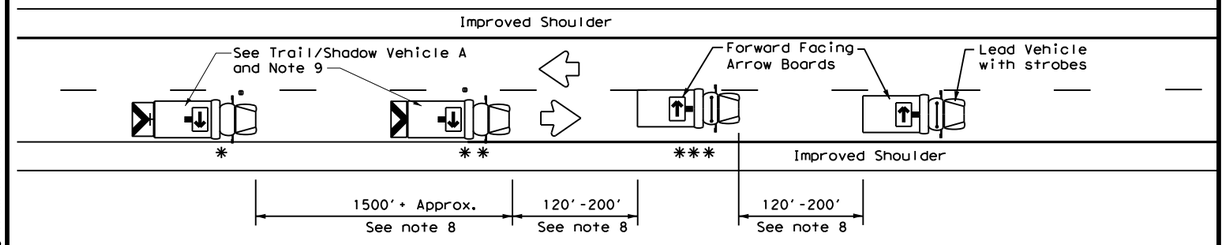
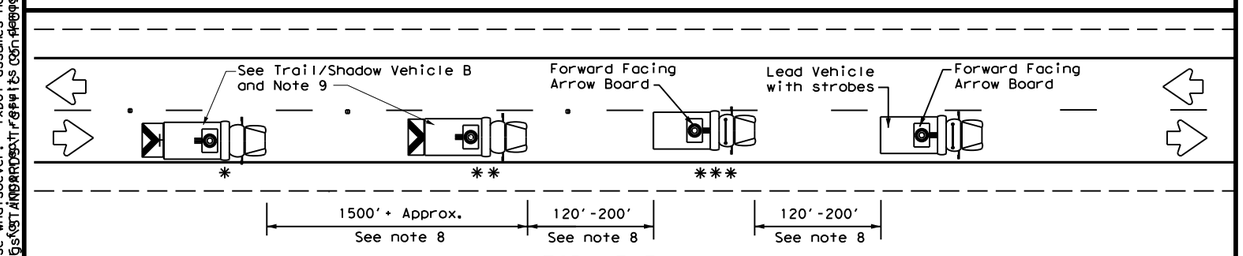


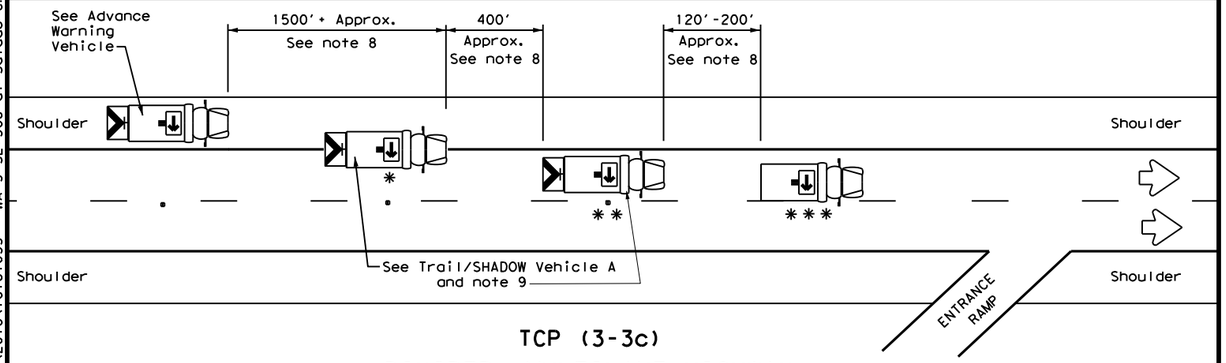
TCP (3-3a)

TWO LANE HIGHWAY WITH PAVED SHOULDERS (WORK ON TRAVEL LANE)



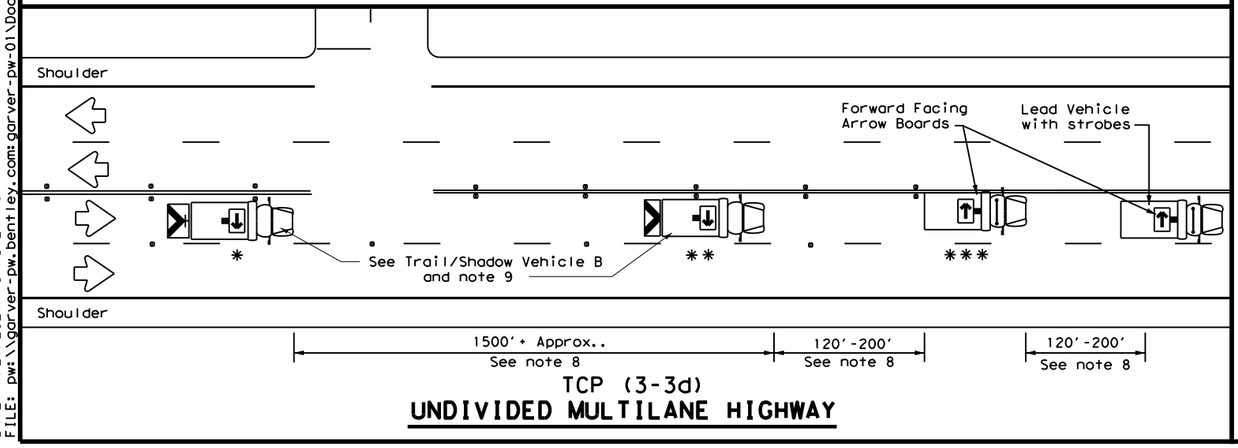
TCP (3-3b)

TWO LANE HIGHWAY WITHOUT PAVED SHOULDERS (WORK ON TRAVEL LANE)



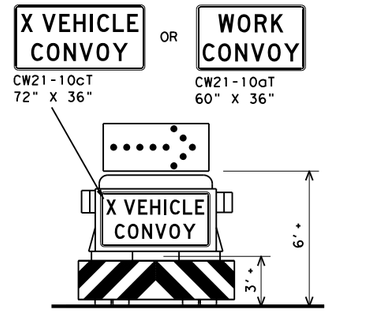
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



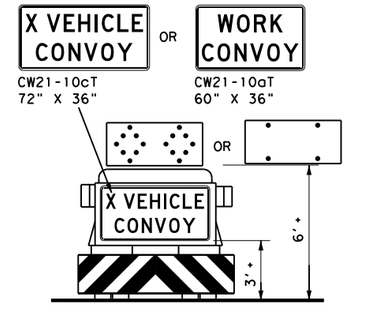
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



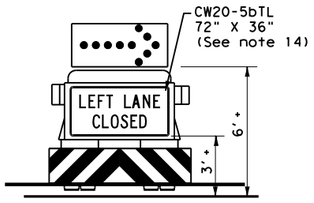
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

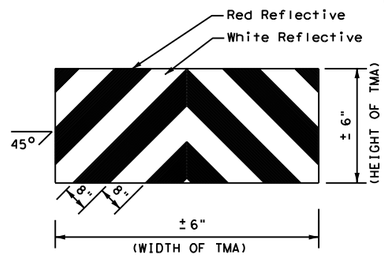


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
✓				

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used on two way roads the WORK vehicle must have an arrow board. For divided roadways, the arrow board on the WORK vehicle is optional based on the type of work being performed. The Engineer will determine if the LEAD vehicle and/or TRAIL vehicle are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating, or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE, ADVANCE WARNING and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. X VEHICLE CONVOY (CW21-10cT) or WORK CONVOY (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" x 48" diamond shaped WORK CONVOY (CW21-10T) or X VEHICLE CONVOY (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The X VEHICLE CONVOY sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. For divided highways with two or three lanes in one direction, the appropriate LEFT LANE CLOSED (CW20-5bTL), RIGHT LANE CLOSED (CW20-5bTR), or CENTER LANE CLOSED (CW20-5dT) sign should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board may be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. A double arrow shall not be displayed on the arrow board on the Advance Warning Vehicle.
12. For divided highways with three or four lanes in each direction, use TCP(3-2).
13. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
14. The Advance Warning Vehicle may straddle the edgeline when Shoulder width makes it necessary.
15. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a DO NOT PASS (R4-1) sign should be placed on the back of the rearmost protection vehicle.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL TCP(3-3)-14

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8-95 7-13	SAT	BEXAR		57
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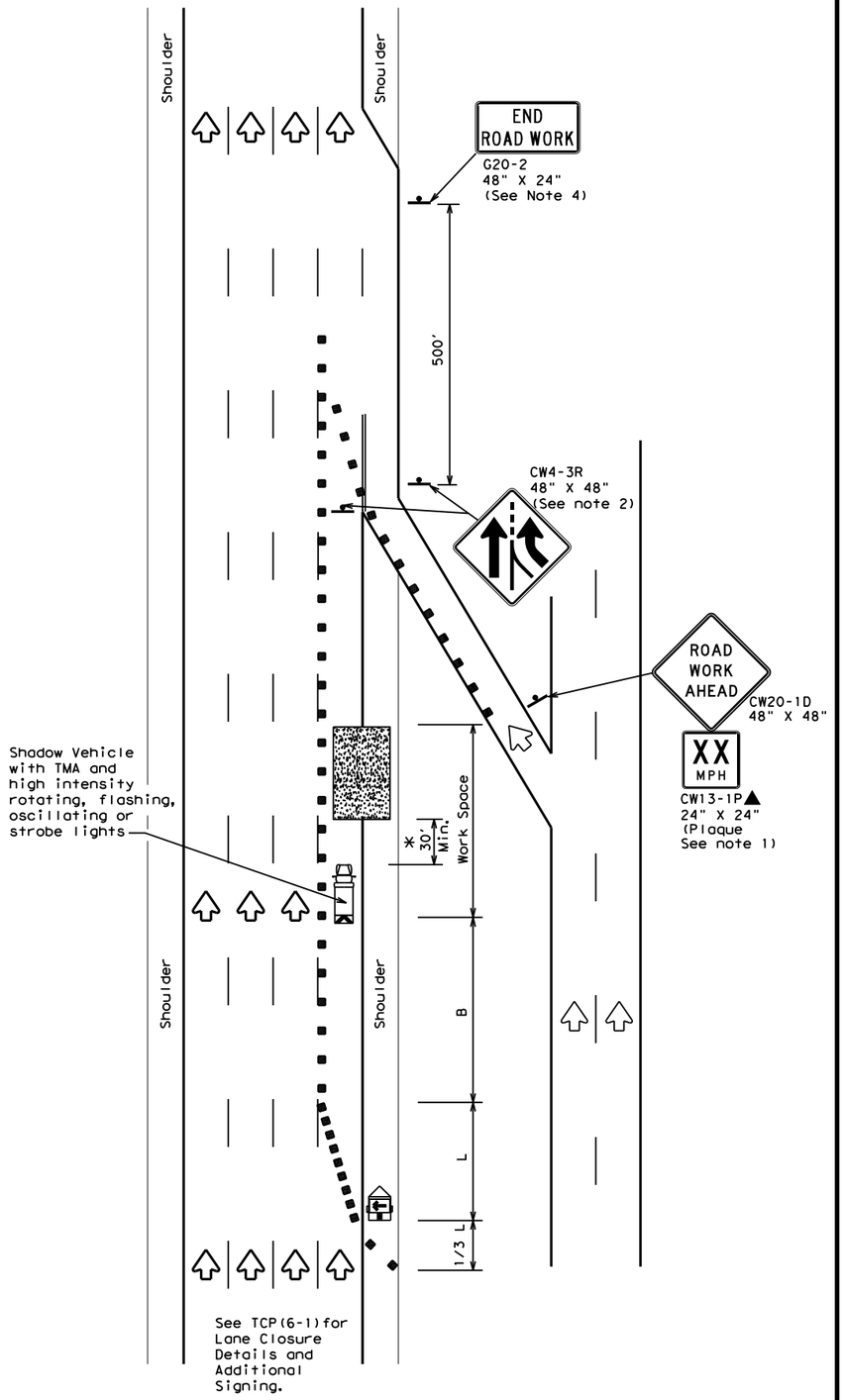
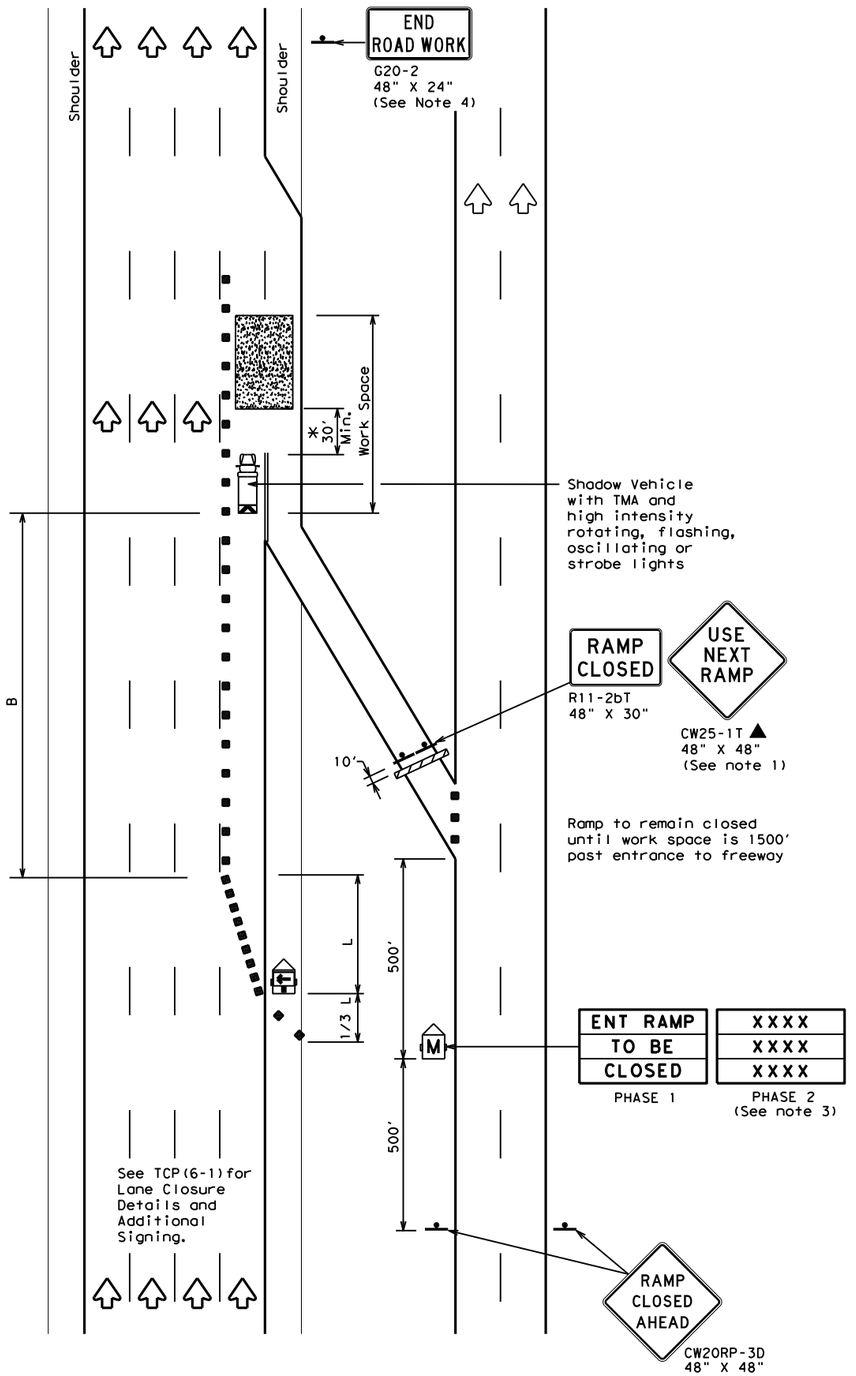


TCP (6-2a)

ENTRANCE RAMP OPEN
WORK WITHIN 500' OF RAMP



TCP (6-2b)

ENTRANCE RAMP CLOSED

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" **			Suggested Maximum Spacing of Channelizing Devices		Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent	
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓	✓	

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. ADDED LANE Symbol (CW4-3) sign may be omitted when sign between ramp and mainlane can be seen from both roadways.
3. See "Advance Notice List" on BC(6) for recommended date and time formatting options for PCMS Phase 2 message.
4. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA NEAR RAMP

TCP(6-2)-12

FILE: tcp6-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	SAT	BEXAR		58

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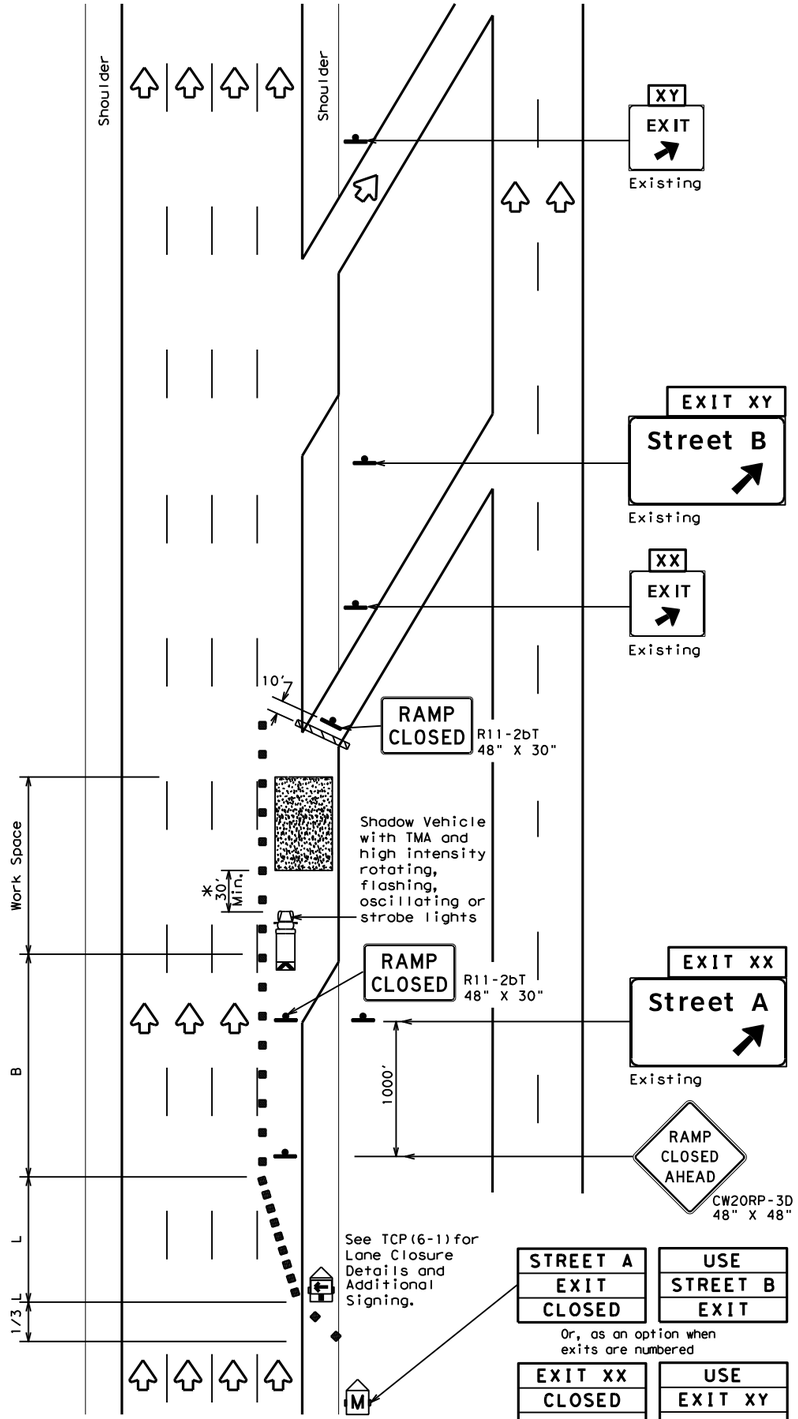
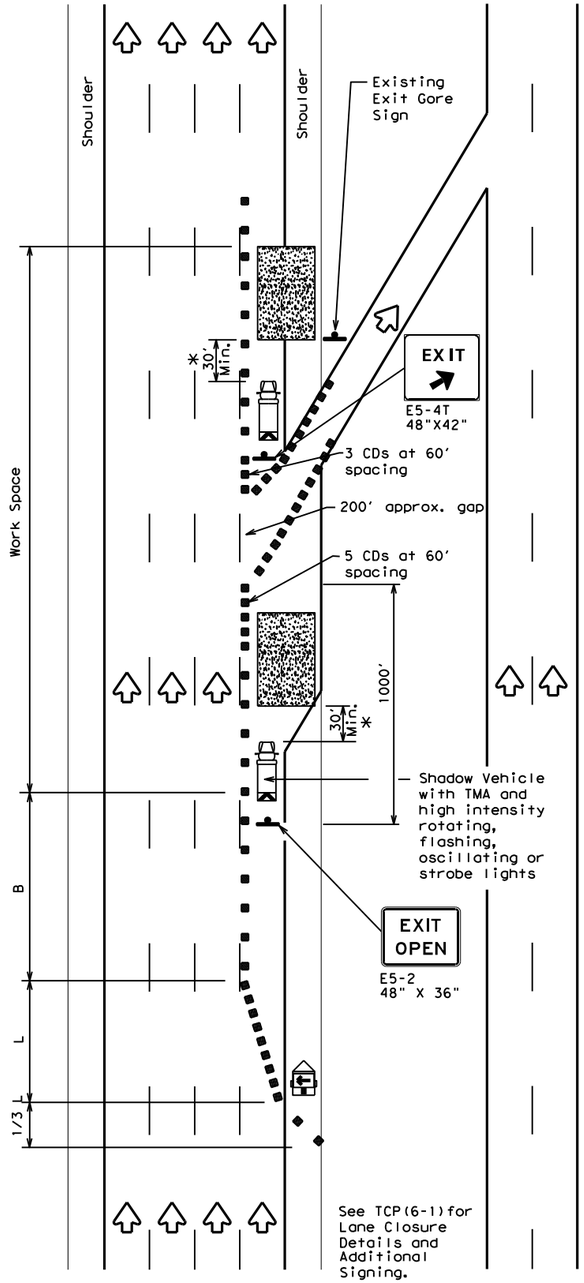


TCP (6-4a)

EXIT RAMP CLOSED
TRAFFIC EXITS PAST CLOSED RAMP



TCP (6-4b)

EXIT RAMP OPEN

LEGEND

	Type 3 Barricade		Channelizing Devices (CDs)
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE

MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓	✓	

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. See BC Standards for sign details.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA AT EXIT RAMP

TCP(6-4)-12

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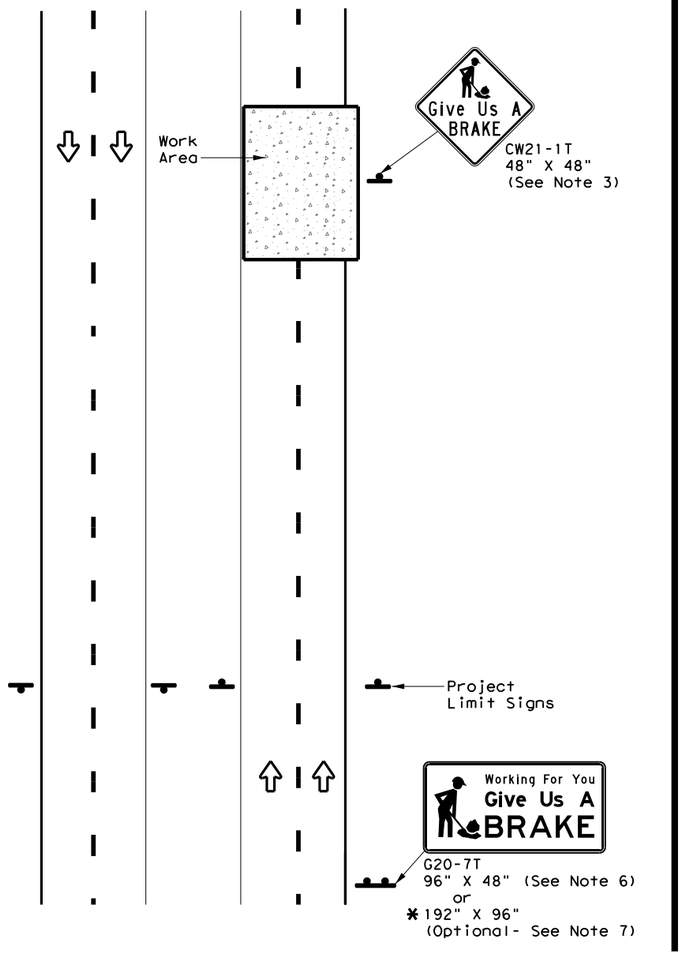
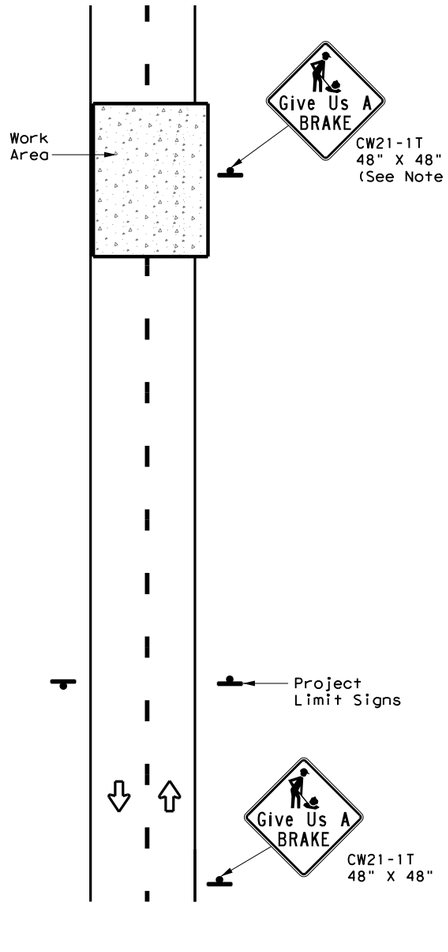
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	SAT	BEXAR		59



DIVIDED HIGHWAY



UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

* When the optional larger WORKING FOR YOU GIVE US A BRAKE (G20-7T) 192" x 96" sign is required, the locations shall be noted elsewhere in the plans.

SUMMARY OF LARGE SIGNS

BACKGROUND COLOR	SIGN DESIGNATION	SIGN	SIGN DIMENSIONS	REFLECTIVE SHEETING	SQ FT	GALVANIZED STRUCTURAL STEEL			DRILLED SHAFT 24" DIA. (LF)
						Size	(LF) ①	(LF) ②	
Orange	G20-7T	Working For You Give Us A BRAKE	96" X 48"	Type B_{FL} or C_{FL}	32	▲	▲	▲	▲
Orange	G20-7T	Working For You Give Us A BRAKE	192" X 96"	Type B_{FL} or C_{FL}	128	W8x18	16	17	12

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL}
BLACK	LEGEND & BORDERS	NON-REFLECTIVE ACRYLIC FILM

GENERAL NOTES

1. See BC and SMD sheets for additional sign support details.
2. Sign locations shall be approved by the Engineer.
3. For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.
4. Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
5. Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
6. The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.
7. The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:
   Item 636 - Aluminum Signs
   Item 647 - Large Roadside Sign Supports and Assemblies.
   Item 416 - Drilled Shaft Foundations
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
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6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	SAT	BEXAR		60

116

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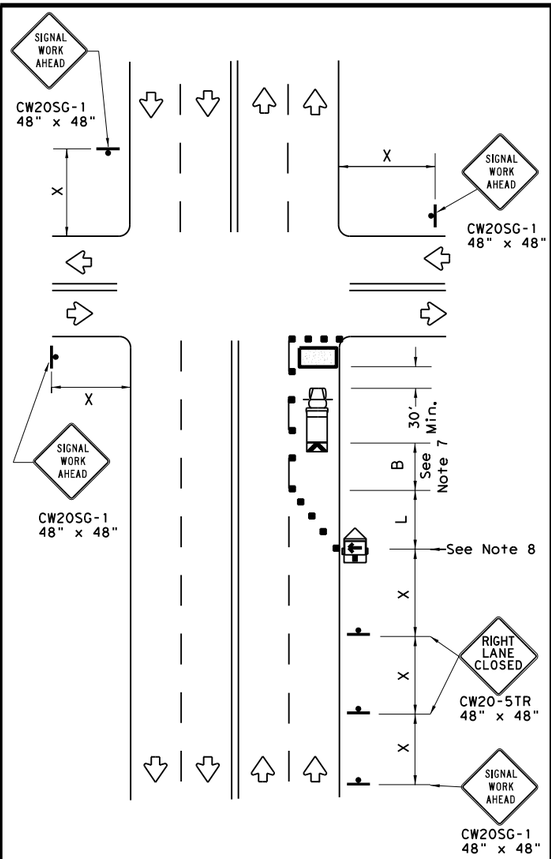
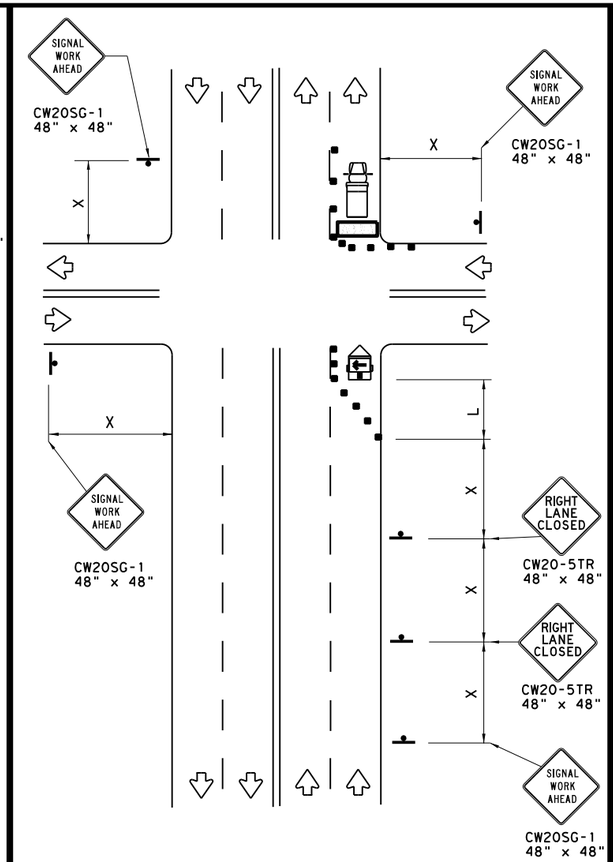


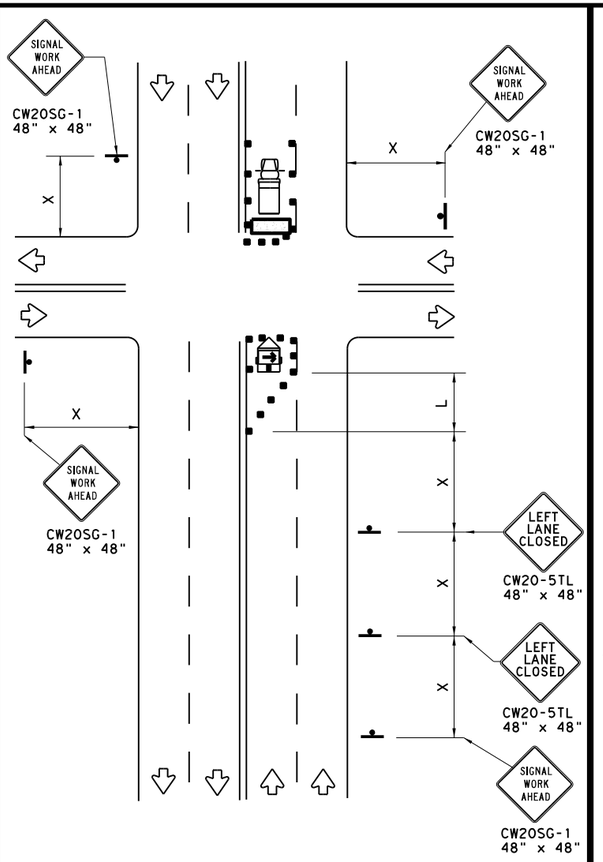
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



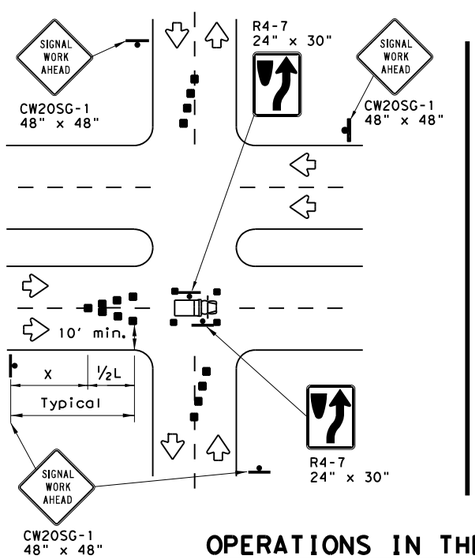
FAR SIDE RIGHT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



OPERATIONS IN THE INTERSECTION

SHORT DURATION

LEGEND			
	Type 3 Barricade	■ ■	Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L = WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

WORKERS IN BUCKET TRUCKS SHALL NOT WORK ABOVE OPEN LANES OF TRAFFIC.

GENERAL NOTES

1. The minimum size channelizing device is the 28" cone. 42" Two-piece cones, drums, vertical panels or barricades will be required when the device must be left unattended at night.
2. Obstructions or hazards at the work area shall be clearly marked and delineated at all times.
3. Flaggers and Flagger Symbol (CW20-7) signs may be required according to field conditions.
4. Vehicles parked in roadway shall be equipped with at least two high intensity rotating, flashing, oscillating or strobe type lights.
5. High level warning devices (flag trees) may be used at corners of the vehicle.
6. When work operations are performed on existing signals, the signals may be placed in flashing red mode when approved by the engineer. If existing signals do not have power, All-Way Stop (R1-1 and R1-3P) signs may be implemented when approved by the engineer.
7. For Short-Term Stationary work the buffer space "B" from the above table should be used if field conditions permit. For Short Duration (less than 1 hour) any buffer space provided will enhance the safety of the setup.
8. The arrow board at this location may be omitted for Short Duration work if the work vehicle has an arrow board in operation. As an option, the arrow board may be placed at the end of the taper in the closed lane if space is not available at the beginning of the taper.
9. Signs and devices for the NEAR SIDE LANE CLOSURE may be altered for a left lane closure by using a LEFT LANE CLOSED (CW20-5TL) and adding channelizing devices on the centerline to protect the work space from opposing traffic.

SHEET 1 OF 2

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
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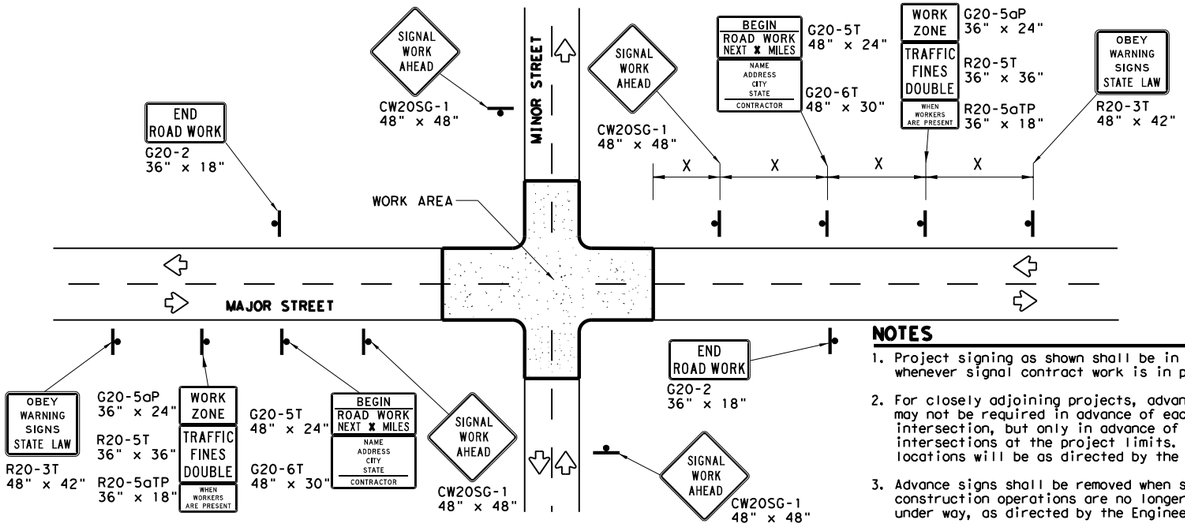


TYPICAL ADVANCE SIGNAL PROJECT SIGNING

FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

1. Project signing as shown shall be in place whenever signal contract work is in progress.
2. For closely adjoining projects, advance signing may not be required in advance of each intersection, but only in advance of the intersections at the project limits. Actual locations will be as directed by the Engineer.
3. Advance signs shall be removed when signal construction operations are no longer under way, as directed by the Engineer.
4. Warning sign spacing shown is typical for both directions.
5. See the Table on sheet 1 of 2 for Typical warning sign spacing.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Signs shall be installed and maintained in a straight and plumb condition.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. Nails shall NOT be used to attach signs to any support.
5. All signs shall be installed in accordance with the plans or as directed by the Engineer.
6. The Contractor shall furnish the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD).
7. The Contractor shall furnish sign supports and substrates listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD), installed as per the manufacturer's recommendations.
8. Temporary signs that have damaged or cracked substrates and/or damaged or marred reflective sheeting shall be replaced as directed by the Engineer.
9. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1".
10. Damaged wood posts shall be replaced. Splicing wood posts will not be allowed.

DURATION OF WORK

1. Work zone durations are defined in Part 6, Section 6G.02 of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

SIGN MOUNTING HEIGHT

1. Sign height of Long-term/Intermediate-term warning signs shall be as shown on Figure 6F-1 of the TMUTCD.
2. Sign height of Short-term/Short Duration warning signs shall be as shown on Figure 6F-2 of the TMUTCD.
3. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered, unless otherwise approved by the Engineer.
2. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night without damaging the sign sheeting. Burlap, or heavy materials such as plywood or aluminum shall not be used to cover signs.
3. Duct tape or other adhesive material shall NOT be affixed to a sign face.
4. Signs and anchor stubs shall be removed and holes back filled upon completion of the work.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the requirements of the DMS and color usage table shown on this sheet.

SIGN SUPPORT WEIGHTS

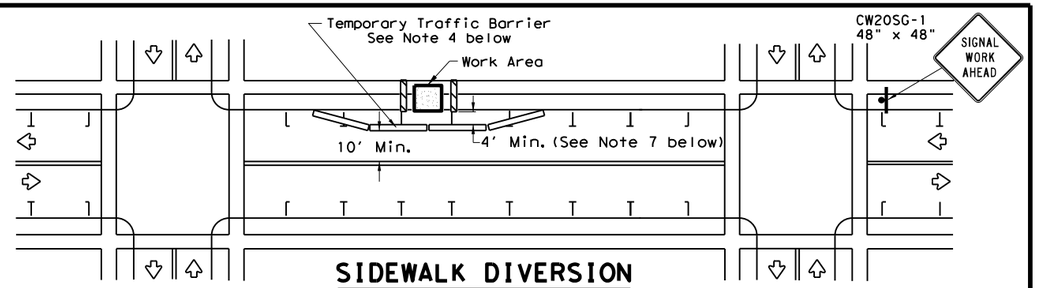
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber, such as tire inner tubes, shall not be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fastners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

LEGEND	
	Sign
	Channelizing Devices
	Type 3 Barricade

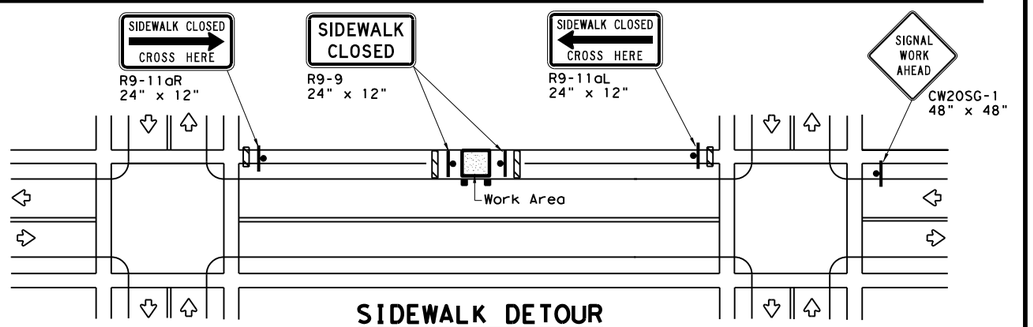
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL} SHEETING
WHITE	BACKGROUND	TYPE A SHEETING
BLACK	LEGEND & BORDERS	ACRYLIC NON-REFLECTIVE SHEETING

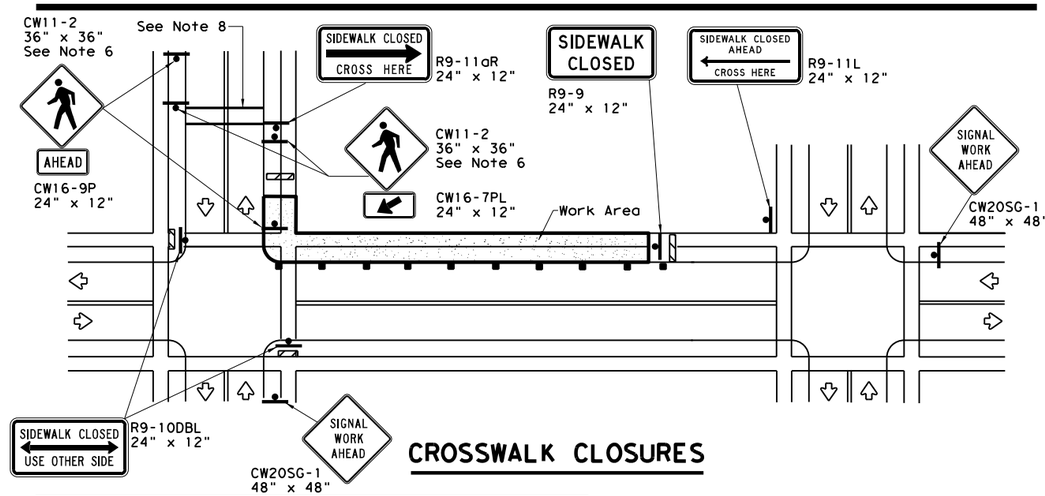
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



SIDEWALK DIVERSION



SIDEWALK DETOUR



CROSSWALK CLOSURES

PEDESTRIAN CONTROL

1. Holes, trenches or other hazards shall be adequately protected by covering, delineating or surrounding the hazard with orange plastic pedestrian fencing or longitudinal channelizing devices, or as directed by the Engineer.
2. "CROSSWALK CLOSURES" as detailed above will require the Engineer's approval prior to installation.
3. R9 series signs shown may be placed on supports detailed on the BC standards or CWZTCD list, or when fabricated from approved lightweight plastic substrates, they may be mounted on top of a plastic drum at or near the location shown.
4. For speeds less than 45 mph longitudinal channelizing devices may be used instead of traffic barriers when approved by the Engineer. Attenuation of blunt ends and installation of water filled devices shall be as per BC(9) and manufacturer's recommendations.
5. Location of devices are for general guidance. Actual device spacing and location must be field adjusted to meet actual conditions.
6. Where pedestrians with visual disabilities normally use the closed sidewalk Detectable Pedestrian Barricades should be used instead of the Type 3 Barricades shown.
7. The width of existing sidewalk should be maintained if practical.
8. Pavement markings for mid-block crosswalks shall be paid for under the appropriate bid items.
9. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.

Texas Department of Transportation | Traffic Operations Division Standard

TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

WZ(BTS-2)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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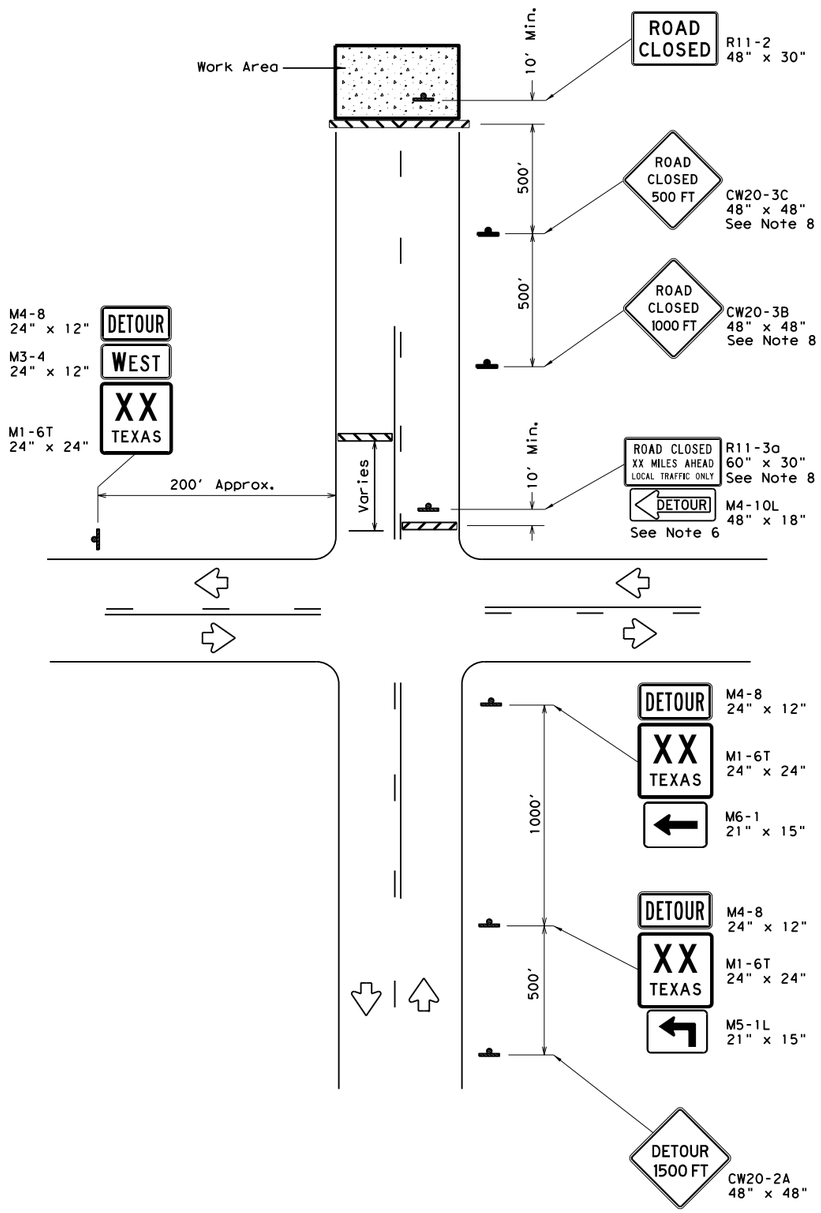
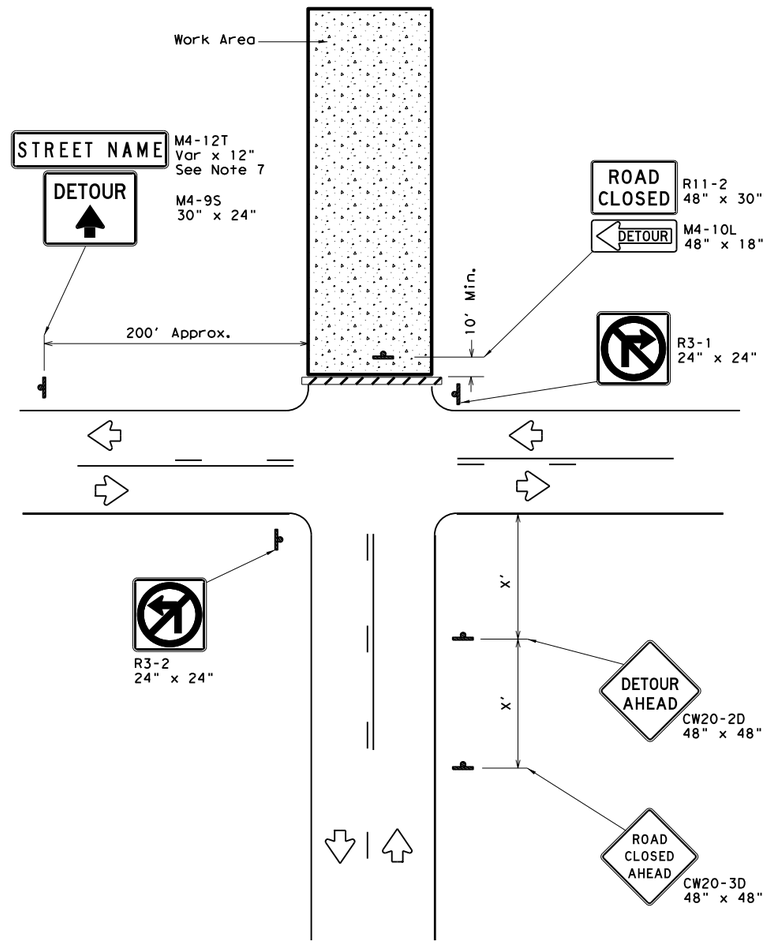


ROAD CLOSURE BEYOND THE INTERSECTION

Signing for a Numbered Route with an Off-Site Detour



ROAD CLOSURE AT THE INTERSECTION

Signing for an Un-numbered Route with an Off-Site Detour

LEGEND	
	Type 3 Barricade
	Sign

Posted Speed *	Minimum Sign Spacing "X" Distance
30	120'
35	160'
40	240'
45	320'
50	400'
55	500'
60	600'
65	700'
70	800'
75	900'

* Conventional Roads Only

GENERAL NOTES

1. This sheet is intended to provide details for temporary work zone road closures. For permanent road closure details see the D&OM standards.
2. Barricades used shall meet the requirements shown on Barricade and Construction Standard BC(10) and listed on the Compliant Work Zone Traffic Control Devices list (CWZTCD).
3. Stockpiled materials shall not be placed on the traffic side of barricades.
4. Barricades at the road closure should extend from pavement edge to pavement edge.
5. Detour signing shown is intended to illustrate the type of signing that is appropriate for numbered routes or un-numbered routes as labeled. It does not indicate the full extent of detour signing required. Detour routes should be signed as shown elsewhere in the plans.
6. If the road is open for a significant distance beyond the intersection or there are significant origin/destination points beyond the intersection, the signs and barricades at this location should be located at the edge of the traveled way.
7. The Street Name (M4-12T) sign is to be placed above the DETOUR (M4-9S) sign.
8. For urban areas where there is a shorter distance between the intersection and the actual closure location, the ROAD CLOSED XX MILES AHEAD (R11-3a) sign may be replaced with a ROAD CLOSED TO THRU TRAFFIC (R11-4) sign. If adequate space does not exist between the intersection and the closure a single ROAD CLOSED AHEAD (CW20-3D) sign spaced as per the table above may replace the ROAD CLOSED 1000 FT (CW20-3B) and ROAD CLOSED 500 FT (CW20-3C) signs.
9. Signs and barricades shown shall be subsidiary to Item 502. Locations where these details will be required shall be as shown elsewhere in the plans.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE ROAD CLOSURE DETAILS

WZ(RCD)-13

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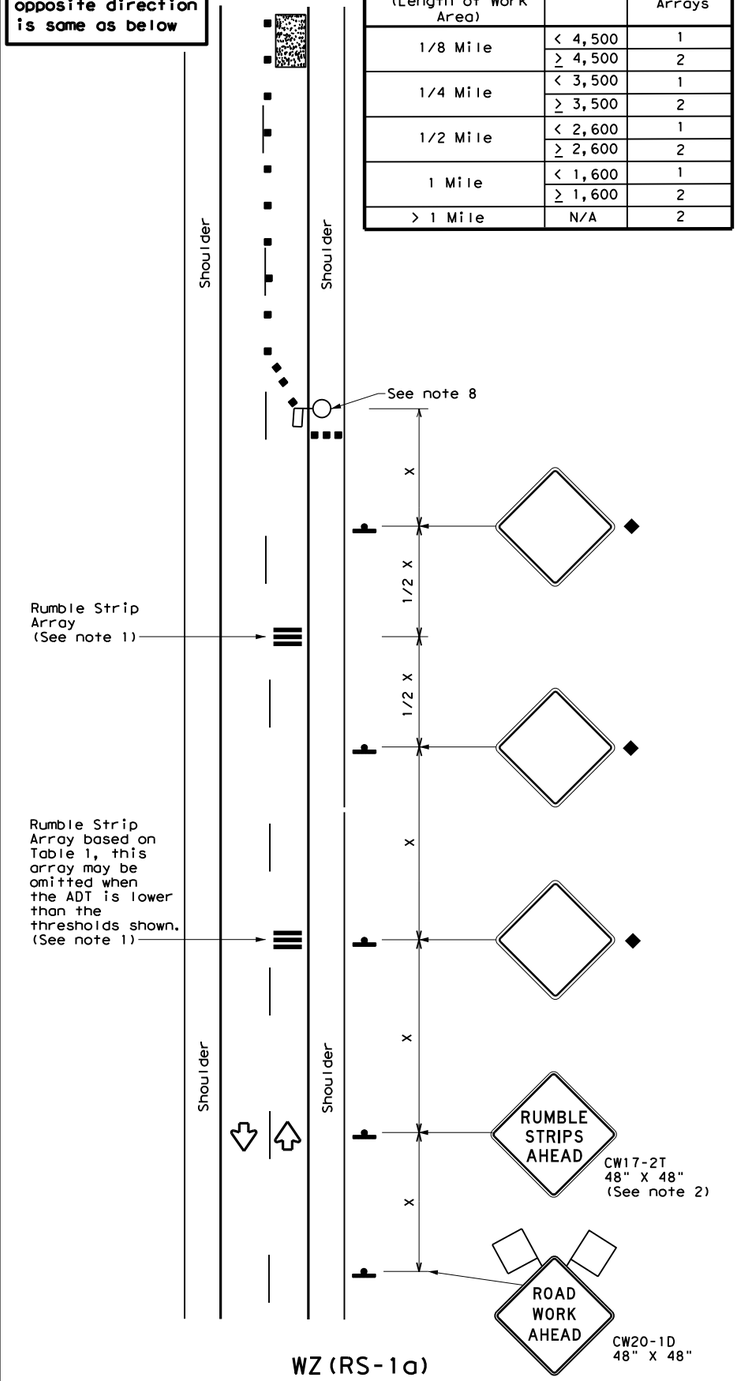
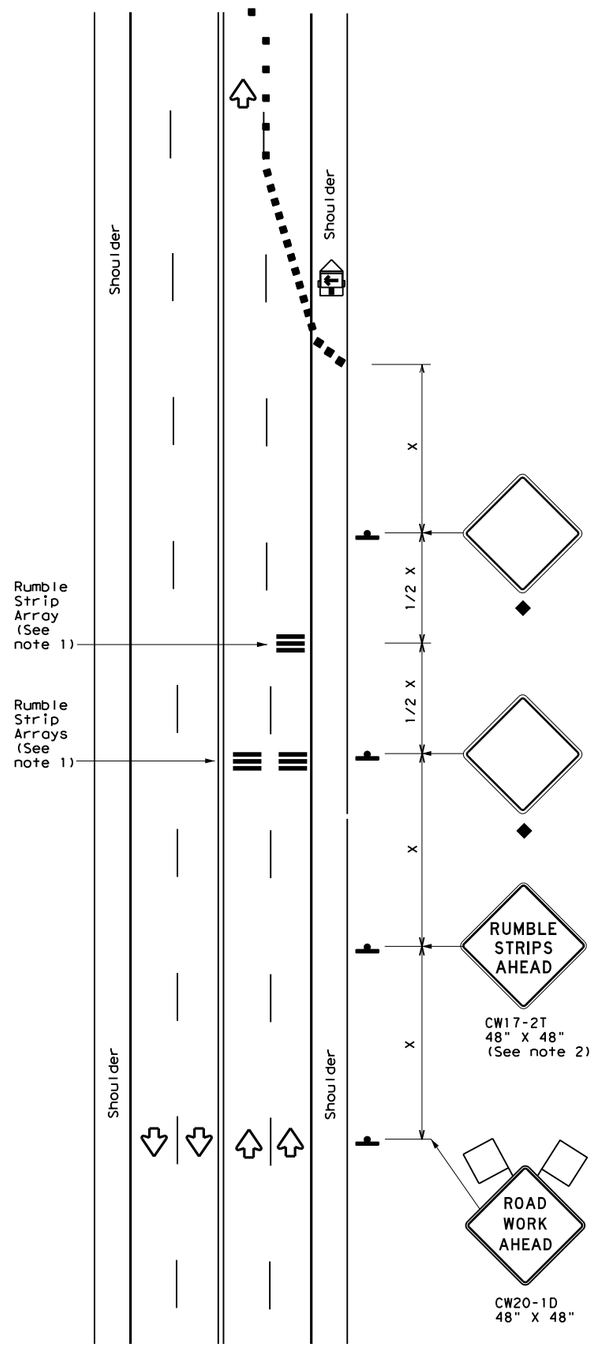
Warning sign and rumble strip sequence in opposite direction is same as below

TABLE 1		
Flagger to Flagger (Length of Work Area)	ADT	# of Rumble Strip Arrays
1/8 Mile	< 4,500	1
	≥ 4,500	2
1/4 Mile	< 3,500	1
	≥ 3,500	2
1/2 Mile	< 2,600	1
	≥ 2,600	2
1 Mile	< 1,600	1
	≥ 1,600	2
> 1 Mile	N/A	2



WZ(RS-1a)
75 mph or Less

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)
75 mph or Less

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

1. Each Rumble Strip Array should consist of three rumble strips spaced center to center at the spacing shown in Table 2, placed transverse across the lane at locations shown.
2. The CW17-2T "RUMBLE STRIPS AHEAD" sign should be located after the CW20-1D "ROAD WORK AHEAD sign and spaced as shown. If traffic is observed to be queuing, or is expected to queue beyond the Rumble Strips, the CW17-2T sign and the first Rumble Strip Array may be located upstream of the CW20-1D sign as necessary to provide needed warning.
3. Temporary Rumble Strips will be considered subsidiary to Item 502, and shall be a product listed on the Compliant Work Zone Traffic Control Devices.
4. Removal of the Temporary Rumble Strips should be accomplished before removing the advance warning signs.
5. Temporary Rumble Strips should not be used on horizontal curves, loose gravel, soft or bleeding asphalt, heavily rutted pavements or unpaved surfaces.
6. Temporary Rumble Strips shall be installed and maintained as per manufacturer's recommendations.
7. This standard sheet shall be used in conjunction with other appropriate TCP standard, TMUTCD typical application or project specific detail for the project.
8. The one-lane two-way application may utilize a flagger, an AFAD or a portable traffic signal.
9. Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment.

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Panel	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only
** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT)
S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

◆ **Signs are for illustrative purposes only. Signs required may vary depending on the TCP, TMUTCD Typical Application, or project specific details for the project.**

TABLE 2	
Speed	Approximate distance between strips in an Array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
> 55 MPH	20'

Texas Department of Transportation

Traffic Operations Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-16

FILE: wzrs16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
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4-16	SAT	BEXAR		64

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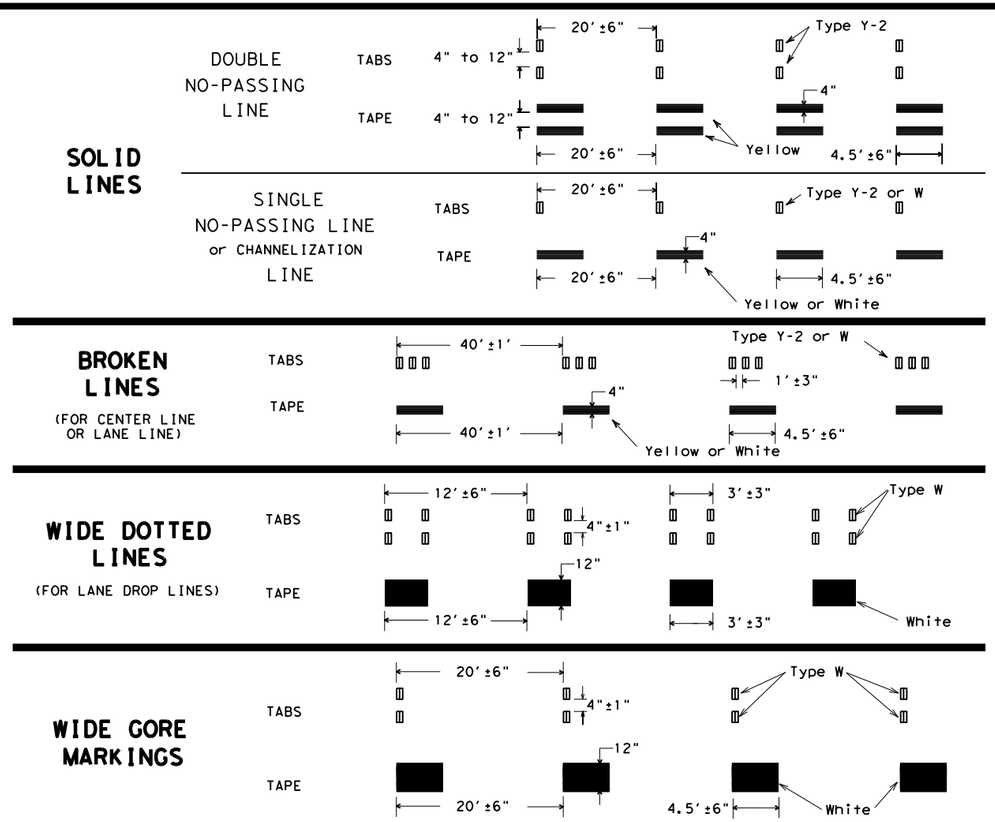
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



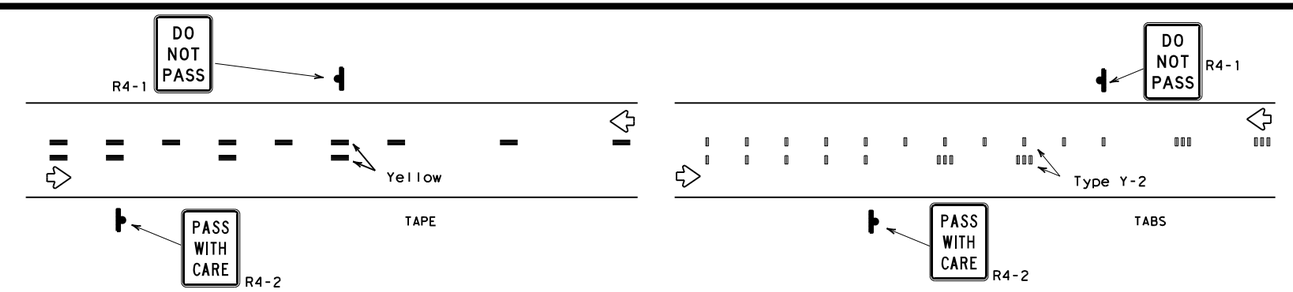
NOTES:

1. Short term pavement markings may be prefabricated markings (stick down tape) or temporary flexible-reflective roadway marker tabs unless otherwise specified elsewhere in plans.
2. Short term pavement markings shall NOT be used to simulate edge lines.
3. Dimensions indicated on this sheet are typical and approximate. Variations in size and height may occur between markers or devices made by manufacturers, by as much as 1/4 inch, unless otherwise noted.
4. Temporary flexible-reflective roadway marker tabs will require normal maintenance replacement when used on roadways with an ADT per lane of up to 7500 vehicles with no more than 10% truck mix. When roadways exceed these values, additional maintenance replacement of devices should be planned.
5. No segment of roadway open to traffic shall remain without permanent pavement markings for a period greater than 14 calendar days. The Contractor will be responsible for maintaining short term pavement markings until permanent pavement markings are in place. When the Contractor is responsible for placement of permanent pavement markings, no segment of roadway shall remain without permanent pavement markings for a period greater than 14 calendar days unless weather conditions prohibit placement. Permanent pavement markings shall be placed as soon as weather permits.
6. For two lane, two-way roadways, DO NOT PASS signs shall be erected to mark the beginning of sections where passing is prohibited and PASS WITH CARE signs shall be erected to mark the beginning of sections where passing is permitted. Signs shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and may be used to indicate the limits of no-passing zones for up to 14 calendar days. Permanent pavement markings should then be placed.
7. For low volume two lane, two-way roadways of 4000 ADT or less, no-passing lines may be omitted when approved by the Engineer. DO NOT PASS and PASS WITH CARE signs shall be erected (see note 6).
8. For exit gores where a lane is being dropped place wide gore markings or retroreflective channelizing devices to guide motorist through the exit. If channelizing devices are to be used it should be noted elsewhere in the plans. One piece cones are not allowed for this purpose.

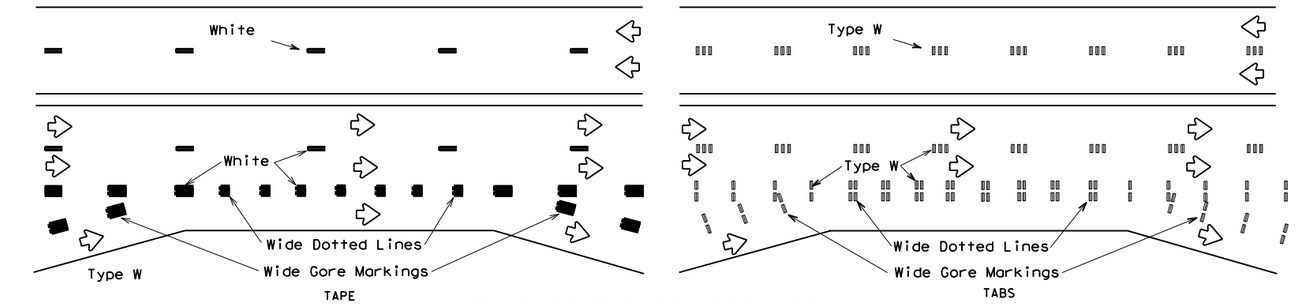
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

1. Temporary flexible-reflective roadway marker tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with yellow body); Type Y (one amber reflective surface with yellow body); and Type W (one white or silver reflective surface with white body). Additional details may be found on BC(11).
2. Tabs shall meet requirements of Departmental Material Specification DMS-8242.
3. When dry, tabs shall be visible for a minimum distance of 200 feet during normal daylight hours and when illuminated by automobile low-beam head light at night, unless sight distance is restricted by roadway geometrics.
4. No two consecutive tabs nor four tabs per 1000 feet of line shall be missing or fail to meet the visual performance requirements of Note 3.

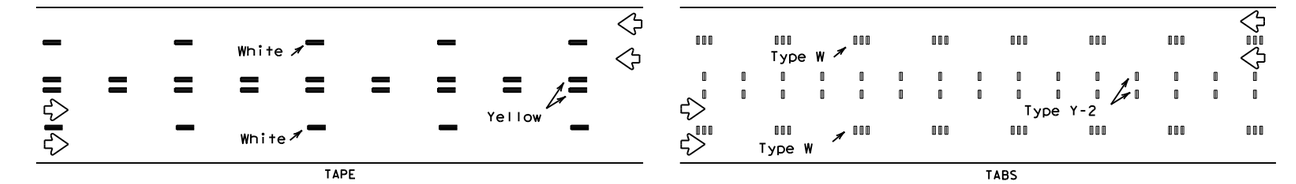
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



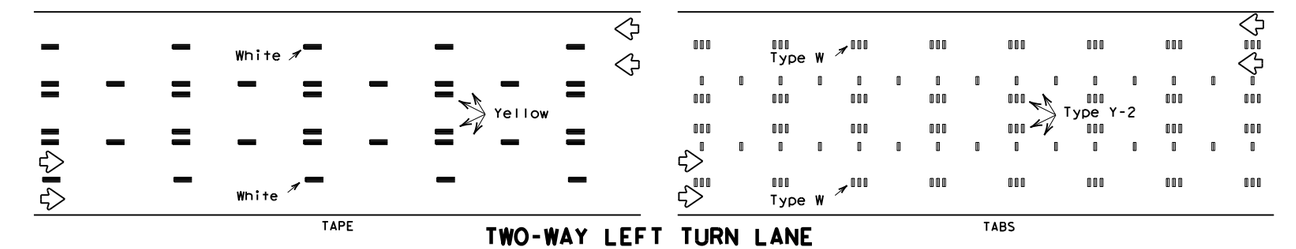
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



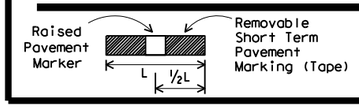
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



If raised pavement markers are used to supplement REMOVABLE short term markings, the markers shall be applied to the top of the tape at the approximate mid length of the tape. This allows an easier removal of raised markers and tape.

PREFABRICATED PAVEMENT MARKINGS

1. Temporary Removable Prefabricated Pavement Markings shall meet the requirements of DMS-8241.
2. Non-removable Prefabricated Pavement Markings shall meet the requirements of either DMS-8240 "Permanent Prefabricated Pavement Markings" or DMS-8243 "Temporary Costruction-Grade Prefabricated Pavement Markings."

RAISED PAVEMENT MARKERS

1. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and DMS-4200.

DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS) & MATERIAL PRODUCER LISTS (MPL)

1. DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:
   http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

FILE:	wzstpm-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
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1-97		DIST	COUNTY		SHEET NO.
3-03		SAT	BEXAR		66
7-13					

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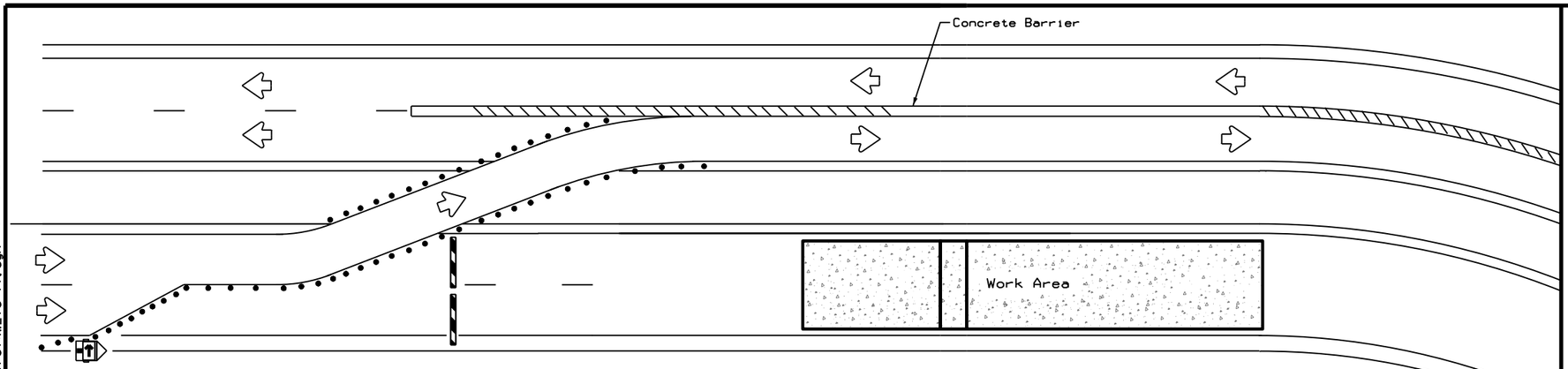


NOTES:

1. Length of Safety Glare screen will be specified elsewhere in the plans.
2. The cumulative nominal length of the modular safety glare screen units shall equal the length of the individual sections of temporary concrete traffic barrier on which they are installed so the joint between barrier sections will not be spanned by any one safety glare screen unit.
3. Screen Panel/blades will be designed such that reflective sheeting conforming with Departmental Material Specification DMS-8300, Sign Face Materials, Type B or C Yellow, minimum size of 2 inches by 12 inches can be attached to the edge of the panel/blade. The sheeting shall be attached to one glare screen panel/blade per section of concrete barrier not to exceed a spacing of 30 feet. Barrier reflectors are not necessary when panel/blades are installed with reflective sheeting as described.
4. Payment for these devices will be under statewide Special Specification "Modular Glare Screens for Headlight Barrier."
5. This detail is only intended to show types of locations where Glare Screens would be appropriate. Required signing and other devices shall be as shown elsewhere in the plans.

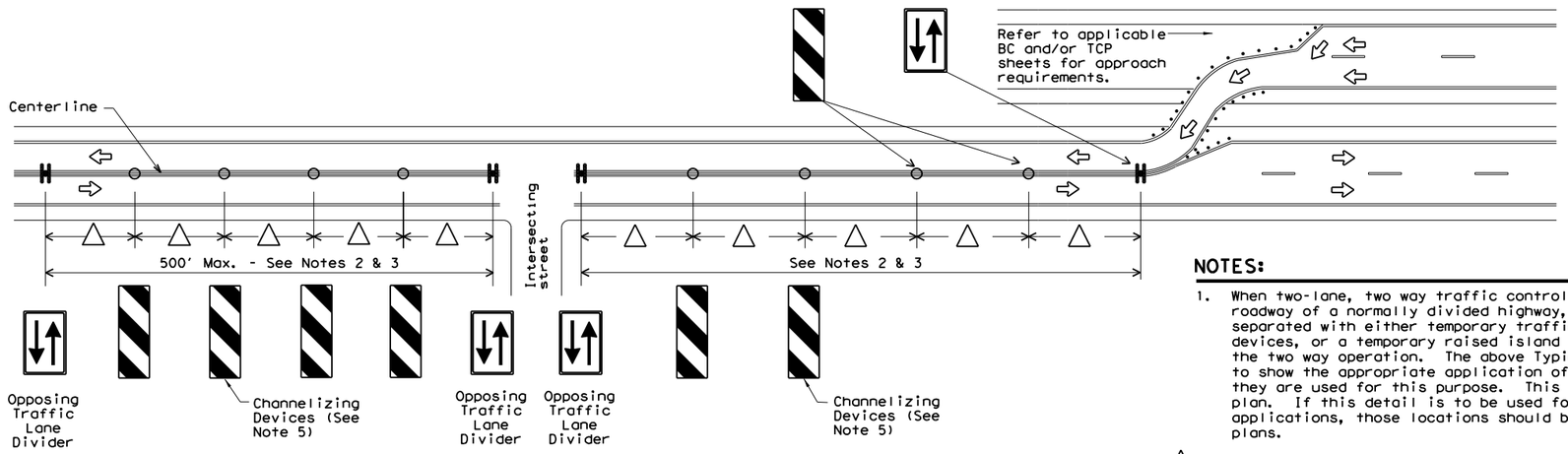
BARRIER DELINEATION WITH MODULAR GLARE SCREENS

LEGEND	
	Type 3 Barricade
• • •	Channelizing Devices
	Trailer Mounted Flashing Arrow Board
	Sign
\\\\	Safety glare screen

DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
DELINEATORS AND OBJECT MARKERS	DMS-8600
MODULAR GLARE SCREENS FOR HEADLIGHT BARRIER	DMS-8610

Only pre-qualified products shall be used. A copy of the Compliant Work Zone Traffic Control Devices List" CWZTCD)describes pre-qualified products and their sources and may be found at the following web address:

http://www.txdot.gov/business/resources/producer-list.html



VERTICAL PANELS & OPPOSING TRAFFIC LANE DIVIDERS (OTLD) SEPARATING TWO-WAY TRAFFIC ON NORMALLY DIVIDED HIGHWAYS

NOTES:

1. When two-lane, two way traffic control must be maintained on one roadway of a normally divided highway, opposing traffic shall be separated with either temporary traffic barriers, channelizing devices, or a temporary raised island throughout the length of the two way operation. The above Typical Application is intended to show the appropriate application of channelizing devices when they are used for this purpose. This is not a traffic control plan. If this detail is to be used for other types of roads or applications, those locations should be stated elsewhere in the plans.
2. △ Space devices according to the Tangent Spacing shown on the Device Spacing table on BC(9) but not exceeding 100'.
3. Every fifth device should be an OTLD except when spaced closer to accommodate an intersection. An OTLD should be the first device on each side of intersecting streets or roads.
4. Locations where surface mount bases with adhesives or self-righting devices will be required in order to maintain them in their proper position should be noted elsewhere in the plans.
5. Channelizing devices are to be vertical panels, 42" cones or tubular markers that are at least 36" tall. Tubular markers used to separate traffic should have a rubber base weighing at least 30 pounds. Tubular markers that are 42" tall or more shall have four bands of reflective material as detailed for 42" cones on BC(10). Tubular markers less than 42" but at least 36" tall shall have three bands of 3" wide white reflective material spaced 2" apart. Reflective material shall meet DMS-8300, Type A.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TYPICAL DETAILS

WZ(TD)-17

FILE: wztd-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
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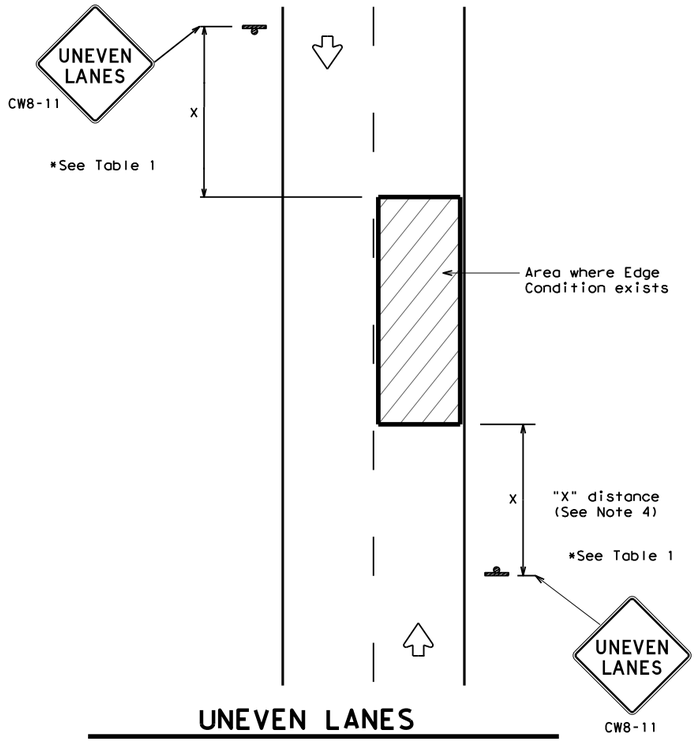
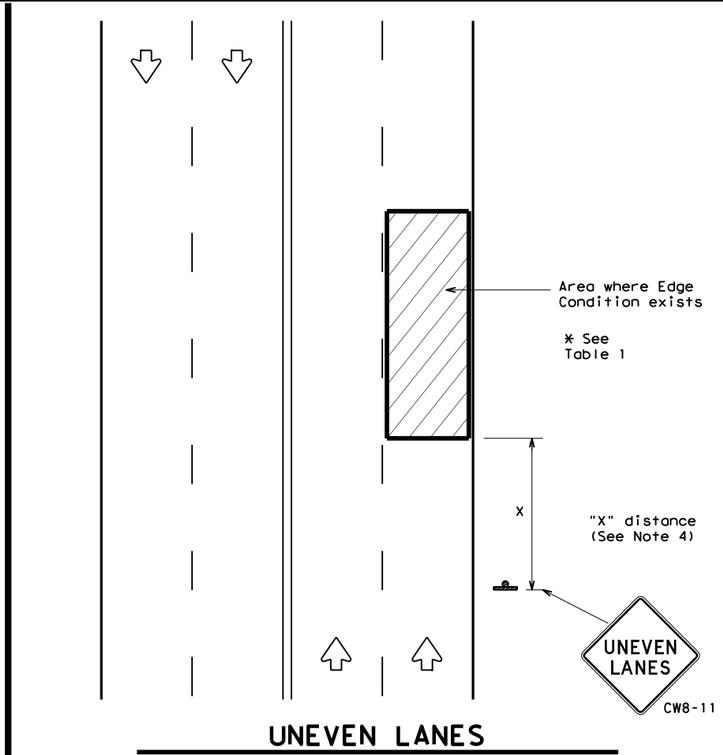
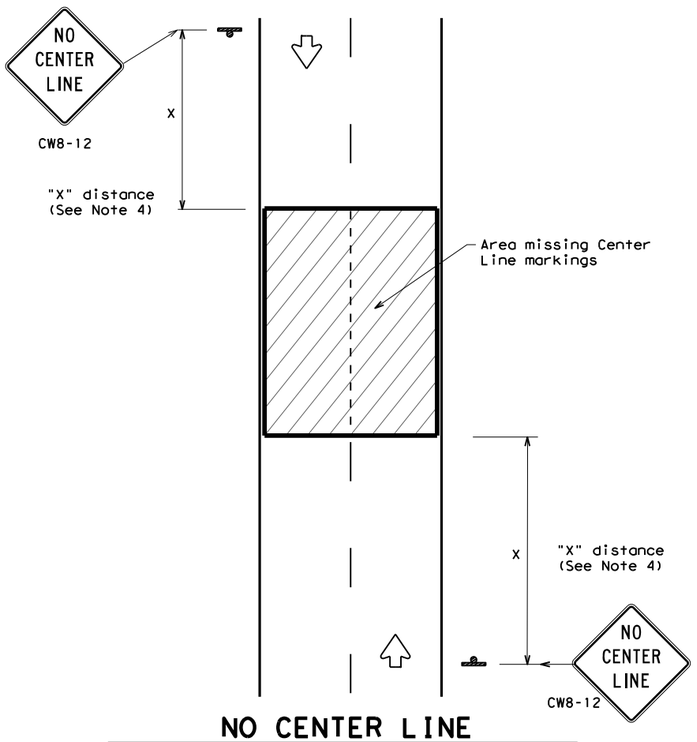


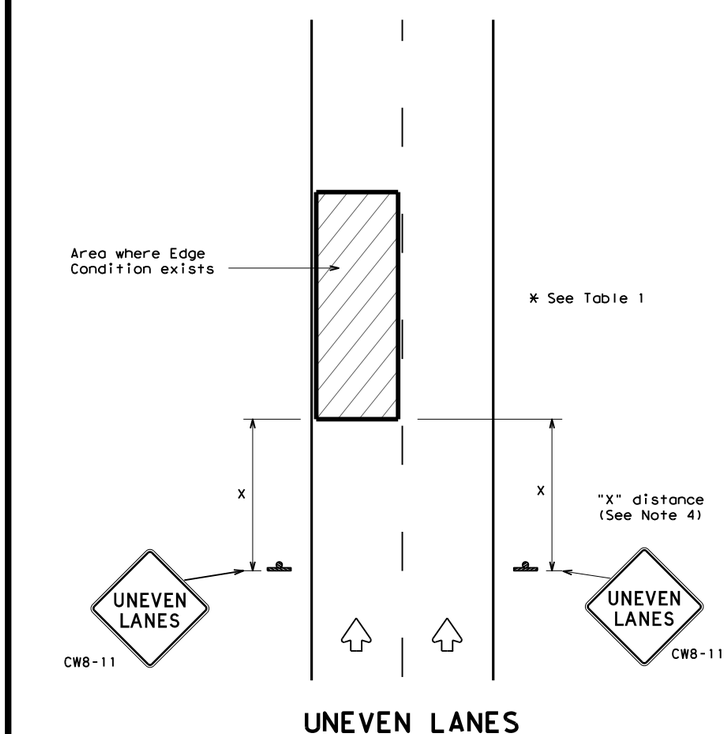
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

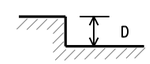
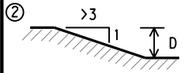
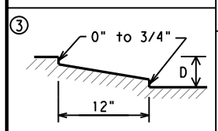
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL} SHEETING
BLACK	LEGEND & BORDERS	ACRYLIC NON-REFLECTIVE SHEETING

GENERAL NOTES

1. If spalling or holes occur, ROUGH ROAD (CW8-8) signs should be placed in advance of the condition and be repeated every two miles where the condition persists.
2. UNEVEN LANES (CW8-11) signs shall be installed in advance of the condition and repeated every mile. Signs installed along the uneven lane condition may be supplemented with the NEXT XX MILES (CW7-3aP) plaque or Advisory Speed (CW13-1P) plaque.
3. NO CENTER LINE (CW8-12) signs and temporary pavement markings as per the WZ(STPM) standard shall be installed if yellow centerlines separating two way traffic are obscured or obliterated. Repeat NO CENTER LINE signs every two miles where the center line markings are not in place. The signs and markings shall remain in place until permanent pavement markings are installed.
4. Signs shall be spaced at the distances recommended as per BC standards.
5. Additional signs may be required as directed by the Engineer. Signs shall remain in place until final surface is applied. Signs shall be considered subsidiary to Item 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING."
6. Signs shall be fabricated and mounted on supports as shown on the BC standards and/or listed on the "Compliant Work Zone Traffic Control Devices" list.
7. Short term markings shall not be used to simulate edge lines.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition.

TABLE 1

Edge Condition	Edge Height (D)	* Warning Devices
① 	Less than or equal to: 1¼" (maximum-planing) 1½" (typical-overlay)	Sign: CW8-11
	Distance "D" may be a maximum of 1 1/4 " for planing operations and 2" for overlay operations if uneven lanes with edge condition 1 are open to traffic after work operations cease.	
② 	Less than or equal to 3"	Sign: CW8-11
③  Notched Wedge Joint	Distance "D" may be a maximum of 3" if uneven lanes with edge condition 2 or 3 are open to traffic after work operations cease. Uneven lanes should not be open to traffic when "D" is greater than 3".	

TRAFFIC CONTROL DURING PLANING, OVERLAY AND LEVELING OPERATIONS ARE SHOWN ELSEWHERE IN THE PLANS.

MINIMUM WARNING SIGN SIZE	
Conventional roads	36" x 36"
Freeways/expressways, divided roadways	48" x 48"

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
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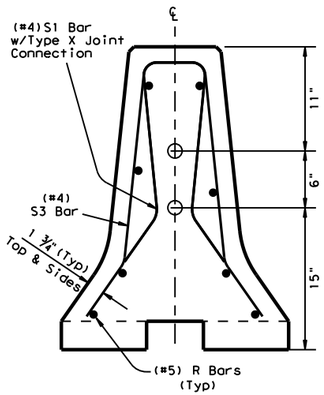
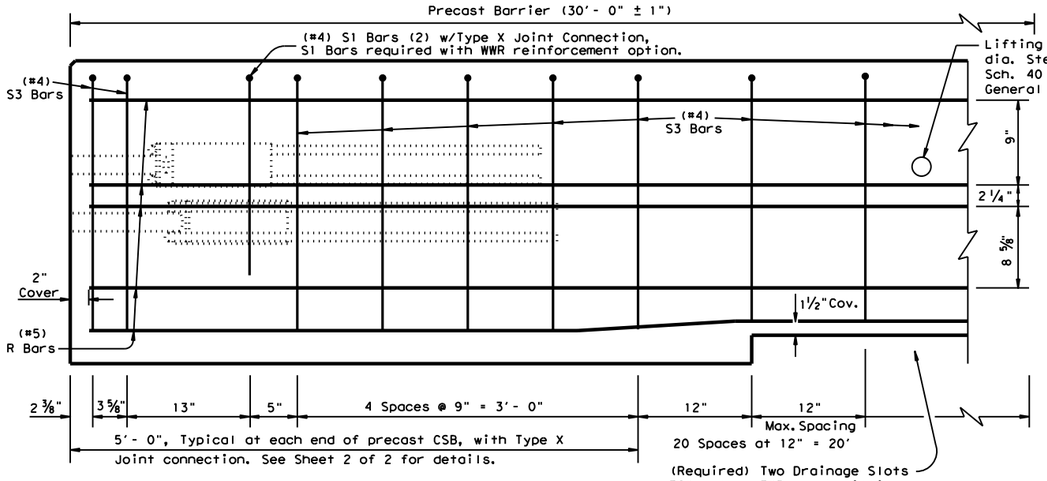


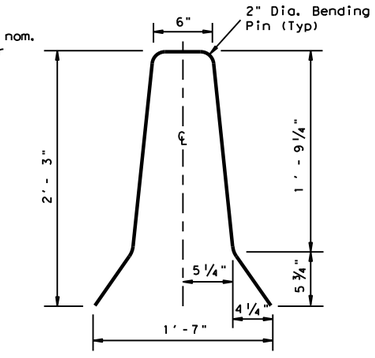
End View Precast Barrier

See sheet 2 of 3 for Joint connection Type X



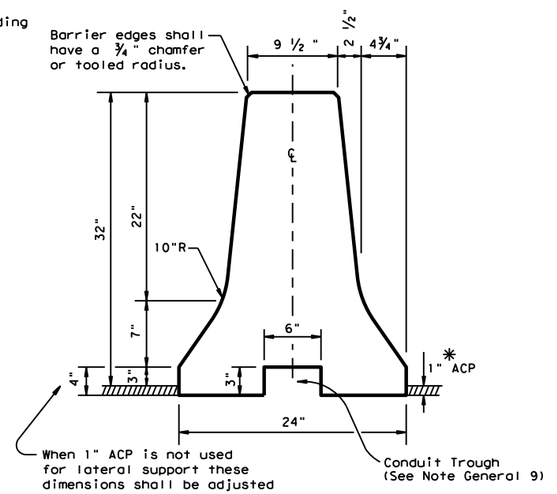
Reinforcement for Precast (CSB) Concrete Safety Barrier (Type 1)

Showing reinforcement for Joint Type X



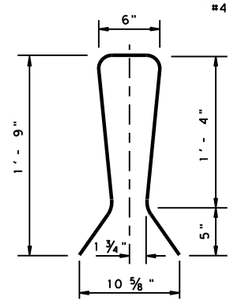
S3 Bar

#4 Bar



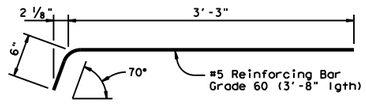
Concrete Safety Barrier

✱ When 1" ACP is "not" used as lateral support for permanent barrier placement. A permissible method of attaining the equivalent lateral support may be used, See CSB(6) sheet.



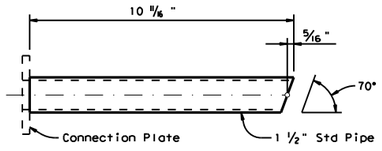
S1 Bar

#4 Bar (2) (Joint Type X)



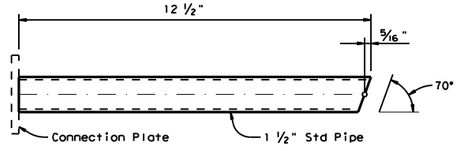
DEFORMED BAR ANCHOR DETAILS

Two (2) Bars required per assembly. Eight (8) required per Joint.



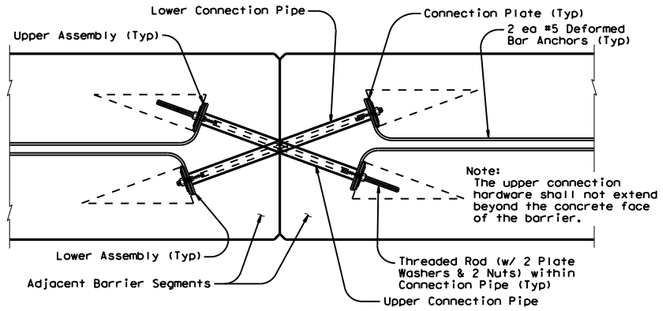
UPPER CONNECTION PIPE DETAILS

One (1) Steel Pipe required per Upper Assembly. Two (2) required per Joint.



LOWER CONNECTION PIPE DETAILS

One (1) Steel Pipe required per Lower Assembly. Two (2) required per Joint.



TYPE X JOINT INSTALLATION DETAIL

Barrier reinforcing and Type X Joint Leave-Out dimensions not shown for clarity.

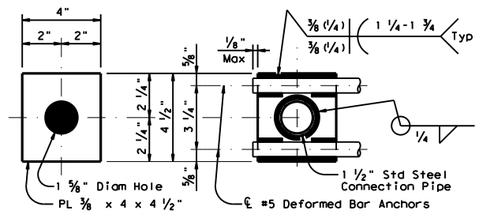
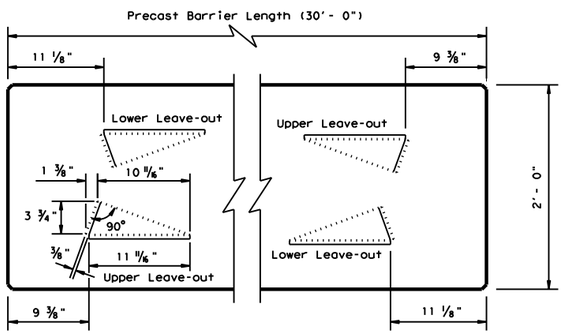


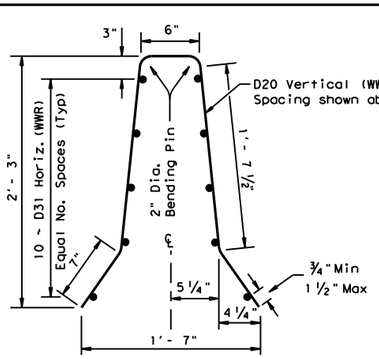
PLATE DIMENSIONS WELDING DETAILS

CONNECTION PLATE DETAILS

One (1) Plate required per assembly. Four (4) required per Joint. All steel fittings for joint Type X shall be galvanized after fabrication in accordance with Item 445.



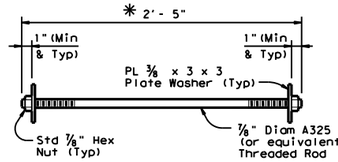
BARRIER PLAN AT END JOINTS



Welded Wire Reinforcement (WWR) Option for Bars R and S3

(WWR) General Notes

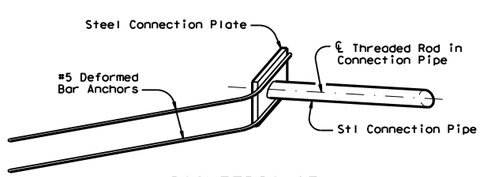
1. Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
2. Welded wire cage may be cut or bent to accommodate the Type X joint connection and drainage slots, as directed by the Engineer.
3. All reinforcement shall comply with Item 440, "Reinforcing Steel."
4. Combinations of reinforcing steel and WWR will be permitted, as directed by the Engineer. The dimension from the end of the barrier section to the first wire shall not exceed 3".



CONNECTION BOLT OR THREADED ROD DETAIL

Two (2) Threaded Rods (Or Equivalent Hex Hd. Bolts) (w/ Two (2) PL 3/8 x 3 x 3 Plate Washers & Two (2) Std Hex Nuts) required per Joint.

✱ The connection hardware shall not extend beyond the concrete face of the barrier. Hex head bolts may be provided. The proper length of all hardware should be verified.



ISOMETRIC OF TYPICAL WELDED ASSEMBLY

Four (4) [2 Upper & 2 Lower] Assemblies required per Joint.

Weight of one Precast 30 ft. (CSB) segment = Approx. 6.5 Tons or 440 lbs per ft.

GENERAL NOTES

1. Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
2. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
3. Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
4. All precast barrier edges shall have a 3/4" chamfer or tooled radius.
5. All concrete, reinforcement, joint connection systems, grout etc. as shown, are considered as part of the barrier payment.
6. All steel assemblies for joint shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."
7. Regardless of the method of handling, barrier lifting points shall be approx. 7.5 feet from the ends of the barrier. Lifting devices and attachments to barrier sections shall be approved by the Engineer.
8. Surface finishing and grouting (where required) shall be two parts sand one part cement with enough water to make the mixture plastic. Grouting shall be done in a manner that will assure a smooth surface. Surface finishing shall be considered subsidiary to the various bid items involved.
9. Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.

Texas Department of Transportation — Design Division Standard

CONCRETE SAFETY BARRIER (F-SHAPE)

PRECAST BARRIER (TYPE 1)

CSB(1)-10

FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD	CK: VP
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		69

DATE: 1/27/2021 3:48:39 PM
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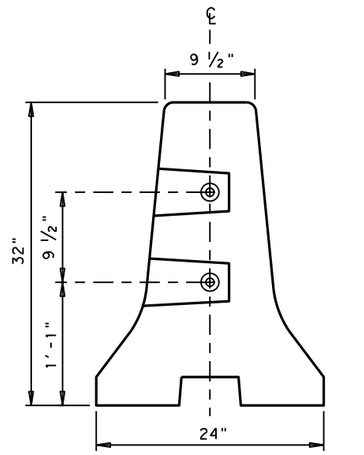
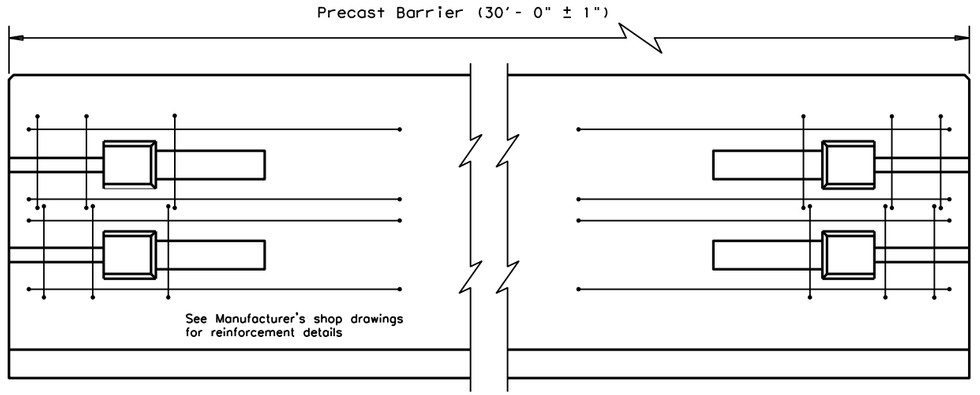
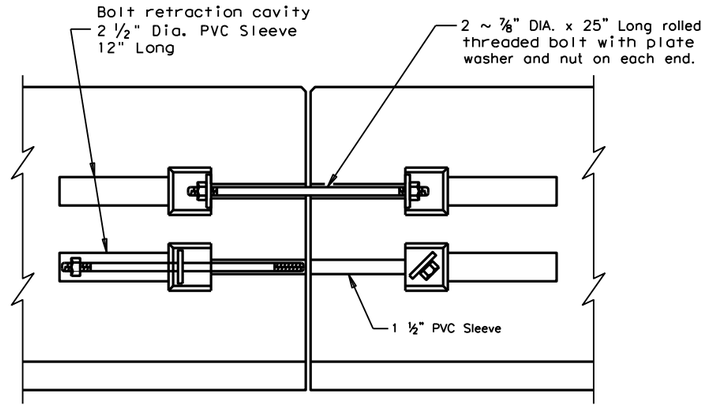


END VIEW (CSB) QUICK-BOLT
QUICK-BOLT POCKET LOCATIONS

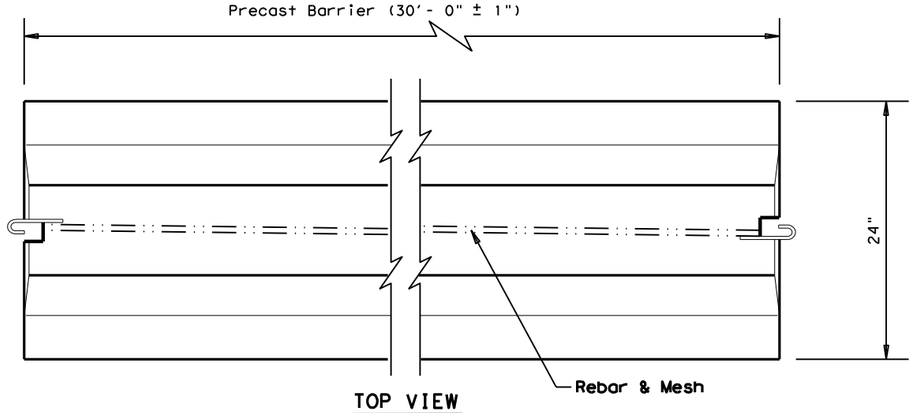


ELEVATION (CSB) QUICK-BOLT
See Manufacturer's shop drawing for additional details

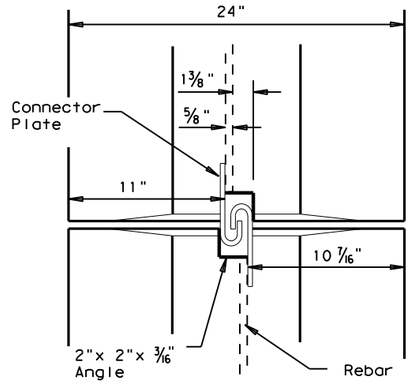


ELEVATION VIEW SHOWING JOINT CONNECTION
"QUICK-BOLT"

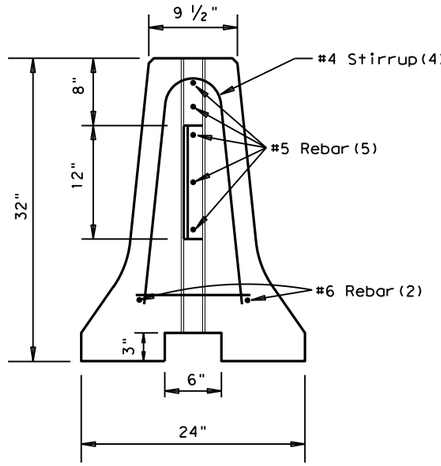
Joint Connection (Type Q)



TOP VIEW
PRECAST (CSB) WITH J-J HOOKS
See Manufacturer's shop drawing for additional details



VIEW FROM ABOVE
J-J HOOK CONNECTION



END VIEW
J-J HOOK CONNECTION

Joint Connection (Type J)

Proprietary Joint Connections (CSB)

Two proprietary joint connections are acceptable as alternates to the (Type X) connection shown, here on. These joint connections types are:

J-J Hooks by Easi-Set Industries, (800)547-4045
Quick-Bolt by Bexar Concrete, (210)497-3773

If one of these connection systems are exclusively specified in the plans, prior approval for sole source use must be obtained. Details of the connection components and barrier reinforcement for these systems, will be shown on the manufacturer's shop drawing(s) furnished to the Engineer.

Texas Department of Transportation
Design Division Standard

CONCRETE SAFETY BARRIER (F-SHAPE)

PRECAST BARRIER
(TYPE 1)

CSB(1)-10

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© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
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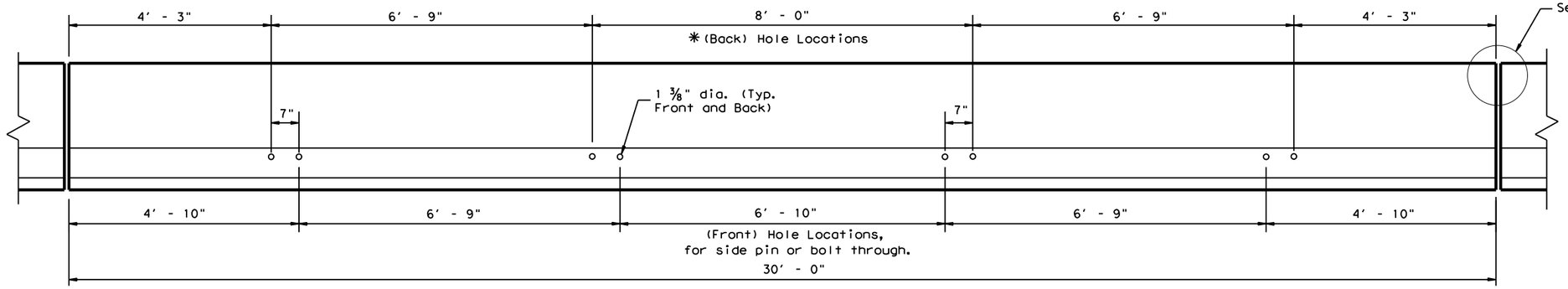
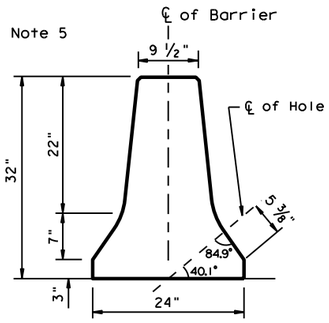
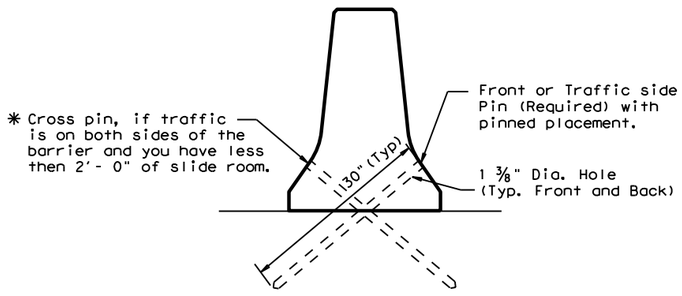


DETAIL 1

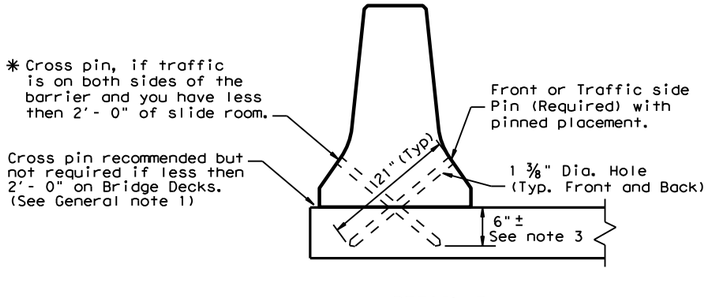


HOLE LOCATION DETAIL



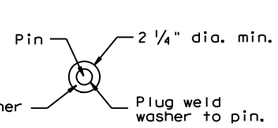
DETAIL 2

Placement on (ACP)
Asphalt Concete Pavement
or Treated Base Material
(30" Pin required)

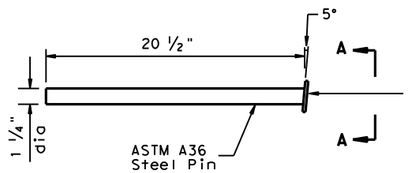


DETAIL 3

Bridge Deck or CRCP
(21" pin required)

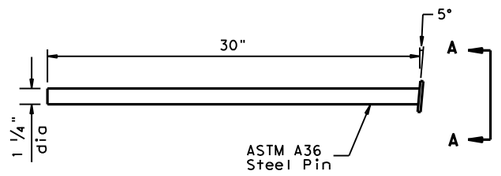


VIEW A-A



(21") PIN DETAIL

See Detail 3

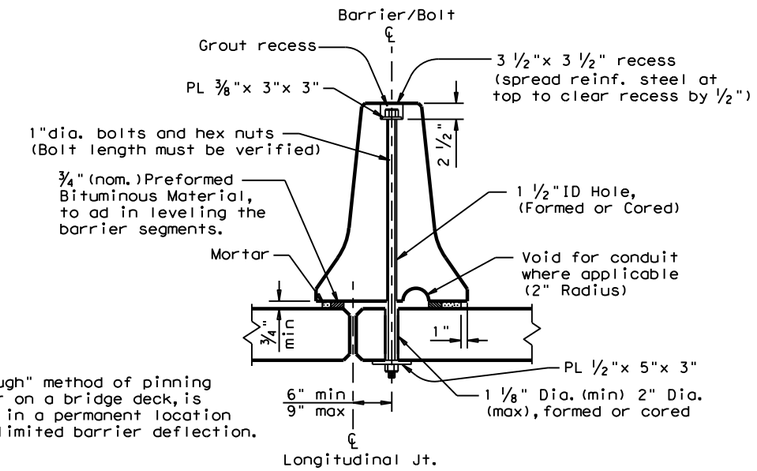


(30") PIN DETAIL

See Detail 2

CORE DRILLING EXISTING BARRIER

Core drilling existing concrete barrier is permitted. Holes shall be drilled with coring or masonry drilling type equipment. Percussion (star) drilling shall not be used. A special drill bit (to cut through existing reinforcing) will likely be required. Spalls in the concrete exceeding 1/2" shall be patched.



Note:
The "Bolt Through" method of pinning precast barrier on a bridge deck, is primarily used in a permanent location that requires limited barrier deflection.

PRECAST CSB (BOLT THROUGH) PLACEMENT OVER LONGITUDINAL EXPANSION JOINT

For bolt through locations, use the (Front) hole locations shown on Detail 1.

GENERAL NOTES

1. These details provide a method of laterally restraining precast concrete barrier to limit deflections under normally expected passenger vehicle impacts. These details are intended for use in work zones, primarily on bridge decks, or pavement where temporary barrier must be placed less then 2 ft. from the longitudinal edge of the deck or dropoff and parallel to the direction of travel. Other applications of these details are acceptable as directed by the Engineer.

2. Each precast concrete barrier section shall have a minimum of four or total of eight 1 3/8" ID, holes formed or cored through the barrier. The center lines of the holes are shown in the hole location detail. If rebar is encountered, the entry point may be shifted 2" plus or minus longitudinally along the barrier. The eight holes are spaced along the length of the barrier as shown in Detail 1.

3. The drilling of the travel surface is accomplished by placing the pre-drilled barrier section on the travel surface in the desired position. Then the hole is drilled with the bit passing though the hole in the barrier. The bit is to be inserted into the hole in the barrier so that the travel surface is drilled to a point which is slightly more than the pin length.

4. Note that steel washers have been welded to the top of the steel pins to aid in the removal of the pins, when the barrier is removed.

5. See CSB(1) standard sheets for reinforcement requirements and joint connection types.

6. The forming or coring of holes in the barrier, drilling of holes in bridge deck or pavement, fabrication and materials for the 1 1/4" pins, installation of pins, and any repair to the barrier shall be considered as subsidiary to the barrier bid items.

7. The barrier and travel surface will be repaired as directed by the Engineer in accordance with Item 429, "Concrete Structure Repair."

8. Provide galvanized bolts, nuts, and plate washers. All steel pins shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."

9. Weight of barrier is approx. 440 lbs per foot.

Texas Department of Transportation

Design Division Standard

CONCRETE SAFETY BARRIER (F-SHAPE)

PRECAST BARRIER
(TYPE 1)
PINNED PLACEMENT

CSB(7)-10

FILE: csb710.dgn	DN: TxDOT	CK: AM	DW: BD	CK:
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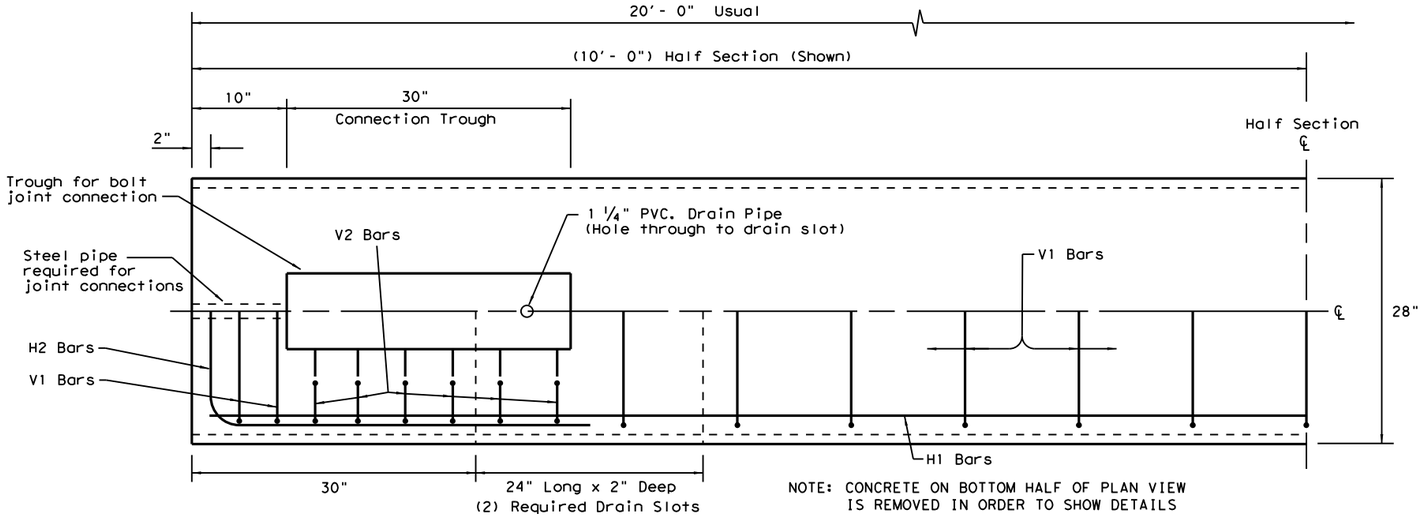
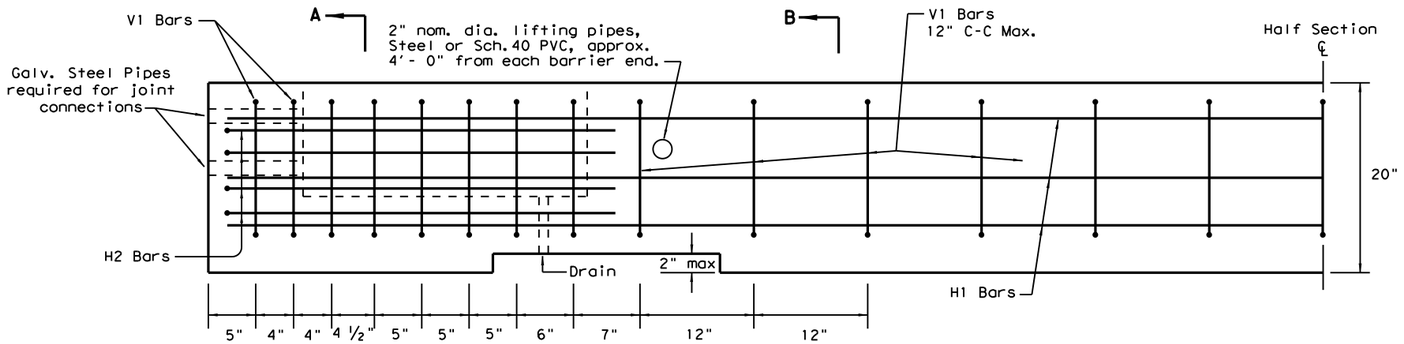
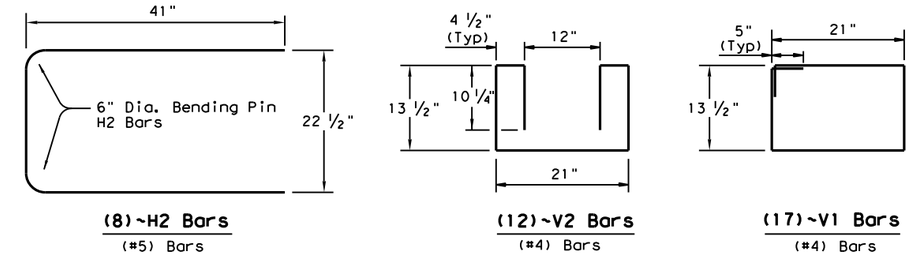
	SAT	BEXAR		71



PLAN
(TYPE 1) BARRIER SEGMENT
(SYMMETRICAL ABOUT CENTER LINES)



ELEVATION
(TYPE 1) BARRIER SEGMENT
(SYMMETRICAL ABOUT CENTER LINES)



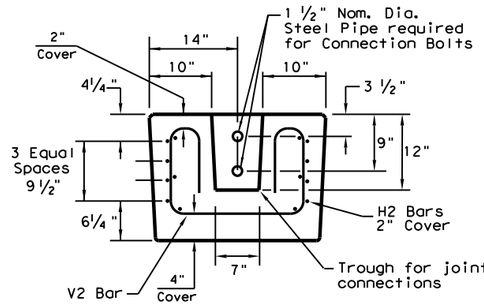
(8)~H2 Bars (#5) Bars

(12)~V2 Bars (#4) Bars

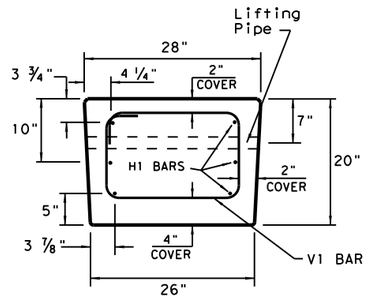
(17)~V1 Bars (#4) Bars

REINFORCING STEEL DETAILS
TYPE 1 - BARRIER SEGMENT

Note: Use 2" Dia. Bending Pin, unless otherwise shown



SECTION A-A



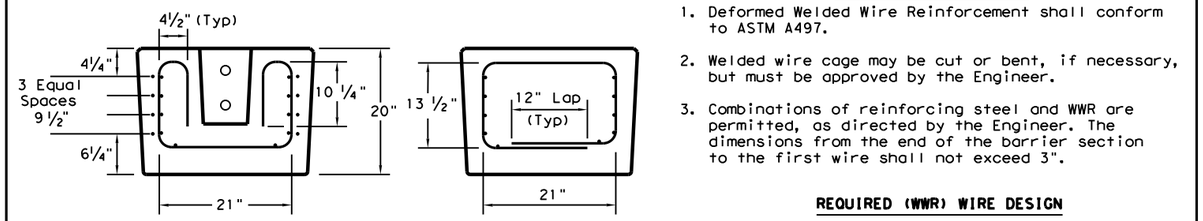
SECTION B-B

GENERAL NOTES

1. Low Profile Concrete Barrier (LPCB), is approved for use in temporary work zone locations, where the posted speed is 45 mph, or less.
2. Concrete shall be Class H for precast barrier with a minimum compressive strength of 3,600 psi.
3. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
4. Precast LPCB barrier length shall be 20 ft.
5. All barrier edges shall have ¾" chamfer or a tooled radius.
6. Joint connection hardware shall be in accordance with Item 449, "Anchor Bolts." and is considered subsidiary.
7. Steel pipe required for joint connection bolts shall be galvanized in accordance with Item 445, "Galvanizing."
8. Welded wire reinforcement (WWR) may be used in lieu of conventional reinforcement for Type 1 barrier, and shall meet the requirements shown.

FOR CONTRACTORS INFORMATION ONLY

(TYPE 1) APPROX. QUANTITIES 20 FT. SECTION		
CONCRETE	CY	2.6
REINFORCING STEEL	LBS	330
TOTAL BARRIER WT.	LBS	11000



SECTION A-A SECTION B-B

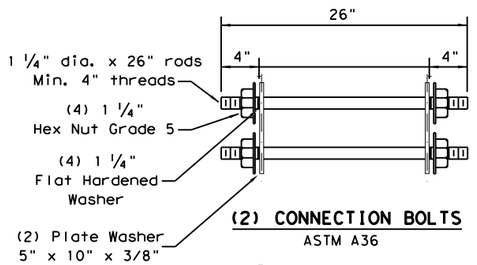
(WWR) GENERAL NOTES

1. Deformed Welded Wire Reinforcement shall conform to ASTM A497.
2. Welded wire cage may be cut or bent, if necessary, but must be approved by the Engineer.
3. Combinations of reinforcing steel and WWR are permitted, as directed by the Engineer. The dimensions from the end of the barrier section to the first wire shall not exceed 3".

REQUIRED (WWR) WIRE DESIGN

8 ~ (D31) Horizontal Wires (Equally spaced)
10 ~ (D20) Horizontal Wires (Equally spaced)
29 ~ (D20) Vertical Wires (Spaced as shown in Elevation View)

WELDED WIRE REINFORCEMENT (WWR)- OPTIONAL REINFORCING



(2) CONNECTION BOLTS ASTM A36

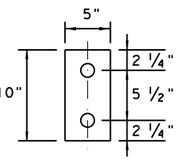


PLATE WASHER 5" x 10" x ⅜"

Note: Rods, Hex nuts and Washers shall be Galvanized.

SHEET 1 OF 2

Texas Department of Transportation — Design Division Standard

LOW PROFILE CONCRETE BARRIER
PRECAST BARRIER (TYPE 1)
LPCB-13

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
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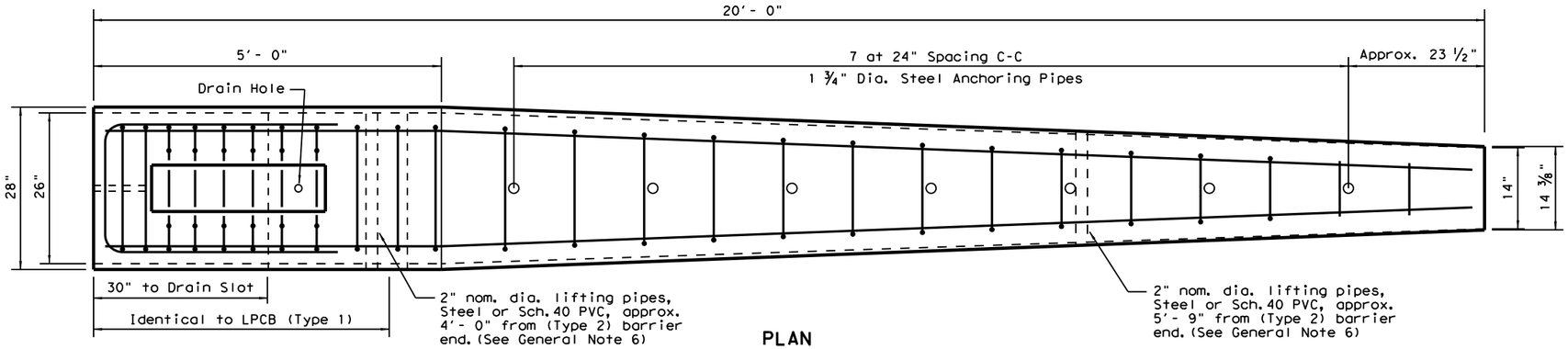
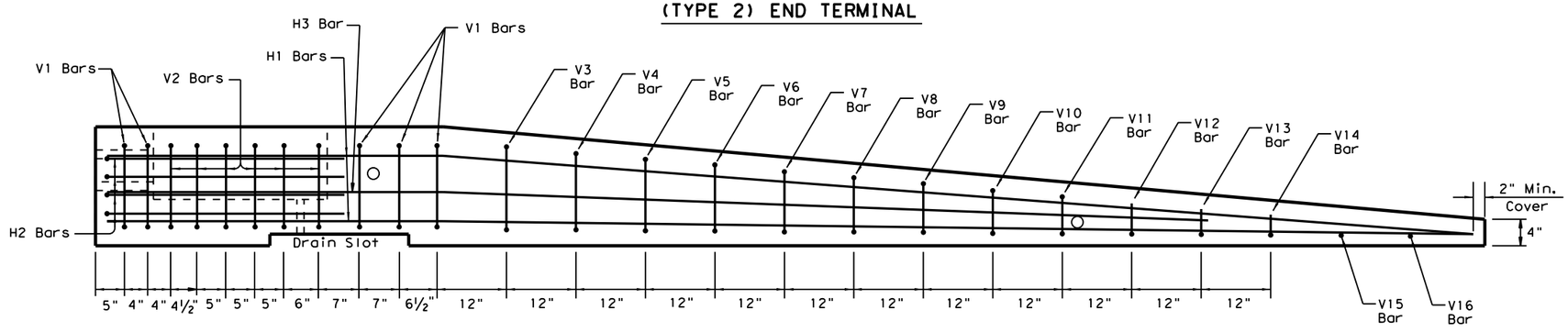
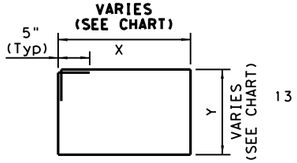


PLAN
(TYPE 2) END TERMINAL

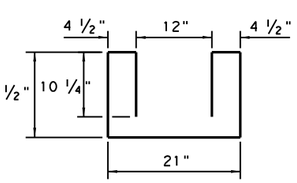


ELEVATION
(TYPE 2) END TERMINAL

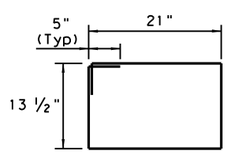
Note:
Anchoring pipes not shown in Elevation View



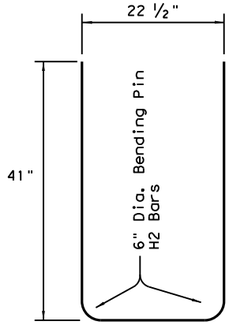
V3-V14 Bars



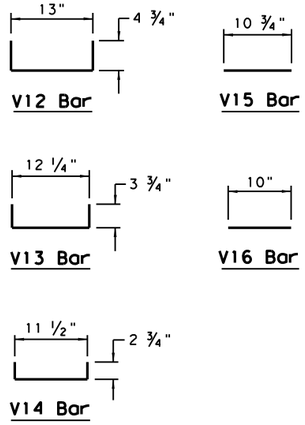
(6)~V2 Bars



(5)~V1 Bars



(4)~H2 Bars
(#5) Bars

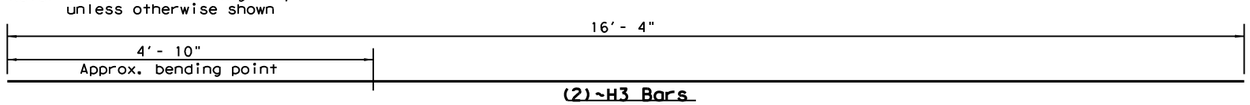


Note: All V Bars are (#4)

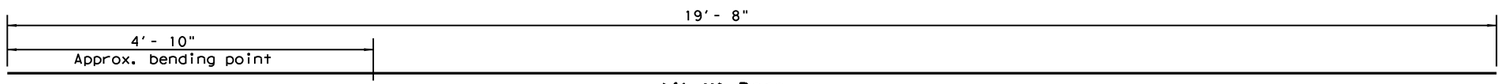
BAR (#4)	X (IN.)	Y (IN.)
V3 BAR	20 ¼	14 ½
V4 BAR	19 ½	13 ½
V5 BAR	18 ½	12 ¼
V6 BAR	17 ½	11 ¼
V7 BAR	17	10 ¼
V8 BAR	16 ¼	9
V9 BAR	15 ½	8
V10 BAR	14 ½	7
V11 BAR	13 ¾	6

REINFORCING STEEL DETAILS
TYPE 2 - END TERMINAL

Note: Use 2" Dia. Bending Pin, unless otherwise shown

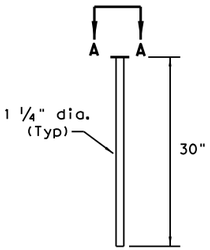


(2)~H3 Bars
(#5) Bar

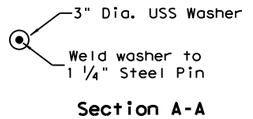


Note: Bends on H1 and H3 bars are slight and do not require formal bends.

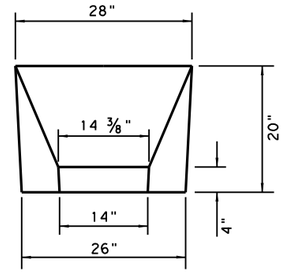
(4)~H1 Bars
(#5) Bar



(7) Anchor Pins
ASTM A36 Steel (See Note 3)



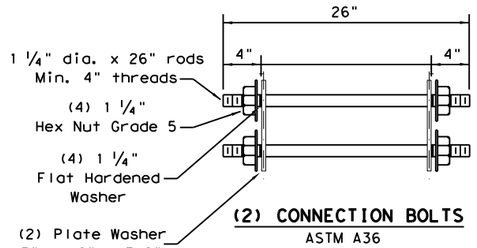
Section A-A
(Head of Anchoring Pin)



APPROACH VIEW

TYPE 2 - NOTES

1. Welded wire reinforcment (WWR) is "not" an option for Type 2 Barrier.
2. Type 2 Barrier shall be used as an end treatment for the Type 1 barrier segments, when applicable.
3. The end treatment can be used without the anchor pins in locations that can accommodate approximately 4 ft. of lateral displacement of the end treatment. The use of non-pinned end treatment does not affect the performance or the deflection of the Low-Profile barrier system.
4. The anchor pins are all the same length and are to be driven flush with the top of the (Type 2) barrier surface.
5. The bends in the H3 and H1 bars are slight, no formal bend is necessary.
6. The Type 2 barrier segment must be lifted from the rear first, to prevent cracking of sloped section.
7. See LPCB sheet 1 for additional information.



(2) CONNECTION BOLTS
ASTM A36

PLATE WASHER
5" x 10" x ⅜"

Note: Rods, Hex nuts and Washers shall be Galvanized.

FOR CONTRACTORS INFORMATION ONLY

(TYPE 2) APPROX. QUANTITIES 20 FT. SECTION		
CONCRETE	CY	1.65
REINFORCING STEEL	LBS	240
TOTAL BARRIER WT.	LBS	7000

Texas Department of Transportation

Design Division Standard

LOW PROFILE CONCRETE BARRIER
PRECAST BARRIER (TYPE 2)
LPCB-13

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		73

DATE: 1/27/2021
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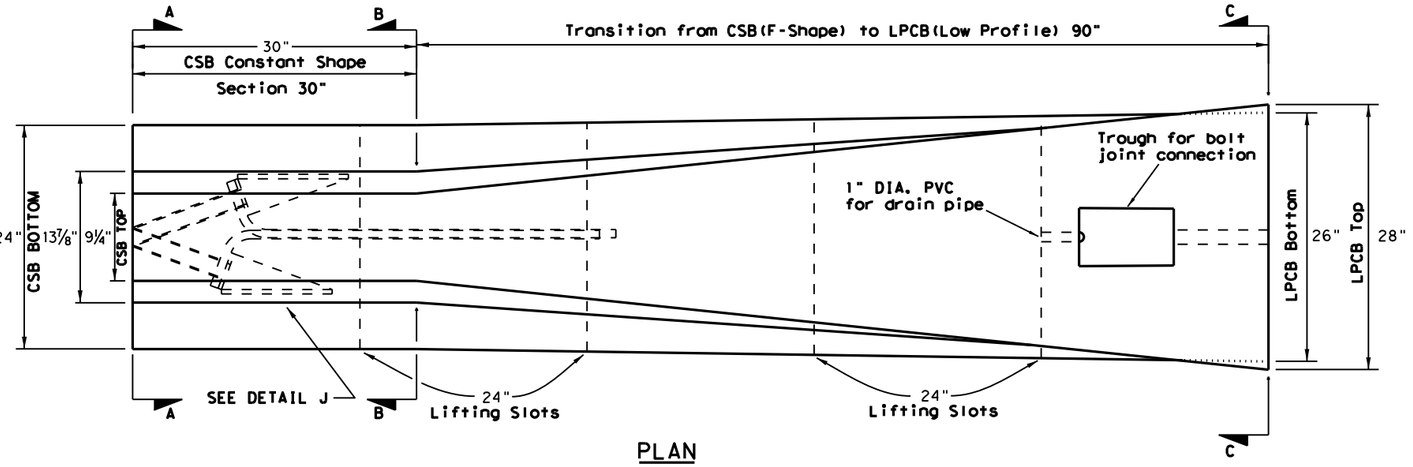
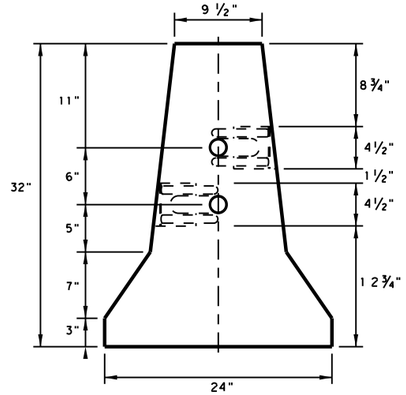
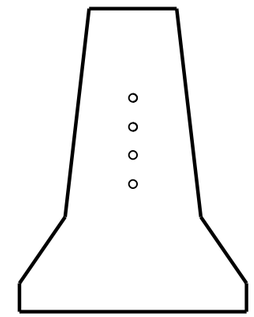


PLAN

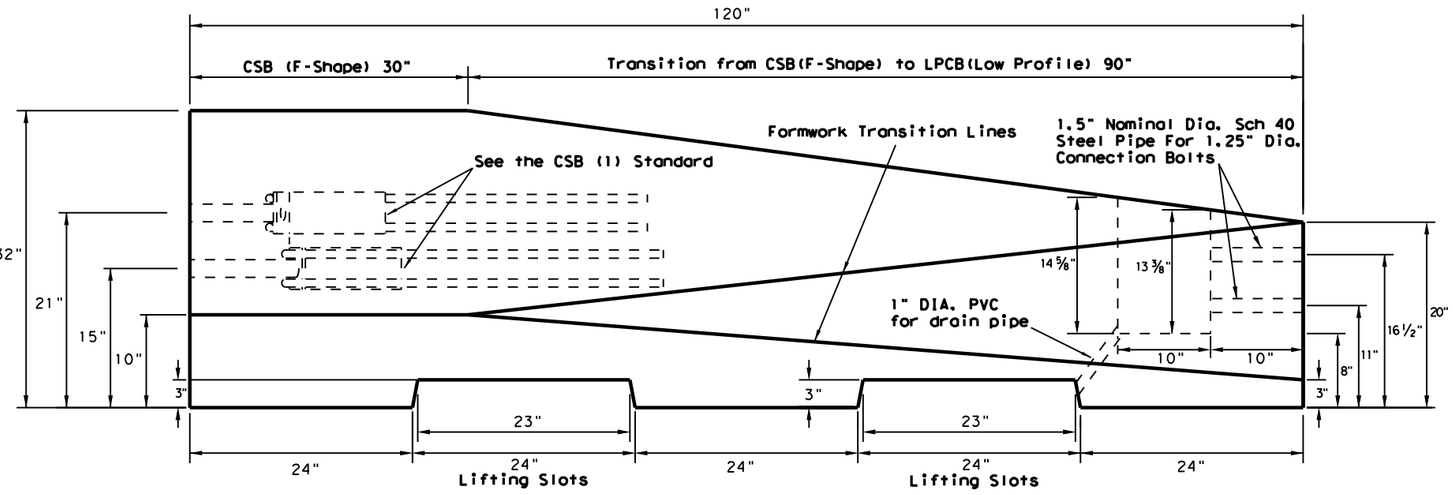
See detail sheet 2 of 2 for reinforcement.



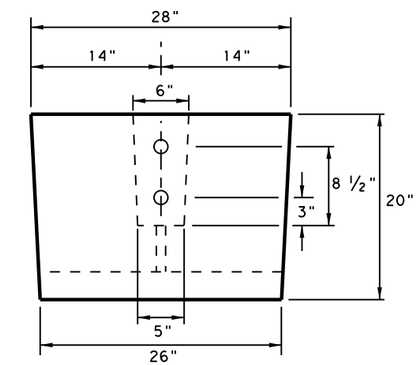
SECTION A-A



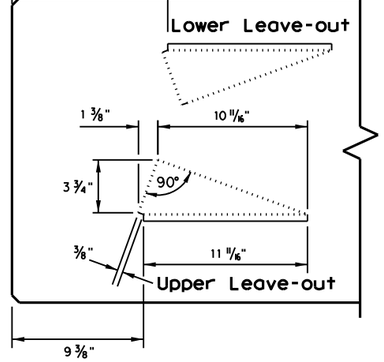
SECTION B-B



ELEVATION



SECTION C-C



DETAIL J
CSB-Side Block-Outs

General Notes

1. Concrete shall be Class H for precast barrier with a minimum compressive strength of 3600 psi.
2. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
3. These details cover barrier per Item 512, "Portable Concrete Traffic Barrier."
4. Barrier edges shall have a ¾ " chamfer or a tooled radius.
5. Precast barrier transition length shall be 10 ft.
6. Joint connection systems are considered subsidiary.
7. All steel assemblies for joint connections shall be galvanized after fabrication in accordance with Item 445, "Galvanizing".
8. For rebars, use 2" bending pin unless otherwise shown.

Texas Department of Transportation

Design Division Standard

F-SHAPE TO LOW PROFILE PRECAST BARRIER TRANSITION (TYPE T)

FSLP(TR)-10

FILE: fslptr10.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		74

DATE: 1/27/2021
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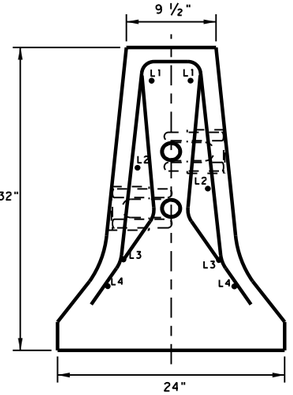
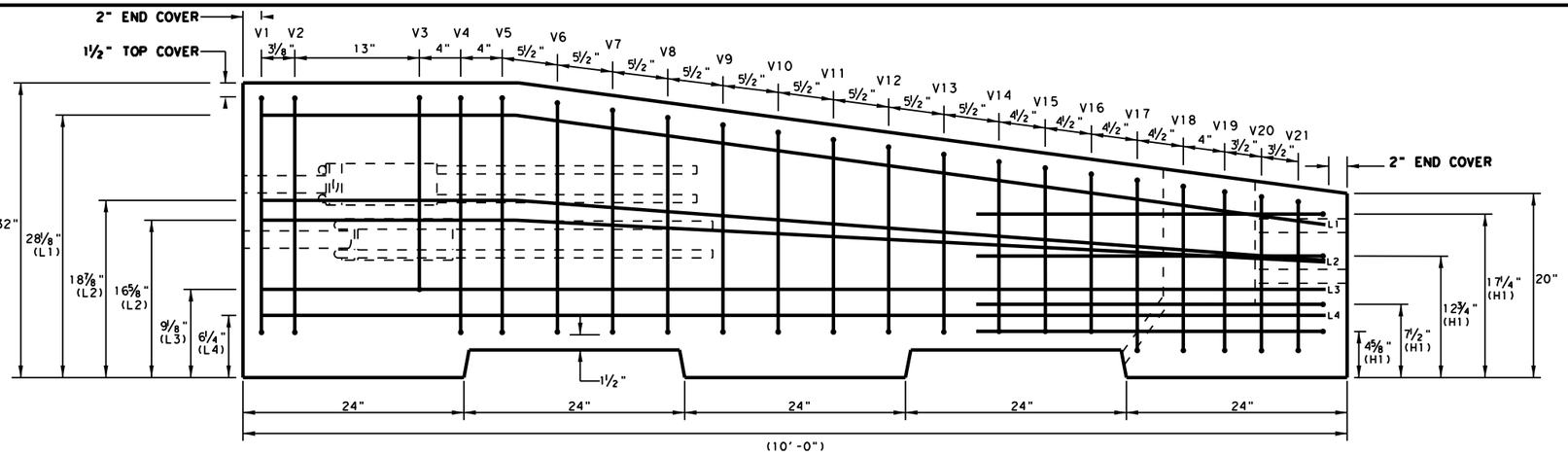
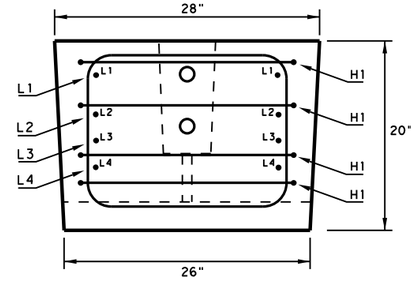


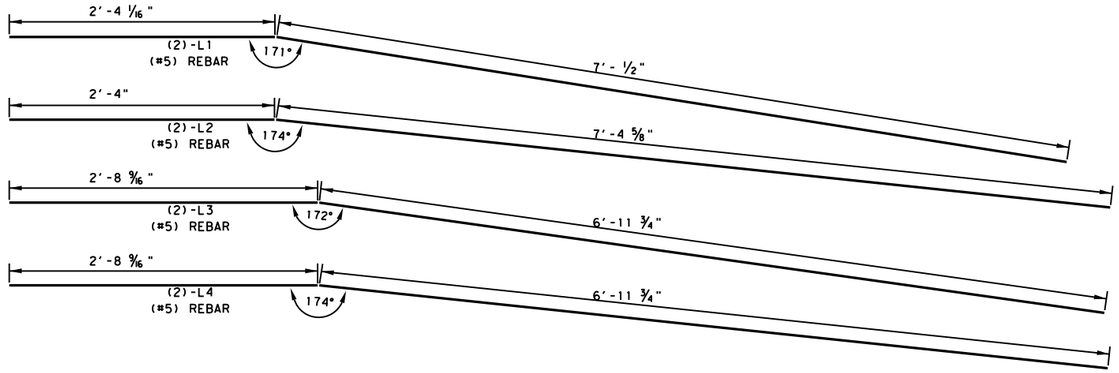
END SECTION AT
CSB (F-SHAPE) BARRIER
For Type X Connection
(See the CSB(1) Standard)

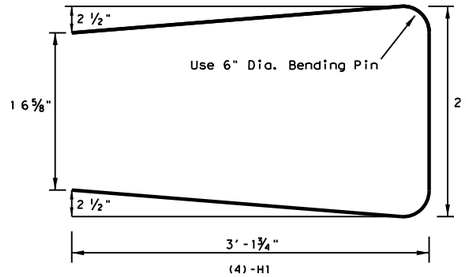


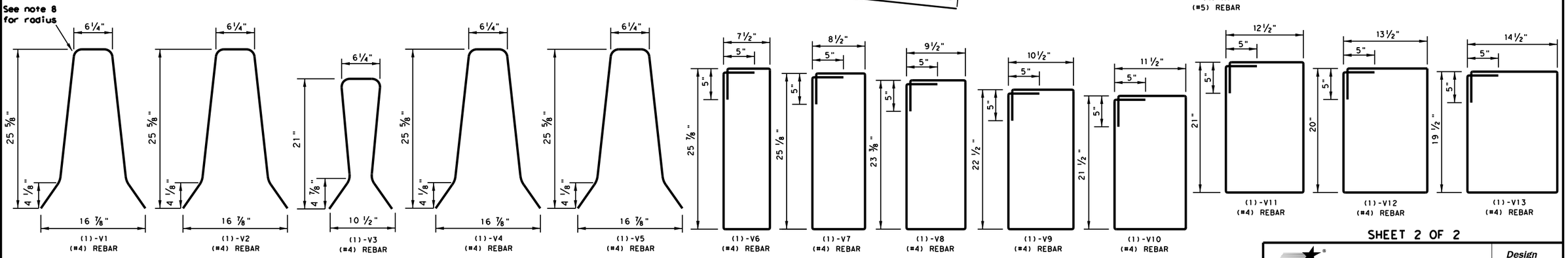
BARRIER TRANSITION ELEVATION
Showing Reinforcement Placement

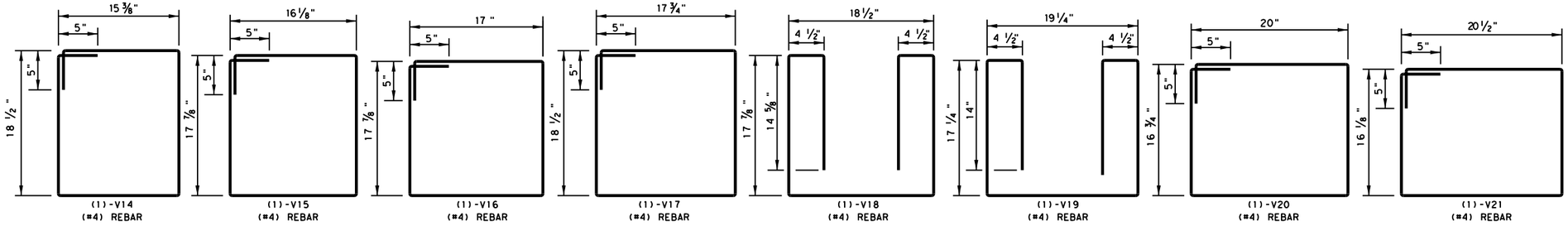


END SECTION AT
LOW PROFILE BARRIER
For Connection Details
(See the LPCB Standard)









SHEET 2 OF 2

Texas Department of Transportation

Design Division Standard

F-SHAPE TO LOW PROFILE PRECAST BARRIER TRANSITION (TYPE T)

FSLP(TR)-10

FILE: fslptr10.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
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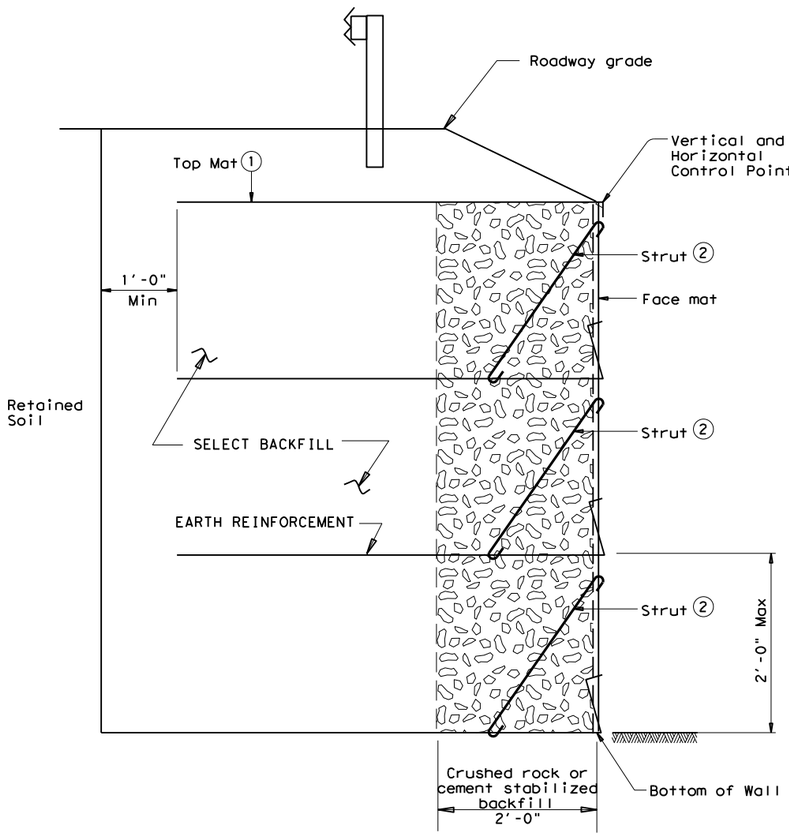
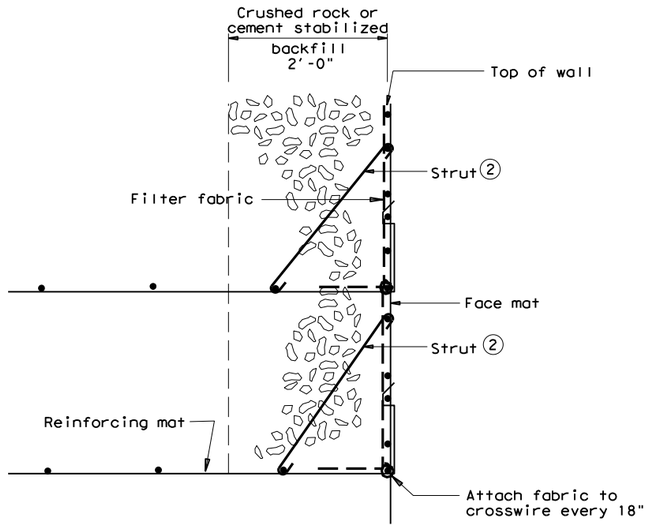


① Provide top mat to stabilize top of wall. Contractor may propose alternate method to stabilize top of wall.

② Provide intermediate stuts as required to stabilize face.

TYPICAL SECTION
(SHOWING TOP MAT OPTION)



DETAIL OF WALL FACE
(SHOWING STRUT OPTION)

SPECIAL NOTE - FACE CONSTRUCTION

When constructing wire faced walls, it is critical that the area immediately behind the face mat be completely filled. Failure to fill and compact this area will result in bulging of the face mats and settlement of the top of wall. The filter fabric shall closely follow the contours of the face unit, with particular attention paid to the lower corner of the basket. The fabric shall be pulled into the corner and attached to the basket with hog rings or tie wire. The coarse rock or cement stabilized backfill in the two foot zone behind the face shall extend completely to the top of the face mat. Particular care shall be taken not to leave a gap or void below the next layer of earth reinforcement.

EARTH REINFORCEMENTS:
The maximum vertical spacing of earth reinforcements shall be 24 inches.
The minimum length of earth reinforcements shall be 6 feet for walls 6 feet and shorter, and 8 feet for walls over 6 feet tall.
Minimum wire size for welded wire earth reinforcements shall be W4.5. Longitudinal wire spacing shall not exceed 12 inches. Transverse wire spacing shall not exceed 24 inches.
Earth reinforcement allowable stresses and pullout shall be calculated with current AASHTO Standard and Interim Specifications.
Factor of safety in pullout of the earth reinforcements shall be greater than 1.5 at each reinforcement level.
Temporary Earth Wall reinforcements that will be placed in the reinforced volume of a permanent MSE wall shall either be non-metallic or galvanized.

WALL FACE:
Minimum wire size for welded wire material used for all facing shall be W4.5. Spacing of the wire shall not exceed 6 inches in either the horizontal or vertical direction. The facing shall be designed to maintain a vertical position during wall backfilling. This may be accomplished with wire struts, external bracing, or other means which provide acceptable performance. If the face does not remain vertical during wall backfilling, work shall be stopped until the system is modified to meet this requirement.
Angled struts or a top mat shall be provided to stabilize the top basket face. Strut spacing shall not exceed 24 inches.

STABILITY CRITERIA:
Factor of safety in sliding along the base of the structure shall be greater than or equal to 1.5.
Factor of safety in overturning shall be greater than or equal to 2.0.
The base pressure resultant shall fall within the middle third of the retaining wall.

DESIGN PARAMETERS:
Structure shall be based on the following design parameters:
Random Backfill: Unit weight = 120 pcf.
(Embankment or Existing Soils) ø = 30° c = 0 psf
Select Backfill: Unit weight = 120 pcf
ø = 30° c = 0 psf

GENERAL NOTES:
Sections shown are for informational purposes only. Specific geometry is to be determined based on wall layouts and other plan information.
The select backfill specified for use within the Temporary Earth Wall Select Volume shall extend horizontally from the back of the 2' backfill zone to a minimum of 1' beyond the end of the earth reinforcements.

Texas Department of Transportation

Bridge Division Standard

TEMPORARY EARTH RETAINING WALL

RW(TEW)

FILE: rwstde04.dgn	DN: TxDOT	CK: TxDOT	DW: GHO	CK: MPM
©TxDOT March 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
01-13: Added Struts.	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		76

DATE: 1/27/2021
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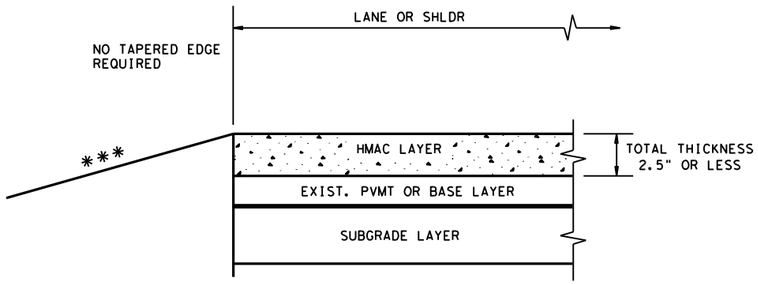
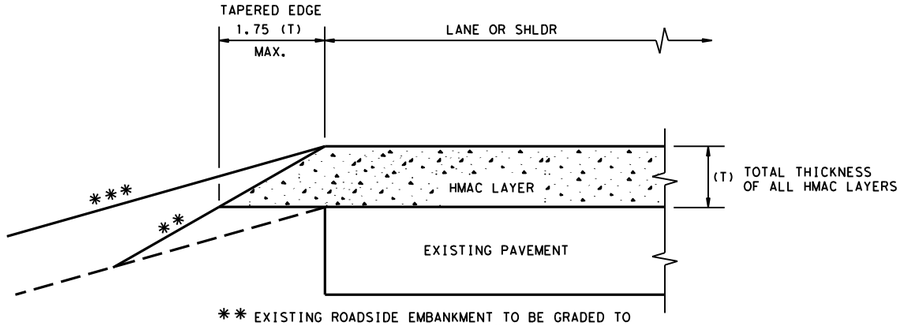


*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

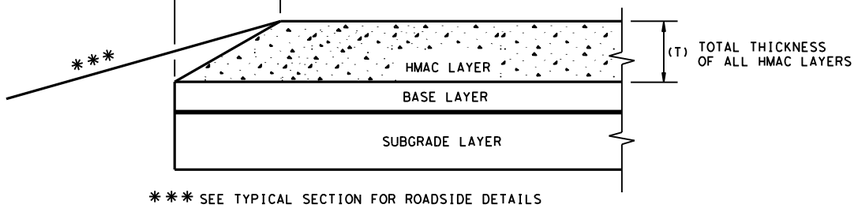
CONDITION - 1
THIN HMAC SURFACES OR HMAC OVERLAY WITH THICKNESS OF 2.5" OR LESS



** EXISTING ROADSIDE EMBANKMENT TO BE GRADED TO PRODUCE A SMOOTH LEVEL SURFACE FOR PLACEMENT OF TAPERED EDGE. THIS WORK IS SUBSIDIARY TO THE VARIOUS BID ITEMS.

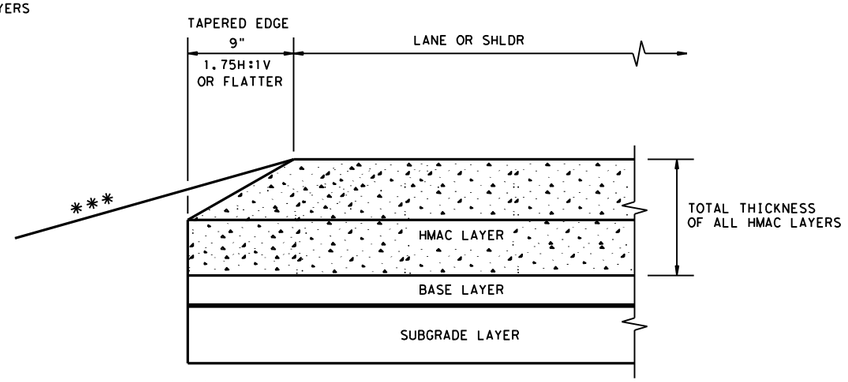
*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 2
OVERLAY OF EXISTING PAVEMENT HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 3
NEW OR RECONSTRUCTED PAVEMENT HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 4
NEW OR RECONSTRUCTED PAVEMENT HMAC THICKNESS 5" OR GREATER

(NOT TO SCALE)

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, A VERTICAL EDGE IS PERMISSIBLE FOR HMAC PLACED GREATER THAN 5" BELOW THE EDGE OF PAVEMENT AND FOR THICKNESS OF HMAC LESS THAN 2.5".
2. FOR FURTHER INFORMATION REGARDING THE ROADSIDE AND PAVEMENT DETAILS, SEE TYPICAL SECTIONS.
3. PAYMENT FOR TAPERED EDGE WILL BE IN ACCORDANCE WITH APPLICABLE ITEMS IN THE CONTRACT.
4. THE SLOPE OF THE TAPERED EDGE SHALL BE 1.75H:1V OR FLATTER.
5. THE TAPERED EDGE SHALL BE PRODUCED BY USE OF A SCREED ATTACHMENT CAPABLE OF PRODUCING A SMOOTH COMPACTED SURFACE. ADDITIONAL COMPACTING EFFORT BEHIND THE SCREED IS NOT REQUIRED.

Texas Department of Transportation

Design Division Standard

TAPERED EDGE DETAILS HMAC PAVEMENT

TE(HMAC)-11

FILE: tehmac11.dgn	DN: TxDOT	CK: RL	DW: KB	CK:
© TxDOT January 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
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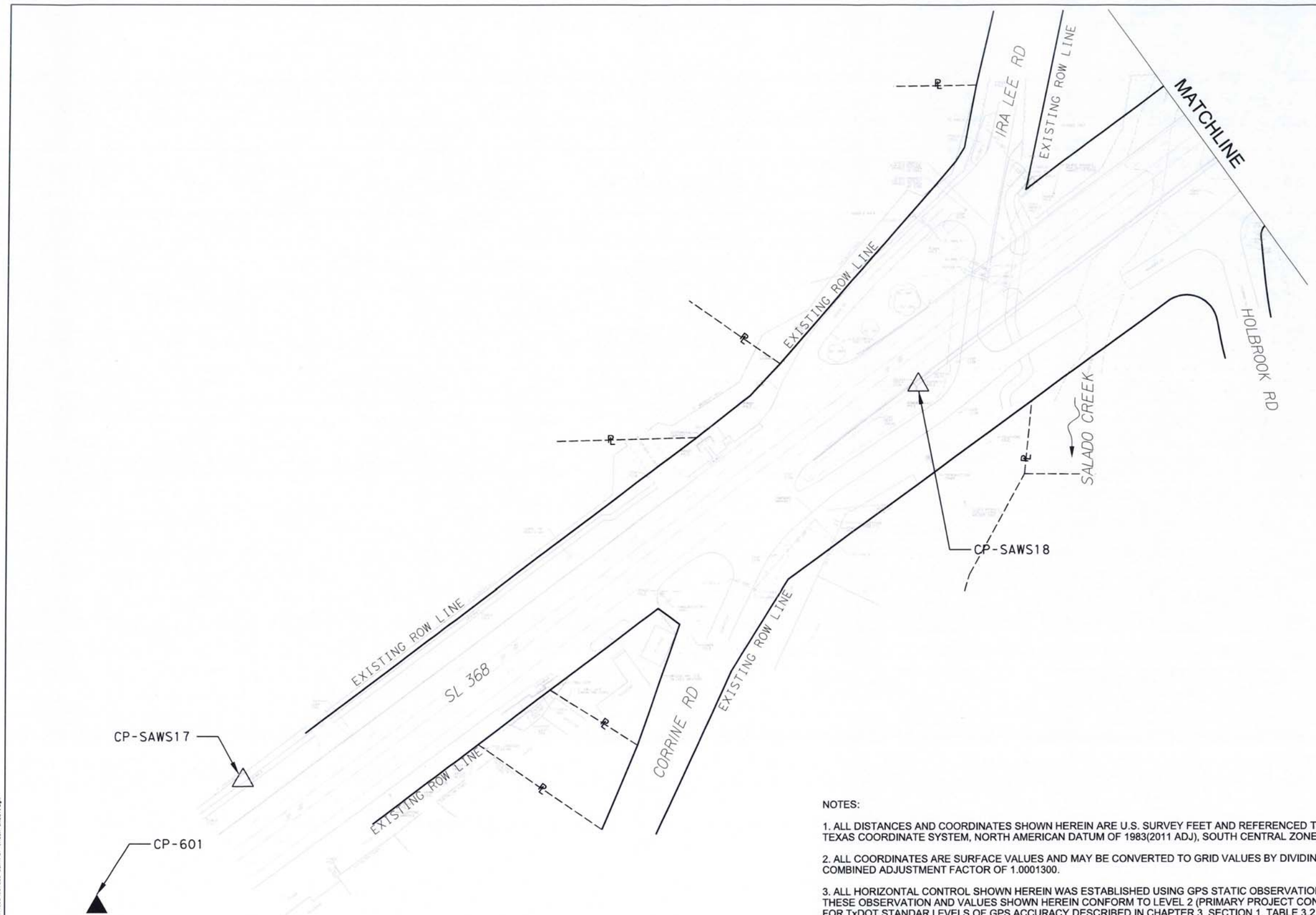
	SAT	BEXAR		77



FROM	TO	DIRECTION	DISTANCE
CP-601	CP-600	N 52°41'58" E	2,209.28'

SURVEY CONTROL TABLE - SURFACE VALUES					
CONTROL POINT NUMBER	NORTHING	EASTING	ELEVATION	MONUMENT DESCRIPTION	MGRS
CP-601	13,730,926.09	2,151,752.34	696.77'	2" CFA EPOXIED ALUMINUM CAP	14RNT5575663324
SAWS17	13,731,068.94	2,151,915.52	696.03'	3" ALUMINUM DISK IN CONCRETE	14RNT5580663367
SAWS18	13,731,503.09	2,152,665.52	688.08'	3" ALUMINUM DISK IN CONCRETE	14RNT5603463500

NOTES:

1. ALL DISTANCES AND COORDINATES SHOWN HEREIN ARE U.S. SURVEY FEET AND REFERENCED TO THE TEXAS COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983(2011 ADJ), SOUTH CENTRAL ZONE NO.4204.

2. ALL COORDINATES ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID VALUES BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.0001300.

3. ALL HORIZONTAL CONTROL SHOWN HEREIN WAS ESTABLISHED USING GPS STATIC OBSERVATIONS. THESE OBSERVATION AND VALUES SHOWN HEREIN CONFORM TO LEVEL 2 (PRIMARY PROJECT CONTROL) FOR TxDOT STANDAR LEVELS OF GPS ACCURACY DESCRIBED IN CHAPTER 3, SECTION 1, TABLE 3.2 OF THE TEXAS DEPARTMENT OF TRANSPORTATION MANUAL DATED APRIL 2016.

4. ALL VERTICAL DATA SHOWN HEREIN IS REFERENCE TO THE FOLLOWING CORS STATION WITH VERTIACAL DATUM NAVD 88, GEOID 12B. A MINIMUM OF 2 HOUR STATIC SESSION WAS PERFORMED CONCURRENTLY ON ALL PRIMARY CONTROL. SECONDARY CONTROL VALUES WERE ESTABLLISH UTILIZING BASE-ROVER (RTK) FROM TWO PROCESSED PRIMARY CONTROL POINTS.

   TXAN SAN ANTONIO CORS ARP
   TXBO BOENRE CORS ARP
   TXSE SEGUIN CORS ARP
   TXSM SAN MARCOS CORS ARP

5. FIELD INFORMATION SHOWN HEREIN IS BASED ON AN "ON-THE-GROUND" SURVEY PERFORMED BY COBB, FENDLEY & ASSOCIATES, INC. FROM IN OCTOBER, 2018.

6. PROPOSED RIGHT-OF-WAY BASELINE MAY NOT MATCH PROPOSED CONSTRUCTION BASELINE OR AS-BUILT BASELINE DUE TO DESIGN CHANGES.

THIS SURVEY INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

STATE OF TEXAS REGISTERED WILLIAM D. WARRICK 4426 PROFESSIONAL LAND SURVEYOR

SURVEYOR CERTIFICATION

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

William D. Warrick 02-19-2019

WILLIAM D. WARRICK DATE:
RPLS #4426

60' 30' 0 60' 120'

GRAPHIC SCALE
SCALE: 1"=60' (22"x34" SHEET)
SCALE: 1"=120' (11"x17" SHEET)
BEXAR COUNTY, TEXAS

CobbFendley
505 East Huntland Drive, Suite 485
Austin, Texas 78752
512.834.9798 | fax 512.834.9553 | www.cobbfendley.com
TBPE NO. F-274 TBPLS NO. 100467

STATE LOOP 368 AT
SALADO CREEK

HORZONTAL & VERTICAL CONTROL INDEX SHEET

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		78
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

DATE: 2/19/2019
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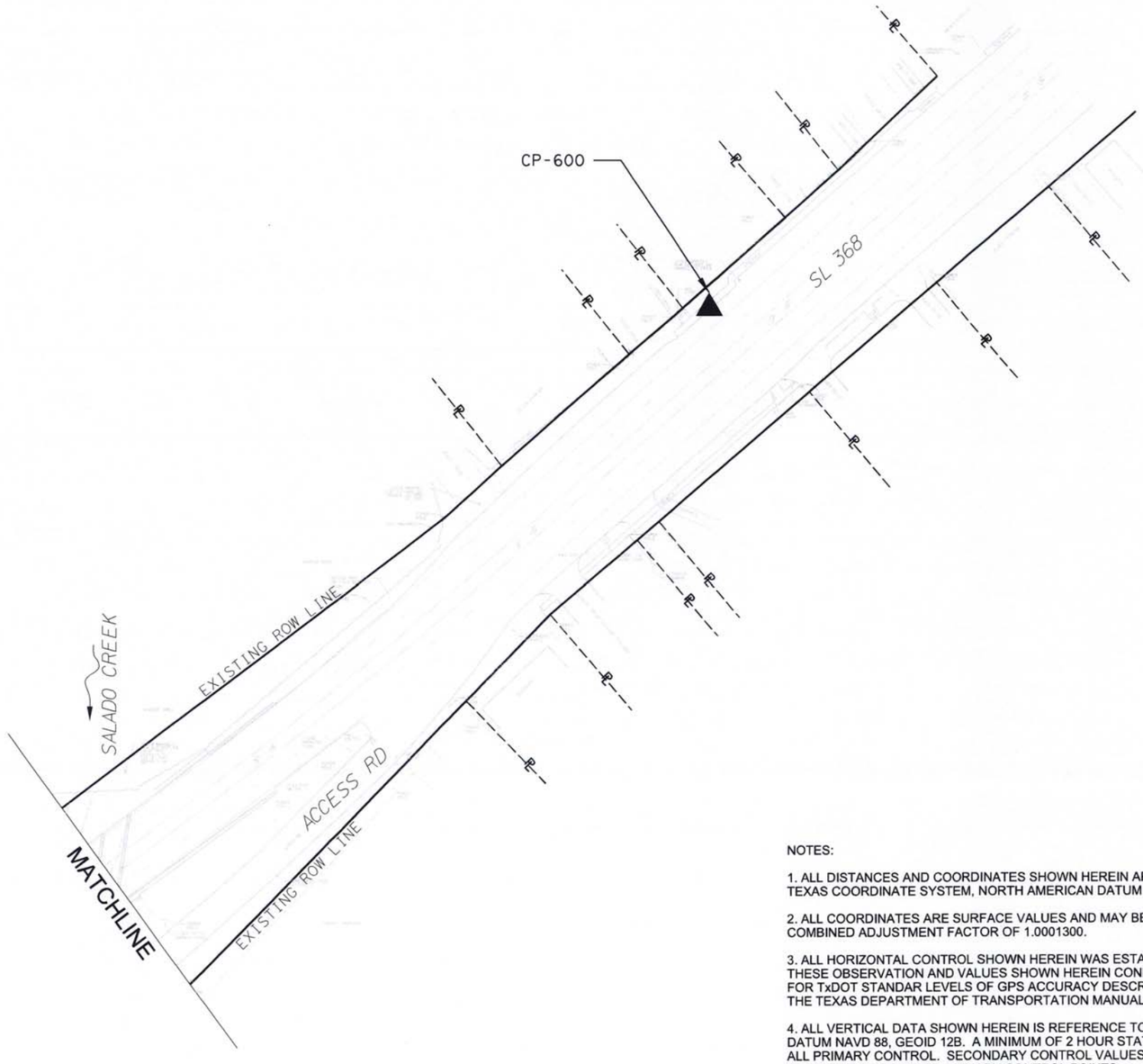

FROM	TO	DIRECTION	DISTANCE
CP-601	CP-600	N 52° 41' 58" E	2,209.28'

SURVEY CONTROL TABLE - SURFACE VALUES					
CONTROL POINT NUMBER	NORTHING	EASTING	ELEVATION	MONUMENT DESCRIPTION	MGRS
CP-600	13,732,265.08	2,153,509.98	692.52'	2" CFA EPOXIED ALUMINUM CAP	14RNT5629263732

NOTES:

1. ALL DISTANCES AND COORDINATES SHOWN HEREIN ARE U.S. SURVEY FEET AND REFERENCED TO THE TEXAS COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983(2011 ADJ), SOUTH CENTRAL ZONE NO.4204.

2. ALL COORDINATES ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID VALUES BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.0001300.

3. ALL HORIZONTAL CONTROL SHOWN HEREIN WAS ESTABLISHED USING GPS STATIC OBSERVATIONS. THESE OBSERVATION AND VALUES SHOWN HEREIN CONFORM TO LEVEL 2 (PRIMARY PROJECT CONTROL) FOR TxDOT STANDAR LEVELS OF GPS ACCURACY DESCRIBED IN CHAPTER 3, SECTION 1, TABLE 3.2 OF THE TEXAS DEPARTMENT OF TRANSPORTATION MANUAL DATED APRIL 2016.

4. ALL VERTICAL DATA SHOWN HEREIN IS REFERENCE TO THE FOLLOWING CORS STATION WITH VERTIACAL DATUM NAVD 88, GEOID 12B. A MINIMUM OF 2 HOUR STATIC SESSION WAS PERFORMED CONCURRENTLY ON ALL PRIMARY CONTROL. SECONDARY CONTROL VALUES WERE ESTABLLISH UTILIZING BASE-ROVER (RTK) FROM TWO PROCESSED PRIMARY CONTROL POINTS.

TXAN SAN ANTONIO CORS ARP
TXBO BOENRE CORS ARP
TXSE SEGUIN CORS ARP
TXSM SAN MARCOS CORS ARP

5. FIELD INFORMATION SHOWN HEREIN IS BASED ON AN "ON-THE-GROUND" SURVEY PERFORMED BY COBB, FENDLEY & ASSOCIATES, INC. FROM IN OCTOBER, 2018.

6. PROPOSED RIGHT-OF-WAY BASELINE MAY NOT MATCH PROPOSED CONSTRUCTION BASELINE OR AS-BUILT BASELINE DUE TO DESIGN CHANGES.

THIS SURVEY INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

STATE OF TEXAS
REGISTERED
WILLIAM D. WARRICK
4426
PROFESSIONAL
LAND SURVEYOR

SURVEYOR CERTIFICATION

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

William D. Warrick 02-19-2019

WILLIAM D. WARRICK
RPLS #4426

DATE:

60' 30' 0 60' 120'

GRAPHIC SCALE
SCALE: 1"=60' (22"x34" SHEET)
SCALE: 1"=120' (11"x17" SHEET)
BEXAR COUNTY, TEXAS

CobbFendley
505 East Huntland Drive, Suite 485
Austin, Texas 78752
512.834.9798 | fax 512.834.9553 | www.cobbfendley.com
TBPE NO. F-274 TBPLS NO. 100467

STATE LOOP 368 AT
SALADO CREEK

HORZONTAL & VERTICAL CONTROL INDEX SHEET

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		79
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

DATE: 2/19/2019
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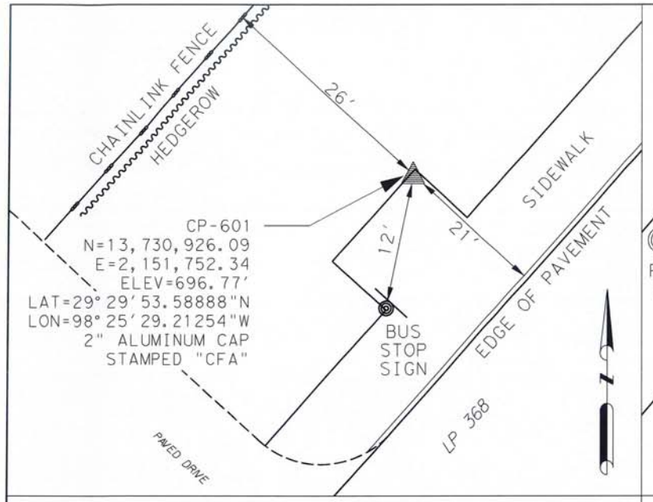
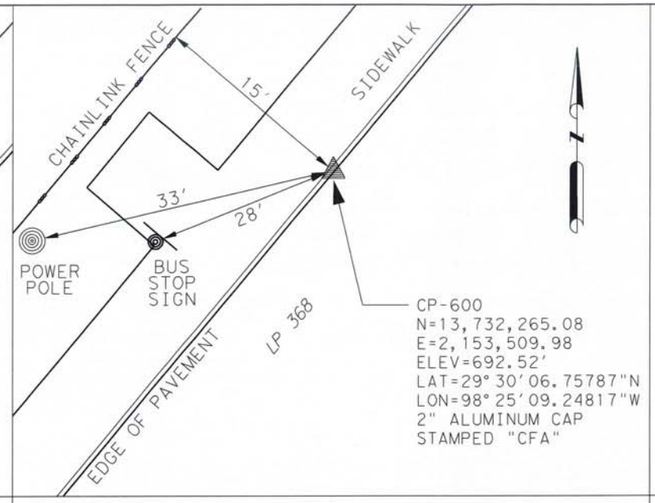
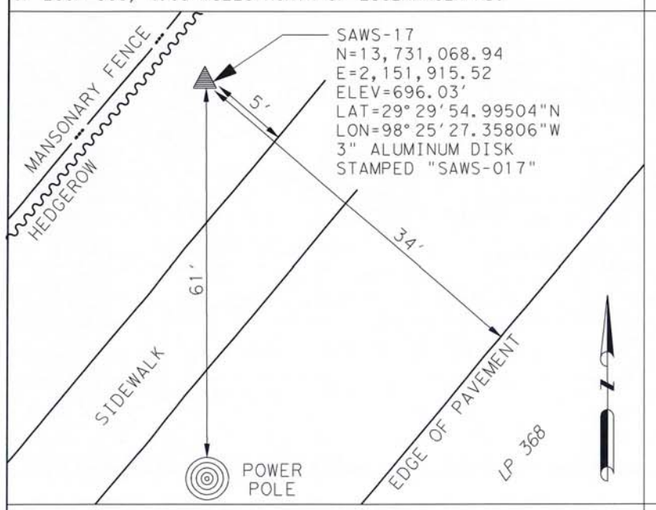


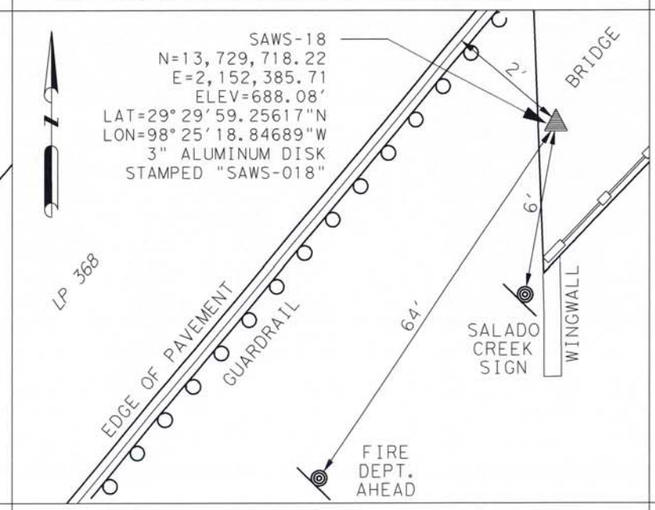
A 2" ALUMINUM CAP STAMPED "CFA" AND EPOXIED INTO THE NORTHERLY CORNER OF A BUS STOP IN THE NORTHWEST RIGHT-OF-WAY OF LOOP 368, 0.33 MILES NORTH OF EISENHAUER RD.



A 2" ALUMINUM CAP STAMPED "CFA" AND EPOXIED INTO THE NORTHWESTERLY CURB IN THE NORTHWEST RIGHT-OF-WAY OF LOOP 368, 0.74 MILES NORTH OF EISENHAUER RD.



A 3" ALUMINUM DISK STAMPED "SAWS-017" FOUND IN CONCRETE IN THE NORTHWEST RIGHT-OF-WAY OF LOOP 368, 0.33 MILES NORTH OF EISENHAUER RD.



A 3" ALUMINUM DISK STAMPED "SAWS-018" FOUND IN CONCRETE IN THE NORTHWEST RIGHT-OF-WAY OF LOOP 368, 0.53 MILES NORTH OF EISENHAUER RD.

NOTES:

1. ALL DISTANCES AND COORDINATES SHOWN HEREIN ARE U.S. SURVEY FEET AND REFERENCED TO THE TEXAS COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983(2011 ADJ), SOUTH CENTRAL ZONE NO.4204.

2. ALL COORDINATES ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID VALUES BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.0001300.

3. ALL HORIZONTAL CONTROL SHOWN HEREIN WAS ESTABLISHED USING GPS STATIC OBSERVATIONS. THESE OBSERVATION AND VALUES SHOWN HEREIN CONFORM TO LEVEL 2 (PRIMARY PROJECT CONTROL) FOR TxDOT STANDAR LEVELS OF GPS ACCURACY DESCRIBED IN CHAPTER 3, SECTION 1, TABLE 3.2 OF THE TEXAS DEPARTMENT OF TRANSPORTATION MANUAL DATED APRIL 2016.

4. ALL VERTICAL DATA SHOWN HEREIN IS REFERENCE TO THE FOLLOWING CORS STATION WITH VERTIACAL DATUM NAVD 88, GEOID 12B. A MINIMUM OF 2 HOUR STATIC SESSION WAS PERFORMED CONCURRENTLY ON ALL PRIMARY CONTROL. SECONDARY CONTROL VALUES WERE ESTABLLISH UTILIZING BASE-ROVER (RTK) FROM TWO PROCESSED PRIMARY CONTROL POINTS.

   TXAN SAN ANTONIO CORS ARP
   TXBO BOENRE CORS ARP
   TXSE SEGUIN CORS ARP
   TXSM SAN MARCOS CORS ARP

5. FIELD INFORMATION SHOWN HEREIN IS BASED ON AN "ON-THE-GROUND" SURVEY PERFORMED BY COBB, FENDLEY & ASSOCIATES, INC. FROM IN OCTOBER, 2018.

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STATE OF TEXAS
REGISTERED
WILLIAM D. WARRICK
4426
PROFESSIONAL
LAND SURVEYOR

SURVEYOR CERTIFICATION

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

William D. Warrick 02-19-2019

WILLIAM D. WARRICK DATE:
RPLS #4426

NOT TO SCALE

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TBPE NO. F-274 TBPLS NO. 100467

STATE LOOP 368 AT
SALADO CREEK

HORIZONTAL & VERTICAL CONTROL DATA SHEET

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		80
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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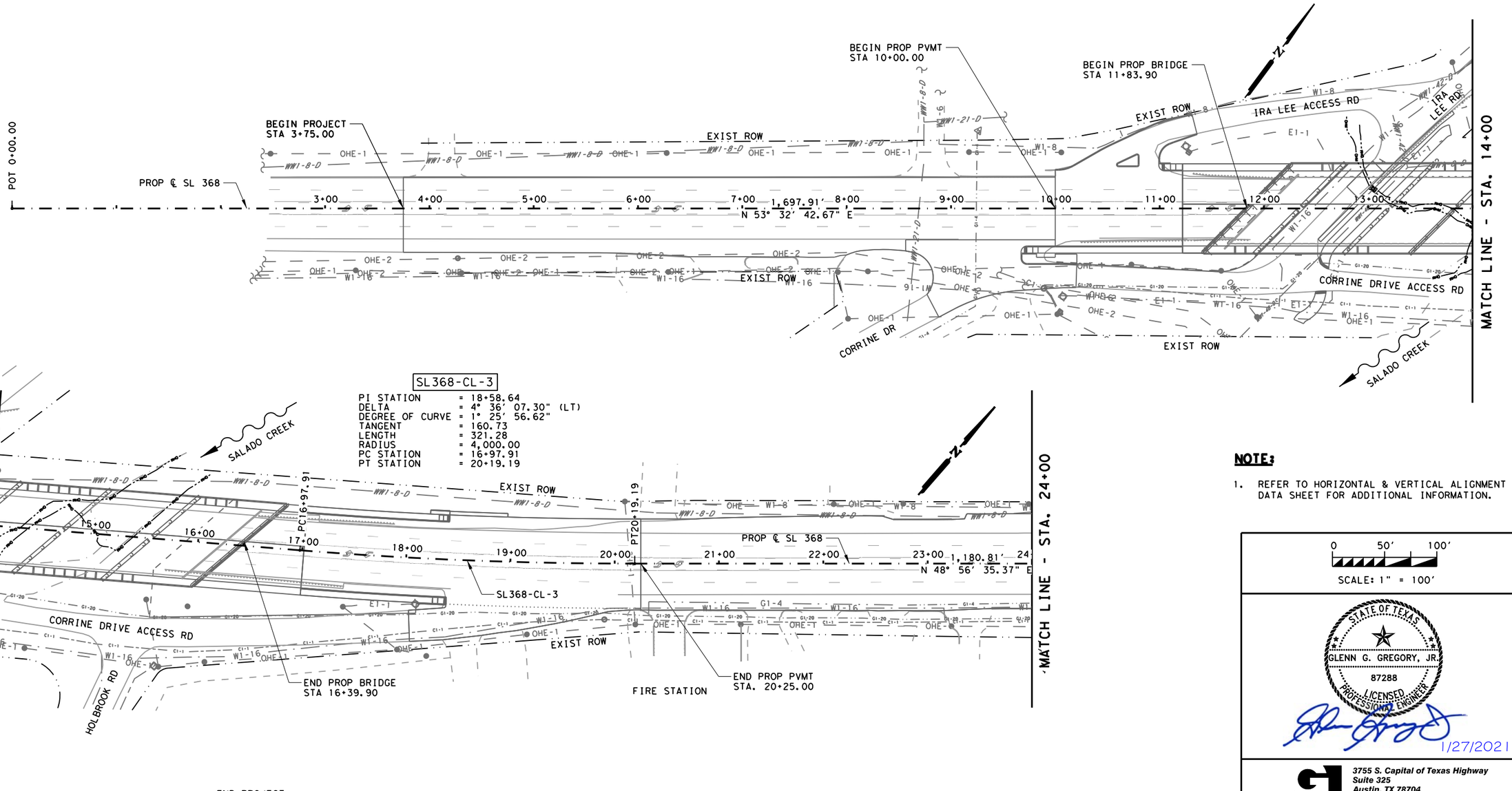

NOTE:

1. REFER TO HORIZONTAL & VERTICAL ALIGNMENT DATA SHEET FOR ADDITIONAL INFORMATION.

LEGEND

CENTERLINE

0 50' 100'

SCALE: 1" = 100'

STATE OF TEXAS
GLENN G. GREGORY, JR.
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LICENSED
PROFESSIONAL ENGINEER

1/27/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

HORIZONTAL GEOMETRY LAYOUT

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		81
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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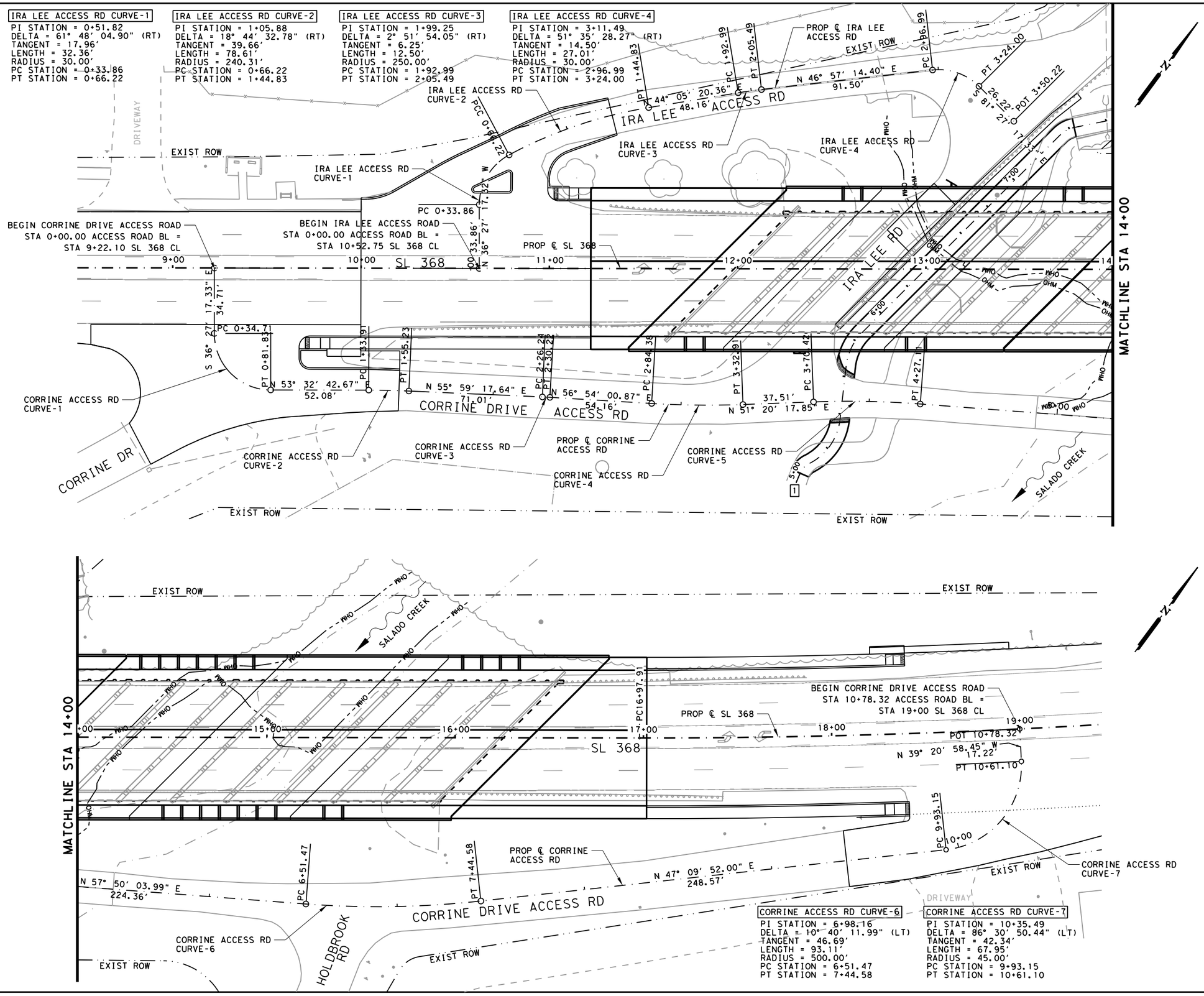

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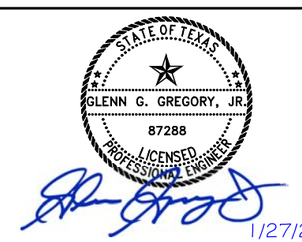
SL 368 HORIZONTAL GEOMETRY

```
<*       1    Describe Chain SL368_CL

Chain SL368_CL contains:
 84 CUR SL368_CL_3 85

Beginning chain SL368_CL description
Feature: Road_Centerline
================================================================================

Point 84              N  13,730,834.1445 E    2,151,706.8197 Sta       0+00.00

Course from 84 to PC SL368_CL_3 N 53° 32' 42.67" E Dist 1,697.9079

                                  Curve Data
                                 *----------*
Curve SL368_CL_3
P.I.  Station            18+58.64  N     13,731,938.5245  E      2,153,201.7681
Delta       =       4° 36' 07.30" (LT)
Degree      =       1° 25' 56.62"
Tangent     =            160.7275
Length      =            321.2822
Radius      =          4,000.0000
External    =              3.2279
Long Chord  =            321.1959
Mid. Ord.   =              3.2253
P.C.  Station            16+97.91  N     13,731,843.0221  E      2,153,072.4908
P.T.  Station            20+19.19  N     13,732,044.0916  E      2,153,322.9660
C.C.                               N     13,735,060.3250  E      2,150,695.7363
Back        = N  53° 32' 42.67" E
Ahead       = N  48° 56' 35.37" E
Chord Bear  = N  51° 14' 39.02" E

Course from PT SL368_CL_3 to 85 N 48° 56' 35.37" E Dist 1,180.8098

Point 85              N  13,732,819.6563 E    2,154,213.3655 Sta      32+00.00

================================================================================
Ending chain SL368_CL description
```

SL 368 VERTICAL GEOMETRY

```
<*       1    PRINT PROFILE SL368_PROFILE

Beginning profile SL368_PROFILE description:
Feature: Road_Centerline
================================================================================

                STATION       ELEV      GRADE    TOTAL L    BACK L    AHEAD L

VPI       1     10+00.00   688.3226

VPC             10+00.50   688.3251     0.4961  K =  166.4
VPI       2     10+68.00   688.6600             135.0000   67.5000   67.5000
VPT             11+35.50   689.5424     1.3072

VPC             12+00.00   690.3855     1.3072  K =  154.3  SSD = 616.1
VPI       3     14+00.00   693.0000             400.0000  200.0000  200.0000
High Point      14+01.66   691.7036
VPT             16+00.00   690.4286    -1.2857

VPC             16+82.50   689.3679    -1.2857  K =  140.2
VPI       4     17+50.00   688.5000             135.0000   67.5000   67.5000
VPT             18+17.50   688.2823    -0.3226

VPC             18+37.50   688.2177    -0.3226  K =  123.5
Low Point       18+77.33   688.1535
VPI       5     19+05.00   688.0000             135.0000   67.5000   67.5000
VPT             19+72.50   688.5203     0.7708

VPI       6     20+25.00   688.9250     0.7708

================================================================================
Ending profile SL368_PROFILE description
```



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SL 368
AT SALADO CREEK

HORIZONTAL & VERTICAL GEOMETRY REPORTS

SHEET 1 OF 7

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		83
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

PROPOSED TRAIL HORIZONTAL GEOMETRY

<* 4 DESCRIBE CHAIN PROP_TRAIL

Chain PROP_TRAIL contains:
101 CUR PROP_TRAIL_3 CUR PROP_TRAIL_6 CUR PROP_TRAIL_9 CUR PROP_TRAIL_12 102

Beginning chain PROP_TRAIL description
Feature: Road_Sidewalk_Subgrade

==========

Point 101 N 13,731,474.3963 E 2,152,764.5939 Sta 4+94.48

Course from 101 to PC PROP_TRAIL_3 N 13° 29′ 46.06" W Dist 5.5154

Curve Data

Curve PROP_TRAIL_3

P.I. Station	5+03.69	N	13,731,483.3463	E	2,152,762.4458
Delta =	40° 29′ 46.06" (RT)				
Degree =	572° 57′ 28.06"				
Tangent =	3.6888				
Length =	7.0679				
Radius =	10.0000				
External =	0.6587				
Long Chord =	6.9217				
Mid. Ord. =	0.6180				
P.C. Station	5+00.00	N	13,731,479.7593	E	2,152,763.3067
P.T. Station	5+07.07	N	13,731,486.6330	E	2,152,764.1205
C.C.		N	13,731,482.0931	E	2,152,773.0306
Back =	N 13° 29′ 46.06" W				
Ahead =	N 27° 00′ 00.00" E				
Chord Bear =	N 6° 45′ 06.97" E				

Curve Data

Curve PROP_TRAIL_6

P.I. Station	5+23.36	N	13,731,501.1471	E	2,152,771.5158
Delta =	57° 00′ 00.00" (LT)				
Degree =	190° 59′ 09.35"				
Tangent =	16.2887				
Length =	29.8451				
Radius =	30.0000				
External =	4.1368				
Long Chord =	28.6295				
Mid. Ord. =	3.6355				
P.C. Station	5+07.07	N	13,731,486.6338	E	2,152,764.1209
P.T. Station	5+36.91	N	13,731,515.2535	E	2,152,763.3715
C.C.		N	13,731,500.2535	E	2,152,737.3907
Back =	N 27° 00′ 00.00" E				
Ahead =	N 30° 00′ 00.00" W				
Chord Bear =	N 1° 30′ 00.00" W				

Course from PT PROP_TRAIL_6 to PC PROP_TRAIL_9 N 30° 00′ 00.00" W Dist 28.7047

PROPOSED TRAIL HORIZONTAL GEOMETRY (CONT.)

Curve Data

Curve PROP_TRAIL_9

P.I. Station	5+76.11	N	13,731,549.1969	E	2,152,743.7742
Delta =	38° 32′ 42.67" (RT)				
Degree =	190° 59′ 09.35"				
Tangent =	10.4897				
Length =	20.1822				
Radius =	30.0000				
External =	1.7810				
Long Chord =	19.8038				
Mid. Ord. =	1.6812				
P.C. Station	5+65.62	N	13,731,540.1125	E	2,152,749.0191
P.T. Station	5+85.80	N	13,731,559.5702	E	2,152,745.3329
C.C.		N	13,731,555.1125	E	2,152,774.9999
Back =	N 30° 00′ 00.00" W				
Ahead =	N 8° 32′ 42.67" E				
Chord Bear =	N 10° 43′ 38.66" W				

Course from PT PROP_TRAIL_9 to PC PROP_TRAIL_12 N 8° 32′ 42.67" E Dist 148.2215

Curve Data

Curve PROP_TRAIL_12

P.I. Station	7+38.52	N	13,731,710.5959	E	2,152,768.0256
Delta =	33° 23′ 45.00" (RT)				
Degree =	381° 58′ 18.71"				
Tangent =	4.4996				
Length =	8.7430				
Radius =	15.0000				
External =	0.6604				
Long Chord =	8.6198				
Mid. Ord. =	0.6325				
P.C. Station	7+34.02	N	13,731,706.1463	E	2,152,767.3570
P.T. Station	7+42.77	N	13,731,713.9429	E	2,152,771.0330
C.C.		N	13,731,703.9174	E	2,152,782.1905
Back =	N 8° 32′ 42.67" E				
Ahead =	N 41° 56′ 27.67" E				
Chord Bear =	N 25° 14′ 35.17" E				

Course from PT PROP_TRAIL_12 to 102 N 41° 56′ 27.67" E Dist 24.2764

Point 102 N 13,731,732.0005 E 2,152,787.2585 Sta 7+67.04

==========

Ending chain PROP_TRAIL description

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TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

HORIZONTAL & VERTICAL GEOMETRY REPORTS

SHEET 2 OF 7

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		84
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

PROPOSED TRAIL VERTICAL GEOMETRY

```
<*       5   PRINT PROFILE TRAIL_PROP

Beginning profile TRAIL_PROP description:
Feature: Profile_Road
================================================================================

                STATION       ELEV      GRADE    TOTAL L    BACK L    AHEAD L

VPI       1      5+00.00   668.2468

VPC              5+05.00   668.0851    -3.2338  K =  9.2  SSD = 345.0
VPI       2      5+20.00   667.6000              30.0000   15.0000   15.0000
VPT              5+35.00   666.6245    -6.5036

VPI       3      5+36.91   666.5000    -6.5036

VPI       4      5+61.35   666.5800     0.3273

VPI       5      5+76.00   667.5000     6.2818

VPI       6      5+80.00   667.5000     0.0000

VPC              6+45.00   669.7425     3.4500  K =  8.7  SSD = 327.8
VPI       7      6+60.00   670.2600              30.0000   15.0000   15.0000
VPT              6+75.00   670.2600     0.0000

VPC              6+95.00   670.2600     0.0000  K =  14.7  SSD = 544.4
VPI       8      7+10.00   670.2600              30.0000   15.0000   15.0000
VPT              7+25.00   669.9543    -2.0380

VPI       9      7+42.72   669.5931    -2.0380

================================================================================
Ending profile TRAIL_PROP description
```

PROPOSED IRA LEE RD HORIZONTAL GEOMETRY

```
<*       6   DESCRIBE CHAIN IRALEE_RD

Chain IRALEE_RD contains:
 109 110 111

Beginning chain IRALEE_RD description
Feature: Road_Centerline
================================================================================

Point 109              N  13,731,486.5677 E   2,152,711.5474 Sta       5+00.00

Course from 109 to 110 N 8° 32' 42.67" E Dist 231.8262

Point 110              N  13,731,715.8204 E   2,152,745.9943 Sta       7+31.83

Course from 110 to 111 N 10° 59' 49.33" E Dist 97.5757

Point 111              N  13,731,811.6043 E   2,152,764.6076 Sta       8+29.40

================================================================================
Ending chain IRALEE_RD description
```

STATE OF TEXAS
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PROFESSIONAL ENGINEER
1/27/2021

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SL 368
AT SALADO CREEK

HORIZONTAL & VERTICAL GEOMETRY REPORTS

SHEET 3 OF 7

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		85
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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IRA LEE ACCESS RD HORIZONTAL GEOMETRY

<* 7 DESCRIBE CHAIN IRLRACCESS_CL

Chain IRLRACCESS_CL contains:
127 CUR IRLRACCESS_CL_3 CUR IRLRACCESS_CL_4 CUR IRLRACCESS_CL_7 CUR IRLRACCESS-_C_10 128

Beginning chain IRLRACCESS_CL description
Feature: Road_Centerline

==========

Point 127 N 13,731,465.6179 E 2,152,561.6162 Sta 0+00.00

Course from 127 to PC IRLRACCESS_CL_3 N 36° 27′ 17.32" W Dist 33.8632

Curve Data

Curve IRLRACCESS_CL_3

P.I. Station	0+51.82	N	13,731,507.2967	E	2,152,530.8263
Delta =	61° 48′ 04.90" (RT)				
Degree =	190° 59′ 09.35"				
Tangent =	17.9551				
Length =	32.3591				
Radius =	30.0000				
External =	4.9626				
Long Chord =	30.8131				
Mid. Ord. =	4.2582				
P.C. Station	0+33.86	N	13,731,492.8550	E	2,152,541.4950
P.T. Station	0+66.22	N	13,731,523.5234	E	2,152,538.5127
C.C.		N	13,731,510.6806	E	2,152,565.6248
Back =	N 36° 27′ 17.33" W				
Ahead =	N 25° 20′ 47.58" E				
Chord Bear =	N 5° 33′ 14.87" W				

Curve Data

Curve IRLRACCESS_CL_4

P.I. Station	1+05.88	N	13,731,559.3652	E	2,152,555.4907
Delta =	18° 44′ 32.78" (RT)				
Degree =	23° 50′ 31.65"				
Tangent =	39.6596				
Length =	78.6106				
Radius =	240.3132				
External =	3.2506				
Long Chord =	78.2606				
Mid. Ord. =	3.2072				
P.C. Station	0+66.22	N	13,731,523.5234	E	2,152,538.5127
P.T. Station	1+44.83	N	13,731,587.8511	E	2,152,583.0848
C.C.		N	13,731,420.6472	E	2,152,755.6922
Back =	N 25° 20′ 47.58" E				
Ahead =	N 44° 05′ 20.35" E				
Chord Bear =	N 34° 43′ 03.97" E				

Course from PT IRLRACCESS_CL_4 to PC IRLRACCESS_CL_7 N 44° 05′ 20.36" E Dist 48.1606

IRA LEE ACCESS RD HORIZONTAL GEOMETRY (CONT.)

Curve Data

Curve IRLRACCESS_CL_7

P.I. Station	1+99.25	N	13,731,626.9333	E	2,152,620.9436
Delta =	2° 51′ 54.05" (RT)				
Degree =	22° 55′ 05.92"				
Tangent =	6.2518				
Length =	12.5010				
Radius =	250.0000				
External =	0.0782				
Long Chord =	12.4997				
Mid. Ord. =	0.0781				
P.C. Station	1+92.99	N	13,731,622.4429	E	2,152,616.5937
P.T. Station	2+05.49	N	13,731,631.2007	E	2,152,625.5124
C.C.		N	13,731,448.4992	E	2,152,796.1587
Back =	N 44° 05′ 20.35" E				
Ahead =	N 46° 57′ 14.40" E				
Chord Bear =	N 45° 31′ 17.38" E				

Course from PT IRLRACCESS_CL_7 to PC IRLRACCESS_C_10 N 46° 57′ 14.40" E Dist 91.4959

Curve Data

Curve IRLRACCESS_C_10

P.I. Station	3+11.49	N	13,731,703.5517	E	2,152,702.9746
Delta =	51° 35′ 28.27" (RT)				
Degree =	190° 59′ 09.35"				
Tangent =	14.4997				
Length =	27.0131				
Radius =	30.0000				
External =	3.3203				
Long Chord =	26.1097				
Mid. Ord. =	2.9894				
P.C. Station	2+96.99	N	13,731,693.6544	E	2,152,692.3782
P.T. Station	3+24.00	N	13,731,701.3972	E	2,152,717.3134
C.C.		N	13,731,671.7303	E	2,152,712.8557
Back =	N 46° 57′ 14.40" E				
Ahead =	S 81° 27′ 17.33" E				
Chord Bear =	N 72° 44′ 58.54" E				

Course from PT IRLRACCESS_C_10 to 128 S 81° 27′ 17.33" E Dist 26.2193

Point 128 N 13,731,697.5013 E 2,152,743.2417 Sta 3+50.22

==========

Ending chain IRLRACCESS_CL description

STATE OF TEXAS
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1/27/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

HORIZONTAL & VERTICAL GEOMETRY REPORTS

SHEET 4 OF 7

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		86
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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IRA LEE ACCESS RD VERTICAL GEOMETRY

```
<*       9   PRINT PROFILE IRLRACES_P


Beginning profile IRLRACES_P description:
Feature: Road_Centerline
================================================================================

               STATION       ELEV      GRADE    TOTAL L     BACK L     AHEAD L

VPI       1      0+30.00   688.1700

VPI       2      0+36.00   688.0500    -2.0000

VPC              0+42.50   687.6585    -6.0227  K =  21.9  SSD = 352.8
VPI       3      0+80.00   685.4000             75.0000    37.5000    37.5000
VPT              1+17.50   681.8583    -9.4444

VPI       4      1+25.00   681.1500    -9.4444

================================================================================
Ending profile IRLRACES_P description
```

CORRINE DR ACCESS RD HORIZONTAL GEOMETRY

```
<*       1   DESCRIBE CHAIN CORACCESS_CL

Chain CORACCESS_CL contains:
 141 CUR CORACCESS_CL_3 CUR CORACCESS_CL_6 CUR CORACCESS_CL_9 CUR CORACCESS_CL_-
12 CUR CORACCESS_CL_15 CUR CORACCESS_CL_18 CUR CORACCESS_CL_21 142

Beginning chain CORACCESS_CL description
Feature: Road_Centerline
================================================================================

Point 141             N  13,731,382.0452 E   2,152,448.4876 Sta       0+00.00

Course from 141 to PC CORACCESS_CL_3 S 36° 27' 17.33" E Dist 34.7069

                                   Curve Data
                                  *----------*
Curve CORACCESS_CL_1
P.I.  Station             0+64.71  N     13,731,329.9998  E      2,152,486.9357
Delta       =      90° 00' 00.00" (LT)
Degree      =     190° 59' 09.35"
Tangent     =             30.0000
Length      =             47.1239
Radius      =             30.0000
External    =             12.4264
Long Chord  =             42.4264
Mid. Ord.   =              8.7868
P.C.  Station             0+34.71  N     13,731,354.1295  E      2,152,469.1100
P.T.  Station             0+81.83  N     13,731,347.8254  E      2,152,511.0655
C.C.                               N     13,731,371.9552  E      2,152,493.2398
Back        = S  36° 27' 17.33" E
Ahead       = N  53° 32' 42.67" E
Chord Bear  = S  81° 27' 17.33" E

Course from PT CORACCESS_CL_3 to PC CORACCESS_CL_6 N 53° 32' 42.67" E Dist 52.0799

                                   Curve Data
                                  *----------*
Curve CORACCESS_CL_2
P.I.  Station             1+44.57  N     13,731,385.1056  E      2,152,561.5299
Delta       =       2° 26' 34.96" (RT)
Degree      =      11° 27' 32.96"
Tangent     =             10.6614
Length      =             21.3196
Radius      =            500.0000
External    =              0.1137
Long Chord  =             21.3180
Mid. Ord.   =              0.1136
P.C.  Station             1+33.91  N     13,731,378.7707  E      2,152,552.9546
P.T.  Station             1+55.23  N     13,731,391.0692  E      2,152,570.3674
C.C.                               N     13,730,976.6078  E      2,152,850.0490
Back        = N  53° 32' 42.67" E
Ahead       = N  55° 59' 17.64" E
Chord Bear  = N  54° 46' 00.16" E
```

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SL 368
AT SALADO CREEK

HORIZONTAL & VERTICAL GEOMETRY REPORTS

SHEET 5 OF 7

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		87
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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CORRINE DR ACCESS RD HORIZONTAL GEOMETRY (CONT.)

Course from PT CORACCESS_CL_6 to PC CORACCESS_CL_9 N 55° 59′ 17.64" E Dist 71.0057

Curve Data

Curve CORACCESS_CL_3

P.I. Station		2+28.23	N	13,731,431.9002	E	2,152,630.8750
Delta	=	0° 54′ 43.24" (RT)				
Degree	=	22° 55′ 05.92"				
Tangent	=	1.9897				
Length	=	3.9794				
Radius	=	250.0000				
External	=	0.0079				
Long Chord	=	3.9794				
Mid. Ord.	=	0.0079				
P.C. Station		2+26.24	N	13,731,430.7872	E	2,152,629.2256
P.T. Station		2+30.22	N	13,731,432.9867	E	2,152,632.5418
C.C.			N	13,731,223.5565	E	2,152,769.0664
Back	= N	55° 59′ 17.64" E				
Ahead	= N	56° 54′ 00.87" E				
Chord Bear	= N	56° 26′ 39.25" E				

Course from PT CORACCESS_CL_9 to PC CORACCESS_CL_12 N 56° 54′ 00.87" E Dist 54.1611

Curve Data

Curve CORACCESS_CL_4

P.I. Station		3+08.66	N	13,731,475.8275	E	2,152,698.2601
Delta	=	5° 33′ 43.02" (LT)				
Degree	=	11° 27′ 32.96"				
Tangent	=	24.2877				
Length	=	48.5372				
Radius	=	500.0000				
External	=	0.5895				
Long Chord	=	48.5181				
Mid. Ord.	=	0.5888				
P.C. Station		2+84.38	N	13,731,462.5641	E	2,152,677.9138
P.T. Station		3+32.91	N	13,731,491.0005	E	2,152,717.2250
C.C.			N	13,731,881.4246	E	2,152,404.8646
Back	= N	56° 54′ 00.87" E				
Ahead	= N	51° 20′ 17.85" E				
Chord Bear	= N	54° 07′ 09.36" E				

Course from PT CORACCESS_CL_12 to PC CORACCESS_CL_15 N 51° 20′ 17.85" E Dist 37.5051

Curve Data

Curve CORACCESS_CL_5

P.I. Station		3+98.79	N	13,731,532.1573	E	2,152,768.6675
Delta	=	6° 29′ 46.14" (RT)				
Degree	=	11° 27′ 32.96"				
Tangent	=	28.3752				
Length	=	56.6896				
Radius	=	500.0000				
External	=	0.8045				

CORRINE DR ACCESS RD HORIZONTAL GEOMETRY (CONT.)

Long Chord	=	56.6593				
Mid. Ord.	=	0.8032				
P.C. Station		3+70.42	N	13,731,514.4307	E	2,152,746.5108
P.T. Station		4+27.11	N	13,731,547.2634	E	2,152,792.6875
C.C.			N	13,731,124.0067	E	2,153,058.8713
Back	= N	51° 20′ 17.85" E				
Ahead	= N	57° 50′ 03.99" E				
Chord Bear	= N	54° 35′ 10.92" E				

Course from PT CORACCESS_CL_15 to PC CORACCESS_CL_18 N 57° 50′ 03.99" E Dist 224.3593

Curve Data

Curve CORACCESS_CL_6

P.I. Station		6+98.16	N	13,731,691.5621	E	2,153,022.1358
Delta	=	10° 40′ 11.99" (LT)				
Degree	=	11° 27′ 32.96"				
Tangent	=	46.6917				
Length	=	93.1133				
Radius	=	500.0000				
External	=	2.1754				
Long Chord	=	92.9788				
Mid. Ord.	=	2.1660				
P.C. Station		6+51.47	N	13,731,666.7050	E	2,152,982.6107
P.T. Station		7+44.58	N	13,731,723.3076	E	2,153,056.3752
C.C.			N	13,732,089.9617	E	2,152,716.4269
Back	= N	57° 50′ 03.99" E				
Ahead	= N	47° 09′ 52.00" E				
Chord Bear	= N	52° 29′ 58.00" E				

Course from PT CORACCESS_CL_18 to PC CORACCESS_CL_21 N 47° 09′ 52.00" E Dist 248.5692

Curve Data

Curve CORACCESS_CL_7

P.I. Station		10+35.49	N	13,731,921.0973	E	2,153,269.7029
Delta	=	86° 30′ 50.44" (LT)				
Degree	=	127° 19′ 26.24"				
Tangent	=	42.3421				
Length	=	67.9479				
Radius	=	45.0000				
External	=	16.7888				
Long Chord	=	61.6745				
Mid. Ord.	=	12.2271				
P.C. Station		9+93.15	N	13,731,892.3090	E	2,153,238.6530
P.T. Station		10+61.10	N	13,731,953.8401	E	2,153,242.8558
C.C.			N	13,731,925.3078	E	2,153,208.0577
Back	= N	47° 09′ 52.00" E				
Ahead	= N	39° 20′ 58.45" W				
Chord Bear	= N	3° 54′ 26.78" E				

Course from PT CORACCESS_CL_21 to 142 N 39° 20′ 58.44" W Dist 17.2212

Point 142 N 13,731,967.1571 E 2,153,231.9367 Sta 10+78.32

==========

Ending chain CORACCESS_CL description

STATE OF TEXAS
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1/27/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

HORIZONTAL & VERTICAL GEOMETRY REPORTS

SHEET 6 OF 7

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		88
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

CORRINE DR ACCESS RD SOUTH VERTICAL GEOMETRY

<* 11 PRINT PROFILE CORACESSS_P

Beginning profile CORACESSS_P description:
Feature: Road_Centerline

		STATION	ELEV	GRADE	TOTAL L	BACK L	AHEAD L
VPI	1	0+30.00	687.8000				
VPC		0+55.00	687.3357	-1.8571	K = 11.6	SSD = 184.4	
VPI	2	1+00.00	686.5000		90.0000	45.0000	45.0000
VPT		1+45.00	682.1800	-9.6000			
VPI	3	1+50.00	681.7000	-9.6000			

Ending profile CORACESSS_P description

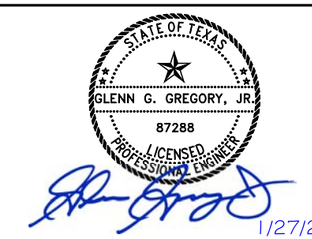
CORRINE DR ACCESS RD NORTH VERTICAL GEOMETRY

<* 2 PRINT PROFILE CORACCESSN_P

Beginning profile CORACCESSN_P description:
Feature: Road_Centerline

		STATION	ELEV	GRADE	TOTAL L	BACK L	AHEAD L
VPI	1	9+00.00	682.5350				
VPI	2	9+89.91	687.3900	5.3997			

Ending profile CORACCESSN_P description



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HORIZONTAL & VERTICAL GEOMETRY REPORTS

SHEET 7 OF 7

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		89
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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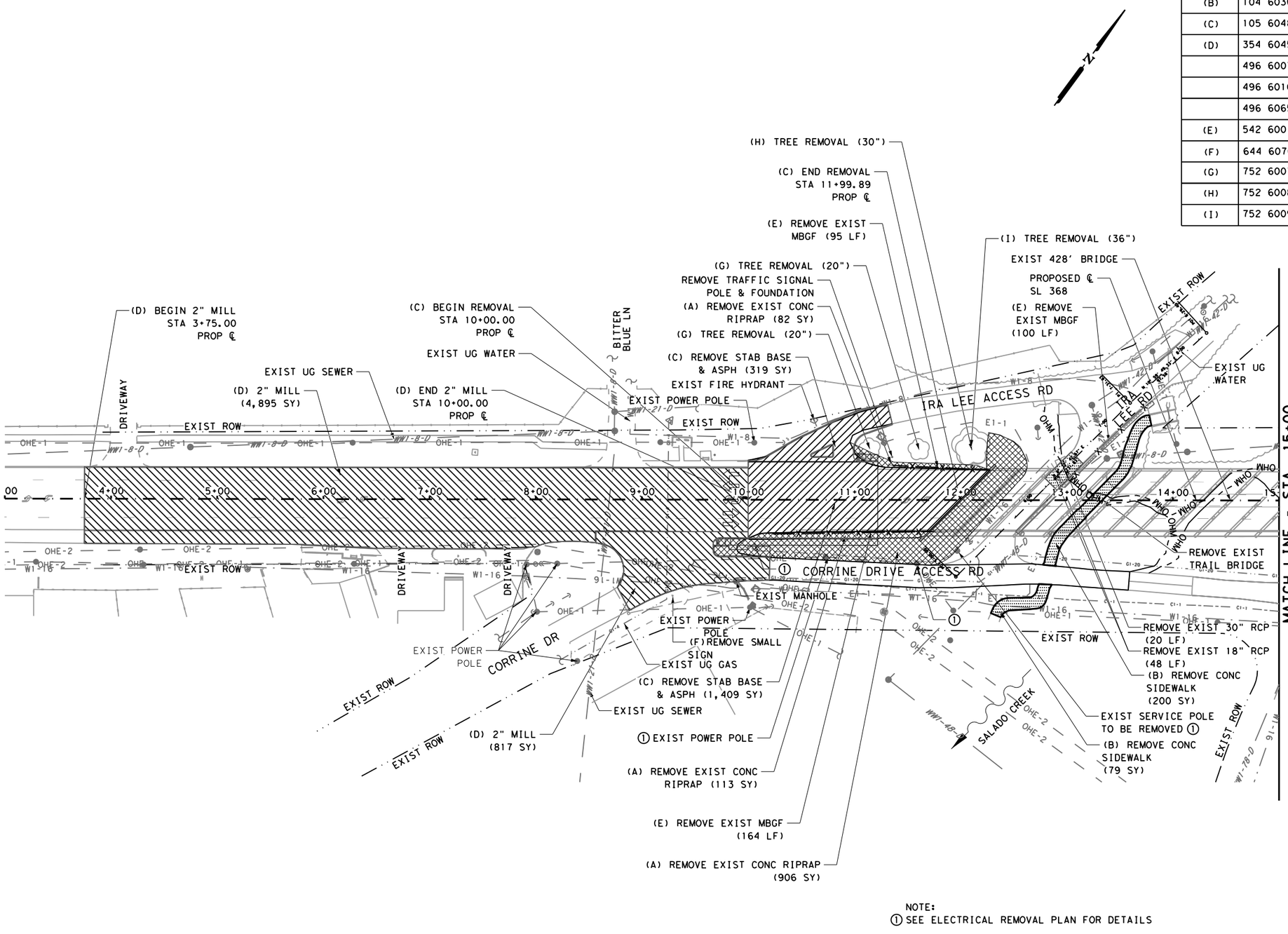
ITEM NO.	ITEM NO.	DESCRIPTION	UNIT	QTY
(A)	104 6009	REMOVING CONC (RIPRAP)	SY	1101
(B)	104 6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	279
(C)	105 6048	REMOVING STAB BASE & ASPH PAV (4"-11")	SY	1728
(D)	354 6045	PLANE ASPH CONC PAV (2")	SY	5711
	496 6007	REMOV STR (PIPE)	LF	68
	496 6010	REMOV STR (BRIDGE 100 - 499 FT LENGTH)	EA	1
	496 6065	REMOV STR(LRG PED BRG) 0 - 50 FT LENGTH)	EA	1
(E)	542 6001	REMOVE METAL BEAM GUARD FENCE	LF	359
(F)	644 6076	REMOVE SM RD SN SUP&AM	EA	1
(G)	752 6007	TREE REMOVAL (18"-24" DIA)	EA	2
(H)	752 6008	TREE REMOVAL (24"-30" DIA)	EA	1
(I)	752 6009	TREE REMOVAL (30"-36" DIA)	EA	1



NOTE:
① SEE ELECTRICAL REMOVAL PLAN FOR DETAILS

LEGEND

- (A) REMOVE CONCRETE RIPRAP
- (B) REMOVE CONCRETE SIDEWALK
- (C) REMOVE STAB BASE & ASPH
- (D) MILL (2")
- —X— (E) REMOVE METAL BEAM GUARD FENCE

0 50' 100'
SCALE: 1" = 100'

STATE OF TEXAS
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SL 368
AT SALADO CREEK

REMOVAL LAYOUT

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		90
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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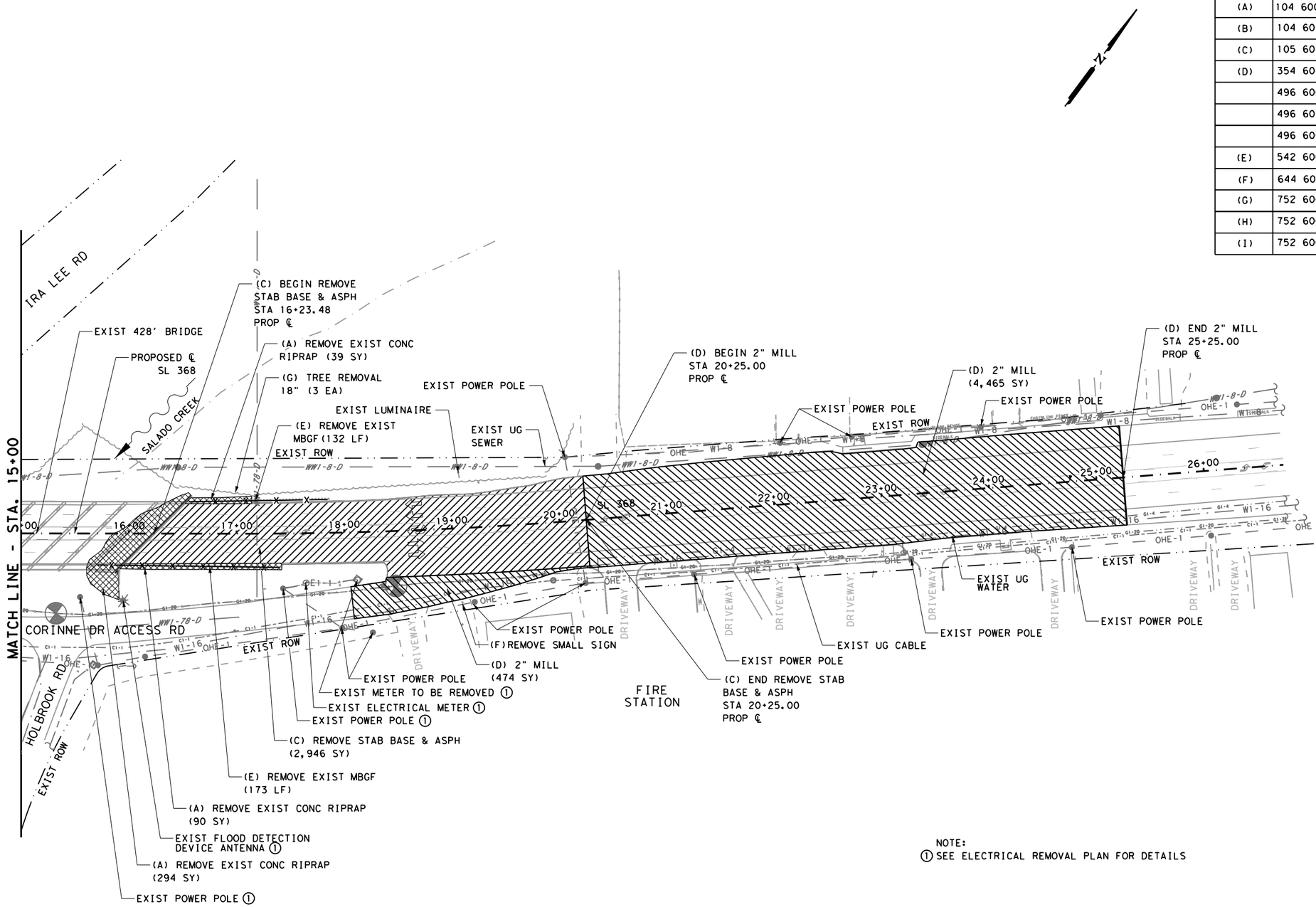
ITEM NO.	ITEM NO.	DESCRIPTION	UNIT	QTY
(A)	104 6009	REMOVING CONC (RIPRAP)	SY	423
(B)	104 6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	
(C)	105 6048	REMOVING STAB BASE & ASPH PAV (4"-11")	SY	2946
(D)	354 6045	PLANE ASPH CONC PAV (2")	SY	5449
	496 6007	REMOV STR (PIPE)	LF	
	496 6010	REMOV STR (BRIDGE 100 - 499 FT LENGTH)	EA	
	496 6065	REMOV STR(LRG PED BRG) 0 - 50 FT LENGTH)	EA	
(E)	542 6001	REMOVE METAL BEAM GUARD FENCE	LF	305
(F)	644 6076	REMOVE SM RD SN SUP&AM	EA	1
(G)	752 6007	TREE REMOVAL (18"-24" DIA)	EA	3
(H)	752 6008	TREE REMOVAL (24"-30" DIA)	EA	
(I)	752 6009	TREE REMOVAL (30"-36" DIA)	EA	



NOTE:
① SEE ELECTRICAL REMOVAL PLAN FOR DETAILS

LEGEND

- (A) REMOVE CONCRETE RIPRAP
- (B) REMOVE CONCRETE SIDEWALK
- (C) REMOVE STAB BASE & ASPH
- (D) MILL (2")
- —X— (E) REMOVE METAL BEAM GUARD FENCE

0 50' 100'

SCALE: 1" = 100'

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SL 368
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REMOVAL LAYOUT

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		91
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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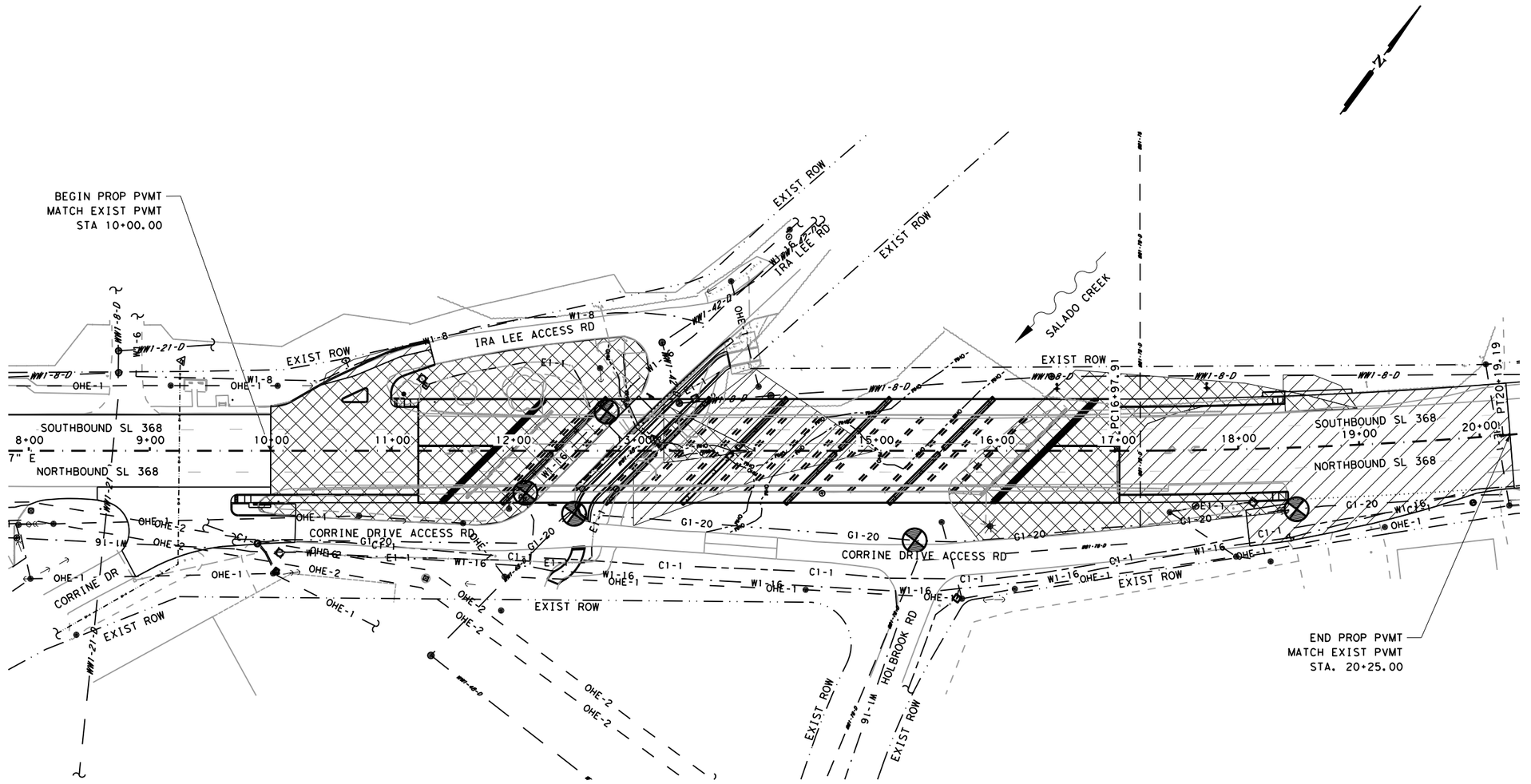
VOLUMES (CY)		
	EARTHWORK	
*	CUT	8051
*	FILL	696

* FOR CONTRACTOR'S INFORMATION ONLY



LEGEND

- CUT
- FILL
- EXIST ROW
- DIRECTION OF FLOW

NOTES:
100 YR FLOOD ELEVATION = 684.77' NAVD88

0 50' 100'

SCALE: 1" = 100'

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SL 368
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CUT AND FILL

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		92
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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BEGIN PROJECT &
2" MILL & OVERLAY
MATCH EXIST PVMT
STA 3+75.00
X = 2152008.4419
Y = 13731056.9652

EXIST FENCE
EXIST ROW
EXIST SIDEWALK
EXIST UG SEWER
EXIST POWER POLE
EXIST OH ELECTRIC
POT2+51.52
3+00
4+00
5+00
6+00
7+00
8+00
SL 368
60' ROADWAY
VAR WIDTH SHLDR
12' 12' 12' 12'
(-)2.00%
(+)2.00%
EXIST ℄ SL 368
PROP ℄ SL 368
SAW CUT 2" DEPTH
VIA BUS STOP
EXIST MANHOLE
EXIST POWER POLE TO REMAIN
EXIST OH ELECTRIC TRANSMISSION
EXIST UG WATER
DRIVEWAY
CORRINE DR
EXIST EDGE OF PVMT
EXIST GAS LINE
MATCHLINE STA 8+50

BEGIN PROJECT &
2" MILL & OVERLAY
MATCH EXIST PVMT
STA 3+75.00
EXIST GRADE @ EXIST ℄ SL 368
EXIST GRADE @ PROP ℄ SL 368
EXISTING
696.61
696.51
696.07
695.52
694.67
693.79
692.91
692.00
690.86
689.86
689.11
688.59
700
695
690
685
680
675
670
665
660
3+00
4+00
5+00
6+00
7+00
8+00
MATCHLINE STA 8+50

ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	4.75
110 6001	EXCAVATION (ROADWAY)	CY	
132 6002	EMBANKMENT (FINAL) DENS CONT) (TY A)	CY	
216 6001	PROOF ROLLING	HR	
247 6475	FL BS (CIP)(TY D GR 1-2, OR 5) FINAL POS	CY	
247 6487	FL BS (CMP IN PLC) (TY D GR 1-2) (24")	SY	
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	
340 6011	D-GR HMA(SQ) TY-B PG64-22	TON	
420 6011	CL B CONC (FLUME)	CY	
432 6001	RIPRAP (CONC)(4 IN)	CY	
432 6045	RIPRAP (MOW STRIP)(4 IN)	CY	
529 6001	CONC CURB (TY I)	LF	
531 6001	CONC SIDEWALKS(4")	SY	
531 6013	CURB RAMPS (TY 10)	EA	
540 6002	MTL W-BEAM GD FEN (STEEL POST)	LF	
540 6007	MTL BEAM GD FEN TRANS (TL-2)	EA	
544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	
545 6026	CRASH CUSHION ATTEN (INSTALL)(QUAD)(N)	EA	
3077 6053	SP MIXES SP-D SAC-B PG70-22	TON	448
3077 6075	TACK COAT	GAL	389
3085 6001	UNDERSEAL COAT	GAL	

LEGEND

- BORING
- EXIST ROW
- EXIST DIRECTION OF TRAFFIC
- PROP DIRECTION OF TRAFFIC
- FLOW ARROW
- C1 — EXIST UNDERGROUND CABLE
- G1 — EXIST UNDERGROUND GAS
- WW1 — EXIST UNDERGROUND SANITARY SEWER
- W1 — EXIST UNDERGROUND WATER
- OHE — EXIST OVERHEAD ELECTRIC
- OHM — ORDINARY HIGH WATER MARK
- PROP MBGF & SGT
- PROP RETAINING WALL
- LIMITS OF BRIDGE
- LIMITS OF MILL AND OVERLAY
- LIMITS OF ASPHALT PAVEMENT

0 25' 50'
SCALE: 1" = 50' HORZ
1" = 10' VERT

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED PROFESSIONAL ENGINEER
1/27/2021

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TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

PLAN & PROFILE
(STA 3+75.00 TO 8+50.00)

SHEET 1 OF 4

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		93
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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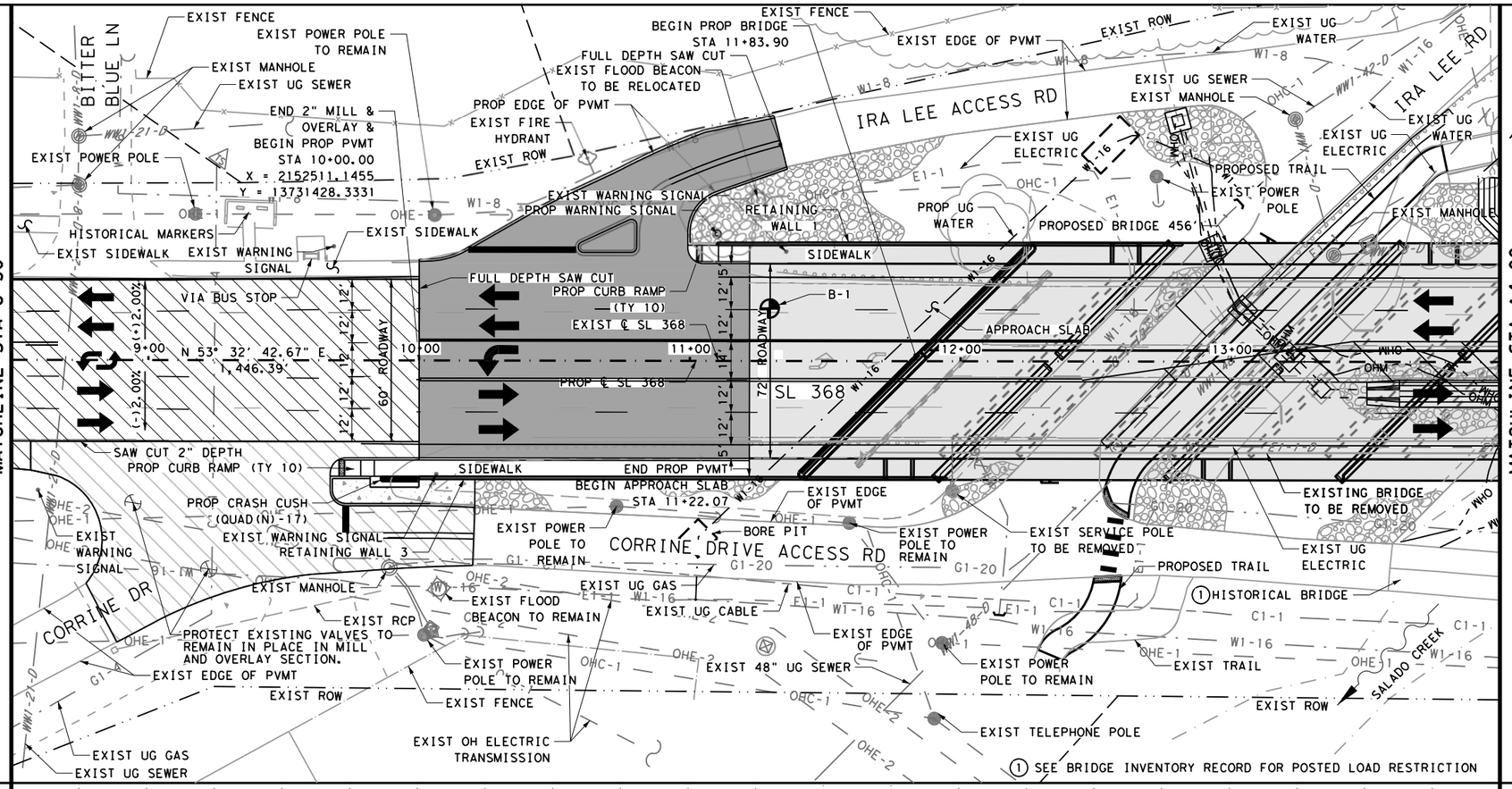

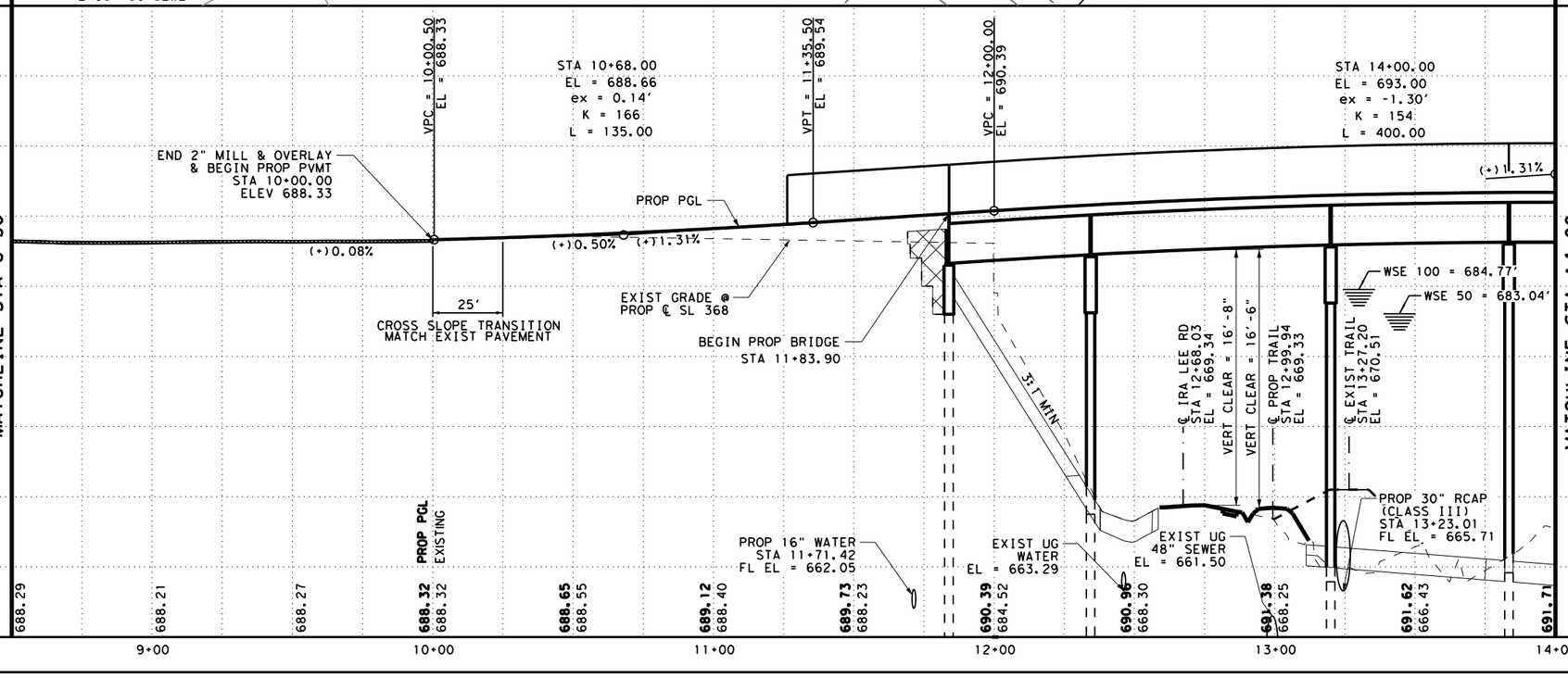

ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	5.50
110 6001	EXCAVATION (ROADWAY)	CY	2898
132 6002	EMBANKMENT (FINAL) DENS CONT) (TY A)	CY	461
216 6001	PROOF ROLLING	HR	30
247 6475	FL BS (CIP)(TY D GR 1-2, OR 5) FINAL POS	CY	35
247 6487	FL BS (CMP IN PLC) (TY D GR 1-2) (24")	SY	1721
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	516
340 6011	D-GR HMA(SQ) TY-B PG64-22	TON	465
420 6011	CL B CONC (FLUME)	CY	
432 6001	RIPRAP (CONC)(4 IN)	CY	6
432 6045	RIPRAP (MOW STRIP)(4 IN)	CY	1
529 6001	CONC CURB (TY I)	LF	155
531 6001	CONC SIDEWALKS(4")	SY	97
531 6013	CURB RAMPS (TY 10)	EA	2
540 6002	MTL W-BEAM GD FEN (STEEL POST)	LF	
540 6007	MTL BEAM GD FEN TRANS (TL-2)	EA	
544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	
545 6026	CRASH CUSHION ATTEN (INSTALL)(QUAD)(N)	EA	1
3077 6053	SP MIXES SP-D SAC-B PG70-22	TON	233
3077 6075	TACK COAT	GAL	177
3085 6001	UNDERSEAL COAT	GAL	344

LEGEND

- BORING
- EXIST ROW
- EXIST DIRECTION OF TRAFFIC
- PROP DIRECTION OF TRAFFIC
- FLOW ARROW
- C1 — EXIST UNDERGROUND CABLE
- G1 — EXIST UNDERGROUND GAS
- WW1 — EXIST UNDERGROUND SANITARY SEWER
- W1 — EXIST UNDERGROUND WATER
- OHE — EXIST OVERHEAD ELECTRIC
- OHM — ORDINARY HIGH WATER MARK
- PROP MBGF & SGT
- PROP RETAINING WALL
- LIMITS OF BRIDGE
- LIMITS OF MILL AND OVERLAY
- LIMITS OF ASPHALT PAVEMENT

0 25' 50'
SCALE: 1" = 50' HORZ
1" = 10' VERT

STATE OF TEXAS
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PROFESSIONAL ENGINEER
1/27/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

PLAN & PROFILE
(STA 8+50.00 TO 14+00.00)

SHEET 2 OF 4

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		94
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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HORIZONTAL CURVE SL368-CL-3

PI STATION	= 18+58.64
DELTA	= 4° 36' 07.30" (LT)
DEGREE OF CURVE	= 1° 25' 56.62"
TANGENT	= 160.73
LENGTH	= 321.28
RADIUS	= 4,000.00
PC STATION	= 16+97.91
PT STATION	= 20+19.19

ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	5.50
110 6001	EXCAVATION (ROADWAY)	CY	4441
132 6002	EMBANKMENT (FINAL) DENS CONT) (TY A)	CY	227
216 6001	PROOF ROLLING	HR	30
247 6475	FL BS (CIP)(TY D GR 1-2, OR 5) FINAL POS	CY	61
247 6487	FL BS (CMP IN PLC) (TY D GR 1-2) (24")	SY	1825
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	548
340 6011	D-GR HMA(SQ) TY-B PG64-22	TON	970
420 6011	CL B CONC (FLUME)	CY	13
432 6001	RIPRAP (CONC)(4 IN)	CY	
432 6045	RIPRAP (MOW STRIP)(4 IN)	CY	5
529 6001	CONC CURB (TY I)	LF	269
531 6001	CONC SIDEWALKS(4")	SY	176
531 6013	CURB RAMPS (TY 10)	EA	2
540 6002	MTL W-BEAM GD FEN (STEEL POST)	LF	12.5
540 6007	MTL BEAM GD FEN TRANS (TL-2)	EA	1
544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
545 6026	CRASH CUSHION ATTEN (INSTALL)(QUAD)(N)	EA	
3077 6053	SP MIXES SP-D SAC-B PG70-22	TON	248
3077 6075	TACK COAT	GAL	42
3085 6001	UNDERSEAL COAT	GAL	365

LEGEND

- BORING
- EXIST ROW
- EXIST DIRECTION OF TRAFFIC
- PROP DIRECTION OF TRAFFIC
- FLOW ARROW
- C1 — EXIST UNDERGROUND CABLE
- G1 — EXIST UNDERGROUND GAS
- WW1 — EXIST UNDERGROUND SANITARY SEWER
- W1 — EXIST UNDERGROUND WATER
- OHE — EXIST OVERHEAD ELECTRIC
- OHM — ORDINARY HIGH WATER MARK
- PROP MBGF & SGT
- PROP RETAINING WALL
- LIMITS OF BRIDGE
- LIMITS OF MILL AND OVERLAY
- LIMITS OF ASPHALT PAVEMENT

① SEE BRIDGE INVENTORY RECORD FOR POSTED LOAD RESTRICTION

SCALE: 1" = 50' HORZ
1" = 10' VERT

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Texas Department of Transportation

SL 368
AT SALADO CREEK

PLAN & PROFILE
(STA 14+00.00 TO 19+50.00)

SHEET 3 OF 4

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		95
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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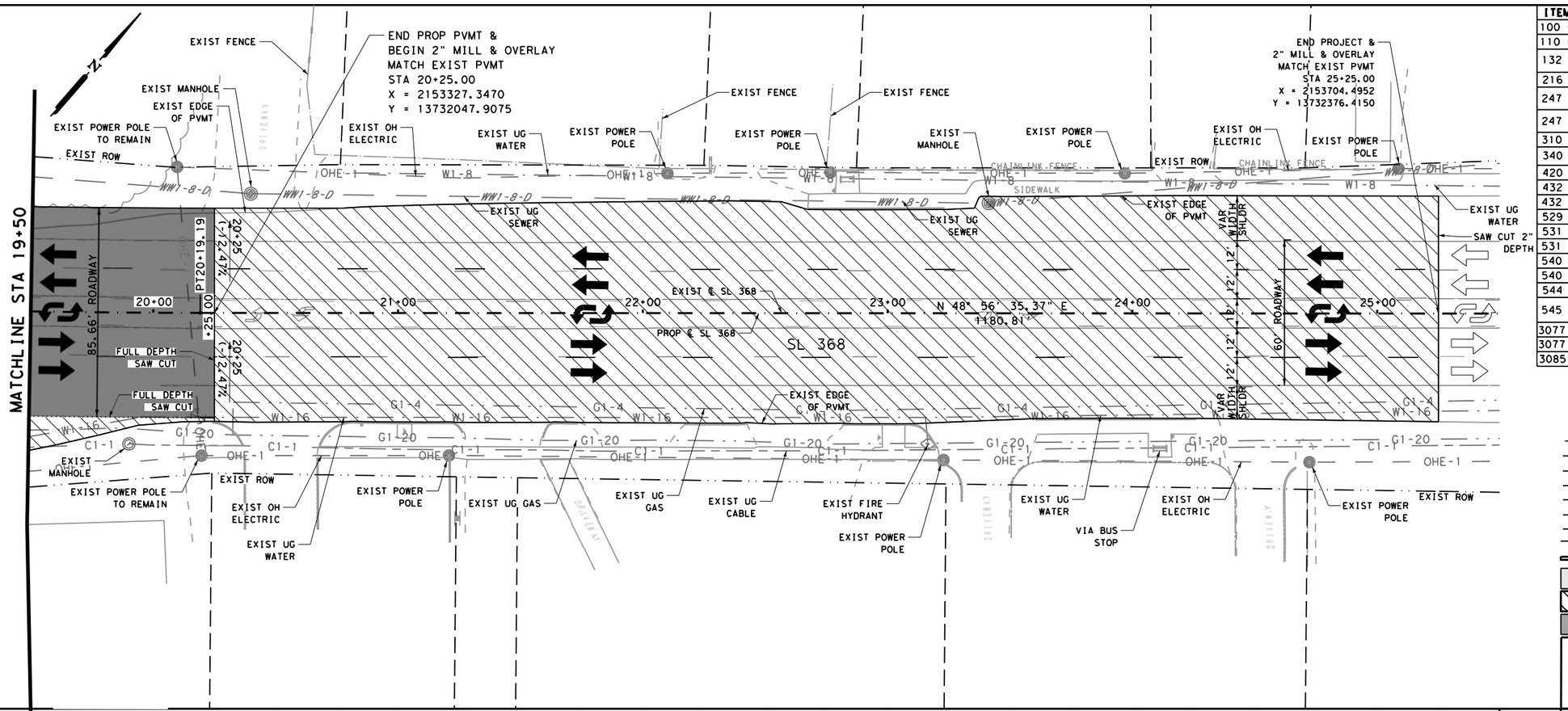

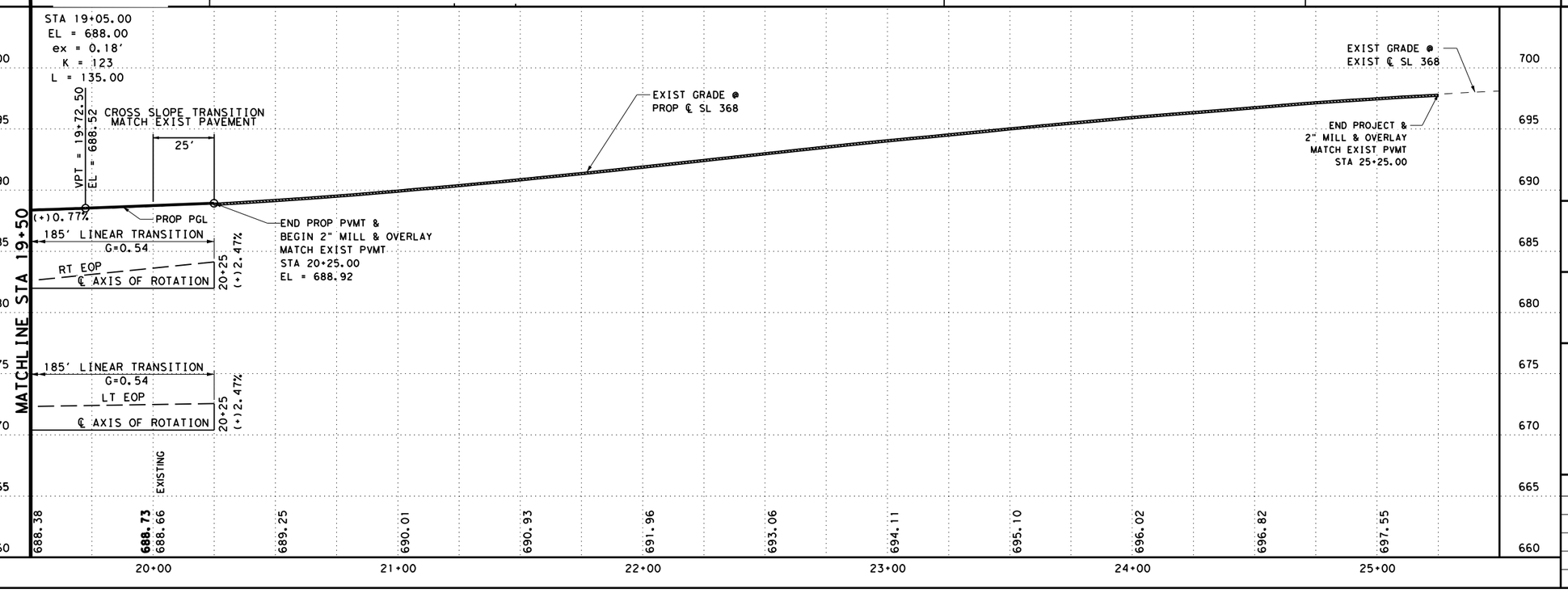

ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	5.75
110 6001	EXCAVATION (ROADWAY)	CY	712
132 6002	EMBANKMENT (FINAL) DENS CONT) (TY A)	CY	8
216 6001	PROOF ROLLING	HR	15
247 6475	FL BS (CIP)(TY D GR 1-2, OR 5) FINAL POS	CY	
247 6487	FL BS (CMP IN PLC) (TY D GR 1-2) (24")	SY	
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	
340 6011	D-GR HMA(SQ) TY-B PG64-22	TON	315
420 6011	CL B CONC (FLUME)	CY	
432 6001	RIPRAP (CONC)(4 IN)	CY	
432 6045	RIPRAP (MOW STRIP)(4 IN)	CY	
529 6001	CONC CURB (TY I)	LF	
531 6001	CONC SIDEWALKS(4")	SY	
531 6013	CURB RAMPS (TY 10)	EA	
540 6002	MTL W-BEAM GD FEN (STEEL POST)	LF	
540 6007	MTL BEAM GD FEN TRANS (TL-2)	EA	
544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	
545 6026	CRASH CUSHION ATTEN (INSTALL)(QUAD)(N)	EA	
3077 6053	SP MIXES SP-D SAC-B PG70-22	TON	655
3077 6075	TACK COAT	GAL	503
3085 6001	UNDERSEAL COAT	GAL	

LEGEND

- BORING
- EXIST ROW
- EXIST DIRECTION OF TRAFFIC
- PROP DIRECTION OF TRAFFIC
- FLOW ARROW
- C1 — EXIST UNDERGROUND CABLE
- G1 — EXIST UNDERGROUND GAS
- WW1 — EXIST UNDERGROUND SANITARY SEWER
- W1 — EXIST UNDERGROUND WATER
- OHE — EXIST OVERHEAD ELECTRIC
- OHM — ORDINARY HIGH WATER MARK
- PROP MBGF & SGT
- PROP RETAINING WALL
- LIMITS OF BRIDGE
- LIMITS OF MILL AND OVERLAY
- LIMITS OF ASPHALT PAVEMENT

0 25' 50'

SCALE: 1" = 50' HORZ
1" = 10' VERT

STATE OF TEXAS
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1/27/2021

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TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

PLAN & PROFILE
(STA 19+50.00 TO 25+25.00)

SHEET 4 OF 4

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		96
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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ITEM NO.	DESCRIPTION	UNIT	QTY
432 6045	RIPRAP (MOW STRIP)(4 IN)	CY	8
540 6002	MTL W-BEAM GD FEN (STEEL POST)	LF	178
544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1

NOTES:
1. ALL STATIONS AND OFFSETS ARE FROM CENTERLINE OF IRA LEE RD UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS ARE FROM BACK OF IRA LEE RD UNLESS OTHERWISE NOTED.

① MBGF TO BE INSTALLED ALONG IRA LEE ROAD SHALL SPAN PZD DROP INLET.
② FULL DEPTH SAW CUT ALONG ALL EDGES OF EXISTING PAVEMENT.

LEGEND
- BORING
- EXIST ROW
- EXIST DIRECTION OF TRAFFIC
- PROP DIRECTION OF TRAFFIC
- FLOW ARROW
- C1 — EXIST UNDERGROUND CABLE
- G1 — EXIST UNDERGROUND GAS
- WW1 — EXIST UNDERGROUND SANITARY SEWER
- W1 — EXIST UNDERGROUND WATER
- OHE — EXIST OVERHEAD ELECTRIC
- PROP MBGF & SGT
- PROP RETAINING WALL
- LIMITS OF CONCRETE MOW STRIP

SCALE: 1" = 40' HORZ
1" = 10' VERT

STATE OF TEXAS
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1/27/2021

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TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

IRA LEE RD
PLAN & PROFILE

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		97
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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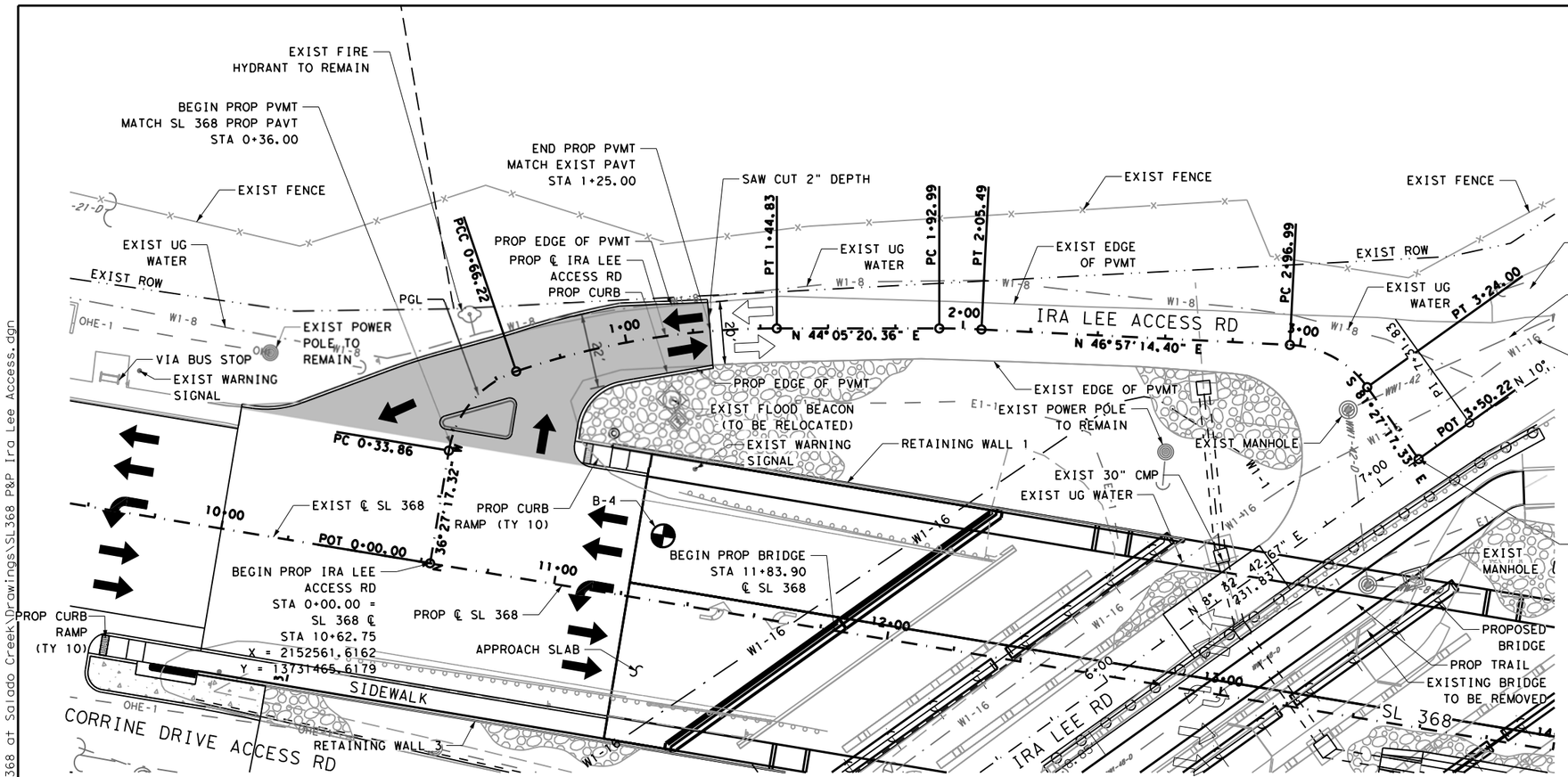
ITEM NO.	DESCRIPTION	UNIT	QTY
216 6001	PROOF ROLLING	HR	4
340 6011	D-GR HMA(SQ) TY-B PG64-22	TON	125
432 6001	RIPRAP (CONC)(4 IN)	CY	2
529 6001	CONC CURB (TY I)	LF	252
3077 6053	SP MIXES SP-D SAC-B PG70-22	TON	33
3085 6001	UNDERSEAL COURSE	GAL	57

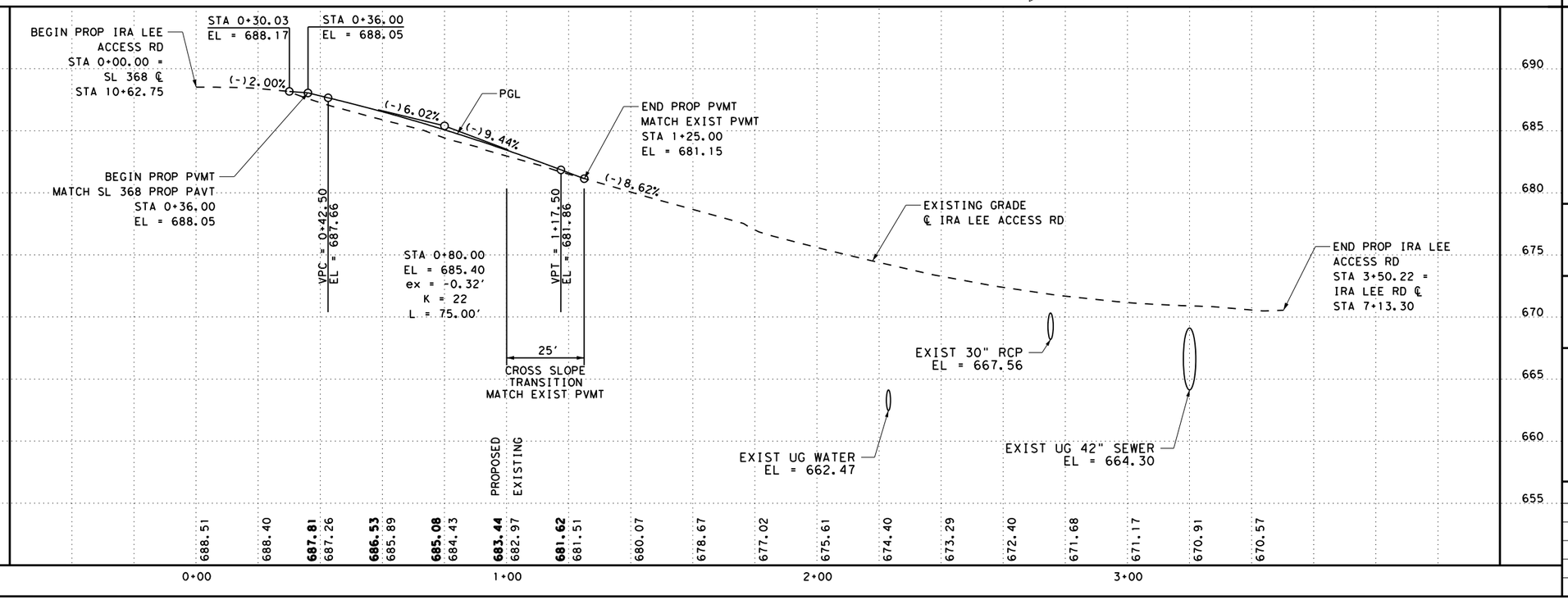
NOTES:
1. ALL STATIONS AND OFFSETS ARE FROM CENTERLINE OF IRA LEE RD UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS ARE FROM BACK OF IRA LEE RD UNLESS OTHERWISE NOTED.



LEGEND

- BORING
- EXIST ROW
- EXIST DIRECTION OF TRAFFIC
- PROP DIRECTION OF TRAFFIC
- FLOW ARROW
- C1 — EXIST UNDERGROUND CABLE
- G1 — EXIST UNDERGROUND GAS
- WW1 — EXIST UNDERGROUND SANITARY SEWER
- W1 — EXIST UNDERGROUND WATER
- OHE — EXIST OVERHEAD ELECTRIC
- PROP MBGF & SGT
- PROP RETAINING WALL
- LIMITS OF ASPHALT PAVEMENT

SCALE: 1" = 40' HORZ
1" = 10' VERT



STATE OF TEXAS
GLENN G. GREGORY, JR.
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1/27/2021

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SL 368
AT SALADO CREEK

IRA LEE ACCESS RD PLAN & PROFILE

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		98
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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ITEM NO.	DESCRIPTION	UNIT	QTY
340 6247	D-GR HMA(SQ) TYP-D PG70-22(LEVEL-UP)	TON	22
529 6001	CONC CURB (TY I)	LF	62
3077 6053	SP MIXES SP-D SAC-B PG70-22	TON	88

NOTES:
1. ALL STATIONS AND OFFSETS ARE FROM CENTERLINE OF CORRINE ACCESS RD UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS ARE FROM BACK OF CORRINE ACCESS RD UNLESS OTHERWISE NOTED.

LEGEND

- BORING
- EXIST ROW
- EXIST DIRECTION OF TRAFFIC
- PROP DIRECTION OF TRAFFIC
- FLOW ARROW
- C1 — EXIST UNDERGROUND CABLE
- G1 — EXIST UNDERGROUND GAS
- WW1 — EXIST UNDERGROUND SANITARY SEWER
- W1 — EXIST UNDERGROUND WATER
- OHE — EXIST OVERHEAD ELECTRIC
- PROP MBGF & SGT
- PROP RETAINING WALL
- LIMITS OF ASPHALT PAVEMENT
- LIMITS OF ASPHALT MILL & OVERLAY

SCALE: 1" = 40' HORZ
1" = 10' VERT

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED PROFESSIONAL ENGINEER
1/27/2021

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TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

CORRINE ACCESS RD SOUTH PLAN & PROFILE

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT	SHEET NO.
6	SEE TITLE SHEET	99

STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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ITEM NO.	DESCRIPTION	UNIT	QTY
340 6247	D-GR HMA(SQ) TY-D PG70-22 (LEVEL-UP)	TON	14
3077 6053	SP MIXES SP-D SAC-B PG70-22	TON	55

NOTES:
1. ALL STATIONS AND OFFSETS ARE FROM CENTERLINE OF CORRINE ACCESS RD UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS ARE FROM BACK OF CORRINE ACCESS RD UNLESS OTHERWISE NOTED.

LEGEND

- BORING
- EXIST ROW
- EXIST DIRECTION OF TRAFFIC
- PROP DIRECTION OF TRAFFIC
- FLOW ARROW
- C1 — EXIST UNDERGROUND CABLE
- G1 — EXIST UNDERGROUND GAS
- WW1 — EXIST UNDERGROUND SANITARY SEWER
- W1 — EXIST UNDERGROUND WATER
- OHE — EXIST OVERHEAD ELECTRIC
- PROP MBGF & SGT
- PROP RETAINING WALL
- LIMITS OF MILL AND OVERLAY

SCALE: 1" = 40' HORZ
1" = 10' VERT

STATE OF TEXAS
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1/27/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

CORRINE ACCESS RD NORTH PLAN & PROFILE

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT	SHEET NO.
6	SEE TITLE SHEET	100
STATE	DISTRICT	COUNTY
TEXAS	SAT	BEXAR
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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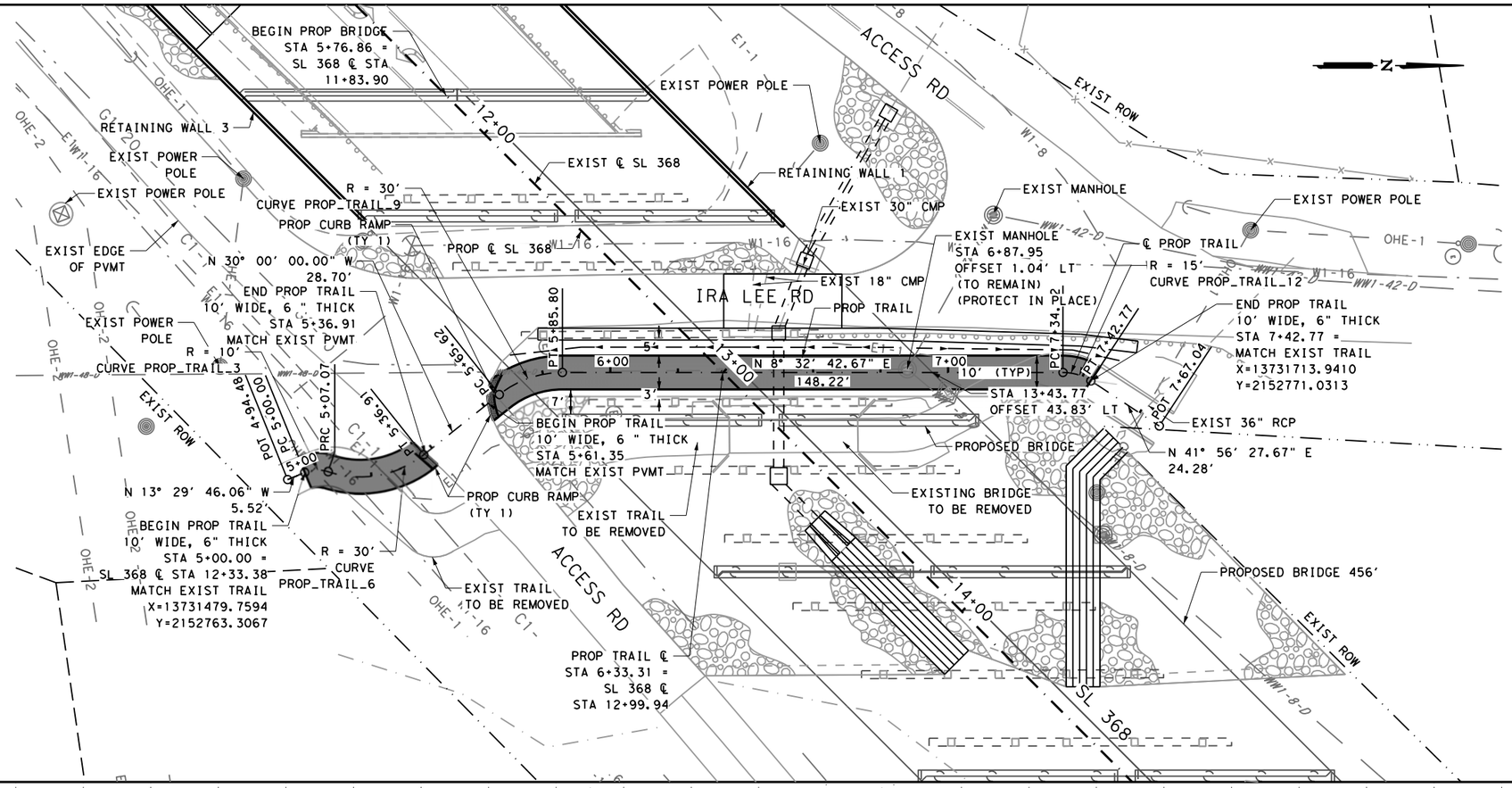
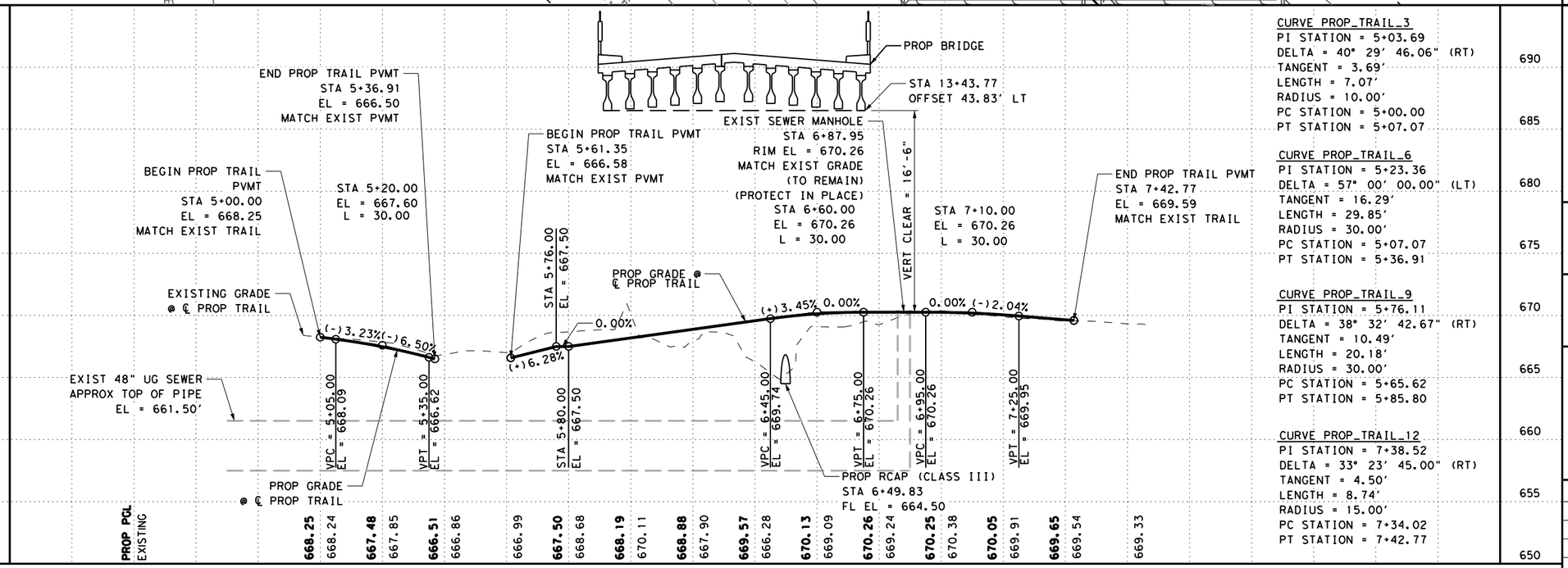
ITEM NO.	DESCRIPTION	UNIT	QTY
216 6001	PROOF ROLLING	HR	6
247 6475	FL BS (CIP)(TY D GR 1-2, OR 5)FINAL POS	CY	52
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	73
340 6011	D-GR HMA(SQ) TY-B PG64-22	TON	80
531 6004	CURB RAMPS (TY 1)	EA	2

NOTES:
1. ALL STATIONS AND OFFSETS ARE FROM CENTERLINE OF TRAIL UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS ARE FROM BACK OF TRAIL UNLESS OTHERWISE NOTED.
3. PROPOSED CURB RAMPS SHALL BE ALIGNED WITH CROSSWALK MARKINGS. SEE SIGNING & PAVEMENT MARKING SHEETS FOR ADDITIONAL INFORMATION.





LEGEND

- BORING
- EXIST ROW
- EXIST DIRECTION OF TRAFFIC
- PROP DIRECTION OF TRAFFIC
- FLOW ARROW
- C1 — EXIST UNDERGROUND CABLE
- G1 — EXIST UNDERGROUND GAS
- WW1 — EXIST UNDERGROUND SANITARY SEWER
- W1 — EXIST UNDERGROUND WATER
- OHE — EXIST OVERHEAD ELECTRIC
- PROP MBGF & SGT
- PROP RETAINING WALL
- LIMITS OF PROP TRAIL

SCALE: 1" = 40' HORZ
1" = 10' VERT

CURVE PROP_TRAIL_3
PI STATION = 5+03.69
DELTA = 40° 29' 46.06" (RT)
TANGENT = 3.69'
LENGTH = 7.07'
RADIUS = 10.00'
PC STATION = 5+00.00
PT STATION = 5+07.07

CURVE PROP_TRAIL_6
PI STATION = 5+23.36
DELTA = 57° 00' 00.00" (LT)
TANGENT = 16.29'
LENGTH = 29.85'
RADIUS = 30.00'
PC STATION = 5+07.07
PT STATION = 5+36.91

CURVE PROP_TRAIL_9
PI STATION = 5+76.11
DELTA = 38° 32' 42.67" (RT)
TANGENT = 10.49'
LENGTH = 20.18'
RADIUS = 30.00'
PC STATION = 5+65.62
PT STATION = 5+85.80

CURVE PROP_TRAIL_12
PI STATION = 7+38.52
DELTA = 33° 23' 45.00" (RT)
TANGENT = 4.50'
LENGTH = 8.74'
RADIUS = 15.00'
PC STATION = 7+34.02
PT STATION = 7+42.77

STATE OF TEXAS
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2/2/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK
PEDESTRIAN TRAIL PLAN & PROFILE
SALADO CREEK GREENWAY

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		101
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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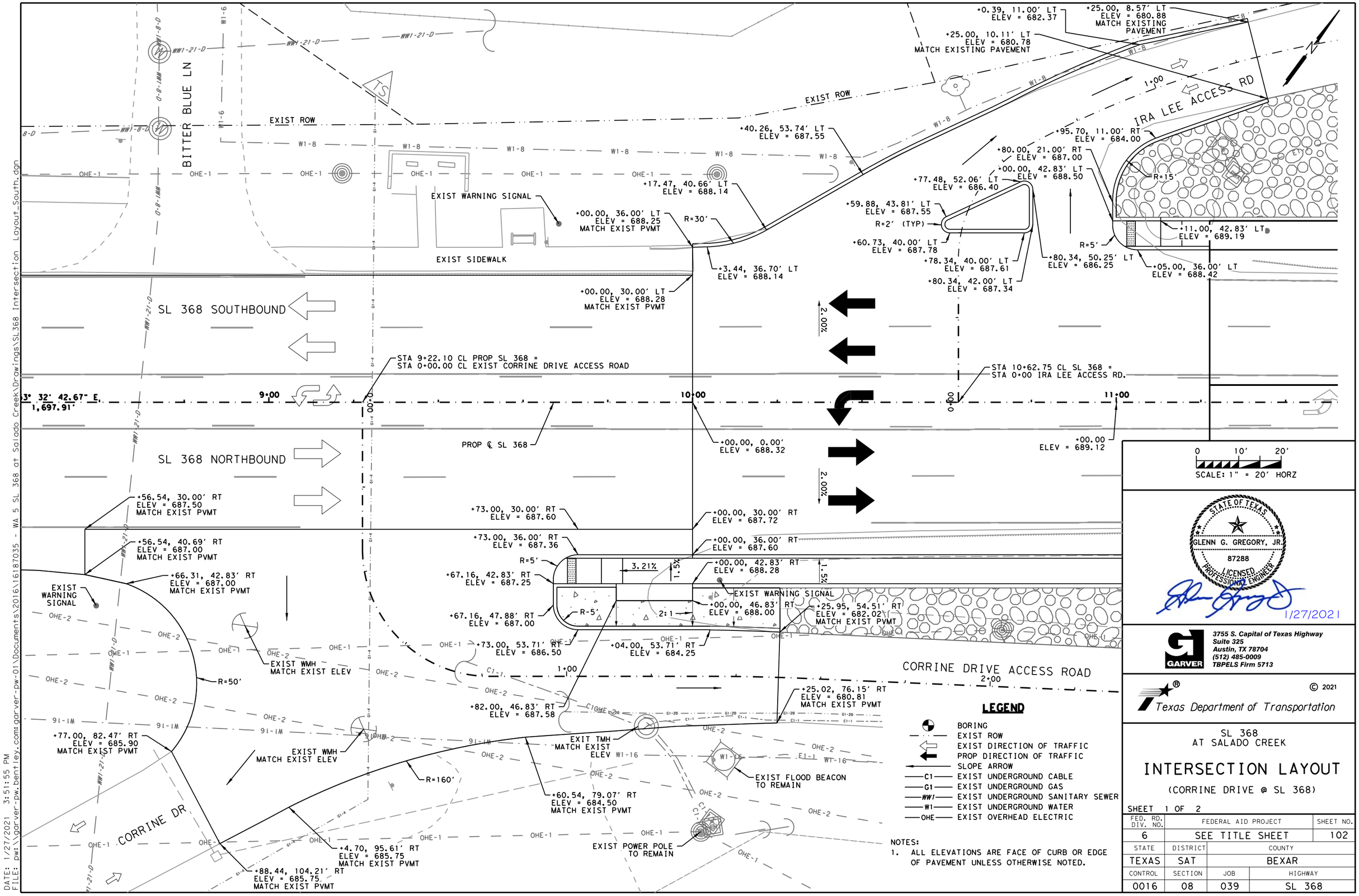

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3755 S. Capital of Texas Highway
Suite 325
Austin, TX 78704
(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

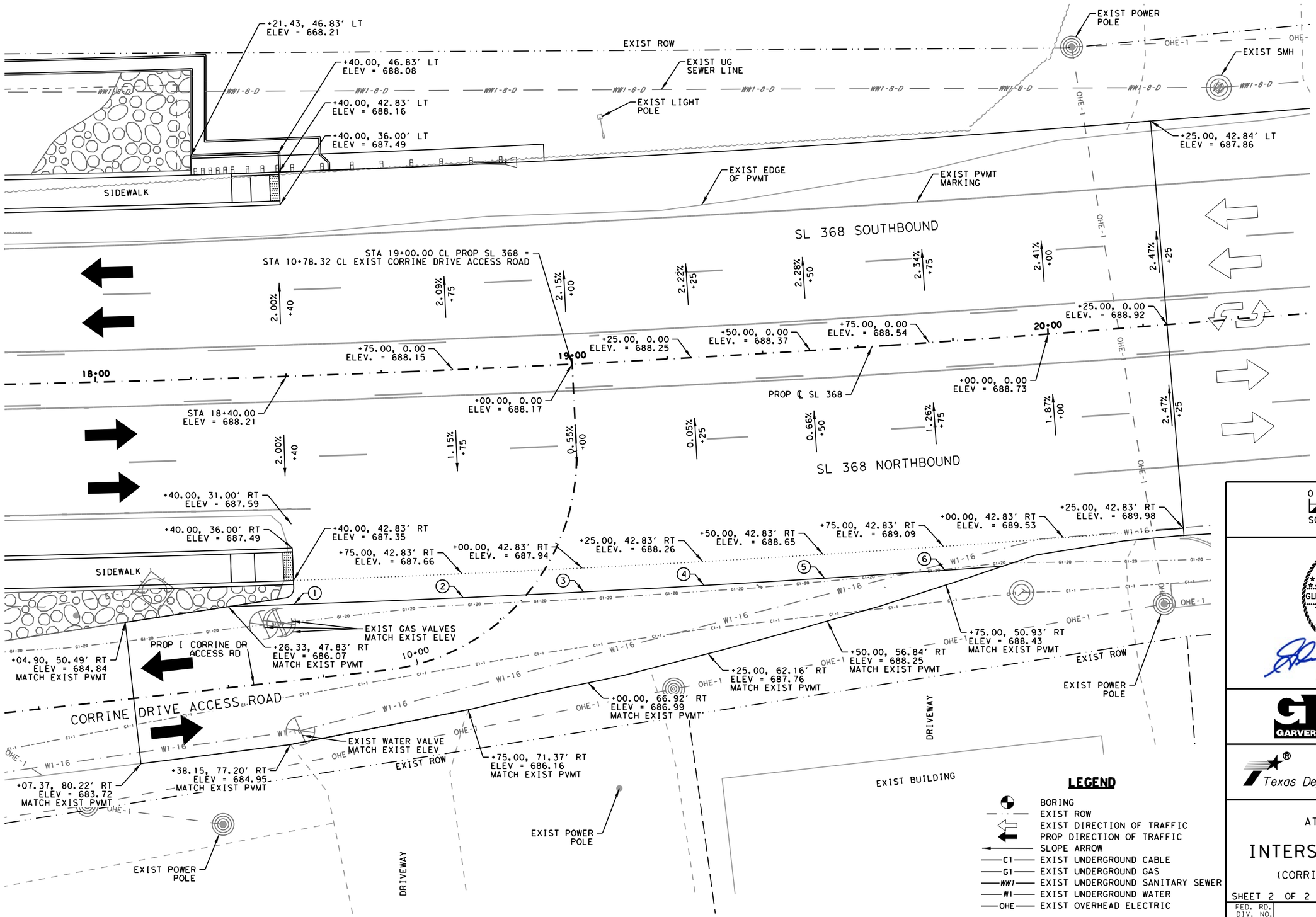
INTERSECTION LAYOUT

(CORRINE DRIVE @ SL 368)

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT	SHEET NO.
6	SEE TITLE SHEET	102

STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368



① +40.00, 47.83' RT
ELEV. = 686.76

② +75.00, 47.83' RT
ELEV. = 687.61

③ +00.00, 47.83' RT
ELEV. = 687.79

④ +25.00, 47.83' RT
ELEV. = 688.00

⑤ +50.00, 47.83' RT
ELEV. = 688.31

⑥ +75.00, 47.83' RT
ELEV. = 688.48

LEGEND

- BORING
- EXIST ROW
- EXIST DIRECTION OF TRAFFIC
- PROP DIRECTION OF TRAFFIC
- SLOPE ARROW
- C1 — EXIST UNDERGROUND CABLE
- G1 — EXIST UNDERGROUND GAS
- WW1 — EXIST UNDERGROUND SANITARY SEWER
- W1 — EXIST UNDERGROUND WATER
- OHE — EXIST OVERHEAD ELECTRIC

NOTES:
1. ALL ELEVATIONS ARE FACE OF CURB OR EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.

0 10' 20'
SCALE: 1" = 20' HORZ

STATE OF TEXAS
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LICENSED
PROFESSIONAL ENGINEER
1/27/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

INTERSECTION LAYOUT

(CORRINE DRIVE @ SL 368)

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		103
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

DATE: 1/27/2021 3:52:02 PM
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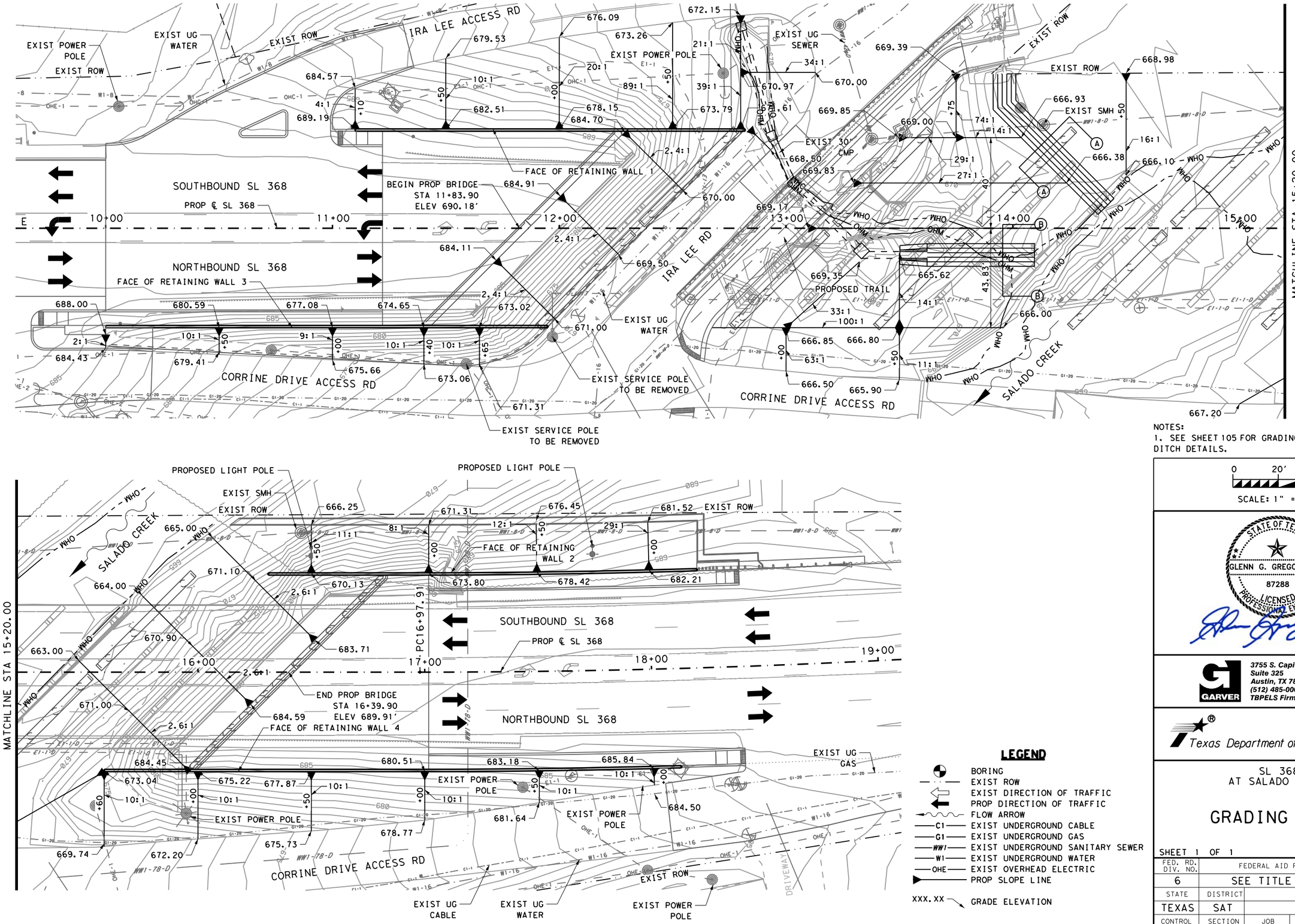

NOTES:
1. SEE SHEET 105 FOR GRADING AND PILOT DITCH DETAILS.

0 20' 40'

SCALE: 1" = 40'

LEGEND

- BORING
- EXIST ROW
- EXIST DIRECTION OF TRAFFIC
- PROP DIRECTION OF TRAFFIC
- FLOW ARROW
- C1 — EXIST UNDERGROUND CABLE
- G1 — EXIST UNDERGROUND GAS
- WW1 — EXIST UNDERGROUND SANITARY SEWER
- W1 — EXIST UNDERGROUND WATER
- OHE — EXIST OVERHEAD ELECTRIC
- PROP SLOPE LINE
- XXX.XX — GRADE ELEVATION

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Texas Department of Transportation

SL 368
AT SALADO CREEK

GRADING PLAN

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		104
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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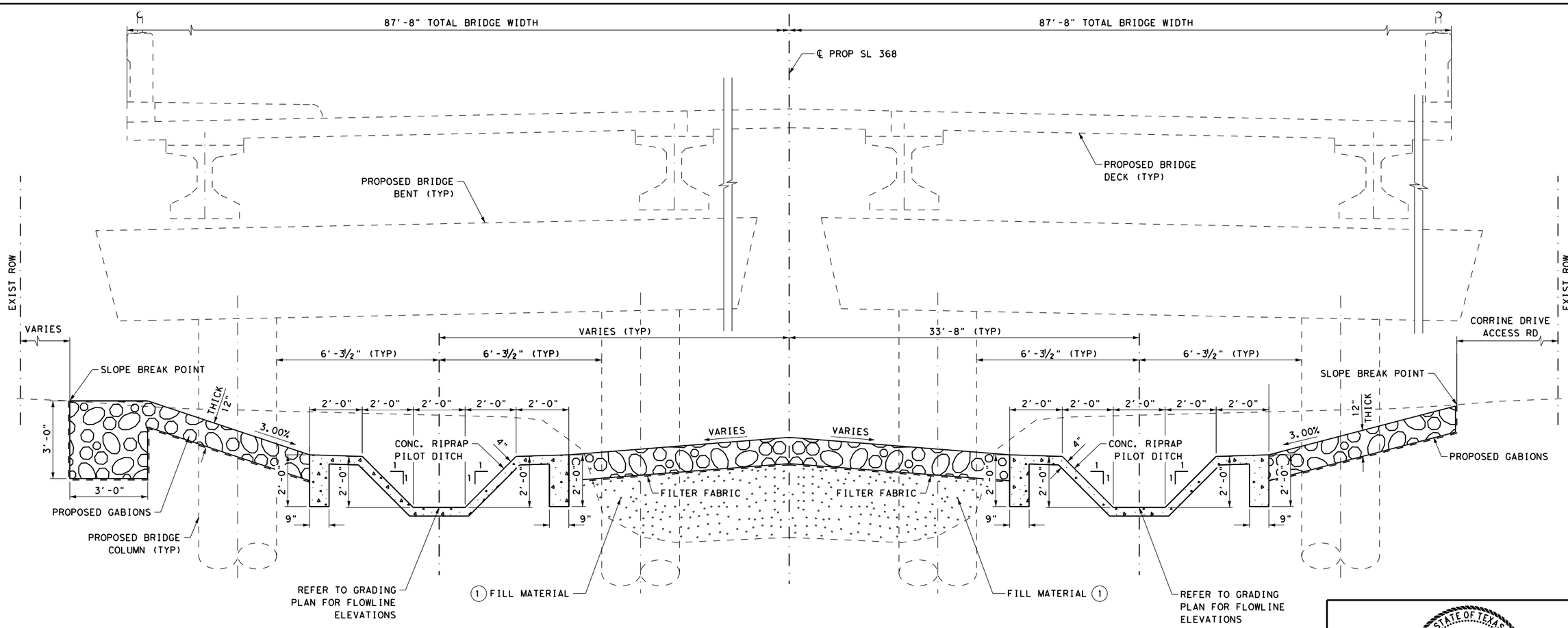
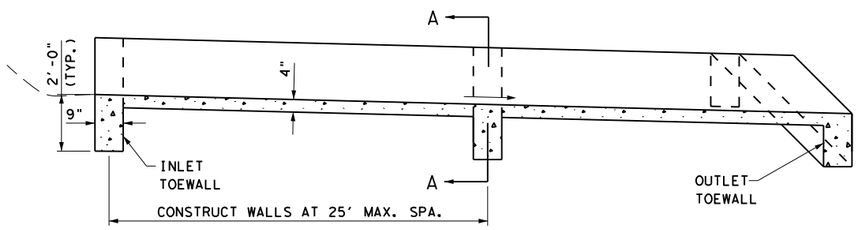
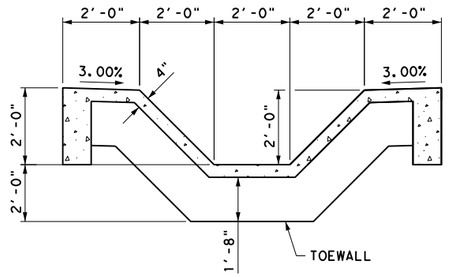


SECTION A-A
NTS

SECTION B-B
NTS



LONGITUDINAL DETAIL
NTS



DETAIL A-A
NTS

(1) FILL MATERIAL USED TO FILL IN EXISTING SWALE SHALL HAVE A PLASTICITY INDEX (PI) OF AT LEAST 20 AND A MINIMUM PERCENT PASSING THE NO. 200 SIEVE OF 50. PROOF ROLL BOTTOM OF SWALE IN ACCORDANCE WITH TxDOT ITEM 216 BEFORE PLACING FILL. ANY SOILS THAT ARE OBSERVED TO RUT OR DEFLECT EXCESSIVELY UNDER MOVING LOAD SHOULD BE UNDER-CUT AND REPLACED WITH FILL MATERIAL. PLACE FILL IN LIFTS WITH DENSITY CONTROL COMPACTION IN ACCORDANCE WITH TxDOT ITEM 132. FILL MATERIAL SHALL BE PAID FOR UNDER ITEM 132, EMBANKMENT (FINAL)(DENS CONT)(TY C2).

NOTES:
1. SEE SHEET 104 FOR GRADING PLAN AND PILOT DITCH SECTION LOCATION.

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Texas Department of Transportation

SL 368
AT SALADO CREEK

GRADING AND PILOT DITCH DETAILS

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		105
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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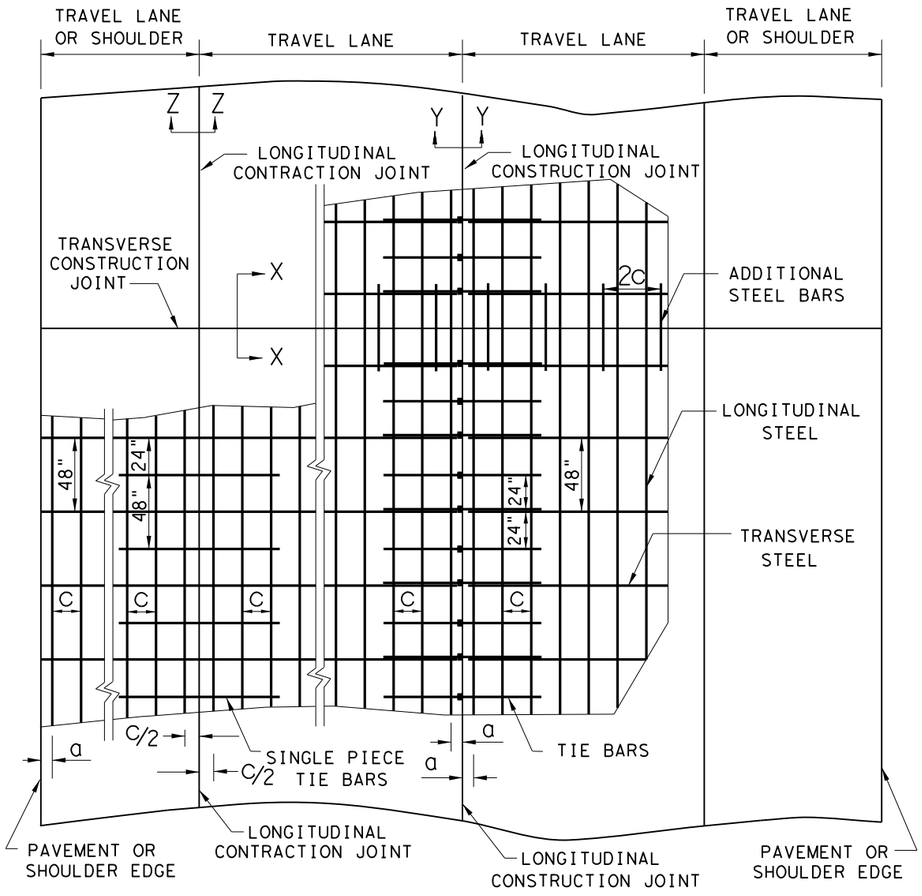
DATE: 1/27/2021 3:52:14 PM
FILE: pw:\\garver-pw.bentley.com:garver-pw-01\Documents\2016\16187035 - WA 5 SL 368 at Salado Creek\Drawings\STANDARDS\Roadway\crcp120.dgn

TABLE NO. 1 LONGITUDINAL STEEL					
SLAB THICKNESS AND BAR SIZE		REGULAR STEEL BARS	FIRST SPACING AT EDGE OR JOINT	ADDITIONAL STEEL BARS AT TRANSVERSE CONSTRUCTION JOINT (SECTION X-X)	
T (IN.)	BAR SIZE	SPACING C (IN.)	SPACING a (IN.)	SPACING 2 X C (IN.)	LENGTH L (IN.)
7.0	#5	6.5	3 TO 4	13	50
7.5	#5	6.0	3 TO 4	12	50
8.0	#6	9.0	3 TO 4	18	50
8.5	#6	8.5	3 TO 4	17	50
9.0	#6	8.0	3 TO 4	16	50
9.5	#6	7.5	3 TO 4	15	50
10.0	#6	7.0	3 TO 4	14	50
10.5	#6	6.75	3 TO 4	13.5	50
11.0	#6	6.5	3 TO 4	13	50
11.5	#6	6.25	3 TO 4	12.5	50
12.0	#6	6.0	3 TO 4	12	50
12.5	#6	5.75	3 TO 4	11.5	50
13.0	#6	5.5	3 TO 4	11	50

TABLE NO. 2 TRANSVERSE STEEL AND TIE BARS						
SLAB THICKNESS (IN.)	TRANSVERSE STEEL		TIE BARS AT LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z)		TIE BARS AT LONGITUDINAL CONSTRUCTION JOINT (SECTION Y-Y)	
	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)
7.0 - 7.5	#5	48	#5	48	#5	24
8.0 - 13.0	#5	48	#6	48	#6	24

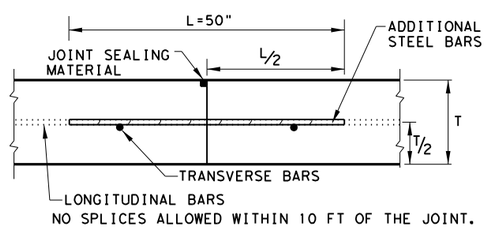


TYPICAL PAVEMENT LAYOUT

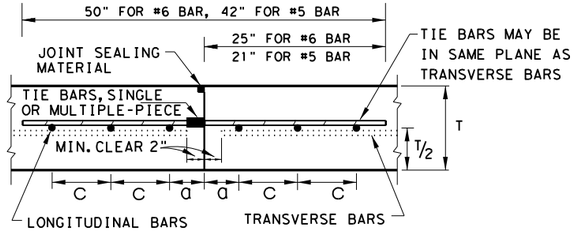
PLAN VIEW (NOT TO SCALE)

GENERAL NOTES

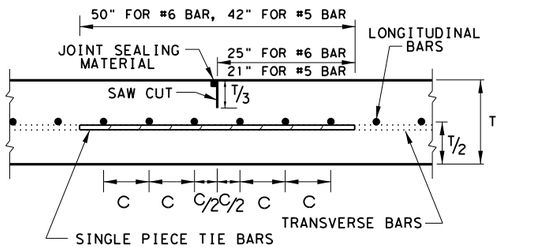
1. DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS. PAVEMENTS WIDER THAN 100 FT. WITHOUT A FREE LONGITUDINAL JOINT ARE NOT COVERED BY THIS STANDARD.
2. USE COARSE AGGREGATES WITH A RATED COEFFICIENT OF THERMAL EXPANSION (CoTE) OF NOT MORE THAN 5.5 X 10^{-6} IN/IN/ °F AS LISTED IN THE CONCRETE RATED SOURCE QUALITY CATALOG (CRSQC).
3. ALL THE REINFORCING STEEL AND TIE BARS SHALL BE DEFORMED STEEL BARS CONFORMING TO ASTM A 615 (GRADE 60) OR ASTM A 996 (GRADE 60) OR ABOVE. STEEL BAR SIZES AND SPACINGS SHALL CONFORM TO TABLE NO. 1 AND TABLE NO. 2.
4. STEEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1 IN. HORIZONTALLY AND +/- 0.5 IN. VERTICALLY. CALCULATED AVERAGE BAR SPACING (CONCRETE PLACEMENT WIDTH / NUMBER OF LONGITUDINAL BARS) SHALL CONFORM TO TABLE NO. 1
5. PAVEMENT WIDTHS OF MORE THAN 15 FT. SHALL HAVE A LONGITUDINAL JOINT (SECTION Z-Z OR SECTION Y-Y). THESE JOINTS SHALL BE LOCATED WITHIN 6 IN. OF THE LANE LINE UNLESS THE JOINT LOCATION IS SHOWN ELSEWHERE ON THE PLANS.
6. THE SAW CUT DEPTH FOR THE LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z) SHALL BE ONE THIRD OF THE SLAB THICKNESS (T/3).
7. WHEN TYING CONCRETE GUTTER AT A LONGITUDINAL JOINT, THE TIE BAR LENGTH OR POSITION MAY BE ADJUSTED. PROVIDE 3 IN. OF CONCRETE COVER FROM THE BACK OF GUTTER TO THE END OF TIE BAR.
8. REPLACE MISSING OR DAMAGED TIE BARS WITHOUT ADDITIONAL COMPENSATION BY DRILLING MIN. 10 IN. DEEP AND GROUTING TIE BARS WITH TYPE III, CLASS C EPOXY. MEET THE PULL-OUT TEST REQUIREMENTS IN ITEM 361.
9. OMIT TIE BARS LOCATED WITHIN 18-IN. OF THE TRANSVERSE CONSTRUCTION JOINTS (SECTION X-X). USE HAND-OPERATED IMMERSION VIBRATORS TO CONSOLIDATE THE CONCRETE ADJACENT TO ALL FORMED JOINTS.
10. LONGITUDINAL REINFORCING STEEL SPLICES SHALL BE A MINIMUM OF 25 IN. STAGGER THE LAP LOCATIONS SO THAT NO MORE THAN 1/3 OF THE LONGITUDINAL STEEL IS SPLICED IN ANY GIVEN 12-FT. WIDTH AND 2-FT. LENGTH OF THE PAVEMENT.
11. THE DETAIL FOR THE JOINT SEALANT AND RESERVOIR IS SHOWN ON STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."



TRANSVERSE CONSTRUCTION JOINT
SECTION X - X



LONGITUDINAL CONSTRUCTION JOINT
SECTION Y - Y



LONGITUDINAL CONTRACTION JOINT
SECTION Z - Z

SHEET 1 OF 2

Texas Department of Transportation | Design Division Standard

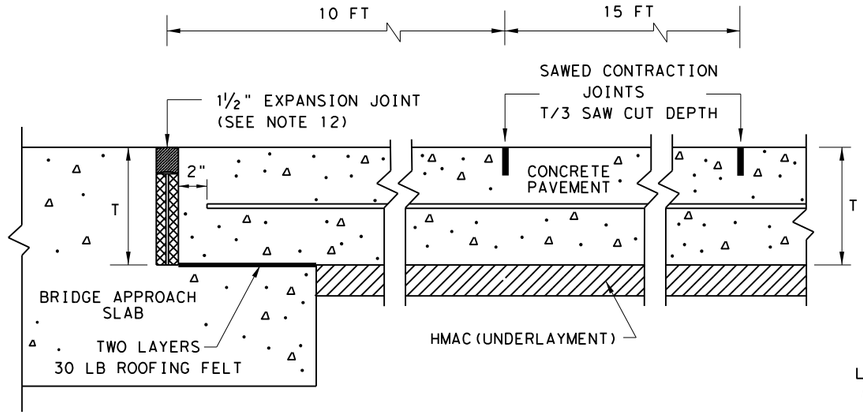
CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

ONE LAYER STEEL BAR PLACEMENT T - 7 to 13 INCHES

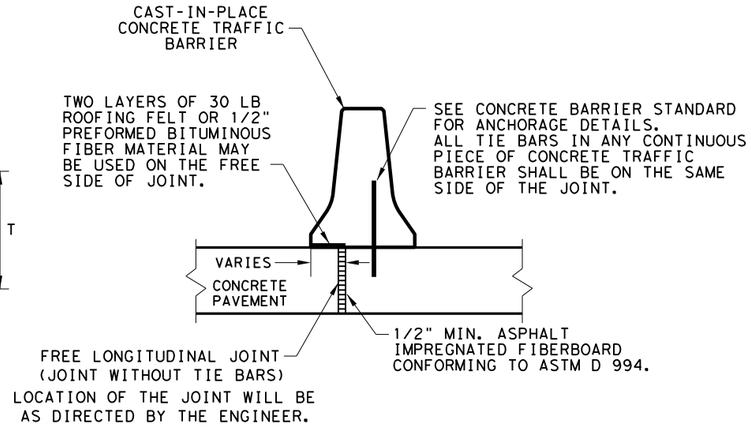
CRCP(1)-20

FILE: crcp120.dgn	DN: TxDOT	CK: KM	DW: AN	CK: VP
© TxDOT: APRIL 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
10/10/2011 ADD GN #12	DIST	COUNTY		SHEET NO.
04/09/2013 REMOVE 6" AND 6.5" ADD CTE REQUIREMENTS	SAT	BEXAR		106
05/05/2017 CoTE AS RATED 4.3				

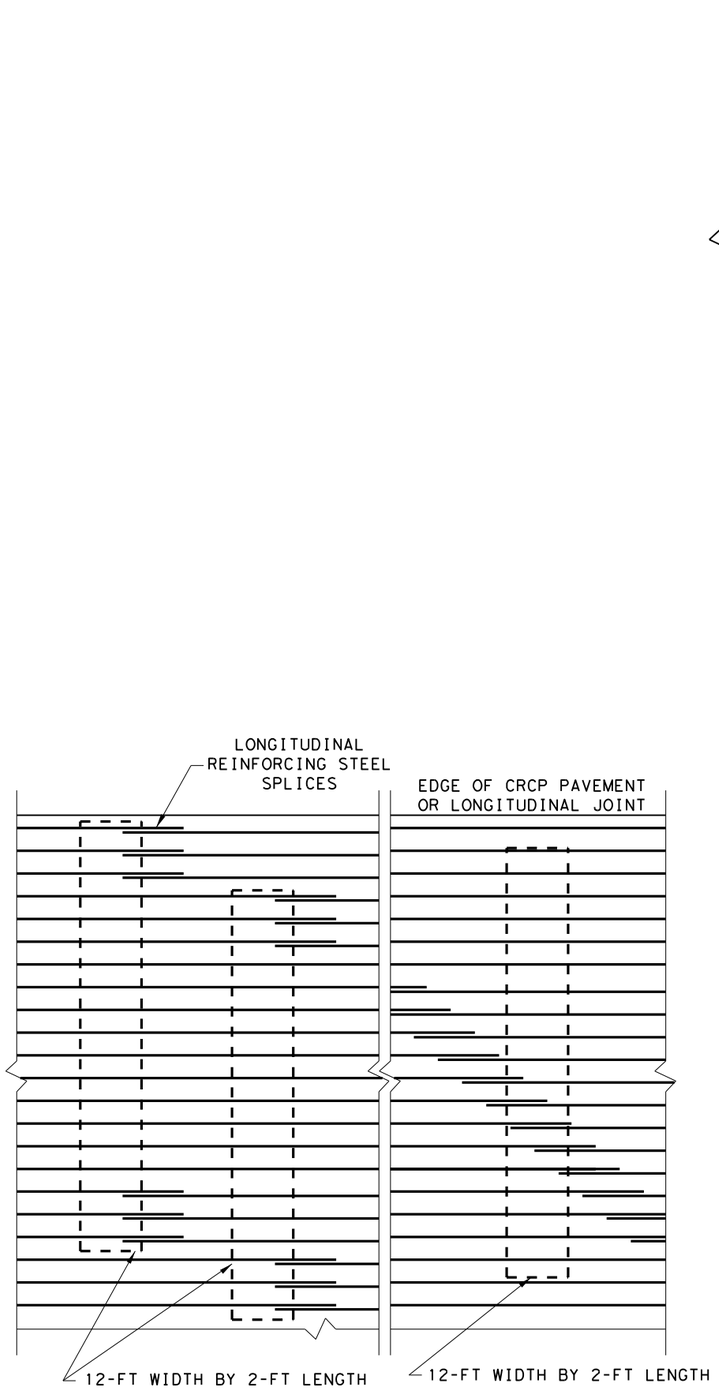
DATE: 1/27/2021 3:52:27 PM
FILE: pw:\\garver-pw.bentley.com:garver-pw-01\Documents\2016\16187035 - WA 5 SL 368 at Salado Creek\Drawings\STANDARDS\Roadway\crcp120.dgn



TRANSVERSE EXPANSION JOINT DETAIL
AT BRIDGE APPROACH

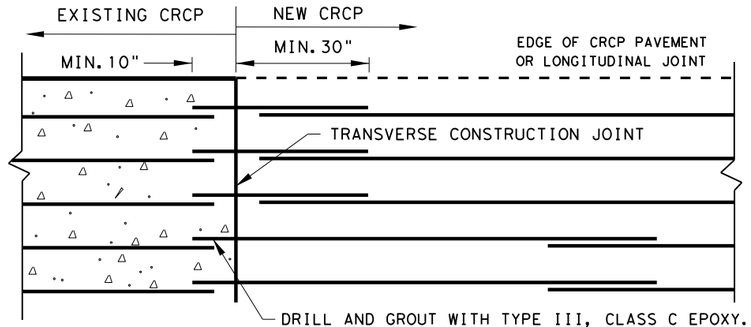


FREE LONGITUDINAL JOINT DETAIL

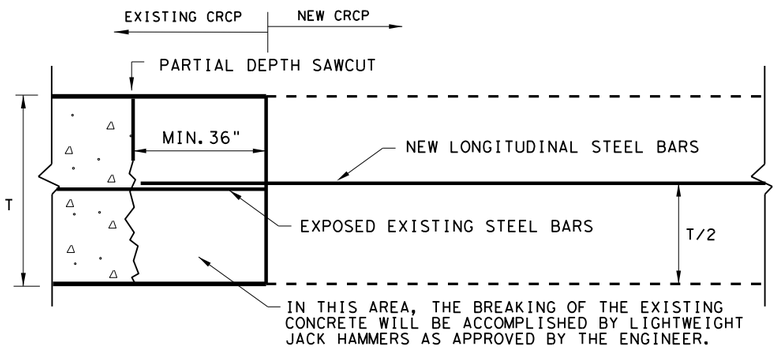


STAGGER THE LAP LOCATIONS SO THAT NO MORE THAN 1/3 OF THE LONGITUDINAL STEEL IS SPLICED IN ANY GIVEN 12-FT. WIDTH AND 2-FT. LENGTH OF THE PAVEMENT. ANY OTHER LAP CONFIGURATION MEETING THIS REQUIREMENT WILL BE ALLOWED.

EXAMPLES OF LAP CONFIGURATION
PLAN VIEW (NOT TO SCALE)

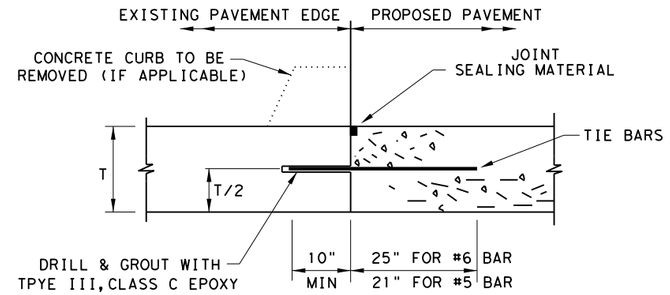


OPTION A: DRILL AND EPOXY
PLAN VIEW (NOT TO SCALE)



OPTION B: BREAKBACK AND LAP

TRANSVERSE TIE JOINT DETAIL
EXISTING CRCP TO NEW CRCP



1. BEFORE WIDENING WORK, DEMONSTRATE THAT THE BOND STRENGTH OF THE EPOXY-GROUTED TIE BARS MEETS THE REQUIRMENTS OF PULL-OUT TEST SPECIFIED IN ITEM 361.
2. SPACE TIE BARS AT 24" SPACING. USE #6 TIE BARS FOR 8" AND THICKER SLABS, USE #5 TIE BARS FOR LESS THAN 8" THICK SLABS.

LONGITUDINAL WIDENING JOINT DETAIL

Texas Department of Transportation — Design Division Standard

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

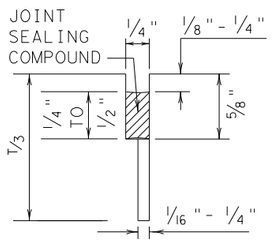
ONE LAYER STEEL BAR PLACEMENT
T - 7 to 13 INCHES

CRCP(1)-20

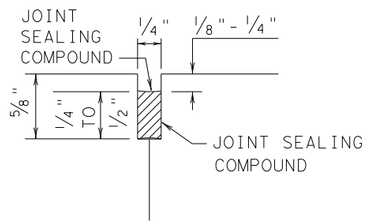
FILE: crcp120.dgn	DN: TxDOT	CK: KM	DW: AN	CK: VP
© TxDOT: APRIL 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 03/16/2020 REMOVED TABLE 1A	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		107

DATE: 1/27/2021
FILE: pw:\\garver-pw.bentley.com:garver-pw-01\Documents\2016\16187035 - WA 5 SL 368 at Salado Creek\Drawings\STANDARDS\Roadway\js14.dgn

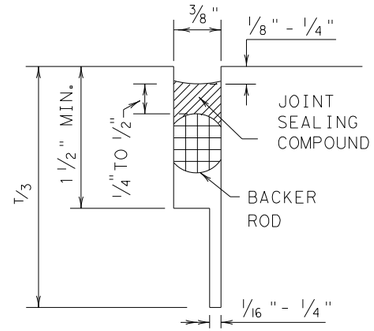
METHOD B: JOINT SEALING COMPOUND



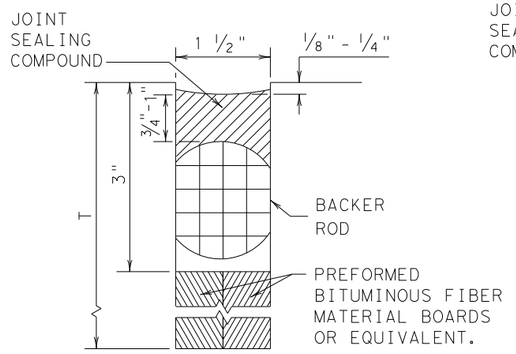
LONGITUDINAL SAWED CONTRACTION JOINT



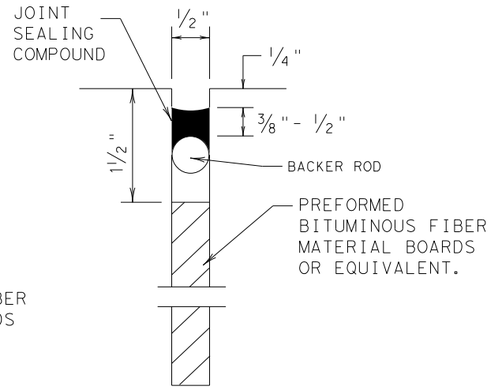
LONGITUDINAL OR TRANSVERSE CONSTRUCTION JOINT



TRANSVERSE SAWED CONTRACTION JOINT

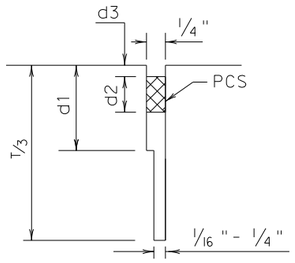


TRANSVERSE FORMED EXPANSION JOINT

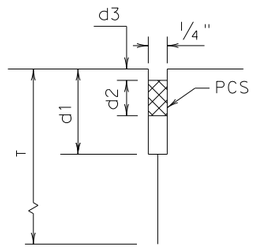


FORMED ISOLATION JOINT

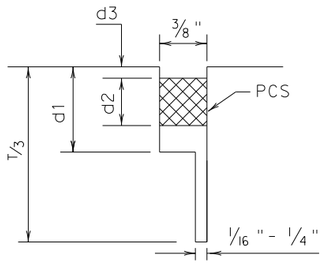
METHOD A: PREFORMED COMPRESSION SEALS (PCS)(DMS-6310 CLASS 6)



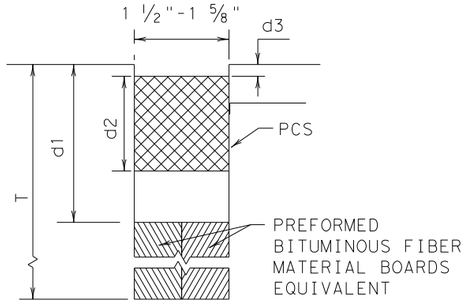
LONGITUDINAL SAWED CONTRACTION JOINT



LONGITUDINAL CONSTRUCTION JOINT



TRANSVERSE SAWED CONTRACTION JOINT



TRANSVERSE FORMED EXPANSION JOINT

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, EITHER METHOD "A" OR METHOD "B" MAY BE USED.
2. THE LOCATION OF JOINTS SHALL BE AS SHOWN ELSEWHERE IN THE PLANS.
3. THE JOINT RESERVOIR FOR SEALANT OR PCS SHALL BE SAWED UNLESS OTHERWISE SHOWN ON THE PLANS FOR THE LONGITUDINAL AND TRANSVERSE CONSTRUCTION JOINTS AND THE SAWED JOINTS.
4. DIMENSIONS d1, d2, AND d3 SHOWN IN METHOD A SHALL BE IN ACCORDANCE WITH THE PREFORMED COMPRESSION SEAL MANUFACTURER'S RECOMMENDATION.
5. REFER TO DMS-6310 "JOINT SEALANTS AND FILLERS" FOR THE CLASSIFICATIONS.
6. FOR SAWED LONGITUDINAL JOINT, LONGITUDINAL OR TRANSVERSE CONSTRUCTION JOINT, USE JOINT SEALANT CLASS 5 OR 8 UNLESS OTHERWISE SHOWN ON THE PLAN OR APPROVED.
7. FOR TRANSVERSE SAWED CONTRACTION, TRANSVERSE FORMED EXPANSION JOINT, AND ISOLATION JOINT USE JOINT SEALANT CLASS 5 OR 8 AT NEW JOINTS. USE JOINT SEALANT CLASS 4,5,7,OR 8 FOR MAINTAINING EXISTING JOINTS.
8. THE JOINTS SHALL BE CLEANED IN ACCORDANCE WITH THE ITEM 438 "CLEANING AND SEALING JOINTS" OR ITEM 713 "CLEANING AND SEALING JOINTS AND CRACKS (CONCRETE PAVEMENT)".
9. ISOLATION JOINTS ACCOMMODATE HORIZONTAL AND VERTICAL MOVEMENTS THAT OCCUR BETWEEN A PAVEMENT AND A STRUCTURE. ISOLATION JOINTS MAY BE USED FOR BRIDGE ABUTMENTS, INTERSECTIONS, CURB AND GUTTER, OLD AND NEW PAVEMENTS, OR AROUND DRAINAGE INLETS, MANHOLES, FOOTINGS AND LIGHTING STRUCTURES.

Texas Department of Transportation

Design Division Standard

CONCRETE PAVING DETAILS

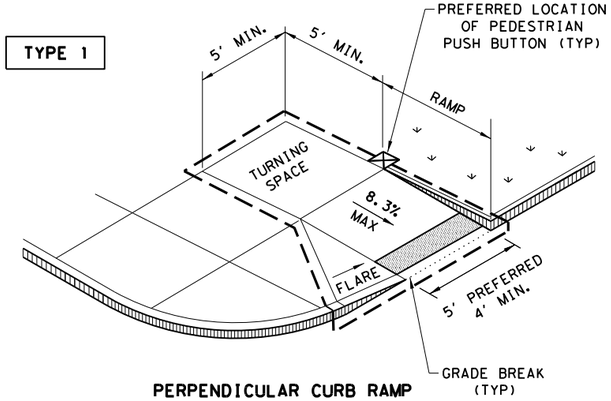
JOINT SEALS

JS-14

FILE: js14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
©TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		108

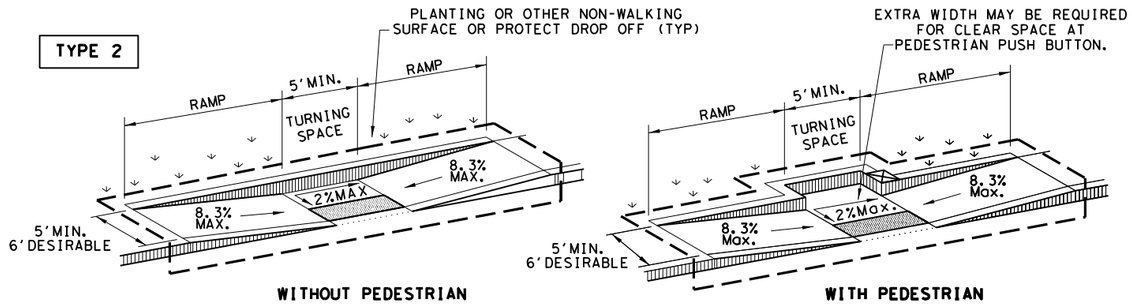
DATE: 1/27/2021
FILE: pw:\\garver-pw.bentley.com:garver-pw-01\Documents\2016\16187035 - WA 5 SL 368 at Salado Creek\Drawings\STANDARDS\Roadway\ped18.dgn

TYPE 1



PERPENDICULAR CURB RAMP

TYPE 2

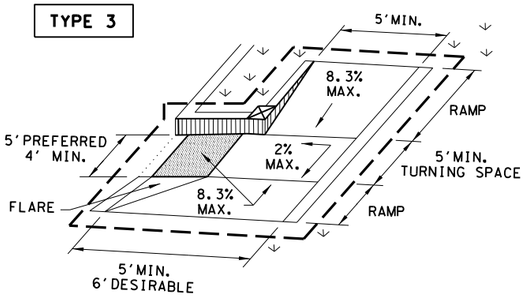


WITHOUT PEDESTRIAN PUSH BUTTON

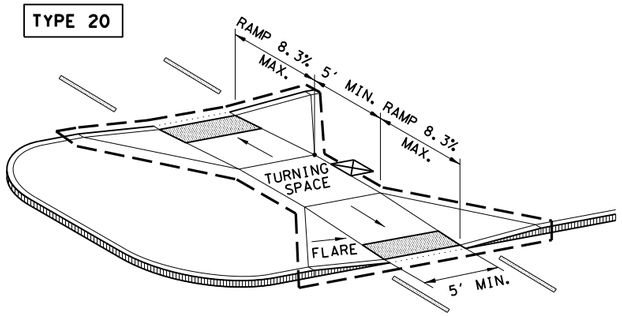
WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3



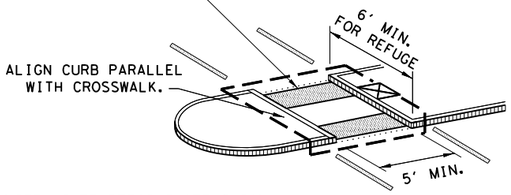
TYPE 20



CURB RAMPS AT MEDIAN ISLANDS

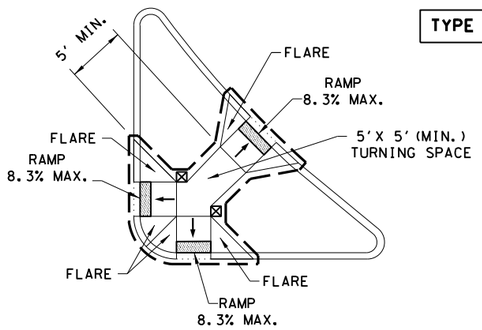
TYPE 21

INSTALL DETECTABLE WARNING SURFACE AT EACH END OF THE CUT-THROUGH RAMP WITH A MINIMUM 2' USUAL SIDEWALK SURFACE BETWEEN. IF MEDIAN IS LESS THAN 6' WIDE, ELIMINATE DETECTABLE WARNING SURFACES.



NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

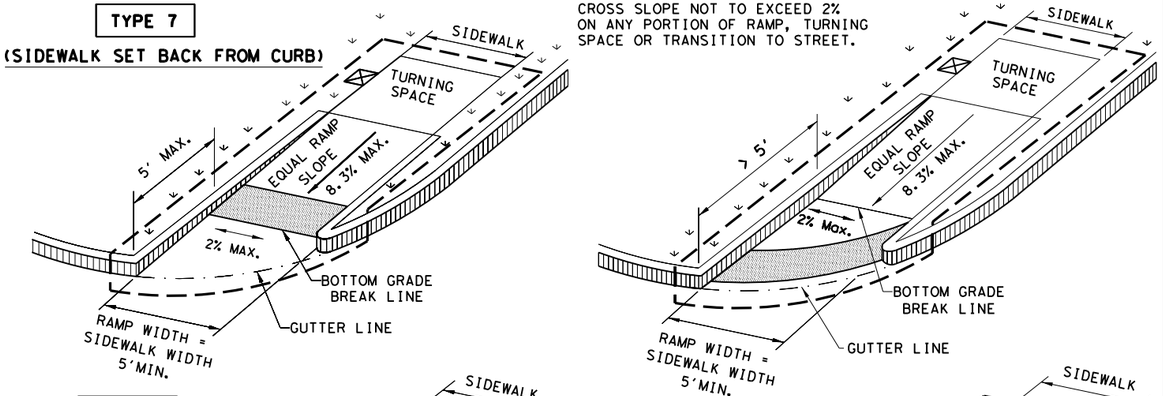
TYPE 22



COMBINATION ISLAND RAMPS

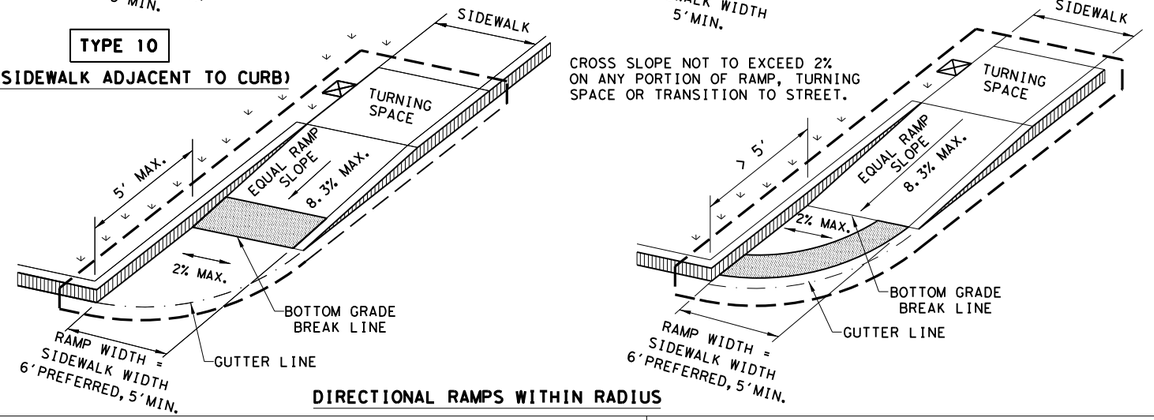
TYPE 7
(SIDEWALK SET BACK FROM CURB)

CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



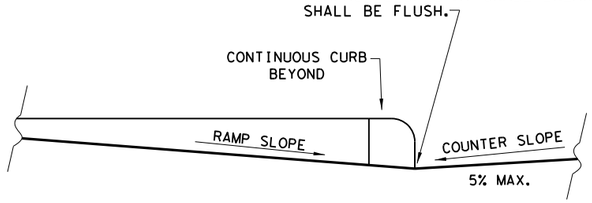
TYPE 10
(SIDEWALK ADJACENT TO CURB)

CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



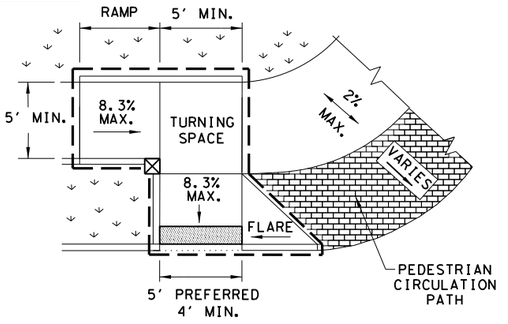
DIRECTIONAL RAMPS WITHIN RADIUS

BOTTOM GRADE BREAK OF CURB RAMP WILL NORMALLY BE AT GUTTER LINE. SURFACE SLOPES AT GRADE BREAKS SHALL BE FLUSH.



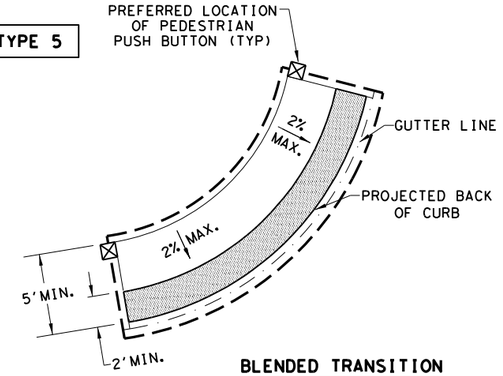
TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

TYPE 6



COMBINATION CURB RAMPS

TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

NOTES / LEGEND:

SEE GENERAL NOTES ON SHEET 2 OF 4 FOR MORE INFORMATION.

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE

GRADE BREAK

RAMP LIMITS OF PAYMENT

SHEET 1 OF 4

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		109

DATE: 1/27/2021
FILE: pw:\\garver-pw.bentley.com:garver-pw-01\Documents\2016\16187035 - WA 5 SL 368 at Salado Creek\Drawings\STANDARDS\Roadway\ped18.dgn

GENERAL NOTES

CURB RAMPS

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Cross slopes of 1.5% and lesser running should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
4. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5'x 5' passing areas at intervals not to exceed 200' are required.
5. Turning Spaces shall be 5'x 5' minimum. Cross slope shall be maximum 2%.
6. Clear space at the bottom of curb ramps shall be a minimum of 4'x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the latest draft of the Proposed Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) as published by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).
9. To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5'x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Provide curb ramps to connect the pedestrian access route at each pedestrian street crossing. Handrails are not required on curb ramps.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Furnish and install No. 3 reinforcing steel bars at 18" o.c. both ways, unless otherwise directed.
16. Provide a smooth transition where the curb ramps connect to the street.
17. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
18. Existing features that comply with applicable standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

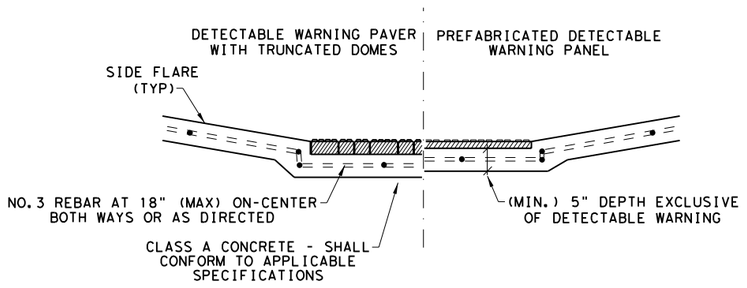
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
20. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
21. Detectable warning surfaces must be firm, stable and slip resistant.
22. Detectable warning surfaces shall be a minimum of 24 inches in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
23. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb and neither end of that edge is greater than 5 feet from the back of curb. Detectable warning surfaces may be curved along the corner radius.
24. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

DETECTABLE WARNING PAVERS (IF USED)

25. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.
26. Lay full-size units first followed by closure units consisting of at least 25 percent (25%) of a full unit. Cut detectable warning paver units using a power saw.

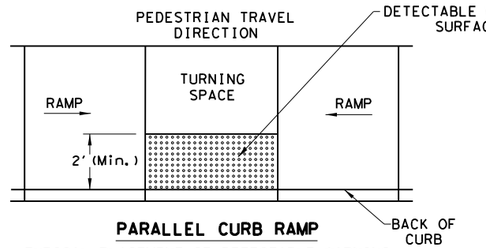
SIDEWALKS

27. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.
28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
29. Street grades and cross slopes shall be as shown elsewhere in the plans.
30. Changes in level greater than 1/4 inch are not permitted.
31. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than five percent (5%) must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with PROWAG R409.
32. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
33. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
34. Sidewalk details are shown elsewhere in the plans.



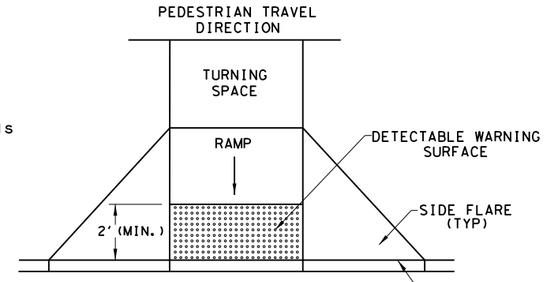
SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

DETECTABLE WARNING SURFACE DETAILS



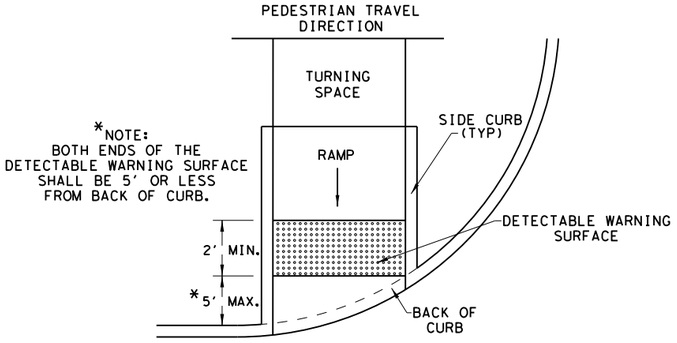
PARALLEL CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.



PERPENDICULAR CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



DIRECTIONAL CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

Texas Department of Transportation | Design Division Standard

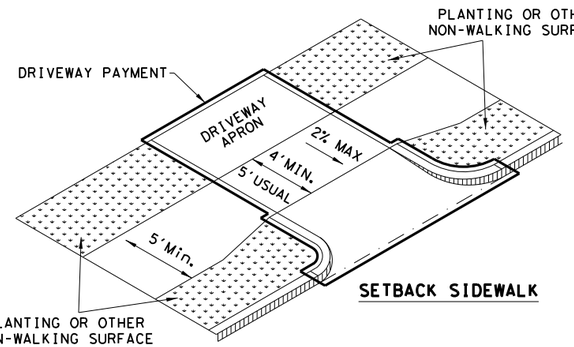
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

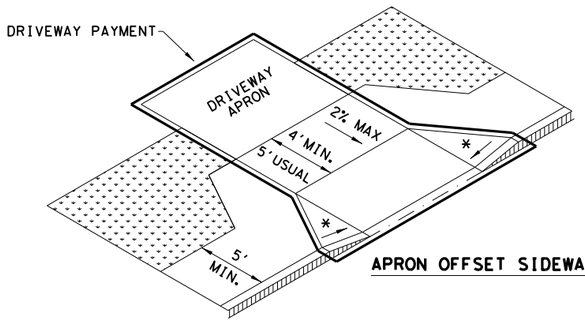
FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0016	08	039		SL 368
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.
	SAT	BEXAR			110

DATE: 1/27/2021
FILE: pw:\\garver-pw.bentley.com:garver-pw-01\Documents\2016\16187035 - WA 5 SL 368 at Salado Creek\Drawings\STANDARDS\Roadway\ped18.dgn

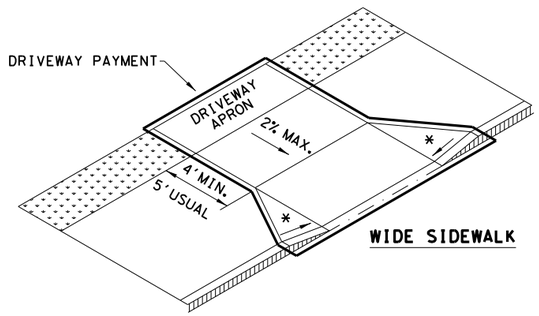
SIDEWALK TREATMENT AT DRIVEWAYS



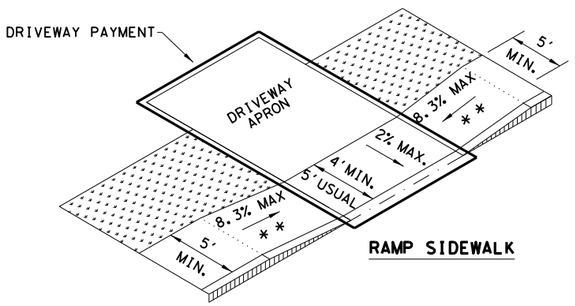
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

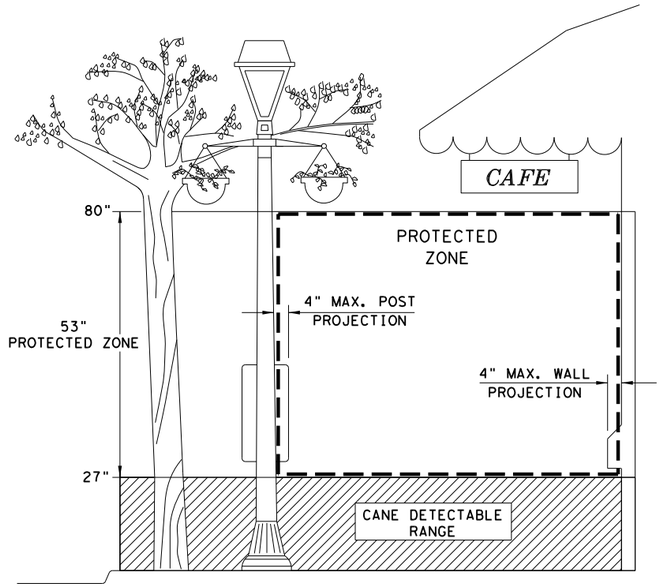


RAMP SIDEWALK

NOTES:

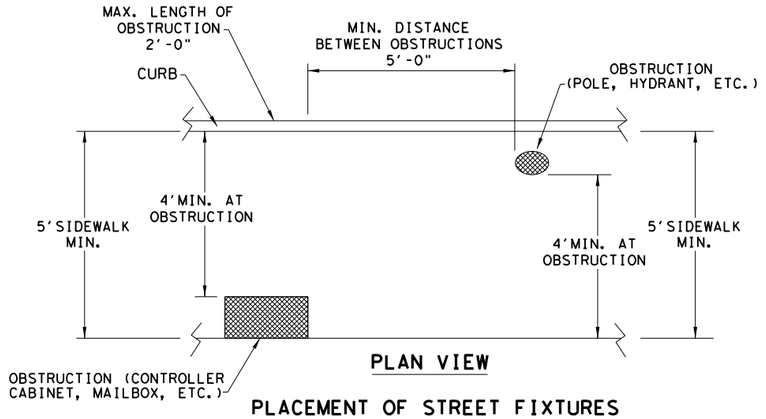
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

* * IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.



PROTECTED ZONE

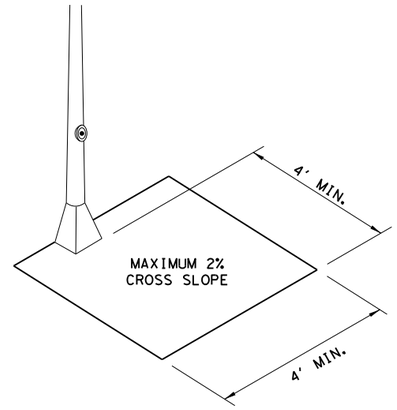
NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



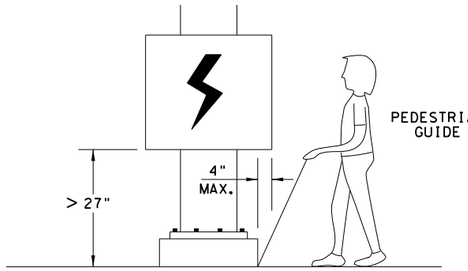
PLAN VIEW

PLACEMENT OF STREET FIXTURES

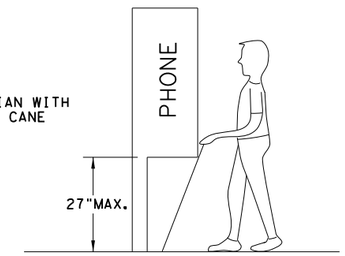
NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



WHEN AN OBSTRUCTION OF A HEIGHT GREATER THAN 27" FROM THE SURFACE WOULD CREATE A PROTRUSION OF MORE THAN 4" INTO THE PEDESTRIAN CIRCULATION AREA, CONSTRUCT ADDITIONAL CURB OR FOUNDATION AT THE BOTTOM TO PROVIDE A MAXIMUM 4" OVERHANG.



PROTRUDING OBJECTS OF A HEIGHT ≤ 27" ARE DETECTABLE BY CANE AND DO NOT REQUIRE ADDITIONAL TREATMENT.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0016	08	039		SL 368
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.
	SAT	BEXAR			111

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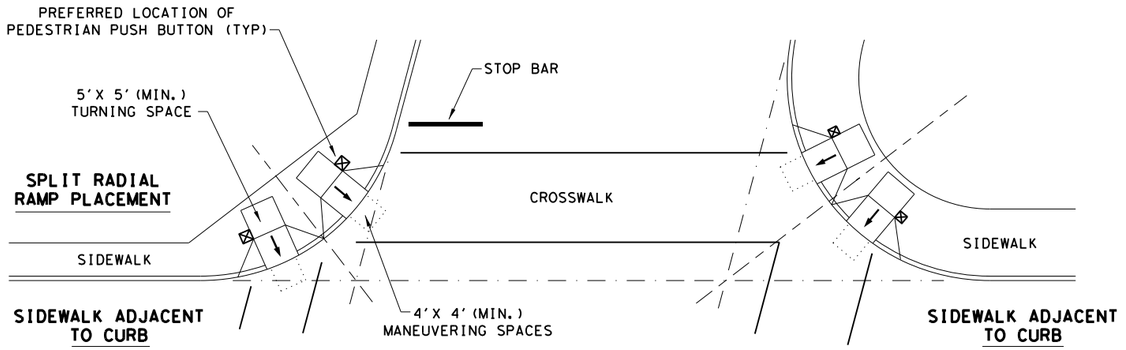
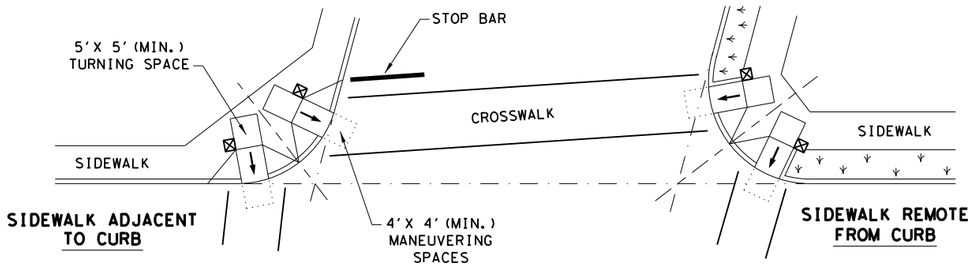
TYPICAL CROSSING LAYOUTS

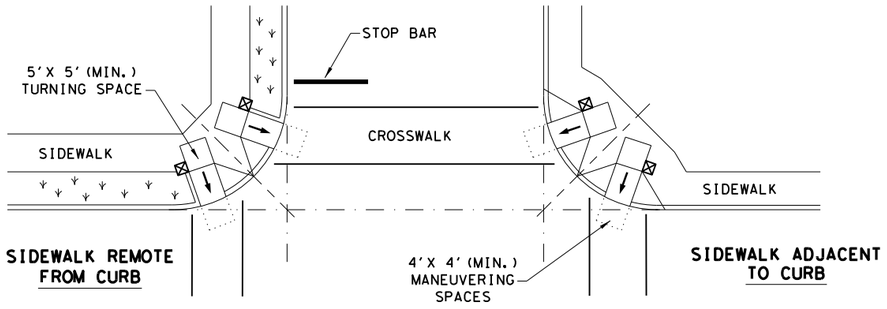
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



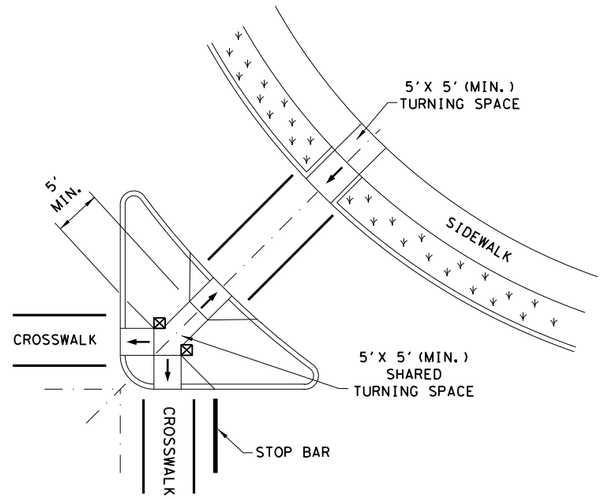
SKEWED INTERSECTION WITH "LARGE" RADIUS



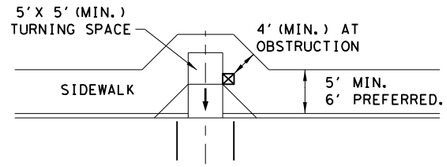
SKEWED INTERSECTION WITH "SMALL" RADIUS

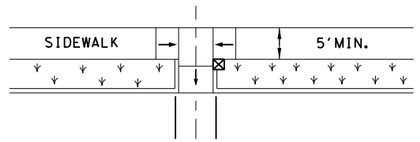


NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND





MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

LEGEND:

SHOWS DOWNWARD SLOPE. →

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON (IF APPLICABLE). ⊠

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG	
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0016	08	039	SL 368	
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.	
	SAT	BEXAR		112	

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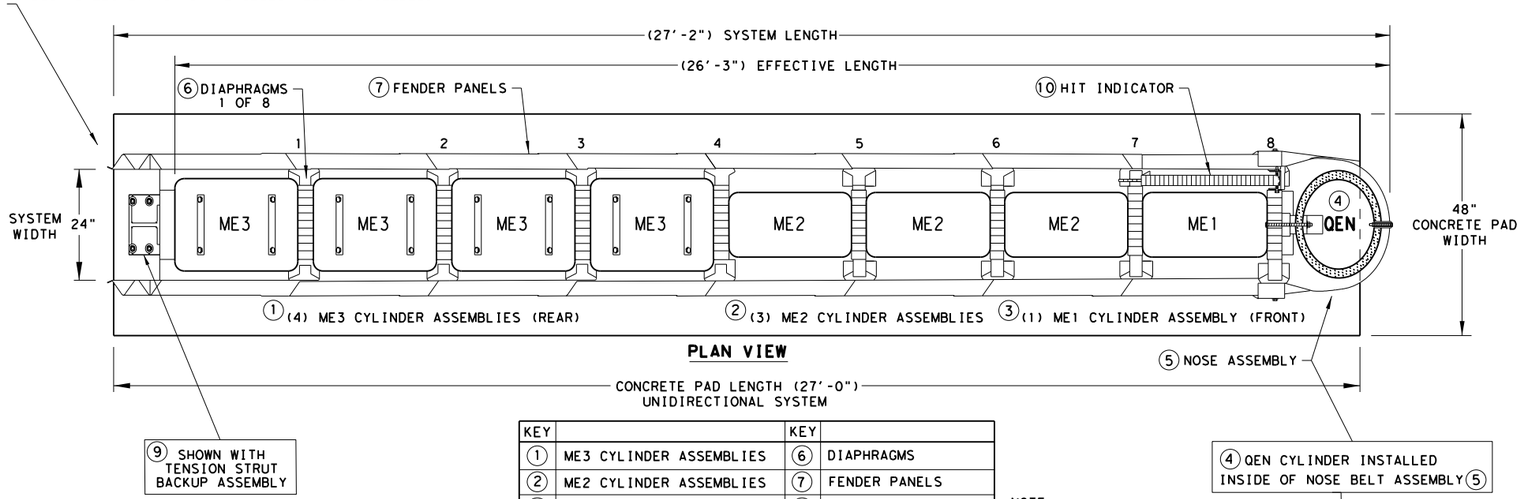
FILE: pw:\\garver-pw.bentley.com:garver-pw-01\Documents\2016\16187035 - WA 5 SL 368 at Solado Creek\Drawings\STANDARDS\Roadway\qgelitem10n20.dgn

NOTE:
A TRANSITION MAY BE REQUIRED TO INSTALL THE QUADGUARD ELITE M10 TO THE OBJECT BEING SHIELDED.

QUADGUARD ELITE M10 24" WIDE (8 BAY) SYSTEM



PLAN VIEW

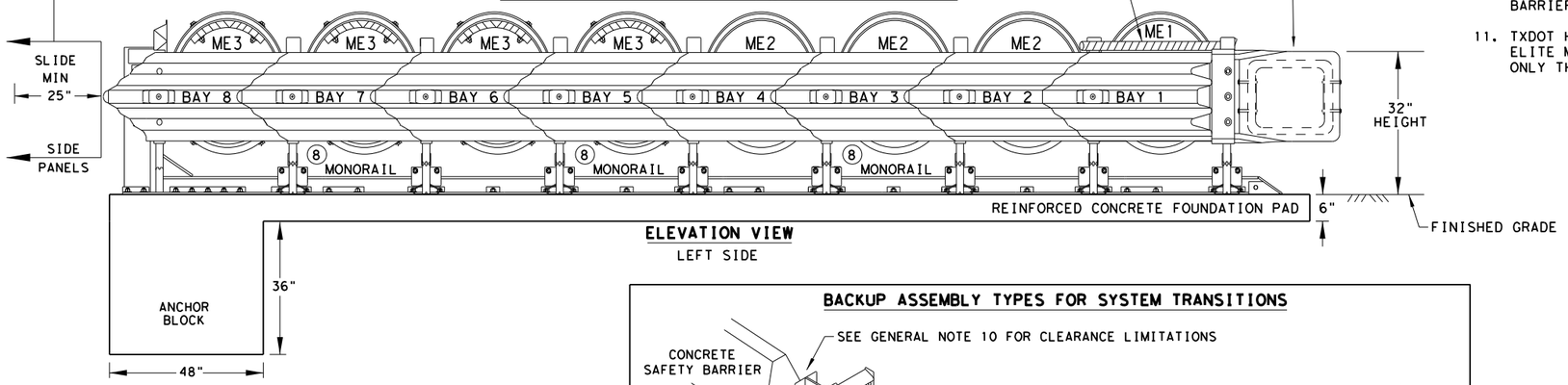
⑨ SHOWN WITH TENSION STRUT BACKUP ASSEMBLY

KEY		KEY	
①	ME3 CYLINDER ASSEMBLIES	⑥	DIAPHRAGMS
②	ME2 CYLINDER ASSEMBLIES	⑦	FENDER PANELS
③	ME1 CYLINDER ASSEMBLY	⑧	MONORAILS
④	QEN CYLINDER	⑨	TYPE OF BACKUP
⑤	NOSE BELT ASSEMBLY	⑩	HIT INDICATOR

④ QEN CYLINDER INSTALLED INSIDE OF NOSE BELT ASSEMBLY ⑤

NOTE:
PROVISION SHALL BE MADE FOR REAR FENDER SIDE PANELS TO SLIDE REARWARD UPON IMPACT, 25" MIN.

NOTE:
HIT INDICATOR WILL RAISE UPON IMPACT.



ELEVATION VIEW
LEFT SIDE

NOTES:
CONTACT THE MANUFACTURER WITH SITE SPECIFIC DATA (SSD) FOR CONCRETE PAD AND ANCHOR BLOCK INSTALLATION REQUIREMENTS.

A MANUFACTURER'S DRAWING PACKAGE UNIQUE AND SPECIFIC FOR THE QUADGUARD ELITE M10 FIELD INSTALATION AND INFORMATION REGARDING THE TYPE OF BACKUP ASSEMBLY REQUIRED FOR THE TRANSITION WILL BE PROVIDED BY THE MANUFACTURER TO THE ENGINEER AND INSTALLER.

6" REINFORCED CONCRETE PAD REQUIRES THE INSTALLATION OF AN ANCHOR BLOCK AS SHOWN ON THE MANUFACTURER'S DRAWING PACKAGE.

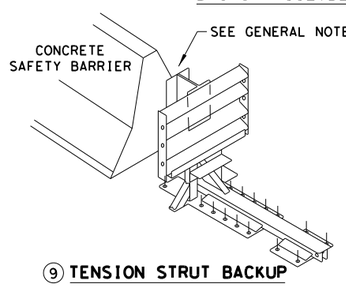
8" NON-REINFORCED CONCRETE PAD MAY NOT REQUIRE AN ANCHOR BLOCK, IF THE PAD IS INSTALLED AGAINST AN IMMOVABLE CONCRETE BACKUP.

CONCRETE PAD AND ANCHOR BLOCK COMBINATIONS SHALL BE CONFIRMED WITH THE MANUFACTURER BASED UPON SITE SPECIFIC DATA (SSD).

NOTE:
THE QUADGUARD ELITE M10 8-BAY, 24" WIDE - NARROW SYSTEM TESTED TO MASH TEST LEVEL 3.

TL-3 MODEL #	QM10024E	CYLINDER TYPES IN BAYS			
BAYS	8	TYPE-ME3	TYPE-ME2	TYPE-ME1	TYPE-QEN
DIAPHRAGMS	8	4	3	1	1
WIDTH	24"	REAR	FRONT		NOSE

BACKUP ASSEMBLY TYPES FOR SYSTEM TRANSITIONS

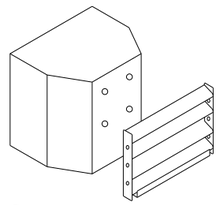


⑨ TENSION STRUT BACKUP

SYSTEM TRANSITIONS TYPES	
1	QUAD-BEAM TO CONCRETE SAFETY BARRIER
2	QUAD-BEAM TO CONCRETE BRIDGE RAIL
3	QUAD-BEAM TO CONCRETE END SHOE
4	QUAD-BEAM TO THRIE-BEAM RAIL
5	QUAD-BEAM TO W-BEAM RAIL

NOTE:
TRANSITION ASSEMBLIES FOR THE QUADGUARD ELITE M10 TO THRIE-BEAM OR W-BEAM FENCE REQUIRES I-BEAM POSTS:

ALL POSTS W6X8.5/9 I-BEAMS (78" LONG).



⑨ CONCRETE BACKUP

NOTES:
CONTACT THE MANUFACTURER WITH SITE SPECIFIC DATA (SSD) FOR THE CORRECT BACKUP ASSEMBLY AND TRANSITION PANELS OR SIDE PANELS USED FOR STANDARD AND BI-DIRECTIONAL INSTALLATIONS: AT DIVIDED-HIGHWAY MEDIANS OR UNDIVIDED ROADWAYS WHERE THE SYSTEM IS EXPOSED TO IMPACTS FROM ONE OR TWO DIFFERENT DIRECTIONS OF TRAFFIC FLOW.

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE QUADGUARD ELITE M10 SYSTEM AND IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY - ENERGY ABSORPTION INC. AT 1(888)323-6374.
2. SEE THE RECENT QUADGUARD ELITE M10 PRODUCT DESCRIPTION ASSEMBLY MANUAL FOR IMPACT PERFORMANCE CHARACTERISTICS AND DESIGN LIMITATIONS AND THE DRAWING PACKAGE FOR THE NARROW 24" SYSTEM BEFORE INSTALLING THE QUADGUARD ELITE M10 AT ANY GIVEN LOCATION.
3. FOR BI-DIRECTIONAL TRAFFIC: THE LOCATION AND OR WIDTH OF THE QUADGUARD ELITE M10 IS RESTRICTED. AS BI-DIRECTIONAL TRAFFIC APPROACHES THE REAR OF THE QUADGUARD ELITE M10, THE QUADGUARD ELITE M10 SHOULD NOT EXTEND FURTHER INTO THE TRAFFIC-SIDE OF THE BARRIER THAN THE OBSTACLE. ANY TRANSITION INSTALLED MUST EITHER BE TANGENT TO BOTH QUADGUARD ELITE M10 AND OBSTACLE OR MUST ANGLE TOWARD FIELD SIDE OF THE BARRIER.
4. SYSTEM TRANSITION: APPROPRIATE TRANSITION PANELS OR SIDE PANELS WILL BE REQUIRED FOR PROPER IMPACT PERFORMANCE. THE CORRECT PANEL(S) TO USE WILL DEPEND ON THE DIRECTION OF TRAFFIC FLOW AND WHAT TYPE OF BARRIER OR ROAD FEATURE THE QUADGUARD ELITE M10 SYSTEM IS SHIELDING. SEE THE QUADGUARD ELITE M10 PRODUCT DESCRIPTION & ASSEMBLY MANUAL FOR FURTHER DETAILS.
5. COMPONENTS FOR THE QUADGUARD ELITE (M10) BACKUP AND REINFORCING DETAILS ARE SHOWN ON THE QUADGUARD ELITE M10 PRODUCT DESCRIPTION & ASSEMBLY MANUAL.
6. CONCRETE PAD SHALL BE 6" MIN. REINFORCED 28MPa [4,000 PSI] (P.C.) OR 8" MIN. NON-REINFORCED 28MPa [4,000 PSI] CONCRETE ROADWAY MEASURING AT LEAST 12'-0" WIDE BY 50'-0" LONG. ANCHOR BLOCK IS NOT REQUIRED WHEN USING 8" CONCRETE PAD INSTALLED AGAINST AN IMMOVABLE STRUCTURE, E.G. CONCRETE WALL.
7. IF THE CROSS-SLOPE VARIES MORE THAN 2% OVER THE LENGTH OF THE SYSTEM, THE CONCRETE PAD WILL REQUIRE LEVELING. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
8. THE INSTALLATION AREA SHOULD BE FREE OF CURBS, ELEVATED OBJECTS,OR DEPRESSIONS.
9. THE QUADGUARD ELITE M10 SYSTEM SHOULD BE INSTALLED APPROXIMATELY PARALLEL WITH THE BARRIER.
10. FOR THE TENSION STRUT BACKUP THE DISTANCE BETWEEN THE BACK OF BACKUP AND THE BARRIER WALL SHOULD NOT EXCEED 7" IN ANY CASE.
11. TXDOT HAS ONLY APPROVED THE 24" WIDE QUADGUARD ELITE M10 SYSTEM. THE QUADGUARD ELITE M10 PRODUCT DESCRIPTION AND ASSEMBLY MANUAL INCLUDES SYSTEM WIDTH OF 24". ONLY THE 24" SYSTEM IS ALLOWED TO BE INSTALLED ON TEXAS ROADWAYS.

FOUNDATION & ANCHORING REQUIREMENTS FOUNDATION TYPES: A, B, C, & D	
FOUNDATION TYPE: A	REINFORCED CONCRETE PAD OR ROADWAY
FOUNDATION:	6" MINIMUM DEPTH (P.C.C.)
ANCHORAGE:	7" STUDS EMBEDDED 5 ½" - APPROVED ADHESIVE
FOUNDATION TYPE: B	ASPHALT OVER P.C.C.
FOUNDATION:	3" MIN. (A.C.) OVER 3" MIN. (P.C.C.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 ½" - APPROVED ADHESIVE
FOUNDATION TYPE: C	ASPHALT OVER SUBBASE
FOUNDATION:	6" MIN. (A.C.) OVER 6" MIN. (C.S.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 ½" - APPROVED ADHESIVE
FOUNDATION TYPE: D	ASPHALT ONLY
FOUNDATION:	8" MIN. (A.C.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 ½" - APPROVED ADHESIVE

KEY:
ASPHALT CONCRETE (A.C.)
COMPACTED SUBBASE (C.S.)
PORTLAND CEMENT CONCRETE (P.C.C.)

NOTE: SEE TRINITY'S PRODUCT DESCRIPTION ASSEMBLY MANUAL FOR THE APPROVED ADHESIVE.

IF THE UNIT IS ANCHORED TO ASPHALTIC CONCRETE, IT SHOULD BE RELOCATED TO FRESH, UNDISTURBED ASPHALT AND RE-ANCHORED AFTER EACH IMPACT TO ENSURE ADEQUATE FUTURE PERFORMANCE.

TENSION STRUT BACKUP MAY BE USED IN CONSTRUCTION ZONES ON ASPHALT CONCRETE (A.C.) FOR TEMPORARY USE ONLY.

LOW MAINTENANCE

Texas Department of Transportation
Design Division Standard

TRINITY HIGHWAY ENERGY ABSORPTION QUADGUARD ELITE M10 (MASH TL-3)

QGELITE(M10)(N)-20

FILE: qgelitem10n20.dgn	DN: TxDOT	CK: KM	DW: VP	CK: AG
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		113

DATE: 2/18/2021
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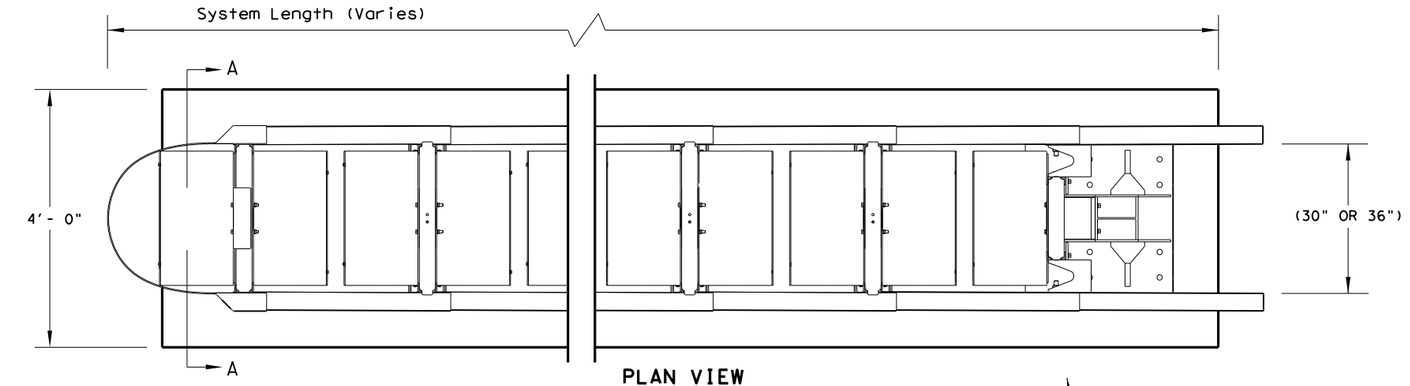
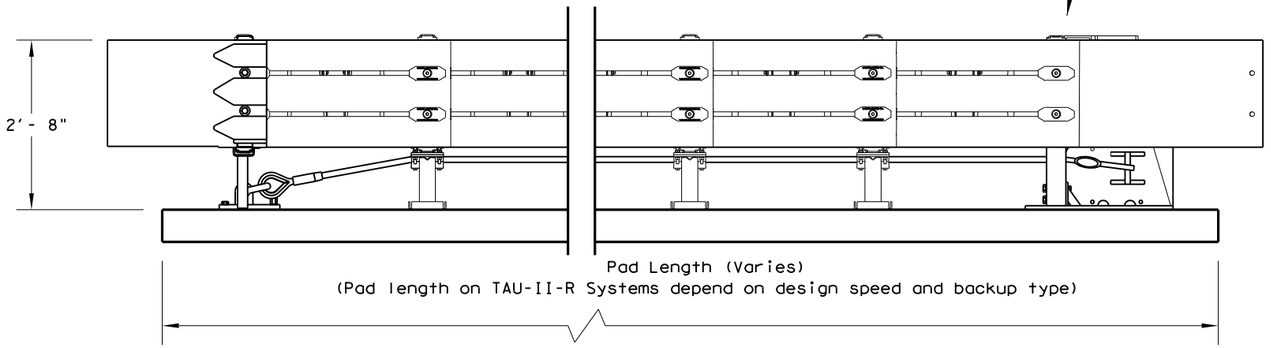


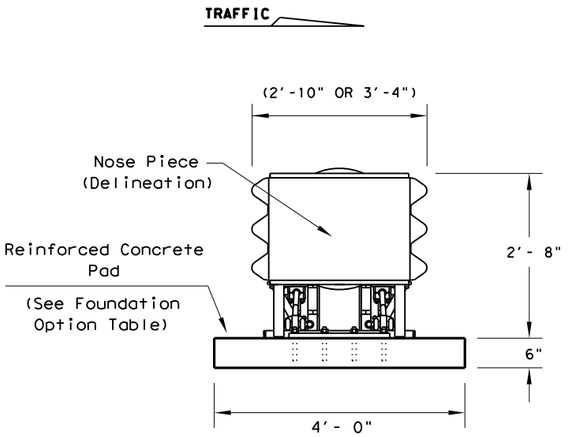
PLAN VIEW

Attachments and transitions to various barrier shapes, barrier railings and bi-directional traffic flows are available.

(SEE MANUFACTURER'S PRODUCT MANUAL)



ELEVATION VIEW



SECTION A-A

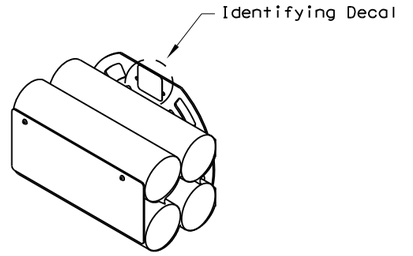
Nose Piece delineation orientation, is shown elsewhere on the plans.

TRANSITION OPTIONS
Vertical Wall
Concrete Traffic Barriers
W-Beam Guardrail
Thrie Beam Guardrail

For bi-directional transition panel and end shoe details.
(See manufacturer's product manual.)

FOUNDATION OPTIONS
6" Reinforced Concrete
8" Unreinforced Concrete
Asphalt over Concrete with Minimum 6" Embedment in Concrete
6" Asphalt over 6" Compact Subbase
8" Minimum Asphalt

For steel placement in concrete foundations.
(See manufacturer's product manual)



ENERGY ABSORBING ELEMENTS (EAE)

BACKUP SUPPORT OPTIONS
Compact (Stand Alone)
Flush Mount
PCB (Concrete Barrier)

TAU-II-R (NARROW) SYSTEM LENGTHS			
BACKSTOP	TL-2	TL-3	70 mph
PCB	13'-7"	27'-10"	30'-7"
Flush Mount	14'-0"	28'-3"	31'-0"
Compact	15'-3"	29'-6"	32'-3"

Backup and Transition types are shown elsewhere on the plans, (i.e. Attenuator location details or in the general notes).

Note: System lengths are ± 2"

GENERAL NOTES

1. For specific information regarding installation and technical guidance of the system, contact: Lindsay Transportation Solutions - Barrier Systems, Inc. at (707) 374-6800. 180 River Road, Rio Vista, CA 94571
2. For bi-directional traffic, appropriate transition panels will be required.
3. Additional details for the backup support option, transition options and foundation option will be shown on the manufacturer's shop drawings furnished to the Engineer.
4. Concrete shall be class "S" with a minimum compressive strength of 4,000 psi.
5. Maximum permissible cross-slope is 8%.
6. The installation area should be free from curbs, elevated objects, or depressions.
7. The TAU-II-R system should be approximately parallel with the barrier or center of merging barriers.
8. Refer to Universal TAU-II-R configuration chart for specific systems configuration number and location of each type of energy absorbing element.
9. 30-inch (30") model shown, also available in 36-inch (36") configuration.

BILL OF MATERIAL

PRODUCT CODE	QTY	DESCRIPTION
B030704	1	Front Support
B030703	TBD	Mid Support
TBD	1	Backstop Assembly (See Table)
TBD	1	Front Cable Anchor
TBD	1	Nose Assembly
B010202	TBD	Sliding Panel
B010659	2	End Panel
K001003	1	Slider Assembly Kit
BSI-1202006-KT	TBD	TAU-II-R Slider Kit
BSI-1107131-KT	TBD	TAU-II-R EAE Mounting Hw Kit
BSI-1012069-00	TBD	Energy Absorbing Element, Type 1
BSI-1012070-00	TBD	Energy Absorbing Element, Type 2
BSI-1012071-00	TBD	Energy Absorbing Element, Type 3
BSI-1110009-00	TBD	Energy Absorbing Element, Type 3N
TBD	TBD	Cable Assembly
K001004	TBD	Cable Guide Kit
K001005	2	Front Support Leg Kit
B010651	4	Pipe Panel Mount
TBD	1	Anchoring Package

(TBD) = To Be Determined, depending on Backup Type and System Length.

(See manufacturer's product manual for details)

Texas Department of Transportation

Design Division Standard

LTS-BARRIER SYSTEMS CRASH CUSHION (R-NARROW)

TAU-II-R(N)-16

LOW MAINTENANCE

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REVISIONS	0016	08	039	SL 368
REVISED 06,2013 (VP)	DIST	COUNTY		SHEET NO.
REVISED 03,2016 (VP)	SAT	BEXAR		113A

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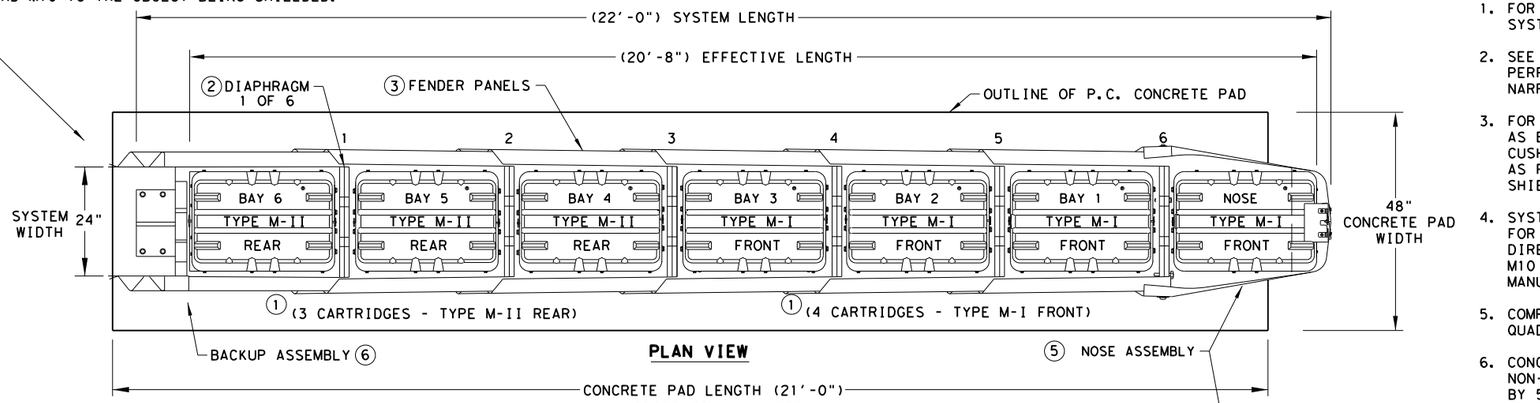
FILE: pw:\\garver-pw.bentley.com:garver-pw-01\Documents\2016\16187035 - WA 5 SL 368 at Salado Creek\Drawings\STANDARDS\Roadway\qguardm10n20.dgn

NOTE:
A TRANSITION MAY BE REQUIRED TO INSTALL THE QUADGUARD M10 TO THE OBJECT BEING SHIELDED.

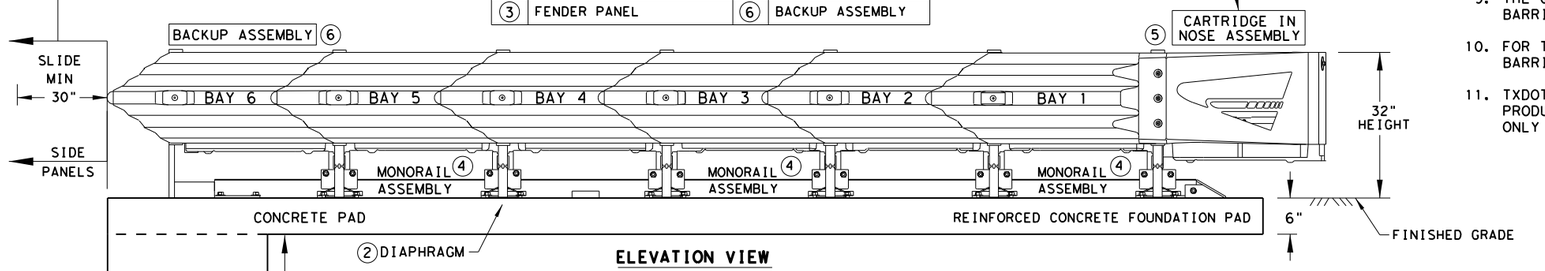
QUADGUARD M10 24" WIDE 6-BAY SYSTEM



PLAN VIEW

KEY		KEY	
(1)	QUADGUARD CARTRIDGE	(4)	MONORAILS
(2)	DIAPHRAGM	(5)	NOSE ASSEMBLY
(3)	FENDER PANEL	(6)	BACKUP ASSEMBLY

NOTE:
PROVISION SHALL BE MADE FOR REAR FENDER SIDE PANELS TO SLIDE REARWARD UPON IMPACT, 30" MIN.



ELEVATION VIEW
LEFT SIDE

NOTES:
CONTACT THE MANUFACTURER WITH SITE SPECIFIC DATA (SSD) FOR CONCRETE PAD AND ANCHOR BLOCK INSTALLATION REQUIREMENTS.

A MANUFACTURER'S DRAWING PACKAGE UNIQUE AND SPECIFIC FOR THE QUADGUARD M10 (N) INSTALATION AND DETAILED INFORMATION REGARDING THE TYPE OF BACKUP ASSEMBLY FOR THE REQUIRED TRANSITION WILL BE PROVIDED TO THE ENGINEER AND INSTALLER.

6" REINFORCED CONCRETE PAD REQUIRES THE INSTALLATION OF AN ANCHOR BLOCK AS SHOWN ON THE MANUFACTURER'S DRAWING PACKAGE.

8" NON-REINFORCED CONCRETE PAD MAY NOT REQUIRE AN ANCHOR BLOCK, IF THE PAD IS INSTALLED AGAINST AN IMMOVABLE CONCRETE BACKUP.

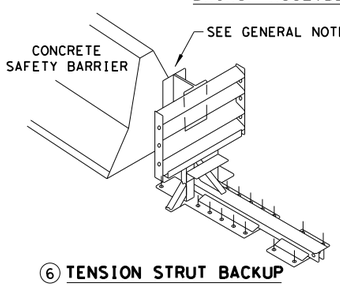
CONCRETE PAD AND ANCHOR BLOCK COMBINATIONS SHALL BE CONFIRMED WITH THE MANUFACTURER BASED UPON SITE SPECIFIC DATA (SSD).

NOTE:
THE QUADGUARD M10 24" WIDE 6-BAY - NARROW SYSTEM HAS BEEN TESTED TO MASH TEST LEVEL 3.

TL-3 MODEL #	QM10024	CARTRIDGE TYPES IN BAYS		
BAYS	6	TYPE-MII	TYPE-MI	TYPE-MI
DIAPHRAGMS	6	3	3	1
WIDTH	24"	REAR	FRONT	NOSE

TL-2 MODEL #	QM7024	CARTRIDGE TYPES IN BAYS		
BAYS	3	TYPE-MII	TYPE-MI	TYPE-MI
DIAPHRAGMS	3	1	2	1
WIDTH	24"	REAR	FRONT	NOSE

BACKUP ASSEMBLY TYPES FOR SYSTEM TRANSITIONS



(6) TENSION STRUT BACKUP

SYSTEM TRANSITIONS TYPES	
1	QUAD-BEAM TO CONCRETE SAFETY BARRIER
2	QUAD-BEAM TO CONCRETE BRIDGE RAIL
3	QUAD-BEAM TO CONCRETE END SHOE
4	QUAD-BEAM TO THRIE-BEAM RAIL
5	QUAD-BEAM TO W-BEAM RAIL

NOTE:
TRANSITION ASSEMBLIES FOR THE QUADGUARD M10 TO THRIE-BEAM OR W-BEAM FENCE REQUIRES I-BEAM POSTS:

ALL POSTS W6X8.5/9 I-BEAMS (78" LONG).

NOTES:
CONTACT THE MANUFACTURER WITH SITE SPECIFIC DATA (SSD) FOR THE CORRECT BACKUP ASSEMBLY AND TRANSITION PANELS OR SIDE PANELS USED FOR STANDARD AND BI-DIRECTIONAL INSTALLATIONS: AT DIVIDED-HIGHWAY MEDIANS OR UNDIVIDED ROADWAYS WHERE THE SYSTEM IS EXPOSED TO IMPACTS FROM ONE OR TWO DIFFERENT DIRECTIONS OF TRAFFIC FLOW.

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY - ENERGY ABSORPTION INC. AT 1(888)323-6374.
2. SEE THE RECENT QUADGUARD M10 PRODUCT DESCRIPTION ASSEMBLY MANAUAL FOR IMPACT PERFORMANCE CHARACTERISTICS AND DESIGN LIMITIONS AND THE DRAWING PACKAGE FOR THE NARROW 24" SYSTEM BEFORE INSTALLING THE QUADGUARD M10 SYSTEM AT ANY GIVEN LOCATION.
3. FOR BI-DIRECTIONAL TRAFFIC: THE PLACEMENT OF THE QUADGUARD M10 IS RESTRICTED. AS BI-DIRECTIONAL TRAFFIC APPROACHES THE REAR OF THE QUADGUARD M10 THE CRASH CUSHION MUST BE PLACED SUCH THAT THE TRAFFIC SIDE OF CRASH CUSHION IS AT LEAST AS FAR FROM ADJACENT TRAVEL LANE LINE AS THE TRAFFIC SIDE OF BARRIER/OBJECT BEING SHIELDED.
4. SYSTEM TRANSITION: APPROPRIATE TRANSITION PANELS OR SIDE PANELS WILL BE REQUIRED FOR PROPER IMPACT PERFORMANCE. THE CORRECT PANEL(S) TO USE WILL DEPEND ON THE DIRECTION OF TRAFFIC FLOW AND WHAT TYPE OF BARRIER OR ROAD FEATURE THE QUADGUARD M10 SYSTEM IS SHIELDING. SEE THE QUADGUARD M10 PRODUCT DESCRIPTION & ASSEMBLY MANUAL FOR FURTHER DETAILS.
5. COMPONENTS FOR THE QUADGUARD M10 BACKUP AND REINFORCING DETAILS ARE SHOWN ON THE QUADGUARD M10 PRODUCT DESCRIPTION & ASSEMBLY MANUAL.
6. CONCRETE PAD SHALL BE 6" MIN. REINFORCED 28MPa [4,000 PSI] (P.C.) OR 8" MIN. NON-REINFORCED 28MPa [4,000 PSI] CONCRETE ROADWAY MEASURING AT LEAST 12'-0" WIDE BY 50'-0" LONG. ANCHOR BLOCK IS NOT REQUIRED WHEN USING 8" CONCRETE PAD INSTALLED AGAINST AN IMMOVABLE STRUCTURE, E.G. CONCRETE WALL.
7. IF THE CROSS-SLOPE VARIES MORE THAN 2% OVER THE LENGTH OF THE SYSTEM, THE CONCRETE PAD WILL REQUIRE LEVELING. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
8. THE INSTALLATION AREA SHOULD BE FREE OF CURBS, ELEVATED OBJECTS,OR DEPRESSIONS.
9. THE QUADGUARD M10 SYSTEM SHOULD BE INSTALLED APPROXIMATELY PARALLEL WITH THE BARRIER.
10. FOR THE TENSION STRUT BACKUP THE DISTANCE BETWEEN THE BACK OF BACKUP AND THE BARRIER WALL SHOULD NOT EXCEED 7" IN ANY CASE.
11. TXDOT HAS ONLY APPROVED THE 24" WIDE QUADGUARD M10 SYSTEM. THE QUADGUARD M10 PRODUCT DESCRIPTION AND ASSEMBLEY MANUAL INCLUDES SYSTEM WIDTH OF 24". ONLY THE 24" SYSTEM IS ALLOWED TO BE INSTALLED ON TEXAS ROADWAYS.

FOUNDATION & ANCHORING REQUIREMENTS
FOUNDATION TYPES: A, B, C, & D

FOUNDATION TYPE: A	REINFORCED CONCRETE PAD OR ROADWAY
FOUNDATION:	6" MINIMUM DEPTH (P.C.C.)
ANCHORAGE:	7" STUDS EMBEDDED 5 ½" - APPROVED ADHESIVE
FOUNDATION TYPE: B	ASPHALT OVER P.C.C.
FOUNDATION:	3" MIN. (A.C.) OVER 3" MIN. (P.C.C.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 ½" - APPROVED ADHESIVE
FOUNDATION TYPE: C	ASPHALT OVER SUBBASE
FOUNDATION:	6" MIN. (A.C.) OVER 6" MIN. (C.S.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 ½" - APPROVED ADHESIVE
FOUNDATION TYPE: D	ASPHALT ONLY
FOUNDATION:	8" MIN. (A.C.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 ½" - APPROVED ADHESIVE

KEY:
ASPHALT CONCRETE (A.C.)
COMPACTED SUBBASE (C.S.)
PORTLAND CEMENT CONCRETE (P.C.C.)

NOTE: SEE TRINITY'S PRODUCT DESCRIPTION ASSEMBLY MANUAL FOR THE APPROVED ADHESIVE.

IF THE UNIT IS ANCHORED TO ASPHALTIC CONCRETE, IT SHOULD BE RELOCATED TO FRESH, UNDISTURBED ASPHALT AND RE-ANCHORED AFTER EACH IMPACT TO ENSURE ADEQUATE FUTURE PERFORMANCE.

TENSION STRUT BACKUP MAY BE USED IN CONSTRUCTION ZONES ON ASPHALT CONCRETE (A.C.) FOR TEMPORARY USE ONLY.

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE QUADGUARD M10 SYSTEM AND IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

REUSABLE

Texas Department of Transportation — Design Division Standard

TRINITY HIGHWAY
ENERGY ABSORPTION
QUADGUARD M10
(MASH TL-3 & TL-2 NARROW-24"ONLY)

QGUARD(M10)(N)-20

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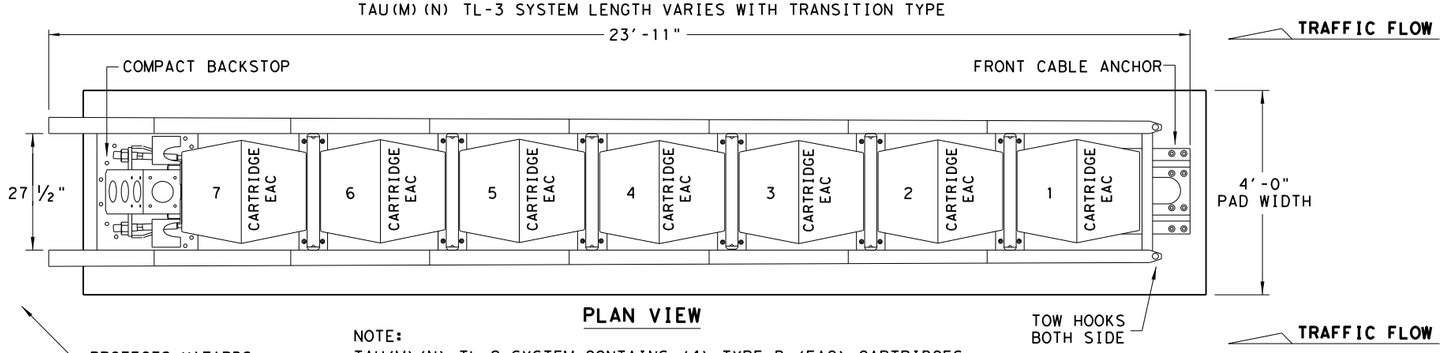
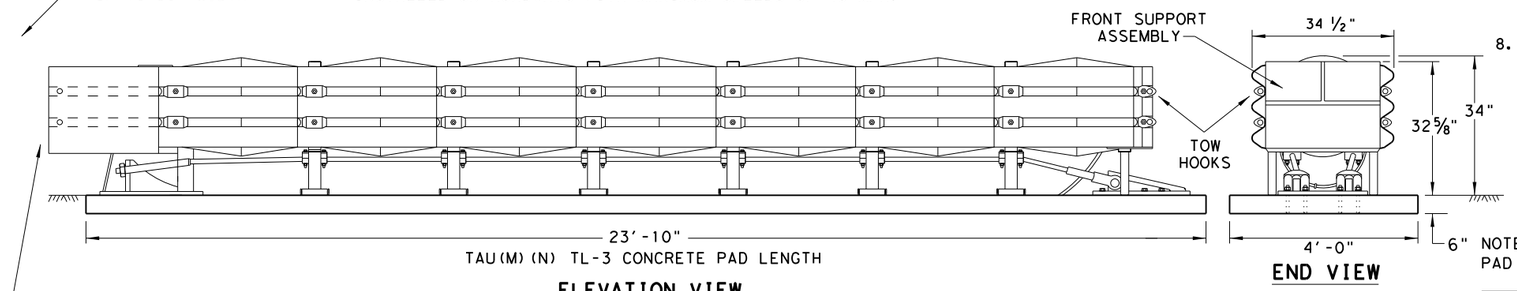
TAU(M)(N) TL-3 SYSTEM LENGTH VARIES WITH TRANSITION TYPE



PLAN VIEW

NOTE:
TAU(M)(N) TL-2 SYSTEM CONTAINS (4) TYPE B (EAC) CARTRIDGES. INSTALLED ON ROADWAYS WITH MAXIMUM SPEEDS OF 45 MPH.

PROTECTS HAZARDS UP TO 30" WIDTH



ELEVATION VIEW

END VIEW

NOTE:
PAD THICKNESS VARIES - SEE FOUNDATION OPTIONS

NOTES:
TRANSITIONS AND ATTACHMENTS TO VARIOUS BARRIER SHAPES, RAILINGS AND BI-DIRECTIONAL TRAFFIC FLOWS ARE AVAILABLE. SEE MANUFACTURER'S INSTALLATION INSTRUCTIONS MANUAL FOR ADDITIONAL TRANSITION DETAILS.

NOTE:
CONCRETE FOUNDATION PAD LENGTH VARIES WITH TL-3 AND TL-2 SYSTEMS, SEE SYSTEM & FOUNDATION LENGTH TABLE.

FOUNDATION OPTIONS	
6" REINFORCED CONCRETE	
8" UNREINFORCED CONCRETE	
ASPHALT OVER CONCRETE WITH MINIMUM 6" EMBEDMENT IN CONCRETE	
* 6" ASPHALT OVER 6" COMPACT SUBBASE	
* 8" MINIMUM ASPHALT	

SYSTEM & FOUNDATION LENGTH TABLE	
SYSTEM LENGTH	FOUNDATION LENGTH
TL-2 = 15'-5"	TL-2 = 15'-4"
TL-3 = 23'-11"	TL-3 = 23'-10"

* NOTE:
REQUIRES AN ASPHALT ANCHORAGE PACKAGE: INCLUDES ADDITIONAL BRACES FOR THE FRONT CABLE ANCHOR AND THE COMPACT BACKSTOP, AND ASPHALT HARDWARE KIT. THE TL-3 ASPHALT CONFIGURATION ALSO REQUIRES NESTED SLIDER PANELS AND SHIMS AT THE LAST TWO BAYS. SEE MANUFACTURER'S INSTALLATION INSTRUCTION MANUAL FOR DETAILS.

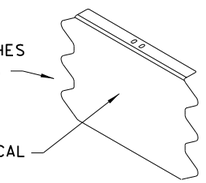
NOTE:
SEE MANUFACTURER'S INSTALLATION INSTRUCTION MANUAL FOR FOUNDATION SPECIFICATIONS THAT INCLUDE, STONE AGGREGATE MIX, COMPRESSION STRENGTH, STEEL SIZE, ANCHOR SIZE, AND EMBEDMENT DEPTH.

TRANSITION OPTIONS	
USE THE COMPACT BACKSTOP	VERTICAL WALL
	CONCRETE TRAFFIC BARRIERS
	W-BEAM GUARDRAIL
	THRIE BEAM GUARDRAIL

NOTE:
FOR BI-DIRECTIONAL TRANSITION PANELS AND BRIDGE RAIL END SHOE DETAILS. SEE MANUFACTURER'S INSTALLATION INSTRUCTIONS MANUAL.

** NOTE:
ENGINEER OR CONTRACTOR SHALL COORDINATE WITH THE MANUFACTURER FOR THE CORRECT DECAL PER TRAFFIC FLOW, LEFT, RIGHT OR BOTH-SIDES.

NOTE:
DELINEATION BRACKET ATTACHES TO FRONT SUPPORT ASSEMBLY.



DELINEATION BRACKET

NOTE:
APPLY A HIGH REFLECTIVE DECAL TO THE DELINEATION BRACKET. DELINEATION DECAL ORIENTATION IS SHOWN ON THE CONSTRUCTION PLAN SET AND SHALL BE IN ACCORDANCE WITH THE TEXAS MUTCD FOR (TRAFFIC CONTROL DEVICES). DECALs ARE AVAILABLE FOR TRAFFIC FLOW ON THE LEFT-SIDE, BOTH -SIDES AND RIGHT-SIDE.

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING THE INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800. 180 RIVER ROAD, RIO VISTA, CA 94571
2. REFER TO THE LATEST (LTS) INSTALLATION INSTRUCTION MANUAL FOR IMPORATANT SAFETY MESSAGES, COMPLETE SYSTEM ASSEMBLY, AND ANCHOR INSTALLATION REQUIREMENTS FOR THE NINE (9) DIFFERENT SITE TRANSITIONS.
3. INSTALLATION DETAILS FOR THE COMPACT BACKSTOP, FRONT CABLE ANCHOR AND FOUNDATION OPTIONS ARE SHOWN ON THE INSTALLATION INSTRUCTION MANUAL FURNISHED TO THE ENGINEER.
4. CONCRETE SHALL BE CLASS "S" WITH A MINIMUM COMPRESSIVE STRENGTH OF 4,000 P.S.I.
5. IF THE CROSS-SLOPES VARIES MORE THAN 2% OVER THE LENGTH OF THE SYSTEM, THE CONCRETE PAD WILL REQUIRE LEVELING. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%
6. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
7. THE TAU(M)(N) SYSTEM SHOULD BE APPROXIMATELY PARALLEL WITH THE BARRIER OR CENTER LINE OF MERGING BARRIERS.
8. THIS DRAWING REPRESENTS THE UNIVERSAL TAU(M)(N) TL-3 SYSTEM, A RE-DIRECTIVE NON-GATING CRASH CUSHION THAT CAN PROTECT HAZARDS UP TO 30-INCHES IN WIDTH. ALSO AVAILABLE IN TL-2 CONFIGURATION.

BILL OF MATERIALS FOR TAU(M)(N) TL-3 & TL-2 SYSTEMS		QUANTITIES	
PART NUMBER	PART DESCRIPTION	TL-3 SYSTEM	TL-2 SYSTEM
BSI-1708019-00	SLIDING PANEL GALVANIZED TAU(M)(N)	14	8
BSI-1708030-00	END PANEL, THRIE BEAM, GALV, TAU(M)(N)	2	2
BSI-1706001-00	CABLE ASSEMBLY, 7 BAY, TAU(M)(N)	2	-
BSI-1805036-00	CABLE ASSEMBLY, 4 BAY, TAU(M)(N)	-	2
BSI-1708018-00	FRONT CABLE ANCHOR	1	1
BSI-1707034-00	COMPACT BACKSTOP	1	1
B030703	MIDDLE SUPPORT ASSEMBLY	6	3
B030704	FRONT SUPPORT	1	1
B010722	ENERGY ABSORBING CARTRIDGE, TYPE B	7	4
K001005	TAU-II FRONT SUPPORT LEG KIT	1	1
BSI-1709083-KT	TETHER KIT (INCLUDES ALL HARDWARE)	1	1
BSI-1809041-KT	SLIDER KIT (INCLUDES ALL HARDWARE)	7	4
BSI-1808033-KT	CABLE GUIDE KIT (INCLUDES ALL HARDWARE)	6	3
BSI-1809040-KT	TOW HOOK KIT (INCLUDES ALL HARDWARE)	1	1
BSI-1808034-KT	DELINEATION BRACKET KIT(INCLUDES ALL HARDWARE)	1	1
BSI-1808035-KT	END PANEL MOUNT KIT (INCLUDES ALL HARDWARE)	1	1
BSI-1808036-KT	CONCRETE ANCHORING KIT	1	1
** SEE NOTE	HIGH REFLECTIVE DECAL	1	1
ECN 3883	INSTALLATION AND INSTRUCTIONS MANUAL	1	1

NOTES:
UPGRADE KITS ARE AVAILABLE TO RETROFIT EXISTING NCHRP 350 TAU-II SYSTEMS TO MASH COMPLIANT SYSTEMS. SEE MANUFACTURER'S PRODUCT INFORMATION.

THE TAU(M)(N) UNIDIRECTIONAL SYSTEM IS FREE STANDING AND IS NOT REQUIRED TO BE CONNECTED TO THE HAZARD.

TRANSITIONS TO GUARD FENCE, BRIDGE RAILS AND ROADSIDE BARRIERS SHALL BE IN ACCORDANCE WITH TxDOT'S POLICY.

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE UNIVERSAL TAU(M)(N) SYSTEM, IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTION MANUAL.

REUSABLE

Texas Department of Transportation — Design Division Standard

LINDSAY TRANSPORTATION SOLUTIONS

UNIVERSAL CRASH CUSHION (MASH TL-3 & TL-2)

TAU(M)(N)-19

FILE: taumn19.dgn	DN: TxDOT	CK: KM	DW: VP	CK:
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REVISIONS	0016	08	039	SL 368
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	SAT	BEXAR		114A

DATE: 1/27/2021
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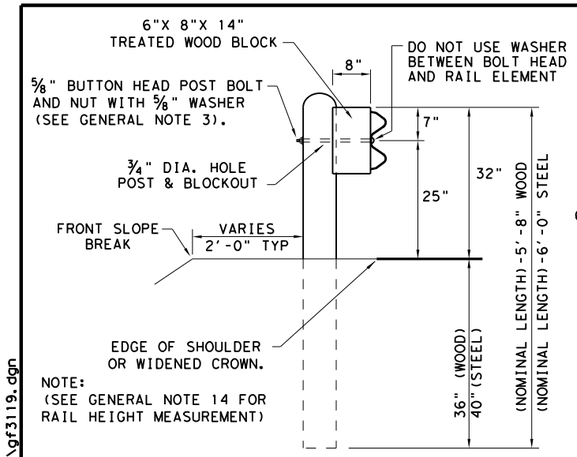
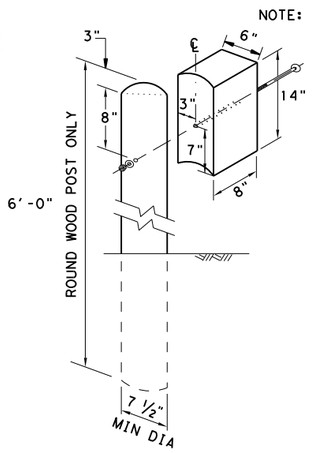
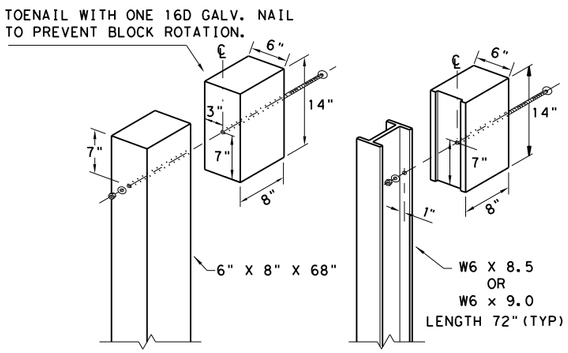


TYPICAL POST PLACEMENT



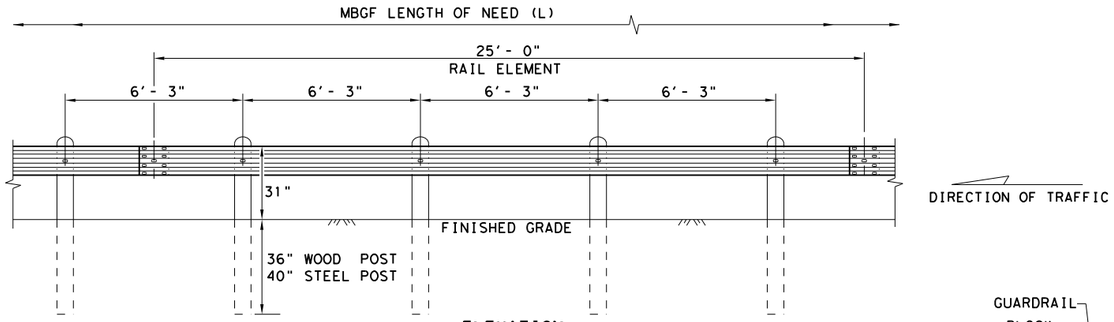
WOOD BLOCK TO ROUND WOOD POST



WOOD BLOCK TO RECTANGULAR WOOD POST

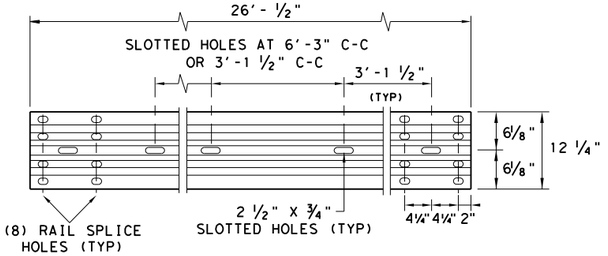
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

NOTE: ** "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



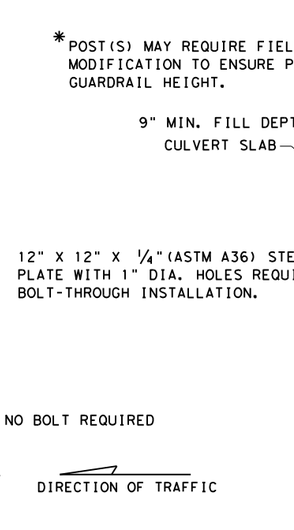
ELEVATION
MID-SPAN RAIL SPLICE

SHOWING A 25'- 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)

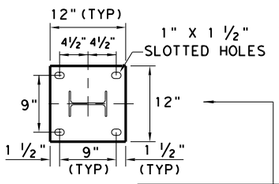


ELEVATION 25'- 0" (NOM.) W-BEAM SECTION

NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES.
SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.



LOW FILL CULVERT POST



STEEL POST CONNECTION TO CULVERT SLAB (USE WHEN THERE IS LESS THAN 36" COVER OVER CULVERT SLAB).

NOTE: TRANSISTIONS TO BRIDGE RAILS OR TRAFFIC BARRIERS.
SEE GF(31)TL3 TR STANDARD FOR HIGH-SPEED TL-3 TRANSITIONS.
SEE GF(31)TL2 TR STANDARD FOR LOW-SPEED TL-2 TRANSITIONS.

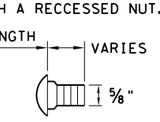
NOTE: TWO INSTALLATION OPTIONS.

1. BOLT-THROUGH OPTION: REQUIRES A 6" MIN. SLAB THICKNESS. ⅞" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS.
   NOTE: BOLT LENGTH = SLAB PLUS 2 ¼" MIN.

2. EPOXY ANCHOR OPTION: THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE ⅞" DIA. ASTM A449 OR A193 GRADE B7 WITH HEAVY HEX NUT, AND ONE HARDENED WASHER EACH. EMBED ANCHOR RODS 6" WITH HILTI HIT RE 500 EPOXY ADHESIVE. OTHER TYPE III CLASS C EPOXY ADHESIVES MEETING THE REQUIREMENTS OF DMS-6100, "EPOXIES AND ADHESIVES", MAY BE USED IF IT CAN BE DEMONSTRATED THAT THEY MEET OR EXCEED THE STRENGTH OF HILTI HIT RE 500 WITH THE SAME EMBEDMENT DEPTH AND THREADED ROD DIA. FOLLOW THE MANUFACTURER'S REQUIREMENTS FOR INSTALLING EPOXIED THREADED RODS. EXTEND RODS ¼" MIN. BEYOND NUT.

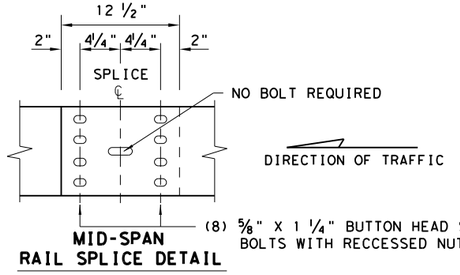
NOTE: CULVERTS OF 25 FT. OR LESS, SEE GF(31)LS STANDARD FOR "LONG SPAN" OPTION.

NOTE:
FOUR TYPES OF BUTTON-HEAD GUARD RAIL BOLTS COME WITH A RECCESSED NUT.



BUTTON HEAD BOLT

NOTE: SEE GENERAL NOTE 3 FOR SPLICE & POST BOLT DETAILS.



MID-SPAN RAIL SPLICE DETAIL

NOTE: GF(31), MID-SPAN RAIL SPLICES ARE REQUIRED WITH 6'-3" POST SPACINGS.

GENERAL NOTES

1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25'- 0", OR 12'- 6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'-1 ½" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE DOWNSTREAM ANCHOR TERMINAL (DAT) AND THE TRANSITION SECTIONS OF GUARDRAIL.
3. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
8. UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE POSITIONED SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF THE RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 25 INCHES ABOVE THE GUTTER PAN OR EDGE OF SHOULDER.
9. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. IF SOLID ROCK IS ENCOUNTERED WITHIN 0 TO 18" OF THE FINISHED GRADE, DRILL A 24" DIA. HOLE, 24" INTO THE ROCK. IF SOLID ROCK IS ENCOUNTERED BELOW 18", DRILL A 12" DIA. HOLE, 12" INTO THE ROCK OR TO THE STANDARD EMBEDMENT DEPTH, WHICHEVER MAYBE LESS. ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT. BACKFILL WITH COARSE AGGREGATE MATERIAL.
10. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
11. SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
12. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210 ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
13. FOR THE LOW FILL CULVERT OPTION, POSTS LOCATED PARTIALLY OR WHOLLY BETWEEN PRECAST BOX CULVERT UNITS, THE USE OF A CAST-IN-PLACE CONCRETE CLOSURE BETWEEN BOXES IS REQUIRED. THE LENGTH OF THE CAST-IN-PLACE CONCRETE CLOSURE SHALL ACCOMMODATE THE PLACEMENT OF THE LOW FILL CULVERT OPTION. SEE CONCRETE CLOSURE DETAILS ON BRIDGE STANDARD SCP-MD.
14. GUARDRAIL HEIGHT MEASUREMENT: WHEN THE GUARDRAIL IS LOCATED ABOVE PAVEMENT, MEASURE THE HEIGHT FROM THE PAVEMENT TO THE TOP OF THE W-BEAM RAIL. WHEN THE GUARDRAIL IS LOCATED UP TO 2 FT. OFF OF THE EDGE OF PAVEMENT OR FOR A PAVEMENT OVERLAY, USE A 10-FOOT STRAIGHTEDGE TO EXTEND THE PAVEMENT/SHOULDER SLOPE TO THE BACK OF RAIL, MEASURE FROM THE BOTTOM OF STRAIGHTEDGE TO THE TOP OF RAIL. FOR GUARDRAIL LOCATED DOWN A 10:1 SLOPE, MEASURE FROM THE NOMINAL TERRAIN.

Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE
TL-3 MASH COMPLIANT
GF(31)-19

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		115

DATE: 1/27/2021
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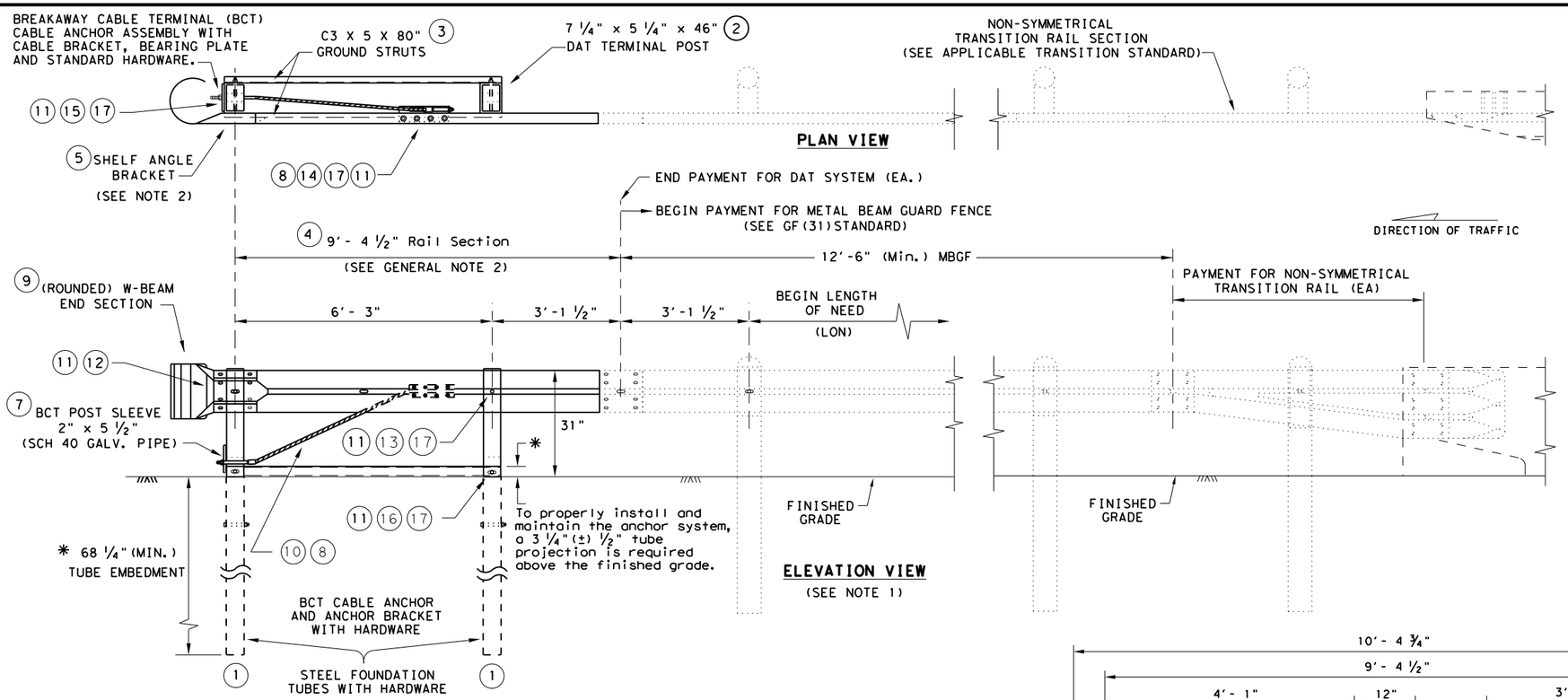


DOWNSTREAM ANCHOR TERMINAL (DAT)

NOTE: ONLY FOR DOWNSTREAM USE, WHEN LOCATED OUTSIDE THE HORIZONTAL CLEARANCE AREA OF OPPOSING TRAFFIC.

GENERAL NOTES

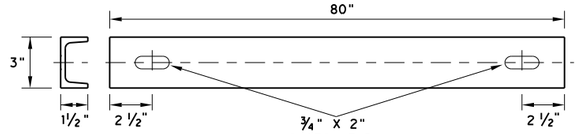
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN 3 3/4" ABOVE THE FINISHED GRADE.
4. ALL HARDWARE FOR DAT SHALL BE ASTM A307 UNLESS OTHERWISE SHOWN.
5. REFER TO GF(31) SHEET FOR TERMINAL CONNECTION DETAILS.

MOW STRIP INSTALLATION

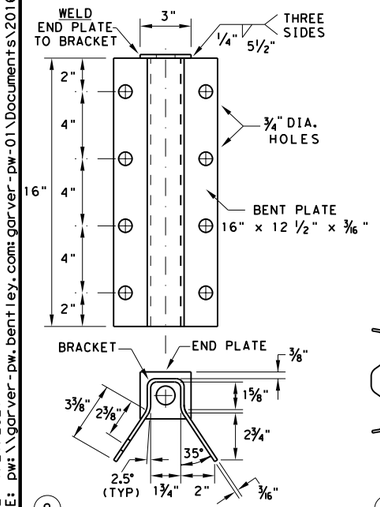
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

#	(DAT) PARTS LIST	QTY
(1)	STEEL FOUNDATION TUBE	2
(2)	DAT TERMINAL POST	2
(3)	CHANNEL STRUT	2
(4)	TERMINAL RAIL ELEMENT	1
(5)	SHELF ANGLE BRACKET	1
(6)	BCT BEARING PLATE	1
(7)	BCT POST SLEEVE	1
(8)	GUARDRAIL ANCHOR BRACKET	1
(9)	(ROUNDED) W-BEAM END SECTION	1
(10)	BCT CABLE ANCHOR	1
(11)	RECESSED NUT, GUARDRAIL	20
(12)	1 1/4" BUTTON HEAD BOLT	4
(13)	10" BUTTON HEAD BOLT	2
(14)	5/8" X 2" HEX HEAD BOLT	8
(15)	5/8" X 8" HEX HEAD BOLT	4
(16)	5/8" X 10" HEX HEAD BOLT	2
(17)	5/8" FLAT WASHER	18

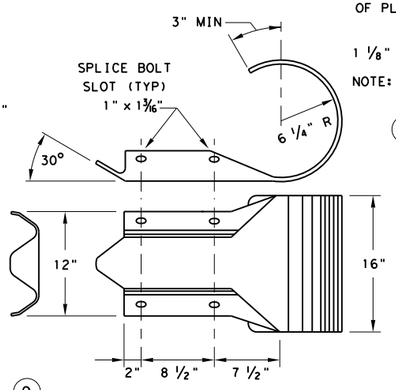
(4) TERMINAL RAIL ELEMENT FOR DAT



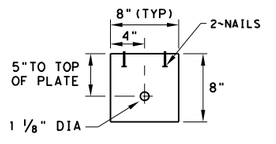
(3) CHANNEL STRUT
C3 X 5 X 80", GRADE A36



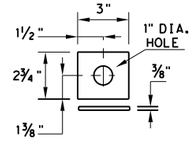
(8) GUARDRAIL ANCHOR BRACKET



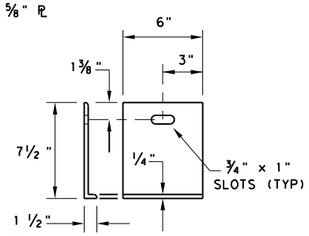
(9) W-BEAM END SECTION (ROUNDED) (12 GA.)



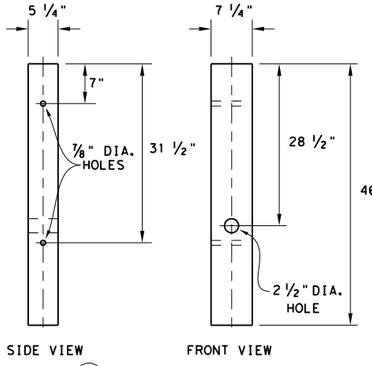
NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION
(6) BEARING PLATE
8"x 8"x 5/8" PL



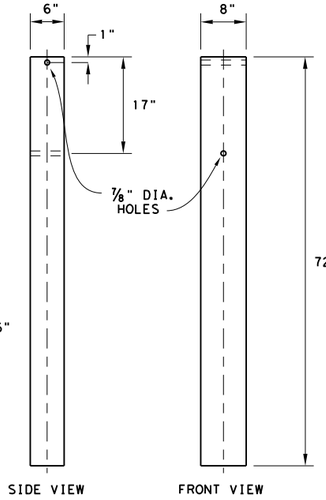
END PLATE



(5) SHELF ANGLE BRACKET



(2) TERMINAL POST
7 1/4"x 5 1/4"x 46" WOOD POST



(1) STEEL FOUNDATION TUBE
6"x 8"x 1/8" x 72" STEEL TUBE

Texas Department of Transportation

Design Division Standard

METAL BEAM GUARD FENCE
(DOWNSTREAM ANCHOR TERMINAL)
TL-3 MASH COMPLIANT

GF(31)DAT-19

FILE: gf31dat19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
© TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
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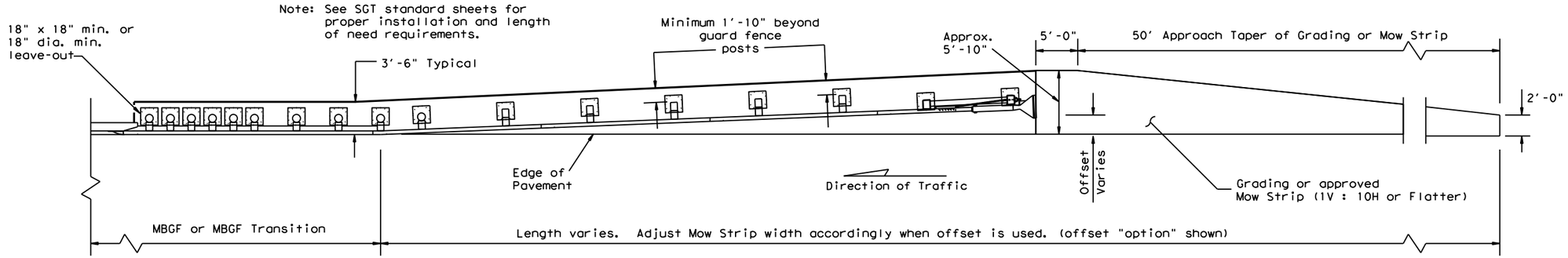
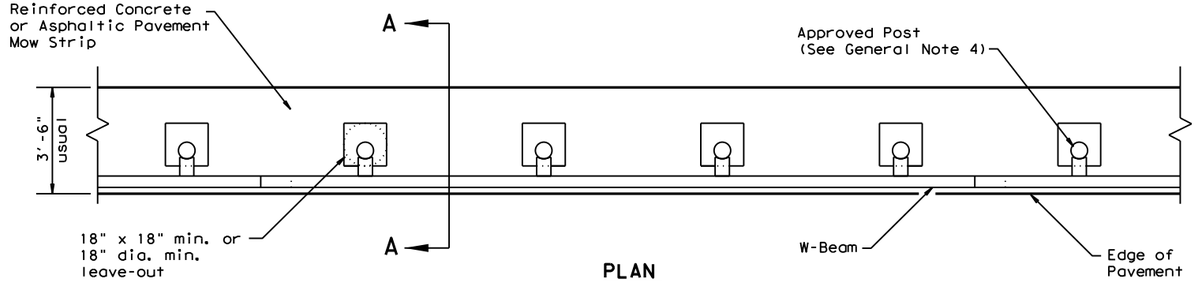


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



PLAN

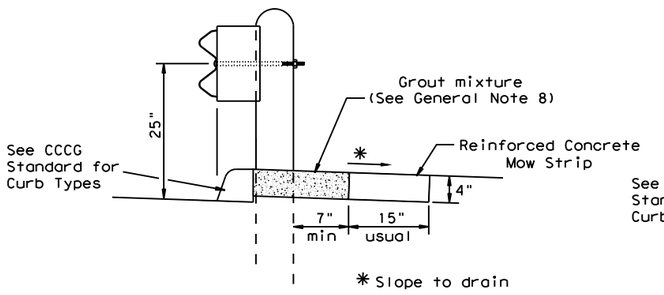
GF(31) shown with Mow Strip
(See GF(31) standard sheet for proper installation)

SECTION A-A

Typical

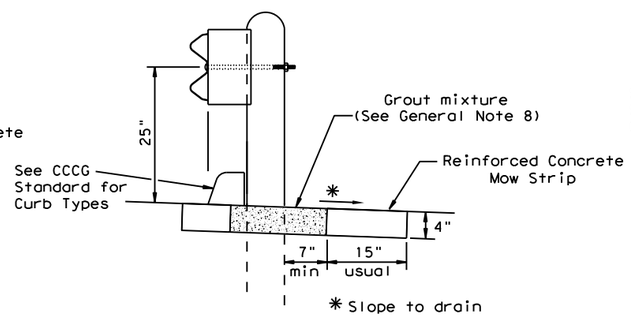
MOW STRIP DETAIL

Reinforced Concrete Mow Strip with 18" x 18" Square or 18" Dia. minimum leave-out.



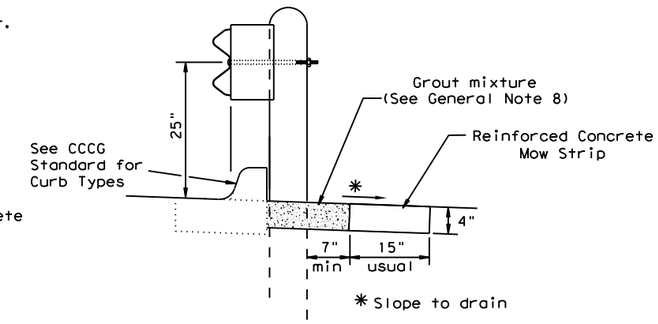
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.

Approach grading or mow strip may be decreased or eliminated, as directed by the Engineer.

GENERAL NOTES

1. This mow strip design is for use with metal beam guard fence, guard fence transitions, and guard fence end treatments. See applicable GF(31) MBGF or GF(31) Transition Standard sheet for additional information.
2. Mow strips shall be reinforced concrete with (wire mesh or synthetic fiber), as shown on the plans and will be paid for under the pertinent bid item. Reinforced concrete shall be placed in accordance with Item 432, "Riprap." The use of the synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Material Producer List (MPL), maintained by TxDOT, Construction Division.
3. The leave-out behind the post shall be a minimum of 7".
4. Only steel (W6 x 8.5 or W6 x 9.0), or 7 ½" Dia. round wood posts are acceptable for use in the mow strip. See GF(31) Standard for additional details.
5. Other curb placement options may be used. Curbs are not considered part of the mow strip and will be paid for under other pertinent bid item.
6. Thickness of the mow strip will be 4".
7. The limits of payment for reinforced concrete will include leave-outs for the posts.
8. The leave-outs shall be filled with a Grout mixture consisting of: 2719 pounds sand, 188 pounds Type I or II cement, and 550 pounds of water per cubic yard, with a 28-day compressive strength of approximately 230 psi or less. Provide grout with a consistency that will flow into and completely fill all voids. Due to auger size, larger leave-out dimensions are acceptable from both an impact performance and maintenance repair standpoint (Suggested Maximum leave-out of 20"). Payment for furnishing and placing the grout mixture will be subsidiary to the pay item of riprap mow strip.

Texas Department of Transportation

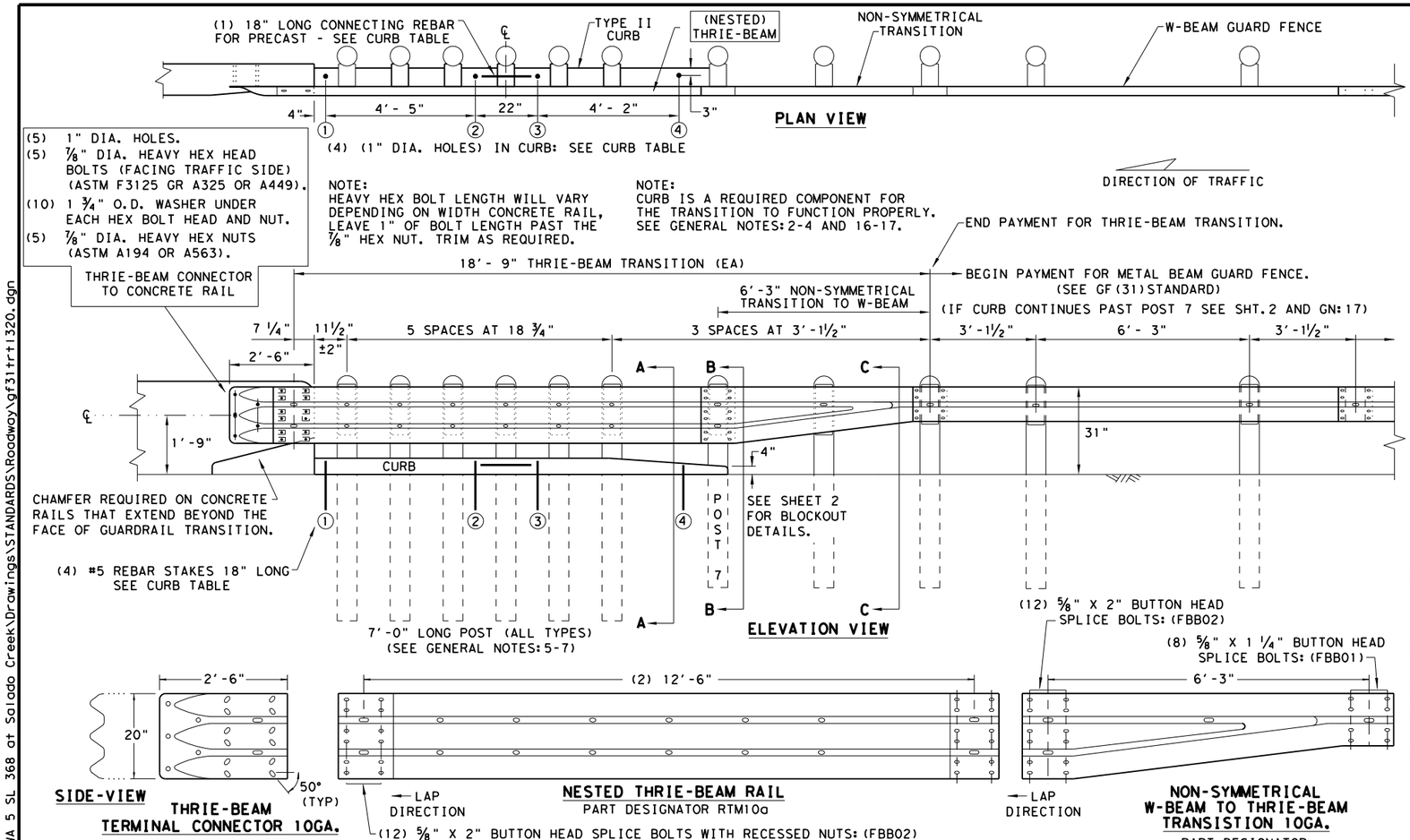
Design Division Standard

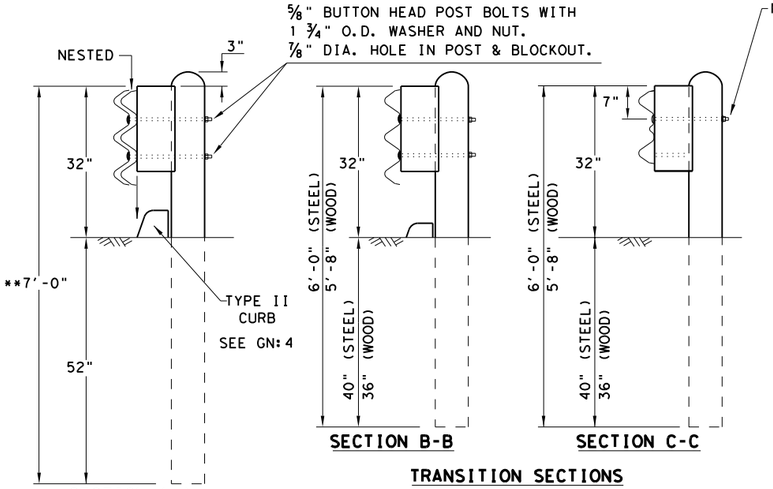
METAL BEAM GUARD FENCE (MOW STRIP) TL-3 MASH COMPLIANT

GF(31)MS-19

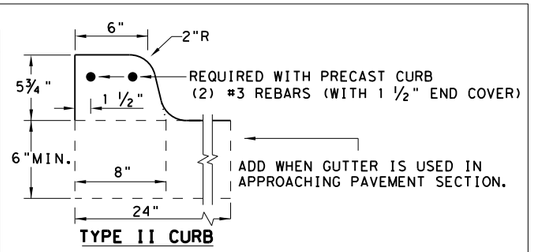
FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		117

DATE: 1/27/2021
FILE: pw:\\garver-pw.bentley.com:garver-pw-01\Documents\2016\16187035 - WA 5 SL 368 at Salado Creek\Drawings\STANDARDS\Roadway\gf31trt1320.dgn





THRIE-BEAM TERMINAL - CURB TABLE
PRECAST CURB FULL LENGTH EQUALS 12'- 2" THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.
CURB (1) LENGTH 5'- 8" CURB (2) LENGTH 6'- 6" TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7
CONNECTING PRECAST CURB SECTIONS (1) & (2): FORM OR CORE 1" DIA. HOLE 9" LONG INTO EACH CURB END. USE (1) #5 GR.60 REBAR 18" LONG TO CONNECT BOTH CURBS.
SECURING PRECAST OR CAST-IN-PLACE TO FINISHED GRADE *: FORM OR CORE (4) 1" DIA. HOLES, SEE PLAN AND ELEVATION VIEWS FOR HOLE LOCATIONS. DRIVE (4) #5 GR.60 REBAR STAKES 18" LONG INTO THE GROUND AND ½" BELOW TOP OF CURB. FILL HOLES WITH APPROVED GROUT MIXTURE.



NOTE: OPTIONS FOR TYPE II CURB:
1. PRECAST
2. CAST-IN-PLACE

* NOTES: NOT NEEDED FOR CAST-IN-PLACE.
SEE TYPE II CURB DETAIL FOR REBAR AND COVER REQUIREMENTS.
PERCUSSION DRILLING IS NOT PERMITTED WITH:
TYPE II CURB, BRIDGE RAIL OR CONCRETE TRAFFIC RAIL.

TYPE II CURB DETAILS

GENERAL NOTES

1. CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
2. CONCRETE CURB MAY BE CAST-IN-PLACE OR PRECAST AS SHOWN ON THIS SHEET. WHEN USED IN CONJUNCTION WITH THE THRIE-BEAM TRANSITIONS, CURB SHALL BE TYPE II (5- ¾" HEIGHT); SEE CURRENT CCCG STANDARD SHEET FOR FURTHER DETAILS. IF OTHER CURB HEIGHTS ARE SHOWN IN THE PLANS IN CONJUNCTION WITH THE TRANSITION, THE CURB HEIGHT MAY BE FROM 4" TO 8" WITH A RELATIVELY VERTICAL FACE. CONCRETE CURB SHALL BE CONTINUOUS TO THE SEVENTH POST UNLESS OTHERWISE SHOWN IN THE PLANS. SEE GENERAL NOTE: 17 FOR CIRCUMSTANCES WHERE CURB CONTINUES PAST POST 7.
3. CONCRETE CURB TYPE II SUBSIDIARY TO "METAL BEAM GUARD FENCE TRANSITION". IF NO ADDITIONAL CURB IS INDICATED BEYOND THE TRANSITION, THEN ANY CURB HEIGHT GREATER THAN 4" WILL BE TAPERED DOWN BEGINNING AT THE LAST 7 FT. POST TO A MAXIMUM HEIGHT OF 4" AT POST 7. IF SHOWN ELSEWHERE IN THE PLANS, ADDITIONAL CURB UNDERNEATH GUARDRAIL WILL BE PAID FOR BY THE LINEAR FOOT.
4. UNLESS OTHERWISE SHOWN IN THE PLANS, TRANSITIONS SHALL BE PLACED WITH THE BLOCKOUT FACE IN FRONT OF OR DIRECTLY ABOVE THE CURB FACE. SEE SECTION A-A.
5. FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 ½" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
6. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. REFER TO GF(31) STANDARD SHEET.
7. THE POST LENGTH SHALL BE MARKED ON ALL 7'- 0" LONG POSTS BY THE MANUFACTURER. THE MARK SHALL BE LOCATED WITHIN THE TOP 1 FT. REGION OF THE POST, AT LEAST ⅝" IN HEIGHT, AND VISIBLE AFTER INSTALLATION. WOODEN POSTS SHALL BE MARKED WITH A BRAND, AND STEEL POSTS WITH A STENCIL BEFORE GALVANIZING.
8. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
9. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE THRIE-BEAM TERMINAL CONNECTOR AND THE THRIE-BEAM TRANSITION TO W-BEAM SHALL BE OF THE SAME MATERIAL, BUT SHALL NOT BE LESS THAN 10 GAUGE. CONTRACTOR SHALL VERIFY THAT THE LOCATIONS OF BOLT HOLES MATCH THOSE IN THE THRIE-BEAM TERMINAL CONNECTOR PRIOR TO ORDERING MATERIALS.
10. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
11. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
12. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
13. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
14. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. TXDOT'S MATERIALS AND TESTS DIVISION MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
15. REFER TO GF(31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
16. THE INSTALLATION OF THE TYPE II CURB IS CRITICAL FOR THE PERFORMANCE OF THE THRIE-BEAM TRANSITION SYSTEM. THE CURB PREVENTS (VEHICLE WHEEL SNAGGING) AT THE CONCRETE RAIL AND IS REQUIRED TO MEET MASH CRASH TEST CRITERIA.
17. IF CURB EXTENDS BEYOND POST 7, 25' OF NESTED W-BEAM GUARDRAIL SHALL BE INSTALLED BEYOND THE PAY LIMITS OF THRIE-BEAM TRANSITION SECTION, (SEE SHT.2). PAYMENT FOR THIS 25' SECTION WILL BE BY LINEAR FOOT, PAY ITEM "0540 6XXX MTL W-BEAM GD FEN (NESTED) (TIM POST)" OR "540 6XXX MTL W-BEAM GD FEN (NESTED) (STEEL POST)" AS APPLICABLE FOR POST TYPE. SEE SHT.2 FOR ADDITIONAL INFORMATION.

HIGH-SPEED TRANSITION

Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

GF(31)TR TL3-20

FILE: gf31trt1320.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		118

DATE: 1/27/2021
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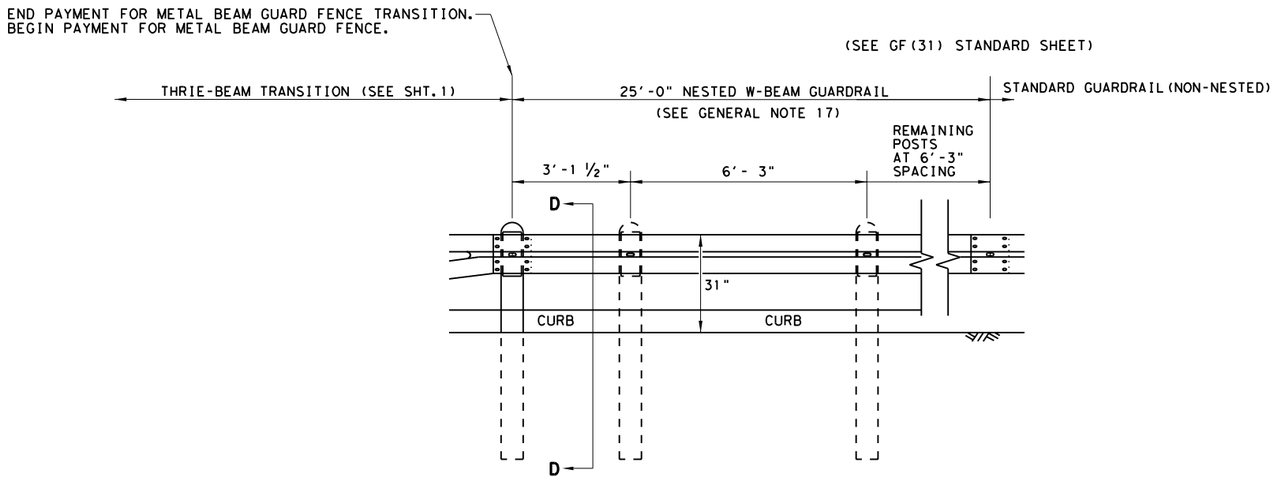
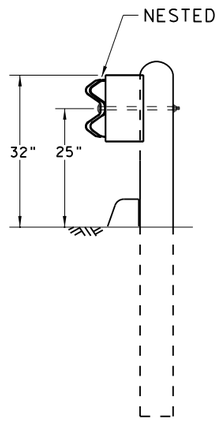
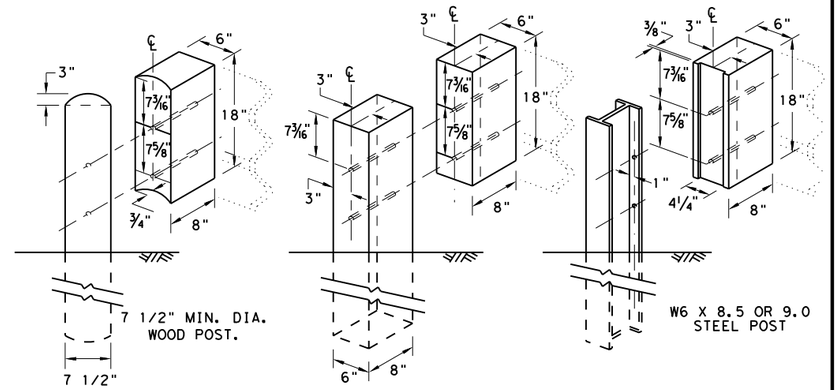
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THRIE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2

Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

GF(31)TR TL3-20

FILE: gf31trt1320.dgn	DN: TxDOT	CK: KM	DW: KM	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY	
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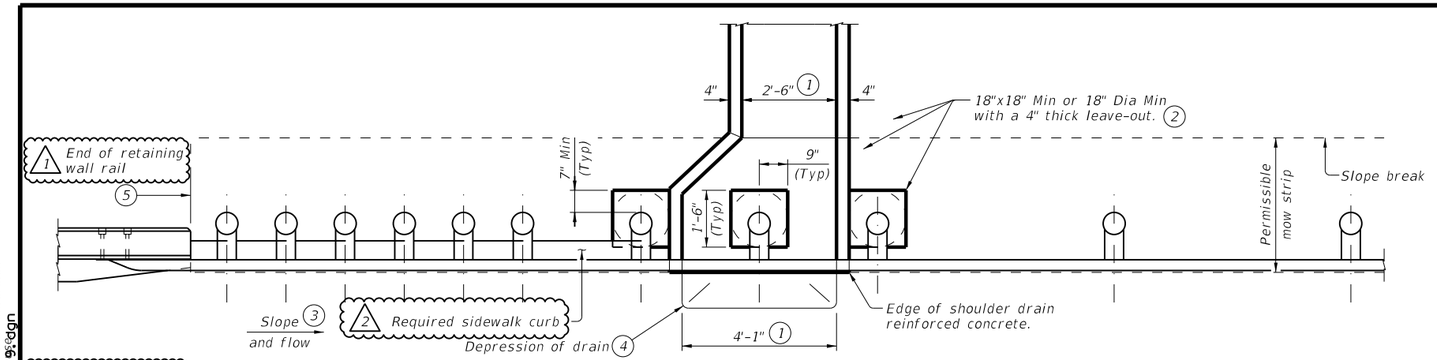
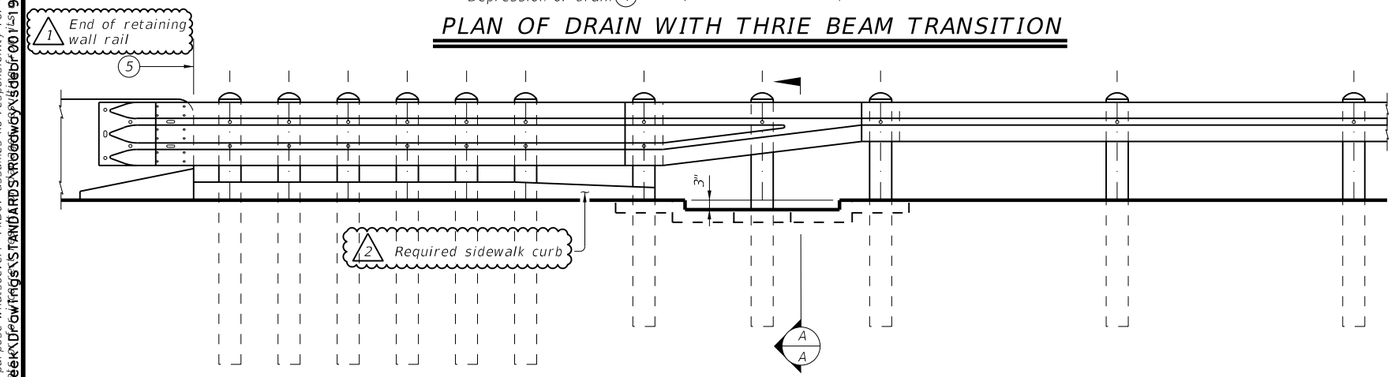
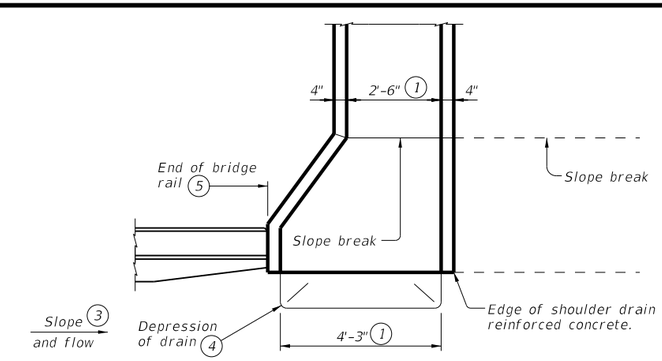


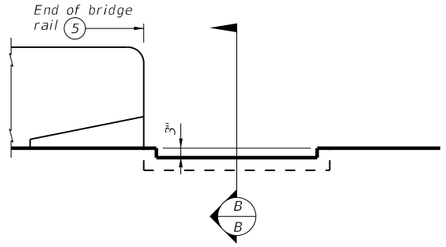
PLAN OF DRAIN WITH THRIE BEAM TRANSITION



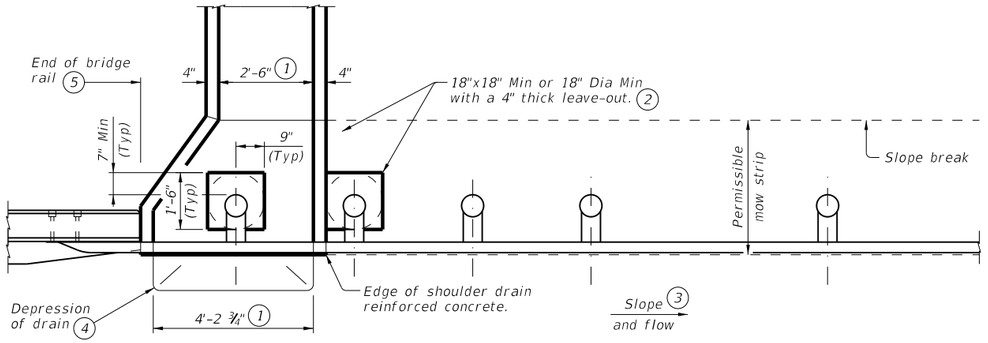
ROADWAY ELEVATION OF DRAIN WITH THRIE BEAM TRANSITION



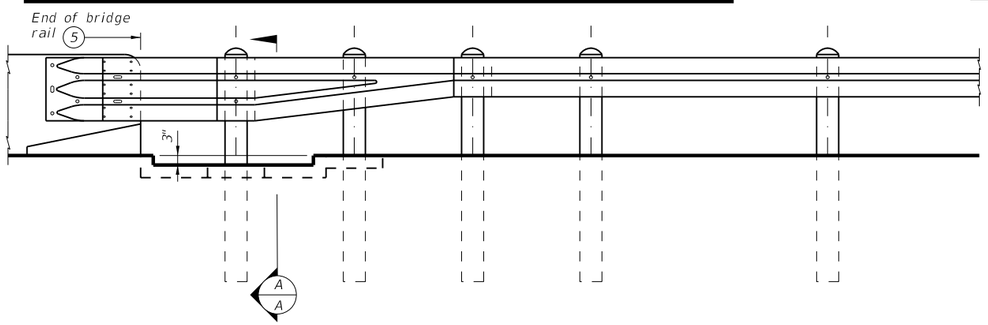
PLAN OF DRAIN WITHOUT MBGF TRANSITION



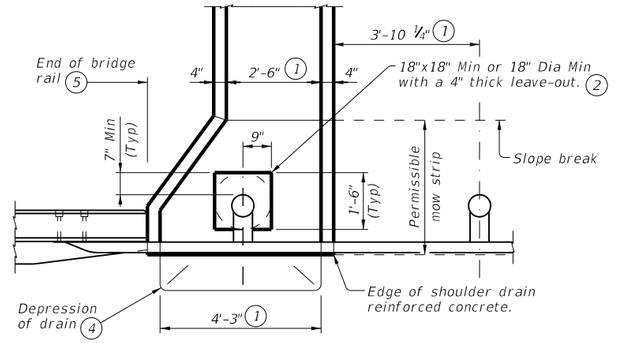
ROADWAY ELEVATION OF DRAIN WITHOUT MBGF TRANSITION



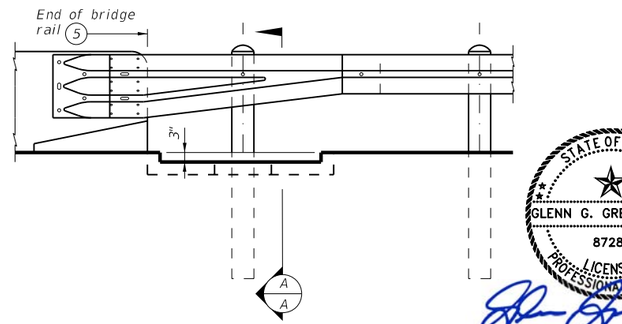
PLAN OF DRAIN WITH TL-2 (LOW SPEED) TRANSITION



ROADWAY ELEVATION OF DRAIN WITH TL-2 (LOW SPEED) TRANSITION



PLAN OF DRAIN WITH DOWNSTREAM ANCHOR TERMINAL



ROADWAY ELEVATION OF DRAIN WITH DOWNSTREAM ANCHOR TERMINAL

(1) Use wider or other drain configurations if shown elsewhere in plans or if directed by the Engineer. Location of shoulder drain must consider limitation imposed by rail transition. Do not locate shoulder drains at expansion joints between approach slab and concrete pavement.

(2) Fill leave-outs with no more than a 2-sack grout mixture (1 part cement, 5 parts water, and 14 parts sand by volume) with a 28-day compressive strength of approximately 120 psi or less. Provide grout of a consistency that will flow into and completely fill all voids. Due to auger size, larger leave-out dimensions are acceptable from both an impact performance and maintenance repair standpoint (20" Max leave-out).

(3) For other slope and flow directions drain configuration may be mirrored wider or tapered wider if shown elsewhere in the plans or directed by the Engineer.

(4) Form depression into concrete, asphalt pavement, or approach slab.

(5) See Bridge Layout for rail type.

(1) CHANGED RAIL TYPE
(2) CHANGED CURB TYPE

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED PROFESSIONAL ENGINEER
1/27/2021

Texas Department of Transportation

Bridge Division Standard

SHOULDER DRAIN AT END OF BRIDGE RAIL

SD-EBR (MOD)

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	SAT	BEXAR		120

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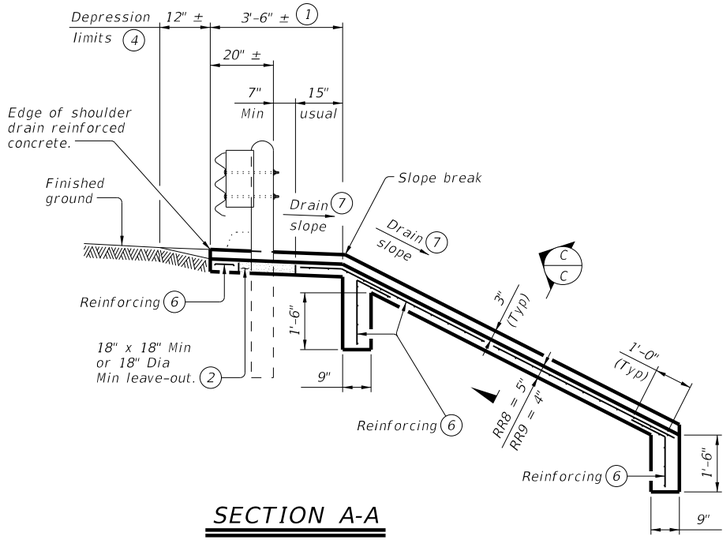
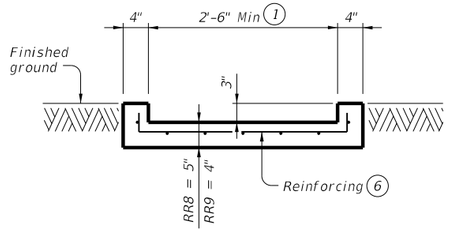
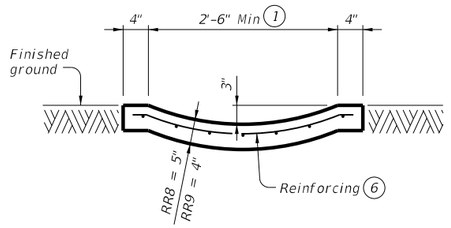


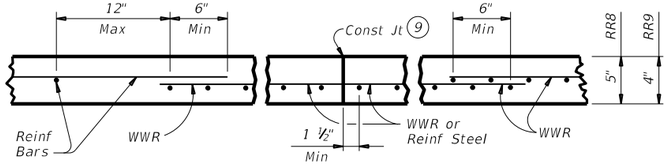
SECTION A-A





SECTION C-C

Sections shown without integrated riprap.



REINFORCEMENT DETAILS (6)

See General Notes for optional synthetic fiber reinforcement.

(1) Use wider or other drain configurations if shown elsewhere in plans or if directed by the Engineer. Location of shoulder drain must consider limitation imposed by rail transition. Do not locate shoulder drains at expansion joints between approach slab and concrete pavement.

(2) Fill leave-outs with no more than a 2-sack grout mixture (1 part cement, 5 parts water, and 14 parts sand by volume) with a 28-day compressive strength of approximately 120 psi or less. Provide grout of a consistency that will flow into and completely fill all voids. Due to auger size, larger leave-out dimensions are acceptable from both an impact performance and maintenance repair standpoint (20" Max leave-out).

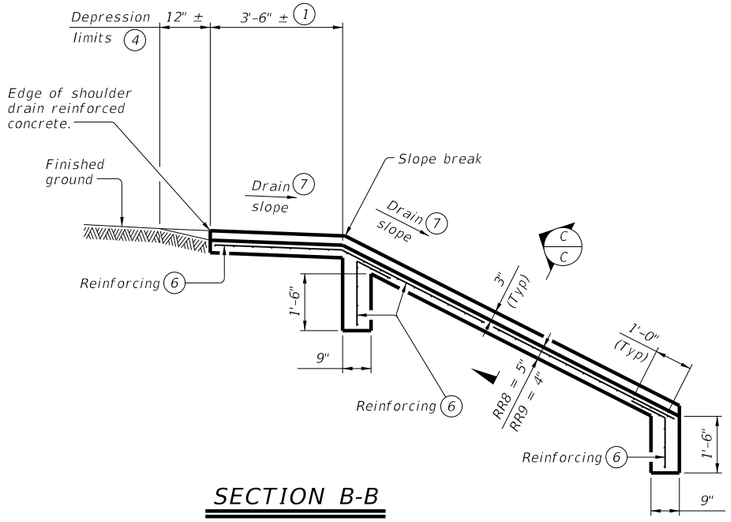
(4) Form depression into concrete, asphalt pavement, or approach slab.

(6) Provide (#3) reinforcing bar at 18" spacing c-c or welded wire reinforcement (WWR) as 6x6-D2.9xD2.9 or D3xD3. Combinations of WWR and reinforcing bars may be used if both are permitted. Use lap splices of a minimum 6 inches, measured from the transverse wire of WWR, and the ends of reinforcing bars, unless shown otherwise.

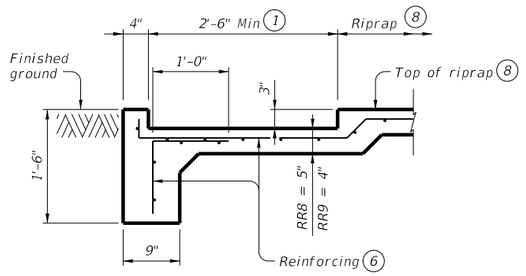
(7) See elsewhere in plans or as directed by the Engineer.

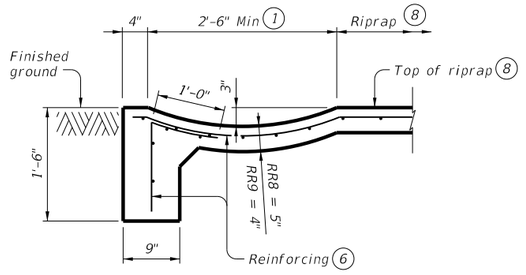
(8) See CRR standard for details and notes not shown.

(9) WWR or reinforcing steel is continuous through riprap construction joints. Provide WWR or reinforcing steel that extends 1'-1" minimum into adjacent riprap on each side of construction joint even if synthetic fiber is utilized.



SECTION B-B





SECTION C-C

Sections shown with integrated riprap.

GENERAL NOTES:

Provide Class "B" concrete with a minimum compressive strength of 2,000 psi unless noted elsewhere in plans.

Provide Grade 60 reinforcing steel.

Provide deformed welded wire reinforcement (WWR) meeting ASTM A1064, unless otherwise shown.

Provide reinforcing bars, deformed WWR, or any suitable combination of both types for riprap reinforcing, unless specified elsewhere in the plans.

Optionally synthetic fibers may be used if approved by the Engineer. Provide synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) in lieu of steel reinforcing in riprap concrete.

See Metal Beam Guard Fence (Mow Strip) standard for details and notes not shown.

Payment for furnishing and placing 2-sack grout mixture will be subsidiary to shoulder drain.

Payment for shoulder drain will be as per Item 420, "Cl B Conc (Flume)". All details shown herein are subsidiary to shoulder drain.

See Layout for limits of shoulder drain.

RR8 is to be used on stream crossings.

RR9 is to be used on other embankments.

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED PROFESSIONAL ENGINEER
1/27/2021

Texas Department of Transportation

Bridge Division Standard

SHOULDER DRAIN AT END OF BRIDGE RAIL

SD-EBR (MOD)

FILE: sdebr001-19.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT April 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
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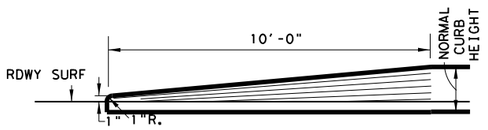
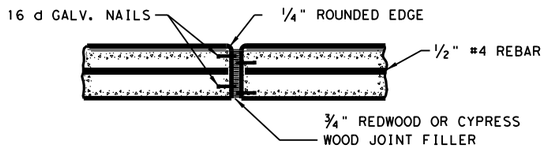
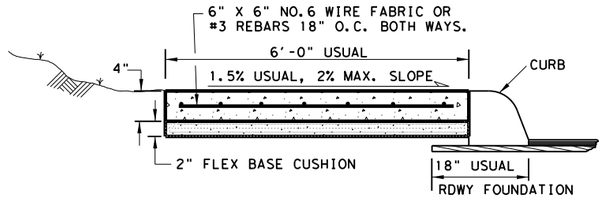


TRANSITION FOR CONCRETE CURB ENDS



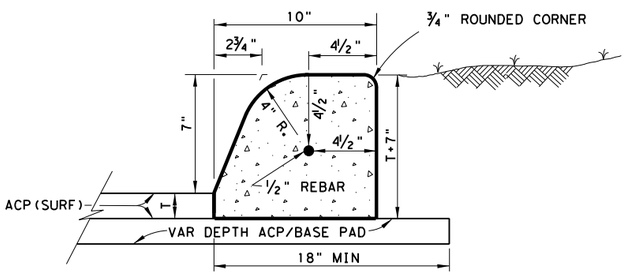
EXPANSION JOINTS TO BE PLACED AT BEGINNING AND END OF CURVES, DRIVEWAYS WHEELCHAIR RAMPS, INLETS, ILLUMINATION/ SIGNAL FOUNDATIONS AND OTHER FIXED OBJECTS.

TYPICAL CURB EXPANSION JOINT DETAIL

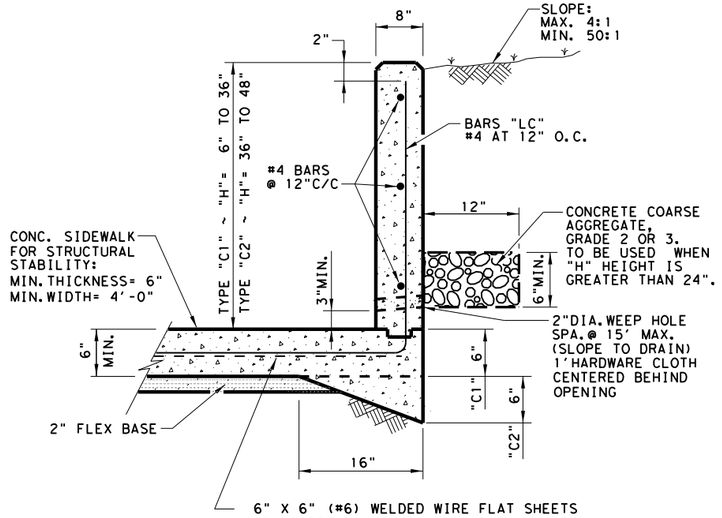


TYPICAL SIDEWALK SECTION

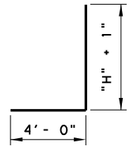
GROOVED JOINTS IN THE SIDE WALK SHALL BE AT A MAX. SPACING OF 10 FT. AND SHALL HAVE 3/4" EXPANSION JOINTS AT A MAX. SPACING OF 60' AND TO COINSIDE WITH THE CURB EXP. JOINTS.



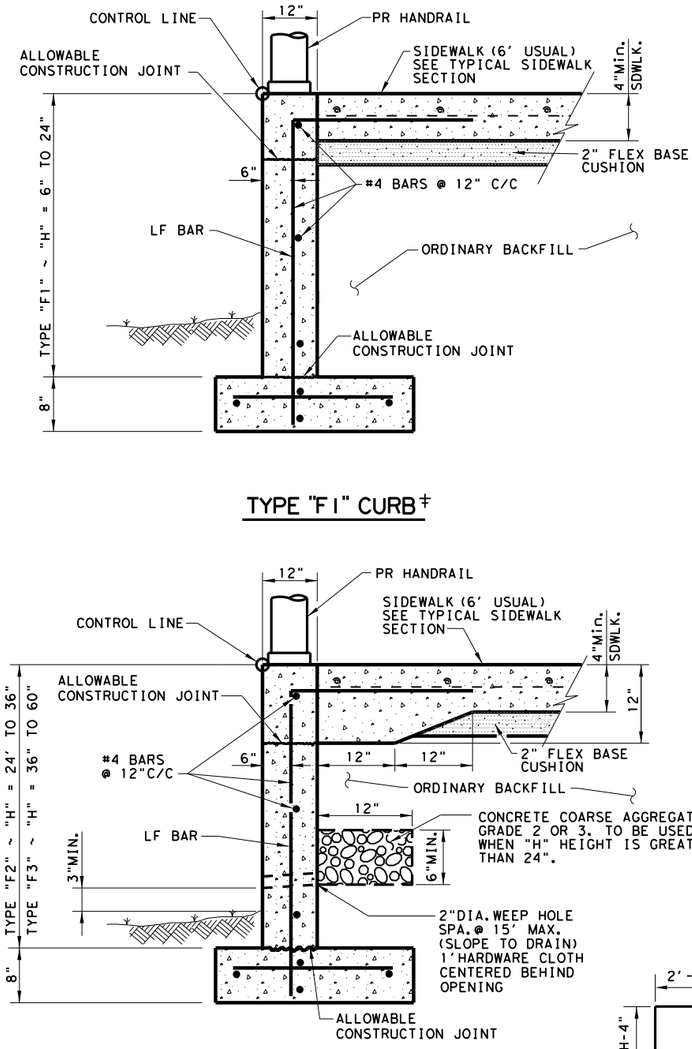
CONCRETE CURB (TYPE I)



TYPE "C1" & "C2" CURB

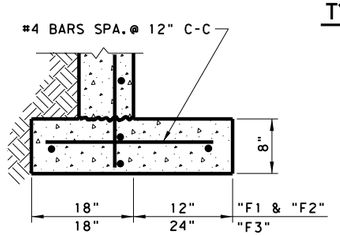


BAR "LC"

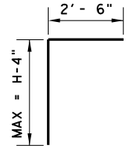


TYPE "F1" CURB‡

TYPE "F2" & "F3" CURB‡



FOOTING DETAIL



BAR "LF"

GENERAL NOTES:
All Concrete shall be Class "C".
All Reinforcing Steel shall be Grade 60.

‡ Until the sidewalk is complete, lateral support for the "F" curbs will be required.

DESIGN SOIL PARAMETERS:
Soil Unit Wt.= 120 pcf
Phi = 30 Degrees
Cohesion = 50 psf
Min. PI = 15
Max. PI = 30
SURCHARGE:
TYPE F CURB q = 2' Adjacent to sidewalk
Max. slope behind TYPE C Curb = 4:1
Min. Factor of Safety against sliding is 1.5.
Designed in accordance with current AASHTO Standards and Interim Specifications.

Texas Department of Transportation
San Antonio District

MISCELLANEOUS CURB AND SIDEWALK DETAILS

San Antonio District Standard

T:Engdata/Standards/MiscCurbdetails.dgn

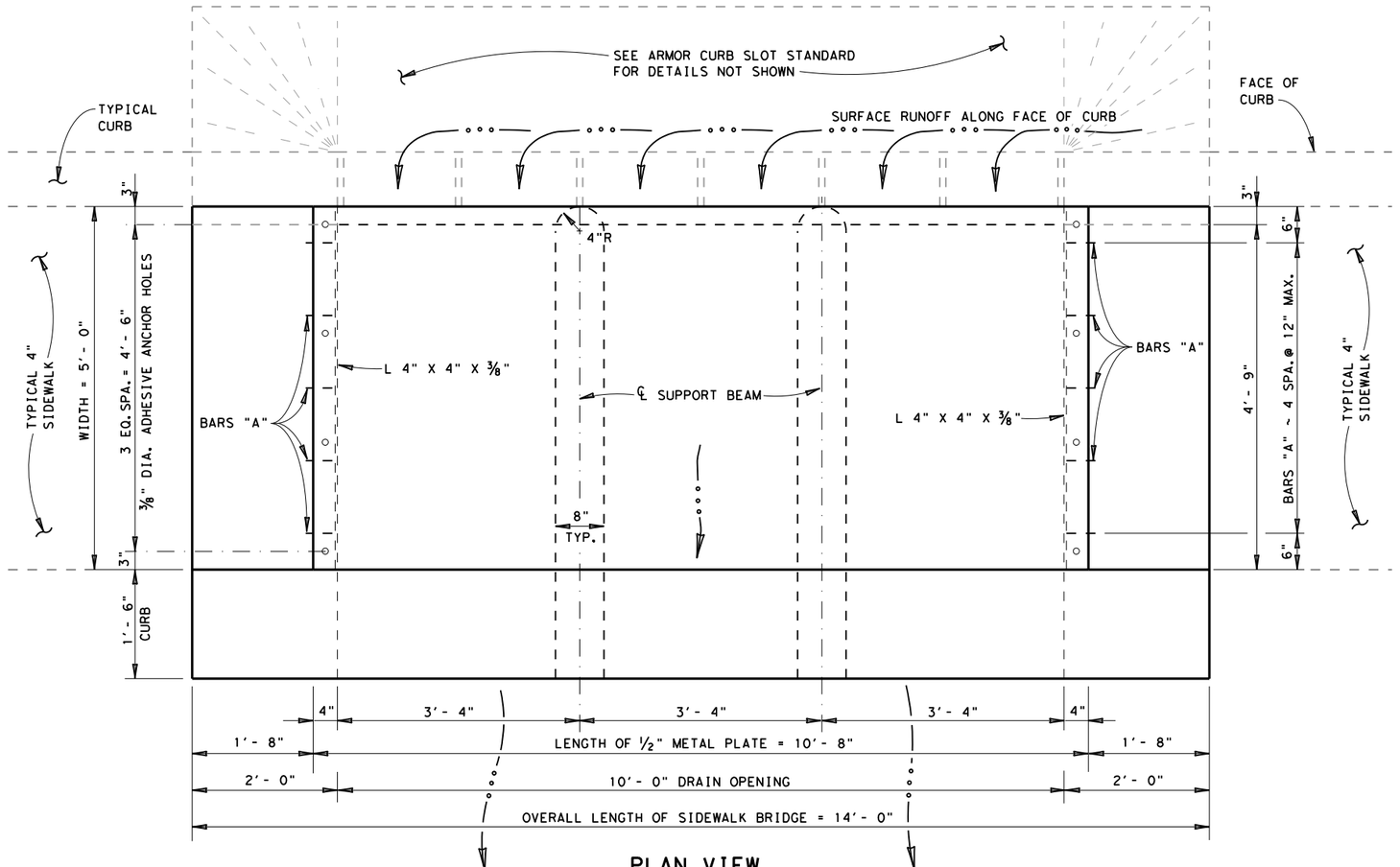
ORIGINAL DRAWING DATE:

REVISIONS
09-01-08
10-10-17 sidewalk width equals 6' usual
- -
- -

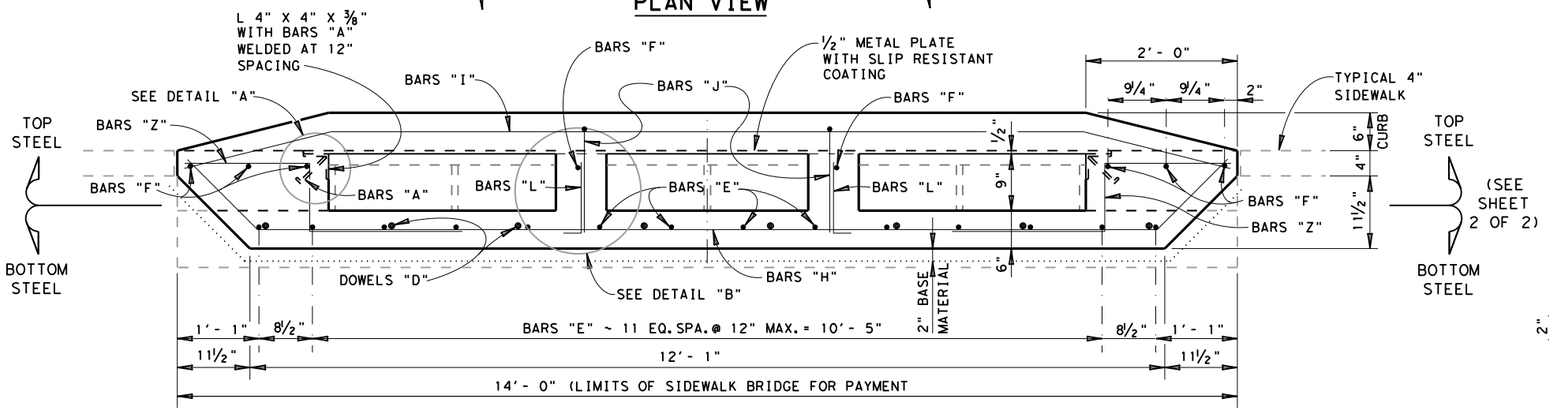
PREPARED BY AND FOR USE OF TxDoT.

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT #	SHEET
	6	SEE TITLE SHEET	122

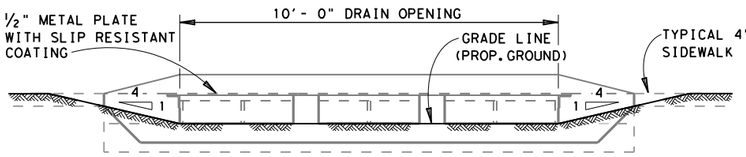
COUNTY	CONTROL	SECTION	JOB	HIGHWAY
BEXAR	0016	08	039	SL 368



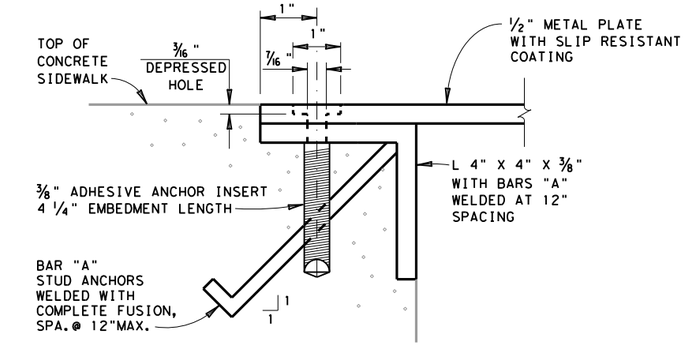
PLAN VIEW



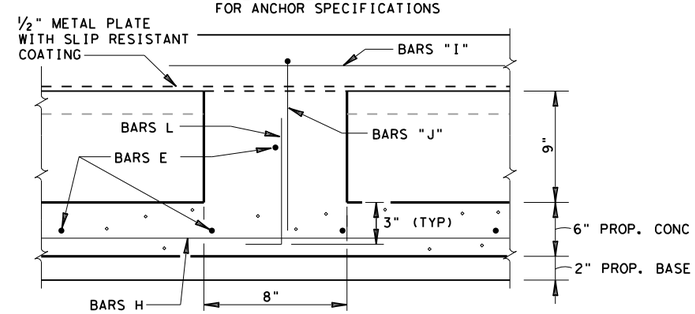
ELEVATION



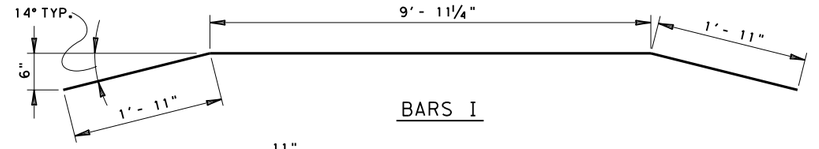
GRADING DETAIL
(AT BACK OF SIDEWALK BRIDGE)



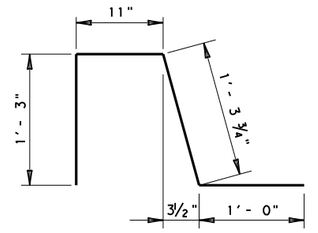
DETAIL "A"
REFER TO GENERAL NOTES FOR ANCHOR SPECIFICATIONS



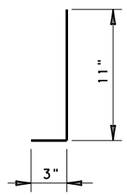
DETAIL "B"



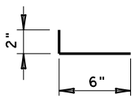
BARS I



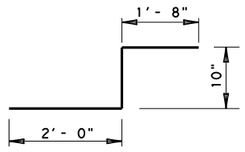
BARS J



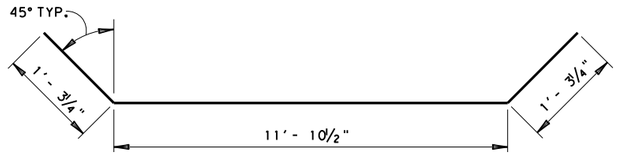
BARS L



BARS A



BARS Z



BARS H

SHEET 1 OF 2

Texas Department of Transportation
San Antonio District (Structural Design)

SIDEWALK BRIDGE INLET

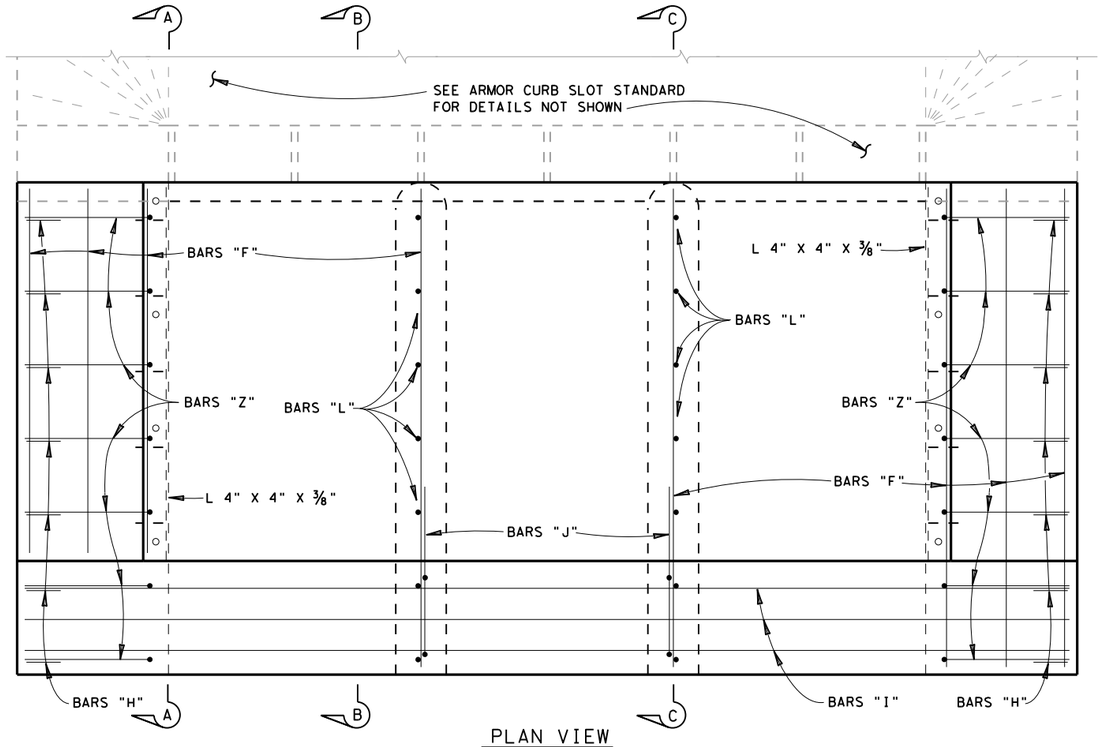
AT ARMOR CURB SLOT

SAN ANTONIO DISTRICT STANDARD

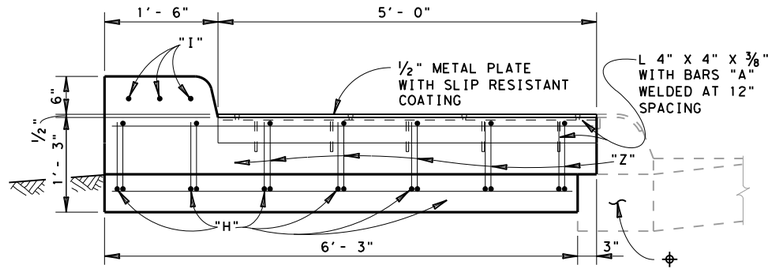
T:\Engdata\Standards\Design\sdwlkbrg.dgn
PREPARED BY AND FOR USE OF TxDoT.
ORIGINAL DRAWING DATE: MAY 2004
DN.: CK.: DW.: MRM CK.: GGG
REVISIONS
02-20-2015 NOW PAID FOR UNDER ITEM 465

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT #	SHEET
SAT	6	SEE TITLE SHEET	123

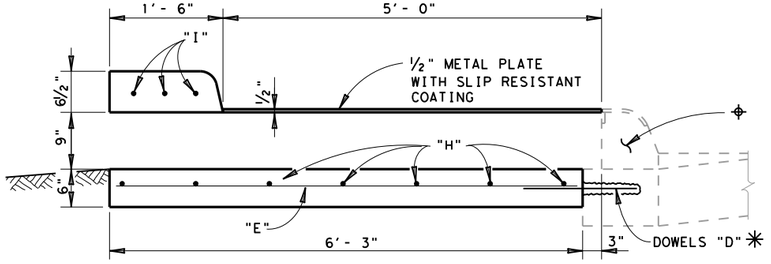
COUNTY	CONTROL	SECTION	JOB	HIGHWAY
BEXAR	0016	08	039	SL 368



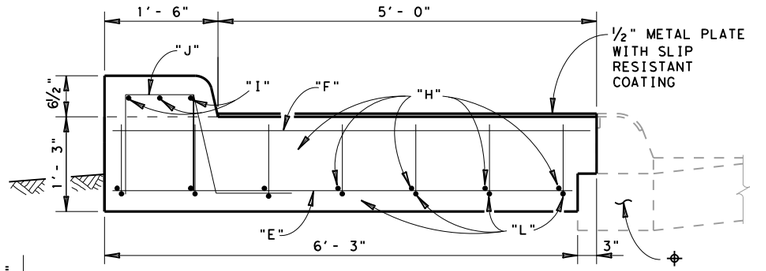
PLAN VIEW
(SHOWING TOP REINF. STEEL)



SECTION A-A

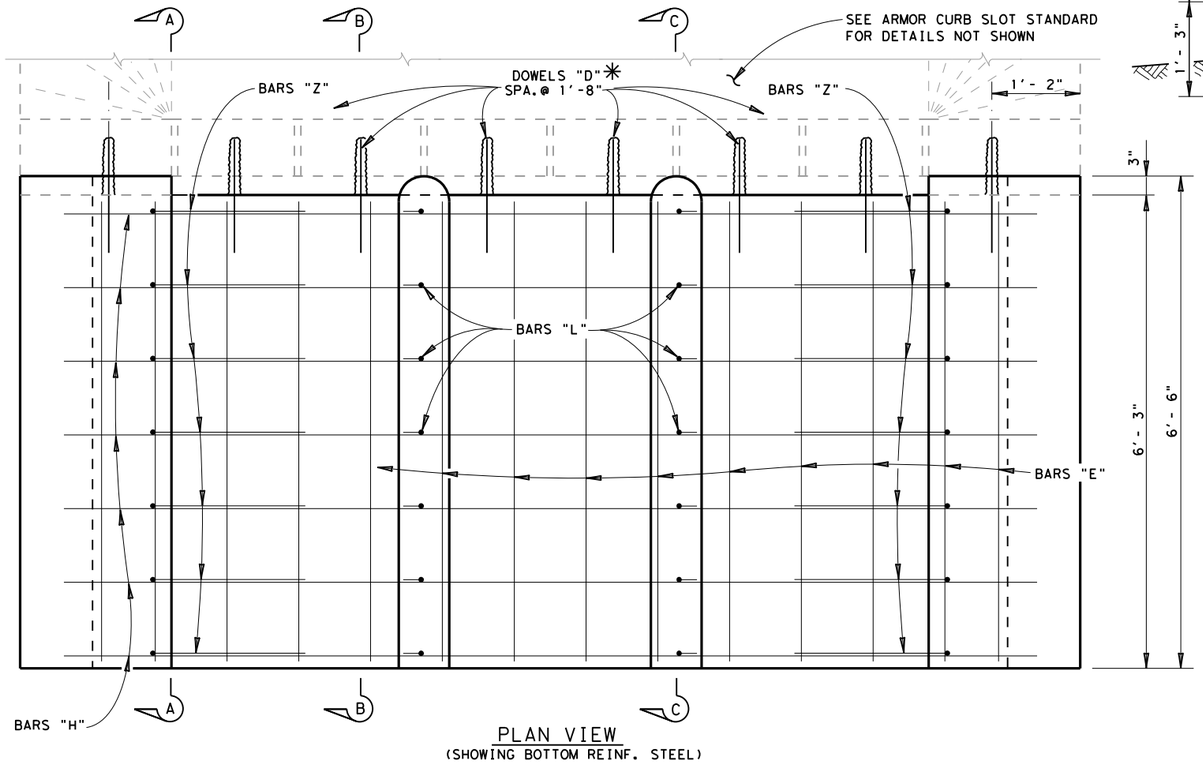


SECTION B-B



SECTION C-C

⊕ SEE ARMOR CURB SLOT FOR DETAILS NOT SHOWN



PLAN VIEW
(SHOWING BOTTOM REINF. STEEL)

* TABLE OF ESTIMATED QUANTITIES FOR ONE SIDEWALK BRIDGE

BAR	NO.	SIZE	LENGTH	WEIGHT
A	10	#4	8"	5
D	8	#6	1'-6"	18
E	14	#4	6'-0"	56
F	8	#4	6'-3"	33
H	7	#4	14'-5"	67
I	3	#5	13'-9"	43
J	2	#4	4'-6"	6
L	14	#4	1'-2"	11
Z	14	#4	4'-6"	42
REINFORCING STEEL			LB	281
CL A CONC.			CY	2.5

* STRUCTURAL STEEL FOR ONE SIDEWALK BRIDGE

FLOOR PLATE 1~5'X 1/2"X 10'-8"	LB	1145
2 ~ 5 FT - L 4" X 4" X3/8"	LB	98
TOTAL WT.	LB	1243

* FOR CONTRACTORS INFORMATION ONLY

GENERAL NOTES

IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL DIMENSIONS IN THE FIELD PRIOR TO ORDERING MATERIAL.
ALL CONCRETE SHALL BE CL. "A"
STRUCTURAL STEEL SHALL BE GRADE A36
ALL REINFORCING STEEL SHALL BE GRADE 60.
ALL REINFORCING STEEL SHALL HAVE A MINIMUM COVER OF 2 IN
ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
ALL METAL COMPONENTS SHALL BE GALVANIZED AFTER FABRICATION.
GALVANIZING DAMAGED DURING TRANSPORT OR CONSTRUCTION SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIFICATIONS.
THE SLIP RESISTANT COATING ON THE METAL PLATE SHALL BE AS APPROVED BY THE ENGINEER.
ADHESIVE ANCHOR SYSTEM SHALL BE HIT HY 150 H.I.S. INTERNALLY THREADED INSERTS, AS FURNISHED BY HILTI, INC. TULSA, OK. OR EQUIVALENT.
SIDEWALK BRIDGE, INCLUDING ALL LABOR, ARMOR CURB, AND ALL OTHER MATERIAL COMPLETE AND IN PLACE, SHALL BE PAID FOR UNDER ITEM 465, "INLET (COMP) (TY SIDEWALK BRIDGE)" BY EACH LOCATION.

* NON-SHRINKING GROUT OR APPROVED EPOXY SHALL BE USED WITH DOWEL BARS. IN LIEU OF DRILLING AND GROUTING, DOWELS "D" MAY BE PLACED WITH ARMOR CURB SLOT FOUNDATION.

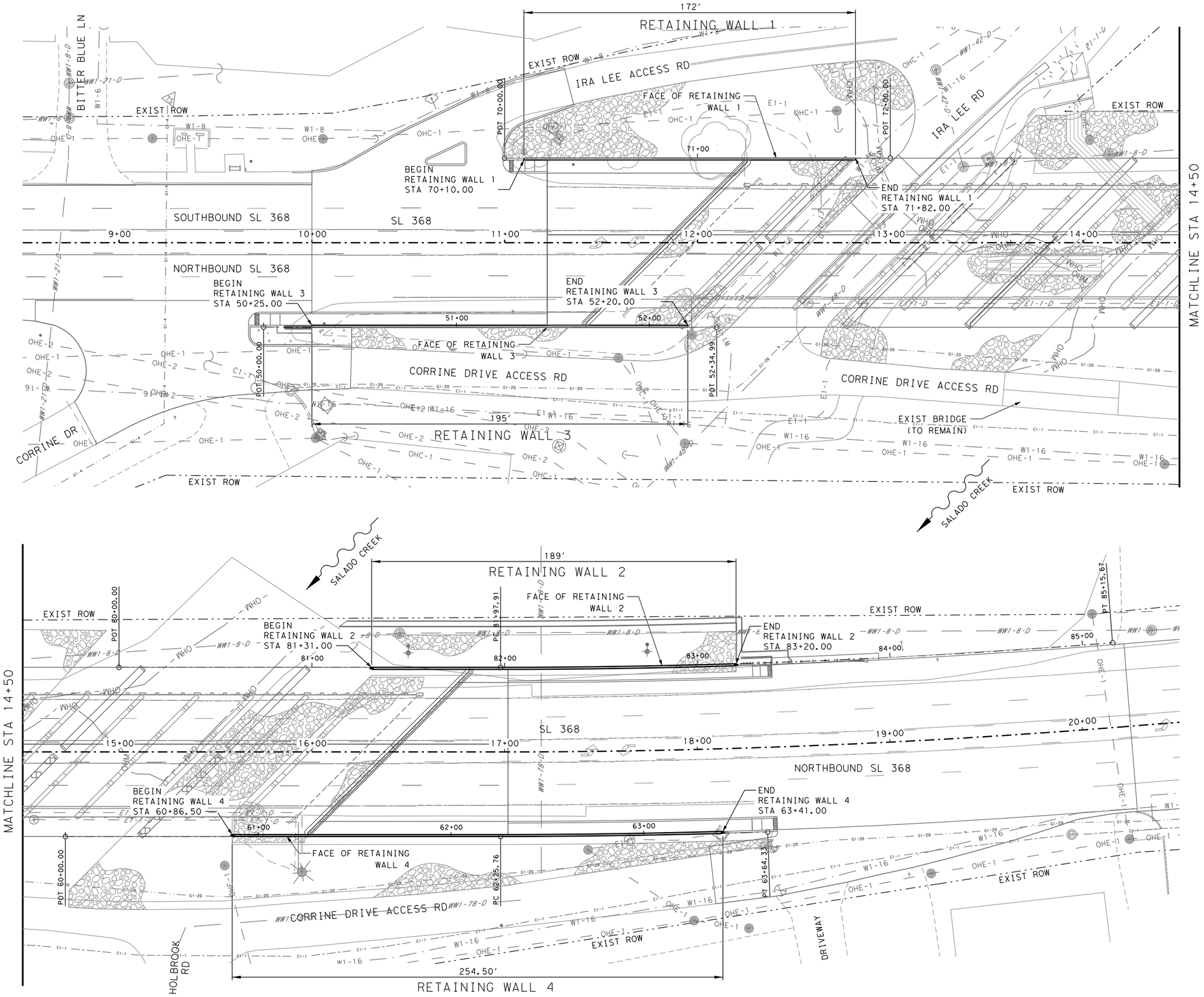
Texas Department of Transportation
San Antonio District (Structural Design)

SIDEWALK BRIDGE INLET

AT ARMOR CURB SLOT

SAN ANTONIO DISTRICT STANDARD

T:Engdata/Standards/Design/sdwlkbrg.dgn
PREPARED BY AND FOR USE OF TxDoT.
ORIGINAL DRAWING DATE: MAY 2004
STATE DISTRICT: SAT | FEDERAL REGION: 6 | FEDERAL AID PROJECT # | SHEET: SEE TITLE SHEET | 124
DN.: | CK.: | DW.: MRM | CK.: GGG
REVISIONS
02-20-2015 NOW PAID FOR UNDER ITEM 465
COUNTY: BEXAR | CONTROL: 0016 | SECTION: 08 | JOB: 039 | HIGHWAY: SL 368



0 25' 50'

SCALE: 1" = 50'

STATE OF TEXAS
Blake W. Staton
121491
LICENSED PROFESSIONAL ENGINEER
1/27/2021

GARVER
3755 S. Capital of Texas Highway
Suite 325
Austin, TX 78704
(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

RETAINING WALL LAYOUT

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		125
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

DATE: 1/27/2021 1:15:16 PM
FILE: pw:\\garver-pw.bentley.com:garver-pw-01\Documents\2016\16187035 - WA 5 SL 368 at Salado Creek\Drawings\SL368 Retaining Wall Layout.dgn

RETAINING WALL 1
HORIZONTAL GEOMETRY

Chain BLRW1 contains:
BLRW11 BLRW12

Beginning chain BLRW1 description
Feature: Struc_Wall

==========

Point BLRW11 N 13,731,523.0056 E 2,152,565.5347 Sta 70+00.00

Course from BLRW11 to BLRW12 N 53° 32′ 42.67" E Dist 200.0000

Point BLRW12 N 13,731,641.8433 E 2,152,726.3999 Sta 72+00.00

==========

Ending chain BLRW1 description

RETAINING WALL 2
HORIZONTAL GEOMETRY

Chain BLRW2 contains:
BLRW21 CUR BLRW2_3

Beginning chain BLRW2 description

==========

Point BLRW21 N 13,731,760.6810 E 2,152,887.2650 Sta 80+00.00

Course from BLRW21 to PC BLRW2_3 N 53° 32′ 42.67" E Dist 197.9079

Curve Data

Curve BLRW2_3

P.I. Station	83+56.87	N	13,731,972.7317	E	2,153,174.3082
Delta =	4° 36′ 07.30" (LT)				
Degree =	1° 26′ 53.75"				
Tangent =	158.9664				
Length =	317.7618				
Radius =	3,956.1700				
External =	3.1925				
Long Chord =	317.6764				
Mid. Ord. =	3.1899				
P.C. Station	81+97.91	N	13,731,878.2757	E	2,153,046.4475
P.T. Station	85+15.67	N	13,732,077.1420	E	2,153,294.1781
C.C.		N	13,735,060.3250	E	2,150,695.7363
Back =	N 53° 32′ 42.67" E				
Ahead =	N 48° 56′ 35.37" E				
Chord Bear =	N 51° 14′ 39.02" E				

==========

Ending chain BLRW2 description

RETAINING WALL 3
HORIZONTAL GEOMETRY

Chain BLRW3 contains:
BLRW31 BLRW32

Beginning chain BLRW3 description
Feature: Struc_Wall

==========

Point BLRW31 N 13,731,378.2248 E 2,152,517.0806 Sta 50+00.00

Course from BLRW31 to BLRW32 N 53° 32′ 42.67" E Dist 234.9894

Point BLRW32 N 13,731,517.8528 E 2,152,706.0886 Sta 52+34.99

==========

Ending chain BLRW3 description

RETAINING WALL 4
HORIZONTAL GEOMETRY

Chain BLRW4 contains:
BLRW41 CUR BLRW4_3

Beginning chain BLRW4 description
Feature: Struc_Wall

==========

Point BLRW41 N 13,731,673.6264 E 2,152,916.9521 Sta 60+00.00

Course from BLRW41 to PC BLRW4_3 N 53° 32′ 42.67" E Dist 225.7567

Curve Data

Curve BLRW4_3

P.I. Station	62+95.05	N	13,731,848.9413	E	2,153,154.2678
Delta =	1° 57′ 48.15" (LT)				
Degree =	1° 25′ 00.73"				
Tangent =	69.2924				
Length =	138.5713				
Radius =	4,043.8300				
External =	0.5936				
Long Chord =	138.5645				
Mid. Ord. =	0.5935				
P.C. Station	62+25.76	N	13,731,807.7685	E	2,153,098.5341
P.T. Station	63+64.33	N	13,731,891.9993	E	2,153,208.5581
C.C.		N	13,735,060.3250	E	2,150,695.7363
Back =	N 53° 32′ 42.67" E				
Ahead =	N 51° 34′ 54.53" E				
Chord Bear =	N 52° 33′ 48.60" E				

==========

Ending chain BLRW4 description

STATE OF TEXAS
Blake W. Staton
121491
LICENSED PROFESSIONAL ENGINEER
1/27/2021

GARVER
3755 S. Capital of Texas Highway
Suite 325
Austin, TX 78704
(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

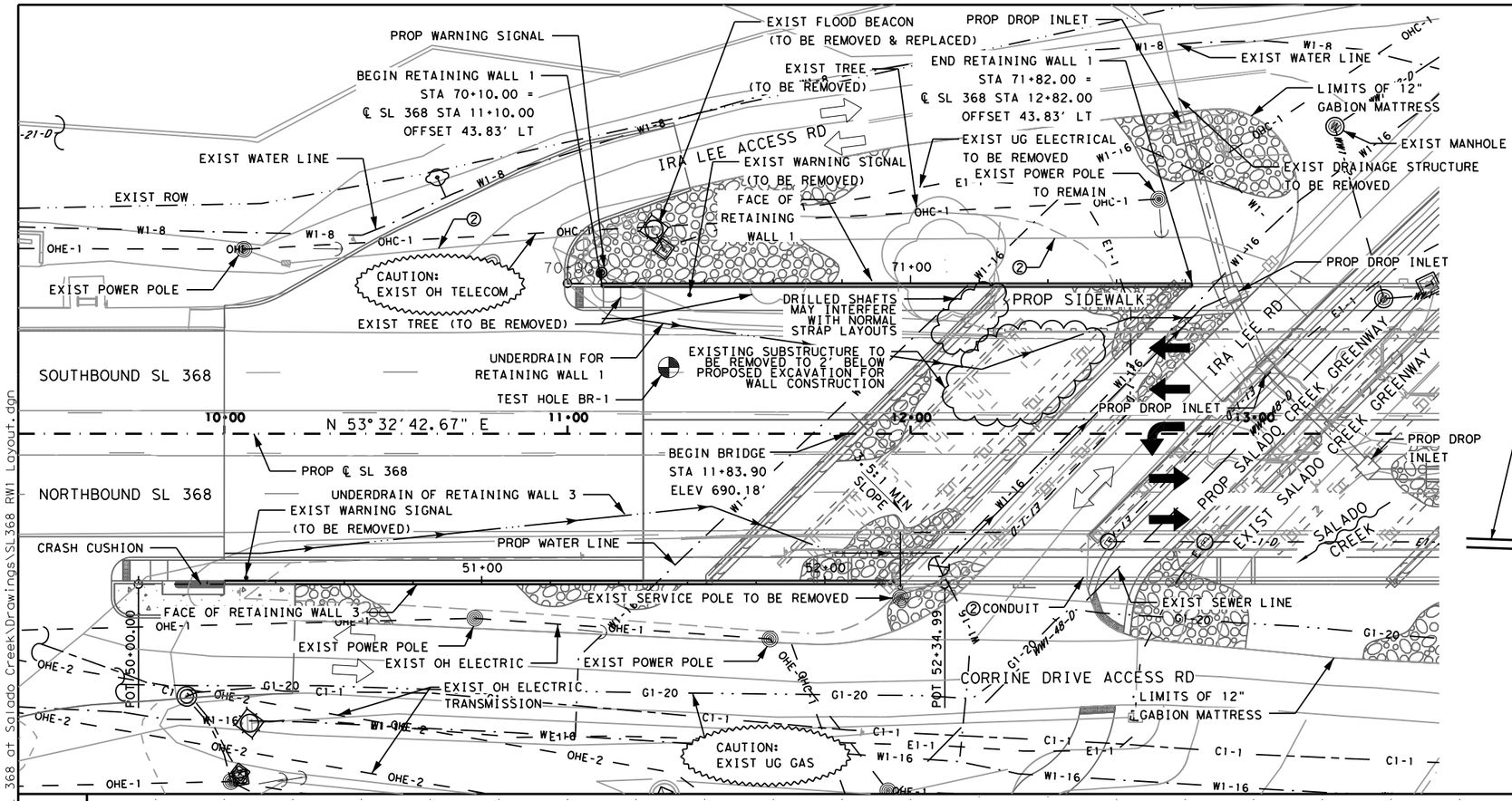
SL 368
AT SALADO CREEK

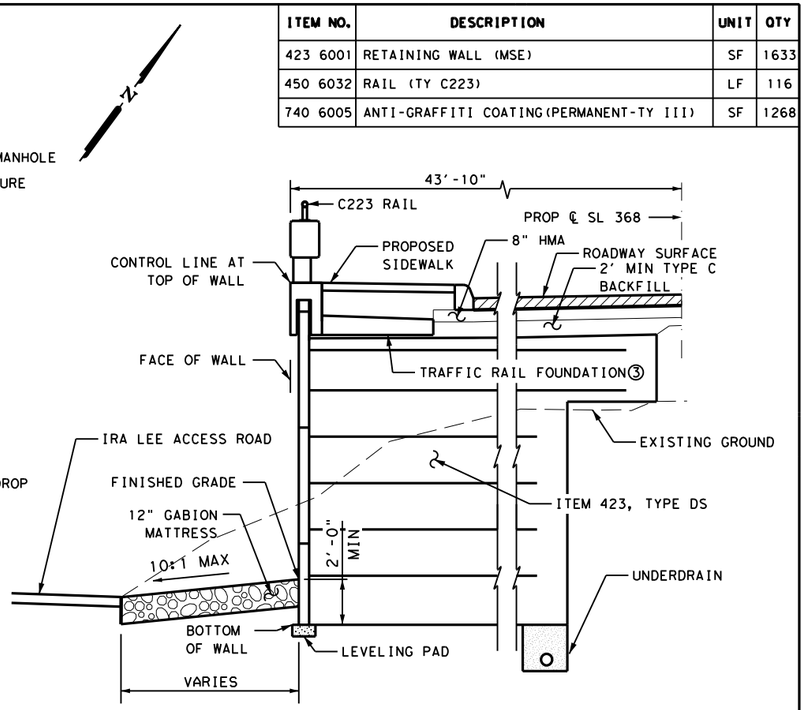
RETAINING WALL ALIGNMENT DATA

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		126
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

ITEM NO.	DESCRIPTION	UNIT	QTY
423 6001	RETAINING WALL (MSE)	SF	1633
450 6032	RAIL (TY C223)	LF	116
740 6005	ANTI-GRAFFITI COATING (PERMANENT-TY III)	SF	1268





TYPICAL SECTION
MSE RETAINING WALL

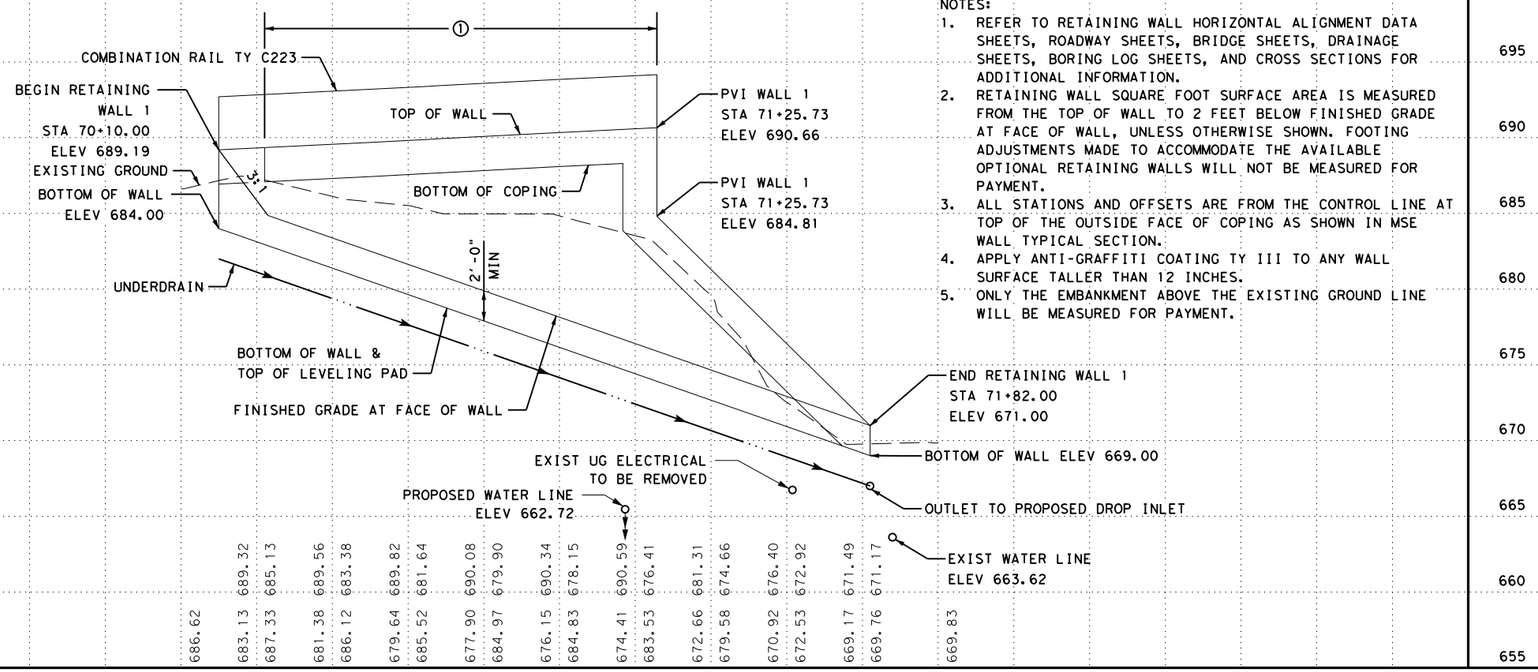
0 20' 40'

SCALE: 1" = 40' HORZ
1" = 10' VERT

① LIMITS OF COPING ADJACENT TO CONCRETE PAVEMENT STA 70+22.07 TO STA 71+25.73 SEE DETAILS ON RW(TRF)(MOD).

② SEE LIGHTING INSTALLATION PLANS FOR NUMBER AND LOCATION OF CONDUITS.

③ SHOWN ANCHOR SLAB SHALL BE PLACED WHEN COPING IS PLACED ADJACENT TO ACP. OMIT WHERE COPING IS PLACED ADJACENT TO BRIDGE APPROACH SLAB. ANCHOR SLAB IS CONSIDERED SUBSIDIARY TO ITEM 423 "RETAINING WALL (MSE)".



BOTTOM OF WALL XXX.XX
TOP OF WALL XXX.XX
FINISHED GRADE XXX.XX
EXISTING GROUND XXX.XX

686.62 683.13 689.32 687.33 685.13 681.38 689.56 686.12 683.38 679.64 689.82 685.52 681.64 677.90 690.08 684.97 679.90 676.15 690.34 684.83 678.15 674.41 690.59 683.53 676.41 672.66 681.31 679.58 674.66 670.92 676.40 672.53 672.92 669.17 671.49 669.76 671.17 669.83

NOTES:
1. REFER TO RETAINING WALL HORIZONTAL ALIGNMENT DATA SHEETS, ROADWAY SHEETS, BRIDGE SHEETS, DRAINAGE SHEETS, BORING LOG SHEETS, AND CROSS SECTIONS FOR ADDITIONAL INFORMATION.
2. RETAINING WALL SQUARE FOOT SURFACE AREA IS MEASURED FROM THE TOP OF WALL TO 2 FEET BELOW FINISHED GRADE AT FACE OF WALL, UNLESS OTHERWISE SHOWN. FOOTING ADJUSTMENTS MADE TO ACCOMMODATE THE AVAILABLE OPTIONAL RETAINING WALLS WILL NOT BE MEASURED FOR PAYMENT.
3. ALL STATIONS AND OFFSETS ARE FROM THE CONTROL LINE AT TOP OF THE OUTSIDE FACE OF COPING AS SHOWN IN MSE WALL TYPICAL SECTION.
4. APPLY ANTI-GRAFFITI COATING TY III TO ANY WALL SURFACE TALLER THAN 12 INCHES.
5. ONLY THE EMBANKMENT ABOVE THE EXISTING GROUND LINE WILL BE MEASURED FOR PAYMENT.

STATE OF TEXAS
Blake W. Staton
121491
LICENSED PROFESSIONAL ENGINEER
1/27/2021

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(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

RETAINING WALL 1 LAYOUT

(STA 70+10.00 TO STA 71+82.00)

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		127
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

DATE: 1/27/2021 12:01:57 PM
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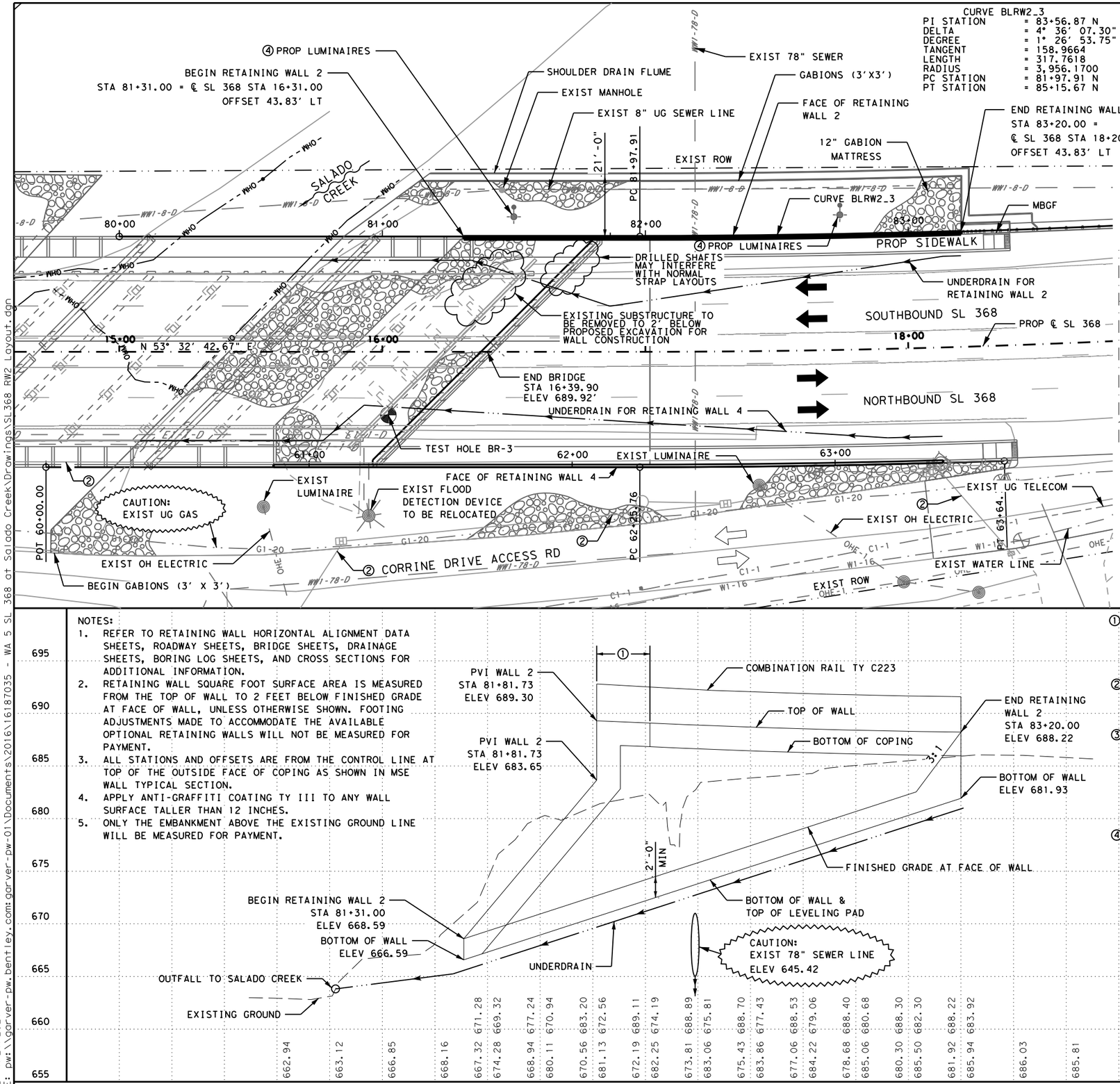
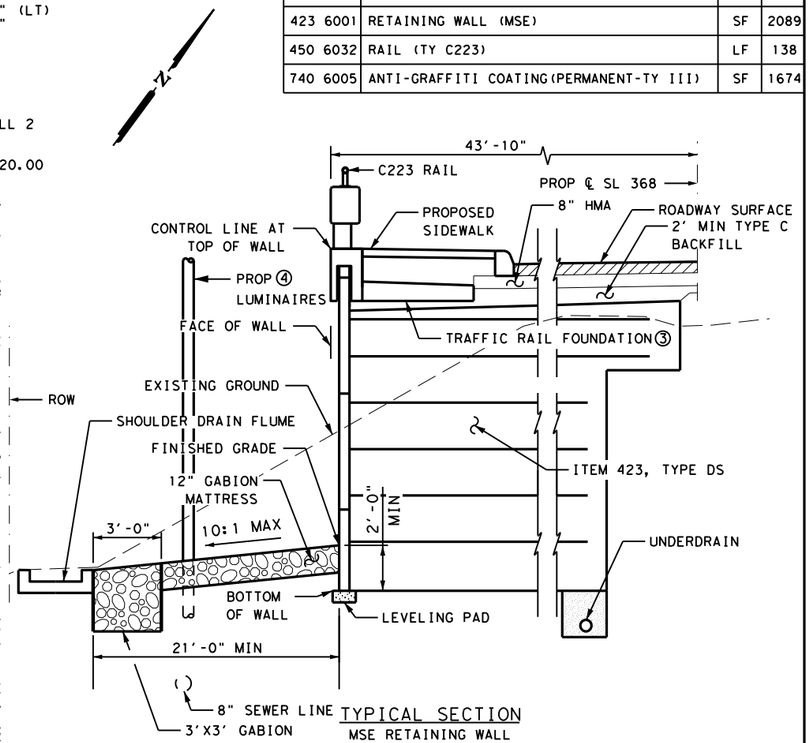
ITEM NO.	DESCRIPTION	UNIT	QTY
423 6001	RETAINING WALL (MSE)	SF	2089
450 6032	RAIL (TY C223)	LF	138
740 6005	ANTI-GRAFFITI COATING (PERMANENT-TY III)	SF	1674

CURVE BLRW2_3
PI STATION = 83+56.87 N
DELTA = 4° 36' 07.30" (LT)
DEGREE = 1° 26' 53.75"
TANGENT = 158.9664
LENGTH = 317.7618
RADIUS = 3,956.1700
PC STATION = 81+97.91 N
PT STATION = 85+15.67 N





TYPICAL SECTION
MSE RETAINING WALL

0 20' 40'
SCALE: 1" = 40' HORZ
1" = 10' VERT

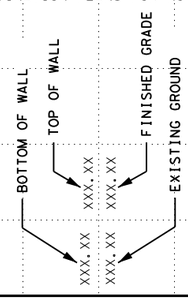
NOTES:
1. REFER TO RETAINING WALL HORIZONTAL ALIGNMENT DATA SHEETS, ROADWAY SHEETS, BRIDGE SHEETS, DRAINAGE SHEETS, BORING LOG SHEETS, AND CROSS SECTIONS FOR ADDITIONAL INFORMATION.
2. RETAINING WALL SQUARE FOOT SURFACE AREA IS MEASURED FROM THE TOP OF WALL TO 2 FEET BELOW FINISHED GRADE AT FACE OF WALL, UNLESS OTHERWISE SHOWN. FOOTING ADJUSTMENTS MADE TO ACCOMMODATE THE AVAILABLE OPTIONAL RETAINING WALLS WILL NOT BE MEASURED FOR PAYMENT.
3. ALL STATIONS AND OFFSETS ARE FROM THE CONTROL LINE AT TOP OF THE OUTSIDE FACE OF COPING AS SHOWN IN MSE WALL TYPICAL SECTION.
4. APPLY ANTI-GRAFFITI COATING TY III TO ANY WALL SURFACE TALLER THAN 12 INCHES.
5. ONLY THE EMBANKMENT ABOVE THE EXISTING GROUND LINE WILL BE MEASURED FOR PAYMENT.

① LIMITS OF COPING ADJACENT TO CONCRETE PAVEMENT STA 81+81.73 TO STA 82+01.73 SEE DETAILS ON RW(TRF)(MOD).

② SEE LIGHTING INSTALLATION PLANS FOR NUMBER AND LOCATION OF CONDUITS.

③ SHOWN ANCHOR SLAB SHALL BE PLACED WHEN COPING IS PLACED ADJACENT TO ACP. OMIT WHERE COPING IS PLACED ADJACENT TO BRIDGE APPROACH SLAB. ANCHOR SLAB IS CONSIDERED SUBSIDIARY TO ITEM 423 "RETAINING WALL (MSE)".

④ LUMINAIRE SHALL BE INSTALLED AFTER RETAINING WALL CONSTRUCTION IS COMPLETE. SEE ILLUMINATION PLANS FOR NOTES.



STATE OF TEXAS
Blake W. Staton
121491
LICENSED PROFESSIONAL ENGINEER
1/27/2021

GARVER
3755 S. Capital of Texas Highway
Suite 325
Austin, TX 78704
(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

RETAINING WALL 2 LAYOUT

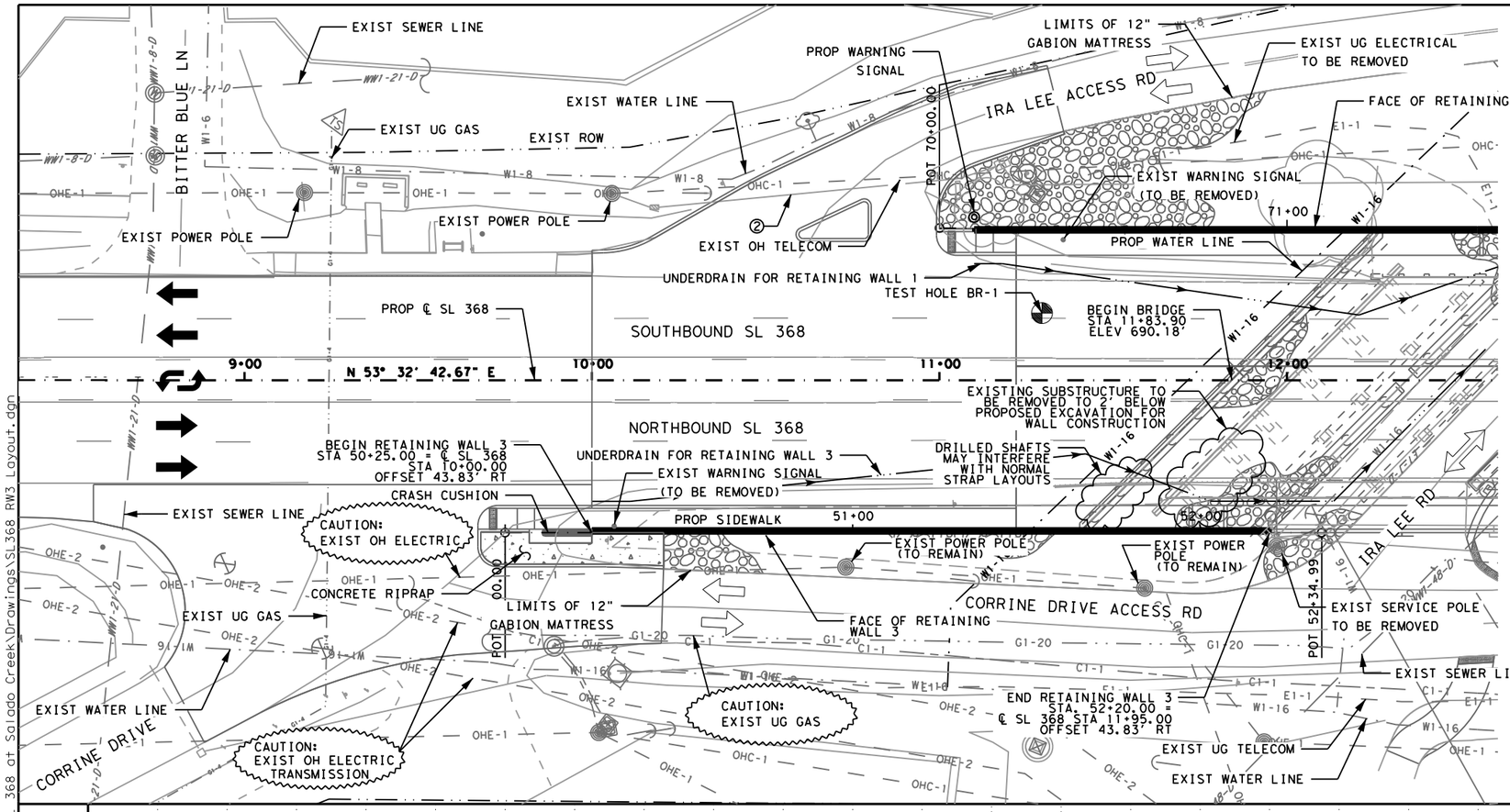
(STA 81+31.00 TO STA 83+20.00)

SHEET 1 OF 1

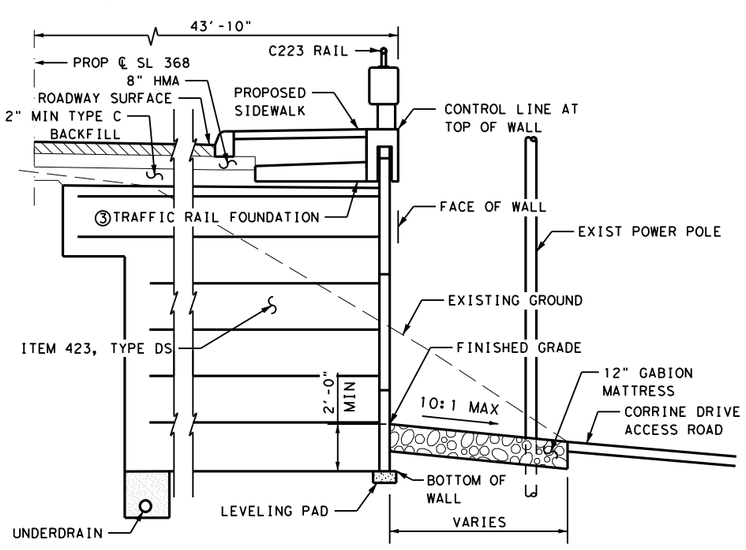
FED. RD. DIV. NO.	FEDERAL AID PROJECT	SHEET NO.
6	SEE TITLE SHEET	128

STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

DATE: 1/27/2021 12:02:03 PM
FILE: pw:\\garver-pw.bentley.com:garver-pw-01\Documents\2016\16187035 - WA 5 SL 368 at Salado Creek\Drawings\SL368 RW2 Layout.dgn



ITEM NO.	DESCRIPTION	UNIT	QTY
423 6001	RETAINING WALL (MSE)	SF	2009
450 6032	RAIL (TY C223)	LF	142
740 6005	ANTI-GRAFFITI COATING (PERMANENT-TY III)	SF	1583



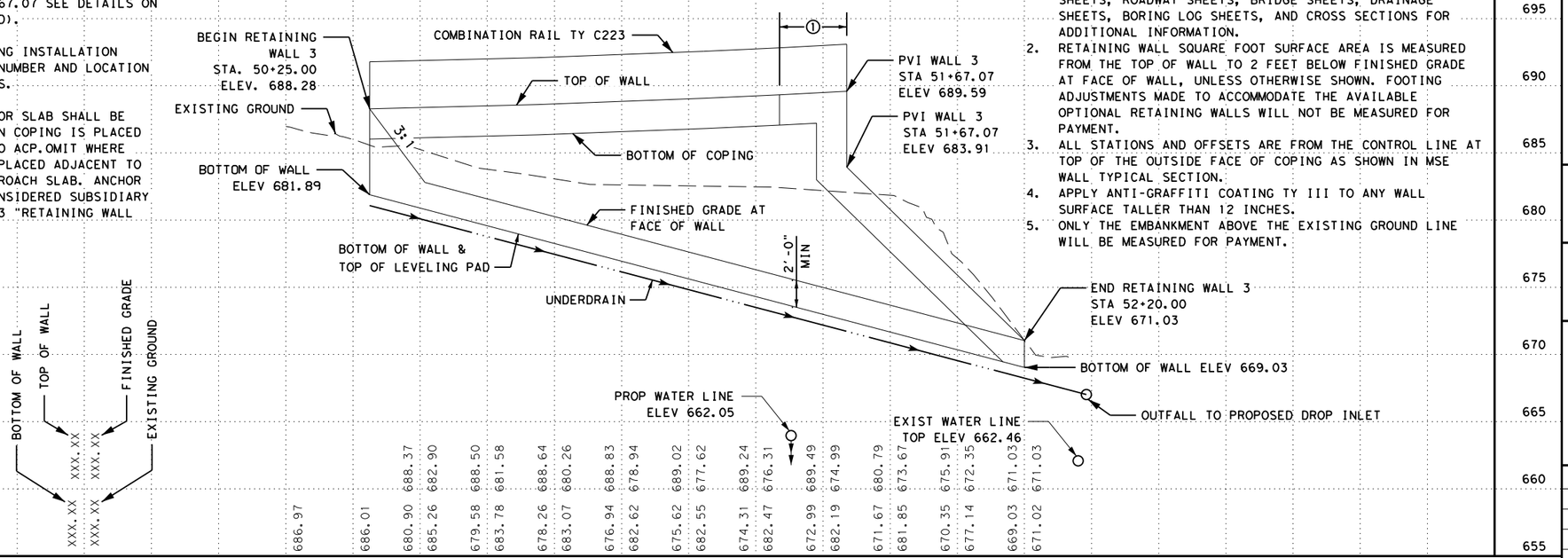
TYPICAL SECTION
MSE RETAINING WALL

SCALE: 1" = 40' HORZ
1" = 10' VERT

① LIMITS OF COPING ADJACENT TO CONCRETE PAVEMENT STA 51+47.07 TO STA 51+67.07 SEE DETAILS ON RW(TRF)(MOD).

② SEE LIGHTING INSTALLATION PLANS FOR NUMBER AND LOCATION OF CONDUITS.

③ SHOWN ANCHOR SLAB SHALL BE PLACED WHEN COPING IS PLACED ADJACENT TO ACP. OMIT WHERE COPING IS PLACED ADJACENT TO BRIDGE APPROACH SLAB. ANCHOR SLAB IS CONSIDERED SUBSIDIARY TO ITEM 423 "RETAINING WALL (MSE)".



NOTES:
1. REFER TO RETAINING WALL HORIZONTAL ALIGNMENT DATA SHEETS, ROADWAY SHEETS, BRIDGE SHEETS, DRAINAGE SHEETS, BORING LOG SHEETS, AND CROSS SECTIONS FOR ADDITIONAL INFORMATION.
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3. ALL STATIONS AND OFFSETS ARE FROM THE CONTROL LINE AT TOP OF THE OUTSIDE FACE OF COPING AS SHOWN IN MSE WALL TYPICAL SECTION.
4. APPLY ANTI-GRAFFITI COATING TY III TO ANY WALL SURFACE TALLER THAN 12 INCHES.
5. ONLY THE EMBANKMENT ABOVE THE EXISTING GROUND LINE WILL BE MEASURED FOR PAYMENT.

STATE OF TEXAS
Blake W. Staton
121491
LICENSED PROFESSIONAL ENGINEER
1/27/2021

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TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

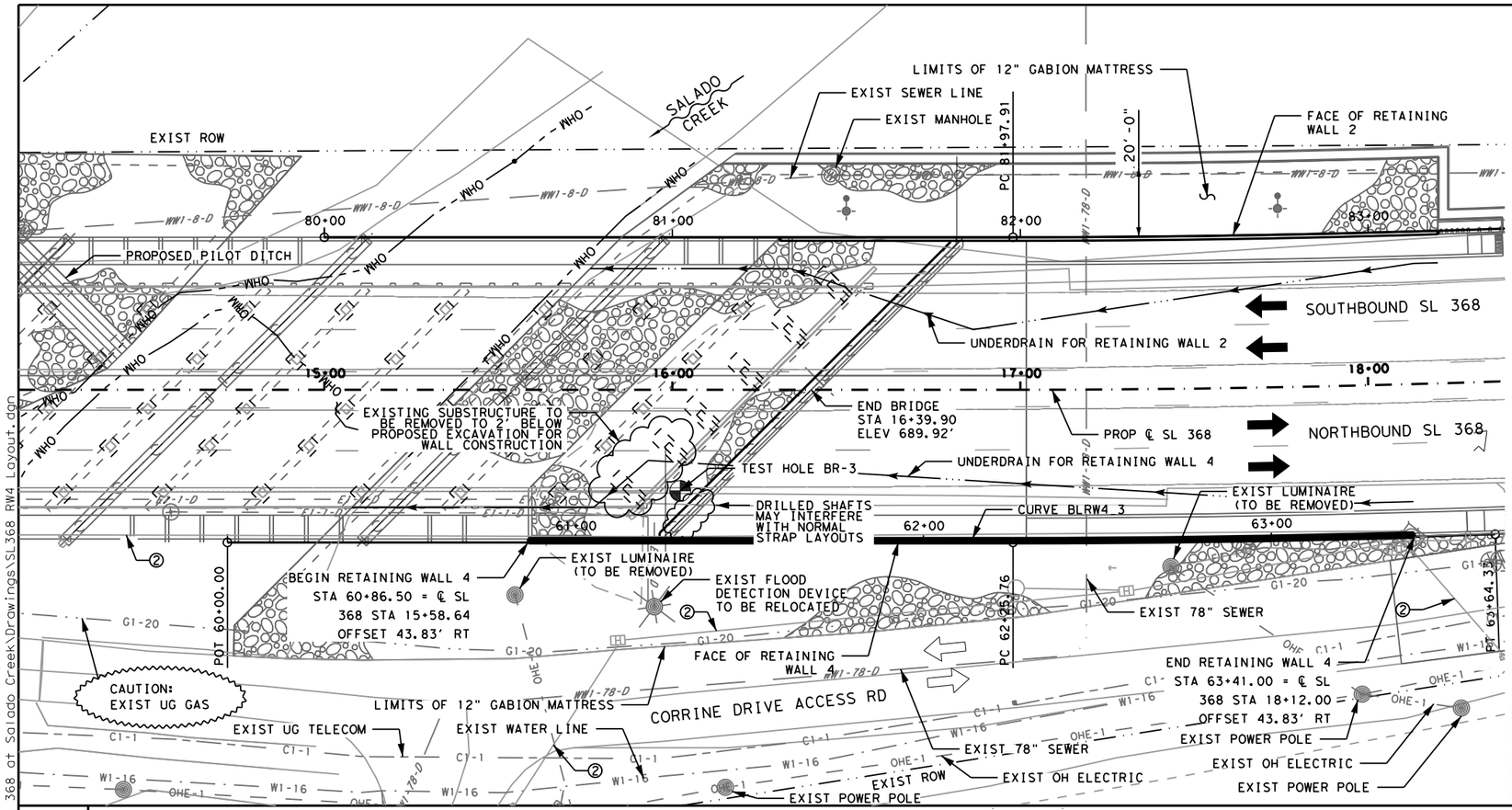
RETAINING WALL 3 LAYOUT
(STA 50+25.00 TO STA 52+20.00)

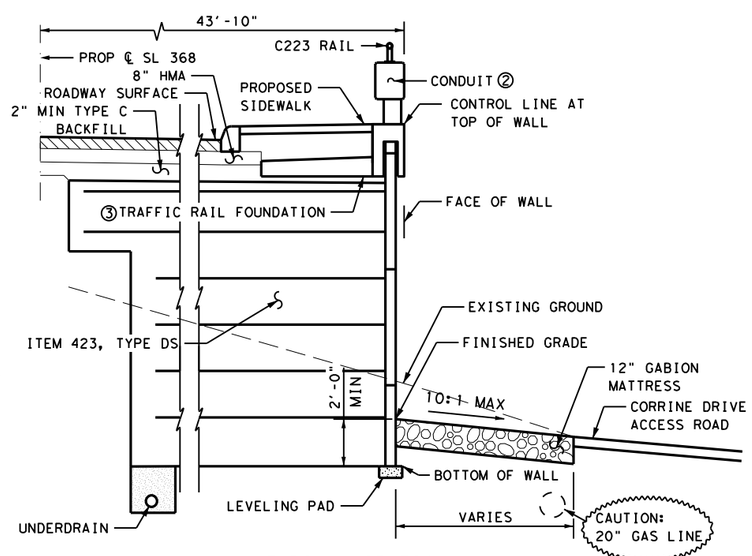
SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		129
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

DATE: 1/27/2021 12:02:08 PM
FILE: pw:\\garver-pw.bentley.com:garver-pw-01\Documents\2016\16187035 - WA 5 SL 368 at Salado Creek\Drawings\SL368 RW3 Layout.dgn

ITEM NO.	DESCRIPTION	UNIT	QTY
423 6001	RETAINING WALL (MSE)	SF	2495
450 6032	RAIL (TY C223)	LF	215
740 6005	ANTI-GRAFFITI COATING (PERMANENT-TY III)	SF	1980





TYPICAL SECTION
MSE RETAINING WALL

CURVE BLRW4_3
PI STATION = 62+95.05 N
DELTA = 1° 57' 48.15" (LT)
DEGREE OF CURVE = 1° 25' 00.73"
TANGENT = 69.2924
LENGTH = 138.5713
RADIUS = 4,043.8300
P.C. STATION = 62+25.76 N
P.T. STATION = 63+64.33 N

0 20' 40'
SCALE: 1" = 40' HORZ
1" = 10' VERT

NOTES:
1. REFER TO RETAINING WALL HORIZONTAL ALIGNMENT DATA SHEETS, ROADWAY SHEETS, BRIDGE SHEETS, DRAINAGE SHEETS, BORING LOG SHEETS, AND CROSS SECTIONS FOR ADDITIONAL INFORMATION.
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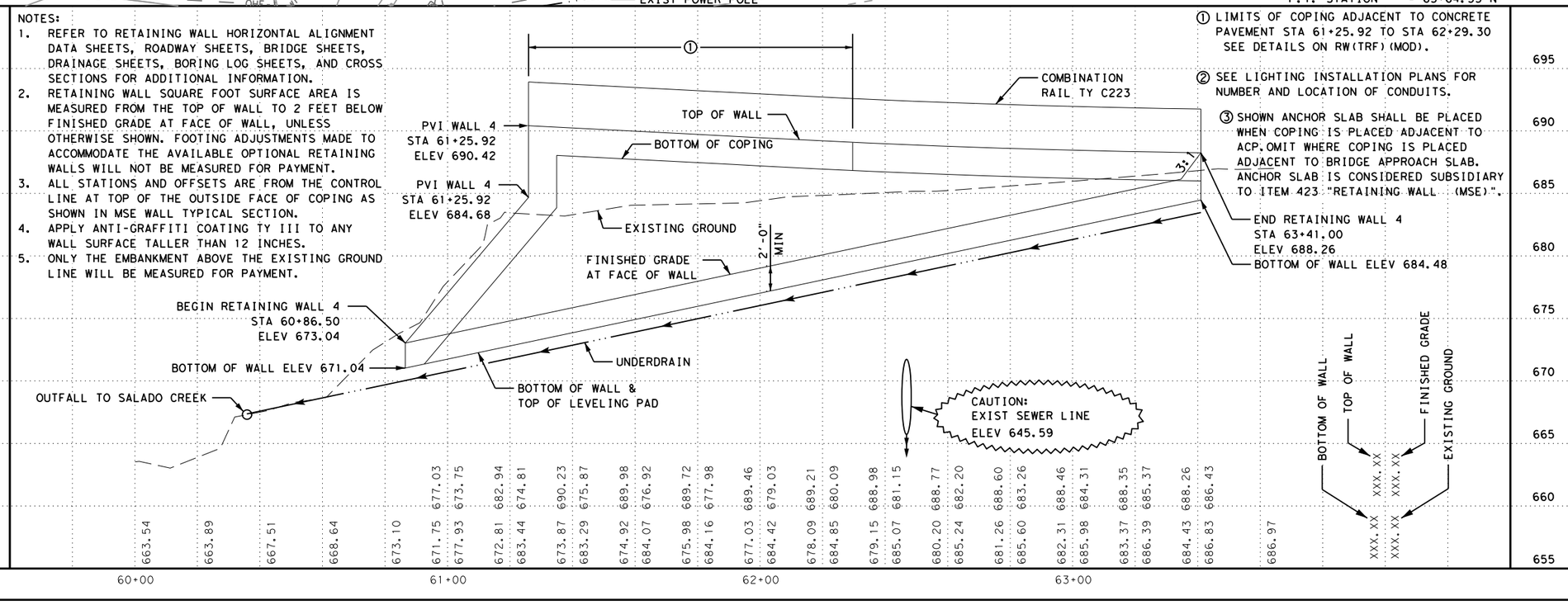
3. ALL STATIONS AND OFFSETS ARE FROM THE CONTROL LINE AT TOP OF THE OUTSIDE FACE OF COPING AS SHOWN IN MSE WALL TYPICAL SECTION.
4. APPLY ANTI-GRAFFITI COATING TY III TO ANY WALL SURFACE TALLER THAN 12 INCHES.
5. ONLY THE EMBANKMENT ABOVE THE EXISTING GROUND LINE WILL BE MEASURED FOR PAYMENT.



STATE OF TEXAS
Blake W. Staton
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1/27/2021

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TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

RETAINING WALL 4 LAYOUT

(STA 60+86.50 TO STA 63+41.00)

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		130
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

DATE: 1/27/2021 12:02:13 PM
FILE: pw:\\garver-pw.bentley.com:garver-pw-01\Documents\2016\16187035 - WA 5 SL 368 at Salado Creek\Drawings\SL368 RW4 Layout.dgn

DATE:
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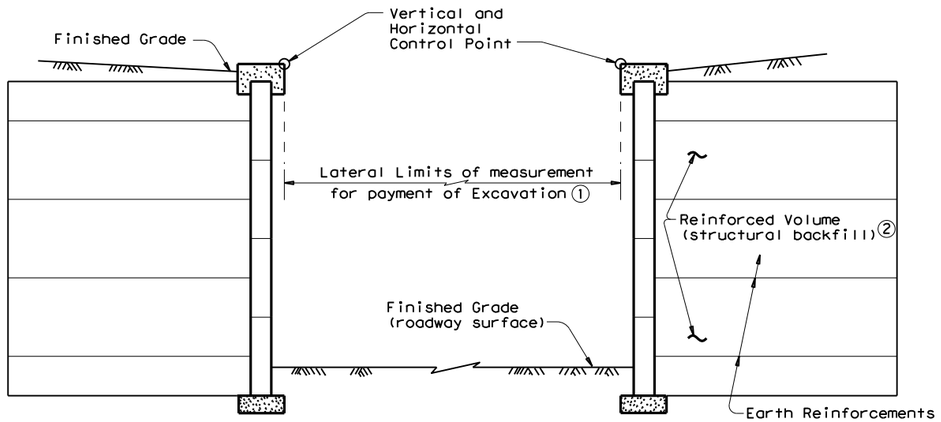
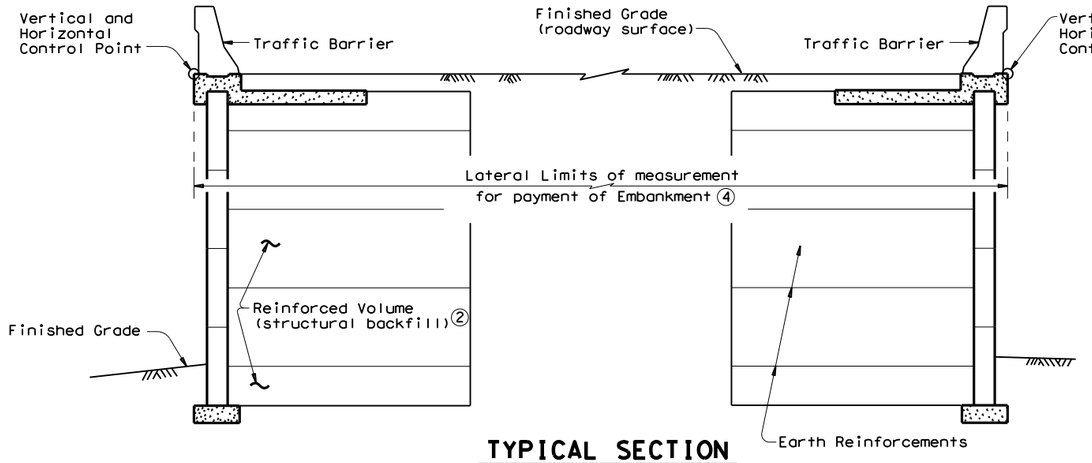


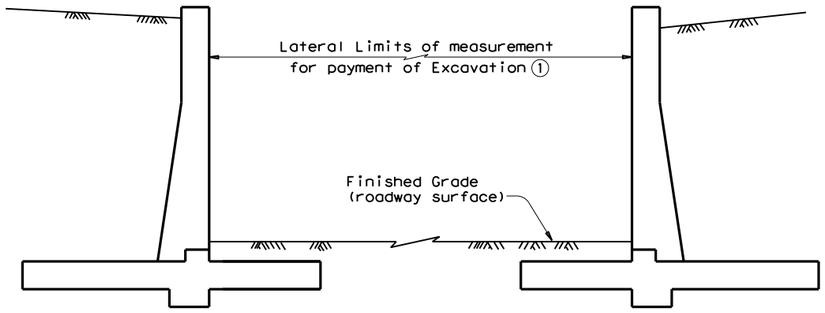
TYPICAL SECTION

Excavation Between MSE Retaining Walls ③



TYPICAL SECTION

Embankment Between MSE Retaining Walls ③



TYPICAL SECTION

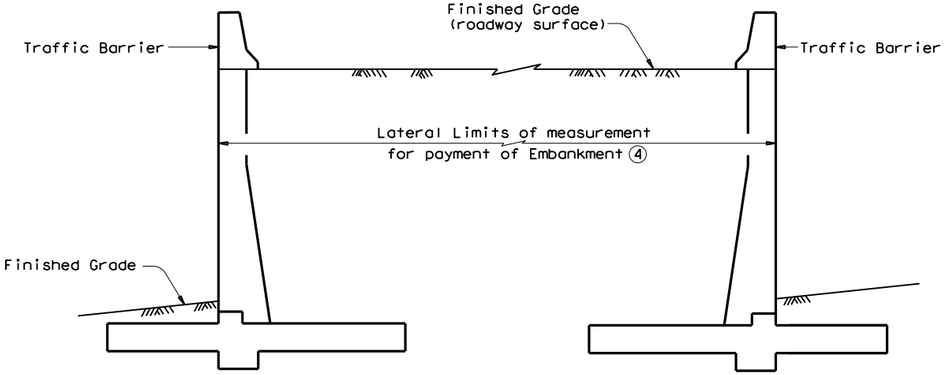
Excavation Between Conventional Retaining Walls

① Only the Excavation above the proposed subgrade elevation will be measured for payment.

② Meeting requirements of Retaining-Wall Item.

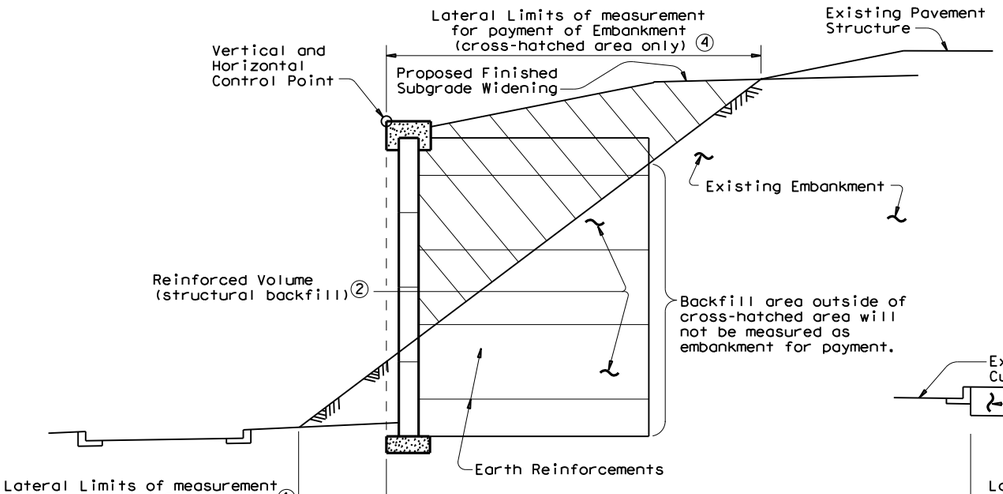
③ Earthwork measurement with other designs of retaining walls will be made to the outside finished face in the same manner.

④ Only the Embankment above the existing ground line will be measured for payment.



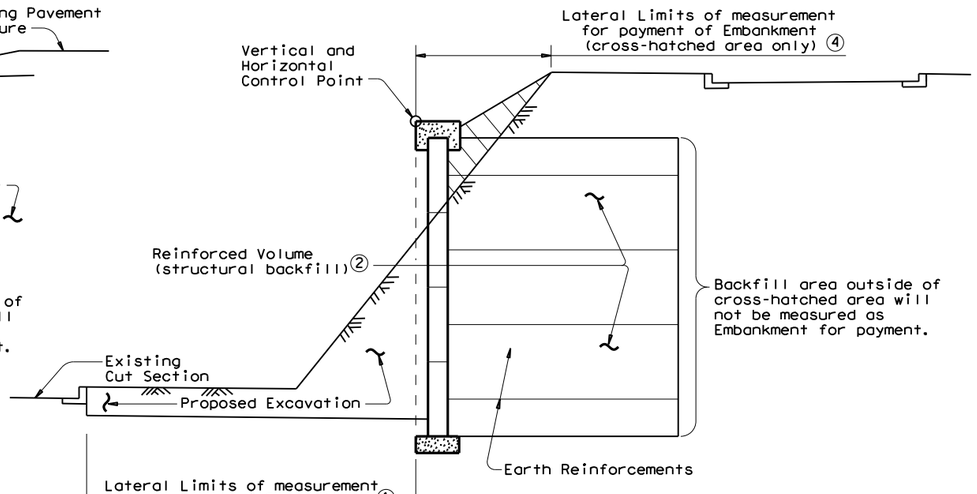
TYPICAL SECTION

Embankment Between Conventional Retaining Walls



TYPICAL SECTION

Widening Embankment with MSE Retaining Walls ③



TYPICAL SECTION

Widening Cut Section with MSE Retaining Walls ③

Texas Department of Transportation

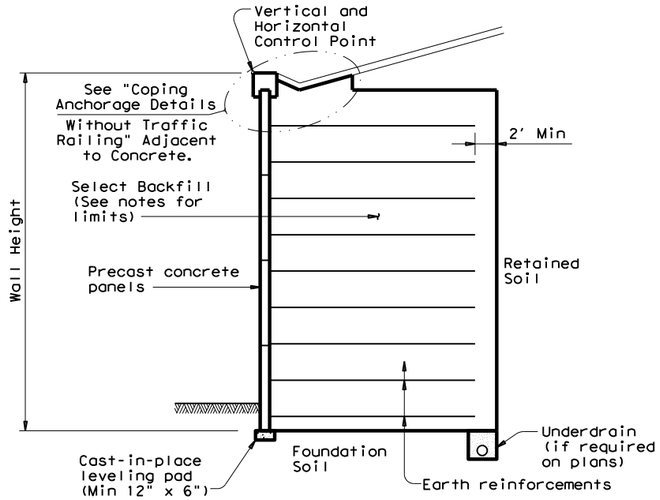
Bridge Division Standard

EARTHWORK MEASUREMENT AT RETAINING WALLS

RW(EM)

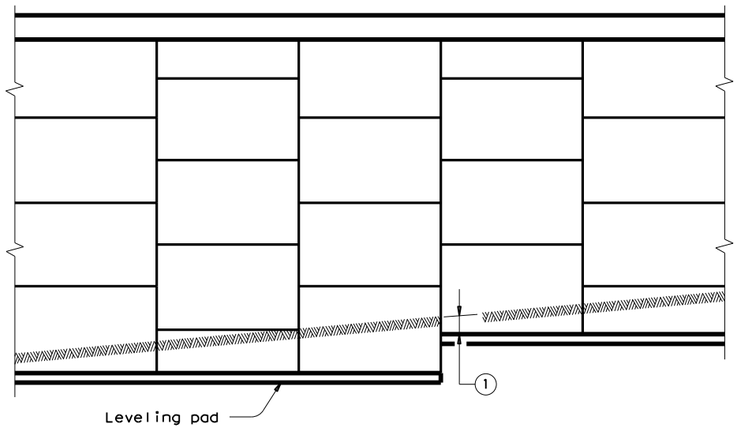
FILE: rwstde12.dgn	DN: TxDOT	CK: TxDOT	DW: BWH	CK: JMH
©TxDOT March 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		131

DATE:
FILE:

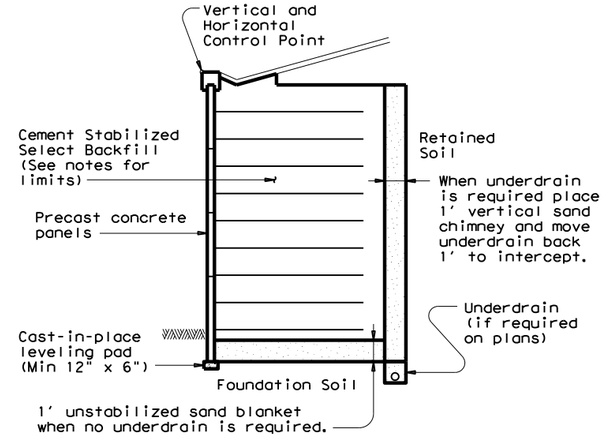


TYPICAL SECTION

(Wall at bottom of slope)

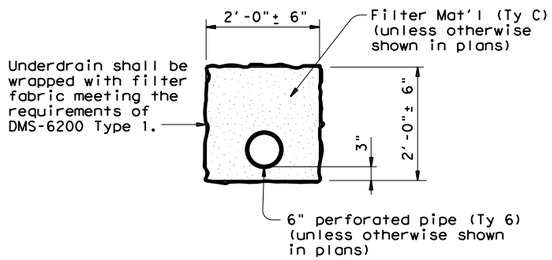


ELEVATION

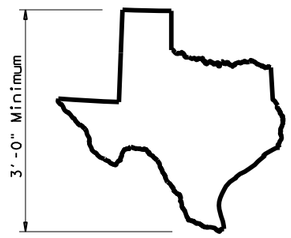


SPECIAL DRAINAGE PROVISIONS

(When cement stabilized backfill is used)



UNDERDRAIN DETAIL



MAP OF TEXAS EMBLEM ②

① Minimum embedment conforming to values given on the RW(MSE)DD standard.

② Map of Texas emblem shall be formed into a wall panel next to each bridge abutment. The exact location of each emblem shall be approved by the Engineer. The cost of forming the emblems will not be paid for directly, but shall be incidental to the Item "Retaining Wall". The map of Texas shall be inset a minimum of ¾" into the face of the panel, and shall receive a smooth finish. The inset area shall be finished in a contrasting color as approved by the Engineer.

Texas Department of Transportation

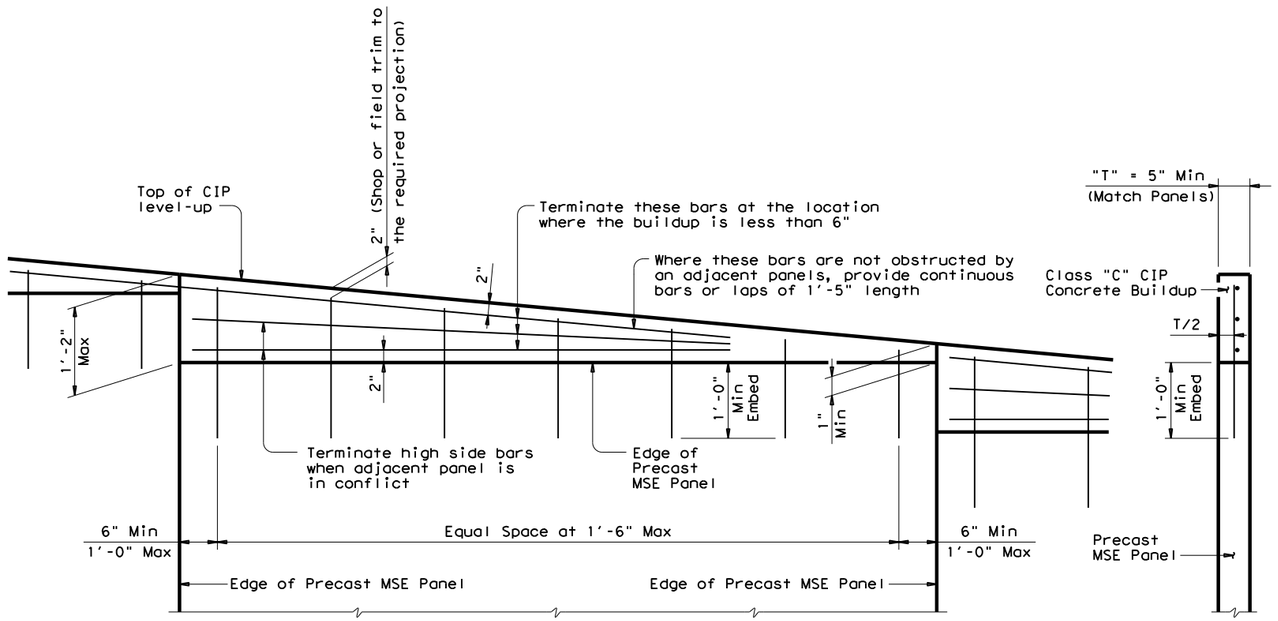
Bridge Division Standard

MECHANICALLY STABILIZED EARTH RETAINING WALL

RW(MSE)

FILE: rwstde01.dgn	DN: TxDOT	CK: TxDOT	DW: JGD	CK: MJG
©TxDOT March 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS 04-11: Added Table & Corrosion Criteria. 01-13: Wall embed, (WS) table, retained fill, soil strength.	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		132

DATE:
FILE:



LEVEL UP DETAIL (5)

Provide Grade 60 (#4) Reinforcement

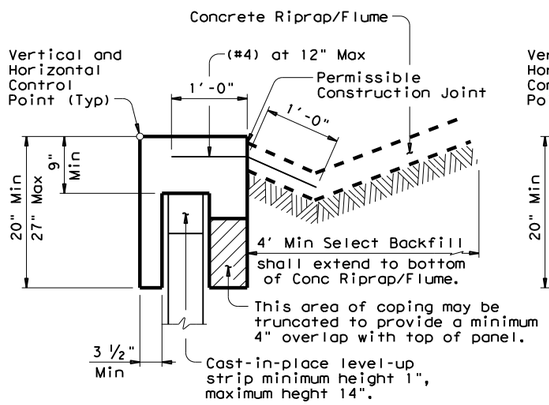
(3) Precast coping shall be anchored to prevent rotation or displacement. Use these details to develop custom anchorage for precast copings. Details shall include coping reinforcement. Concrete flume (if required) shall be paid for separately from Item 423.

(4) Soil design parameter must be based on long term soil strength. Design parameters must be listed on the RW(MSE)DD standard.

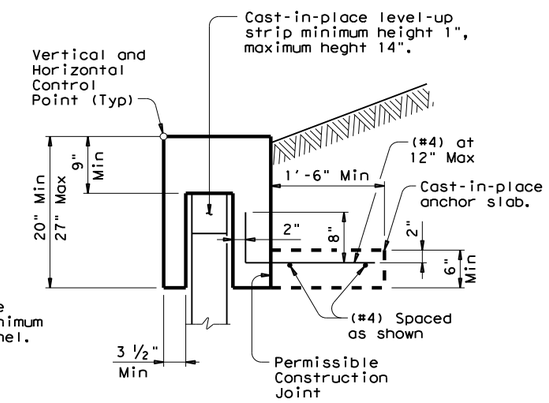
(5) Cast vertical bars into the top of panels. At contractor's option vertical bars may be embedded 4" with a Type III Clac C epoxy anchorage system. Follow manufacturer's directions for installing the epoxied vertical bars.

(6)

SELECT BACKFILL UNIT WEIGHT			
Type AS, BS & DS	Unit Weight	Inernal Stability	External Stability
	105 PCF	Pullout	Sliding, Overturning, Eccentricity
	125 PCF	Rupture	Bearing



ADJACENT TO CONCRETE
(Excluding Concrete Pavement)



ADJACENT TO SOIL

COPING ANCHORAGE DETAILS WITHOUT TRAFFIC RAILING (3)

DESIGN PARAMETERS:

Design of retaining walls shall be based on the following design parameters unless stated elsewhere in the plans:

Retained Soil	Unit Weight = 125 pcf Ø = (4) C = 0 psf
Foundation Soil	Ø = (4) C = 0 psf
Select Backfill	Unit Weight = See Table (6) Ø = 34 C = 0 psf
Cement Stabilized Select Backfill	Unit Weight = 125 pcf Ø = 45 C = 0 psf

Stress in steel and concrete shall be in accordance with current AASHTO Standard and Interim Specifications. The minimum length of earth reinforcements are as shown on the RW(MSE)DD standard.

STABILITY CRITERIA:

Stability criteria applies to both dry and drawdown analysis.
Factor of safety in sliding along the base of the structure shall be greater than or equal to 1.5.
Factor of safety in overturning shall be greater than or equal to 2.0.
The base pressure resultant shall fall within the middle third of the retaining wall.
The factor of safety against pullout of the earth reinforcements shall be greater than or equal to 1.5 at each level. Pullout resistance shall be determined from test data evaluated at ¾ inch strain.

CORROSION CRITERIA:

The earth reinforcement elements shall be designed to have a minimum design life of 75 years, using current AASHTO corrosion rates.
Stress calculations (rupture) shall be done on the calculated earth reinforcement section remaining after 75 years. Pullout calculations may be based on non-corroded section.

PRECAST COPINGS:

Wall supplier is to maximize lengths of precast coping. Precast coping is to be provided in 10' minimum lengths (typical). To optimize coping lengths at radiuses, end of runs or other wall geometric conditions favorable to shorter coping sections, shorter lengths may be used pending approval by the Engineer. This applies only to coping without railing.

JOINT SEALER:

The joints between coping segments must be sealed in accordance with the DMS-6310 "Joint Sealant's and Fillers", joint sealing material, Class 4. The joint must be sealed 3" below and 6" above the adjoining pavement surface, or as directed by the Engineer. The purpose of the joint sealing is to contain surface drainage and prevent infiltration into the retaining wall backfill.

GENERAL NOTES:

Section and elevation shown is for informational purposes only. Specific geometry is to be determined based on wall layouts and other plan information.
The select backfill specified for use within the mechanically stabilized earth volume shall extend horizontally from the back of the panels to a minimum 2' beyond the end of the earth reinforcements. The select backfill shall extend vertically from the top of the leveling pad or 4" below the lowest earth reinforcement, whichever is lower, to the top of panels.
The uppermost earth reinforcements shall be no more than 3.0' below the top of wall.
The lowest level of earth reinforcements shall be no more than 2.0' above the top of the leveling pad.
Minimum wire size for earth reinforcements shall be W7.0. If different longitudinal and cross wires are used in an earth reinforcement mesh, the smaller wire shall have at least 50% of the cross sectional area of the larger wire.
A maximum of four wire mesh configurations (wire sizes) will be allowed on a project. Each mesh configuration shall have a unique transverse bar spacing, differing from other configurations by a minimum of 3". Earth reinforcement lengths shall be stepped in increments no finer than 12".
Standard precast concrete panels shall have a maximum height of 6', and a maximum surface area of 50 sq ft. Top and bottom panels may exceed these limitations as necessary to achieve required wall grades. Maximum height of any panel shall be 7'-6". Minimum panel thickness shall be 5". Panels shall be arranged to provide offset horizontal joints.
An open joint shall be provided around the perimeter of the concrete panels. The joint configuration shall be such that 1) the filter fabric and/or pad materials are not exposed at the wall face and 2) the design opening is between ⅜" and ¾".
A one-piece corner panel shall be provided for wall angle changes of greater than 30 degrees. Butting of chamfered panels will be allowed for angle changes of 30 degrees or less.
Concrete coping shall be provided along the top of wall, at the vertical steps at bridge backwalls, and at other vertical steps along the top of wall. The joints between all coping segments shall be sealed to prevent infiltration of water into the retaining wall backfill. Sealing shall be in accordance with the DMS-6310 "Joint Sealants and Fillers", using Class 4 joint sealant.
When obstructions (inlets, drilled shafts, piling, etc.) prevent placement of soil reinforcements in their normal locations, provide details and calculations that establish support for the affected panels. Furnish the same earth reinforcement coverage as that required in the absence of the obstruction. For skewed (rotated) earth reinforcements no adjustment in length is needed for skew angles between 1 and 10 degrees. For skew angles greater than 10 degrees adjust the length of earth reinforcement to provide a cosine length of the reinforcement equivalent to the stated design length for the section of wall. Provide calculations that justify any alterations made to the soil reinforcements or modifications to their normal placement. Do not use panels without any soil reinforcements connected to them unless they are connected with galvanized hardware to adjacent panels which do have supporting Soil reinforcements attached to them and as approved by the Engineer.
Reinforced concrete must be Class "C", Precast concrete Class "H", Unreinforced concrete Class "A".
All reinforcing steel must be Grade 60.
Coping and anchor slabs are considered subsidiary to the Item "Retaining Wall".
These details are to be used in conjunction with the retaining wall layout, standard RW(MSE)DD and other applicable standards.

Texas Department of Transportation

Bridge Division Standard

MECHANICALLY STABILIZED EARTH RETAINING WALL

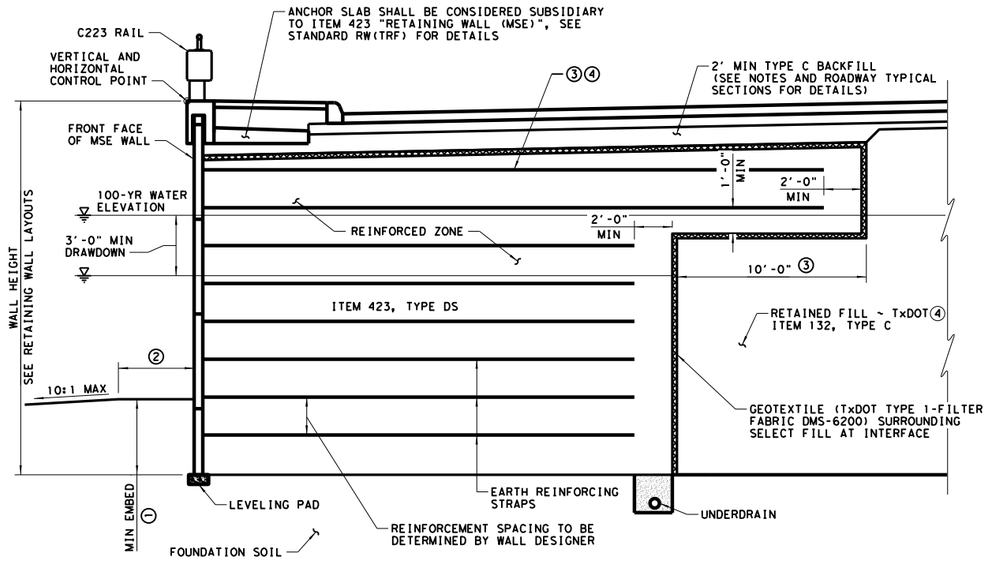
RW(MSE)

FILE: rwstde01.dgn	DN: TxDOT	CK: TxDOT	DW: JGD	CK: MJG
©TxDOT March 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS 04-11: Added Table & Corrosion Criteria. 01-13: Wall embed, (WS) table, retained fill, soil strength.	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		133

DATE:
FILE:

WALL SUMMARY

MSE Retaining Wall	Begin Station	End Station	Min Earth Reinforcement Length ④	Retained Soil Friction Angle	Foundation Soil Friction Angle	Ground Improvement	Min Wall Embedment ①	Underdrain Required	Drawdown Analysis	Bench Width ②
RW1	70+10.00	70+20.00	8 ft	30°	29°	NA	2 ft	YES	YES	2 ft
	70+20.00	70+36.00	10 ft							
	70+36.00	70+52.00	12 ft							
	70+52.00	70+66.00	14 ft							
	70+66.00	70+82.00	16 ft							
	70+82.00	70+98.00	18 ft							
	70+98.00	71+12.00	20 ft							
	71+12.00	71+25.73	22 ft							
	71+25.73	71+32.00	15 ft							
	71+32.00	71+42.00	13 ft							
	71+42.00	71+52.00	11 ft							
	71+52.00	71+82.00	9 ft							
RW2	81+31.00	81+51.00	8 ft	30°	29°	NA	2 ft	YES	YES	2 ft
	81+51.00	81+59.00	10 ft							
	81+59.00	81+65.00	12 ft							
	81+65.00	81+73.00	14 ft							
	81+73.00	81+79.00	16 ft							
	81+79.00	81+81.52	18 ft							
	81+81.52	81+85.00	26 ft							
	81+85.00	82+01.00	24 ft							
	82+01.00	82+17.00	22 ft							
	82+17.00	82+35.00	20 ft							
	82+35.00	82+51.00	18 ft							
	82+51.00	82+69.00	16 ft							
	82+69.00	82+87.00	14 ft							
	82+87.00	83+05.00	12 ft							
	83+05.00	83+20.00	10 ft							



TYPICAL SECTION (M)

③ IF FOUR OR MORE SOIL STRAPS ARE REQUIRED, THE TOP TWO SOIL STRAPS SHALL BE A MINIMUM LENGTH OF 10' LONGER THAN MINIMUMS SHOWN IN THE DESIGN DATA SHEET RW(MSE)DD(MOD).

④ RETAINED FILL BETWEEN REINFORCED ZONE AND TEMPORARY SPECIAL SHORING BELOW EXISTING GROUND LINE WILL NOT BE MEASURED FOR SEPARATE PAYMENT, BUT SHALL BE SUBSIDIARY TO ITEM 423, "RETAINING WALL (MSE)". ANY CONTRACTOR SUBSTITUTIONS TO THIS MATERIAL SHALL BE APPROVED BY THE ENGINEER AND SHALL BE AT NO ADDITIONAL COST TO THE PROJECT.

NOTES APPLY TO MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS:

WALL HEIGHT AT BRIDGE ABUTMENTS IS MEASURED TO THE FINISHED GRADE AT THE BRIDGE ABUTMENT BACKWALL.

SOIL STRAP LENGTH SHALL NOT BE LESS THAN 8 FT.

WHERE UTILITIES ARE TO BE CONSTRUCTED WITHIN 20 FT OF THE WALL FOOTING, UTILITY LINES (STORM DRAIN, CULVERT, ETC.) BACKFILL SHOULD BE PLACED IN 8 INCH LIFTS AND COMPACTED TO 95% OF STANDARD PROCTOR DENSITY.

A GEOTEXTILE MEETING TXDOT DMS 6200 TYPE 2 SHOULD BE USED AT THE INTERFACE OF THE SELECT BACKFILL AND ITEM 132, TYPE C MATERIAL.

THE UPPER 24 INCHES OF THE BACKFILL SHOULD CONSIST OF COMPACTED ON-SITE MATERIAL MEETING ITEM 132, TYPE C. COMPACTION SHOULD BE PER DENSITY CONTROL PER ITEM 132.

RETAINED FILL SHOULD CONFORM TO TXDOT ITEM 132, TYPE C HAVING A PLASTICITY INDEX LESS THAN 20 AND 10% OR MORE MATERIAL RETAINED ON THE NO. 4 SIEVE. THE BACKFILL WITHIN THE RETAINED ZONE SHOULD BE COMPACTED IN A MAXIMUM OF 12 INCH HORIZONTAL LIFTS AND DENSITY CONTROLLED AND BE BETWEEN 98% AND 102% OF MAXIMUM DRY DENSITY AND GREATER THAN THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY TEX-114E.

THE INTERNAL FRICTION ANGLE OF TXDOT ITEM 132, TYPE C MATERIAL SHOULD BE VERIFIED WITH THE APPROPRIATE TRIAXIAL OR DIRECT SHEAR TESTING.

PREVENT SURFACE WATER OR RAIN WATER FROM DAMAGING THE RETAINING WALLS DURING CONSTRUCTION.

SHAPE THE BACKFILL TO PREVENT WATER FROM PONDING OR FLOWING ON THE BACKFILL OR AGAINST THE WALL FACE.

REMOVE AND REPLACE ANY PORTION OF THE RETAINING WALL DAMAGED OR MOVED OUT OF TOLERANCE BY EROSION, SLOUGHING, OR SATURATION OF THE RETAINING WALL OR EMBANKMENT BACKFILL.

DAMAGED REINFORCEMENTS (SOIL STRAPS) SHALL BE REJECTED AND REMOVED FROM THE JOB.

BENCHING TO BE PERFORMED WHERE EXCAVATION REQUIRED BEHIND THE WALL.

THE WALL SHALL NOT BE CONSTRUCTED ON PRE-EXISTING FILL OR PAVEMENT. ANY FILL PLACED BENEATH THE WALLS SHALL HAVE A PLASTICITY INDEX (PI) OF LESS THAN 20, AND 10% OR MORE MATERIAL RETAINED ON THE NO. 4 SIEVE. THIS FILL SHALL BE PLACED IN COMPACTED LIFTS NOT EXCEEDING 12 INCHES AND DENSITY CONTROLLED TO BE BETWEEN 98% AND 102% OF MAXIMUM DRY DENSITY AND GREATER THAN THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY TEX-114E.

AFTER FINAL GRADING AND PRIOR TO PLACEMENT OF EMBANKMENT FILL, PROOF ROLLING IN ACCORDANCE WITH TxDOT STANDARD SPECIFICATION ITEM 216, "PROOF ROLLING" SHOULD BE CONDUCTED. ALL WEAK OR SOFT AREAS SHOULD BE REMOVED AND REPLACED WITH EMBACKMENT FILL.

MODIFICATION:
Modified wall summary and details.

LEGEND:
(M) Indicates modified detail or area

STATE OF TEXAS
LEONEL RUIZ
97291
LICENSED
PROFESSIONAL ENGINEER

01/26/2021

SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

MECHANICALLY STABILIZED EARTH RETAINING WALL DESIGN DATA

RW(MSE)DD(MOD)

FILE: rwstde16.dgn	DN: TxDOT	CK: MJG	DW: JTR	CK: MJG
©TxDOT January 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		134

DATE:
FILE:

WALL SUMMARY

MSE Retaining Wall	Begin Station	End Station	Min Earth Reinforcement Length ④	Retained Soil Friction Angle	Foundation Soil Friction Angle	Ground Improvement	Min Wall Embedment ①	Underdrain Required	Drawdown Analysis	Bench Width ②
RW3	50+25.00	50+43.00	10 ft	30°	29°	NA	2 ft	YES	YES	2 ft
	50+43.00	50+65.00	12 ft							
	50+65.00	50+87.00	14 ft							
	50+87.00	51+07.00	16 ft							
	50+97.00	51+27.00	18 ft							
	51+27.00	51+47.00	20 ft							
	51+47.00	51+63.00	22 ft							
	51+63.00	51+67.07	24 ft							
	51+67.07	51+75.00	14 ft							
	51+75.00	51+89.00	12 ft							
	51+89.00	51+97.00	10 ft							
	51+97.00	52+20.00	8 ft							
RW4	60+86.50	61+06.50	10 ft	30°	29°	NA	2 ft	YES	YES	2 ft
	61+06.50	61+16.50	12 ft							
	61+16.50	61+25.92	16 ft							
	61+25.92	61+32.50	24 ft							
	61+32.50	61+56.50	22 ft							
	61+56.50	61+78.50	20 ft							
	61+78.50	62+02.50	18 ft							
	62+02.50	62+26.50	16 ft							
	62+26.50	62+50.50	14 ft							
	62+50.50	62+74.50	12 ft							
	62+74.50	63+00.50	10 ft							
	63+00.50	63+41.00	8 ft							

NOTES APPLY TO MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS:

WALL HEIGHT AT BRIDGE ABUTMENTS IS MEASURED TO THE FINISHED GRADE AT THE BRIDGE ABUTMENT BACKWALL.

SOIL STRAP LENGTH SHALL NOT BE LESS THAN 8 FT.

WHERE UTILITIES ARE TO BE CONSTRUCTED WITHIN 20 FT OF THE WALL FOOTING, UTILITY LINES (STORM DRAIN, CULVERT, ETC.) BACKFILL SHOULD BE PLACED IN 8 INCH LIFTS AND COMPACTED TO 95% OF STANDARD PROCTOR DENSITY.

A GEOTEXTILE MEETING TXDOT DMS 6200 TYPE 2 SHOULD BE USED AT THE INTERFACE OF THE SELECT BACKFILL AND ITEM 132, TYPE C MATERIAL.

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RETAINED FILL SHOULD CONFORM TO TXDOT ITEM 132, TYPE C HAVING A PLASTICITY INDEX LESS THAN 20 AND 10% OR MORE MATERIAL RETAINED ON THE NO. 4 SIEVE. THE BACKFILL WITHIN THE RETAINED ZONE SHOULD BE COMPACTED IN A MAXIMUM OF 12 INCH HORIZONTAL LIFTS AND DENSITY CONTROLLED AND BE BETWEEN 98% AND 102% OF MAXIMUM DRY DENSITY AND GREATER THAN THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY TEX-114E.

THE INTERNAL FRICTION ANGLE OF TXDOT ITEM 132, TYPE C MATERIAL SHOULD BE VERIFIED WITH THE APPROPRIATE TRIAXIAL OR DIRECT SHEAR TESTING.

PREVENT SURFACE WATER OR RAIN WATER FROM DAMAGING THE RETAINING WALLS DURING CONSTRUCTION.

SHAPE THE BACKFILL TO PREVENT WATER FROM PONDING OR FLOWING ON THE BACKFILL OR AGAINST THE WALL FACE.

REMOVE AND REPLACE ANY PORTION OF THE RETAINING WALL DAMAGED OR MOVED OUT OF TOLERANCE BY EROSION, SLOUGHING, OR SATURATION OF THE RETAINING WALL OR EMBANKMENT BACKFILL.

DAMAGED REINFORCEMENTS (SOIL STRAPS) SHALL BE REJECTED AND REMOVED FROM THE JOB.

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THE WALL SHALL NOT BE CONSTRUCTED ON PRE-EXISTING FILL OR PAVEMENT. ANY FILL PLACED BENEATH THE WALLS SHALL HAVE A PLASTICITY INDEX (PI) OF LESS THAN 20, AND 10% OR MORE MATERIAL RETAINED ON THE NO. 4 SIEVE. THIS FILL SHALL BE PLACED IN COMPACTED LIFTS NOT EXCEEDING 12 INCHES AND DENSITY CONTROLLED TO BE BETWEEN 98% AND 102% OF MAXIMUM DRY DENSITY AND GREATER THAN THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY TEX-114E.

AFTER FINAL GRADING AND PRIOR TO PLACEMENT OF EMBANKMENT FILL, PROOF ROLLING IN ACCORDANCE WITH TxDOT STANDARD SPECIFICATION ITEM 216, "PROOF ROLLING" SHOULD BE CONDUCTED. ALL WEAK OR SOFT AREAS SHOULD BE REMOVED AND REPLACED WITH EMBACKMENT FILL.

STATE OF TEXAS
LEONEL RUIZ
97291
LICENSED
PROFESSIONAL ENGINEER

01/26/2021

SHEET 2 OF 2

Texas Department of Transportation

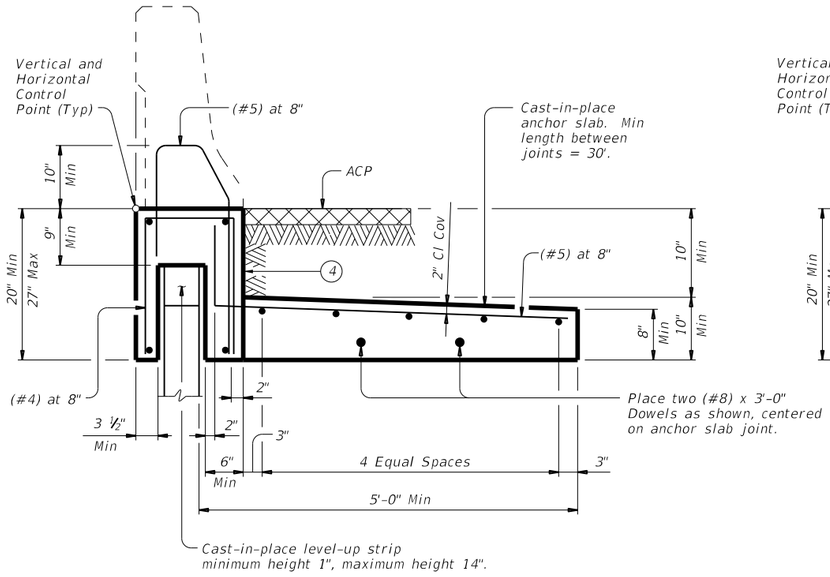
Bridge Division Standard

MECHANICALLY STABILIZED EARTH RETAINING WALL DESIGN DATA

RW(MSE)DD(MOD)

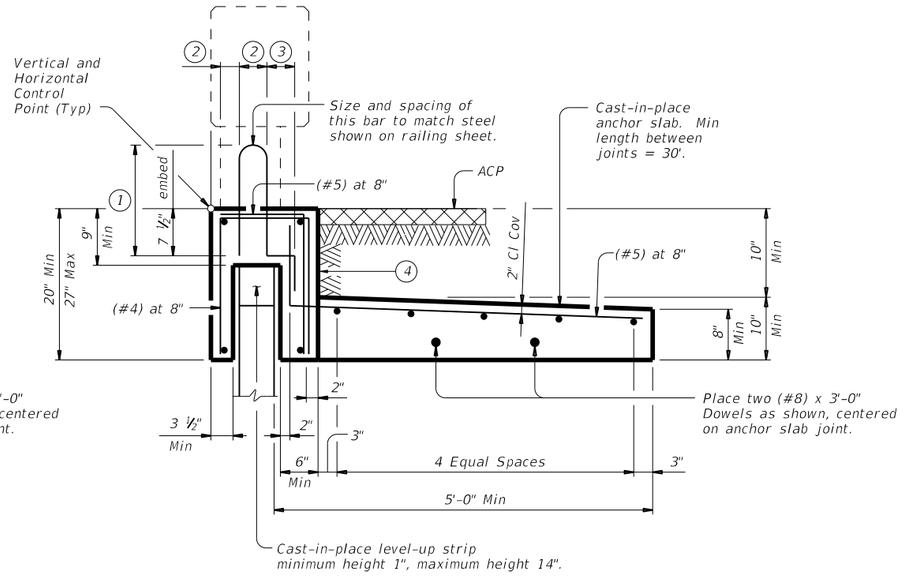
FILE: rwstde16.dgn	DN: TxDOT	CK: MJG	DW: JTR	CK: MJG
© TxDOT January 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		135

DATE:
FILE:



"WIDE BASED" ADJACENT TO ACP

(Showing T551 Rail, other rails listed similar)



"NARROW BASED" ADJACENT TO ACP

(Showing T223 Rail, other rails listed similar)

Rail Type (5)	Detail	Precasting Rail with Coping Allowed
T1F/T1W/C1W/T2P/C2P	NARROW	NO
T221/C221/T222	NARROW	YES
T223/C223	NARROW	NO
T401/T402/C402	NARROW	NO
T411/C411	NARROW	NO
T551/T552	WIDE	YES
T66	NARROW	NO
SSTR	WIDE	YES

CAST-IN-PLACE COPINGS:

Provide compressible material to isolate precast panel from cast-in-place coping to prevent cracking. Attach compressible material to both sides of precast panel prior to casting concrete for coping.

When cast-in-place coping is anchored to reinforced concrete pavement, a smooth level-up strip must be provided on the top of the precast panels. The purpose of the level-up is to allow the pavement and coping to move longitudinally relative to the wall without causing damage.

Align coping and railing joints with precast panel joints. Optional rail joints are allowed as approved by Engineer. Provide railing construction joints or expansion joints at no greater than 100' spacing.

PRECAST COPINGS:

Provide a smooth level-up strip on top of the precast panels prior to installation of the coping. Shims may be used on top of the level-up strip to facilitate alignment. Total shim thickness not to exceed 1".

Provide precast coping in 10' minimum lengths.

JOINTED CONCRETE PAVEMENT:

When coping is adjacent to and anchored into jointed concrete pavement, the coping joints must coincide with the pavement joints.

JOINT SEALER:

Seal joints between coping segments in accordance with Item 438, "Cleaning and Sealing Joints". Provide Class 4 joint seal. Place sealant flush with coping surface. The purpose of the joint sealing is to reduce surface drainage infiltration into the retaining wall backfill. Sealing coping joint is considered subsidiary to other items.

GENERAL NOTES:

Details on this sheet are to be used in development of specific details for mounting traffic railing on mechanically stabilized earth (MSE) walls.

The specific details proposed must have strengths equivalent to those shown on this sheet. Areas of particular importance are the connection of the coping to the railing, the strength of the vertical coping leg connecting the railing to the anchor slab, and the connection of the coping to the anchor slab or concrete pavement.

Submit shop drawings for the traffic railing foundations to the Engineer in accordance with Item 423 "Retaining Wall". The shop drawings must include bar bending details.

Precasting of railing with the coping will be allowed as noted in the table on this sheet.

The Contractor's attention is directed to the fact that various configurations of precast coping/railing combinations are covered by patent. The contractor must provide for use of these systems in accordance with Article 7.3.

Provide Class C concrete (f'c=3,600 psi).

Provide Grade 60 reinforcing steel.

Provide (#4) longitudinal bars, unless otherwise shown.

Coping and anchor slabs are considered subsidiary to Item 423 "Retaining Wall". Payment for traffic railing is per the linear foot for the appropriate railing type.

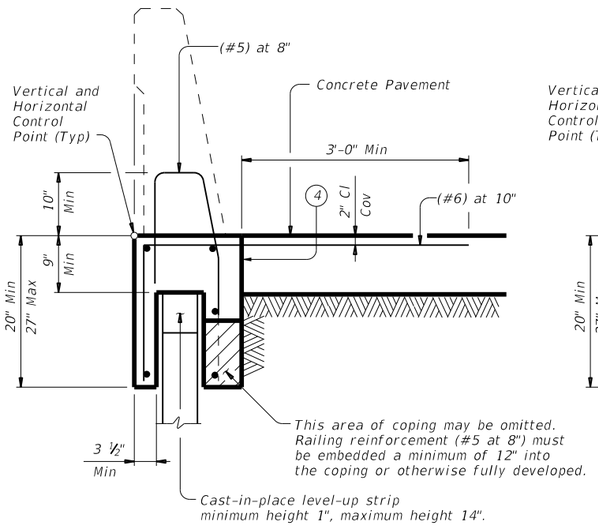
(1) Reinforcement length equal to length shown on the appropriate Rail standard plus 1".

(2) Match dimension on the appropriate Rail standard.

(3) Match dimension on the appropriate Rail standard. Bend end of rail anchorage reinforcing as shown as required to maintain clear cover.

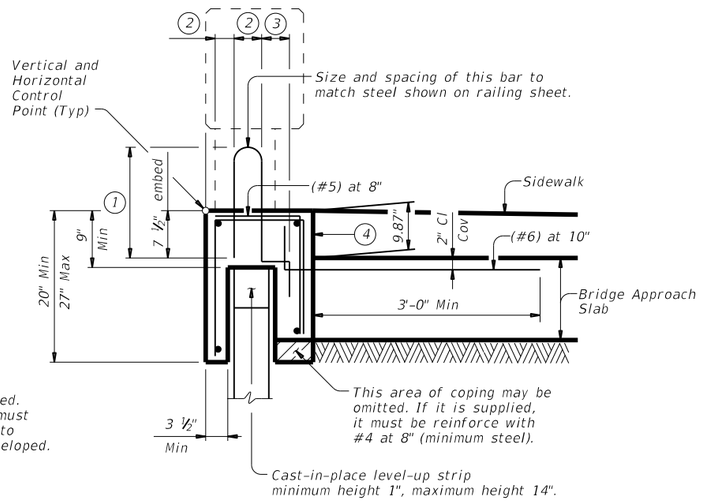
(4) See "Coping Joint Sealer Details".

(5) Use of these rails will result in a railing acceptable for MASH Test Level 3 (TL-3) regardless of the higher ratings that may be indicated on the rail standard.



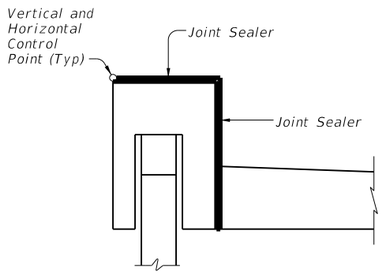
"WIDE BASED" ADJACENT TO CONCRETE PAVEMENT

(Showing SSTR Rail, other rails listed similar)

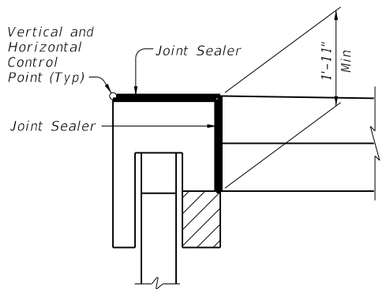


"NARROW BASED" ADJACENT TO CONCRETE PAVEMENT (M)

(Showing T223 Rail, other rails listed similar)



ADJACENT TO ACP



ADJACENT TO CONCRETE PAVEMENT

COPING JOINT SEALER DETAILS (M)

(Reinforcing steel not shown for clarity)

MODIFICATION:
Added sidewalk and supplementary reinforcing. Extended min. sealer depth to accomodate added sidewalk.

LEGEND:
(M) Indicates modified detail or area

STATE OF TEXAS
Blake W. Staton
121491
LICENSED PROFESSIONAL ENGINEER
2/22/2021

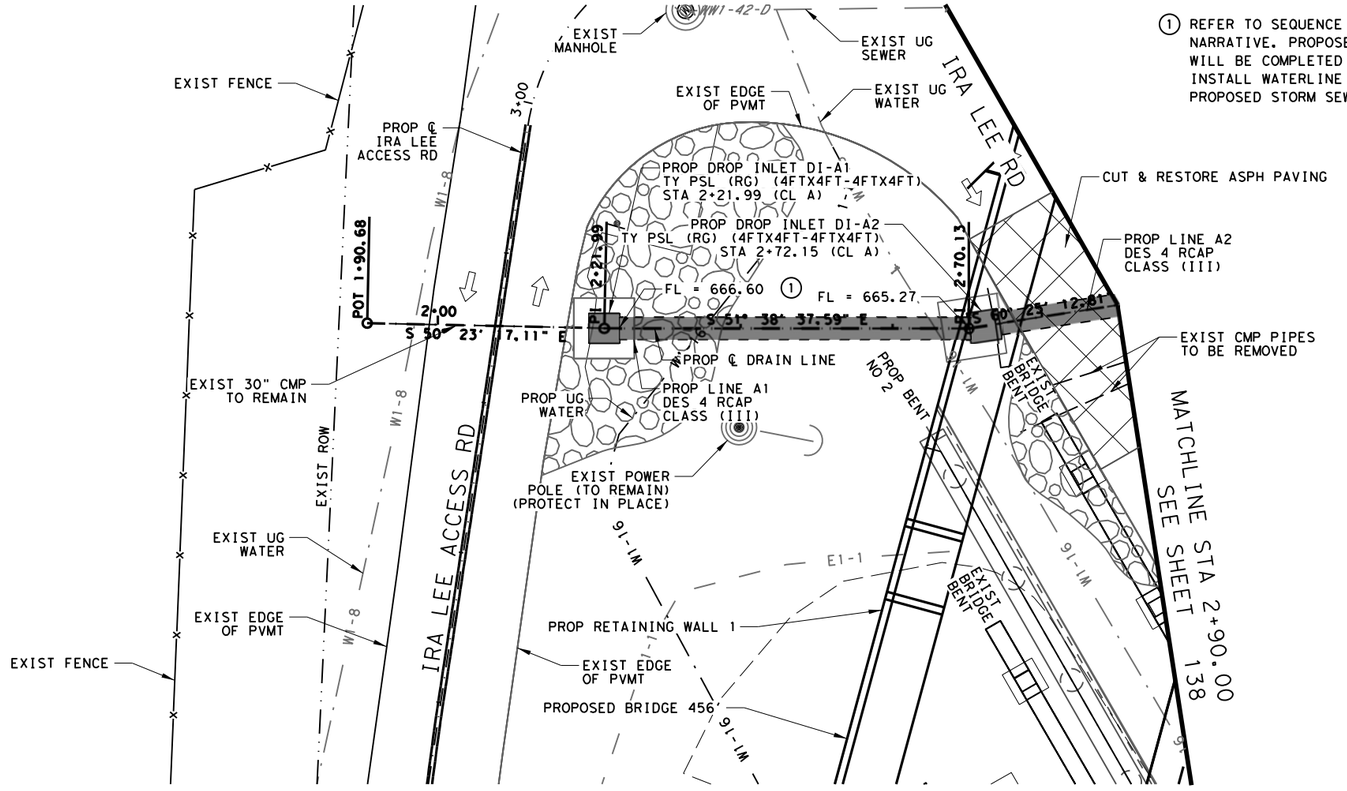
Texas Department of Transportation

Bridge Division Standard

RETAINING WALL TRAFFIC RAILING FOUNDATIONS

RW(TRF)(MOD)

FILE: rwstde03-20.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: MPM
©TxDOT March 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS 01-13: Precast option with Rails, 03-18: Cast-In-Place Copings, railing construction and expansion joints. 02-20: Note 5 added for precast rail option.	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		136



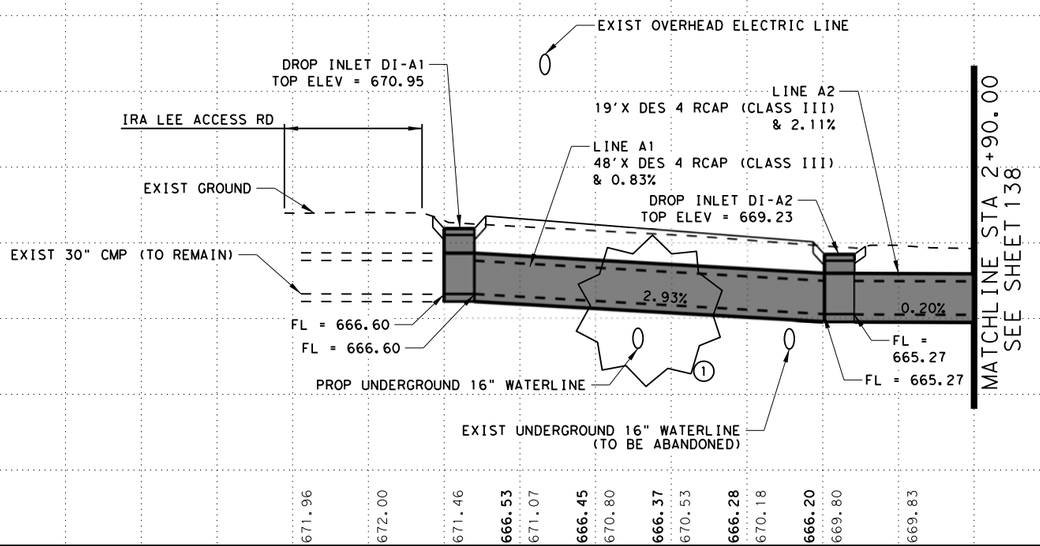
1 REFER TO SEQUENCE OF WORK LISTED ON TCP NARRATIVE. PROPOSED WATERLINE INSTALLATION WILL BE COMPLETED IN PHASE 1. CONTRACTOR SHALL INSTALL WATERLINE TO NOT CONFLICT WITH PROPOSED STORM SEWER INSTALLATION.

ITEM NO.	DESCRIPTION	UNIT	QTY
400 6003	STRUCT EXCAV (PIPE)	CY	68
400 6005	CEM STABIL BKFL	CY	34
400 6008	CUT & RESTORE ASPH PAVING	SY	42
402 6001	TRENCH EXCAVATION PROTECTION	LF	70
464 6033	RC PIPE (ARCH) (CL III) (DES 4)	LF	62
465 6079	INLET (COMPL) (PSL) (RG) (4FTX4FT)	EA	2

NOTES:
1. ALL STATIONS AND OFFSETS ARE FROM CENTERLINE OF TRAIL UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS ARE FROM BACK OF TRAIL UNLESS OTHERWISE NOTED.
3. PROPOSED 30" RCP SHALL BE CONNECTED TO EXISTING 30" CMP. SEE TRAIL DRAINAGE LAYOUT SHEET FOR ADDITIONAL INFORMATION.

LEGEND

- BORING
- EXIST ROW
- EXIST DIRECTION OF TRAFFIC
- PROP DIRECTION OF TRAFFIC
- FLOW ARROW
- C1 — EXIST UNDERGROUND CABLE
- G1 — EXIST UNDERGROUND GAS
- WW1 — EXIST UNDERGROUND SANITARY SEWER
- W1 — EXIST UNDERGROUND WATER
- OHE — EXIST OVERHEAD ELECTRIC
- PROP MBGF & SGT
- PROP RETAINING WALL
- PROP DRAIN LINE



SCALE: 1" = 20' HORZ
1" = 10' VERT

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED PROFESSIONAL ENGINEER
1/27/2021

GARVER
3755 S. Capital of Texas Highway
Suite 325
Austin, TX 78704
(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

STORM SEWER PLAN AND PROFILE
(DRAIN LINE "A")

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		137
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

DATE: 1/27/2021 3:54:52 PM
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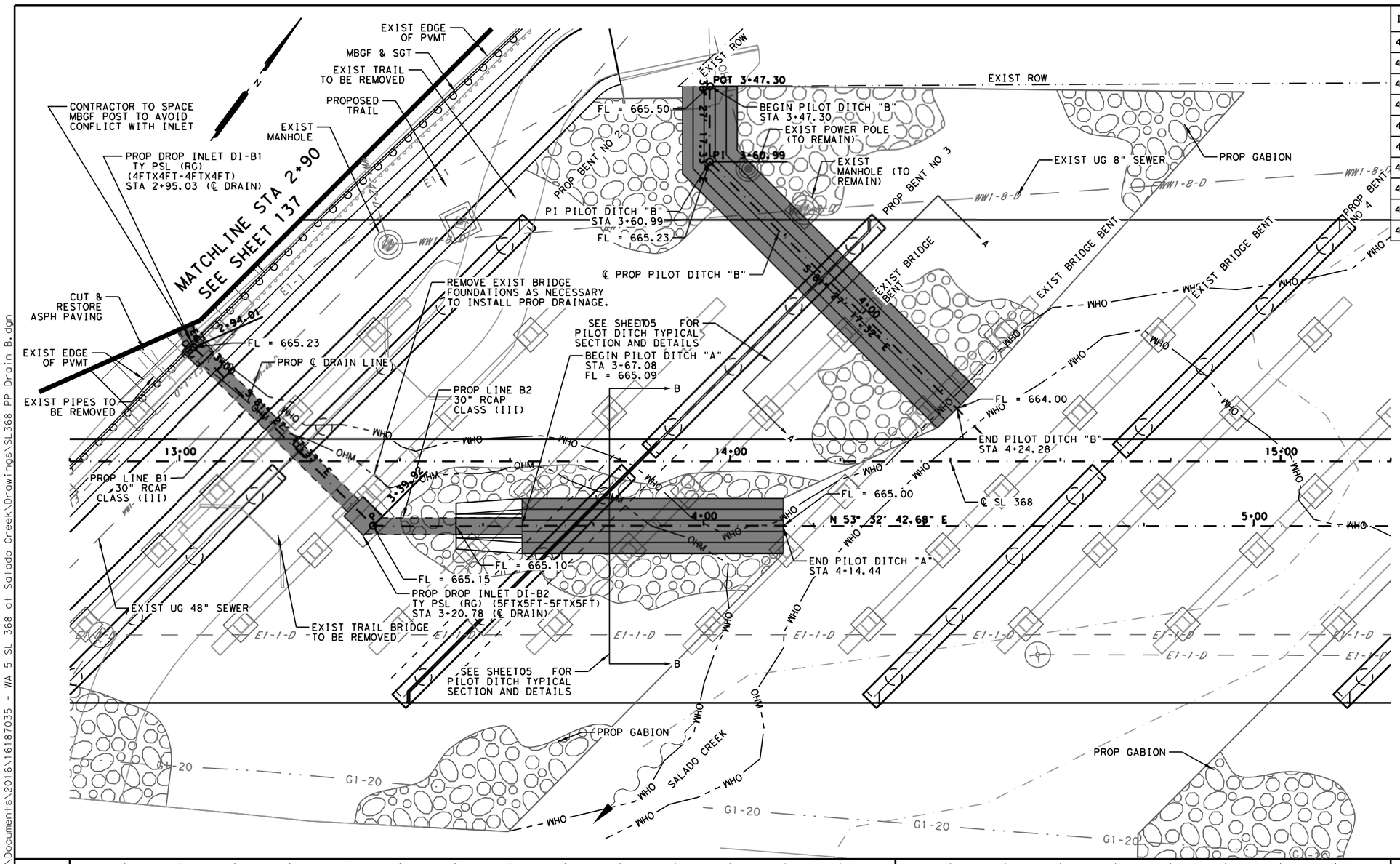
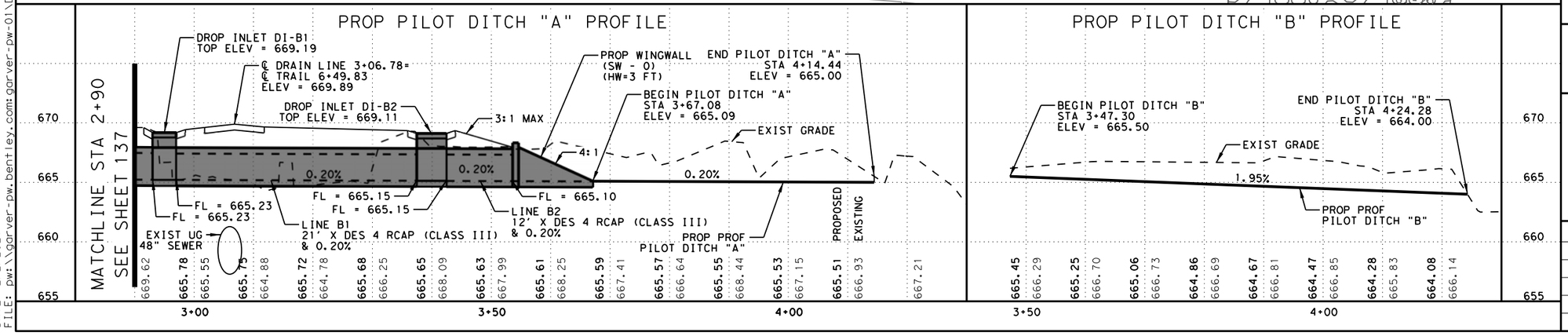


ITEM NO.	DESCRIPTION	UNIT	QTY
400 6001	STRUCT EXCAV	CY	193
400 6003	STRUCT EXCAV(PIPE)	CY	33
400 6005	CEM STABIL BKFL	CY	20
400 6008	CUT & RESTORE ASPH PAVING	SY	18
402 6001	TRENCH EXCAVATION PROTECTION	LF	74
432 6001	RIPRAP(CONC)(4 IN)	CY	31
464 6033	RC PIPE(ARCH)(CL III)(DES 4)	LF	50
465 6079	INLET(COMPL)(PSL)(RG)(4FTX4FT)	EA	1
465 6082	INLET(COMPL)(PSL)(RG)(5FTX5FT)	EA	1
466 6206	WINGWALL (SW - 0) (HW=3 FT)	EA	1

NOTES:
1. ALL STATIONS ARE FROM CENTERLINE OF DITCH UNLESS OTHERWISE NOTED.

LEGEND

- BORING
- EXIST ROW
- EXIST DIRECTION OF TRAFFIC
- PROP DIRECTION OF TRAFFIC
- FLOW ARROW
- C1 — EXIST UNDERGROUND CABLE
- G1 — EXIST UNDERGROUND GAS
- WW1 — EXIST UNDERGROUND SANITARY SEWER
- W1 — EXIST UNDERGROUND WATER
- OHE — EXIST OVERHEAD ELECTRIC
- PROP MBGF & SGT
- PROP RETAINING WALL
- PROP DRAIN LINE AND PILOT DITCH



0 10' 20'
SCALE: 1" = 20' HORZ
1" = 10' VERT

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED PROFESSIONAL ENGINEER
2/2/2021

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Austin, TX 78704
(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

STORM SEWER PLAN AND PROFILE

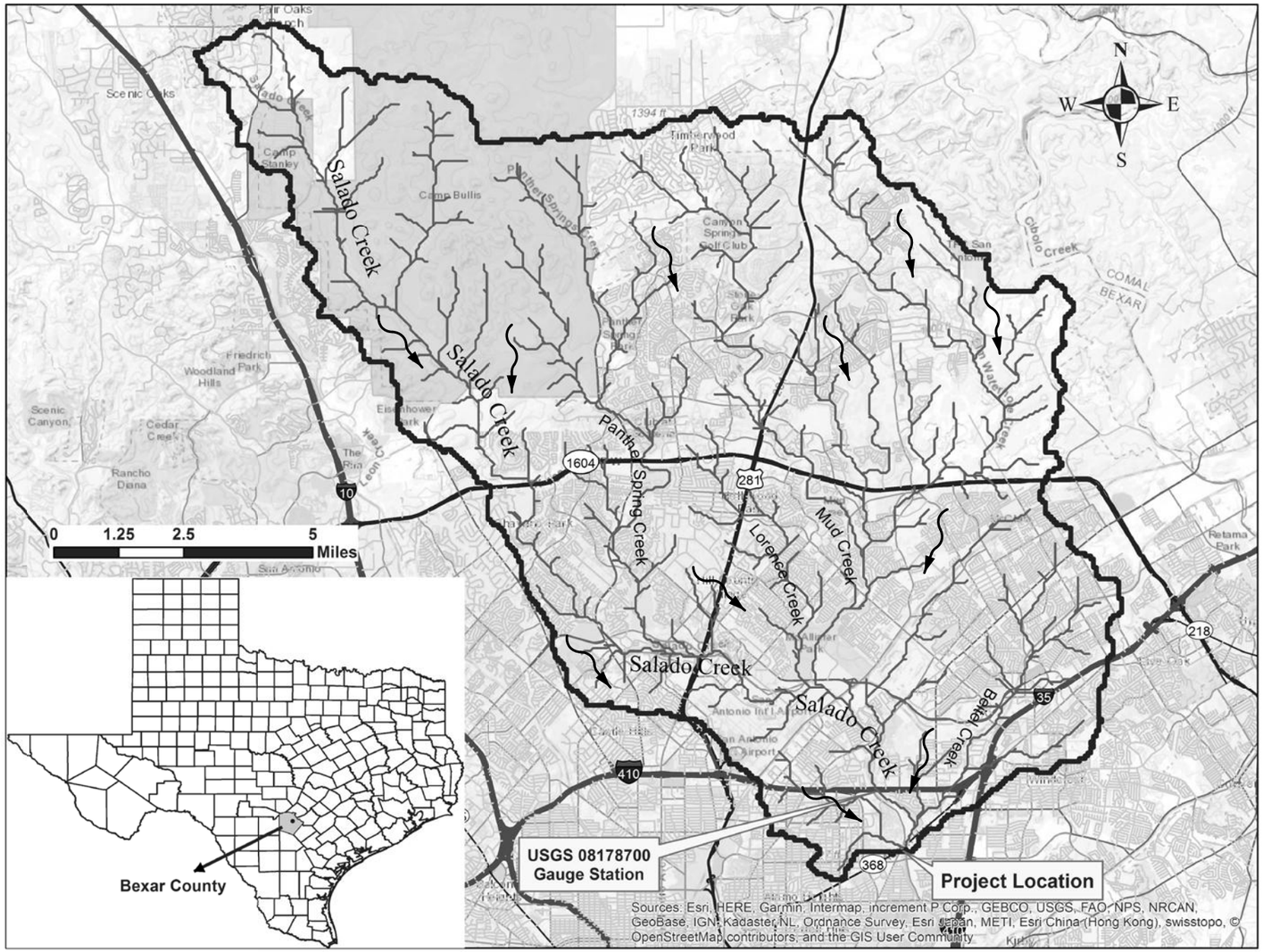
SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		138
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

DATE: 2/2/2021 4:09:30 PM
FILE: pw:\\garver-pw.bentley.com:garver-pw-01\Documents\2016\16187035 - WA 5 SL 368 at Salado Creek\Drawings\SL368 PP Drain B.dgn

DRAINAGE AREA MAP

SALADO CREEK DRAINAGE AREA AT SL 368 CROSSING



NOTES:

1) THE PORTION OF SALADO CREEK THAT EXTENDS THROUGH THE PROJECT AREA HAS BEEN STUDIED BY DETAILED METHODS AS PART OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE STUDY (FIS - 48029CV001C) FOR BEXAR COUNTY, TEXAS AND INCORPORATED AREA, EFFECTIVE DATE: SEPTEMBER 29, 2010.

2) SALADO CREEK HAS A DESIGNATED SPECIAL FLOOD HAZARD AREA (SFHA) ZONE AE FLOODPLAIN WITH NO FLOODWAY THROUGHOUT THE PROJECT REACH WHICH INDICATES THAT BASE FLOOD ELEVATIONS (BFE'S) HAVE BEEN DETERMINED. IT CAN BE FOUND IN THE FLOOD INSURANCE RATE MAP (FIRM) NUMBER 48029C0270G, EFFECTIVE DATE: SEPTEMBER 29, 2010.

3) DRAINAGE AREA BOUNDARY WAS DELINEATED IN THE WATERSHED MODELING SYSTEM (WMS V10.1) SOFTWARE USING USGS 10-M DEM DATA. THE TOTAL DRAINAGE AREA WAS CALCULATED AS 155.60 SQ.MI.

4) THE PEAK FLOWS FROM THE FEMA HYDROLOGIC MODEL AT SL 368 WERE EVALUATED WITH THOSE RESULTING FROM THE STATISTICAL LOG-PEARSON TYPE III MODEL IN CONJUNCTION WITH THE TRANSPOSITION METHOD.

5) H&H FILES WERE SENT TO THE LOCAL FLOODPLAIN ADMINISTRATOR "NEFI GARZA, P.E.,CFM" WITH THE CITY OF SAN ANTONIO ON 01/25/2019.

STATE OF TEXAS
JASON N. VERNER
95935
LICENSED PROFESSIONAL ENGINEER
P.E.

9/24/2019

LTRA
LINA T. RAMEY & ASSOCIATES, INC.
3320 Belt Line Rd
Farmers Branch, Texas 75234
Firm Registration No. F-782

Texas Department of Transportation

SL 368 AT SALADO CREEK

HYDRAULIC DATA SHEET

SHEET 1 OF 5

FED. RD. DIV. NO.	FEDERAL PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		139
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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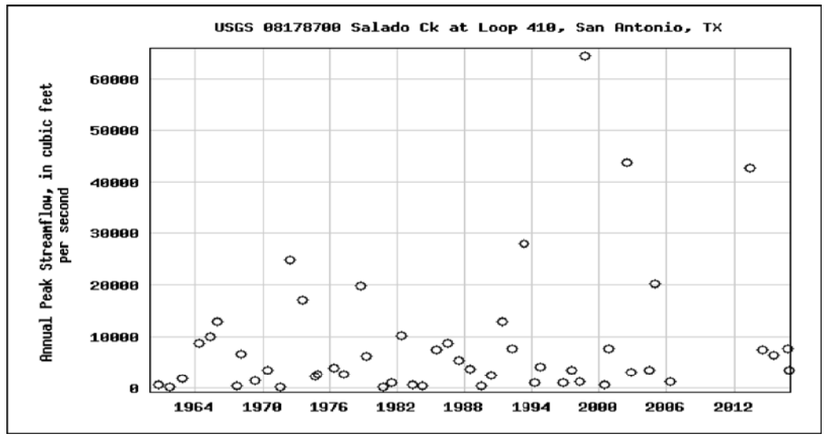
Rank	Year	Peak Streamflow (CFS)	Log Q	(Log Q)^2	(Log Q)^3	Return Period Tr=[(n+1)/m]	Exceedence Probability (1/Tr)
	~~10/17/1998~~	~~64,400~~			High Outlier		
	~~7/1/2002~~	~~43,800~~			High Outlier		
	~~5/25/2013~~	~~42,600~~			High Outlier		
1	1993	28,100	4.449	19.791	88.044	35.00	0.029
2	1972	24,900	4.396	19.327	84.963	17.50	0.057
3	2004	20,200	4.305	18.536	79.804	11.67	0.086
4	1978	19,800	4.297	18.461	79.322	8.75	0.114
5	1973	17,100	4.233	17.918	75.848	7.00	0.143
6	1965	13,000	4.114	16.925	69.627	5.83	0.172
7	1991	12,900	4.111	16.897	69.456	5.00	0.200
8	1982	10,200	4.009	16.069	64.414	4.38	0.228
9	1964	8,700	3.940	15.520	61.141	3.89	0.257
10	1986	8,660	3.938	15.504	61.047	3.50	0.286
11	2000	7,660	3.884	15.087	58.602	3.18	0.314
12	1992	7,630	3.883	15.074	58.525	2.92	0.342
13	2016	7,580	3.880	15.052	58.396	2.69	0.372
14	2014	7,560	3.879	15.043	58.344	2.50	0.400
15	1985	7,550	3.878	15.038	58.318	2.33	0.429
16	1968	6,600	3.820	14.589	55.723	2.19	0.457
17	2015	6,450	3.810	14.513	55.287	2.06	0.485
18	1979	6,120	3.787	14.339	54.300	1.94	0.515
19	1987	5,400	3.732	13.931	51.995	1.84	0.543
20	1994	4,080	3.611	13.037	47.072	1.75	0.571
21	1976	3,870	3.588	12.872	46.180	1.67	0.599
22	1988	3,780	3.577	12.798	45.786	1.59	0.629
23	1997	3,510	3.545	12.569	44.562	1.52	0.658
24	1970	3,390	3.530	12.462	43.994	1.46	0.685
25	1974	2,740	3.438	11.818	40.628	1.40	0.714
26	1977	2,720	3.435	11.796	40.515	1.35	0.741
27	1990	2,500	3.398	11.546	39.233	1.30	0.769
28	1962	1,870	3.272	10.705	35.025	1.25	0.800
29	1969	1,370	3.137	9.839	30.862	1.21	0.826
30	2006	1,100	3.041	9.250	28.133	1.17	0.855
31	1981	1,070	3.029	9.177	27.801	1.13	0.885
32	1996	901	2.955	8.730	25.796	1.09	0.917
33	1960	595	2.775	7.698	21.358	1.06	0.943
34	1983	473	2.675	7.155	19.138	1.03	0.971
	~~6/14/1989~~	~~433~~			Low Outlier		
	~~3/12/1984~~	~~279~~			Low Outlier		
	~~9/22/1967~~	~~278~~			Low Outlier		
	~~9/6/1980~~	~~232~~			Low Outlier		
	~~10/11/1961~~	~~214~~			Low Outlier		
	~~8/3/1971~~	~~176~~			Low Outlier		
n		Average	SUM	SUM	SUM		
34		7,649	125.346	469.067	1779.242		

Average Q
(M)
3.687

Variance = 0.2109
Standard Deviation (S) = 0.4592
Skew Coefficent (G) = -0.4502
Low Outlier = 449 CFS
High Outlier = 130,181 CFS



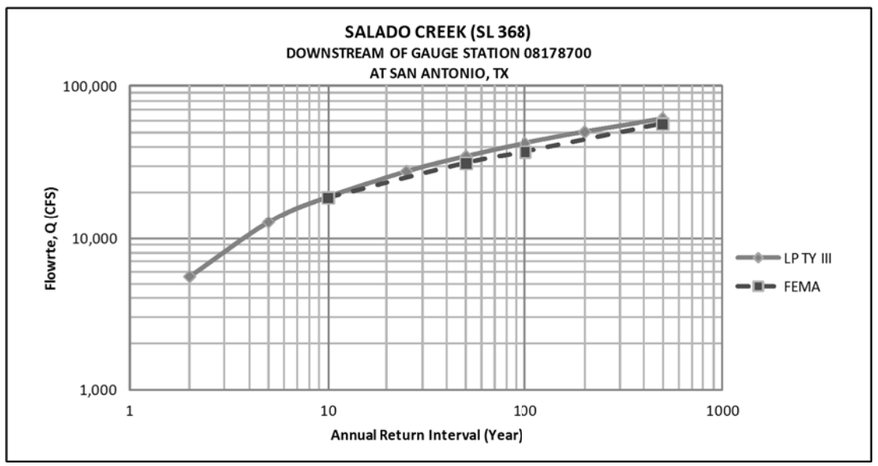
FLOW DATA FOR SALADO CREEK AT IH410

		$G_{boundary1}$ -0.4	G -0.4502	$G_{boundary2}$ -0.5	log Q= M +KS	Validation Method
Tr (ARI)	Tr (AEP, prob)	*K values* (frequency factor)			Q (CFS)	*Binomial Distribution*
2	0.5	0.06651	0.07480	0.08302	5,260	*0.09*
5	0.2	0.85508	0.85581	0.85653	12,013	*0.14*
10	0.1	1.23114	1.22363	1.21618	17,723	*0.11*
25	0.04	1.60574	1.58649	1.5674	26,012	*0.09*
50	0.02	1.83361	1.80527	1.77716	32,782	*0.06*
100	0.01	2.02933	1.99188	1.95472	39,932	*0.01*
200	0.005	2.20092	2.15440	2.10825	47,419	*0.20*
500	0.002	2.39942	2.34103	2.28311	57,764	*0.09*

FLOW DATA FOR SALADO CREEK AT SL368
(TRANSPOSITION OF GAUGE ANALYSIS RESULTS)

DA at IH410 = 137 SQ.MI.
DA south of Beitel Confluence = 154 SQ.MI.
DA at SL368 = 155.6 SQ.MI.

		HECRAS RS ID =	*127372*	*124301*	FEMA EFFECTIVE FLOW DATA	DIFFERENCE (FEMA VS 124301)
Tr (ARI)	Tr (AEP, prob)		**Q (CFS)**	**Q (CFS)**	Q (CFS)	%
2	0.5		**5,577**	**5,606**	NA	
5	0.2		**12,737**	**12,803**	NA	
10	0.1		**18,790**	**18,888**	18,601	1.54
25	0.04		**27,579**	**27,722**	NA	
50	0.02		**34,756**	**34,937**	31,399	11.27
100	0.01		**42,337**	**42,556**	37,245	14.26
200	0.005		**50,275**	**50,536**	NA	
500	0.002		**61,243**	**61,560**	56,924	8.14



NOTES:

1) THE LOG-PEARSON TYPE III (LP TY-III) DISTRIBUTION WAS FITTED TO THE ANNUAL PEAK STREAMFLOWS TO CALCULATE PEAK FLOWS AT THE USGS GAUGE (08178700) LOCATED 1.72-MILES UPSTREAM OF THE SL 368 BRIDGE, AND WERE USED TO VERIFY THE PEAK FLOWS PROVIDED IN THE EFFECTIVE FEMA HYDROLOGIC MODEL.

2) USING THE METHOD OUTLINED IN BULLIENT #17B AND PRESCRIBED IN TXDOT HYDRAULIC DESIGN MANUAL, JULY 2016, THE LOW AND HIGH OUTLIER THRESHOLDS WERE CALCULATED. IN ADDITION TO PEAK STREAMFLOWS LESS THAN THE LOW OUTLIER, LARGE FLOOD EVENTS OCCURRED ON 10/17/1998, 7/1/2002 AND 5/25/2013 WERE REMOVED FROM THE HISTORICAL DATA, SINCE THEY ARE DUE TO THE EXTREME STORM EVENTS.

3) THE VALIDATION TEST USING BINOMIAL PROBABILITY DISTRIBUTION CONFIRMS THAT THE ASSUMPTION FOR REMOVING THE THREE LARGE FLOOD EVENTS FROM THE PEAK STREAFLOWS WAS APPROPRIATE.

4) LP TY-III CALCULATED PEAK FLOW VALUES WERE UTILIZED FOR THE PROPOSED BRIDGE DESIGN.

STATE OF TEXAS
JASON N. VERNER
95935
LICENSED PROFESSIONAL ENGINEER
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HYDRAULIC DATA SHEET

SHEET 2 OF 5

FED. RD. DIV. NO.	FEDERAL PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		140
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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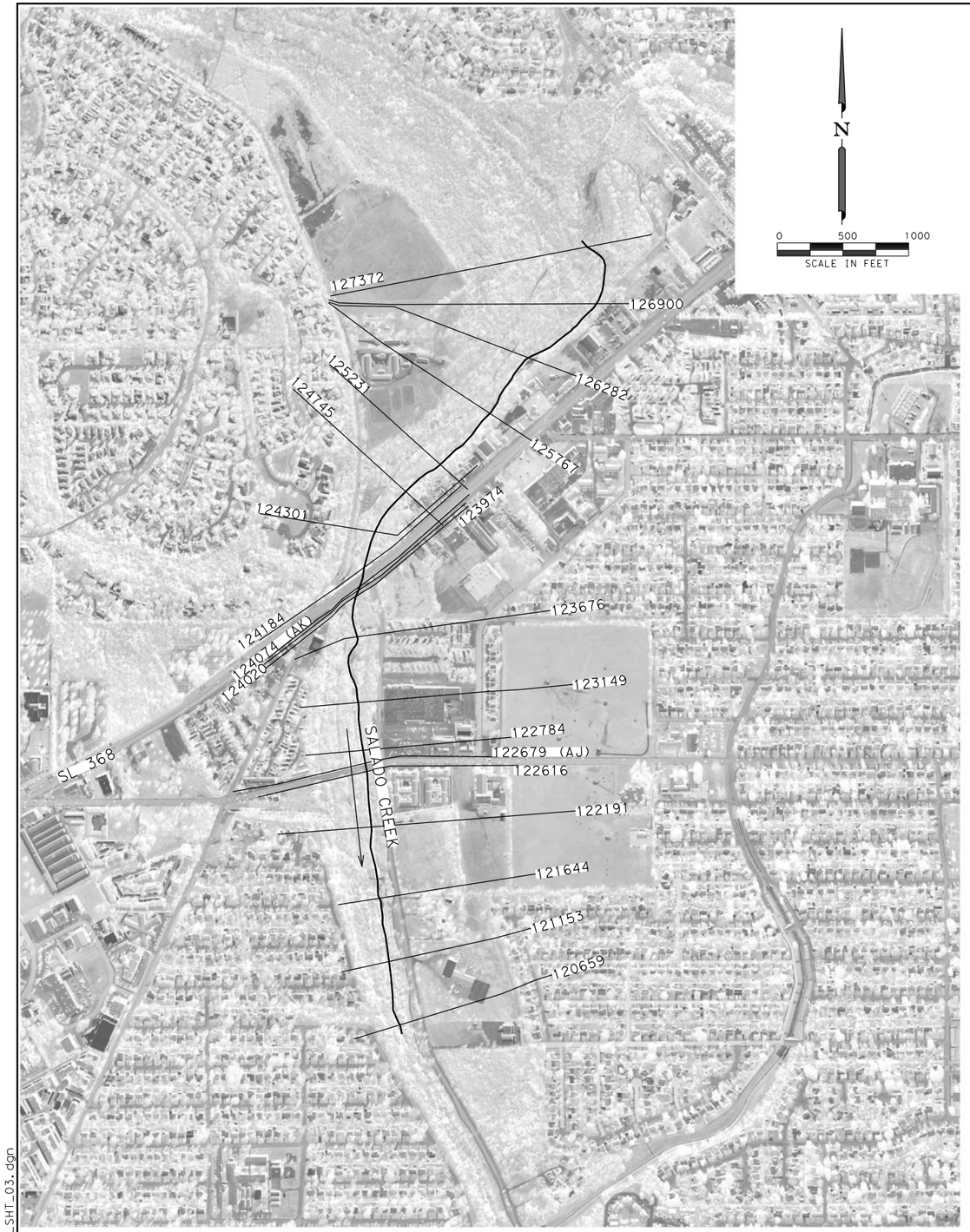
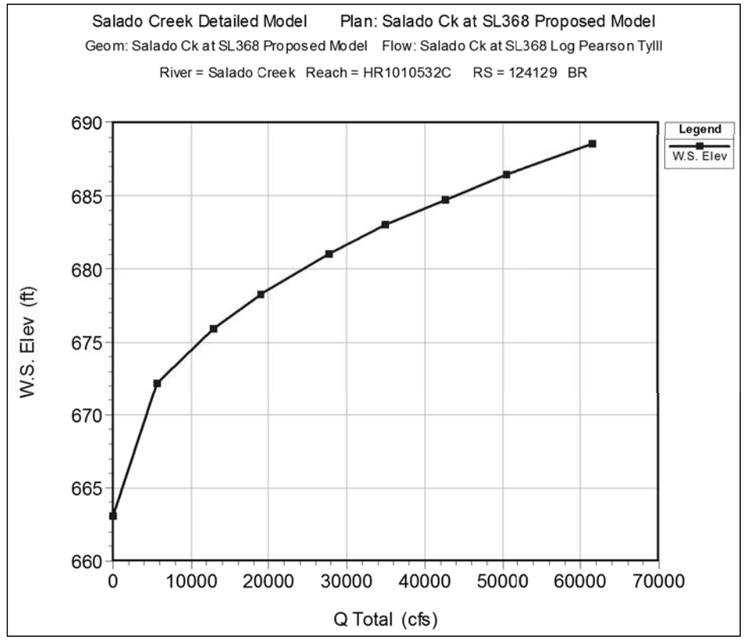
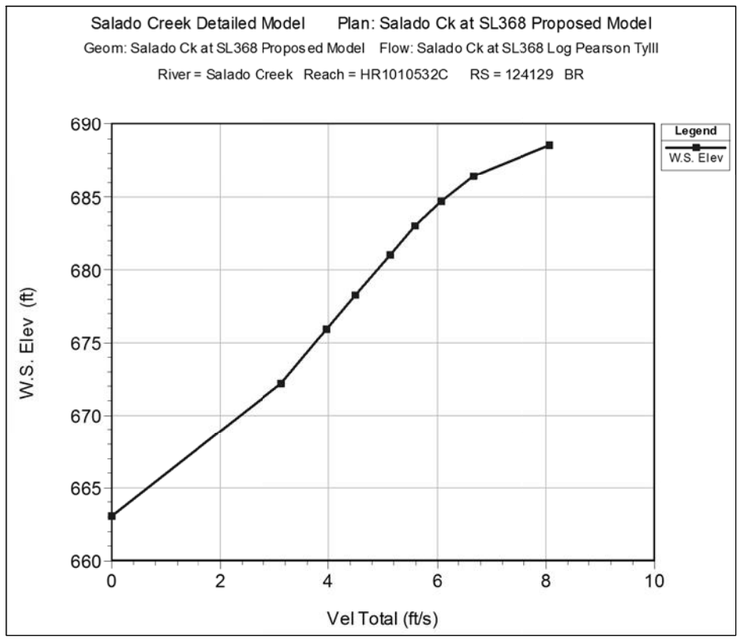


CROSS-SECTION LOCATION MAP



CONVEYANCE CURVE



VELOCITY CURVE

NOTES:

1) USACE HEC-RAS VERSION 5.0.6 UTILIZED FOR THE ANALYSIS.

2) THIS SITE IS DESIGNATED AS A FEMA ZONE "AE"AS SHOWN ON PANEL 48029C0270G.

3) ALL ELEVATIONS ARE BASED ON THE NAVD88 VERTICAL DATUM.

4) THE DOWNSTREAM BOUNDARY CONDITION WAS ESTABLISHED USING A KNOWN WATER SURFACE ELEVATION FROM THE FEMA MODEL.

5) TOPOGRAPHY DATA UTILIZED FROM TNRIS, "2017 STRATMAP CENTRAL TEXAS 50CM LIDAR". DATA WAS CONFIRMED WITH THE PROJECT'S CONVENTIONAL SURVEY DATA.

9/25/2019

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HYDRAULIC DATA SHEET

SHEET 3 OF 5

FED. RD. DIV. NO.	FEDERAL PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		141
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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HYDRAULIC COMPUTATIONS

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
HR1010532C	127372	LP-4PCT	Corr Existing	27579	673.88	688.10	680.20	688.17	0.000603	3.36	13493.20	2057.08	0.17
HR1010532C	127372	LP-4PCT	Prop Model	27579	673.88	688.07	680.20	688.14	0.00061	3.38	13431.80	2049.10	0.17
HR1010532C	127372	LP-1PCT	Corr Existing	42337	673.88	691.15	681.44	691.23	0.000459	3.39	19953.07	2144.15	0.15
HR1010532C	127372	LP-1PCT	Prop Model	42337	673.88	691.02	681.44	691.10	0.00048	3.44	19674.88	2141.48	0.15
HR1010532C	126900	LP-4PCT	Corr Existing	27579	668.06	687.69	681.22	687.87	0.000928	6.11	10409.72	1047.14	0.25
HR1010532C	126900	LP-4PCT	Prop Model	27579	668.06	687.65	681.22	687.84	0.000938	6.13	10374.13	1047.00	0.25
HR1010532C	126900	LP-1PCT	Corr Existing	42337	668.06	690.83	682.56	691.00	0.000783	6.24	16153.28	2041.06	0.24
HR1010532C	126900	LP-1PCT	Prop Model	42337	668.06	690.68	682.56	690.86	0.000822	6.36	15854.82	2039.11	0.24
HR1010532C	126282	LP-4PCT	Corr Existing	27579	666.50	686.60	680.31	687.21	0.001806	8.17	6099.97	602.74	0.35
HR1010532C	126282	LP-4PCT	Prop Model	27579	666.50	686.56	680.31	687.17	0.001826	8.20	6073.07	601.02	0.35
HR1010532C	126282	LP-1PCT	Corr Existing	42337	666.50	690.08	682.43	690.51	0.001238	7.65	11275.78	1623.16	0.30
HR1010532C	126282	LP-1PCT	Prop Model	42337	666.50	689.88	682.43	690.34	0.001331	7.88	10952.78	1590.45	0.31
HR1010532C	125767	LP-4PCT	Corr Existing	27579	664.91	685.76		686.29	0.00191	8.74	6790.01	816.64	0.36
HR1010532C	125767	LP-4PCT	Prop Model	27579	664.91	685.70		686.24	0.001946	8.80	6740.18	814.40	0.36
HR1010532C	125767	LP-1PCT	Corr Existing	42337	664.91	689.34		689.84	0.001601	9.01	10239.91	1343.04	0.34
HR1010532C	125767	LP-1PCT	Prop Model	42337	664.91	689.09		689.62	0.001702	9.22	9914.18	1278.65	0.35
HR1010532C	125231	LP-4PCT	Corr Existing	27579	664.50	684.84		685.35	0.001846	8.52	6734.93	722.85	0.35
HR1010532C	125231	LP-4PCT	Prop Model	27579	664.50	684.76		685.28	0.001888	8.59	6676.48	713.56	0.35
HR1010532C	125231	LP-1PCT	Corr Existing	42337	664.50	688.67		689.09	0.001353	8.26	10316.14	1018.73	0.31
HR1010532C	125231	LP-1PCT	Prop Model	42337	664.50	688.35		688.82	0.001493	8.60	9997.26	1012.23	0.32
HR1010532C	124745	LP-4PCT	Corr Existing	27579	663.25	683.09	678.11	684.06	0.003523	11.41	5430.04	587.90	0.48
HR1010532C	124745	LP-4PCT	Prop Model	27579	663.25	682.93	678.11	683.94	0.003699	11.63	5336.35	587.05	0.49
HR1010532C	124745	LP-1PCT	Corr Existing	42337	663.25	687.25	680.74	688.11	0.00269	11.48	8108.36	700.35	0.43
HR1010532C	124745	LP-1PCT	Prop Model	42337	663.25	686.76	680.74	687.72	0.003039	12.02	7770.81	694.28	0.46
HR1010532C	124301	LP-4PCT	Corr Existing	27722	663.13	681.39		682.38	0.00312	10.36	4137.88	367.35	0.45
HR1010532C	124301	LP-4PCT	Prop Model	27722	663.13	681.11		682.16	0.003353	10.62	4037.46	365.15	0.47
HR1010532C	124301	LP-1PCT	Corr Existing	42556	663.13	685.44		686.65	0.002919	11.62	5668.32	460.80	0.46
HR1010532C	124301	LP-1PCT	Prop Model	42556	663.13	684.71		686.05	0.003397	12.23	5384.72	400.87	0.49
HR1010532C	124184	LP-4PCT	Corr Existing	27722	663.09	681.37	673.97	681.87	0.001507	7.68	5835.18	552.86	0.32
HR1010532C	124184	LP-4PCT	Prop Model	27722	663.09	681.07	673.97	681.61	0.001658	7.96	5670.85	542.78	0.34
HR1010532C	124184	LP-1PCT	Corr Existing	42556	663.09	685.52	675.82	686.13	0.00140	8.53	7848.53	821.36	0.32
HR1010532C	124184	LP-1PCT	Prop Model	42556	663.09	684.77	675.82	685.45	0.00165	9.05	7463.19	783.35	0.35
HR1010532C	124129 BR U	LP-4PCT	Corr Existing	27722	663.09	681.19	674.00	681.80	0.004323	8.30	5093.09	392.50	0.35
HR1010532C	124129 BR U	LP-4PCT	Prop Model	27722	663.09	681.07	673.90	681.59	0.002476	7.67	5403.84	434.82	0.33
HR1010532C	124129 BR U	LP-1PCT	Corr Existing	42556	663.09	685.11	676.10	686.00	0.009493	10.10	6395.49		0.28
HR1010532C	124129 BR U	LP-1PCT	Prop Model	42556	663.09	684.73	675.90	685.43	0.002823	8.93	7008.03	441.00	0.35
HR1010532C	124129 BR D	LP-4PCT	Corr Existing	27722	661.56	680.99	672.44	681.41	0.004545	5.18	5312.42	392.50	0.22
HR1010532C	124129 BR D	LP-4PCT	Prop Model	27722	661.56	680.93	672.76	681.38	0.001658	6.33	5775.54	432.64	0.26
HR1010532C	124129 BR D	LP-1PCT	Corr Existing	42556	661.56	684.62	674.46	685.26	0.009134	6.25	6692.75	47.43	0.23
HR1010532C	124129 BR D	LP-1PCT	Prop Model	42556	661.56	684.56	674.87	685.20	0.002024	7.59	7360.76	441.00	0.29
HR1010532C	124074	LP-4PCT	Corr Existing	27722	661.56	680.98		681.30	0.001269	4.98	6288.79	552.09	0.21
HR1010532C	124074	LP-4PCT	Prop Model	27722	661.56	680.92	672.52	681.35	0.000957	6.25	6281.99	550.88	0.26
HR1010532C	124074	LP-1PCT	Corr Existing	42556	661.56	684.63		685.08	0.001361	5.84	8032.01	729.66	0.22
HR1010532C	124074	LP-1PCT	Prop Model	42556	661.56	684.56	674.90	685.15	0.001053	7.42	8045.83	722.65	0.28
HR1010532C	124020	LP-4PCT	Corr Existing	27722	659.00	681.00	671.37	681.21	0.000424	4.27	7960.83	727.30	0.17
HR1010532C	124020	LP-4PCT	Prop Model	27722	659.00	680.99	671.28	681.21	0.000405	4.28	7959.19	727.24	0.17
HR1010532C	124020	LP-1PCT	Corr Existing	42556	659.00	684.68	673.41	684.96	0.000425	4.79	10495.55	862.21	0.17
HR1010532C	124020	LP-1PCT	Prop Model	42556	659.00	684.68	673.43	684.96	0.000407	4.80	10492.57	861.91	0.17
HR1010532C	123997			Culvert									
HR1010532C	123974	LP-4PCT	Corr Existing	27722	659.00	680.87	671.53	681.11	0.000519	4.45	7362.28	630.46	0.18
HR1010532C	123974	LP-4PCT	Prop Model	27722	659.00	680.87	671.52	681.11	0.000519	4.45	7362.28	630.46	0.18
HR1010532C	123974	LP-1PCT	Corr Existing	42556	659.00	684.50	673.59	684.81	0.000542	5.06	9799.03	767.76	0.18
HR1010532C	123974	LP-1PCT	Prop Model	42556	659.00	684.50	673.60	684.81	0.000542	5.06	9799.03	767.76	0.18
HR1010532C	123676	LP-4PCT	Corr Existing	27722	661.38	680.05		680.71	0.002201	9.30	5217.18	491.46	0.39
HR1010532C	123676	LP-4PCT	Prop Model	27722	661.38	680.05		680.71	0.002201	9.30	5217.18	491.46	0.39
HR1010532C	123676	LP-1PCT	Corr Existing	42556	661.38	683.59		684.38	0.002188	10.48	7069.89	570.24	0.40
HR1010532C	123676	LP-1PCT	Prop Model	42556	661.38	683.59		684.38	0.002188	10.48	7069.89	570.24	0.40
HR1010532C	123149	LP-4PCT	Corr Existing	27722	659.38	678.94		679.54	0.002353	8.62	5562.61	463.37	0.37
HR1010532C	123149	LP-4PCT	Prop Model	27722	659.38	678.94		679.54	0.002353	8.62	5562.61	463.37	0.37
HR1010532C	123149	LP-1PCT	Corr Existing	42556	659.38	682.33		683.17	0.002646	10.31	7368.43	558.37	0.40
HR1010532C	123149	LP-1PCT	Prop Model	42556	659.38	682.33		683.17	0.002646	10.31	7368.43	558.37	0.40
HR1010532C	122784	LP-4PCT	Corr Existing	27722	659.38	678.05		678.72	0.002163	9.82	5764.81	486.90	0.41
HR1010532C	122784	LP-4PCT	Prop Model	27722	659.38	678.05		678.72	0.002163	9.82	5764.81	486.90	0.41
HR1010532C	122784	LP-1PCT	Corr Existing	42556	659.38	681.36		682.25	0.002393	11.57	7495.47	806.51	0.45
HR1010532C	122784	LP-1PCT	Prop Model	42556	659.38	681.36		682.25	0.002393	11.57	7495.47	806.51	0.45
HR1010532C	122679	LP-4PCT	Corr Existing	27722	659.38	677.82	671.96	678.42	0.00187	9.22	5883.62	497.87	0.39
HR1010532C	122679	LP-4PCT	Prop Model	27722	659.38	677.82	671.96	678.42	0.00187	9.22	5883.62	497.87	0.39
HR1010532C	122679	LP-1PCT	Corr Existing	42556	659.38	681.10	673.87	681.92	0.002089	10.92	7547.15	709.83	0.42
HR1010532C	122679	LP-1PCT	Prop Model	42556	659.38	681.10	673.87	681.92	0.002089	10.92	7547.15	709.83	0.42
HR1010532C	122648 BR U	LP-4PCT	Corr Existing	27722	659.38	677.80	671.87	678.41	0.00353	9.22	5585.05	475.28	0.39
HR1010532C	122648 BR U	LP-4PCT	Prop Model	27722	659.38	677.80	671.87	678.41	0.00353	9.22	5585.05	475.28	0.39
HR1010532C	122648 BR U	LP-1PCT	Corr Existing	42556	659.38	681.04	673.80	681.90	0.004424	11.08	7154.38	503.00	0.28
HR1010532C	122648 BR U	LP-1PCT	Prop Model	42556	659.38	681.04	673.80	681.90	0.004424	11.08	7154.38	503.00	0.28
HR1010532C	122648 BR D	LP-4PCT	Corr Existing	27722	659.06	677.54	672.17	678.23	0.00425	9.54	5295.75	470.01	0.41
HR1010532C	122648 BR D	LP-4PCT	Prop Model	27722	659.06	677.54	672.17	678.23	0.00425	9.54	5295.75	470.01	0.41
HR1010532C	122648 BR D	LP-1PCT	Corr Existing	42556	659.06	680.75	674.11	681.68	0.005185	11.22	6832.48	487.41	0.44
HR1010532C	122648 BR D	LP-1PCT	Prop Model	42556	659.06	680.75	674.11	681.68	0.005185	11.22	6832.48	487.41	0.44

HYDRAULIC COMPUTATIONS CONT'D

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
HR1010532C	122616	LP-4PCT	Corr Existing	27722	659.06	677.38		678.18	0.0023	10.22	5487.98	491.74	0.44
HR1010532C	122616	LP-4PCT	Prop Model	27722	659.06	677.38		678.18	0.0023	10.22	5487.98	491.74	0.44
HR1010532C	122616	LP-1PCT	Corr Existing	42556	659.06	680.54		681.61	0.002571	12.12	7068.47	584.98	0.48
HR1010532C	122616	LP-1PCT	Prop Model	42556	659.06	680.54		681.61	0.002571	12.12	7068.47	584.98	0.48
HR1010532C	122191	LP-4PCT	Corr Existing	27722	658.81	676.27		677.20	0.002643	10.54	4978.65	512.45	0.46
HR1010532C	122191	LP-4PCT	Prop Model	27722	658.81	676.27		677.20	0.002643	10.54	4978.65	512.45	0.46
HR1010532C	122191	LP-1PCT	Corr Existing	42556	658.81	679.33		680.54	0.002906	12.36	6764.93	727.36	0.49
HR1010532C	122191	LP-1PCT	Prop Model	42556	658.81	679.33		680.54	0.002906	12.36	6764.93	727.36	0.49
HR1010532C	121644	LP-4PCT	Corr Existing	27722	656.62	674.81		675.59	0.002538	9.70	5010.21	508.01	0.42
HR1010532C	121644	LP-4PCT	Prop Model	27722	656.62	674.81		675.59	0.002538	9.70	5010.21	508.01	0.42
HR1010532C	121644	LP-1PCT	Corr Existing	42556	656.62	677.81		678.77	0.002722	11.20	6757.58	701.90	0.44
HR1010532C	121644	LP-1PCT	Prop Model	42556	656.62	677.81		678.77	0.002722	11.20	6757.58	701.90	0.44
HR1010532C	121153	LP-4PCT	Corr Existing	27722	655.25	673.57		674.27	0.002732	9.90	5215.36	553.63	0.43
HR1010532C	121153	LP-4PCT	Prop Model	27722	655.25	673.57		674.27	0.002732	9.90	5215.36	553.63	0.43
HR1010532C	121153	LP-1PCT	Corr Existing	42556	655.25	676.45		677.33	0.003023	11.57	7000.90	768.62	0.46
HR1010532C	121153	LP-1PCT	Prop Model	42556	655.25	676.45		677.33	0.003023	11.57	7000.94	768.62	0.46
HR1010532C	120659	LP-4PCT	Corr Existing	27722	655.09	672.78	666.98	673.31	0.001413	6.91	5263.58	580.74	0.30
HR1010532C	120659	LP-4PCT	Prop Model	27722	655.09	672.78	666.98	673.31	0.001413	6.91	5263.58	580.74	0.30
HR1010532C	120659	LP-1PCT	Corr Existing	42556	655.09	675.59	668.87	676.28	0.001544	8.05	7036.65	707.20	0.33
HR1010532C	120659	LP-1PCT	Prop Model	42556	655.09	675.59	668.87	676.28	0.001544	8.05	7036.65	707.20	0.33

NOTES:

1) USACE HEC-RAS VERSION 5.0.6 UTILIZED FOR THE ANALYSIS.

2) NO WEIR FLOW DATA OBSERVED FOR HEC-RAS MODELED 2-YR THROUGH 100-YR STORM EVENTS.

STATE OF TEXAS
JASON N. VERNER
95935
LICENSED PROFESSIONAL ENGINEER
P.E.

9/24/2019

LTRA
LINA T. RAMEY & ASSOCIATES, INC.
3320 Belt Line Rd
Farmers Branch, Texas 75234
Firm Registration No. F-782

Texas Department of Transportation

SL 368 AT SALADO CREEK

HYDRAULIC DATA SHEET

SHEET 4 OF 5

FED. RD. DIV. NO.	FEDERAL PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		142
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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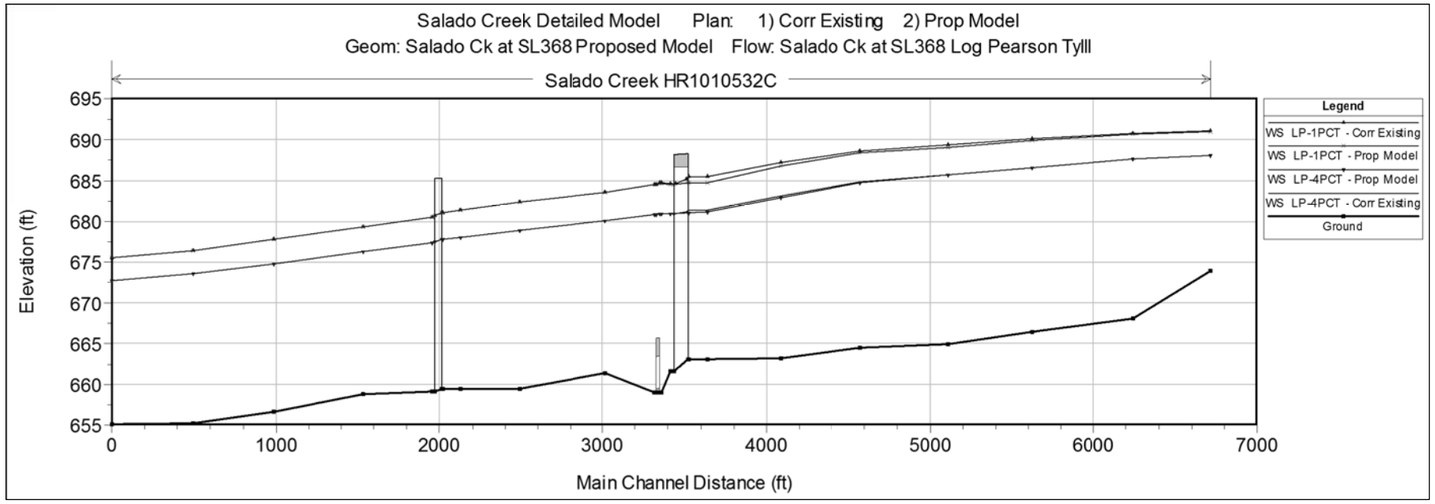

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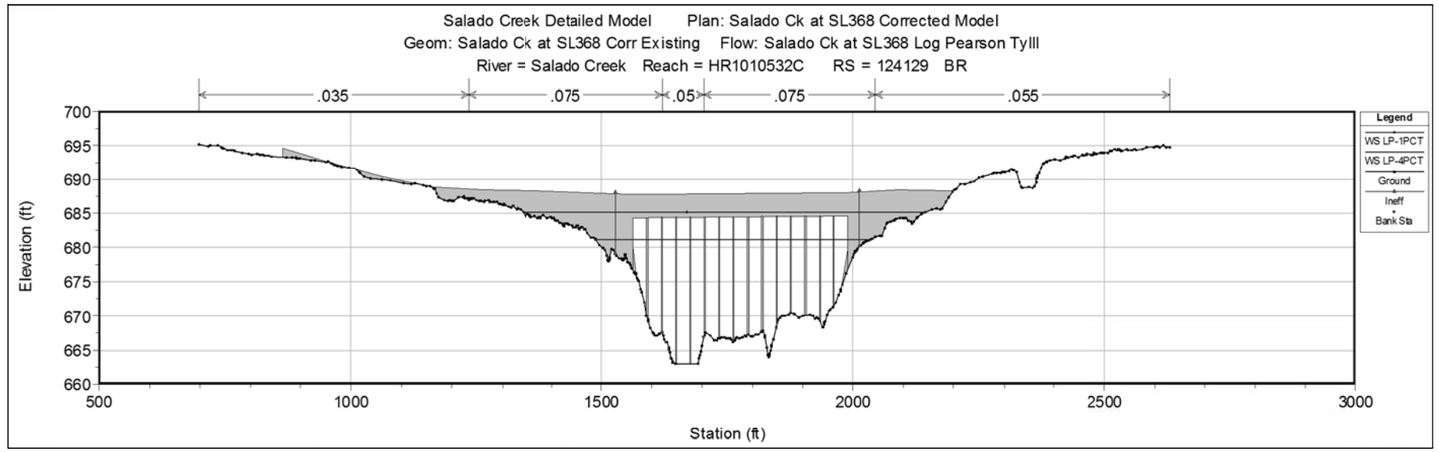
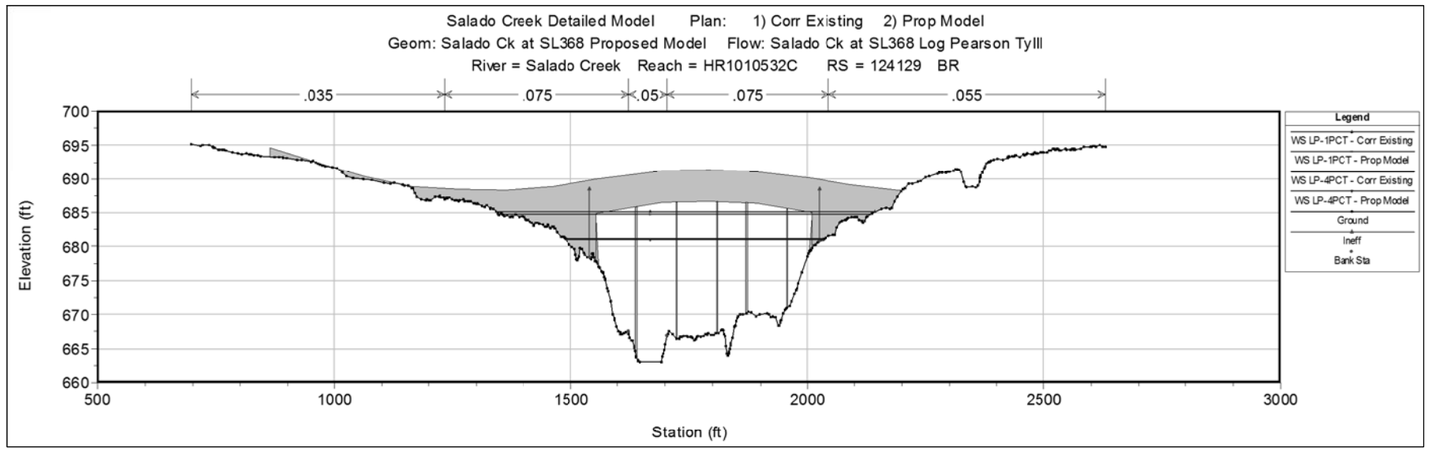


EXISTING STREAM CROSS-SECTION AT STRUCTURE



PROPOSED STREAM CROSS-SECTION AT STRUCTURE

NOTES:

1) USACE HEC-RAS VERSION 5.0.6 UTILIZED FOR THE ANALYSIS.

2) NO WEIR FLOW DATA OBSERVED FOR HEC-RAS MODELED 2-YR THROUGH 100-YR STORM EVENTS.

STATE OF TEXAS
JASON N. VERNER
95935
LICENSED
PROFESSIONAL ENGINEER
P.E.

9/25/2019

LINA T. RAMEY & ASSOCIATES, INC.
3320 Belt Line Rd
Farmers Branch, Texas 75234
Firm Registration No. F-782

Texas Department of Transportation

SL 368 AT SALADO CREEK

HYDRAULIC DATA SHEET

SHEET 5 OF 5

FED. RD. DIV. NO.	FEDERAL PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		143
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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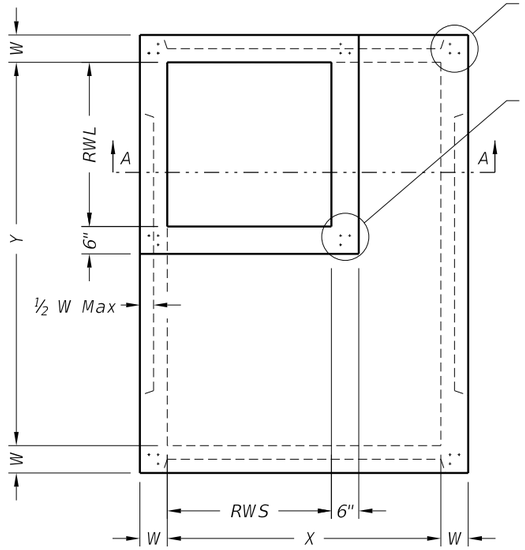
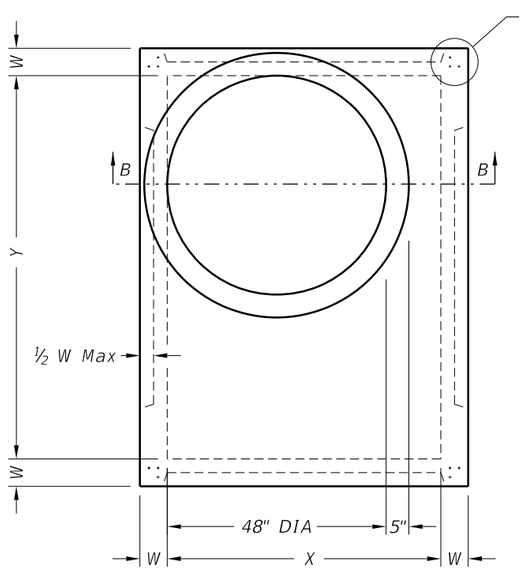


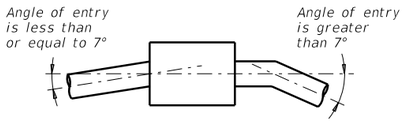
PLAN VIEW "A"

SQUARE REDUCED RISER OPTION



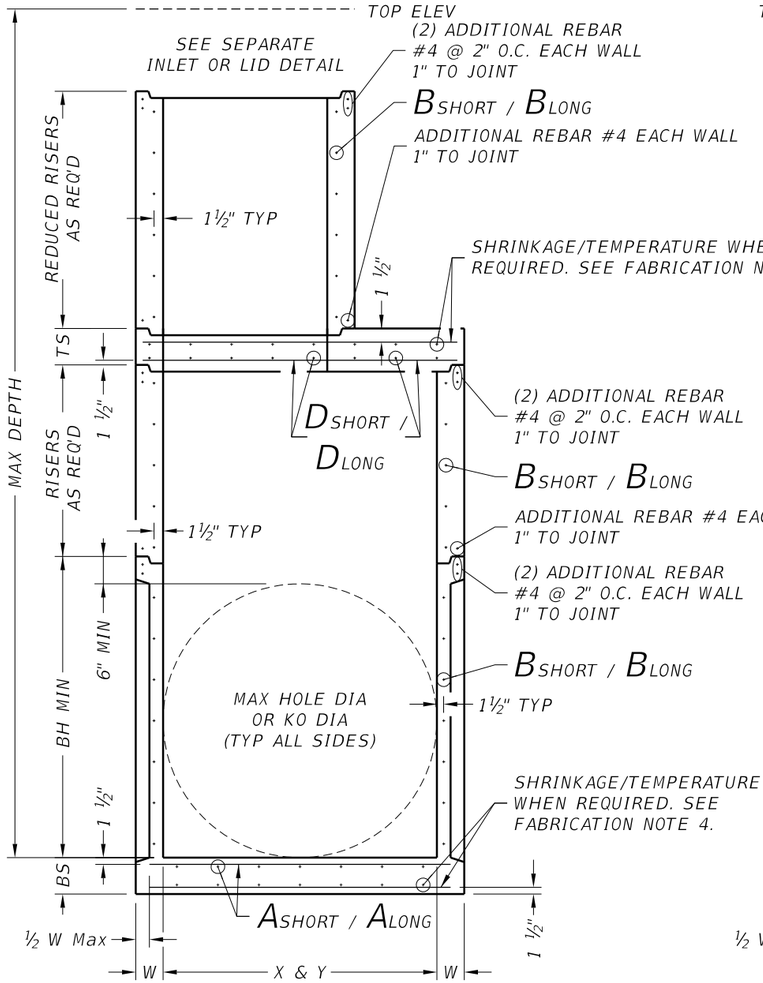
PLAN VIEW "B"

ROUND REDUCED RISER OPTION



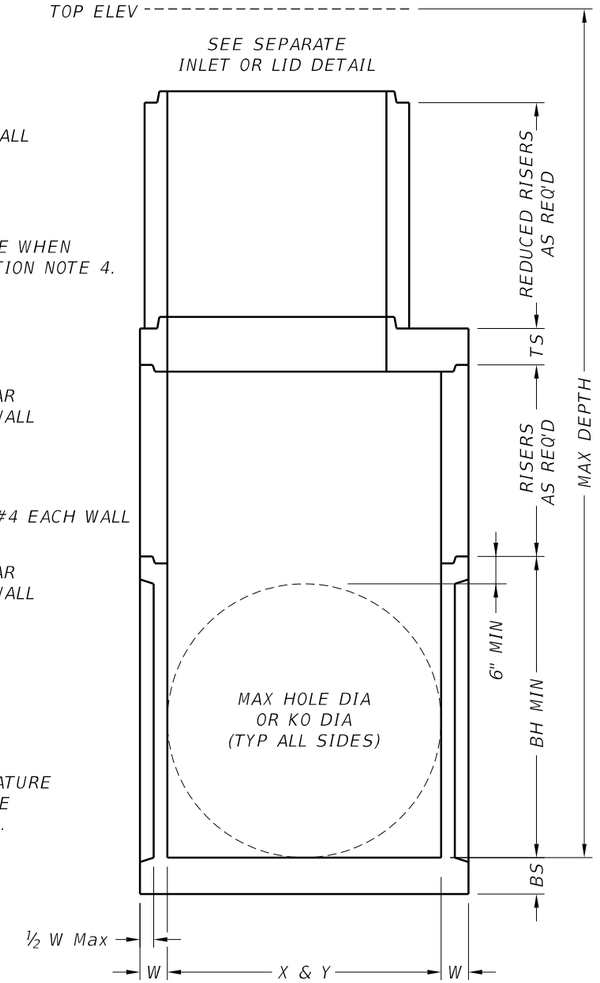
PIPE CONNECTION DETAIL

Connect pipes within 7° of normal to PB wall.
If necessary, use pipe elbow or curved
approach alignment to stay within this limit.



SECTION A-A

SQUARE REDUCED RISER OPTION



SECTION B-B

ROUND REDUCED RISER OPTION

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide typical clear cover of 1 ½" to reinforcing steel at interior or exterior walls.
4. Walls or slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in^2/ft each way.
5. No substitution is allowed for vertical and horizontal #4 bars in corners.
6. Manufacture base and risers to nearest 3" increment.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.
9. See sheet PDD for sizes, dimensions, and reinforcing steel not shown.

INSTALLATION NOTES:

1. If required elsewhere. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to specified inlet or manhole.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. For rigid pipe, cut hole in thin wall panel (KO) 4" Max, 2" Min larger than pipe OD.
5. For flexible pipe, consult boot/seal Manufacturer's specification for placement tolerance and hole size. Center pipe in hole and install boot/seal per Manufacturer's specification.

GENERAL NOTES:

1. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for precast base is subsidiary to the specified inlet, per Item 465, "Junction Boxes, Manholes, and Inlets."

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRECAST BASE

PB

FILE: prestd01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		144

DATE: 2/19/2021 4:09:06 PM
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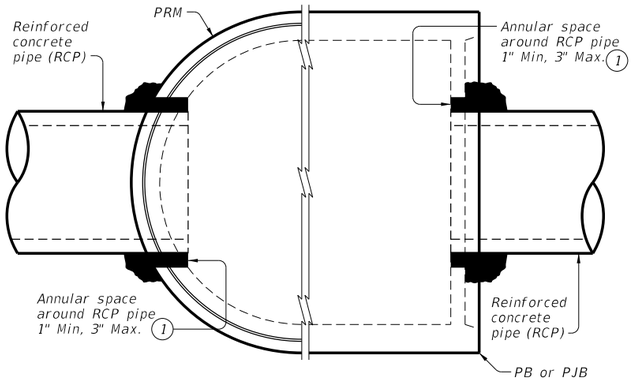
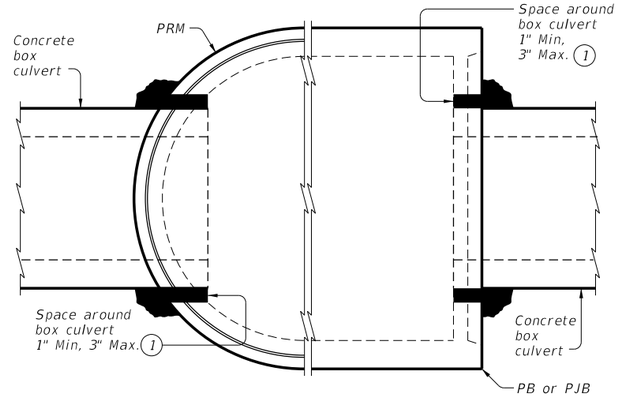


PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

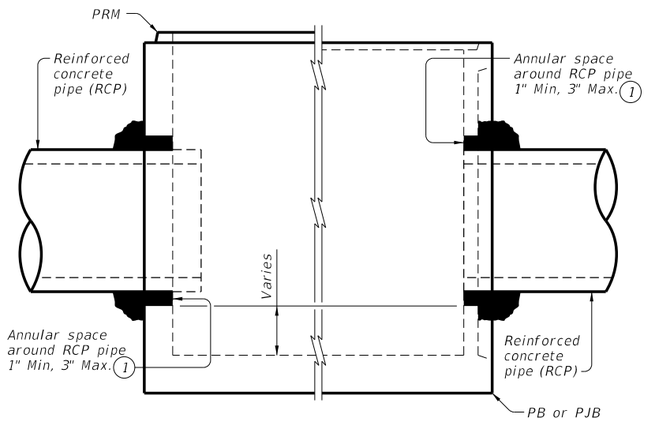
TYPICAL HALF PLAN



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

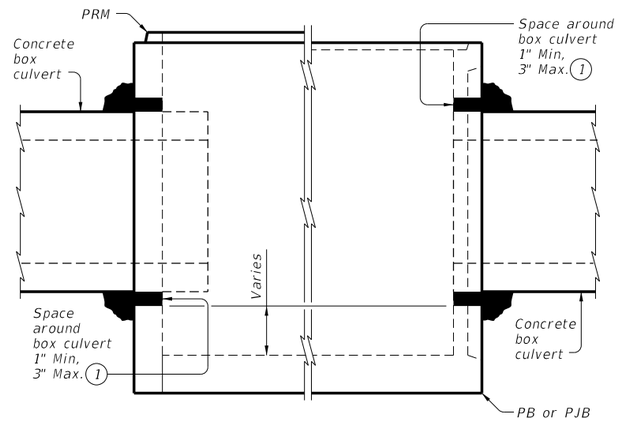
TYPICAL HALF PLAN



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

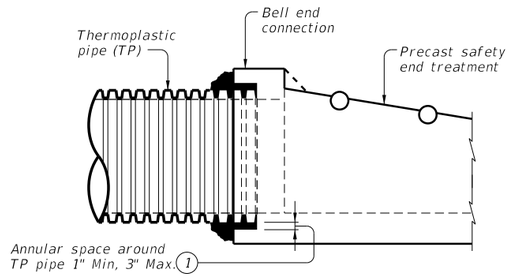
TYPICAL HALF ELEVATION



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

TYPICAL HALF ELEVATION



TYPICAL PARTIAL ELEVATION OF PRECAST SAFETY END TREATMENTS

Showing square PSET for parallel drainage, cross drainage shown similar.

(1) Completely fill the void between the precast structure and the connecting pipe or box with cementitious grouts and mortars in accordance with DMS-4675 "Cementitious Grouts and Mortars for Miscellaneous Application".

CONSTRUCTION NOTES:

Do not grout rubber gasket joints without Manufacturer's recommendations.

Do not use bricks, masonry blocks, native stone, or similar materials in conjunction with grouted connections when filling void spaces around pipes or box culverts.

MATERIAL NOTES:

Provide grouted connections in accordance with DMS-4675 "Cementitious Grouts and Mortars for Miscellaneous Application".

GENERAL NOTES:

See applicable standards for notes and details not shown:
- Precast Base (PB)
- Precast Junction Box (PJB)
- Precast Round Manhole (PRM)
- Precast Safety End Treatments C/D Square (PSET-SC)
- Precast Safety End Treatments P/D Square (PSET-SP)

Provide Concrete Box Culverts in accordance with Item 462 "Concrete Box Culverts and Drains".

Provide Reinforced Concrete Pipe (RCP) in accordance with Item 464 "Reinforced Concrete Pipe".

Provide Thermoplastic Pipe (TP) in accordance with Special Specification Thermoplastic Pipe.

Payment for grouted connections is considered subsidiary to other bid Items.

Texas Department of Transportation

Bridge Division Standard

PIPE AND BOX GROUTED CONNECTIONS FOR PRECAST STRUCTURES

PBGC

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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
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	SAT	BEXAR		145

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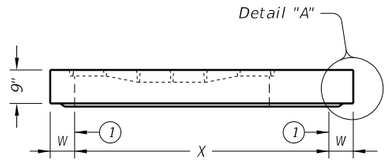
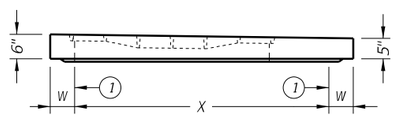
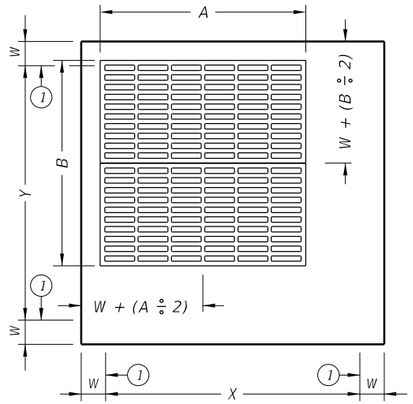


STYLE 'FG'

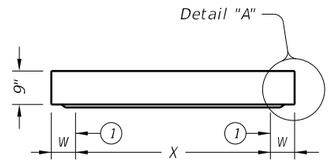
ORIENT TAPER TO CORRESPOND WITH ROADWAY CROSS-SLOPE.



STYLE 'SFG'
ELEVATION VIEW



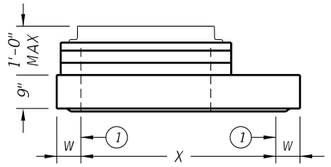
PLAN VIEW
CAST-IN FRAME & GRATE
STYLES 'FG' & 'SFG'



ELEVATION VIEW

STYLE 'SL'

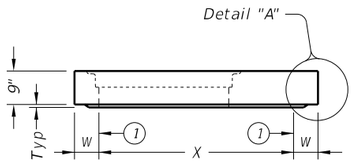
PLAN VIEW
NO OPENINGS



ELEVATION VIEW

STYLE 'RH'

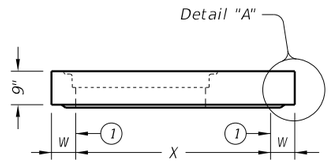
PLAN VIEW
SHIP LOOSE RING & COVER



ELEVATION VIEW

STYLE 'RC'

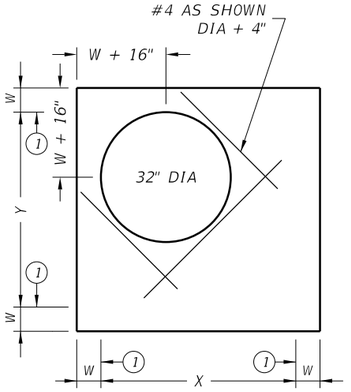
PLAN VIEW
32" DIA CAST-IN RING & COVER

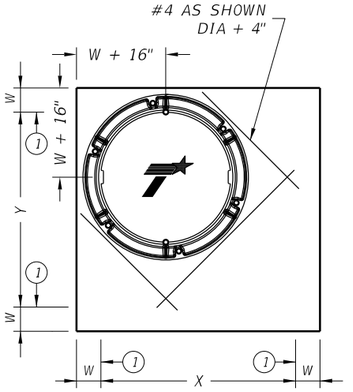


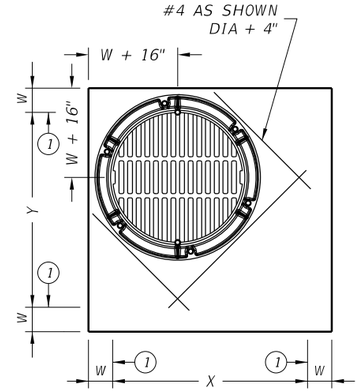
ELEVATION VIEW

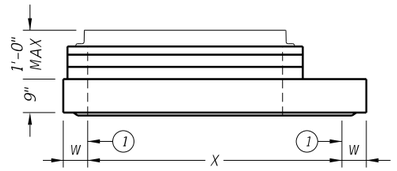
STYLE 'RG'

PLAN VIEW
32" DIA CAST-IN RING & GRATE





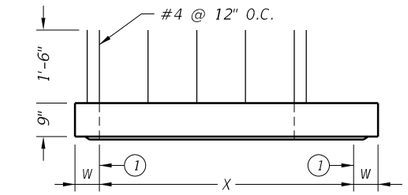




ELEVATION VIEW

STYLE 'SH'

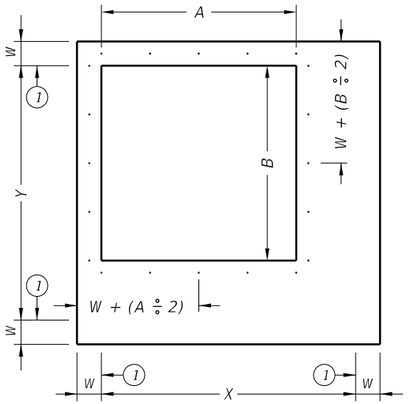
PLAN VIEW
SHIP LOOSE FRAME & GRATE



ELEVATION VIEW

STYLE 'S1'

PLAN VIEW
EXPOSED REBAR



(1) Matches inside face of wall of precast base or riser below inlet.

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

PRECAST SLAB LID

PSL

FILE: prestd05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		146

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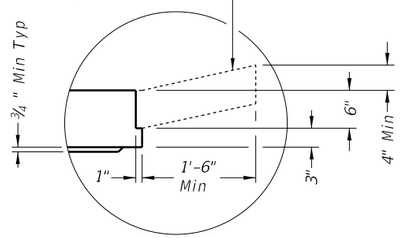
Style	Size (X x Y)	W (2)	A x B (nominal)	Short Span Reinf Steel Area	Long Span Reinf Steel Area
SL	3'x3'	6"	n/a	0.37 in²/ft	0.37 in²/ft
RH,RC,RG,SH,S1,FG	3'x3'	6"	3'x3' or 32" Dia	0.37 in²/ft	0.37 in²/ft
SFG	3'x3'	6"	3'x3'	0.32 in²/ft	0.32 in²/ft
SL	4'x4'	6"	n/a	0.34 in²/ft	0.34 in²/ft
RH,RC,RG,SH,S1,FG	4'x4'	6"	3'x3' or 32" Dia	0.41 in²/ft	0.41 in²/ft
SH,S1,FG	4'x4'	6"	4'x4'	0.41 in²/ft	0.41 in²/ft
SFG	4'x4'	6"	4'x4'	0.32 in²/ft	0.32 in²/ft
SL	3'x5'	6"	n/a	0.39 in²/ft	0.39 in²/ft
RH,RC,RG,SH,S1,FG	3'x5'	6"	3'x3' or 32" Dia	0.48 in²/ft	0.48 in²/ft
SH,S1,FG	3'x5'	6"	3'x5'	0.48 in²/ft	0.48 in²/ft
SFG	3'x5'	6"	3'x5'	0.32 in²/ft	0.32 in²/ft
SL	4'x5'	6"	n/a	0.42 in²/ft	0.42 in²/ft
RH,RC,RG,SH,S1,FG	4'x5'	6"	3'x3' or 32" Dia	0.42 in²/ft	0.42 in²/ft
SH,S1,FG	4'x5'	6"	4'x4'	0.63 in²/ft	0.63 in²/ft
SH,S1,FG	4'x5'	6"	3'x5'	0.66 in²/ft	0.66 in²/ft
SL	5'x5'	6"	n/a	0.36 in²/ft	0.36 in²/ft
RH,RC,RG,SH,S1,FG	5'x5'	6"	3'x3' or 32" Dia	0.43 in²/ft	0.43 in²/ft
SH,S1,FG	5'x5'	6"	4'x4'	0.63 in²/ft	0.63 in²/ft
SH,S1,FG	5'x5'	6"	3'x5'	0.63 in²/ft	0.63 in²/ft
SL	5'x6'	6"/8"	n/a	0.48 in²/ft	0.48 in²/ft
RH,RC,RG,SH,S1,FG	5'x6'	6"/8"	3'x3' or 32" Dia	0.48 in²/ft	0.48 in²/ft
SH,S1,FG	5'x6'	6"/8"	4'x4'	0.60 in²/ft	0.60 in²/ft
SH,S1,FG	5'x6'	6"/8"	3'x5'	0.60 in²/ft	0.60 in²/ft
SL	6'x6'	6"/8"	n/a	0.43 in²/ft	0.43 in²/ft
RH,RC,RG,SH,S1,FG	6'x6'	6"/8"	3'x3' or 32" Dia	0.56 in²/ft	0.56 in²/ft
SH,S1,FG	6'x6'	6"/8"	4'x4'	0.56 in²/ft	0.56 in²/ft
SH,S1,FG	6'x6'	6"/8"	3'x5'	0.59 in²/ft	0.59 in²/ft
SL	8'x8'	8"/10"	n/a	0.45 in²/ft	0.45 in²/ft
RH,RC,RG,SH,S1,FG	8'x8'	8"/10"	3'x3' or 32" Dia	0.45 in²/ft	0.45 in²/ft
SH,S1,FG	8'x8'	8"/10"	4'x4'	0.45 in²/ft	0.45 in²/ft
SH,S1,FG	8'x8'	8"/10"	3'x5'	0.45 in²/ft	0.45 in²/ft

(2) See sheet PDD for corresponding wall thickness (W) of base unit or riser.

Construct cast-in-place reinforced concrete apron, when shown elsewhere in plans. Use Class "A" concrete. Apron is subsidiary to PSL. Apron is 1'-6" Min width around precast zone drain.



DETAIL "A"

(Reinforcing not shown for clarity)

When an apron is to be cast around PSL, use detail above to create an apron ledge on all 4 sides.

FABRICATION NOTES:

1. Locate penetration (Style 'RH'), ring and cover (Style 'RC'), ring and grate (Style 'RG'), and frame and grate (Style 'FG') in a corner. Only one penetration is allowed per slab lid.
2. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
3. Provide Grade 60 reinforcing steel or equivalent area of WWR.
4. Provide clear cover of ¾" to reinforcing from lower outside shoulder of slab for structural reinforcement, and 2" from top of slab for shrinkage and temperature reinforcement. Place short span reinforcing closest to surface.
5. Slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing. Provide steel area = 0.11 in²/ft each way.
6. No substitution is allowed for diagonal #4 bars around openings.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.

INSTALLATION NOTES:

1. Precast slab lids are intended for direct traffic and may be placed in roadway.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. Initial installation of grade adjustment rings for Styles 'RH' and 'SH' is limited to 1'-0" Max as shown.
5. Grade adjustment rings for Styles 'RH' and 'SH' may be increased to 2'-0" Max when future construction affects final grade of structure. Make adjustments greater than 2'-0" with additional risers. Adjustments can be made up to Max depth shown on sheet PDD. Structure must be evaluated if Max depth will be exceeded.
6. Orient long dimension of grate slots perpendicular to traffic, unless noted otherwise on plans

GENERAL NOTES:

1. Designed according to ASTM C913.
2. Payment for lid is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, style, size, and opening size (when applicable).

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRECAST SLAB LID

PSL

FILE: prestd05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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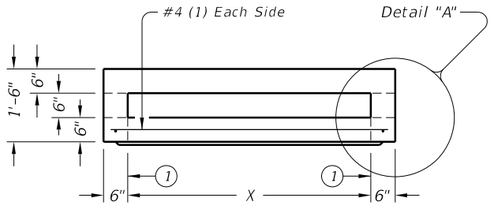
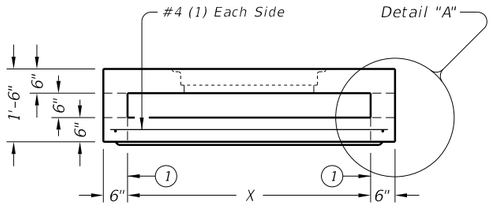
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		147



ELEVATION VIEW



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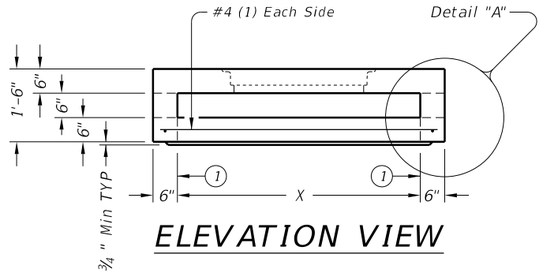

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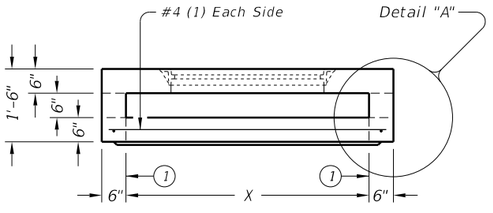

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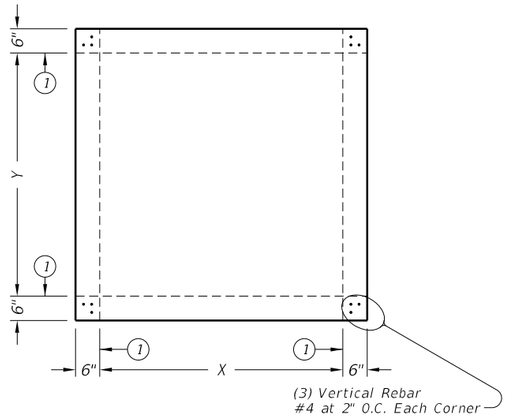
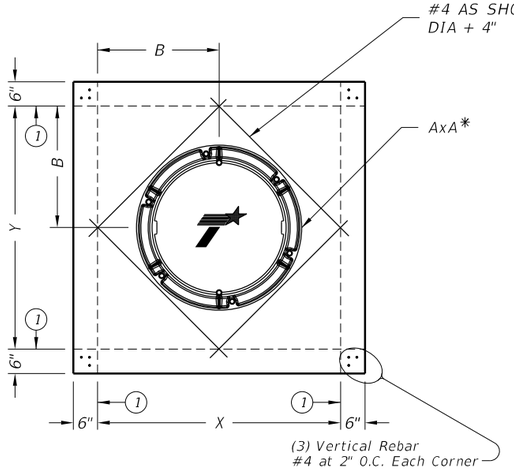


PLAN VIEW

NO OPENINGS

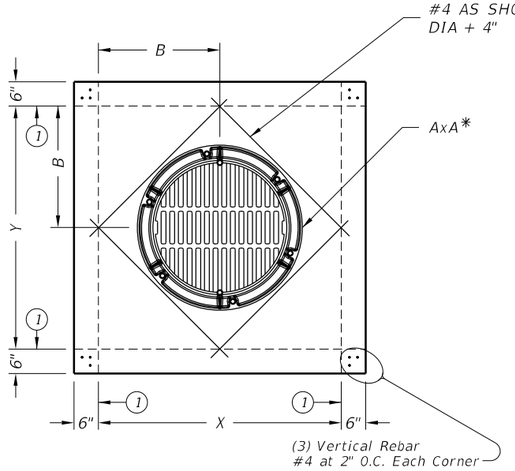
STYLE 'SL'



PLAN VIEW

32" DIA CAST-IN RING & COVER

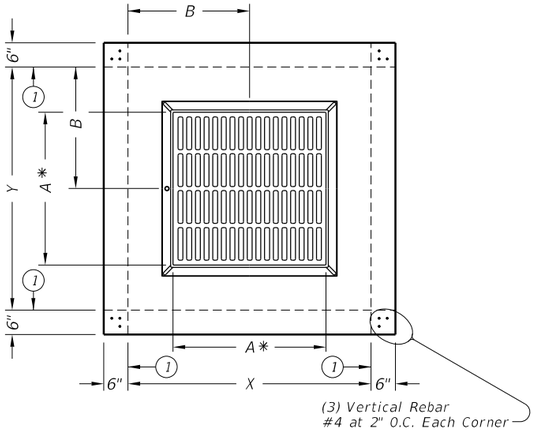
STYLE 'RC'



PLAN VIEW

32" DIA CAST-IN RING & GRATE

STYLE 'RG'



PLAN VIEW

CAST-IN FRAME & GRATE

STYLE 'FG'

Style	Size (X x Y)	A x A *	B x B	Short Span Reinf Steel Area	Long Span Reinf Steel Area
SL	3'x3'	n/a	n/a	0.37 in²/ft	0.37 in²/ft
RC,RG	3'x3'	32" Dia	1.5'x1.5'	0.37 in²/ft	0.37 in²/ft
FG	3'x3'	3'x3'	1.5'x1.5'	0.37 in²/ft	0.37 in²/ft
SL	4'x4'	n/a	n/a	0.34 in²/ft	0.34 in²/ft
RC,RG	4'x4'	32" Dia	2'x2'	0.34 in²/ft	0.34 in²/ft
FG	4'x4'	3'x3'	2'x2'	0.34 in²/ft	0.34 in²/ft
FG	4'x4'	4'x4'	2'x2'	0.34 in²/ft	0.34 in²/ft
SL	5'x5'	n/a	n/a	0.43 in²/ft	0.43 in²/ft
RC,RG	5'x5'	32" Dia	2.5'x2.5'	0.68 in²/ft	0.68 in²/ft
FG	5'x5'	3'x3'	2.5'x2.5'	0.43 in²/ft	0.43 in²/ft
FG	5'x5'	4'x4'	2.5'x2.5'	0.43 in²/ft	0.43 in²/ft

* Nominal frame/grate or ring/cover size.

(1) Matches inside face of wall of precast base or riser below inlet.

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide clear cover of ¾" to reinforcing from bottom of slab for structural reinforcement. Place short span reinforcing closest to surface.
4. No substitution is allowed for diagonal #4 bars around openings.
5. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
6. Provide lifting devices in conformance with Manufacturer's recommendations.

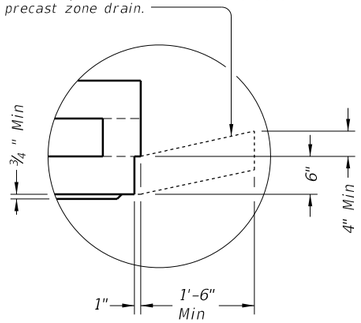
INSTALLATION NOTES:

1. PAZD is for use in ditches and medians outside of the horizontal clearance (clear zone). Precast Area Zone Drain is not intended for direct traffic and may not be placed in roadway.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.

GENERAL NOTES:

1. Designed according to ASTM C913.
2. Payment for inlet is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, style, size, and opening size (when applicable).

Construct cast-in-place reinforced concrete apron when shown elsewhere in plans. Use Class "A" concrete. Apron is subsidiary to PAZD. Apron is 1'-6" Min width around precast zone drain.



DETAIL "A"

(Reinforcing not shown for clarity)

When an apron is to be cast around PAZD, use detail above to create an apron ledge on all 4 sides.

Texas Department of Transportation

Bridge Division Standard

PRECAST AREA ZONE DRAIN

PAZD

FILE: prestd08-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		148

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TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

Dimensions					Variable Reinforcing				Estimated Quantities per ft of wing length (2~wings) (3)	
					Bars J1		Bars J2			
Maximum Wingwall Height Hw	W	X	Y	Z	Size	Spa	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'-8"	1'-9"	1'-3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'-2"	2'-0"	1'-6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'-8"	2'-3"	1'-9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'-2"	2'-6"	2'-0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'-8"	2'-9"	2'-3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'-2"	3'-0"	2'-6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'-8"	3'-3"	2'-9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'-2"	3'-6"	3'-0"	1'-0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'-8"	4'-0"	3'-0"	1'-1"	#9	6"	#6	6"	283.06	1.068
16'-0"	8'-2"	4'-6"	3'-0"	1'-3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING
(2~wings)

Bar	Size	No.	Spa
D	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
R	#5	6	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

Bar	Size	No.	Spa
L	#4	~	1'-6"
Q	#4	1	~
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION FORMULAS:

(All values are in feet.)

Hw = H + T + C – 0.250'
A = (Hw – 0.333') (SL)
B = (A) tangent (30°)
Lw = (A) ÷ cosine (30°)

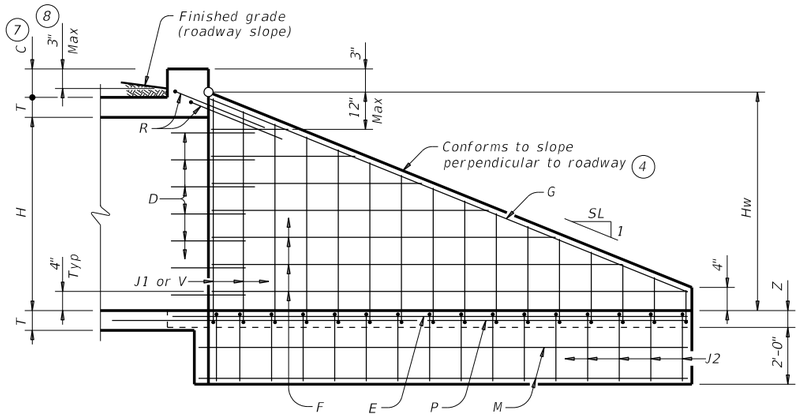
For cast-in-place culverts:
Ltw = (N) (S) + (N + 1) (U)

For precast culverts:
Ltw = (N) (2U + S) + (N – 1) (0.5')

Total Wingwall Area (two wings ~ SF) = (Hw + 0.333') (Lw)

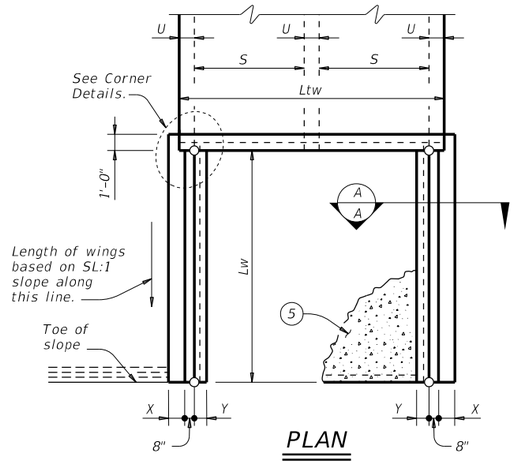
Hw = Height of wingwall
SL:1 = Side slope ratio (horizontal:1 vertical)
Lw = Length of wingwall
Ltw = Culvert toewall length
N = Number of culvert spans

See applicable box culvert standard sheet for H, S, T, and U values.



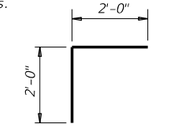
INSIDE ELEVATION

(Showing reinforcing. Culvert and culvert toewall reinforcing not shown for clarity.)

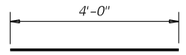


PLAN

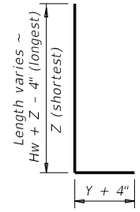
(Showing dimensions.)



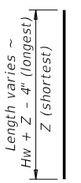
BARS R



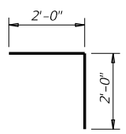
BARS D



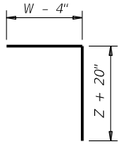
BARS J1



BARS V



BARS L



BARS J2

(1) Extend Bars P 3'-0" minimum into bottom slab of box culvert.

(2) Adjust as necessary to maintain 1 1#2" clear cover and 4" minimum between bars.

(3) Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings, multiply the tabulated values by Lw.

(4) Recommended values of side slope are: 2:1, 3:1, 4:1, and 6:1.

(5) When shown elsewhere on the plans, construct 5" deep concrete riprap. Payment for riprap is as required by Item 432, "Riprap". Unless otherwise shown on the plans or directed by the Engineer, provide a 6" wide by 1'-6" deep reinforced concrete toewall along all edges of the riprap adjacent to natural ground; reinforce the toewall by extending typical riprap reinforcing into the toewall; and extend construction joints or grooved joints oriented in the direction of flow across the full distance of the riprap at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required.

(6) At Contractor's option, culvert toewall may be ended flush with wingwall toewall. Adjust reinforcing as needed.

(7) 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.

(8) For vehicle safety, the following requirements must be met:
- For structures without bridge rail, construct curbs no more than 3" above finished grade.
- For structures with bridge rail, construct curbs flush with finished grade.

Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

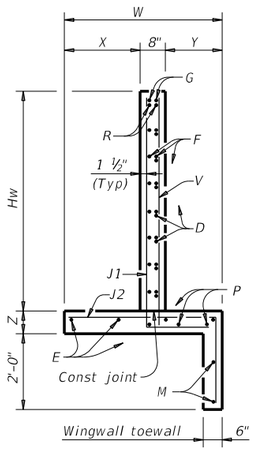
MATERIAL NOTES:

Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
In riprap concrete, synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing unless noted otherwise.

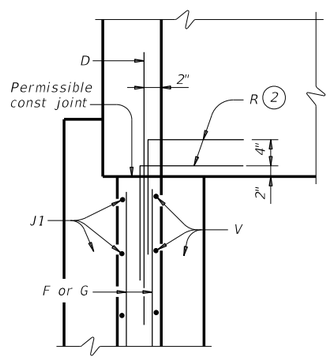
GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
See Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

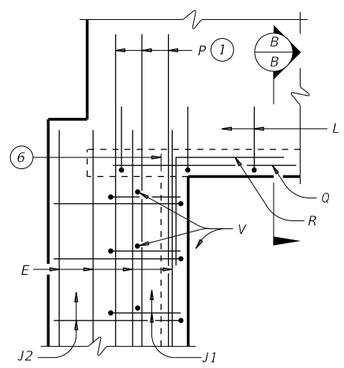
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.



SECTION A-A

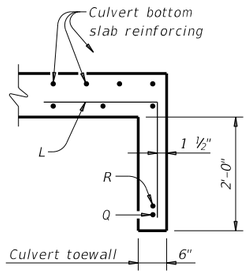


WINGWALL



FOOTING AND TOEWALL

CORNER DETAILS



SECTION B-B (5)

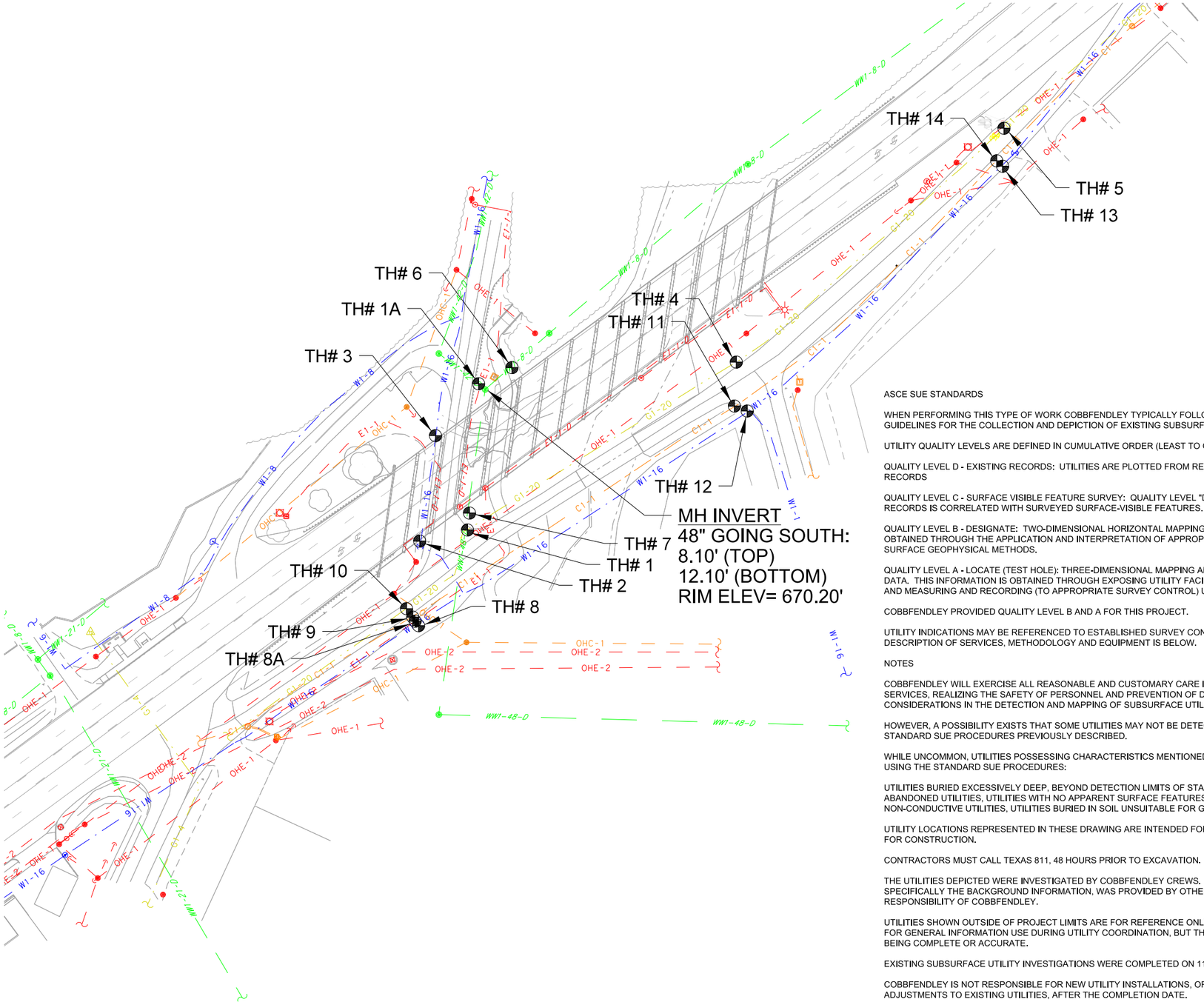
Texas Department of Transportation

Bridge Division Standard

CONCRETE WINGWALLS WITH STRAIGHT WINGS FOR 0° SKEW BOX CULVERTS

SW-O

FILE: sw-0std-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		149



N

LEGEND

WW1-8-D	SAWS 8" WW QLB
WW1-21-D	SAWS 21" WW QLB
WW1-48-D	SAWS 48" WW QLB
W1-6	SAWS 6" W QLB
W1-8	SAWS 8" W QLB
W1-16	SAWS 16" W QLB
C1-1	AT&T TELECOM QLB
G1-4	CPS 4" GAS QLB
G1-20	CPS 20" GAS QLB
OHE-1	CPS OVERHEAD ELECTRIC QLB
OHE-2	CPS OVERHEAD TRANSMISSION QLB
OHC-1	SPECTRUM OVERHEAD TELECOM QLD

0 25′ 50′
SCALE: 1" = 50′ HORZ

ASCE SUE STANDARDS

WHEN PERFORMING THIS TYPE OF WORK COBBFENDLEY TYPICALLY FOLLOWS ASCE 38-02 "THE STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA"- SEE BELOW.

UTILITY QUALITY LEVELS ARE DEFINED IN CUMULATIVE ORDER (LEAST TO GREATEST):

QUALITY LEVEL D - EXISTING RECORDS: UTILITIES ARE PLOTTED FROM REVIEW OF AVAILABLE EXISTING RECORDS

QUALITY LEVEL C - SURFACE VISIBLE FEATURE SURVEY: QUALITY LEVEL "D" INFORMATION FROM EXISTING RECORDS IS CORRELATED WITH SURVEYED SURFACE-VISIBLE FEATURES.

QUALITY LEVEL B - DESIGNATE: TWO-DIMENSIONAL HORIZONTAL MAPPING. THIS INFORMATION IS OBTAINED THROUGH THE APPLICATION AND INTERPRETATION OF APPROPRIATE NON-DESTRUCTIVE SURFACE GEOPHYSICAL METHODS.

QUALITY LEVEL A - LOCATE (TEST HOLE): THREE-DIMENSIONAL MAPPING AND OTHER CHARACTERIZATION DATA. THIS INFORMATION IS OBTAINED THROUGH EXPOSING UTILITY FACILITIES THROUGH TEST HOLES AND MEASURING AND RECORDING (TO APPROPRIATE SURVEY CONTROL) UTILITY/ENVIRONMENT DATA.

COBBFENDLEY PROVIDED QUALITY LEVEL B AND A FOR THIS PROJECT.

UTILITY INDICATIONS MAY BE REFERENCED TO ESTABLISHED SURVEY CONTROL. ADDITIONAL DESCRIPTION OF SERVICES, METHODOLOGY AND EQUIPMENT IS BELOW.

NOTES

COBBFENDLEY WILL EXERCISE ALL REASONABLE AND CUSTOMARY CARE IN THE PERFORMANCE OF SUE SERVICES, REALIZING THE SAFETY OF PERSONNEL AND PREVENTION OF DAMAGE ARE THE PRIME CONSIDERATIONS IN THE DETECTION AND MAPPING OF SUBSURFACE UTILITY FEATURES.

HOWEVER, A POSSIBILITY EXISTS THAT SOME UTILITIES MAY NOT BE DETECTED AND/OR MAPPED USING STANDARD SUE PROCEDURES PREVIOUSLY DESCRIBED.

WHILE UNCOMMON, UTILITIES POSSESSING CHARACTERISTICS MENTIONED BELOW CAN BE MISSED WHILE USING THE STANDARD SUE PROCEDURES:

UTILITIES BURIED EXCESSIVELY DEEP, BEYOND DETECTION LIMITS OF STANDARD LOCATING EQUIPMENT, ABANDONED UTILITIES, UTILITIES WITH NO APPARENT SURFACE FEATURES AND NO RECORDS PROVIDED, NON-CONDUCTIVE UTILITIES, UTILITIES BURIED IN SOIL UNSUITABLE FOR GPR DETECTION.

UTILITY LOCATIONS REPRESENTED IN THESE DRAWING ARE INTENDED FOR DESIGN PURPOSES AND NOT FOR CONSTRUCTION.

CONTRACTORS MUST CALL TEXAS 811, 48 HOURS PRIOR TO EXCAVATION.

THE UTILITIES DEPICTED WERE INVESTIGATED BY COBBFENDLEY CREWS. ALL OTHER PLAN INFORMATION, SPECIFICALLY THE BACKGROUND INFORMATION, WAS PROVIDED BY OTHERS AND NOT THE RESPONSIBILITY OF COBBFENDLEY.

UTILITIES SHOWN OUTSIDE OF PROJECT LIMITS ARE FOR REFERENCE ONLY. THESE UTILITIES ARE SHOWN FOR GENERAL INFORMATION USE DURING UTILITY COORDINATION, BUT THEY HAVE NOT BEEN VERIFIED AS BEING COMPLETE OR ACCURATE.

EXISTING SUBSURFACE UTILITY INVESTIGATIONS WERE COMPLETED ON 11/13/2018.

COBBFENDLEY IS NOT RESPONSIBLE FOR NEW UTILITY INSTALLATIONS, OR MODIFICATIONS AND ADJUSTMENTS TO EXISTING UTILITIES, AFTER THE COMPLETION DATE.

WHERE AVAILABLE, UTILITY SIZE AND TYPE INFORMATION IS SHOWN.

THIS INFORMATION IS BASED ON RECORDS SUPPLIED BY UTILITY REPRESENTATIVES AND HAS ONLY BEEN VERIFIED BY LEVEL A VACUUM EXCAVATION TEST HOLES IN LOCATIONS SHOWN.

WHERE POSSIBLE, SERVICE LINES WERE DESIGNATED. HOWEVER, SOME SERVICE LINES ARE CONSTRUCTED OF NONCONDUCTIVE MATERIAL AND UTILITY COMPANY DRAWINGS DO NOT SHOW SERVICE LINE LOCATIONS, THEREFORE NOT ALL SERVICE LINES ARE SHOWN.

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LOOP 368
AT SALADO CREEK

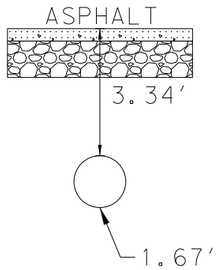
EXISTING UTILITIES LEVEL A LAYOUT

SHEET 1 OF 9

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		150
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	LP 368

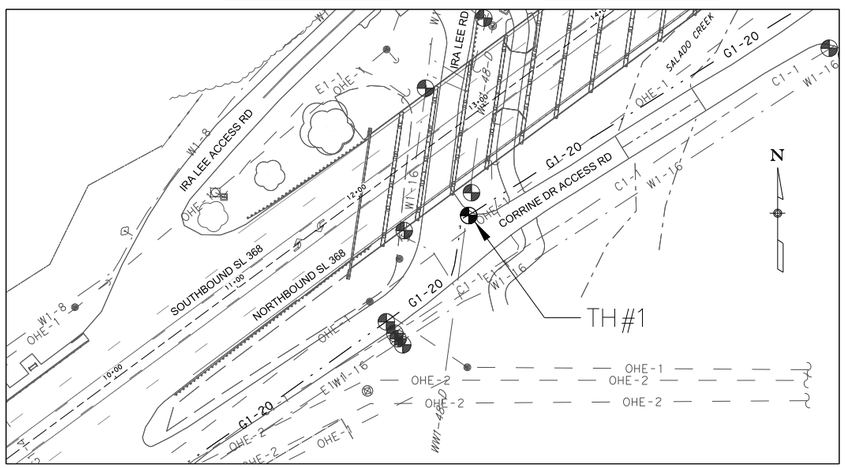
TH#: 1
DATE: 11-21-2018

SURFACE ELEVATION: 667.64'
TOP OF UTILITY: 664.30'
PAVEMENT THICKNESS AND TYPE: 0.40' ASPHALT



SOIL CONDITIONS: ROAD BASE
UTILITY OWNER: CPS
UTILITY TYPE: GAS
UTILITY SIZE: 1.67'
UTILITY MATERIAL: COATED STEEL

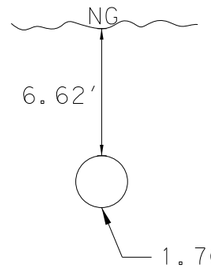
COORDINATES: N: 13729750.63 E: 2152463.96
STA: 12+50.79 OFFSET: 52.04' RT



REMARKS: HAD TO ADJUST HOLE DUE TO CONCRETE CASING, WHICH WAS APPROXIMATELY 1.50' THICK. COULD NOT OBTAIN PICTURE OF UTILITY. GROUND WATER KEPT FILLING IN.

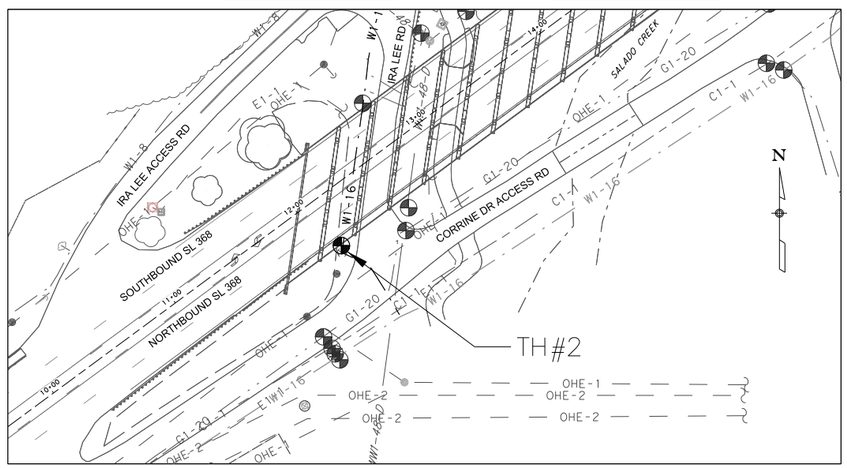
TH#: 2
DATE: 11-19-2018

SURFACE ELEVATION: 669.08'
TOP OF UTILITY: 662.46'
PAVEMENT THICKNESS AND TYPE: NG



SOIL CONDITIONS: ROCK, DIRT & CLAY
UTILITY OWNER: SAWS
UTILITY TYPE: WATER
UTILITY SIZE: 1.70'
UTILITY MATERIAL: N/A

COORDINATES: N: 13729740.70 E: 2152421.33
STA: 12+10.60 OFFSET: 34.69' RT



REMARKS: N/A

B.M. CP 110	Elev.= 694.53'	Description:	CHECK
Northing:	13729230.74	Easting:	2151746.66
B.M. CP 707	Elev.= 686.88'	Description:	CHECK
Northing:	13730111.00	Easting:	2152932.27

0 25' 50'
SCALE: 1" = 50' HORZ

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LOOP 368
AT SALADO CREEK

EXISTING UTILITIES TEST HOLE DATA 1 & 2

SHEET 2 OF 9

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		151
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

10/1/2019
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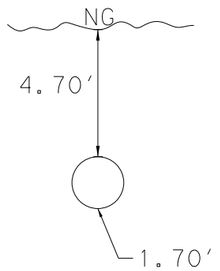
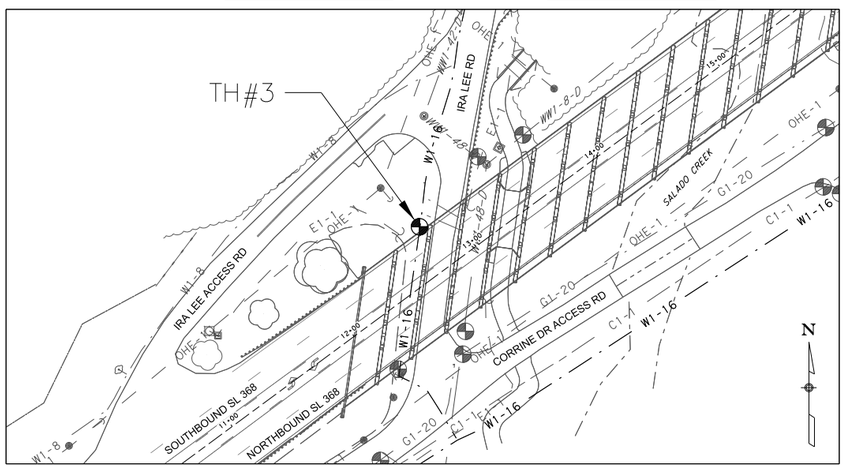
TH#: 3
DATE: 11-19-2018

SURFACE ELEVATION: 669.17'
TOP OF UTILITY: 664.47'
PAVEMENT THICKNESS AND TYPE: NG



SOIL CONDITIONS: ROCK, DIRT & CLAY
UTILITY OWNER: SAWS
UTILITY TYPE: WATER
UTILITY SIZE: 1.70'
UTILITY MATERIAL: N/A

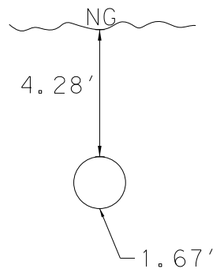
COORDINATES: N: 13729834.68 E: 2152435.40
STA: 12+77.77 OFFSET: 32.55' LT



REMARKS: N/A

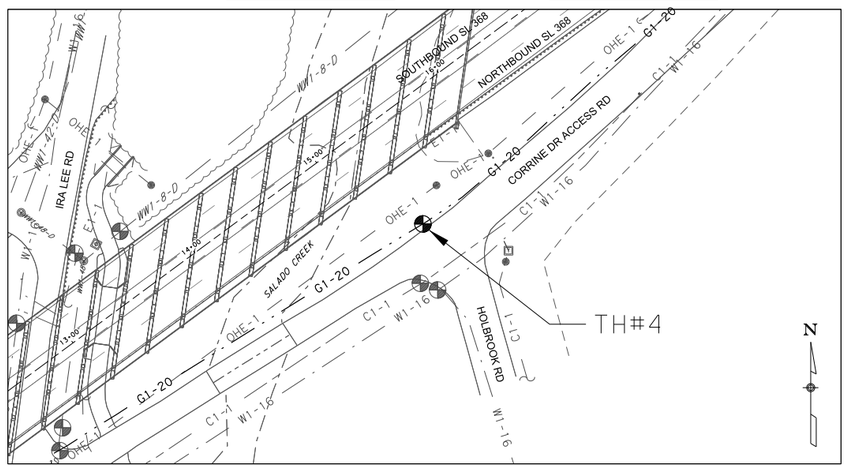
TH#: 4
DATE: 11-20-2018

SURFACE ELEVATION: 668.87'
TOP OF UTILITY: 664.59'
PAVEMENT THICKNESS AND TYPE: NG



SOIL CONDITIONS: ROCK, DIRT & CLAY
UTILITY OWNER: CPS
UTILITY TYPE: GAS
UTILITY SIZE: 1.67'
UTILITY MATERIAL: COATED STEEL

COORDINATES: N: 13729900.22 E: 2152703.58
STA: 15+32.44 OFFSET: 74.10' RT



REMARKS: N/A

B.M. CP 110	Elev.= 694.53'	Description:	CHECK
Northing: 13729230.74		Easting:	2151746.66
B.M. CP 707	Elev.= 686.88'	Description:	CHECK
Northing: 13730111.00		Easting:	2152932.27

0 25' 50'
SCALE: 1" = 50' HORZ

STATE OF TEXAS
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LOOP 368
AT SALADO CREEK

EXISTING UTILITIES TEST HOLE DATA 3 & 4

SHEET 3 OF 9

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		152
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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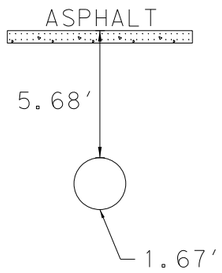
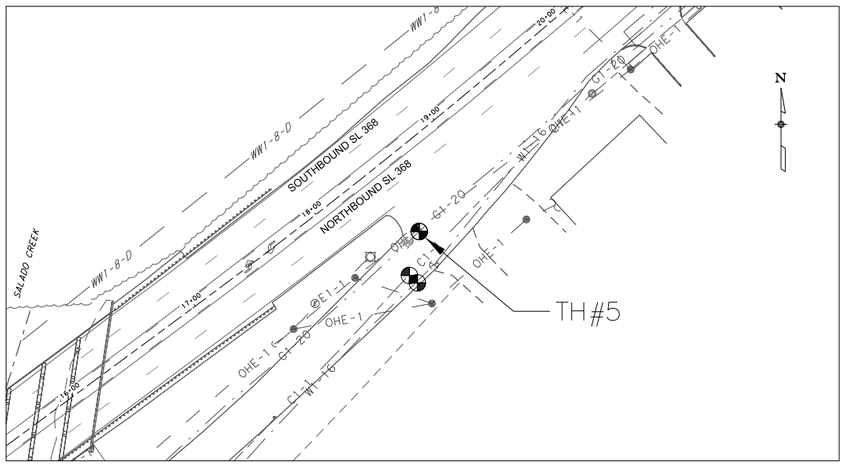
TH#: 5
DATE: 11-21-2018

SURFACE ELEVATION: 686.56'
TOP OF UTILITY: 680.88'
PAVEMENT THICKNESS AND TYPE: 0.40' ASPHALT



SOIL CONDITIONS: ROAD BASE
UTILITY OWNER: CPS
UTILITY TYPE: GAS
UTILITY SIZE: 1.67'
UTILITY MATERIAL: COATED STEEL

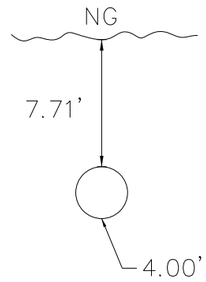
COORDINATES: N: 13730108.64 E: 2152942.17
STA: 18+46.37 OFFSET: 51.01' RT



REMARKS: N/A

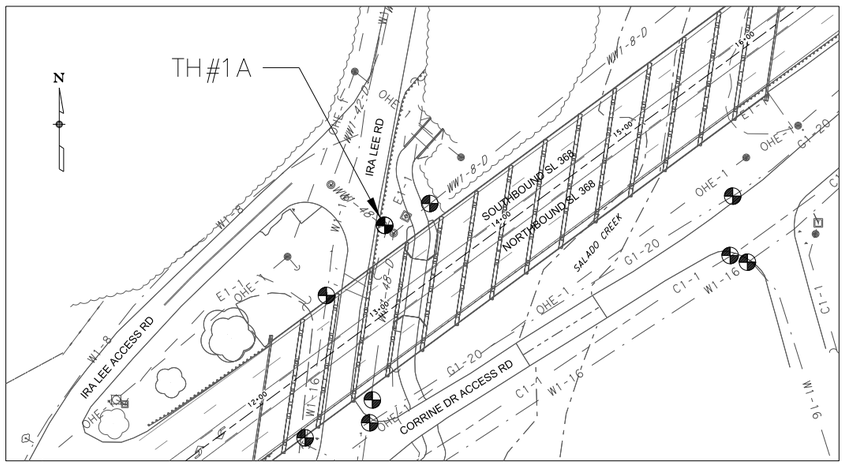
TH#: 1A
DATE: 3-26-2019

SURFACE ELEVATION: 670.02'
TOP OF UTILITY: 662.31'
PAVEMENT THICKNESS AND TYPE: NG



SOIL CONDITIONS: ROCK & DIRT
UTILITY OWNER: SAWS
UTILITY TYPE: WASTEWATER
UTILITY SIZE: 4.00'
UTILITY MATERIAL: CONCRETE

COORDINATES: N: 13729880.94 E: 2152473.87
STA: 13+36.20 OFFSET: 46.90' LT



REMARKS: N/A

B.M. CP 110	Elev.= 694.53'	Description:	CHECK
Northing:	13729230.74	Easting:	2151746.66
B.M. CP 707	Elev.= 686.88'	Description:	CHECK
Northing:	13730111.00	Easting:	2152932.27

0 25' 50'
SCALE: 1" = 50' HORZ

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LOOP 368
AT SALADO CREEK

EXISTING UTILITIES TEST HOLE DATA 5 & 1A

SHEET 4 OF 9

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		153
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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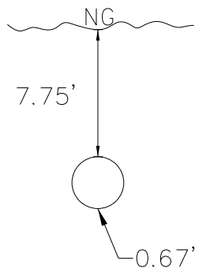
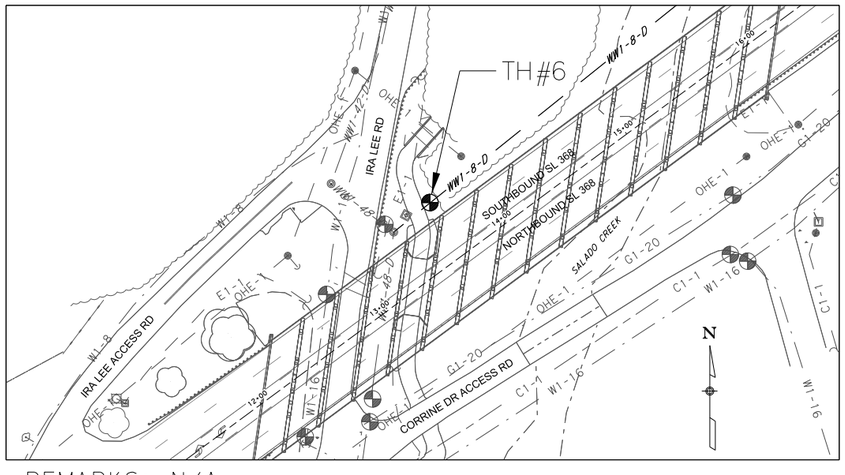
TH#: 6
DATE: 3-27-2019

SURFACE ELEVATION: 669.70'
TOP OF UTILITY: 661.95'
PAVEMENT THICKNESS AND TYPE: NG



SOIL CONDITIONS: ROCK & DIRT
UTILITY OWNER: SAWS
UTILITY TYPE: WASTEWATER
UTILITY SIZE: 0.67'
UTILITY MATERIAL: PVC

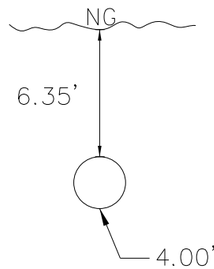
COORDINATES: N:13729895.33 E:2152503.59
STA: 13+68.66 OFFSET: 40.81' LT



REMARKS: N/A

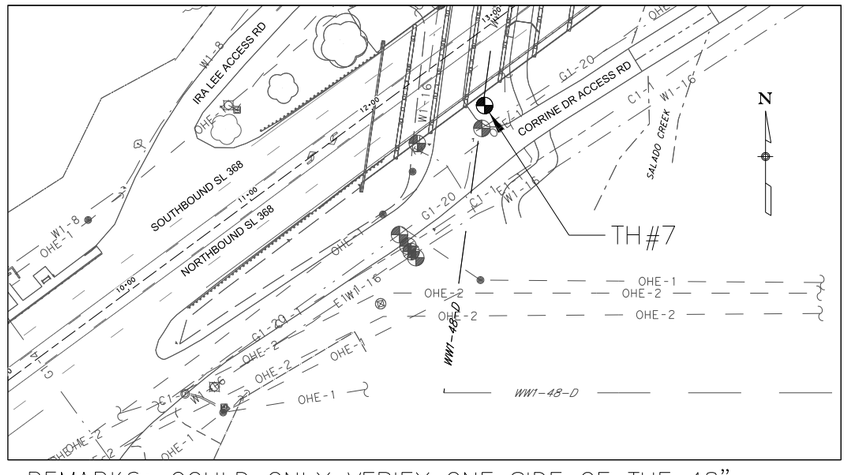
TH#: 7
DATE: 3-27-2019

SURFACE ELEVATION: 668.75'
TOP OF UTILITY: 662.40'
PAVEMENT THICKNESS AND TYPE: NG



SOIL CONDITIONS: ROCK & DIRT
UTILITY OWNER: SAWS
UTILITY TYPE: WASTEWATER
UTILITY SIZE: 4.00'
UTILITY MATERIAL: CONCRETE

COORDINATES: N:13729765.70 E:2152465.73
STA: 12+61.17 OFFSET: 40.96' RT



REMARKS: COULD ONLY VERIFY ONE SIDE OF THE 48" WASTEWATER LINE. OTHER SIDE BURIED UNDER ROCKS.

B.M. CP 110	Elev.= 694.53'	Description:	CHECK
Northing:	13729230.74	Easting:	2151746.66
B.M. CP 707	Elev.= 686.88'	Description:	CHECK
Northing:	13730111.00	Easting:	2152932.27

0 25' 50'
SCALE: 1" = 50' HORZ

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10/01/19

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LOOP 368
AT SALADO CREEK

EXISTING UTILITIES TEST HOLE DATA 6 & 7

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		154
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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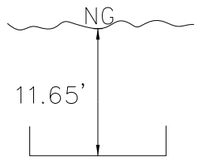
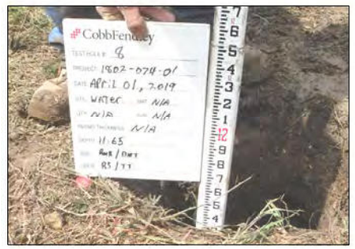
TH#: 8
DATE: 4-1-2019

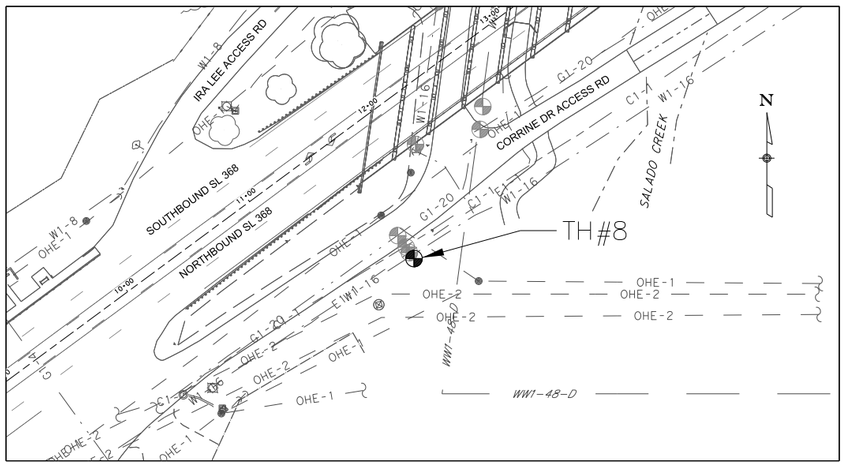
SURFACE ELEVATION: 670.90'
TOP OF UTILITY: N/A
PAVEMENT THICKNESS AND TYPE: NG



SOIL CONDITIONS: ROCK & DIRT
UTILITY OWNER: N/A
UTILITY TYPE: N/A
UTILITY SIZE: N/A
UTILITY MATERIAL: N/A



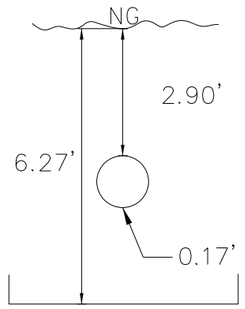
COORDINATES: N: 13729665.35 E: 2152420.32
STA: 11+65.01 OFFSET: 94.70' RT



REMARKS: NO UTILITY FOUND IN THIS LOCATION. DEPTH OF 11.65' HIT THE WATER TABLE.

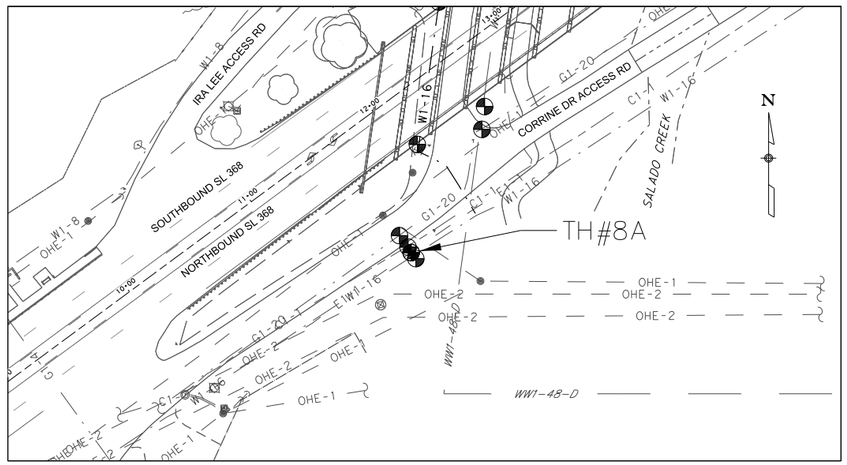
TH#: 8A
DATE: 4-2-2019

SURFACE ELEVATION: 670.53'
TOP OF UTILITY: 667.63'
PAVEMENT THICKNESS AND TYPE: NG



SOIL CONDITIONS: ROCK & DIRT
UTILITY OWNER: N/A
UTILITY TYPE: N/A
UTILITY SIZE: 0.17'
UTILITY MATERIAL: N/A

COORDINATES: N: 13729669.33 E: 2152417.24
STA: 11+64.89 OFFSET: 89.67' RT



REMARKS: DID NOT FIND TARGET UTILITY. FOUND UNKNOWN CONDUIT AT A DEPTH OF 2.90'. TEST HOLE DEPTH OF 6.27'

B.M. CP 110	Elev.= 694.53'	Description:	CHECK
Northing:	13729230.74	Easting:	2151746.66
B.M. CP 707	Elev.= 686.88'	Description:	CHECK
Northing:	13730111.00	Easting:	2152932.27

0 25' 50'
SCALE: 1" = 50' HORZ

STATE OF TEXAS
JAMES L. HERBERT
93658
REGISTERED PROFESSIONAL ENGINEER
10/01/19

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TBPE Firm 5713

Texas Department of Transportation

CobbFendley
TBPE NO. F-274 / TBPLS NO. 10046701
505 East Huntland Drive, Suite 100
Austin, Texas 78752
512.834.9798 | fax 512.834.9553 | www.cobbfendley.com

LOOP 368
AT SALADO CREEK

EXISTING UTILITIES TEST HOLE DATA 8 & 8A

SHEET 6 OF 9

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		155
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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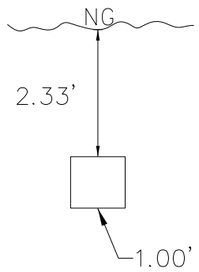
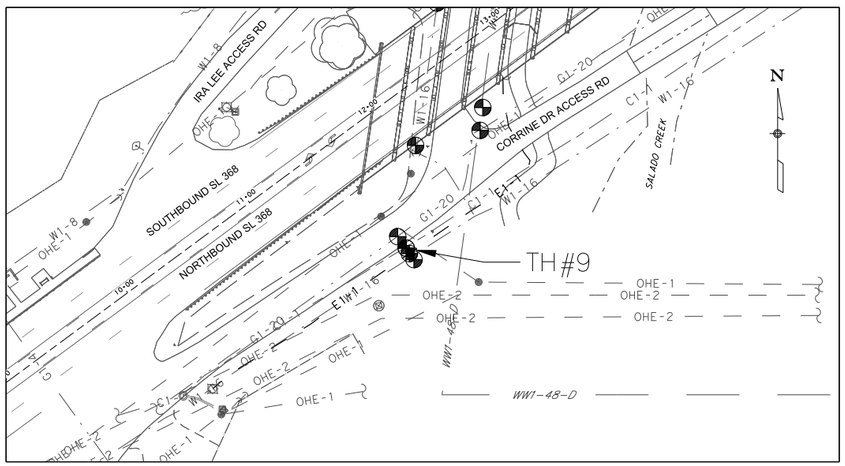
TH#: 9
DATE: 4-1-2019

SURFACE ELEVATION: 669.96'
TOP OF UTILITY: 667.63'
PAVEMENT THICKNESS AND TYPE: NG



SOIL CONDITIONS: ROCK & DIRT
UTILITY OWNER: AT&T
UTILITY TYPE: TELECOM
UTILITY SIZE: 1.00'
UTILITY MATERIAL: CLAY

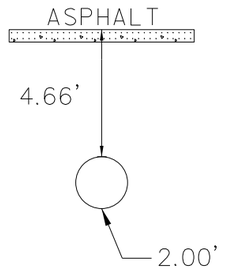
COORDINATES: N: 13729672.91 E: 2152415.20
STA: 11+65.38 OFFSET: 85.57' RT



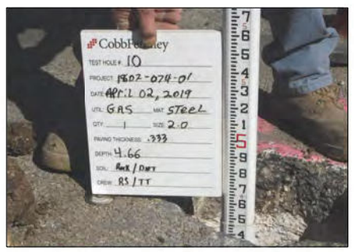
REMARKS: 12" X 12" CLAY DUCT

TH#: 10
DATE: 4-2-2019

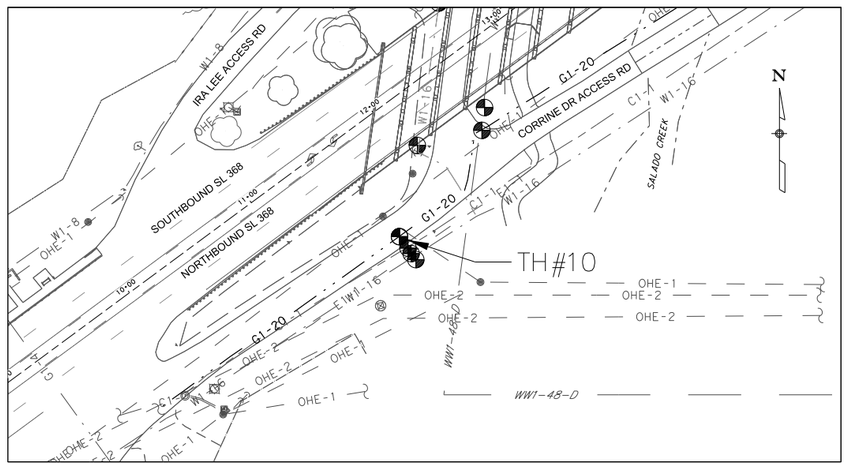
SURFACE ELEVATION: 670.65'
TOP OF UTILITY: 665.99'
PAVEMENT THICKNESS AND TYPE: 0.33' ASPHALT



SOIL CONDITIONS: ASPHALT & ROCK
UTILITY OWNER: CPS
UTILITY TYPE: GAS
UTILITY SIZE: 2.00'
UTILITY MATERIAL: STEEL



COORDINATES: N: 13729680.49 E: 2152409.58
STA: 11+65.36 OFFSET: 76.14' RT



REMARKS: N/A

B.M. CP 110	Elev.= 694.53'	Description:	CHECK
Northing: 13729230.74		Easting:	2151746.66
B.M. CP 707	Elev.= 686.88'	Description:	CHECK
Northing: 13730111.00		Easting:	2152932.27

0 25' 50'
SCALE: 1" = 50' HORZ

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LOOP 368
AT SALADO CREEK

EXISTING UTILITIES TEST HOLE DATA 9 & 10

SHEET 7 OF 9

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		156
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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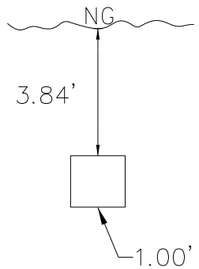
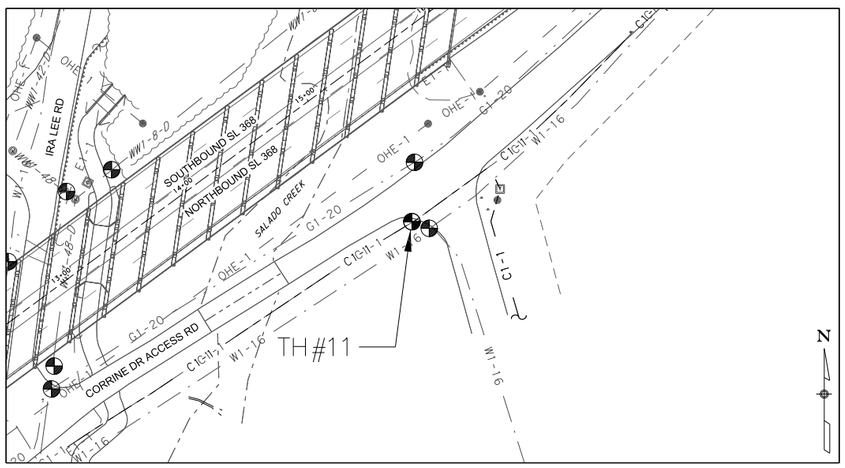
TH#: 11
DATE: 4-2-2019

SURFACE ELEVATION: 667.73'
TOP OF UTILITY: 663.89'
PAVEMENT THICKNESS AND TYPE: NG



SOIL CONDITIONS: ROCK & DIRT
UTILITY OWNER: AT&T
UTILITY TYPE: TELECOM
UTILITY SIZE: 1.00'
UTILITY MATERIAL: CLAY

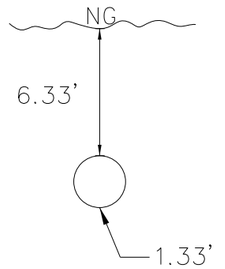
COORDINATES: N: 13729861.04 E: 2152701.88
STA: 15+07.79 OFFSET: 104.60' RT



REMARKS: 12" X 12" CLAY DUCT

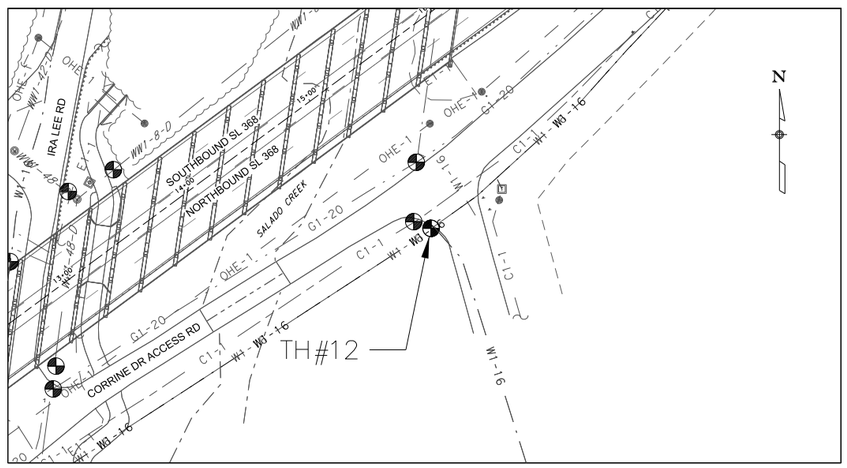
TH#: 12
DATE: 4-3-2019

SURFACE ELEVATION: 668.98'
TOP OF UTILITY: 662.65'
PAVEMENT THICKNESS AND TYPE: NG



SOIL CONDITIONS: ROCK & DIRT
UTILITY OWNER: SAWS
UTILITY TYPE: WATER
UTILITY SIZE: 1.33'
UTILITY MATERIAL: WRAPPED STEEL

COORDINATES: N: 13729856.63 E: 2152713.30
STA: 15+14.36 OFFSET: 114.94' RT



REMARKS: N/A

B.M. CP 110	Elev.= 694.53'	Description:	CHECK
Northing:	13729230.74	Easting:	2151746.66
B.M. CP 707	Elev.= 686.88'	Description:	CHECK
Northing:	13730111.00	Easting:	2152932.27

0 25' 50'
SCALE: 1" = 50' HORZ

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LOOP 368
AT SALADO CREEK

EXISTING UTILITIES TEST HOLE DATA 11 & 12

SHEET 8 OF 9

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		157
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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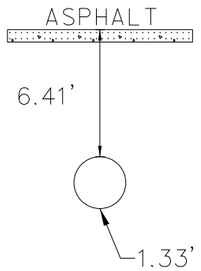
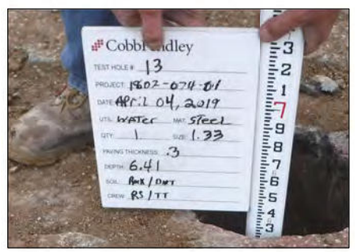
TH#: 13
DATE: 4-4-2019

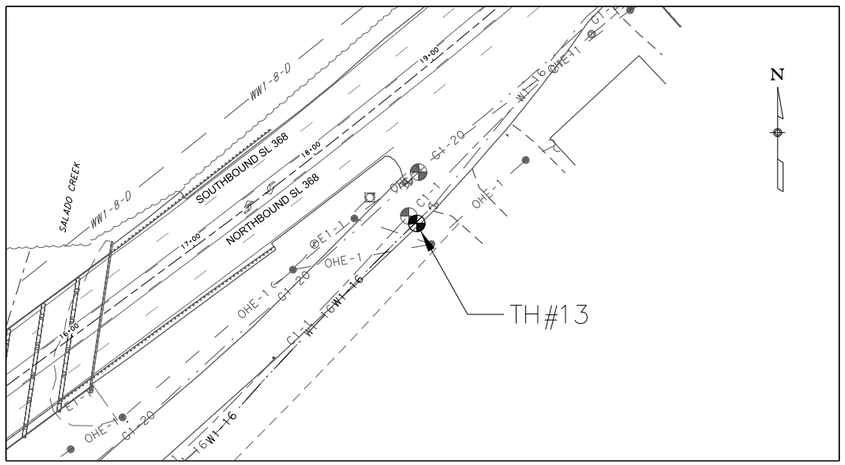
SURFACE ELEVATION: 684.17'
TOP OF UTILITY: 677.76'
PAVEMENT THICKNESS AND TYPE: 0.30' ASPHALT



SOIL CONDITIONS: ROCK & DIRT
UTILITY OWNER: SAWS
UTILITY TYPE: WATER
UTILITY SIZE: 1.33'
UTILITY MATERIAL: STEEL



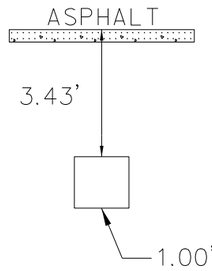
COORDINATES: N: 13730074.79 E: 2152940.95
STA: 18+25.19 OFFSET: 76.78' RT



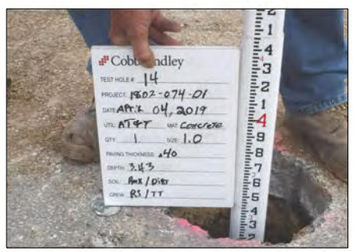
REMARKS: N/A

TH#: 14
DATE: 4-4-2019

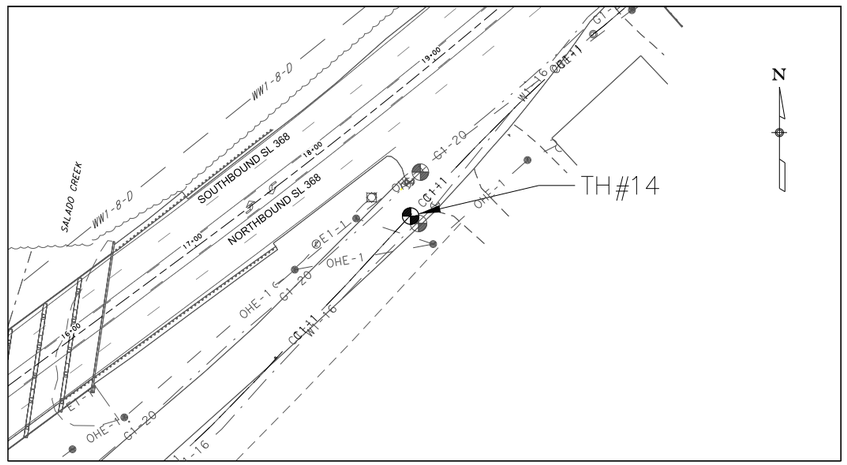
SURFACE ELEVATION: 684.80'
TOP OF UTILITY: 681.37'
PAVEMENT THICKNESS AND TYPE: 0.40' ASPHALT



SOIL CONDITIONS: ROCK & DIRT
UTILITY OWNER: AT&T
UTILITY TYPE: TELECOM
UTILITY SIZE: 1.00'
UTILITY MATERIAL: CLAY



COORDINATES: N: 13730079.63 E: 2152935.71
STA: 18+24.03 OFFSET: 69.73' RT



REMARKS: 12" X 12" CLAY DUCT

B.M. CP 110	Elev.= 694.53'	Description:	CHECK
Northing: 13729230.74		Easting:	2151746.66
B.M. CP 707	Elev.= 686.88'	Description:	CHECK
Northing: 13730111.00		Easting:	2152932.27

0 25' 50'
SCALE: 1" = 50' HORZ

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LOOP 368
AT SALADO CREEK

EXISTING UTILITIES TEST HOLE DATA 13 & 14

SHEET 9 OF 9

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		158
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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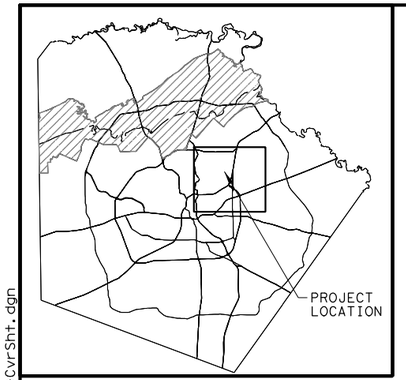


BEXAR COUNTY LOCATION MAP
NTS

N

NTS

SAN ANTONIO WATER SYSTEM

SAWS WATER JOB NO: 18-5052

AUSTIN HWY. BRIDGE REPLACEMENT WATER ADJUSTMENT

CSJ: 0016-08-039

100% SUBMITTAL

PREPARED BY:

LNV

TBPE FIRM NO. F-366
TBPLS FIRM NO. 10126502

engineers | architects | surveyors

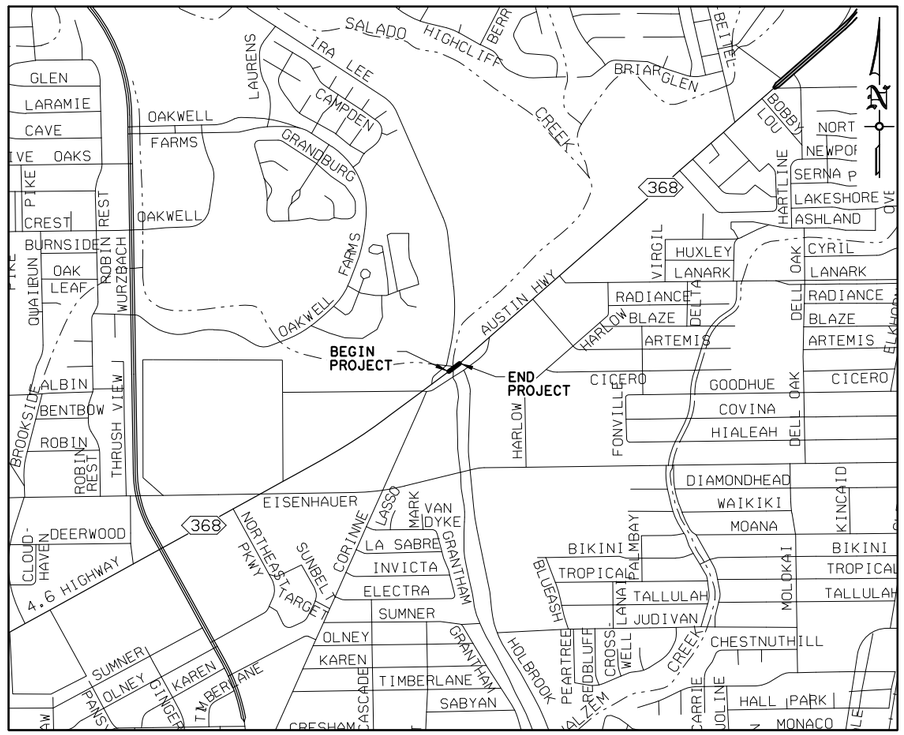
8918 TESORO DR., SUITE 401
SAN ANTONIO, TX 78217

PH. (210) 822-2232
FAX (210) 822-4032

WWW.LNVINC.COM

STATE OF TEXAS
BRYAN J. SPINA
103776
LICENSED
PROFESSIONAL ENGINEER

9/22/2020



SITE LOCATION MAP
NTS

SHEET INDEX	
SHEET NO.	SHEET DESCRIPTION
W1	COVER SHEET AND INDEX
W2	GENERAL NOTES
W3	QUANTITY SUMMARY AND HORIZONTAL ALIGNMENT
W4	PROPOSED WATER MAIN IMPROVEMENTS
W5	PROPOSED WATER MAIN CONNECTIONS
W6	PROPOSED BORE PIT DETAILS
W7	PROPOSED RECEIVING PIT DETAILS

CALL BEFORE YOU DIG!

Texas 811 Know what's below. Call before you dig.

PARTICIPANTS REQUEST 48 HOURS NOTICE BEFORE YOU DIG, DRILL, OR BLAST – STOP AND CALL 811

THE LONE STAR NOTIFICATION COMPANY AT 1-800-669-8344

Texas Department of Transportation ©

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
–			159
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	08	039	368

9/22/2020
Plotted by: bspina
S:\Projects\SAWS\180070 2018 Small Diameter and Large Diameter Condition\050 Austin Hwy Bridge Rplc\20-Drawings\Plans\Civil\180070050*CvrSht.dgn

GENERAL NOTES:

1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE APPROVED BY THE SAN ANTONIO WATER SYSTEM (SAWS) AND COMPLY WITH THE PLANS, SPECIFICATIONS, GENERAL CONDITIONS AND WITH THE FOLLOWING AS APPLICABLE:
   - A. CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) "DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEM", TEXAS ADMINISTRATIVE CODE (TAC) TITLE 30 PART 1 CHAPTER 217 AND "PUBLIC DRINKING WATER", TAC TITLE 30 PART 1 CHAPTER 290.
   - B. CURRENT TxDOT "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND DRAINAGE".
   - C. CURRENT "SAN ANTONIO WATER SYSTEM STANDARD SPECIFICATIONS FOR CONSTRUCTION".
   - D. CURRENT CITY OF SAN ANTONIO "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION".
   - E. CURRENT CITY OF SAN ANTONIO "UTILITY EXCAVATION CRITERIA MANUAL" (UECM).
2. THE CONTRACTOR SHALL OBTAIN SAWS STANDARD DETAILS FROM SAWS WEBSITE, http://www.saws.org/buisness_center/specs. UNLESS OTHERWISE NOTED WITHIN DESIGN PLANS.
3. THE CONTRACTOR IS TO NOTIFY AND MAKE ARRANGEMENTS WITH THE SAWS CONSTRUCTION INSPECTION DIVISIONAT 233-3500, AND PROVIDE NOTIFICATION PROCEDURES THE CONTRACTOR WILL USE TO NOTIFIY AFFECTED HOME RESIDENTS AND/OR PROPERTY OWNERS 48 HOURS PRIOR TO EXCAVATION.
4. LOCATIONS AND DEPTHS OF EXISTING UTILITIES AND SERVICE LATERALS SHOWN ON THE PLANS ARE UNDERSTOOD TO BE APPROXIMATE. ACTUAL LOCATIONS AND DEPTHS MUST BE FIELD VERIFIED BY THE CONTRACTOR AT LEAST 1 WEEK PRIOR TO CONSTRUCTION. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO LOCATE UTILITY SERVICE LINES AS REQUIRED FOR CONSTRUCTIONAND TO PROTECT THEM DURING CONSTRUCTION AT NO COST TO SAWS.
5. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF UNDERGROND UTUILITES AND DRAINAGE STRUCTURES AT LEAST 1-2 WEEKS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT. PLEASE ALLOW UP TO 7 BUISNESS DAYS FOR LOCATES REQUESTING PIPE LOCATION MARKERS ON SAWS FACILITIES. THE FOLLOWING CONTACT INFORMATION ARE SUPPLIED FOR VERIFICATION.

   SAN ANTONIO WATER SYSTEM
   SAWS UTILITY LOCATES:
   http://www.saws.org/Service/Locates
   COSA DRAINAGE 207-8048
   COSA TRAFFIC SIGNAL OPERATIONS 207-7720
   TEXAS STATE WIDE ONE CALL LOCATOR
   1-800-545-6005 OR 811
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING EXISTING FENCES, CURBS, STREETS, DRIVEWAYS, SIDEWALKS, LANDSCAPING AND STRUCTURES TO ITS ORIGINAL OR BETTER CONDITION AS A RESULT OF DAMAGES DONE BY THE PROJECTS CONSTRUCTION.
7. THE CONTRACTOR SHALL AVOID CUTTING ROOTS LARGER THEN ONE INCH IN DIAMETER WHEN EXCAVATING NEAR EXISTING TREES. EXCAVATION IN VICINITY OF TREES SHALL PROCEED WITH CAUTION. THE CONTRACTOR SHALL CONTACT THE CITY ARBORIST AT 207-8053 FOR GUIDANCE. SAWS CONSTRUCTION INSPECTOR SHALL ALSO BE NOTIFIED.
8. THE CONTRACTOR SHALL NOT PLACE ANY WASTE MATERIALS IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN PERMIT.
9. ALL WORK IN TEXAS HIGHWAY DEPARTMENT AND BEXAR COUNTY RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH RESPECTIVE CONSTRUCTION SPECIFICATIONS AND PERMIT.
10. THE CONTRACTOR SHALL COMPLY WITH CITY OF SAN ANTONIO OF OTHER GOVERNING MUNICIPALITY'S TREE ORDINANCES WHEN EXCAVATING NEAR TREES.
11. DUE TO LIMITED RIGHT-OF-WAY AND NUMBER OF UTILITIES, PROPOSED UTILITIES MAY BE IN CLOSE PROXIMITY OF EXISTING AND OTHER PROPOSED UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPORTING AND PROTECTING ALL UTILITIES AND MAINS WITHIN AND ADJACENT TO CONSTRUCTION TRENCHES TO PREVENT ANY UNDUE STRESSES AND/OR DAMAGE TO THE UTILITIES AND MAINS AS TO MAINTAIN CONTINUAL SERVICE.
12. ANY WORK COMPLETED WITHOUT PRIOR WRITTEN AUTHORIZATION WHICH IS NOT INCLUDED IN THESE PLANS AND SPECIFICATIONS WILL NOT BE COMPENSATED BY THE SAN ANTONIO WATER SYSTEM.
13. HOLIDAY WORK: CONTRACTORS WILL NOT BE ALLOWED TO PERFORM SAWS WORK ON SAWS RECOGNIZED HOLIDAYS. REQUEST SHOULD BE SENT TO constworkreq@saws.org.

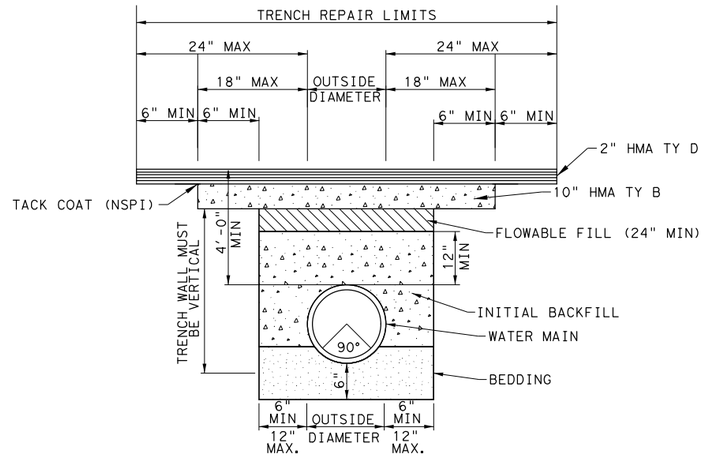
    WEEKEND WORK: CONTRACTORS ARE REQUIRED TO NOTIFY THE SAWS INSPECTION CONSTRUCTION DEPARTMENT 48 HOURS IN ADVANCE TO REQUEST WEEKEND WORK. REQUEST SHOULD BE SENT TO constworkreq@saws.org.

    ANY AND ALL SAWS UTILITY WORK INSTALLED WITHOUT HOLIDAY/WEEKEND APPROVAL WILL BE SUBJECT TO BE UNCOVERED FOR PROPER INSPECTION.
14. WHERE WATER MAINS AND NEW SEWER MAINS ARE INSTALLED WITH A SEPARATION DISTANCE CLOSER THAN NINE FEET (I.E., WATER MAINS CROSSING SEWER MAINS, WATER MAINS PARALLELING SEWER MAINS, OR WATER MAINS NEXT TO MANHOLES) THE INSTALLATION MUST MEET REQUIREMENT OF 30 TAC 217.53(d)(PIPE DESIGN) AND 30 TAC 290.44(e)(WATER DISTRIBUTION).
15. EXISTING MAILBOXES TO REMAIN IN PLACE.
16. PRE CON SITE VIDEO: BEFORE THE START OF ANY CONSTRUCTION. THE SITE MUST BE VIDEO RECORDED BY THE CONTRACTOR WITH ONE COPY SUBMITTED TO SAWS INSPECTIONS. A PRE-SITE VIDEO WILL PROVIDE ACCURATE DOCUMENTAION OF THE EXISTING CONDITIONS (NSPI).
17. POWER POLE BRACING: CONTRACTORS SHOULD BE ADVISED THAT THERE ARE EXISTING OVERHEAD UTILITY POLES ALONG THE PROJECT CORRIDOR. CONTRACTORS SHOULD FURTHER BE ADVISED THAT IF THE DISTANCE FORM THE OUTSIDE FACE OF A UTILITY TRENCH TO THE FACE OF A UTILITY POLE IS LESS THAN 5 FEET, SAID UTILITY POLE IS SUBJECT TO BRACING, BASED ON A DETERMINATION MADE BY UTILITY POLE OWNER. COSTS INCURRED BY CONTRACTOR FOR BRACING OF THESE UTILITY POLES IS SUBSIDIARY TO THAT RESPECTIVE UTILITY COMPANY'S WORK. IT IS ADVISABLE FOR THE CONTRACTOR TO REVIEW THE CONSTRUCTION DOCUMENTS, AND VISIT THE CONSTRUCTION SITE TO DETERMINE POTENTIAL IMPACTS.
18. CONSTRUCTION SEQUENCING: IT IS THE CONTRACTOR SOLE RESPONSIBILITY TO SCHEDULE SEQUENCING FOR REMOVAL AND INSTALLATION OF EXISTING AND PROPOSED SAWS UTILITIES IN CONJUNCTION WITH GENERAL PROJECT CONSTRUCTION. SEQUENCE OF CONSTRUCTION ACTIVITIES SHALL BE CONSIDERED IN ORDER TO MINIMIZE THE EXTENT AND DURATION OF DISTURBANCES.

WATER GENERAL NOTES

1. PRIOR TO TIE-INS, ANY SHUTDOWNS OF EXISTING MAINS OF ANY SIZE MUST BE COORDINATED WITH THE SAWS INSPECTION AND/OR SAWS SAWS PRODUCTION GROUPS AT LEAST TWO WEEKS OR MORE IN ADVANCE OF THE SHUTDOWN. THE CONTRACTOR MUST ALSO PROVIDE A SEQUENCE OF WORK AS REALTED TO THE TIE-INS, THIS IS AT NO ADDITONAL COST TO SAWS OR THE PROJECT AND IS THE RESPONSIBILITY OF THE CONTRACTOR TO SEQUENCE THE WORK ACCORDINGLY.

   SAWS PRODCUTION CONTROL CENTER 233-2016
2. THE CONTRACTOR WILL KEEP THE AREA ON TOP OF AND AROUND THE WATER METER BOX FREE OF ALL OBJECTS AND DEBRIS.
3. WATER SYSTEM TO BE COMPLETELY RESTRAINED. RESTRAINED LENGTH CALCULATIONS ARE FOR P.V.C. PIPE BEDDED IN COMPACTED GRANULAR MATERIAL EXTENDING TO THE TOP OF THE PIPE. THE NATIVE SOIL MATERIAL IS ASSUMED TO BE INORGANIC CLAY OF HIGH PLASTICITY. DEPTH OF BURY IS ASSUMED TO BE 4 FEET. NOTE: THESE CALCULATIONS ARE PROVIDED FOR REFERENCE. THE RESTRAINED LENGTHS SHALL BE DESIGNED BASED UPON THE CONDITIONS ENCOUNTERED DURING THE INSTALLATION. SEE SAWS SPECIFICATION BOOK.
4. ASBESTOS CEMENT (AC) PIPE, ALSO KNOWN AS TRANSITE PIPE WHICH IS KNOWN TO CONTAIN ASBESTOS-CONTAINING MATERIAL (ACM), MAYBE LOCATED WITHIN THE PROJECT LIMITS. SPECIAL WASTE MANAGEMENT PROCEDURES AND HEALTH AND SAFETY REQUIREMENTS WILL BE APPLICABLE WHEN REMOVAL AND/OR DISTURBANCE OF THIS PIPE OCCURS, PAYMENT FOR SUCH WORK IS TO BE MADE UNDER SPECIAL SPECIFICATION ITEM NO. 3000, "SPECIAL SPECIFICATION FOR HANDLING ASBESTOS CEMENT PIPE".
5. VALVE REMOVAL: WHERE THE CONTRACTOR IS TO ABANDON A WATER MAIN, THE CONTROL VALVE LOCATED ON THE ABANDONING BRANCH WILL BE REMOVED AND REPLACED WITH A CAP/PLUG. (NSPI)
6. NSPI STANDS FOR NO SEPARATE PAY ITEM.
7. DISTANCE TO NEXT VALVE SHOWN ON PLANS IS APPROXIMATE AND FOR CONTRACTOR'S AND INSPECTOR'S INFORMATION ONLY.
8. TRENCH EXCAVATION SAFTEY PROTECTION: CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL/ DESIGN/ GEOTECHNICAL/ SAFETY/ EQUIPMENT CONSULTANT, IF ANY SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OF SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.
9. SAWS SHALL MACHINE CHLORINATE NEW WATER MAINS IF THE WATER MAIN LENGTH IS GREATER THAN 750 FEET. FOR LENGTHS LESS THAN 750 FEET, CONTRACTOR SHALL CHLORINATE THE NEW MAINS WITH HTH.



TRENCH PAVEMENT REPAIR DETAIL

N.T.S.

STATE OF TEXAS
BRYAN J. SPINA
103776
LICENSED PROFESSIONAL ENGINEER

12/10/2019

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SAN ANTONIO WATER SYSTEM

AUSTIN HIGHWAY
WATER ADJUSTMENT

GENERAL NOTES

SCALE: N.T.S.

Texas Department of Transportation

FED.RD. DIV.NO.	FEDERAL AID PROJECT		SHEET NO.
–			160
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	08	039	368

QUANTITY SUMMARY

SAWS #18-5052 WATER SUMMARY		340 6011	340 6120	500 6001	7196 6001	7196 * 6002	7196 6003	7196 6004	7196 6005	7196 * 6030
SHT. NO.	STATION TO STATION	D-GR HMA (SQ) TY-B PG64-22	D-GR HMA (SQ) TY-D SAC-B PG70-22	MOBILIZATION	TRENCH EXCAVATION PROTECTION	DUCTILE IRON FITTINGS	HYDROSTATIC PRESSURE TEST	TEMPORARY BLOW-OFF (COMPLETE) (2")	FLOWABLE FILL BACKFILL	GATE VALVE AND BOX (COMPLETE) (16")
		TON	TON	LS	LF	TON	EA	EA	CY	EA
	AUSTIN HIGHWAY									
W4	STA 00+00.00 TO STA 02+94.79	12.00	4.00		227.00	2.23	1.00	3.00	11.00	1.00
	PROJECT TOTALS	12.00	4.00	1.00	227.00	2.23	1.00	3.00	11.00	1.00

SAWS #18-5052 WATER SUMMARY		7196 6035	7196 6037	7196 6049	7196 * 6056	7196 6057	7196 6058
SHT. NO.	STATION TO STATION	TIE-IN (COMPLETE) (16")	AIR RELEASE VALVE (COMPLETE) (1")	PIPE WATER MAIN (PVC) (16")	STEEL CASING (30") BORE	CARRIER PIPE IN CAS (PVC) (16")	WTR (JACK, BORE, OR TUNNEL) (30")
		EA	EA	LF	LF	LF	LF
	AUSTIN HIGHWAY						
W4	STA 00+00.00 TO STA 02+94.79	3.00	1.00	229.00	198.00	198.00	198.00
	PROJECT TOTALS	3.00	1.00	229.00	198.00	198.00	198.00

* REQUIRES BUY AMERICA COMPLIANCE

STATE OF TEXAS
BRYAN J. SPINA
103776
LICENSED PROFESSIONAL ENGINEER

12/9/2020

HORIZONTAL ALIGNMENT

Beginning chain 16IN_PVC description

Point 100	N	13,731,418.18 E	2,152,645.83 Sta	0+00.00
Course from 100 to 101 N 34° 07′ 37.08" W Dist 23.13				
Point 101	N	13,731,437.33 E	2,152,632.86 Sta	0+23.13
Course from 101 to 102 N 9° 52′ 22.92" E Dist 210.94				
Point 102	N	13,731,645.14 E	2,152,669.03 Sta	2+34.07
Course from 102 to 103 N 32° 25′ 39.34" E Dist 8.00				
Point 103	N	13,731,651.89 E	2,152,673.32 Sta	2+42.07
Course from 103 to 104 N 53° 55′ 39.32" E Dist 4.00				
Point 104	N	13,731,654.25 E	2,152,676.55 Sta	2+46.07
Course from 104 to 105 N 76° 54′ 01.13" E Dist 30.95				
Point 105	N	13,731,661.26 E	2,152,706.69 Sta	2+77.02
Course from 105 to 106 S 80° 07′ 37.08" E Dist 11.54				
Point 106	N	13,731,659.28 E	2,152,718.07 Sta	2+88.56
Course from 106 to 107 N 54° 52′ 22.92" E Dist 4.00				
Point 107	N	13,731,661.59 E	2,152,721.34 Sta	2+92.56
Course from 107 to 108 N 10° 27′ 47.36" E Dist 8.14				
Point 108	N	13,731,669.59 E	2,152,722.82 Sta	3+00.70
Course from 108 to 109 N 17° 04′ 42.87" E Dist 44.65				
Point 109	N	13,731,712.28 E	2,152,735.93 Sta	3+45.36

Ending chain 16IN_PVC description

NOTE: PLEASE SEE TXDOT PLANS FOR BENCHMARK AND CONTROL POINTS.

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SAN ANTONIO WATER SYSTEM

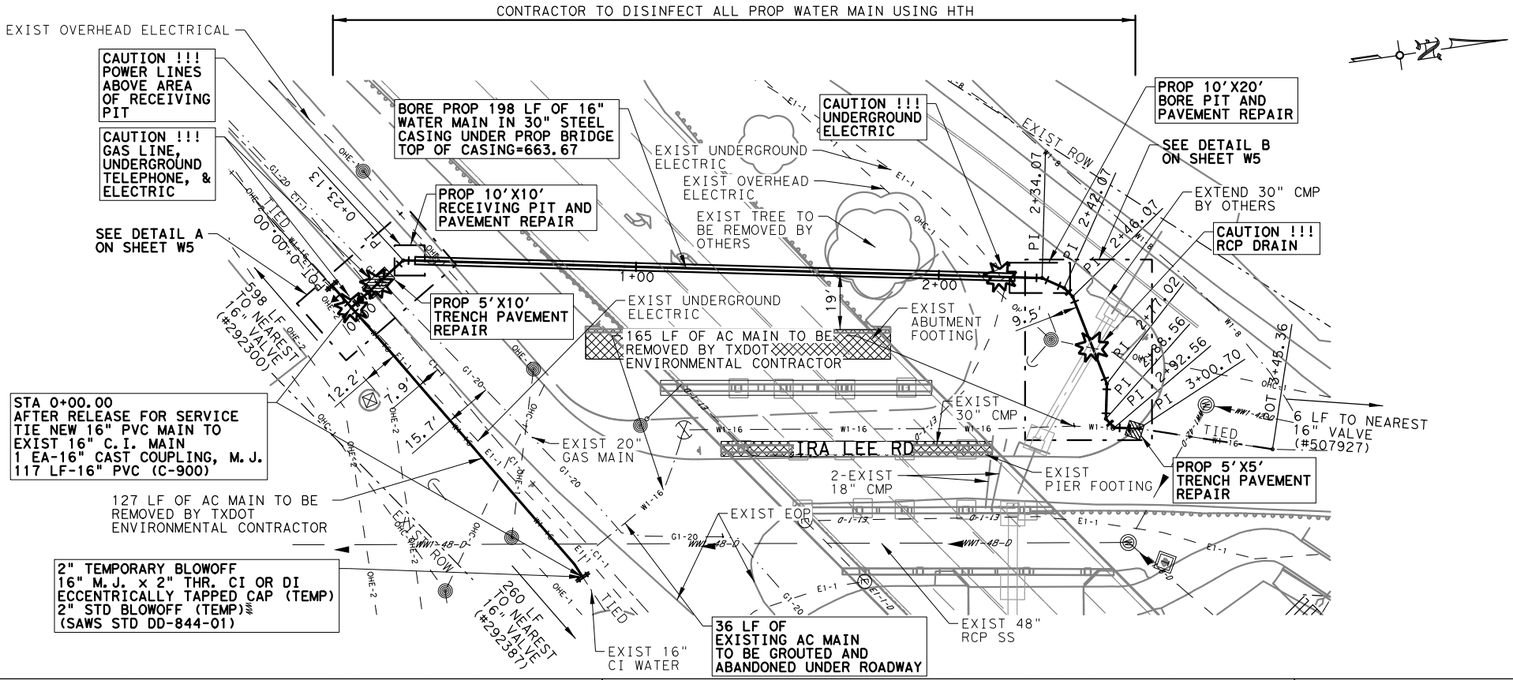
AUSTIN HIGHWAY
WATER ADJUSTMENT

QUANTITY SUMMARY AND HORIZONTAL ALIGNMENT

SCALE: N.T.S.

Texas Department of Transportation ©

FED.RD. DIV.NO.	FEDERAL AID PROJECT		SHEET NO.
–			161
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	08	039	368



QUANTITY SUMMARY			
ITEM #	ITEM	UNIT	QTY
340-6011	D-GR HMA (SQ) TY-B PG64-22	TON	12
340-6120	D-GR HMA (SQ) TY-D SAC-B PG70-22	TON	4
500-6001	MOBILIZATION	LS	1
7196-6001	TRENCH EXCAVATION PROTECTION	LF	227
7196-6002	DUCTILE IRON FITTINGS	TON	2.23
7196-6003	HYDROSTATIC PRESSURE TEST	EA	1
7196-6004	TEMPORARY BLOW-OFF (COMPLETE) (2")	EA	3
7196-6005	FLOWABLE FILL BACKFILL	CY	11
7196-6030	GATE VALVE AND BOX (COMPLETE) (16")	EA	1
7196-6035	TIE-IN (COMPLETE) (16")	EA	3
7196-6037	AIR RELEASE VALVE (COMPLETE) (1")	EA	1
7196-6049	PIPE WATER MAIN (PVC) (16")	LF	229
7196-6056	STEEL CASING (30") BORE	LF	198
7196-6057	CARRIER PIPE (PVC) (16")	LF	198
7196-6058	WTR (JACK, BORE, OR TUNNEL) (30")	LF	198

TRENCH EXCAVATION SAFETY PROTECTION:
CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAIN EMPLOYEE OR STRUCTURAL/DESIGN/GEOTECHNICAL/ SAFETY/ EQUIPMENT CONSULTANT, IF ANY SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES, THE CONTRACTOR'S IMPLEMENTATION OF THE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS.

SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAIN EMPLOYEE OF SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

CONTRACTOR SHALL BE REQUIRED TO CUT AND REMOVE EXISTING WATER SERVICES IN CONFLICT WITH PROPOSED SANITARY SEWER AS A NON-SEPARATE PAY ITEM (NSPI).

CONTRACTOR SHALL BE REQUIRED TO REMOVE EXISTING SANITARY SEWER, LATERALS AND MANHOLES AS A NON-SEPARATE PAY ITEM (NSPI).

ADJUSTED WATER MAIN TO BE FULLY RESTRAINED.

CPS ENERGY NOTES:
CALL THE TEXAS STATE WIDE ONE CALL LOCATOR NUMBER 1-800-344-8377, 48 HOURS BEFORE BEGINNING ANY EXCAVATION.

DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.181, CPS ENERGY MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT AREA.

THE PROJECT MUST BE GAS LEAK SURVEYED PRIOR TO THE FINAL OVERLAY. ALLOW 10 WORKING DAYS FOR THE LEAK SURVEY AND ALLOW AN ADDITIONAL 10 WORKING DAYS FOR VALVE ADJUSTMENTS. THE CONTRACTOR MUST COORDINATE THE SURVEY AND THE ADJUSTMENTS THROUGH THE PROJECT INSPECTOR.

THE CONTRACTOR WILL BE RESPONSIBLE FOR PROTECTING CPS ENERGY OVERHEAD AND UNDERGROUND ELECTRIC FACILITIES IF ADJACENT TO WORK AREAS.

AT&T NOTE:
"THE EXISTENCE AND LOCATION OF UNDERGROUND CABLE INDICATED ON THE PLANS ARE TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE NOT GUARANTEED TO BE ACCURATE. CONTRACTOR TO CONTACT THE TELEPHONE COMPANY CABLE LOCATOR 48 HOURS PRIOR TO EXCAVATION AT 1-800-828-5127. CONTRACTOR IS TO PROTECT AND SUPPORT TELEPHONE COMPANY PLANT DURING CONSTRUCTION."

NOTE:

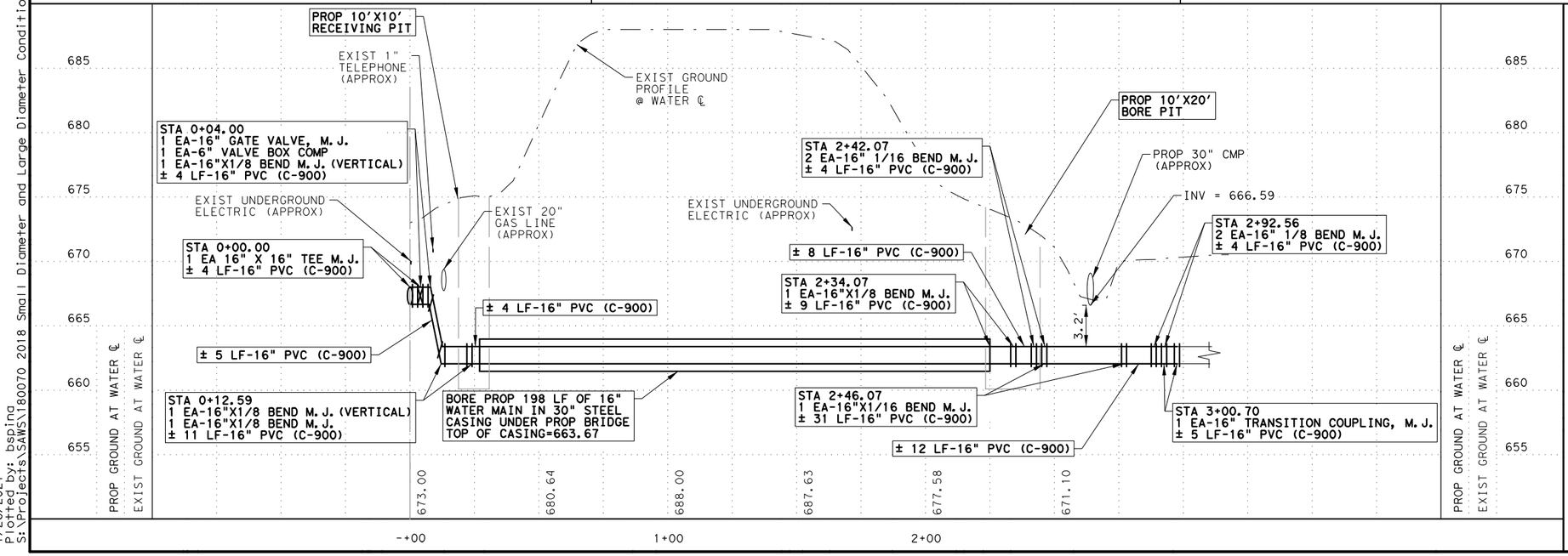
USE TEMPORARY BLOWOFFS AT BOTH ENDS OF PROPOSED WATER MAIN TO CONDUCT HYDROSTATIC PRESSURE TESTING OF THE MAIN BEFORE TYING PROPOSED WATER MAIN TO EXISTING WATER MAIN AT LOCATIONS SHOWN IN PLANS.

FLOWABLE FILL SHALL BE ONLY USED IN LOCATION DIRECTED BY SAWS/TXDOT INSPECTOR OR ENGINEER.

S.A.W.S. NOTE:
LOCATION AND DEPTH OF EXISTING WATER MAINS AND SERVICES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. ACTUAL LOCATION AND DEPTHS MUST BE VERIFIED BY THE CONTRACTOR 48 HOURS PRIOR TO BEGINNING CONSTRUCTION BY USING SAWS.ORG/LOCATES AS STATED IN THE GENERAL NOTES.

THE CONTRACTOR SHOULD EXERCISE EXTREME CAUTION WHEN WORKING NEAR EXISTING WATER FACILITIES AND WATER MAIN MUST BE PROTECTED WHEN NECESSARY AND KEPT IN SERVICE UNTIL TIE INS ARE COMPLETED.

SHOULD A WATER OR SEWER FACILITY BE DAMAGED DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR WILL BE REQUIRED TO REIMBURSE THE SAN ANTONIO WATER SYSTEM FOR THE TOTAL COST TO REPAIR OR REPLACE THE DAMAGED FACILITIES.



LEGEND

- PROP. WATER MAIN
- EXIST. WATER MAIN — 6" C.I.
- GAS MAIN — 2"G
- SANITARY SEWER — 8"WW
- STORM SEWER — 24"ST
- UTILITY POLE LINE
- ELECTRIC CABLE — E
- TELEPHONE CABLE — T
- SERVICE RELAY: 3/4" 1" OR LARGER
- SERVICE RELOCATE: 3/4" 1" OR LARGER
- RELOCATE METER
- NEW SERVICE: 3/4" 1" OR LARGER
- REDUCER
- GAS, WATER, ELEC, UGT & STORM DRAIN CROSSING
- 30" STEEL CASING

STATE OF TEXAS
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1/26/2021

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SAN ANTONIO WATER SYSTEM

AUSTIN HWY
WATER ADJUSTMENT

PROPOSED WATER MAIN IMPROVEMENTS

HORIZ. SCALE: 1"=50' (0, 25, 50) SCALE IN FEET
VERT. SCALE: 1"= 5' (0, 2.5, 5) SCALE IN FEET

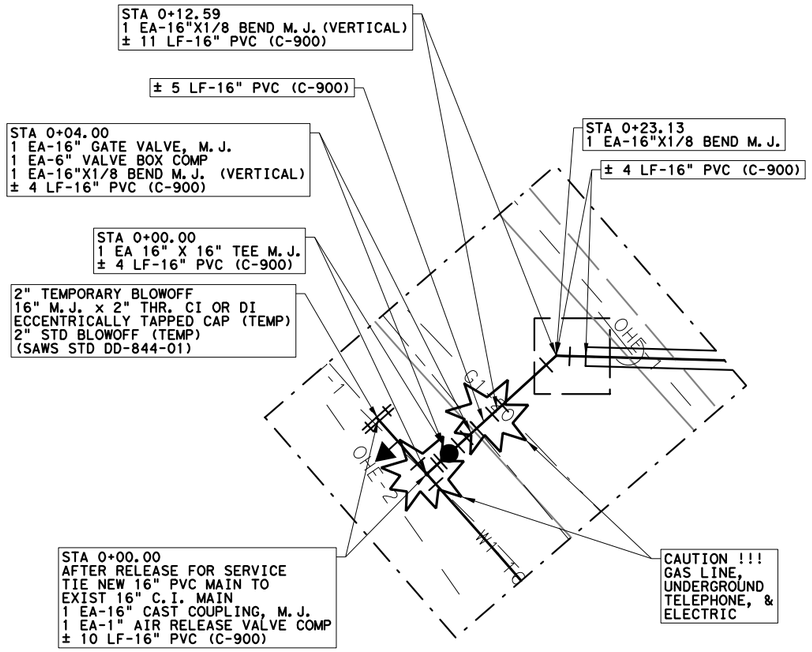
Texas Department of Transportation ©

FED.RD. DIV.NO.	FEDERAL AID PROJECT	SHEET NO.
–		162

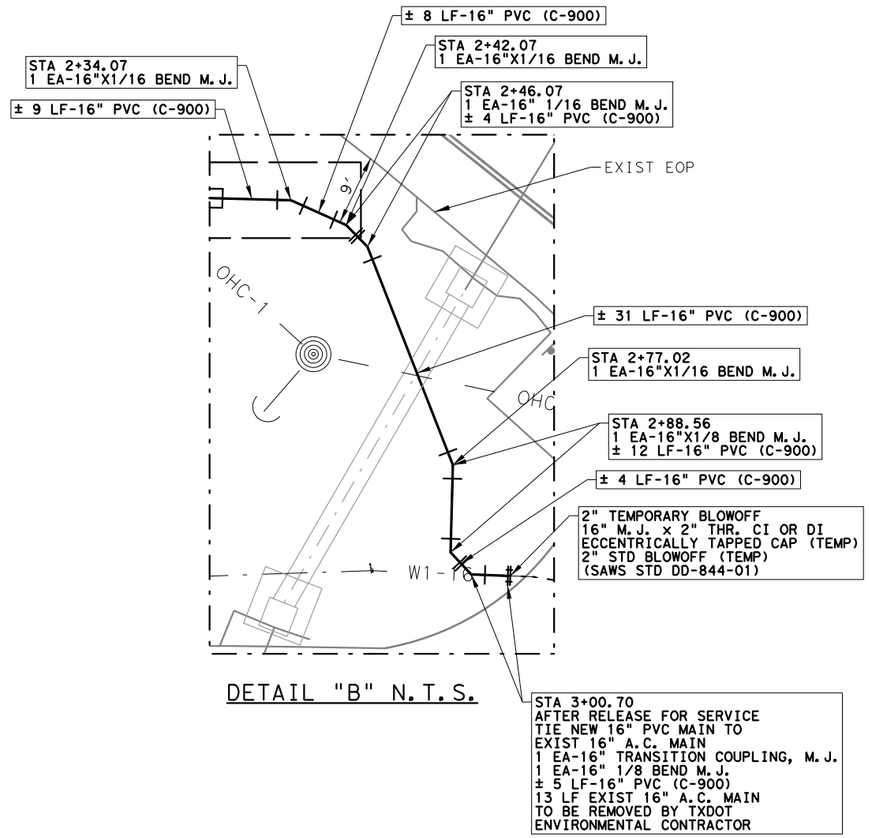
STATE	DIST.	COUNTY
TEXAS	SAT	BEXAR

CONT.	SECT.	JOB	HIGHWAY NO.
0016	08	039	368

1/26/2021
Plotted by: bspina
S:\Projects\SAWS\1800070 2018 Small Diameter and Large Diameter Condition\050 Austin Hwy Bridge Rplc\20-Drawings\Plans\Civil\1800700050*WTR*1.dgn



DETAIL "A" N.T.S.



DETAIL "B" N.T.S.

LEGEND

- PROP. WATER MAIN
- EXIST. WATER MAIN — 6" C.I.
- GAS MAIN — 2"G
- SANITARY SEWER — 8"WW
- STORM SEWER — 24"ST
- UTILITY POLE LINE
- ELECTRIC CABLE — E
- TELEPHONE CABLE — T
- SERVICE RELAY: 3/4" / 1" OR LARGER
- SERVICE RELOCATE: 3/4" / 1" OR LARGER
- RELOCATE METER
- NEW SERVICE: 3/4" / 1" OR LARGER
- REDUCER
- GAS, WATER, ELEC, UGT & STORM DRAIN CROSSING
- 30" STEEL CASING

STATE OF TEXAS
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1/26/2021

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SAN ANTONIO WATER SYSTEM

AUSTIN HWY
WATER ADJUSTMENT

PROPOSED WATER MAIN CONNECTIONS

SCALE: NTS

Texas Department of Transportation ©

FED.RD. DIV.NO.	FEDERAL AID PROJECT		SHEET NO.
–			163
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	08	039	368

1/26/2021
Plotted by: bspina
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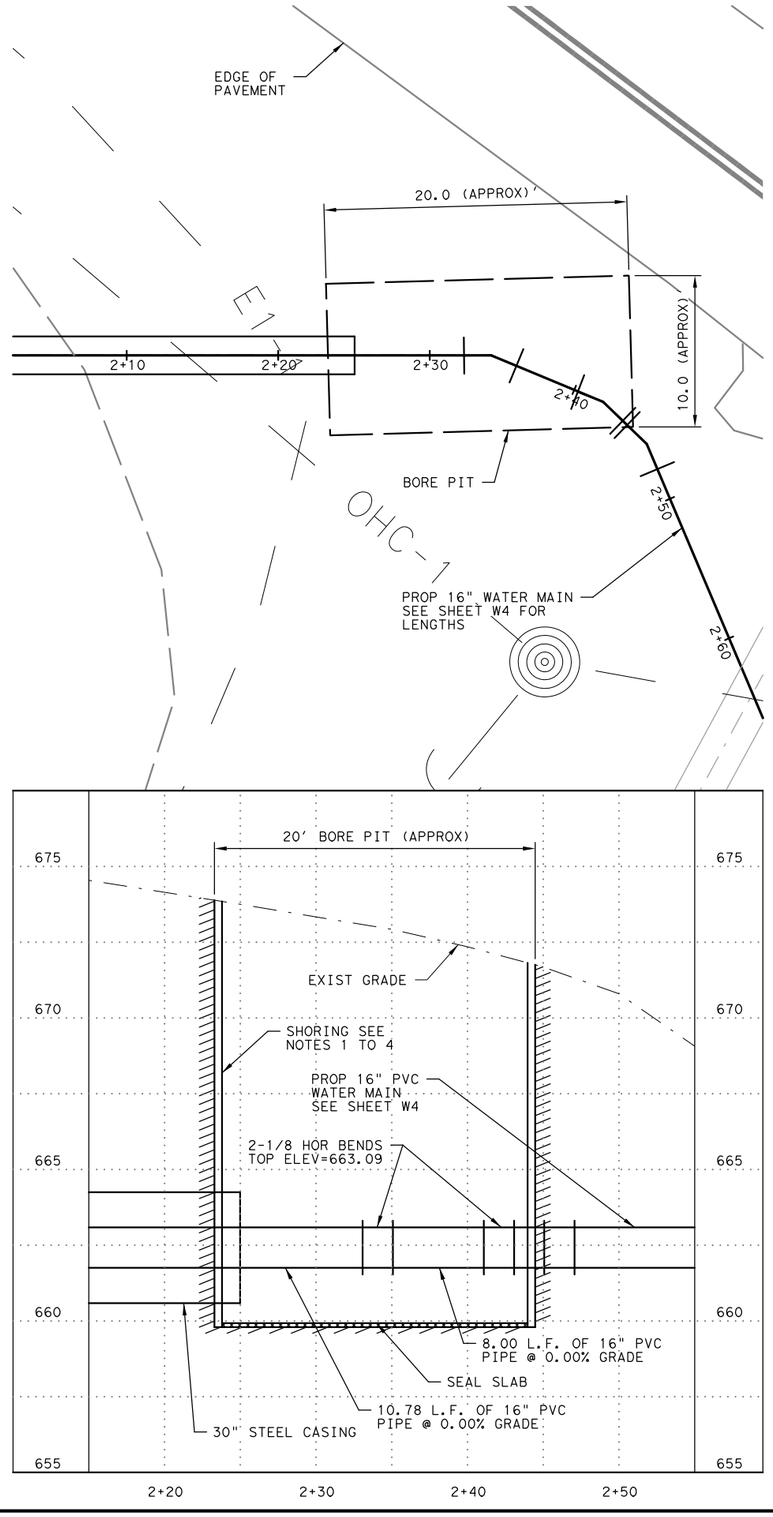
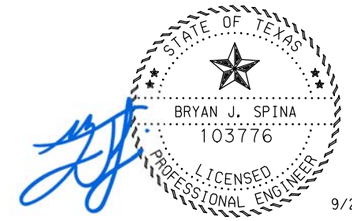
BORE PIT



NOTES:

1. PRIMARY LINING GROUND SUPPORT;
   THE FOLLOWING METHODS OF ACCESS PIT LINING AND GROUND SUPPORT ARE PERMITTED BASED ON CONTRACTOR'S ELECTION:
   - STEEL LINER PLATE.
   - RING STIFFENED LINER PLATE (CIRCULAR RIBS WITH STEEL LINER PLATE).
   - STEEL MESH OR STEEL FIBER REINFORCED SHOTCRETE WITH ROCK BOLTS.
   - IN THE CASE OF RECEIVING PITS, STEEL SLIDE RAIL SYSTEM(S) OR EQUIVALENT SHORING NOTED ABOVE CANNOT BE USED.
2. TEMPORARY SHORING DESIGN SUBMITTAL BY THE CONTRACTOR SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF TEXAS.
3. SHORING SHALL WITHSTAND A MINIMUM LATERAL EARTH PRESSURE RESULTING FROM AN EQUIVALENT FLUID WITH A UNIT WEIGHT OF 100 PCF.
4. SHORING FOR BORING AND RECEIVING PITS SHALL BE PAID UNDER ITEM 7196-6001 TRENCH EXCAVATION PROTECTION.
5. PITS SHALL BE EXCAVATED BY MECHANICAL MEANS. BLASTING IS NOT ALLOWED.
6. GROUND SUPPORT INSTALLED IN THE ACCESS PITS IS CONSIDERED TO BE TEMPORARY AND IS NOT INTENDED TO BE INCORPORATED INTO THE PERMANENT STRUCTURES, ALTHOUGH PERMANENT STRUCTURES WILL BE CONSTRUCTED IN THE PITS.
7. SUBMIT CONSTRUCTION DRAWINGS AND GENERAL DESCRIPTION OF WORK INCLUDING: DETAILS FOR EXCAVATION, INITIAL GROUND SUPPORT SYSTEM, SUCH AS LINER PLATE, RIBS, LAGGING, SHEETING, SHORING, BRACING, ROCK BOLTS AND REINFORCED SHOTCRETE (MIN. 6 IN), AND STABILIZATION; PROTECTION OF THE EXCAVATION, SPECIAL REQUIREMENTS FOR PIT PENETRATIONS; TUNNEL "EYE", STARTER AND BACK OR TAIL TUNNELS; TBM/RBM LAUNCH FRAME; AND SEAL SLABS. ALLOWABLE SURCHARGE LOADS AND ANY RESTRICTIONS ON SURCHARGE CAPACITY, INCLUDING LIVE LOADS, SHALL BE CLEARLY SHOWN ON THE CONSTRUCTION DRAWINGS. THRUST BLOCKS OR OTHER REACTIONS REQUIRED FOR TBM LAUNCH OR PIPE JACKING (IF USED) SHALL BE SHOWN, IF APPLICABLE. FOR ALL PITS INCLUDE THE FOLLOWING SPECIFIC DETAILS IN THE CONSTRUCTION PLANS AND DESIGN CALCULATIONS:
   1. DIMENSIONS OF THE PROPOSED PITS.
   2. SHAFT COLLAR, PRIMARY LINING, AND SEAL OR PIT BOTTOM SLAB(S).
   3. METHOD OF EXTENDING THE PIT LINING ABOVE THE GROUND SURFACE TO PROVIDE A SECURE BARRIER AS REQUIRED BY SAFETY AND SAFE ACCESS CONSIDERATIONS.
   4. DESIGN CRITERIA AND EQUIPMENT STAGING DETAILS.
   5. SEQUENCING OF WORK FOR CONSTRUCTION OF PITS.
   6. TUNNEL "EYES" (IF PLANNED).
   7. PLANS FOR BACKFILL, COMPLETION OR ABANDONMENT AND CLOSURE OF THE SHAFTS PITS.
8. SUBMIT DESCRIPTION OF METHOD OF EXTENDING THE PIT ABOVE THE FLOOD LEVEL, OR OTHER MEANS OF PREVENTING PIT AND TUNNEL INUNDATION.
9. SUBMIT ANY GEOTECHNICAL/BORING TESTING OR ANY ANALYSIS UNDERTAKEN BY THE CONTRACTOR FOR WHATEVER PURPOSE CONNECTED TO THE WORK.
10. PIT DESIGN MUST INCLUDE ALLOWANCE FOR CONTRACTOR'S EQUIPMENT (E.G., CRANE, LOADER, ETC.) THAT WILL BE OPERATED NEAR THE PIT.
11. PITS SHALL BE DESIGNED TO NOT FAIL UNDER FULL HYDROSTATIC HEAD FROM THE 50-YEAR STORM EVENT.
12. PIT SHALL BE PROTECTED AGAINST FLOODING AND INUNDATION FROM THE 50-YEAR STORM EVENT.
13. STEEL PLATE DECK, IF SUCH IS REQUIRED, SHALL BE DESIGNED FOR H-20 LOADING.
14. SHORING METHOD SHALL PROVIDE OPENINGS AS REQUIRED FOR THE PROPER FUNCTION REQUIRED PER THE PIT.



9/22/2020

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SAN ANTONIO WATER SYSTEM

AUSTIN HWY
WATER ADJUSTMENT

PROPOSED BORE PIT DETAILS

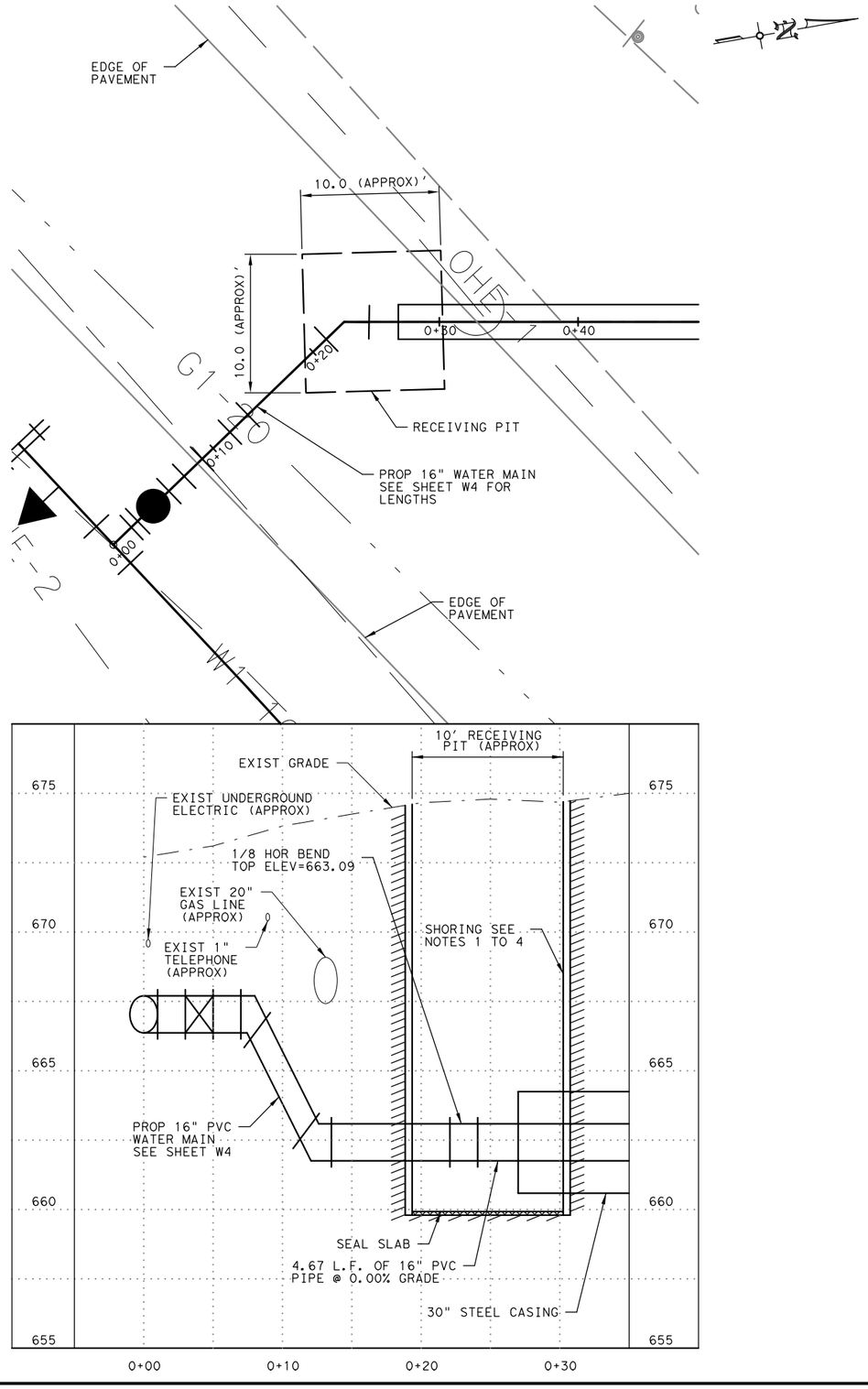
HORIZ. SCALE: 1"=10'
0 5 10
SCALE IN FEET

VERT. SCALE: 1"= 5'
0 2.5 5
SCALE IN FEET

Texas Department of Transportation ©

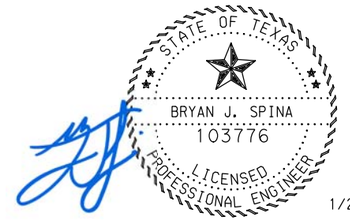
FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
–			164
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	08	039	368

RECEIVING PIT



NOTES:

1. PRIMARY LINING GROUND SUPPORT;
   THE FOLLOWING METHODS OF ACCESS PIT LINING AND GROUND SUPPORT ARE PERMITTED BASED ON CONTRACTOR'S ELECTION:
   - STEEL LINER PLATE.
   - RING STIFFENED LINER PLATE (CIRCULAR RIBS WITH STEEL LINER PLATE).
   - STEEL MESH OR STEEL FIBER REINFORCED SHOTCRETE WITH ROCK BOLTS.
   - IN THE CASE OF RECEIVING PITS, STEEL SLIDE RAIL SYSTEM(S) OR EQUIVALENT SHORING NOTED ABOVE CANNOT BE USED.
2. TEMPORARY SHORING DESIGN SUBMITTAL BY THE CONTRACTOR SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF TEXAS.
3. SHORING SHALL WITHSTAND A MINIMUM LATERAL EARTH PRESSURE RESULTING FROM AN EQUIVALENT FLUID WITH A UNIT WEIGHT OF 100 PCF.
4. SHORING FOR BORING AND RECEIVING PITS SHALL BE PAID UNDER ITEM 7196-6001 TRENCH EXCAVATION PROTECTION.
5. PITS SHALL BE EXCAVATED BY MECHANICAL MEANS. BLASTING IS NOT ALLOWED.
6. GROUND SUPPORT INSTALLED IN THE ACCESS PITS IS CONSIDERED TO BE TEMPORARY AND IS NOT INTENDED TO BE INCORPORATED INTO THE PERMANENT STRUCTURES, ALTHOUGH PERMANENT STRUCTURES WILL BE CONSTRUCTED IN THE PITS.
7. SUBMIT CONSTRUCTION DRAWINGS AND GENERAL DESCRIPTION OF WORK INCLUDING: DETAILS FOR EXCAVATION, INITIAL GROUND SUPPORT SYSTEM, SUCH AS LINER PLATE, RIBS, LAGGING, SHEETING, SHORING, BRACING, ROCK BOLTS AND REINFORCED SHOTCRETE (MIN. 6 IN), AND STABILIZATION; PROTECTION OF THE EXCAVATION, SPECIAL REQUIREMENTS FOR PIT PENETRATIONS; TUNNEL "EYE", STARTER AND BACK OR TAIL TUNNELS; TBM/RBM LAUNCH FRAME; AND SEAL SLABS. ALLOWABLE SURCHARGE LOADS AND ANY RESTRICTIONS ON SURCHARGE CAPACITY, INCLUDING LIVE LOADS, SHALL BE CLEARLY SHOWN ON THE CONSTRUCTION DRAWINGS. THRUST BLOCKS OR OTHER REACTIONS REQUIRED FOR TBM LAUNCH OR PIPE JACKING (IF USED) SHALL BE SHOWN, IF APPLICABLE. FOR ALL PITS INCLUDE THE FOLLOWING SPECIFIC DETAILS IN THE CONSTRUCTION PLANS AND DESIGN CALCULATIONS:
   1. DIMENSIONS OF THE PROPOSED PITS.
   2. SHAFT COLLAR, PRIMARY LINING, AND SEAL OR PIT BOTTOM SLAB(S).
   3. METHOD OF EXTENDING THE PIT LINING ABOVE THE GROUND SURFACE TO PROVIDE A SECURE BARRIER AS REQUIRED BY SAFETY AND SAFE ACCESS CONSIDERATIONS.
   4. DESIGN CRITERIA AND EQUIPMENT STAGING DETAILS.
   5. SEQUENCING OF WORK FOR CONSTRUCTION OF PITS.
   6. TUNNEL "EYES" (IF PLANNED).
   7. PLANS FOR BACKFILL, COMPLETION OR ABANDONMENT AND CLOSURE OF THE SHAFTS PITS.
8. SUBMIT DESCRIPTION OF METHOD OF EXTENDING THE PIT ABOVE THE FLOOD LEVEL, OR OTHER MEANS OF PREVENTING PIT AND TUNNEL INUNDATION.
9. SUBMIT ANY GEOTECHNICAL/BORING TESTING OR ANY ANALYSIS UNDERTAKEN BY THE CONTRACTOR FOR WHATEVER PURPOSE CONNECTED TO THE WORK.
10. PIT DESIGN MUST INCLUDE ALLOWANCE FOR CONTRACTOR'S EQUIPMENT (E.G., CRANE, LOADER, ETC.) THAT WILL BE OPERATED NEAR THE PIT.
11. PITS SHALL BE DESIGNED TO NOT FAIL UNDER FULL HYDROSTATIC HEAD FROM THE 50-YEAR STORM EVENT.
12. PIT SHALL BE PROTECTED AGAINST FLOODING AND INUNDATION FROM THE 50-YEAR STORM EVENT.
13. STEEL PLATE DECK, IF SUCH IS REQUIRED, SHALL BE DESIGNED FOR H-20 LOADING.
14. SHORING METHOD SHALL PROVIDE OPENINGS AS REQUIRED FOR THE PROPER FUNCTION REQUIRED PER THE PIT.



1/26/2021

LNV
engineers | architects | surveyors
8918 TESORO DR., SUITE 401
SAN ANTONIO, TX 78217
TBPE FIRM NO. F-366
TBPLS FIRM NO. 10126502
PH. (210) 822-2232
FAX (210) 822-4032
WWW.LNVINC.COM

SAN ANTONIO WATER SYSTEM

AUSTIN HWY
WATER ADJUSTMENT

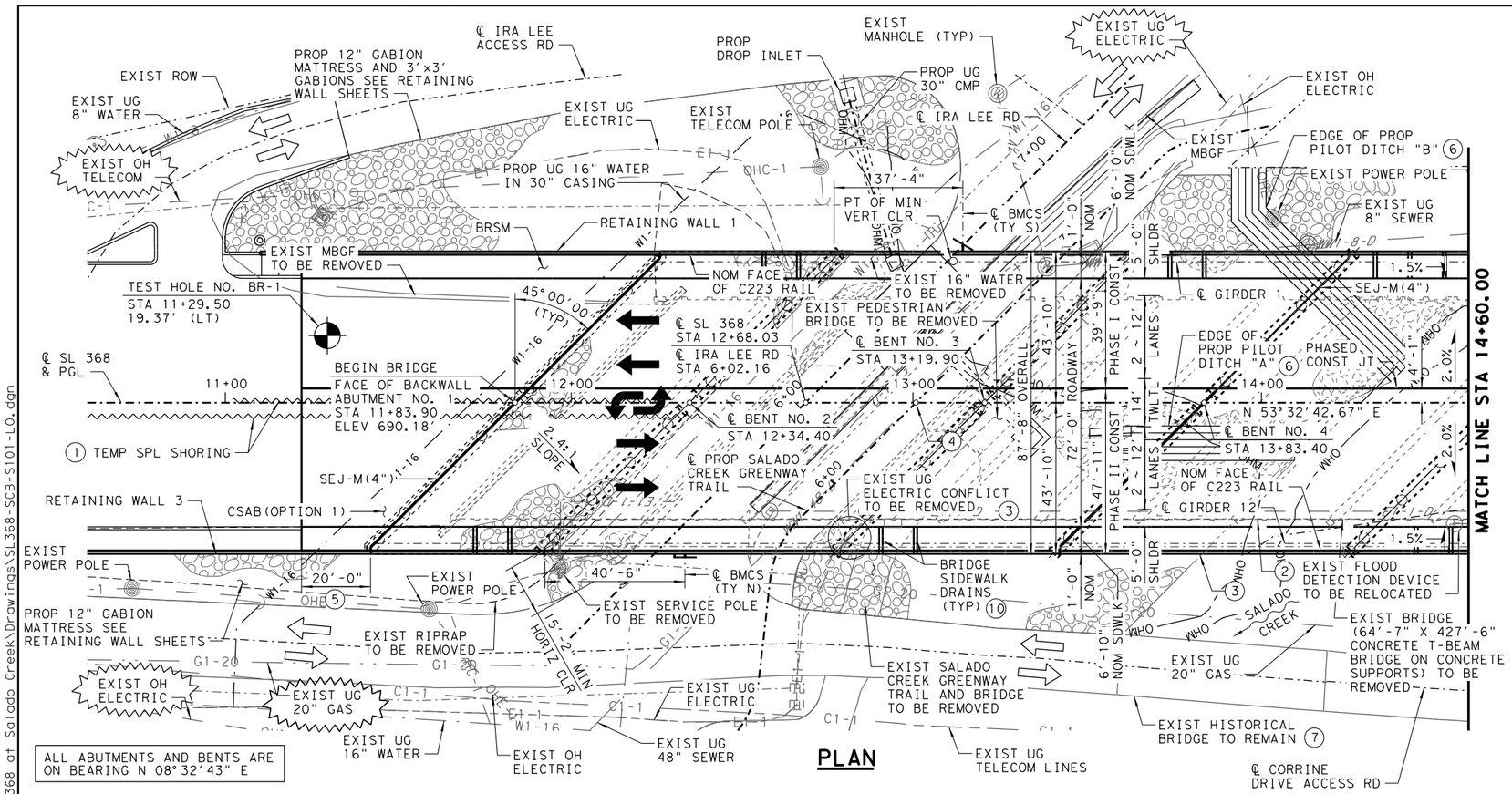
PROPOSED RECEIVING PIT DETAILS

HORIZ. SCALE: 1"=10'
0 5 10
SCALE IN FEET

VERT. SCALE: 1"= 5'
0 2.5 5
SCALE IN FEET

Texas Department of Transportation ©

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
–			165
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	08	039	368



(1) BEGIN TEMP SPL SHORING AT STA 9+88.46, END TEMP SPL SHORING AT STA 12+38.20, SEE TEMP SPL SHORING DETAILS SHEET FOR TEMPORARY SPECIAL SHORING DETAILS AND NOTES NOT SHOWN.

(2) EXIST ELECTRICAL CONDUIT ON BRIDGE TO BE RELOCATED.

(3) PROP ELECTRICAL CONDUIT SEE "LIGHTING INSTALLATION PLAN" SHEET FOR DETAILS.

(4) ℄ SL 368, STA 12+99.94 AT ℄ TRAIL, STA 6+33.31

(5) SEE APPROACH SLAB DETAILS SHEET FOR ADDITIONAL APPROACH SLAB INFORMATION.

(6) SEE GRADING AND PILOT DITCH DETAILS SHEET FOR ADDITIONAL INFORMATION ON PILOT DITCH.

(7) CONSTRUCTION EQUIPMENT SHALL NOT BE ALLOWED ON THE HISTORIC BRIDGE. CONTRACTOR SHALL GET APPROVAL FROM ENGINEER PRIOR TO ALLOWING EQUIPMENT ON OR ACROSS THE BRIDGE.

(8) ℄ IRA LEE RD

(9) ℄ PROP SALADO CREEK GREENWAY TRAIL

(10) SEE PRESTRESSED CONCRETE GIRDER UNIT NO. 1 & 2 FOR LOCATION OF BRIDGE DRAINS.

GENERAL NOTES:

DESIGN IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION (2017), WITH CURRENT INTERIMS.

THE CONTRACTOR'S ATTENTION IS DRAWN TO THE WATER BEARING SAND MATERIAL SHOWN IN THE BORING LOGS. HOLE STABILITY IS THE RESPONSIBILITY OF THE CONTRACTOR.

ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL AND MUST BE CORRECTED FOR VERTICAL GRADE AND CROSS-SLOPE WHERE APPROPRIATE.

FOR SOIL BORING INFORMATION, SEE "TEST HOLE DATA" SHEETS.

"H" VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. THE CONTRACTOR IS RESPONSIBLE FOR CALCULATING THE ACTUAL COLUMN HEIGHTS BASED ON FIELD CONDITIONS.

CONTRACTOR MUST VERIFY THE LOCATIONS AND DEPTHS OF ALL UTILITIES PRIOR TO CONSTRUCTION AND FABRICATION. NOTIFY ENGINEER OF ANY CONFLICTS PRIOR TO CONSTRUCTION.

SEE RETAINING WALL SHEETS FOR WALL LAYOUTS AND DETAILS.

EXISTING SUBSTRUCTURE SHALL BE REMOVED TO 2 FT BELOW THE FINISHED GRADE.

"D" DENOTES CAPS WITH D BARS AND SLOTTED HOLES AT GIRDER 2 AND GIRDER 11.

SEE FOUNDATION LAYOUT SHEET FOR "EXISTING ABUTMENT AND BENT STATIONING".

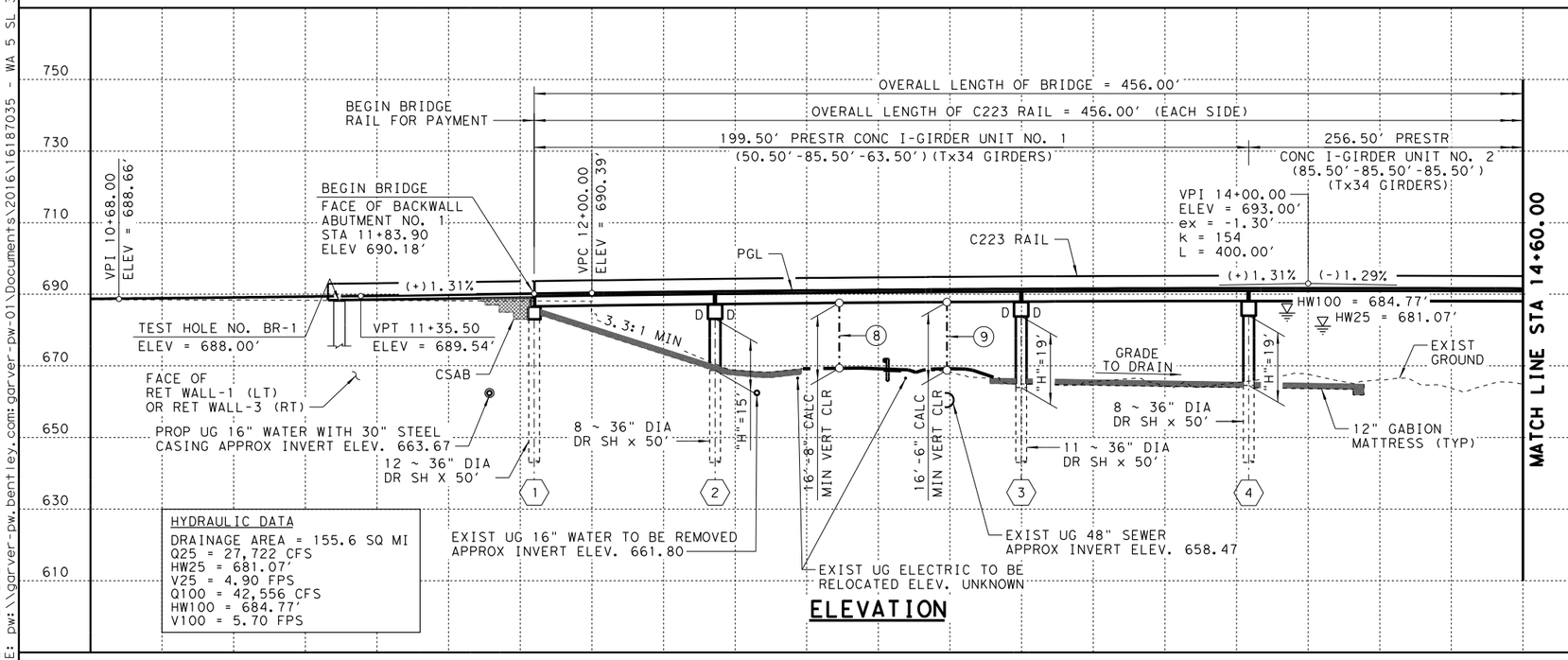
SEE FOUNDATION LAYOUT SHEET FOR CLEARANCES TO UTILITIES.

SEE SLAB DETAIL SHEETS FOR LOCATION OF SIDEWALK EXPANSION JOINT COVER PLATES.

FUNCTIONAL CLASS: URBAN ARTERIAL STREET
DESIGN SPEED: 45 MPH
ADT: 24,000 (2021), 32,900 (2041)
PROP NBI NO.: 15-015-0-0016-08-460
EXST NBI NO.: 15-015-0-0016-08-027

HL 93 LOADING

0 20' 40'
SCALE: 1" = 40'



ELEVATION

STATE OF TEXAS
Blake W. Staton
121491
LICENSED PROFESSIONAL ENGINEER
1/27/2021

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(512) 485-0009
TBPELS Firm 5713

SL 368
AT SALADO CREEK

BRIDGE LAYOUT

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		166
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

DATE: 1/27/2021 12:53:28 PM
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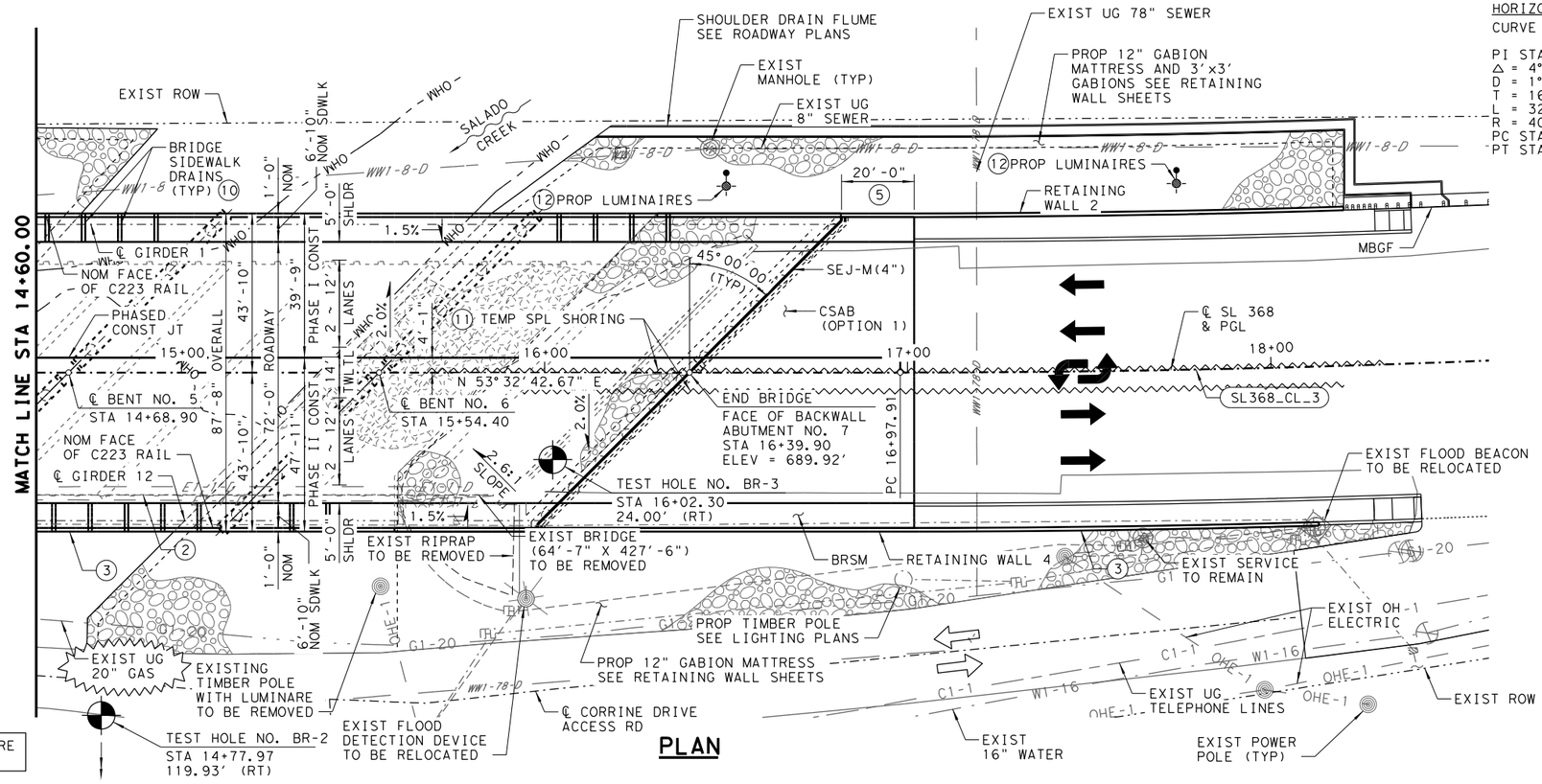


ALL ABUTMENTS AND BENTS ARE ON BEARING N 08°32'43" E

HORIZONTAL CURVE DATA
CURVE = SL368_CL_3

PI STA = 18+58.64
△ = 4°36'07.30" (LT)
D = 1°25'56.62"
T = 160.73'
L = 321.28'
R = 4000'
PC STA = 16+97.91
PT STA = 20+19.19

(2) EXIST ELECTRICAL CONDUIT ON BRIDGE TO BE RELOCATED.

(3) PROP ELECTRICAL CONDUIT SEE "LIGHTING INSTALLATION PLAN" SHEETS FOR DETAILS.

(5) SEE APPROACH SLAB DETAILS SHEET FOR ADDITIONAL APPROACH SLAB INFORMATION.

(6) SEE GRADING AND PILOT DITCH DETAILS SHEET FOR ADDITIONAL INFORMATION ON PILOT DITCH.

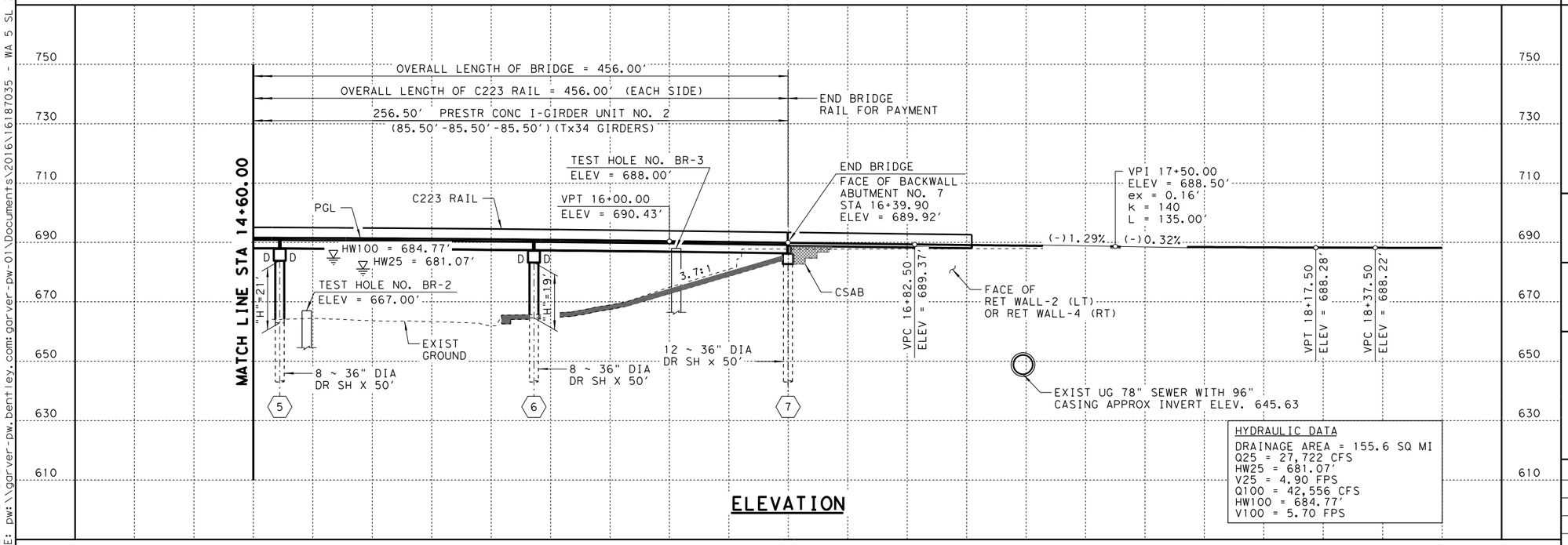
(10) SEE PRESTRESSED CONCRETE GIRDER UNIT NO. 1 & 2 FOR LOCATION OF BRIDGE DRAINS.

(11) BEGIN TEMP SPL SHORING AT STA 15+67.00, END TEMP SPL SHORING AT STA 18+31.36, SEE TEMP SPL SHORING DETAILS SHEET FOR TEMPORARY SPECIAL SHORING DETAILS AND NOTES NOT SHOWN.

(12) LUMINAIRE SHALL BE INSTALLED AFTER RETAINING WALL CONSTRUCTION IS COMPLETE. SEE ILLUMINATION PLANS FOR NOTES.

HL 93 LOADING

0 20' 40'
SCALE: 1" = 40'



ELEVATION

HYDRAULIC DATA
DRAINAGE AREA = 155.6 SQ MI
Q25 = 27,722 CFS
HW25 = 681.07'
V25 = 4.90 FPS
Q100 = 42,556 CFS
HW100 = 684.77'
V100 = 5.70 FPS

STATE OF TEXAS
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1/27/2021

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(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

BRIDGE LAYOUT

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		167
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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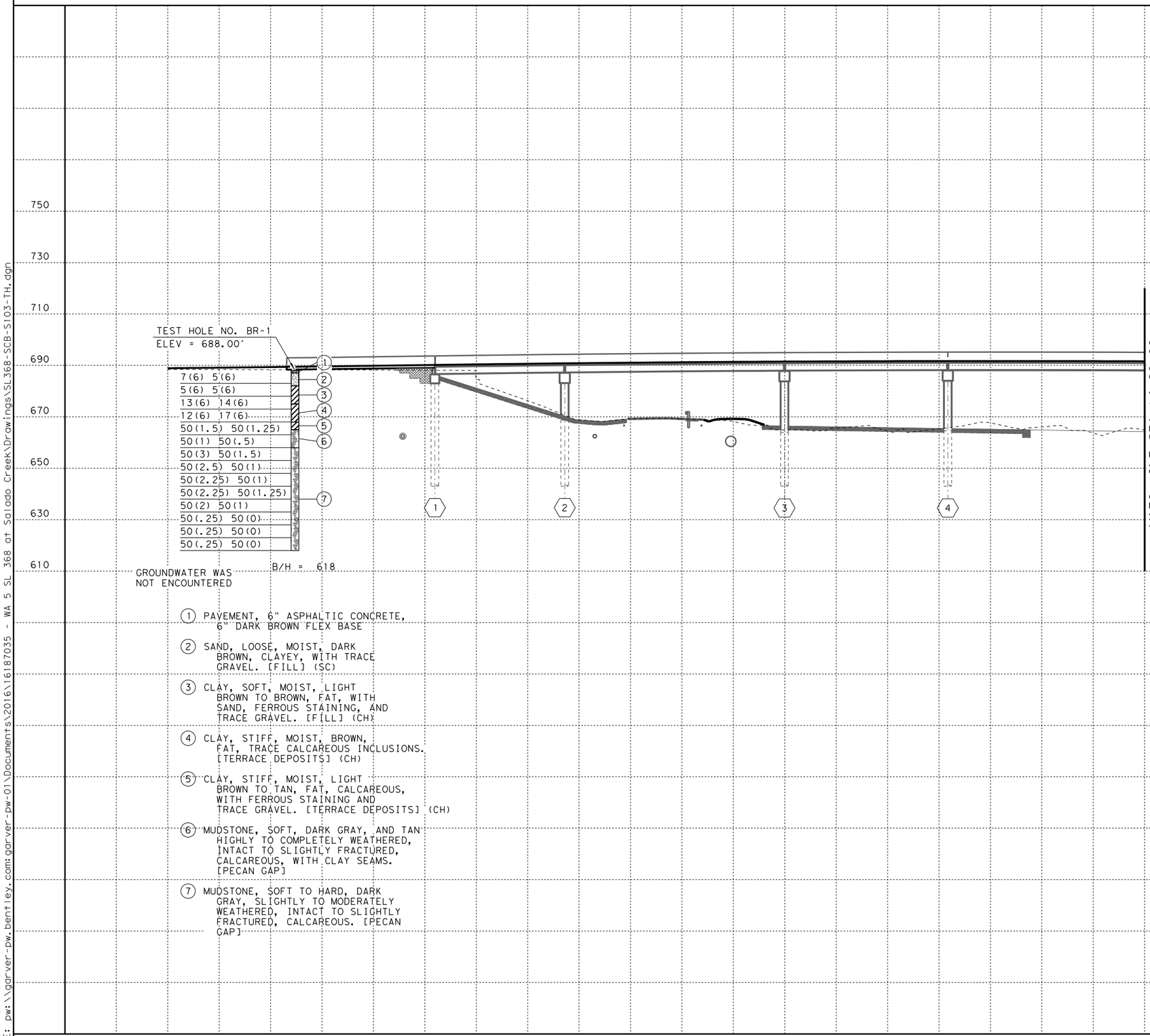

(1) PAVEMENT, 6" ASPHALTIC CONCRETE, 6" DARK BROWN FLEX BASE

(2) SAND, LOOSE, MOIST, DARK BROWN, CLAYEY, WITH TRACE GRAVEL. [FILL] (SC)

(3) CLAY, SOFT, MOIST, LIGHT BROWN TO BROWN, FAT, WITH SAND, FERROUS STAINING, AND TRACE GRAVEL. [FILL] (CH)

(4) CLAY, STIFF, MOIST, BROWN, FAT, TRACE CALCAREOUS INCLUSIONS. [TERRACE DEPOSITS] (CH)

(5) CLAY, STIFF, MOIST, LIGHT BROWN TO TAN, FAT, CALCAREOUS, WITH FERROUS STAINING AND TRACE GRAVEL. [TERRACE DEPOSITS] (CH)

(6) MUDSTONE, SOFT, DARK GRAY, AND TAN HIGHLY TO COMPLETELY WEATHERED, INTACT TO SLIGHTLY FRACTURED, CALCAREOUS, WITH CLAY SEAMS. [PECAN GAP]

(7) MUDSTONE, SOFT TO HARD, DARK GRAY, SLIGHTLY TO MODERATELY WEATHERED, INTACT TO SLIGHTLY FRACTURED, CALCAREOUS. [PECAN GAP]

GENERAL NOTES:

TEST HOLE LOGS DEPICTED ARE A DIRECT REPRODUCTION OF THE SIGNED/SEALED TEST HOLE LOGS OBTAINED BY HVJ DATED 03/26/19.

HL 93 LOADING

0 20' 40'

SCALE: 1" = 40'

STATE OF TEXAS
LEONEL RUIZ
97291
LICENSED
PROFESSIONAL ENGINEER

12-04-2020

HVJ ASSOCIATES

Texas Department of Transportation

SL 368
AT SALADO CREEK

TEST HOLE DATA

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		168
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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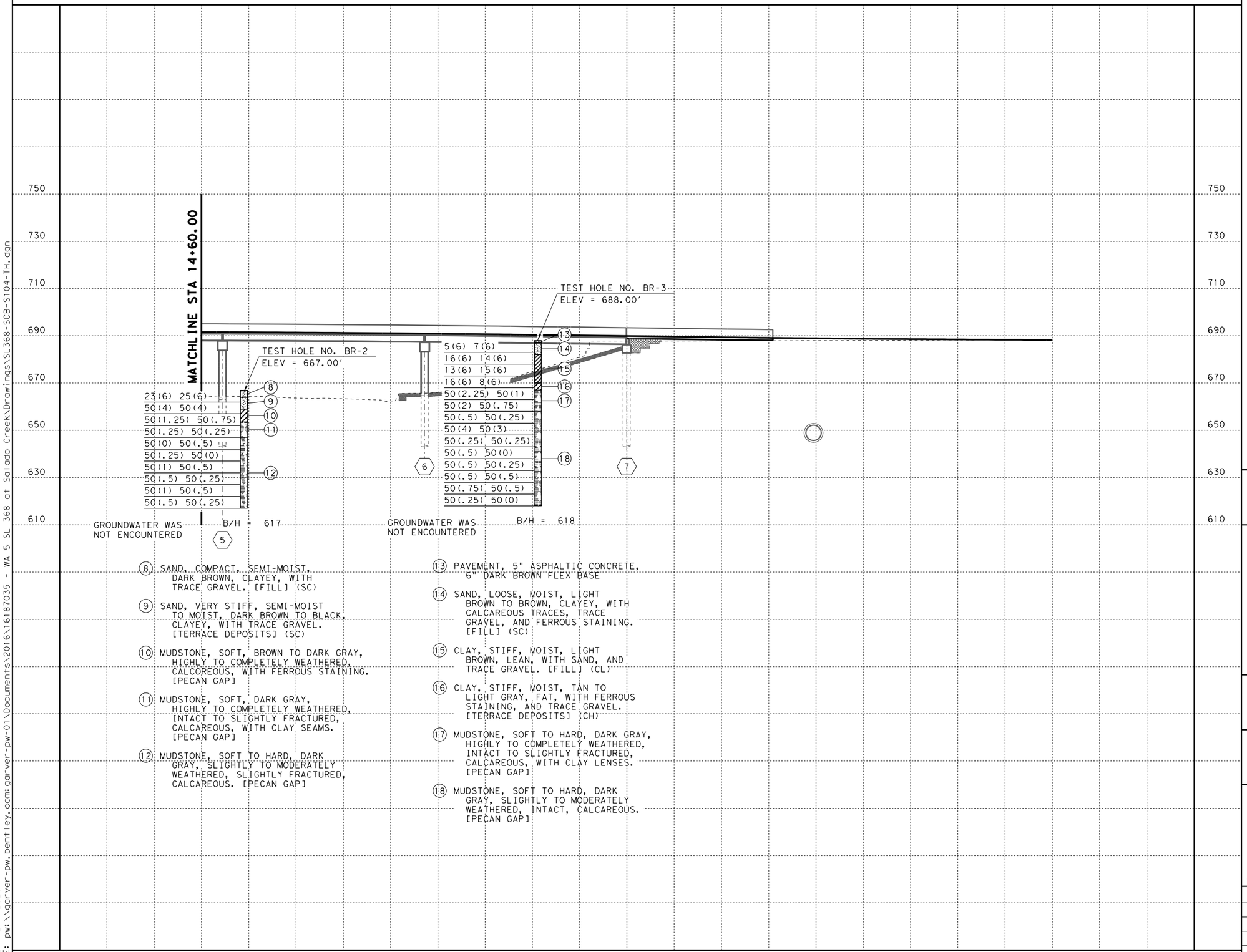

(8) SAND, COMPACT, SEMI-MOIST, DARK BROWN, CLAYEY, WITH TRACE GRAVEL. [FILL] (SC)

(9) SAND, VERY STIFF, SEMI-MOIST TO MOIST, DARK BROWN TO BLACK, CLAYEY, WITH TRACE GRAVEL. [TERRACE DEPOSITS] (SC)

(10) MUDSTONE, SOFT, BROWN TO DARK GRAY, HIGHLY TO COMPLETELY WEATHERED, CALCOREOUS, WITH FERROUS STAINING. [PECAN GAP]

(11) MUDSTONE, SOFT, DARK GRAY, HIGHLY TO COMPLETELY WEATHERED, INTACT TO SLIGHTLY FRACTURED, CALCAREOUS, WITH CLAY SEAMS. [PECAN GAP]

(12) MUDSTONE, SOFT TO HARD, DARK GRAY, SLIGHTLY TO MODERATELY WEATHERED, SLIGHTLY FRACTURED, CALCAREOUS. [PECAN GAP]

(13) PAVEMENT, 5" ASPHALTIC CONCRETE, 6" DARK BROWN FLEX BASE

(14) SAND, LOOSE, MOIST, LIGHT BROWN TO BROWN, CLAYEY, WITH CALCAREOUS TRACES, TRACE GRAVEL, AND FERROUS STAINING. [FILL] (SC)

(15) CLAY, STIFF, MOIST, LIGHT BROWN, LEAN, WITH SAND, AND TRACE GRAVEL. [FILL] (CL)

(16) CLAY, STIFF, MOIST, TAN TO LIGHT GRAY, FAT, WITH FERROUS STAINING, AND TRACE GRAVEL. [TERRACE DEPOSITS] (CH)

(17) MUDSTONE, SOFT TO HARD, DARK GRAY, HIGHLY TO COMPLETELY WEATHERED, INTACT TO SLIGHTLY FRACTURED, CALCAREOUS, WITH CLAY LENSES. [PECAN GAP]

(18) MUDSTONE, SOFT TO HARD, DARK GRAY, SLIGHTLY TO MODERATELY WEATHERED, INTACT, CALCAREOUS. [PECAN GAP]

HL 93 LOADING

0 20' 40'

SCALE: 1" = 40'

STATE OF TEXAS
LEONEL RUIZ
97291
LICENSED
PROFESSIONAL ENGINEER

12-04-2020

HVJ ASSOCIATES

Texas Department of Transportation

SL 368
AT SALADO CREEK

TEST HOLE DATA

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		169
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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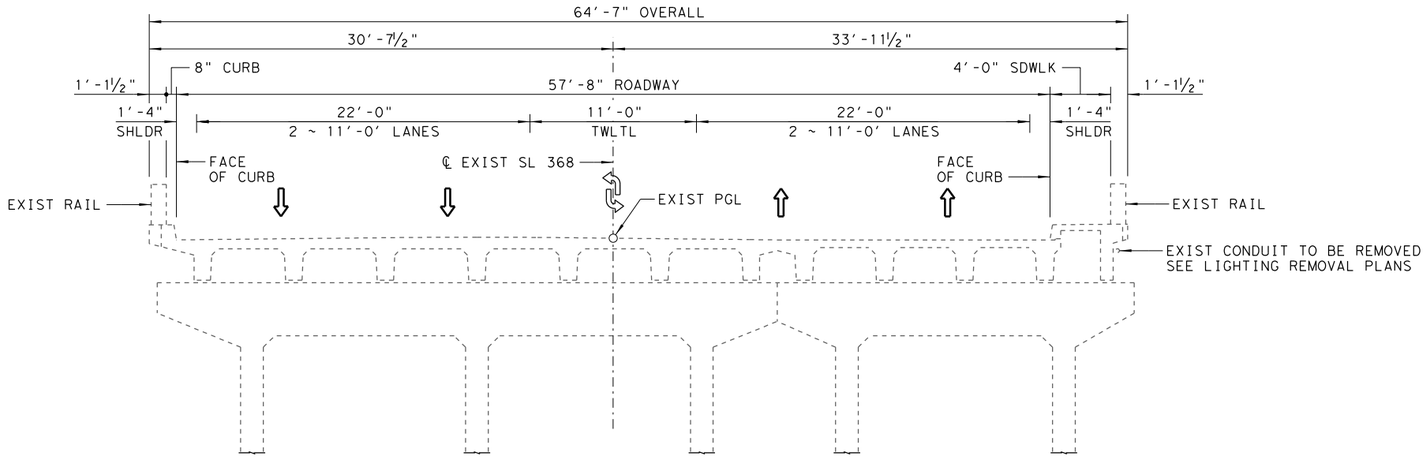
LEGEND

- EXISTING TO REMAIN THIS PHASE
- EXISTING STRUCTURE TO BE REMOVED THIS PHASE
- CONSTRUCTION THIS PHASE



CONSTRUCTION SEQUENCE - EXISTING

CONSTRUCTION SEQUENCE - PHASE I

HL 93 LOADING

0 5′ 10′

SCALE: 1" = 10′

STATE OF TEXAS
Blake W. Staton
121491
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1/27/2021

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Austin, TX 78704
(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

CONSTRUCTION SEQUENCE

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		170
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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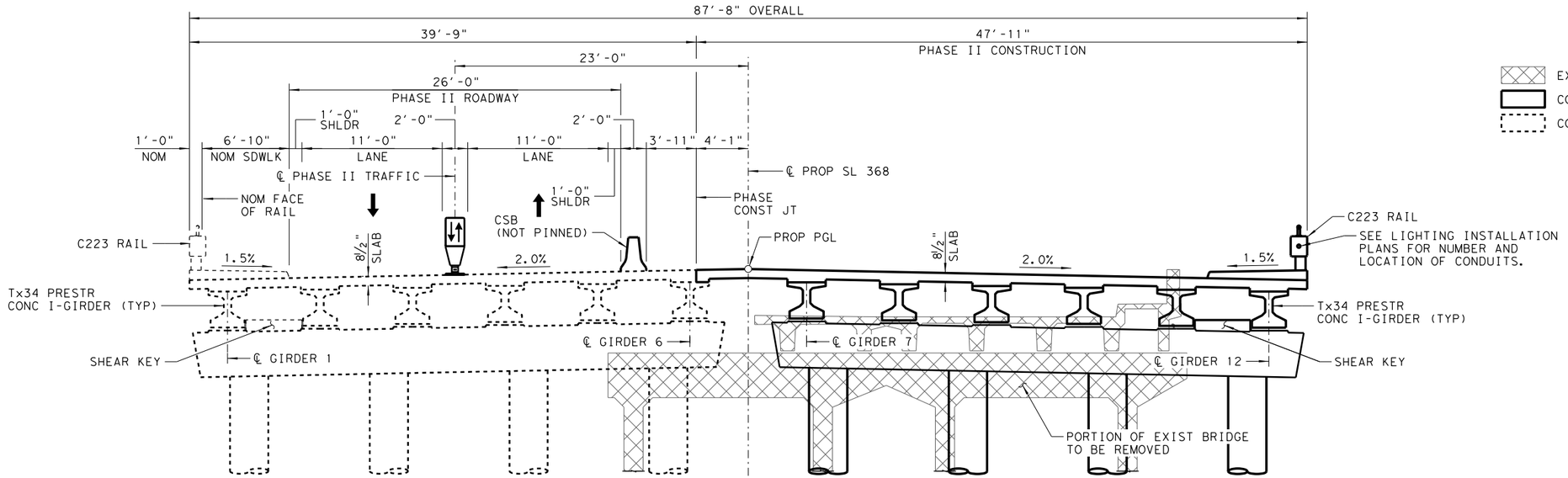
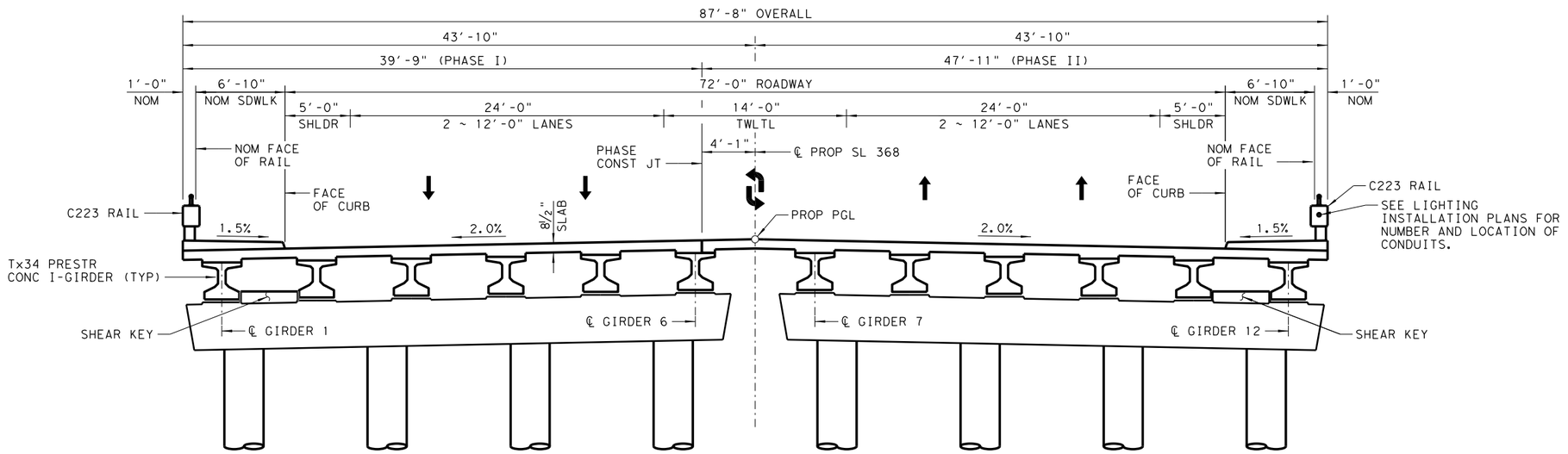


CONSTRUCTION SEQUENCE - PHASE II



COMPLETED TYPICAL SECTION

LEGEND

- EXISTING STRUCTURE TO BE REMOVED THIS PHASE
- CONSTRUCTION THIS PHASE
- CONSTRUCTED PREVIOUS PHASE

HL 93 LOADING

0 5′ 10′

SCALE: 1" = 10′

STATE OF TEXAS
Blake W. Staton
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1/27/2021

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SL 368
AT SALADO CREEK

CONSTRUCTION SEQUENCE

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		171
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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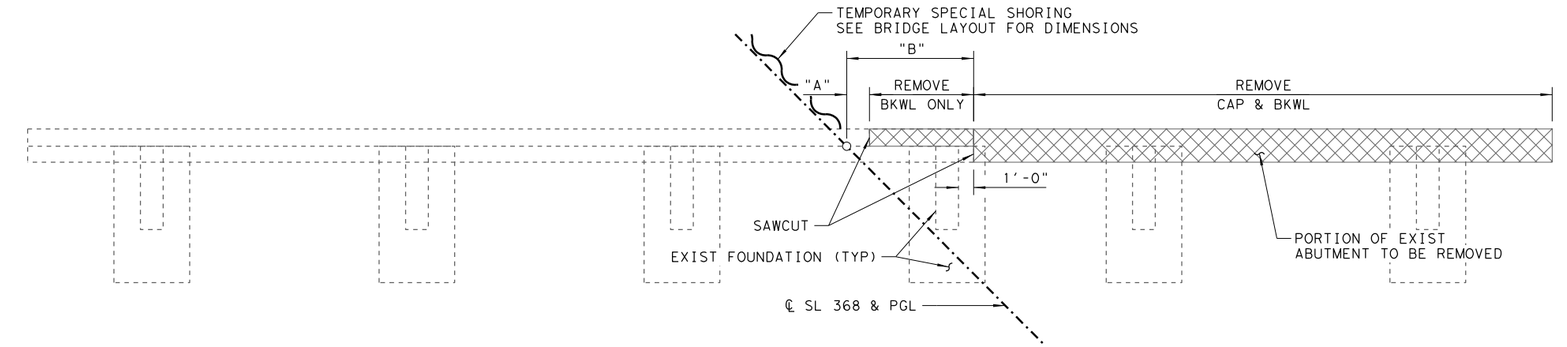
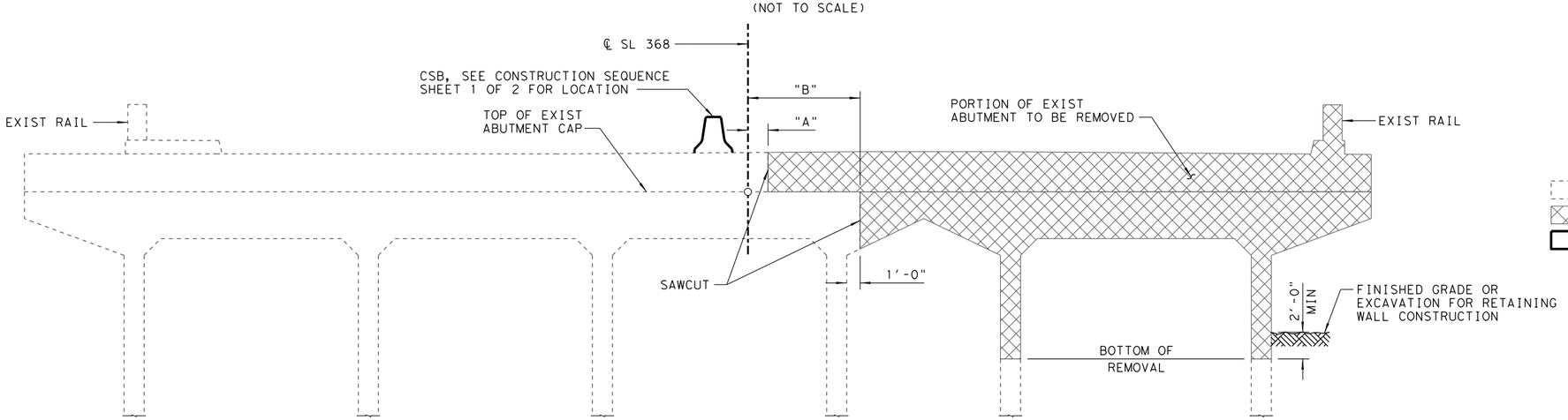


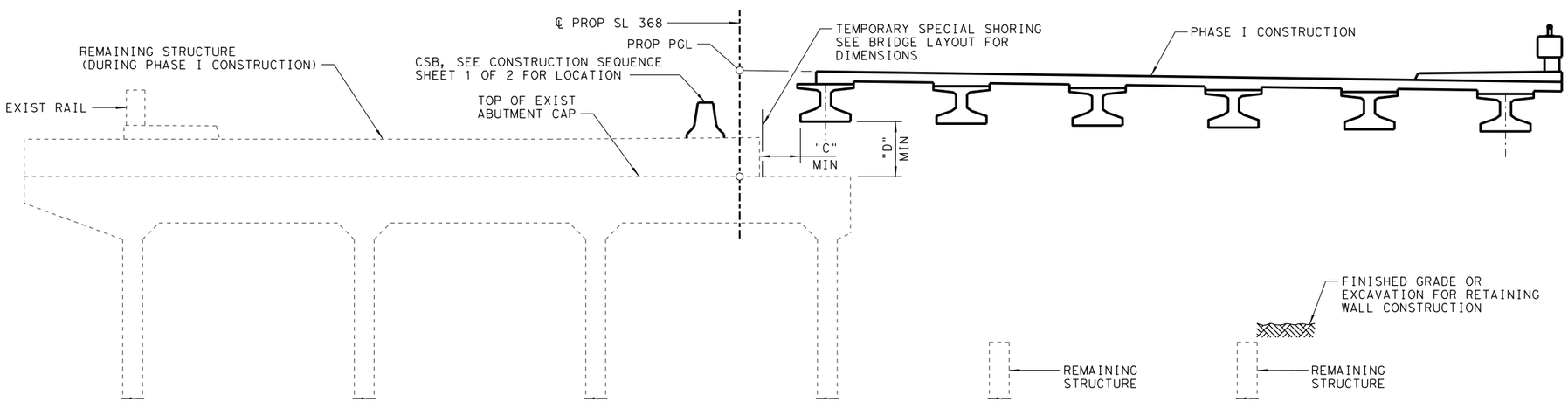
PLAN VIEW - EXISTING ABUTMENT PHASE I REMOVAL

(LOOKING BACK STATION)
(ABUTMENT NO. 1 SHOWN, ABUTMENT NO. 16 OPPOSITE HAND)
(NOT TO SCALE)



ELEVATION VIEW - EXISTING ABUTMENT PHASE I REMOVAL

(LOOKING BACK STATION, PERPENDICULAR TO ABUTMENT)
(ABUTMENT NO. 1 SHOWN, ABUTMENT NO. 16 OPPOSITE HAND)
(NOT TO SCALE)



ELEVATION VIEW - EXISTING ABUTMENT PHASE I CONSTRUCTION

(LOOKING BACK STATION, PERPENDICULAR TO ABUTMENT)
(ABUTMENT NO. 1 SHOWN, ABUTMENT NO. 16 OPPOSITE HAND)
(NOT TO SCALE)

GENERAL NOTES:

ALL DIMENSIONS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

TABLE OF VARIABLE DIMENSIONS				
ABUTMENT NO.	"A"	"B"	"C"	"D"
1	1'-6"	6'-7 1/4"	1'-3 3/4"	2'-0"
16	2'-6"	3'-5 1/4"	1'-5 3/4"	1'-7"

LEGEND

- EXISTING TO REMAIN THIS PHASE
- EXISTING STRUCTURE TO BE REMOVED THIS PHASE
- CONSTRUCTION THIS PHASE

HL 93 LOADING

0 5' 10'

SCALE: 1" = 10'

STATE OF TEXAS
Blake W. Staton
121491
LICENSED
PROFESSIONAL ENGINEER
1/27/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

REMOVAL SEQUENCE

SHEET 1 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		172
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

DATE: 1/27/2021 12:54:02 PM
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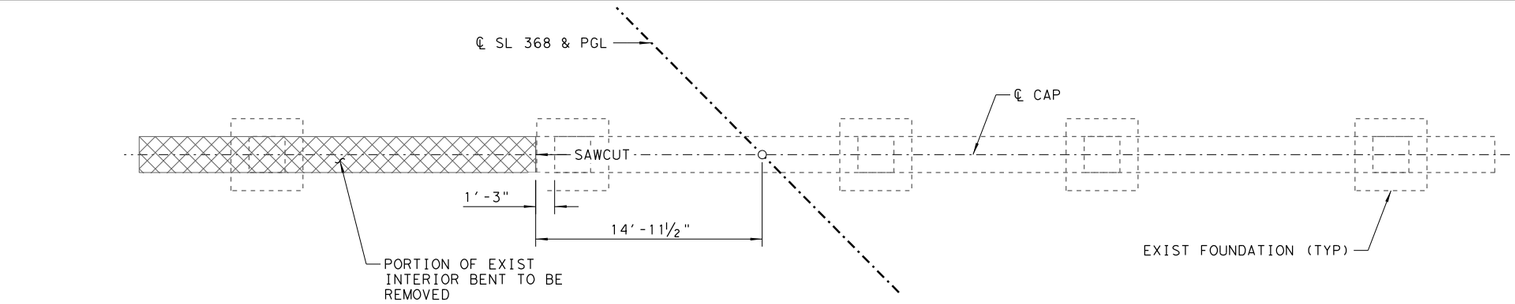
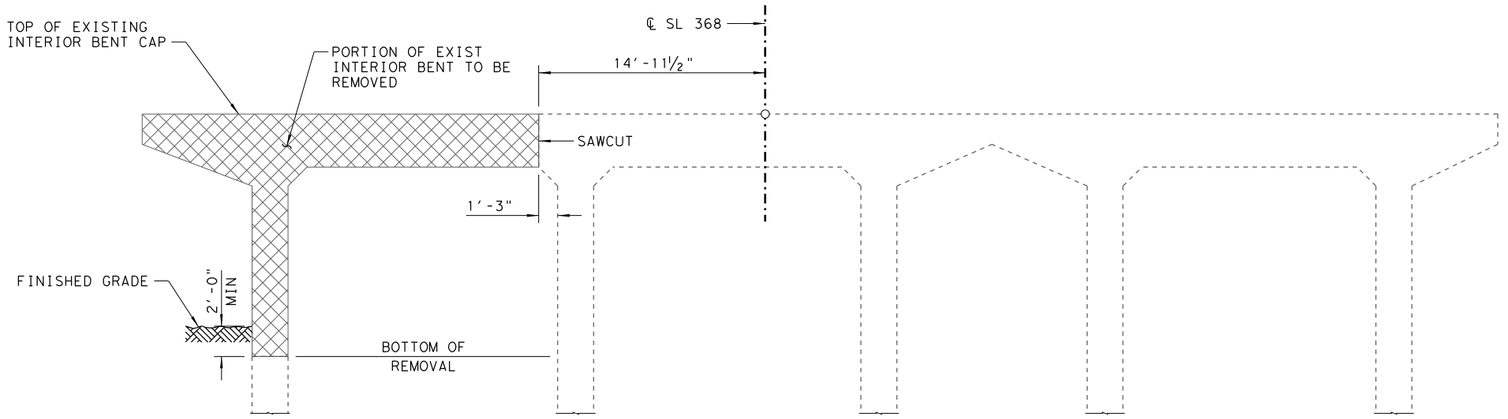


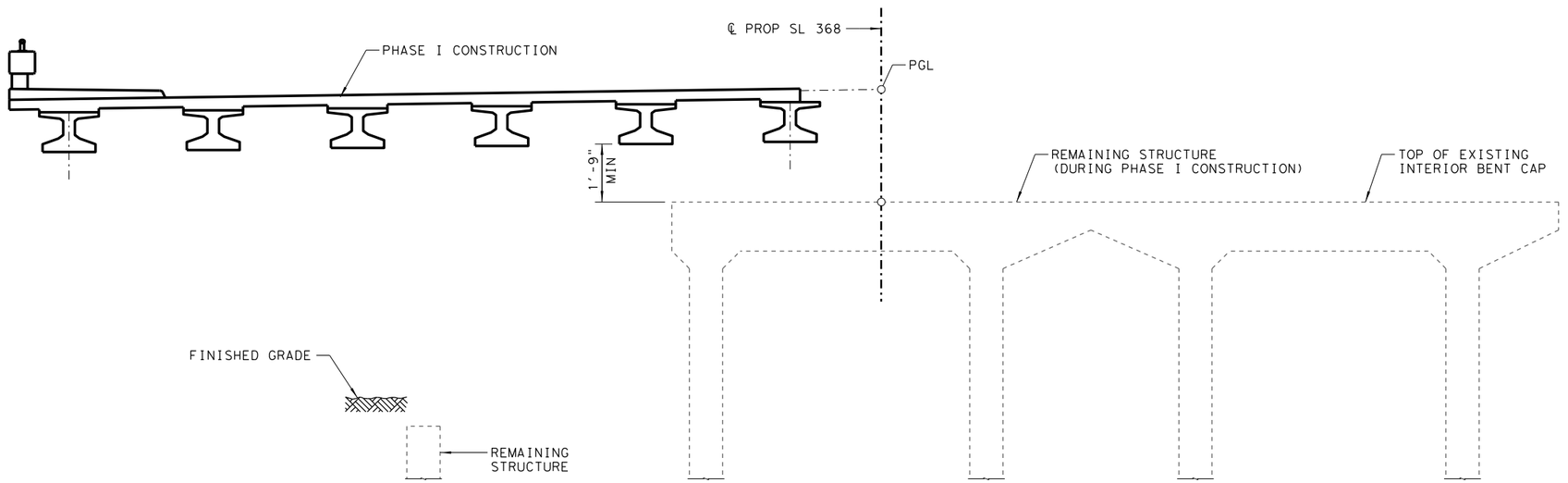
PLAN VIEW - EXISTING INTERIOR BENT PHASE I REMOVAL

(LOOKING FORWARD STATION)
(NOT TO SCALE)



ELEVATION VIEW - EXISTING INTERIOR BENT PHASE I REMOVAL

(LOOKING FORWARD STATION, PERPENDICULAR TO INTERIOR BENT)
(NOT TO SCALE)



ELEVATION VIEW - EXISTING INTERIOR BENT PHASE I CONSTRUCTION

(LOOKING FORWARD STATION, PERPENDICULAR TO INTERIOR BENT)
(NOT TO SCALE)

GENERAL NOTES:

ALL DIMENSIONS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

LEGEND

- EXISTING TO REMAIN THIS PHASE
- EXISTING STRUCTURE TO BE REMOVED THIS PHASE
- CONSTRUCTION THIS PHASE

HL 93 LOADING

0 5′ 10′

SCALE: 1" = 10′

STATE OF TEXAS
Blake W. Staton
121491
LICENSED PROFESSIONAL ENGINEER
1/27/2021

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Austin, TX 78704
(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

REMOVAL SEQUENCE

SHEET 2 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		173
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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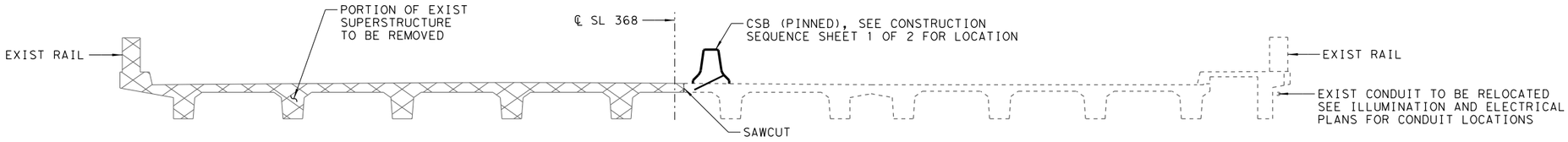
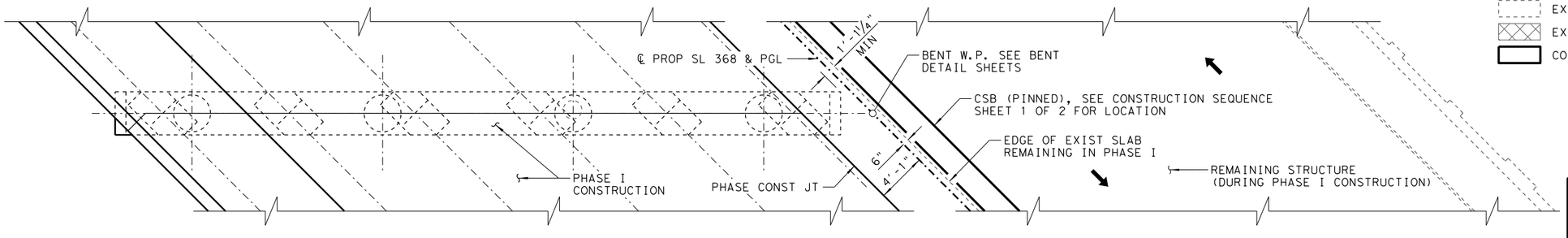
GENERAL NOTES:

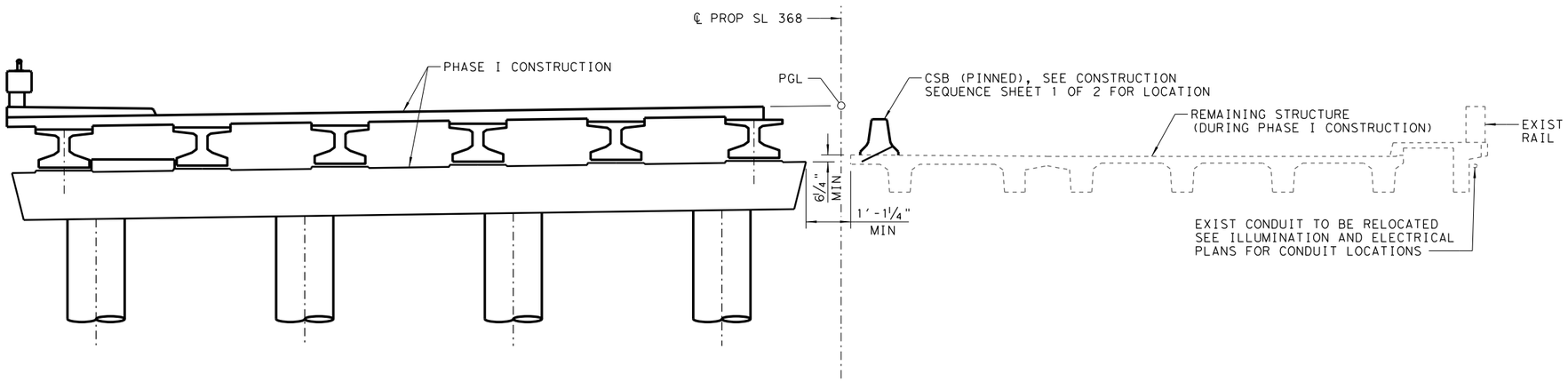
ALL DIMENSIONS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.



ELEVATION VIEW - EXISTING SUPERSTRUCTURE PHASE I REMOVAL



PLAN VIEW - PHASE I CONSTRUCTION AT PROPOSED INTERIOR BENT



ELEVATION VIEW - PHASE I CONSTRUCTION AT PROPOSED INTERIOR BENT

LEGEND

- EXISTING TO REMAIN THIS PHASE
- EXISTING STRUCTURE TO BE REMOVED THIS PHASE
- CONSTRUCTION THIS PHASE

HL 93 LOADING

0 5′ 10′

SCALE: 1" = 10′

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AT SALADO CREEK

REMOVAL SEQUENCE

SHEET 3 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		174
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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SUMMARY OF ESTIMATED QUANTITIES

	BID ITEM NUMBER	400 6004	400 6005	416 6004	420 6013	420 6029	420 6037	420 6043	422 6001	422 6013	422 6015	425 6036	442 6007	450 6032	454 6018	459 6007	459 6009	496 6010	496 6065	4171 6001
	BID ITEM DESCRIPTION	STRUCT EXCAV (BRIDGE)	CEM STABIL BKFL	DRILL SHAFT (36 IN)	CL C CONC (ABUT)	CL C CONC (CAP)	CL C CONC (COLUMN)	CL C CONC (FOOTING)	REINF CONC SLAB	BRIDGE SIDEWALK	APPROACH SLAB	PRESTR CONC GIRDER (Tx34)	STR STEEL (MISC NON-BRIDGE) (1)	RAIL (TY C223)	SEALED EXPANSION JOINT (4 IN) (SEJ-M)	GABION MATTRESSES (GALV) (12 IN)	GABIONS (3' X 3') (GALV)	REMOV STR (BRIDGE 100-499FT LENGTH)	REMOV STR (LRG PED BRG) 0-50FT LENGTH)	INSTALL BRIDGE IDENTIFICATION NUMBERS
	BRIDGE ELEMENT	CY	CY	LF	CY	CY	CY	CY	SF	SF	CY	LF	LB	LF	LF	SY	CY	EA	EA	EA
PHASE 1	2 ~ ABUTMENTS		10	600	52.3					846 (2)	192.3		252		92					
PHASE 1	5 ~ INTERIOR BENTS	38		1,100		138.0	97.5	17.2					126		46					
PHASE 1	1 ~ 199.50' PRESTR CONC I-GIRDER UNIT								7,932	1,564		1,187.40	1,692	199.5						
PHASE 1	1 ~ 256.50' PRESTR CONC I-GIRDER UNIT								10,197	2,010		1,529.40	4,653	256.5						
PHASE 1																				
	PHASE 1 TOTAL	38	10	1,700	52.3	138.0	97.5	17.2	18,129	4,420	192.3	2,716.80	6,723	456.0	138					
PHASE 2	2 ~ ABUTMENTS		36	600	58.3					846 (2)	232.8		252		116					
PHASE 2	5 ~ INTERIOR BENTS	19		1,050		138.0	97.5	8.6					126		58					
PHASE 2	1 ~ 199.50' PRESTR CONC I-GIRDER UNIT								9,560	1,564		1,187.40	1,692	199.5						
PHASE 2	1 ~ 256.50' PRESTR CONC I-GIRDER UNIT								12,291	2,010		1,529.40	3,807	256.5						
PHASE 2																				
	PHASE 2 TOTAL	19	36	1,650	58.3	138.0	97.5	8.6	21,851	4,420	232.8	2,716.80	5,877	456.0	174					
	TOTAL	57	46	3,350	110.6	276.0	195.0	25.8	39,980	8,840	425.1	5,433.60	12,600	912.0	312	5,539.9	228.2	1	1	2

(1) QUANTITY IS FOR SIDEWALK EXPANSION JOINT COVER PLATES AND DRAIN COVER PLATES.

(2) QUANTITY IS FOR SIDEWALK ON APPROACH SLABS.

BEARING SEAT ELEVATIONS

		GIRDER 1	GIRDER 2	GIRDER 3	GIRDER 4	GIRDER 5	GIRDER 6	GIRDER 7	GIRDER 8	GIRDER 9	GIRDER 10	GIRDER 11	GIRDER 12
ABUT 1	(FWD)	685.597	685.658	685.715	685.769	685.820	685.870	685.750	685.511	685.271	685.031	684.791	684.551
BENT 2	(BK)	686.069	686.152	686.232	686.309	686.382	686.452	686.352	686.124	685.893	685.658	685.420	685.180
	(FWD)	686.085	686.170	686.251	686.328	686.402	686.473	686.374	686.147	685.917	685.683	685.446	685.206
BENT 3	(BK)	686.538	686.662	686.782	686.899	687.012	687.122	687.073	686.885	686.694	686.500	686.301	686.100
	(FWD)	686.544	686.668	686.789	686.907	687.021	687.132	687.084	686.897	686.707	686.514	686.316	686.116
BENT 4	(BK)	686.580	686.734	686.884	687.030	687.173	687.313	687.302	687.144	686.983	686.818	686.650	686.478
	(FWD)	686.577	686.732	686.883	687.030	687.174	687.315	687.305	687.148	686.987	686.824	686.656	686.486
BENT 5	(BK)	686.224	686.417	686.608	686.794	686.978	687.158	687.197	687.079	686.958	686.834	686.706	686.574
	(FWD)	686.210	686.404	686.595	686.783	686.967	687.148	687.189	687.072	686.952	686.828	686.701	686.571
BENT 6	(BK)	685.393	685.627	685.857	686.084	686.308	686.528	686.618	686.541	686.460	686.376	686.288	686.197
	(FWD)	685.368	685.603	685.834	686.062	686.287	686.508	686.599	686.523	686.443	686.359	686.272	686.182
ABUT 7	(BK)	684.300	684.539	684.777	685.015	685.253	685.491	685.609	685.558	685.506	685.454	685.402	685.350

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SL 368
AT SALADO CREEK

ESTIMATED QUANTITIES AND BEARING SEAT ELEVATIONS

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		175
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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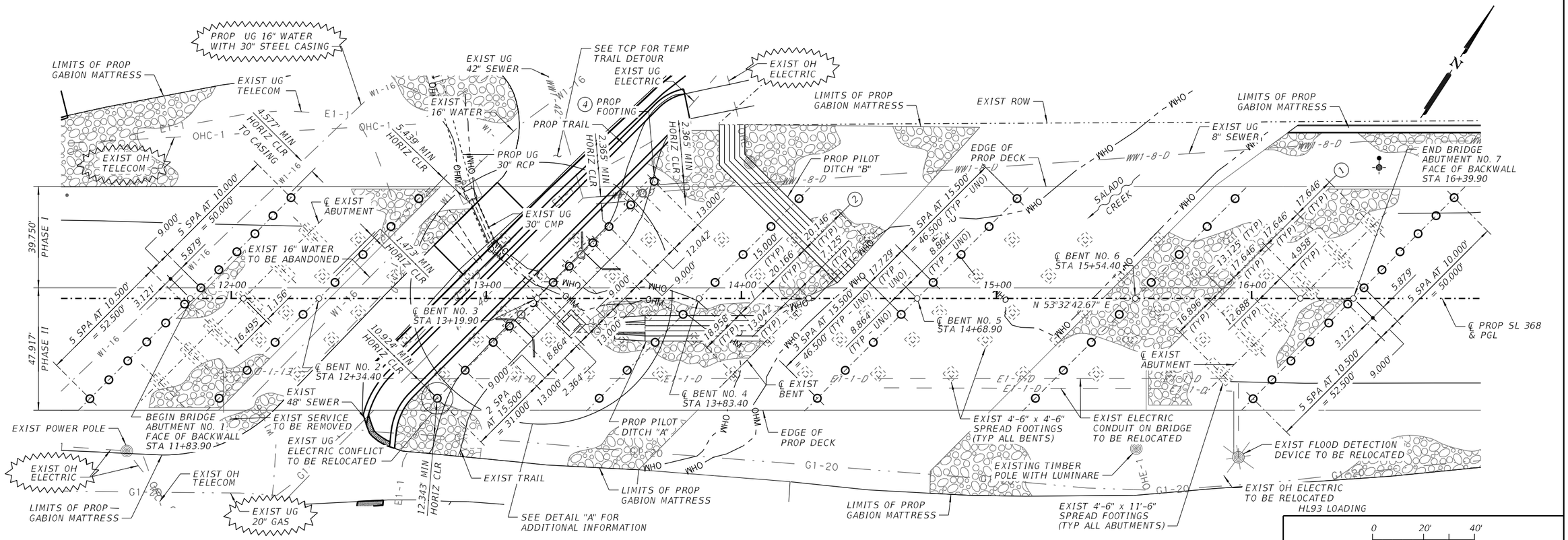
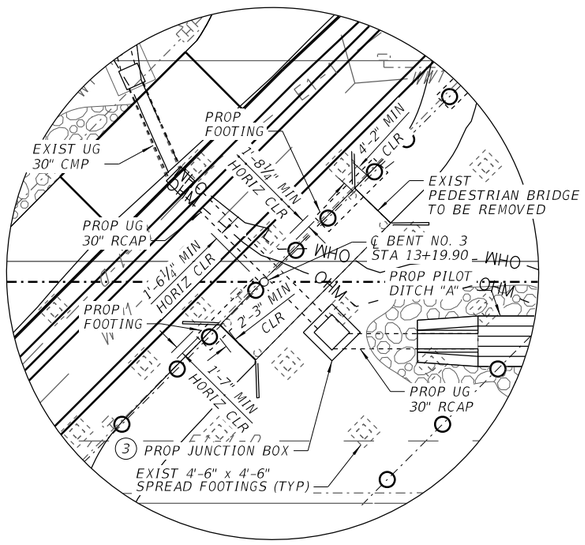


ALL ABUTMENTS AND BENTS ARE ON BEARING N 08°32'43" E

FOUNDATION LAYOUT

ALL DRILLED SHAFTS ARE 36" DIA UNLESS NOTED OTHERWISE



DETAIL "A"

SEE FOUNDATION LAYOUT FOR ADDITIONAL DIMENSIONS

EXISTING ABUTMENT AND BENT STATIONING AT ℄ SL 368	
ABUT 1	11+99.90
BENT 2	12+27.00
BENT 3	12+55.42
BENT 4	12+83.94
BENT 5	13+12.33
BENT 6	13+40.77
BENT 7	13+69.31
BENT 8	13+97.80
BENT 9	14+26.33
BENT 10	14+54.78
BENT 11	14+83.22
BENT 12	15+11.75
BENT 13	15+40.11
BENT 14	15+68.66
BENT 15	15+97.11
ABUT 16	16+24.09

(1) DIMENSIONS SHOWN FOR EXISTING ABUTMENT FOUNDATIONS ARE TYPICAL FOR BOTH ABUTMENTS AND ARE BASED ON AS-BUILT PLANS. FIELD CONDITIONS MAY VARY.

(2) DIMENSIONS SHOWN FOR EXISTING BENT FOUNDATIONS ARE BASED ON AS-BUILT PLANS. FIELD CONDITIONS MAY VARY.

(3) PARTIAL REMOVAL OF EXISING FOOTINGS MAY BE NECESSARY TO ACCOMODATE PROPOSED DITCH, CONTRACTOR TO VERIFY.

(4) CONTRACTOR TO EXPOSE UTILITIES WITHIN A 5 FOOT RADIUS PRIOR TO CONSTRUCTION OF PROPOSED DRILLED SHAFT FOUNDATIONS. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY CONFLICTS PRIOR TO CONSTRUCTION.

GENERAL NOTES:

CONTRACTOR MUST VERIFY THE EXACT LOCATIONS AND DEPTHS OF ALL UTILITIES PRIOR TO CONSTRUCTION AND FABRICATON. NOTIFY ENGINEER OF ANY CONFLICTS PRIOR TO CONSTRUCTION.

ALL CLEARANCES TO GAS LINES, WATER LINES, AND SANITARY SEWERS ARE MEASURED FROM THE FACE OF CONCRETE TO THE OUTSIDE FACE OF THE UTILITY.

SEE FOOTING DETAILS FOR INTERIOR BENT NO. 3 DRILLED SHAFT DETAILS.

SEE FOUNDATION DETAIL STANDARD SHEET, FD, FOR ALL FOUNDATION DETAILS AND NOTES NOT SHOWN FOR ABUTMENTS AND BENTS.

SEE BRIDGE LAYOUT FOR SHAFT LENGTHS.

SEE TEST HOLE DATA SHEET FOR TEST HOLE INFORMATION NOT SHOWN.

REFER TO GEOTECHNICAL REPORT, SECTION 5.8, DRILLED SHAFT CONSTRUCTION RECOMMENDATIONS, RELATED TO CONSTRUCTION USING CASING, CLEANING OF DRILLED SHAFT HOLE PRIOR TO CONCRETE PLACEMENT, AND ALL OTHER ITEMS RELATED TO FOUNDATION CONSTRUCTION.

THE CONTRACTOR SHALL BE ADVISED THAT GROUND WATER AND INUNDATION DUE TO FLOODING MAY BE EXPERIENCED DURING DRILLED SHAFT CONSTRUCTION. APPROPRIATE MEASURES TO STABILIZE THE DRILLED SHAFT HOLES IF GROUND WATER OR CAVING OF THE SOILS IS ENCOUNTERED. TEMPORARY CASING AND/OR SLURRY METHODS, IN ACCORDANCE WITH TXDOT ITEM 416, MAY BE NECESSARY. USE OF CLASS "SS" CONCRETE MAY BE REQUIRED.

THE CONTRACTOR MAY NOT CONSTRUCT HAUL ROADS ACROSS OR OPERATE EQUIPMENT WITHIN THE CREEK.

NEITHER TEMPORARY NOR PERMANENT CASING SHOULD BE USED WITHIN THE ROCK SOCKET.

CONTRACTOR SHALL NOT OPERATE CONSTRUCTION EQUIPMENT WITHIN 5 FEET OF UNDERGROUND GAS LINES OR UNDERGROUND WATER LINES.

STATE OF TEXAS
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1/27/2021

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TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

FOUNDATION LAYOUT

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		176
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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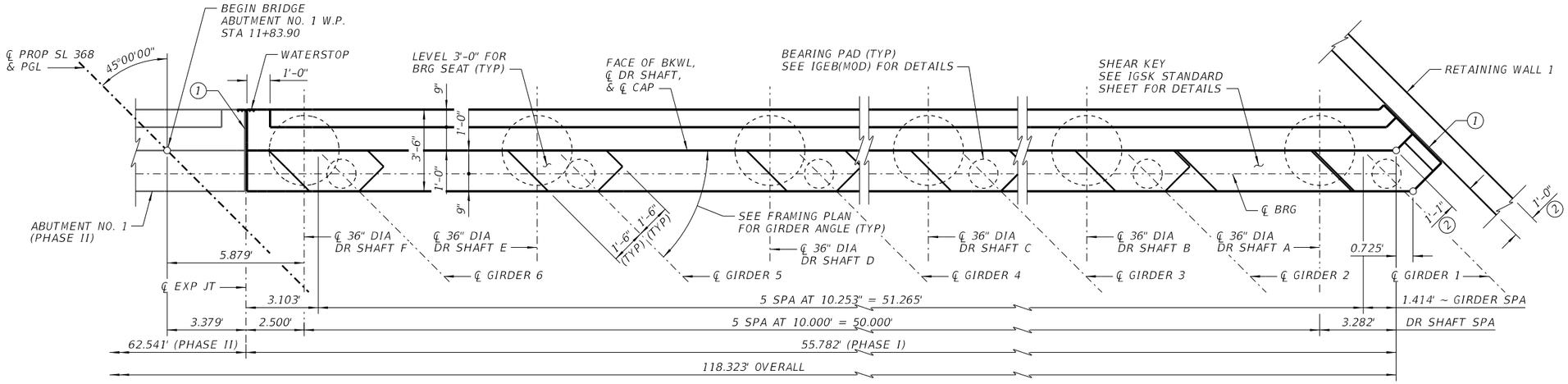
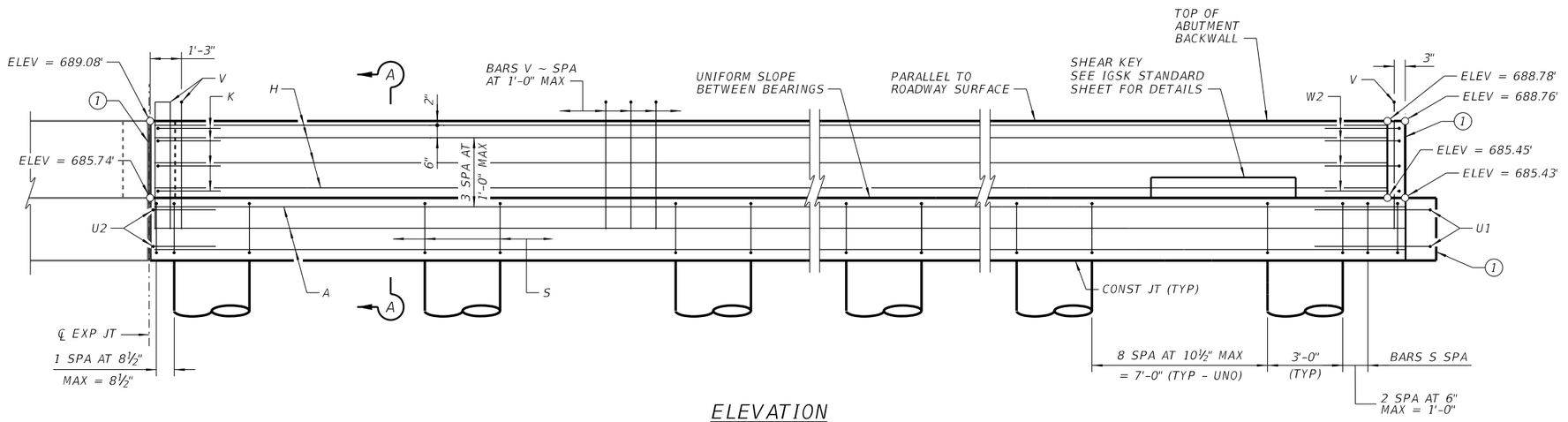


PLAN
(LOOKING BACK STATION)



ELEVATION
(LOOKING BACK STATION)
(MSE WALLS NOT SHOWN FOR CLARITY)

1. 1" PREFORMED JOINT MATERIAL. INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.4.7.6.
2. DIMENSION IS BASED ON ASSUMED WALL PANEL AND COPING DIMENSIONS. THE CONTRACTOR SHALL ACCOUNT FOR THEIR CHOSEN WALL GEOMETRY AND ADJUST THESE DIMENSIONS AND ASSOCIATED REINFORCING ACCORDINGLY.

NOTE:

SEE ABUTMENT DETAILS SHEET FOR SECTION A-A, MISCELLANEOUS DETAILS, BAR DETAILS, ESTIMATED QUANTITIES, AND GENERAL NOTES.

HL93 LOADING

STATE OF TEXAS
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SL 368
AT SALADO CREEK

ABUTMENT NO. 1 (PHASE I)

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		177
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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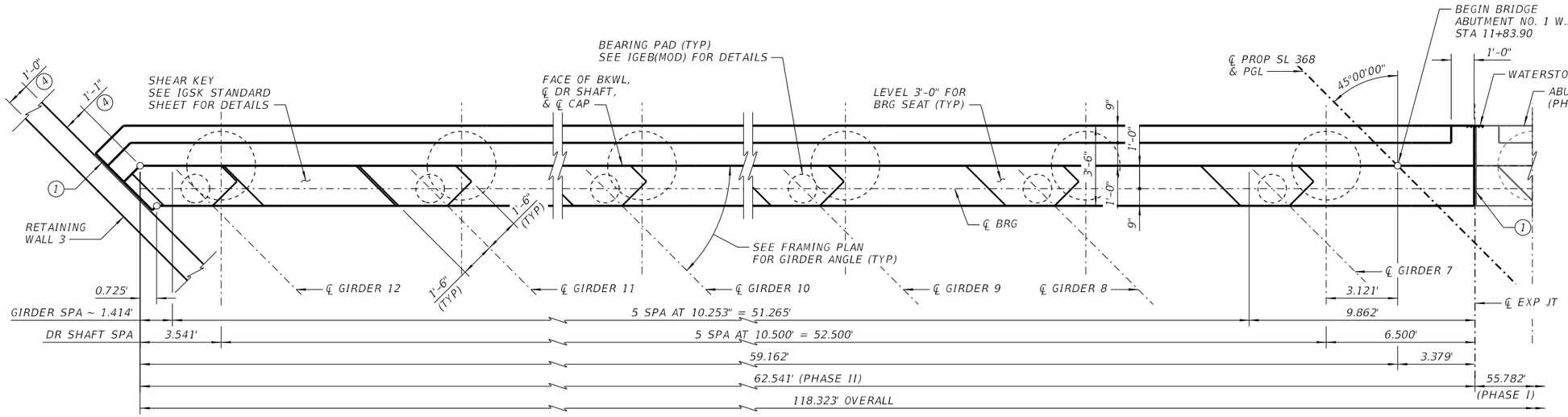


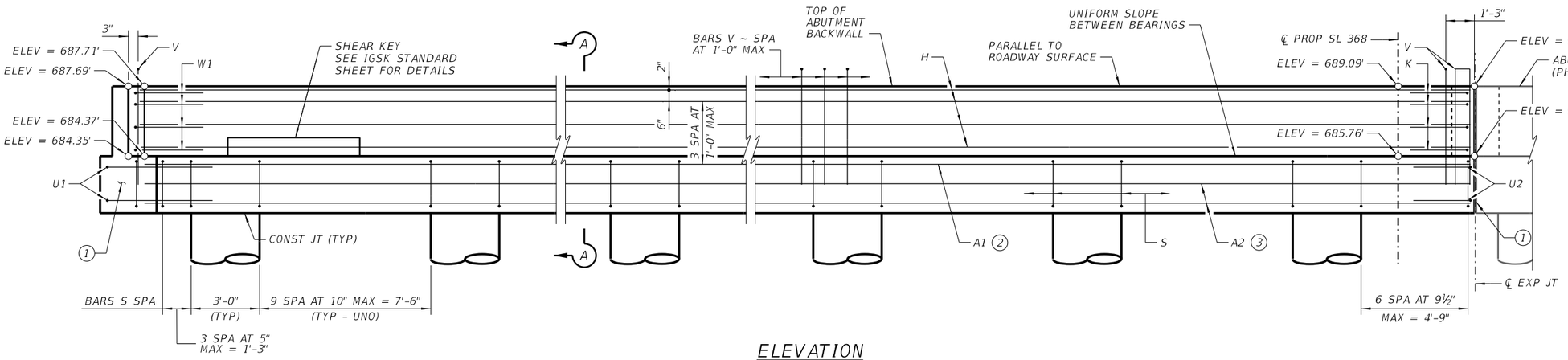
PLAN

(LOOKING BACK STATION)

1. 1" PREFORMED JOINT MATERIAL. INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.4.7.6.
2. LAP SLPICE BARS BY ALTERNATING LOCATION OF SPLICES BETWEEN DRILLED SHAFT BAY 2 AND 4, SUCH THAT NO MORE THAN HALF OF THE BARS ARE SPLICED AT ON LOCATION. CENTER SPLICES IN CENTER OF BAYS.
3. LAP SPLICE BARS IMMEDIATELY ADJACENT TO DRILLED SHAFT AND EXTEND INTO BAY. SPLICES SHALL ALTERNATE ON EITHER SIDE OF DRILLED SHAFT SUCH THAT NO MORE THAN HALF OF THE BARS ARE SPLICED AT ONE LOCATION.
4. DIMENSION IS BASED ON ASSUMED WALL PANEL AND COPING DIMENSIONS. THE CONTRACTOR SHALL ACCOUNT FOR THEIR CHOSEN WALL GEOMETRY AND ADJUST THESE DIMENSIONS AND ASSOCIATED REINFORCING ACCORDINGLY.

NOTE:

SEE ABUTMENT DETAILS SHEET FOR SECTION A-A, MISCELLANEOUS DETAILS, BAR DETAILS, ESTIMATED QUANTITIES, AND GENERAL NOTES.



ELEVATION

(LOOKING BACK STATION)
(MSE WALLS NOT SHOWN FOR CLARITY)

HL93 LOADING

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SL 368
AT SALADO CREEK

ABUTMENT NO. 1 (PHASE II)

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		178
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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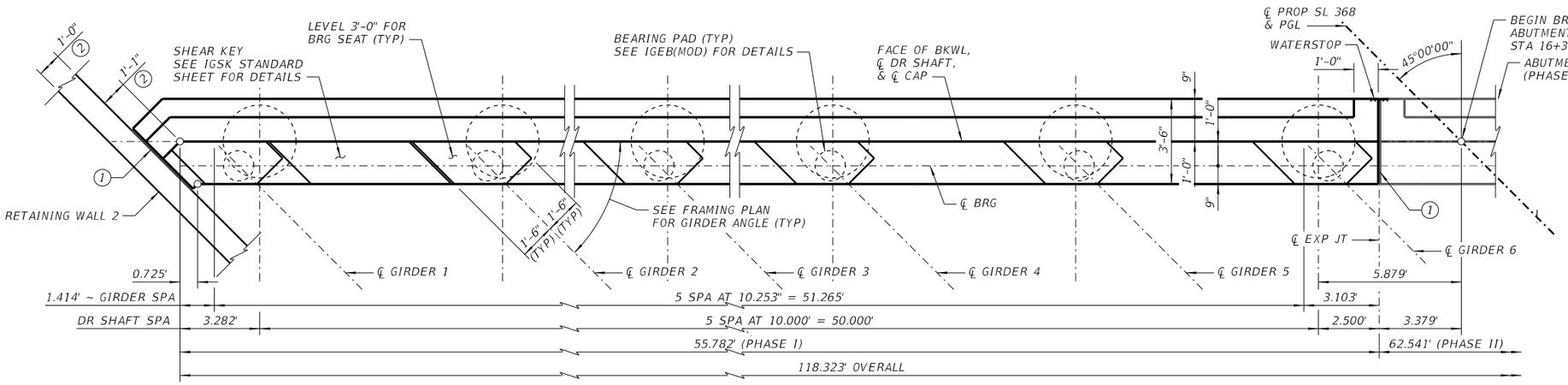

PLAN

(LOOKING UP STATION)

1. 1" PREFORMED JOINT MATERIAL. INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.4.7.6.
2. DIMENSION IS BASED ON ASSUMED WALL PANEL AND COPING DIMENSIONS. THE CONTRACTOR SHALL ACCOUNT FOR THEIR CHOSEN WALL GEOMETRY AND ADJUST THESE DIMENSIONS AND ASSOCIATED REINFORCING ACCORDINGLY.

NOTE:

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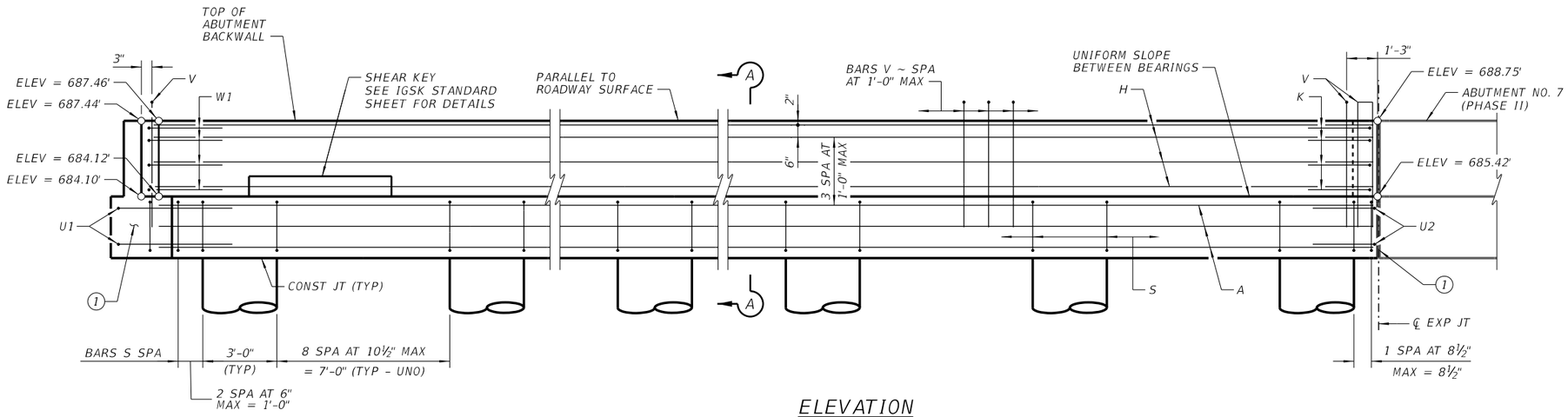

ELEVATION

(LOOKING UP STATION)
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HL93 LOADING

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SL 368
AT SALADO CREEK

ABUTMENT NO. 7
(PHASE I)

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		179
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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NOTE:

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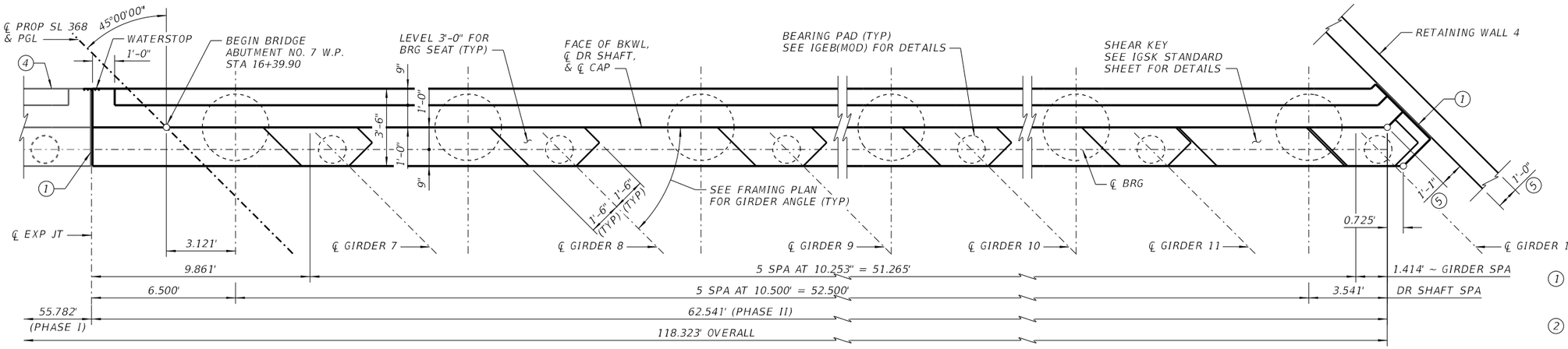
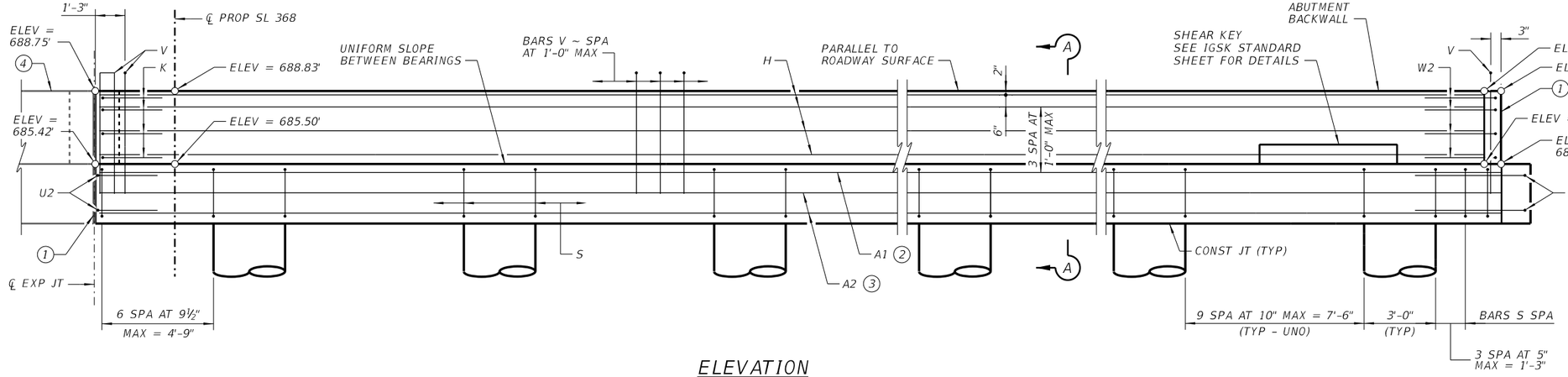


PLAN

(LOOKING UP STATION)



ELEVATION

(LOOKING UP STATION)
(MSE WALLS NOT SHOWN FOR CLARITY)

(1) 1" PREFORMED JOINT MATERIAL. INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.4.7.6.

(2) LAP SLPICE BARS BY ALTERNATING LOCATION OF SPLICES BETWEEN DRILLED SHAFT BAY 2 AND 4, SUCH THAT NO MORE THAN HALF OF THE BARS ARE SPLICED AT ON LOCATION. CENTER SPLICES IN CENTER OF BAYS.

(3) LAP SPLICE BARS IMMEDIATELY ADJACENT TO DRILLED SHAFT AND EXTEND INTO BAY. SPLICES SHALL ALTERNATE ON EITHER SIDE OF DRILLED SHAFT SUCH THAT NO MORE THAN HALF OF THE BARS ARE SPLICED AT ONE LOCATION.

(4) ABUTMENT NO. 7 (PHASE I)

(5) DIMENSION IS BASED ON ASSUMED WALL PANEL AND COPING DIMENSIONS. THE CONTRACTOR SHALL ACCOUNT FOR THEIR CHOSEN WALL GEOMETRY AND ADJUST THESE DIMENSIONS AND ASSOCIATED REINFORCING ACCORDINGLY.

HL93 LOADING

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SL 368
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ABUTMENT NO. 7 (PHASE II)

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		180
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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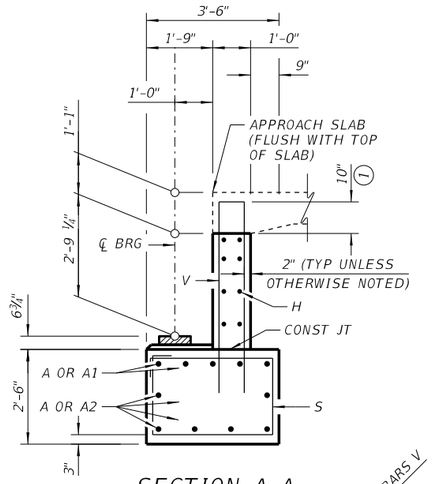
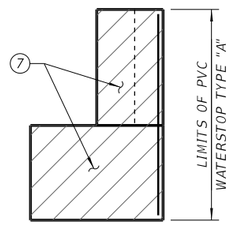
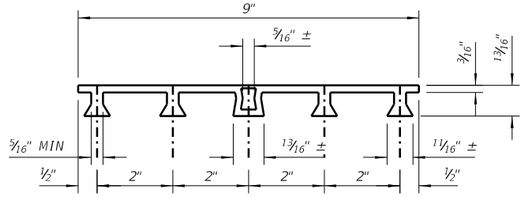


SECTION A-A

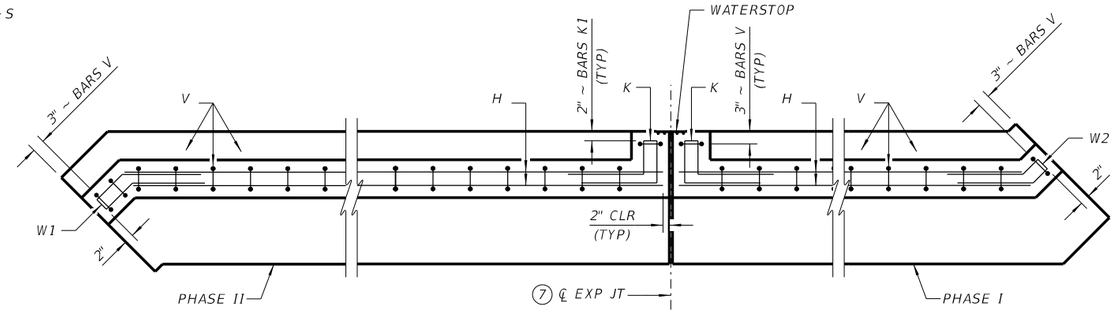


ABUTMENT JOINT

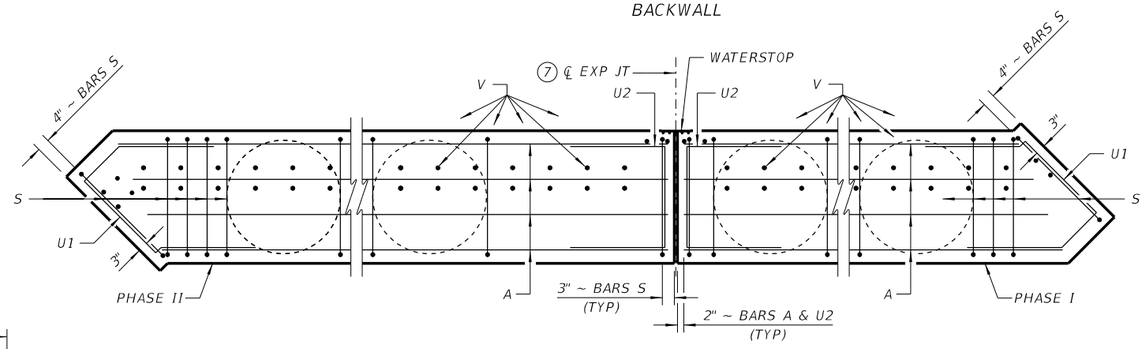


PVC WATERSTOP TYPE "A"

NOTE: DIMENSIONS AND SHAPES MAY VARY SLIGHTLY DEPENDING ON MANUFACTURE.



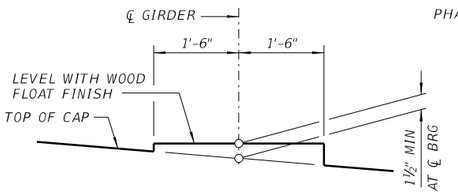
BACKWALL



CAP

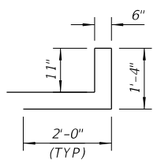
CORNER DETAILS

(SHOWING ABUTMENT NO. 1 PHASING)
(ABUTMENT 7 PHASING OPPOSITE)

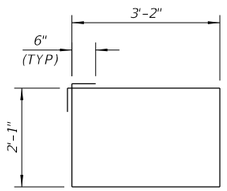


BEARING SEAT DETAIL

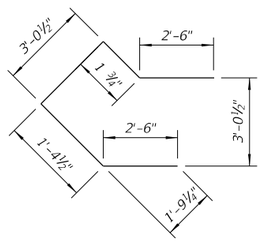
(BEARING SURFACE MUST BE CLEAN AND FREE OF ALL LOOSE MATERIAL BEFORE PLACING BEARING PAD)



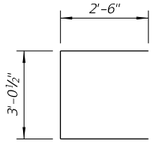
BARS K



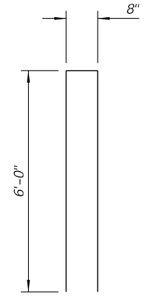
BARS S



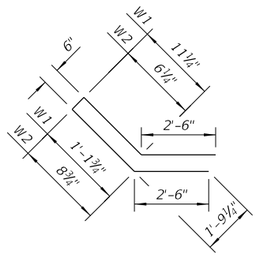
BARS U1



BARS U2



BARS V



BARS W1 & W2

TABLE OF ESTIMATED QUANTITIES ABUTMENT 1 (PHASE I)

	BAR	NO.	SIZE	LENGTH	WEIGHT
(6)	A	11	#11	55'-7"	3,249
(6)	H	8	#6	55'-4"	665
	K	4	#6	6'-9"	41
	S	51	#5	11'-6"	612
	U1	2	#6	9'-7"	29
	U2	2	#6	8'-1"	25
	V	58	#5	12'-8"	767
	W2	4	#6	6'-9"	41
(5)	REINFORCING STEEL		LB		5,429
	CL C CONC (ABUT)		CY		26.1

TABLE OF ESTIMATED QUANTITIES ABUTMENT 1 (PHASE II)

	BAR	NO.	SIZE	LENGTH	WEIGHT
(2)(6)	A1	5	#11	69'-2"	1,838
(3)(6)	A2	6	#11	67'-7"	2,155
(4)(6)	H	8	#6	64'-8"	778
	K	4	#6	6'-9"	41
	S	62	#5	11'-6"	744
	U1	2	#6	9'-7"	29
	U2	2	#6	8'-1"	25
	V	66	#5	12'-8"	872
	W1	4	#6	7'-7"	46
(5)	REINFORCING STEEL		LB		6,528
	CL C CONC (ABUT)		CY		29.2

TABLE OF ESTIMATED QUANTITIES ABUTMENT 7 (PHASE I)

	BAR	NO.	SIZE	LENGTH	WEIGHT
(6)	A	11	#11	55'-7"	3,224
(6)	H	8	#6	55'-9"	670
	K	4	#6	6'-9"	41
	S	51	#5	11'-6"	612
	U1	2	#6	9'-7"	29
	U2	2	#6	8'-1"	25
	V	58	#5	12'-8"	767
	W1	4	#6	7'-7"	46
(5)	REINFORCING STEEL		LB		5,439
	CL C CONC (ABUT)		CY		26.2

TABLE OF ESTIMATED QUANTITIES ABUTMENT 7 (PHASE II)

	BAR	NO.	SIZE	LENGTH	WEIGHT
(2)(6)	A1	5	#11	69'-2"	1,838
(3)(6)	A2	6	#11	67'-7"	2,155
(4)(6)	H	8	#6	64'-3"	778
	K	4	#6	6'-9"	41
	S	62	#5	11'-6"	744
	U1	2	#6	9'-7"	29
	U2	2	#6	8'-1"	25
	V	66	#5	12'-8"	872
	W2	4	#6	6'-9"	41
(5)	REINFORCING STEEL		LB		6,518
	CL C CONC (ABUT)		CY		29.1

(1) INCREASE AS REQUIRED TO MAINTAIN 3" FROM FINISHED GRADE

(2) INCLUDES ONE 6'-10" LAP LENGTH

(3) INCLUDES ONE 5'-3" LAP LENGTH

(4) INCLUDES ONE 2'-2" LAP LENGTH

(5) FOR CONTRACTORS INFORMATION ONLY.

(6) AVERAGE LENGTH

(7) 1" PREFORMED JOINT MATERIAL INSTALL EXPANSION JOINT MATERIAL IN ACCORDANCE WITH ITEM 420.4.7.6

GENERAL NOTES:

DESIGNED IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION (2017), WITH CURRENT INTERIMS.

SEE BRIDGE LAYOUT FOR FOUNDATION TYPE, SIZE, AND LENGTH.

SEE FD STANDARD FOR ALL FOUNDATION DETAILS AND NOTES NOT SHOWN.

CALCULATED DRILLED SHAFT FOUNDATION LOADS =
142 TONS/DR SH (ABUTMENT NO. 1)
142 TONS/DR SH (ABUTMENT NO. 7)

COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE. REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.

SEE ABUTMENT NO. 1 OR ABUTMENT NO. 7 SHEETS FOR PLAN AND ELEVATION.

MATERIAL NOTES:

PROVIDE CLASS "C" CONCRETE (f'c = 3,600 PSI).

PROVIDE GRADE 60 REINFORCING STEEL.

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1/27/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

ABUTMENT DETAILS

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		181
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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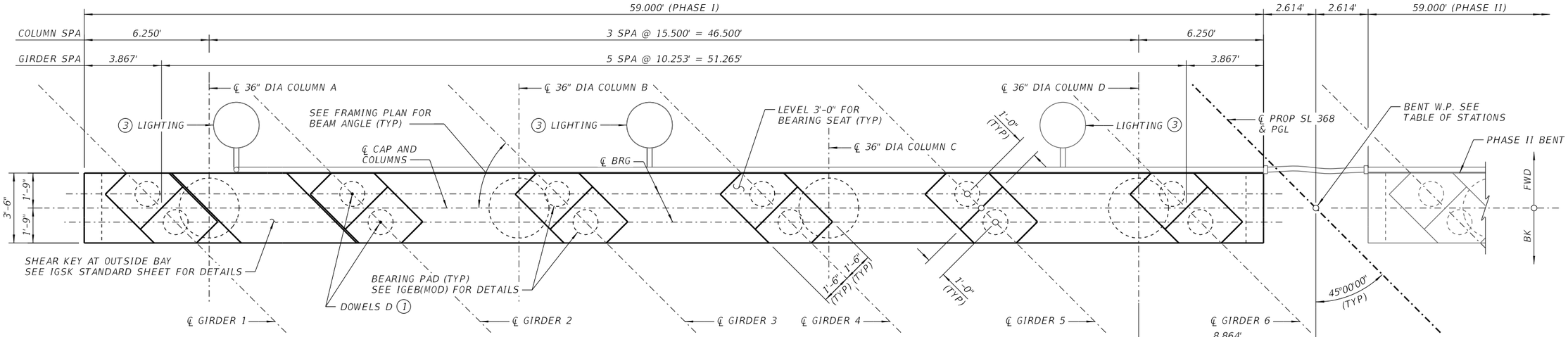
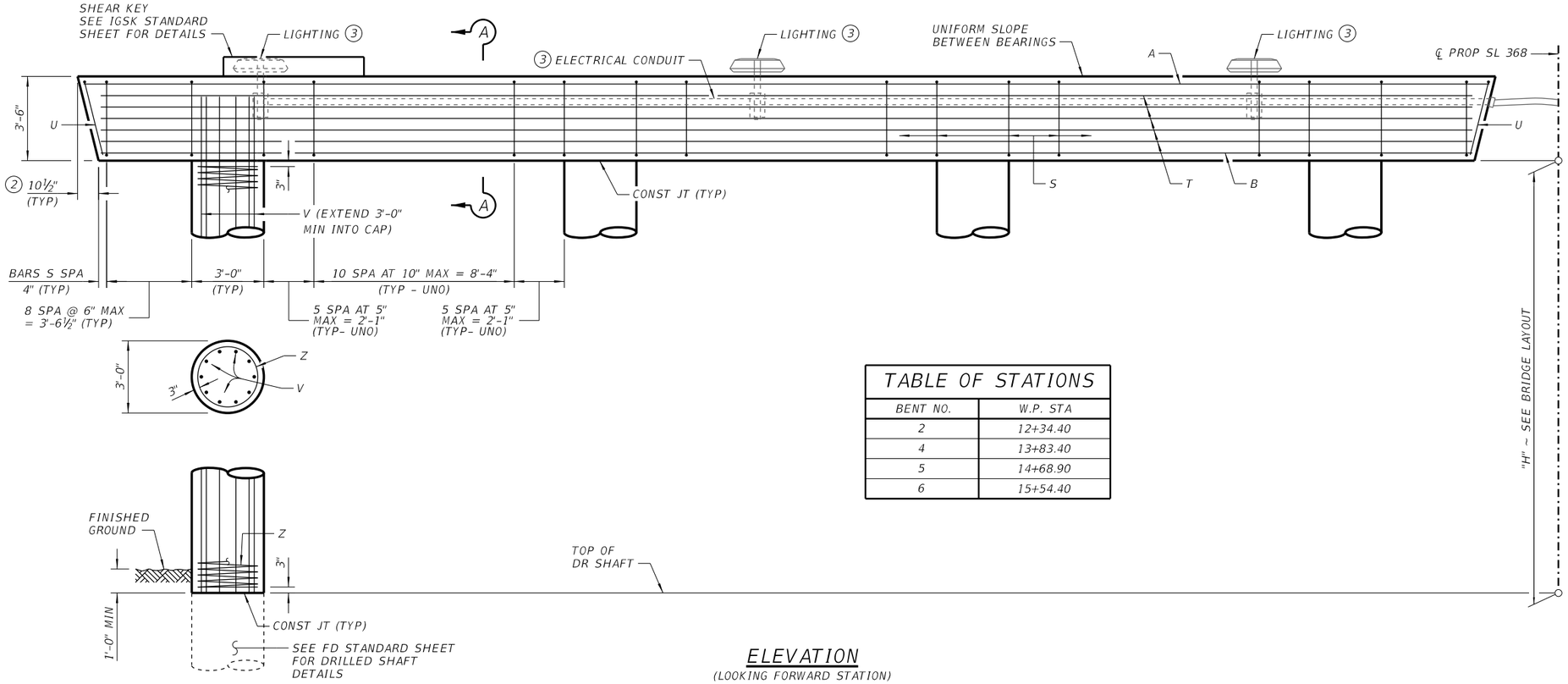


PLAN
(LOOKING FORWARD STATION)



ELEVATION
(LOOKING FORWARD STATION)

TABLE OF STATIONS	
BENT NO.	W.P. STA
2	12+34.40
4	13+83.40
5	14+68.90
6	15+54.40

NOTE: SEE "INTERIOR BENT DETAILS" SHEET FOR SECTION A-A, BAR DETAILS, ESTIMATED QUANTITIES, AND GENERAL NOTES.

(1) OMIT DOWELS D AT INTERIOR BENT NO. 4.

(2) MEASURED PARALLEL TO TOP OF CAP CROSS-SLOPE.

(3) ALL LIGHTING AND ASSOCIATED ELECTRICAL CONDUIT SHOWN APPLIES TO BENT NO. 2 ONLY. SEE LIGHTING INSTALLATION PLANS FOR DETAILS.

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INTERIOR BENT NOS. 2, 4 - 6 (PHASE I)

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		182
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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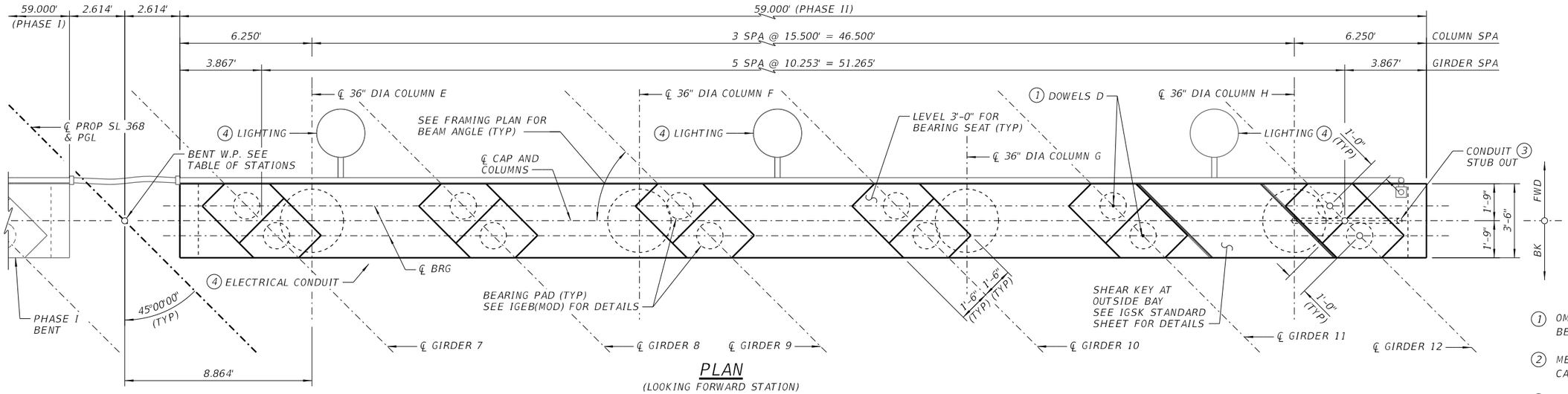
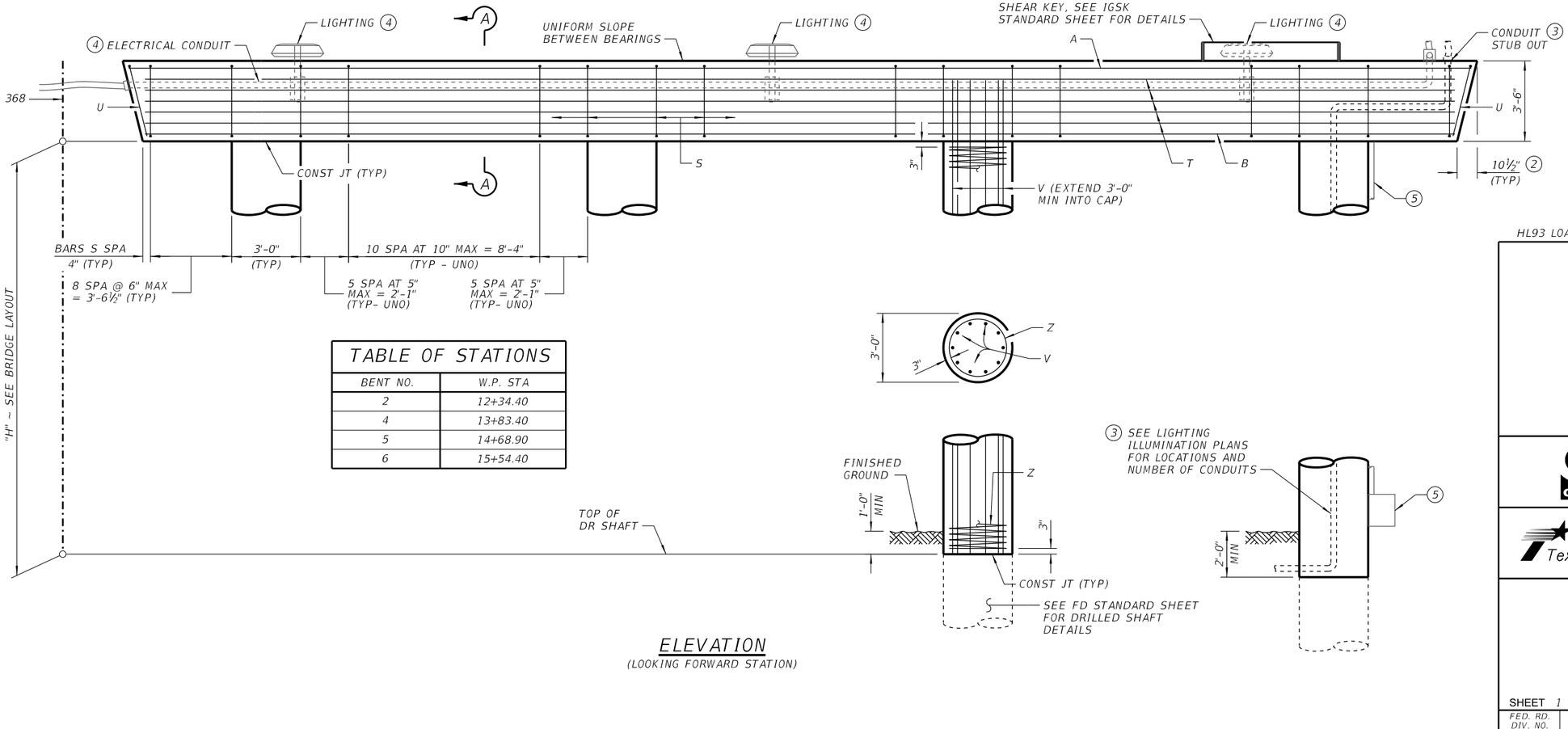


PLAN
(LOOKING FORWARD STATION)



ELEVATION
(LOOKING FORWARD STATION)

TABLE OF STATIONS	
BENT NO.	W.P. STA
2	12+34.40
4	13+83.40
5	14+68.90
6	15+54.40

1. OMIT DOWELS D AT INTERIOR BENT NO. 4.
2. MEASURED PARALLEL TO TOP OF CAP CROSS-SLOPE.
3. CONDUIT SHOWN APPLIES TO BENT NO. 2 ONLY.
4. ALL LIGHTING AND ASSOCIATED ELECTRICAL CONDUIT SHOWN APPLIES TO BENT NO. 2 ONLY. SEE LIGHTING INSTALLATION PLANS FOR DETAILS.
5. CONDUIT AND WATER LEVEL DETECTION EQUIPMENT ATTACHED TO COLUMN EXTERIOR APPLIES TO BENT NO. 5 ONLY. SEE LIGHTING INSTALLATION PLANS FOR DETAILS.

NOTE: SEE "INTERIOR BENT DETAILS" SHEET FOR SECTION A-A, BAR DETAILS, ESTIMATED QUANTITIES, AND GENERAL NOTES.

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SL 368
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INTERIOR BENT NOS. 2, 4 - 6 (PHASE II)

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		183
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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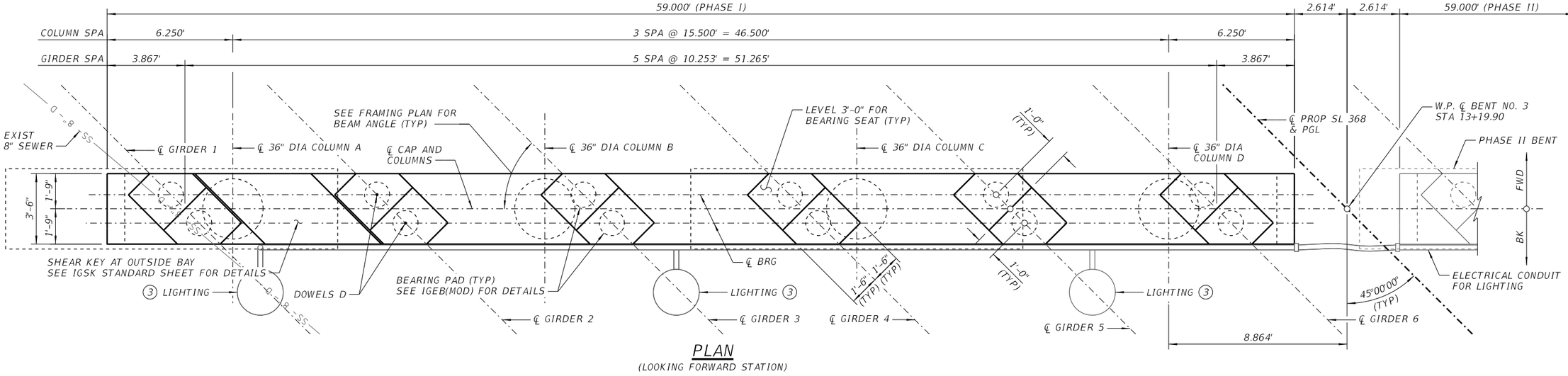

PLAN
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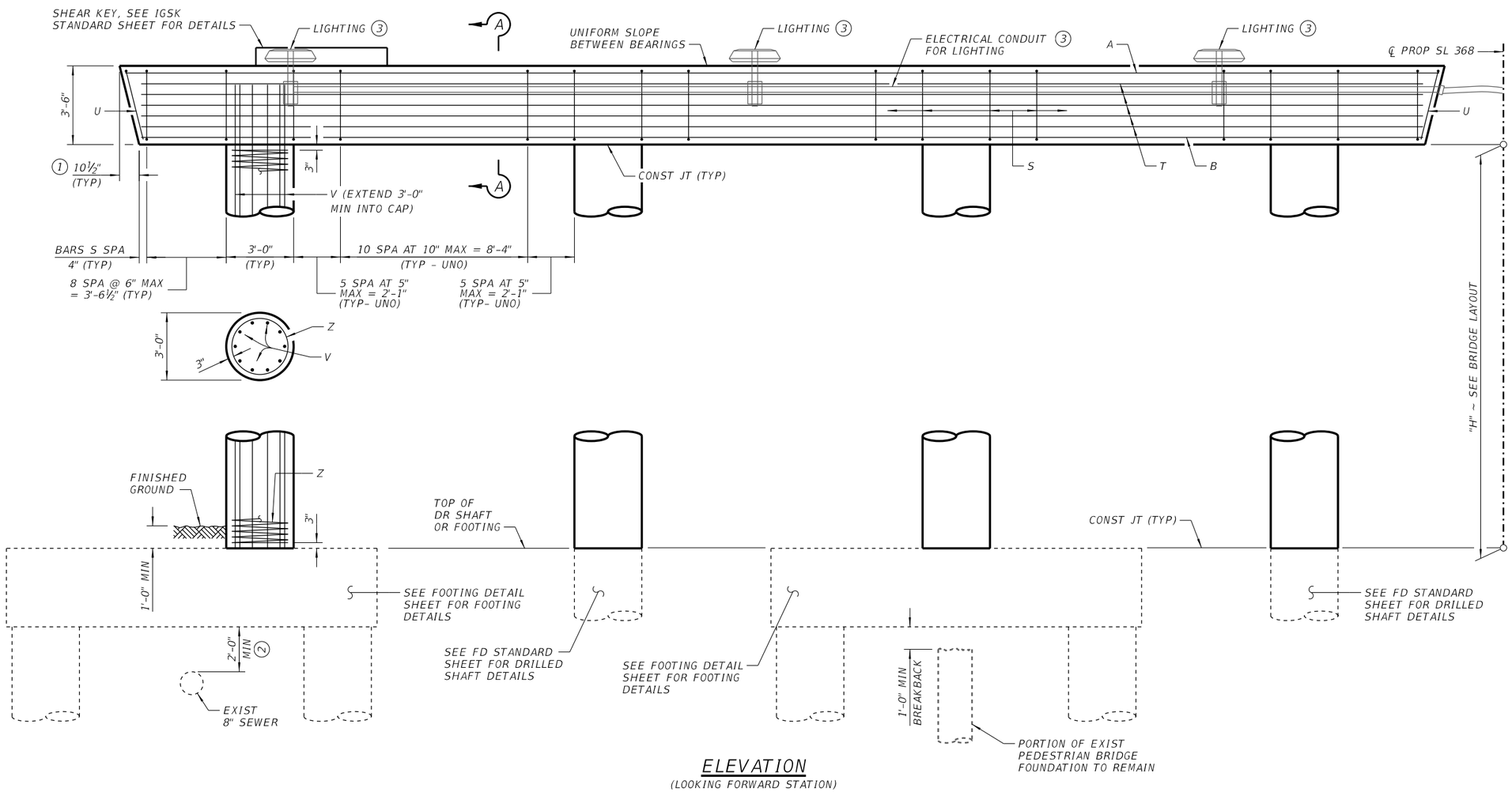

ELEVATION
(LOOKING FORWARD STATION)

1. MEASURED PARALLEL TO TOP OF CAP CROSS-SLOPE.
2. CONTRACTOR MUST VERIFY THE LOCATION AND VERTICAL AND HORIZONTAL CLEARANCE OF EXISTING SEWER LINE PRIOR TO CONSTRUCTION. NOTIFY ENGINEER OF ANY CONFLICTS PRIOR TO CONSTRUCITON.
3. SEE LIGHTING INSTALLATION PLANS FOR DETAILS.

NOTE: SEE "INTERIOR BENT DETAILS" SHEET FOR SECTION A-A, BAR DETAILS, ESTIMATED QUANTITIES, AND GENERAL NOTES.

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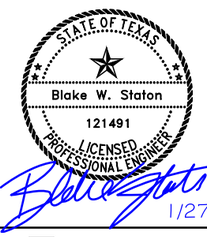

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SL 368
AT SALADO CREEK

INTERIOR BENT NO. 3 (PHASE I)

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT	SHEET NO.
6	SEE TITLE SHEET	184

STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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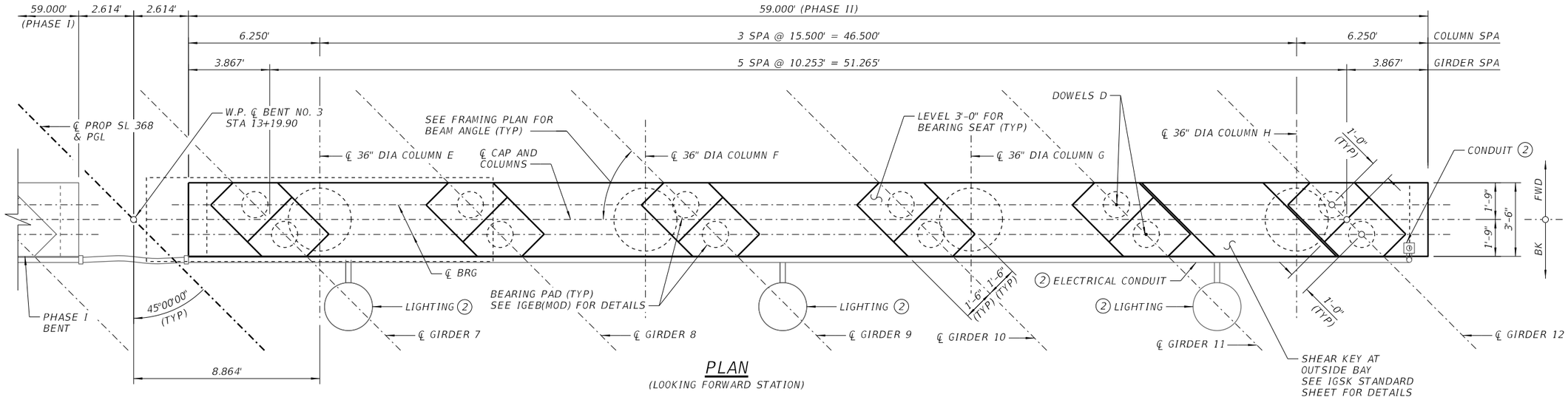

PLAN
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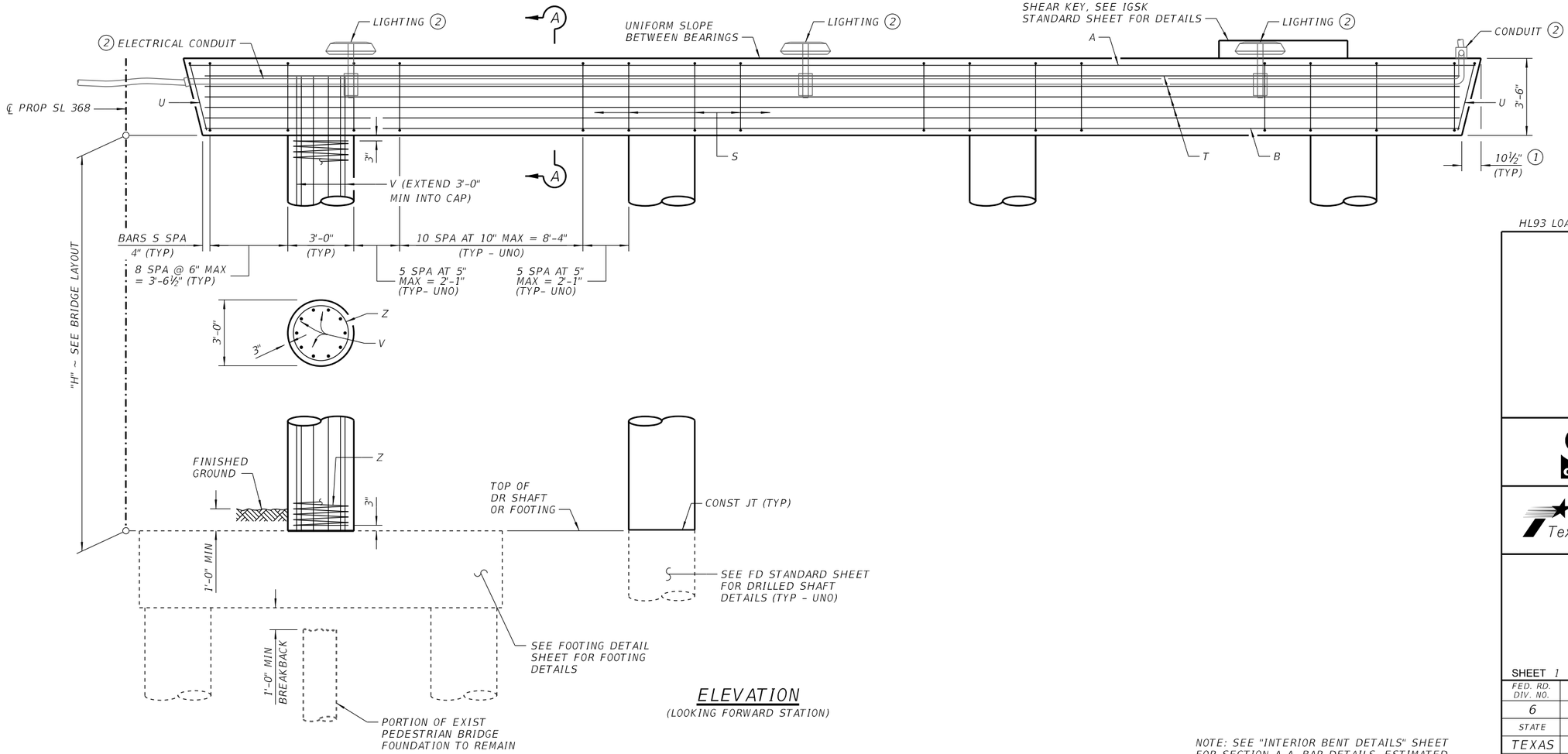

ELEVATION
(LOOKING FORWARD STATION)

(1) MEASURED PARALLEL TO TOP OF CAP CROSS-SLOPE.

(2) SEE LIGHTING INSTALLATION PLANS FOR DETAILS.

NOTE: SEE "INTERIOR BENT DETAILS" SHEET FOR SECTION A-A, BAR DETAILS, ESTIMATED QUANTITIES, AND GENERAL NOTES.

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INTERIOR BENT NO. 3 (PHASE II)

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		185
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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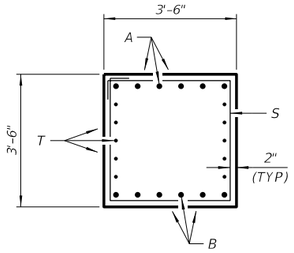
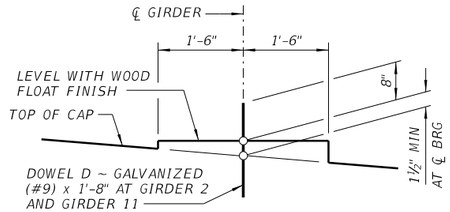


SECTION A-A



BEARING SEAT DETAIL

(BEARING SURFACE MUST BE CLEAN AND FREE OF ALL LOOSE MATERIAL BEFORE PLACING BEARING PAD)

TABLE OF CAP QUANTITIES (1)

	BAR	NO.	SIZE	LENGTH	WEIGHT
	A	6	#11	58'-6"	1,865
	B	6	#11	57'-0"	1,817
(4)	D	2	#9	1'-8"	11
	S	81	#5	13'-8"	1,156
	T	10	#5	57'-0"	595
	U	2	#5	9'-8"	20
(2)	REINFORCING STEEL			LB	5,464
	CL C CONC (CAP)			CY	27.6

TABLE OF COLUMN QUANTITIES (1)(3)

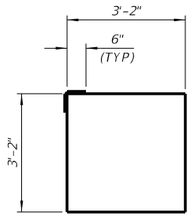
BENT	"H"	BARS V 40 ~ #9		BARS Z 4 ~ #4		REINF STEEL (2)	CLASS "C" CONC (COL)
NO.	HEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LB	CY
2	15	18'-0"	2,448	479'-4"	1,281	3,729	15.8
3	19	22'-0"	2,992	605'-1"	1,617	4,609	19.9
4	19	22'-0"	2,992	605'-1"	1,617	4,609	19.9
5	21	24'-0"	3,264	667'-11"	1,785	5,049	22.0
6	19	22'-0"	2,992	605'-1"	1,617	4,609	19.9

(1) QUANTITES SHOWN ARE FOR ONE BENT FOR ONE PHASE ONLY. QUANTITIES APPLY TO BOTH PHASES.

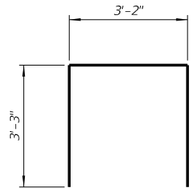
(2) FOR CONTRACTORS INFORMATION ONLY.

(3) FOR EACH LINEAR FOOT OF VARIATION IN "H" VALUE, MAKE THE FOLLOWING ADJUSTMENTS:
BARS V LENGTH, 1'-0"
BARS Z LENGTH, 31'-5"
REINFORCING STEEL, 220 LB
CL C CONC (COLUMN), 1.05 CY PER BENT.

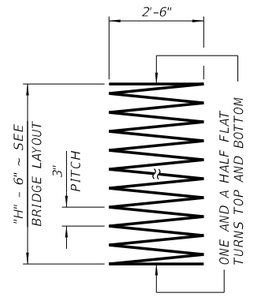
(4) OMIT BARS D AT BENT 4 AND ADJUST QUANTITIES AS NECESSARY.



BARS S



BARS U



BARS Z

GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION (2017), WITH CURRENT INTERIMS.

SEE BRIDGE LAYOUT FOR FOUNDATION TYPE, SIZE, AND LENGTH.

SEE ILLUMINATION PLANS FOR ILLUMINATION CONDUIT.

SEE COMMON FOUNDATION DETAILS (FD) STANDARD SHEET, FOR ALL FOUNDATION DETAILS AND NOTES NOT SHOWN.

CALCULATED DRILLED SHAFT FOUNDATION LOADS =
160 TONS/DR SH (BENT NO. 2)
170 TONS/DR SH (BENT NO. 3)
170 TONS/DR SH (BENT NO. 4)
190 TONS/DR SH (BENT NO. 5)
190 TONS/DR SH (BENT NO. 6)

COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE. REINFORCING BAR DIMENSIONS ARE OUT-TO-OUT OF BAR.

MATERIAL NOTES:

PROVIDE CLASS "C" CONCRETE ~ (f'c= 3600 PSI).

PROVIDE GRADE 60 REINFORCING STEEL.

GALVANIZE DOWEL BARS D

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3755 S. Capital of Texas Highway
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Austin, TX 78704
(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK
INTERIOR BENT NOS. 2 - 6 DETAILS

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		186
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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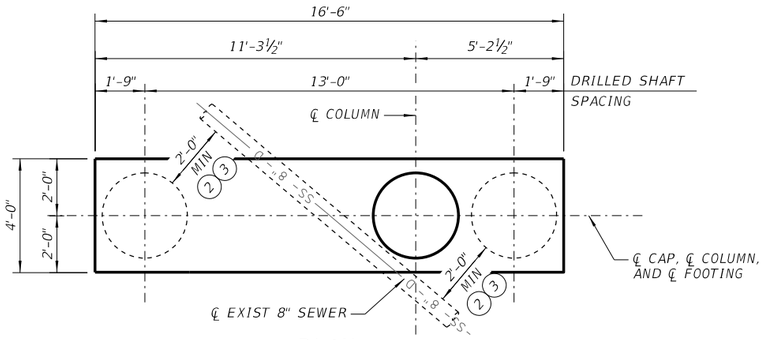
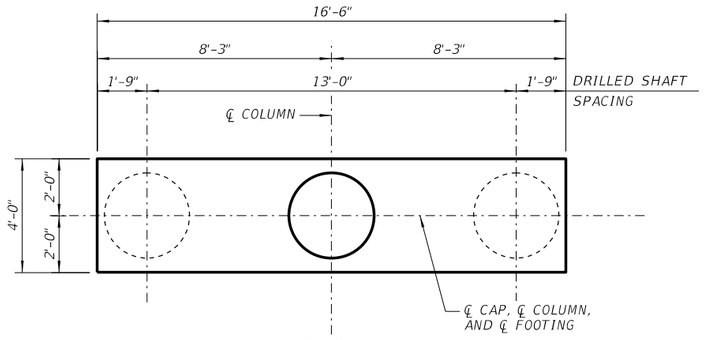


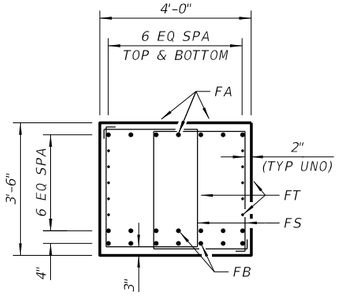
PLAN

(SHOWING COLUMN A - PHASE I)
(LOOKING FORWARD STATION)



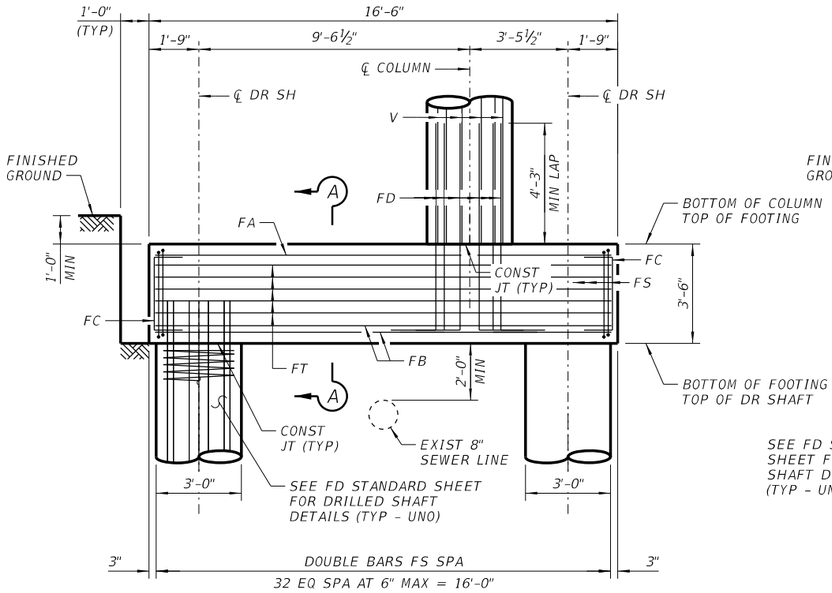
PLAN

(SHOWING COLUMN C - PHASE I & COLUMN E - PHASE II)
(LOOKING FORWARD STATION)



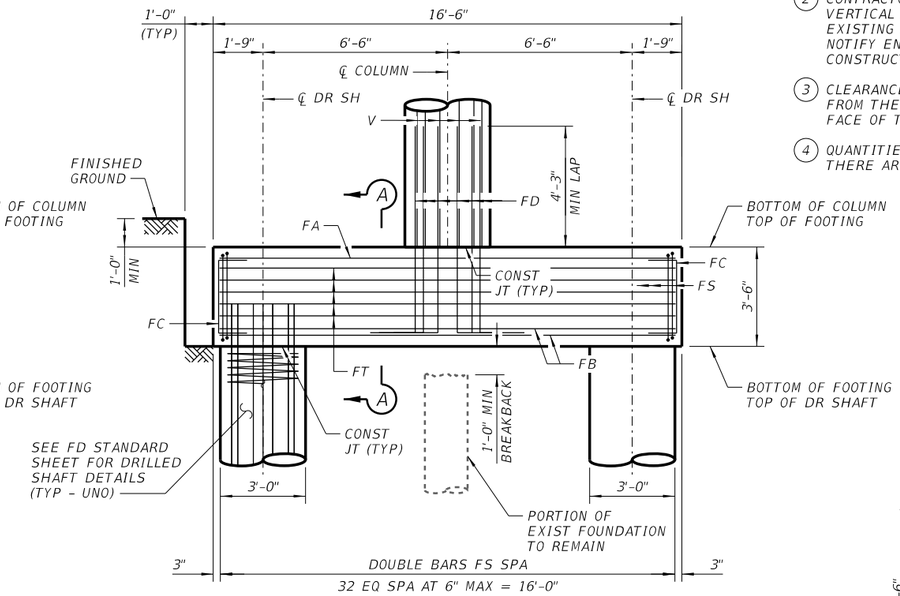
SECTION A-A

(FD BARS NOT SHOWN FOR CLARITY)



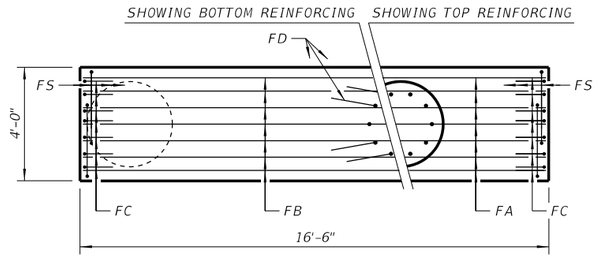
ELEVATION

(SHOWING COLUMN A - PHASE I)
(LOOKING FORWARD STATION)
(NOT SHOWING ALL FS BARS FOR CLARITY)



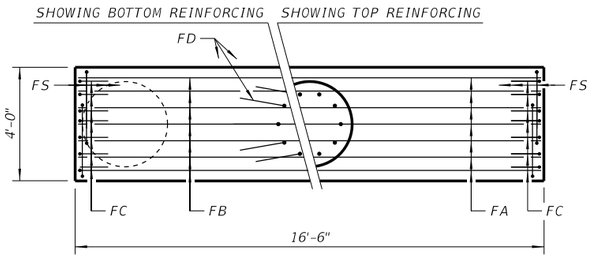
ELEVATION

(SHOWING COLUMN C - PHASE I & COLUMN E - PHASE II)
(LOOKING FORWARD STATION)
(NOT SHOWING ALL FS BARS FOR CLARITY)



PLAN - SHOWING REINFORCING

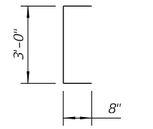
(SHOWING COLUMN A - PHASE I)
(LOOKING FORWARD STATION)



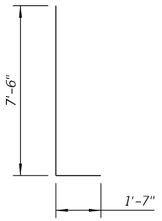
PLAN - SHOWING REINFORCING

(SHOWING COLUMN C - PHASE I & COLUMN E - PHASE II)
(LOOKING FORWARD STATION)

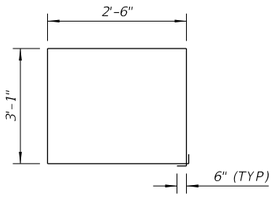
1. FOR CONTRACTOR'S INFORMATION ONLY.
2. CONTRACTOR MUST VERIFY THE LOCATION AND VERTICAL AND HORIZONTAL CLEARANCE OF EXISTING SEWER LINE PRIOR TO CONSTRUCTION. NOTIFY ENGINEER OF ANY CONFLICTS PRIOR TO CONSTRUCTION.
3. CLEARANCES TO SEWER LINE ARE MEASURED FROM THE FACE OF CONCRETE TO THE OUTSIDE FACE OF THE WATER LINE.
4. QUANTITIES SHOWN ARE FOR ONE FOOTING. THERE ARE 3 FOOTINGS TOTAL.



BAR FC



BAR FD



BAR FS

TABLE OF ESTIMATED QUANTITIES (4)

BAR	NO.	SIZE	LENGTH	WEIGHT
FA	7	#11	16'-2"	601
FB	14	#11	16'-2"	1,203
FC	14	#4	4'-4"	41
FD	10	#9	9'-1"	309
FS	66	#5	12'-2"	838
FT	10	#5	16'-2"	169
(1) REINFORCING STEEL			LB	3,159
CL C CONC (FOOTING)			CY	8.6

GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION (2017), WITH CURRENT INTERIMS.

SEE FOUNDATION LAYOUT FOR FOUNDATION TYPE, SIZE AND LENGTH.

SEE COMMON FOUNDATION DETAILS FD STANDARD SHEET FOR DRILLED SHAFT DETAILS AND NOTES.

COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE. REINFORCING BAR DIMENSIONS ARE OUT-TO-OUT OF BAR.

MATERIAL NOTES:

PROVIDE CLASS "C" CONCRETE ~ (f'c = 3,600 PSI).

PROVIDE GRADE 60 REINFORCING STEEL.

HL93 LOADING

STATE OF TEXAS
Blake W. Staton
121491
LICENSED PROFESSIONAL ENGINEER
1/27/2021

GARVER
3755 S. Capital of Texas Highway
Suite 325
Austin, TX 78704
(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

FOOTING DETAILS
BENT NO. 3

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		187
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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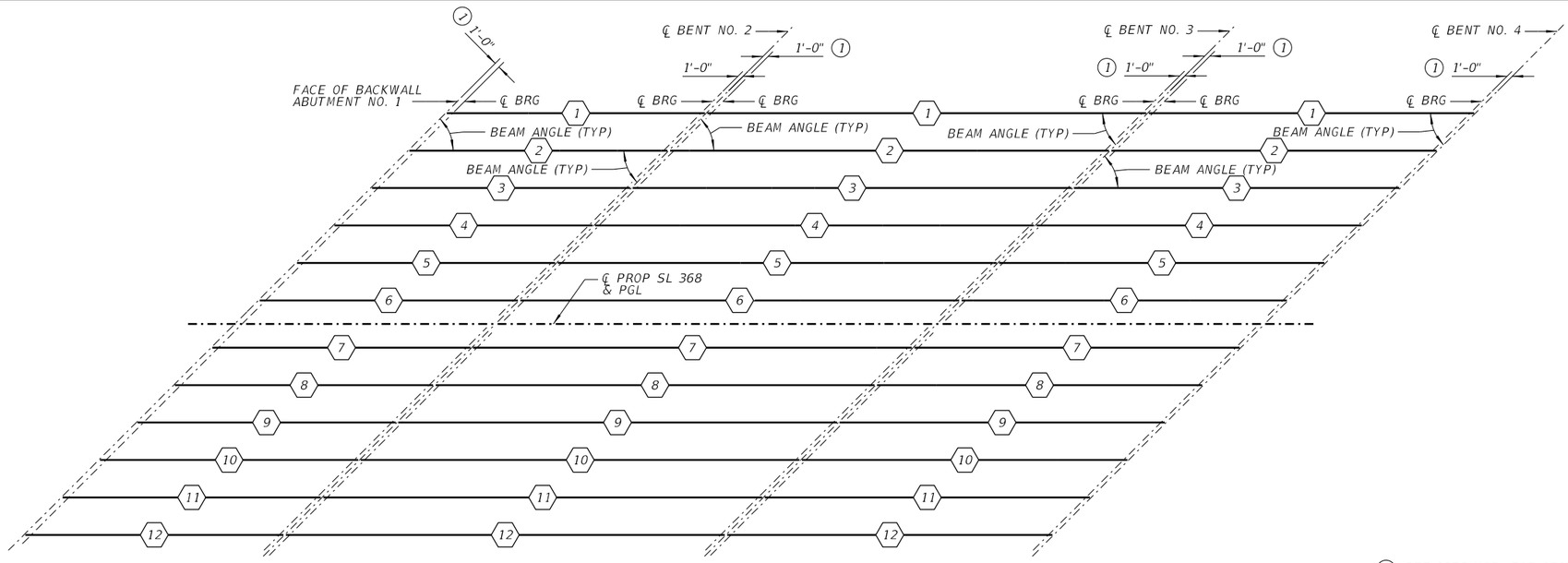

BENT REPORT

ABUT NO. 1 (N 08° 32' 43" E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 57.747L

		BEAM SPA. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 1	BEAM 1	0.000	45	00	00
	BEAM 2	10.253	45	00	00
	BEAM 3	10.253	45	00	00
	BEAM 4	10.253	45	00	00
	BEAM 5	10.253	45	00	00
	BEAM 6	10.253	45	00	00
	BEAM 7	12.964	45	00	00
	BEAM 8	10.253	45	00	00
	BEAM 9	10.253	45	00	00
	BEAM 10	10.253	45	00	00
	BEAM 11	10.253	45	00	00
	BEAM 12	10.253	45	00	00
	TOTAL	115.494			

BENT NO. 2 (N 08° 32' 43" E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 57.747L

		BEAM SPA. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 1	BEAM 1	0.000	45	00	00
	BEAM 2	10.253	45	00	00
	BEAM 3	10.253	45	00	00
	BEAM 4	10.253	45	00	00
	BEAM 5	10.253	45	00	00
	BEAM 6	10.253	45	00	00
	BEAM 7	12.964	45	00	00
	BEAM 8	10.253	45	00	00
	BEAM 9	10.253	45	00	00
	BEAM 10	10.253	45	00	00
	BEAM 11	10.253	45	00	00
	BEAM 12	10.253	45	00	00
	TOTAL	115.494			
SPAN 2	BEAM 1	0.000	45	00	00
	BEAM 2	10.253	45	00	00
	BEAM 3	10.253	45	00	00
	BEAM 4	10.253	45	00	00
	BEAM 5	10.253	45	00	00
	BEAM 6	10.253	45	00	00
	BEAM 7	12.964	45	00	00
	BEAM 8	10.253	45	00	00
	BEAM 9	10.253	45	00	00
	BEAM 10	10.253	45	00	00
	BEAM 11	10.253	45	00	00
	BEAM 12	10.253	45	00	00
	TOTAL	115.494			

BENT NO. 3 (N 08° 32' 43" E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 57.747L

		BEAM SPA. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 2	BEAM 1	0.000	45	00	00
	BEAM 2	10.253	45	00	00
	BEAM 3	10.253	45	00	00
	BEAM 4	10.253	45	00	00
	BEAM 5	10.253	45	00	00
	BEAM 6	10.253	45	00	00
	BEAM 7	12.964	45	00	00
	BEAM 8	10.253	45	00	00
	BEAM 9	10.253	45	00	00
	BEAM 10	10.253	45	00	00
	BEAM 11	10.253	45	00	00
	BEAM 12	10.253	45	00	00
	TOTAL	115.494			
SPAN 3	BEAM 1	0.000	45	00	00
	BEAM 2	10.253	45	00	00
	BEAM 3	10.253	45	00	00
	BEAM 4	10.253	45	00	00
	BEAM 5	10.253	45	00	00
	BEAM 6	10.253	45	00	00
	BEAM 7	12.964	45	00	00
	BEAM 8	10.253	45	00	00
	BEAM 9	10.253	45	00	00
	BEAM 10	10.253	45	00	00
	BEAM 11	10.253	45	00	00
	BEAM 12	10.253	45	00	00
	TOTAL	115.494			

BENT NO. 4 (N 08° 32' 43" E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 57.747L

		BEAM SPA. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 3	BEAM 1	0.000	45	00	00
	BEAM 2	10.253	45	00	00
	BEAM 3	10.253	45	00	00
	BEAM 4	10.253	45	00	00
	BEAM 5	10.253	45	00	00
	BEAM 6	10.253	45	00	00
	BEAM 7	12.964	45	00	00
	BEAM 8	10.253	45	00	00
	BEAM 9	10.253	45	00	00
	BEAM 10	10.253	45	00	00
	BEAM 11	10.253	45	00	00
	BEAM 12	10.253	45	00	00
	TOTAL	115.494			

BEAM REPORT

BEAM REPORT, SPAN 1

	HORIZONTAL DISTANCE C-C BENT	C-C BRG	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM 1	50.500	48.086	49.90	0.0098
BEAM 2	50.500	48.086	49.90	0.0103
BEAM 3	50.500	48.086	49.90	0.0108
BEAM 4	50.500	48.086	49.90	0.0112
BEAM 5	50.500	48.086	49.90	0.0117
BEAM 6	50.500	48.086	49.90	0.0121
BEAM 7	50.500	48.086	49.90	0.0125
BEAM 8	50.500	48.086	49.90	0.0128
BEAM 9	50.500	48.086	49.90	0.0129
BEAM 10	50.500	48.086	49.90	0.0130
BEAM 11	50.500	48.086	49.90	0.0131
BEAM 12	50.500	48.086	49.90	0.0131
TOTAL			598.80	

BEAM REPORT, SPAN 2

	HORIZONTAL DISTANCE C-C BENT	C-C BRG	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM 1	85.500	83.500	85.000	0.0054
BEAM 2	85.500	83.500	85.000	0.0059
BEAM 3	85.500	83.500	85.000	0.0064
BEAM 4	85.500	83.500	85.000	0.0068
BEAM 5	85.500	83.500	85.000	0.0073
BEAM 6	85.500	83.500	85.000	0.0078
BEAM 7	85.500	83.500	85.000	0.0084
BEAM 8	85.500	83.500	85.000	0.0088
BEAM 9	85.500	83.500	85.000	0.0093
BEAM 10	85.500	83.500	85.000	0.0098
BEAM 11	85.500	83.500	85.000	0.0102
BEAM 12	85.500	83.500	85.000	0.0107
TOTAL			1020.00	

BEAM REPORT, SPAN 3

	HORIZONTAL DISTANCE C-C BENT	C-C BRG	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM 1	63.500	61.500	63.000	0.0006
BEAM 2	63.500	61.500	63.000	0.0011
BEAM 3	63.500	61.500	63.000	0.0015
BEAM 4	63.500	61.500	63.000	0.0020
BEAM 5	63.500	61.500	63.000	0.0025
BEAM 6	63.500	61.500	63.000	0.0029
BEAM 7	63.500	61.500	63.000	0.0035
BEAM 8	63.500	61.500	63.000	0.0040
BEAM 9	63.500	61.500	63.000	0.0045
BEAM 10	63.500	61.500	63.000	0.0049
BEAM 11	63.500	61.500	63.000	0.0054
BEAM 12	63.500	61.500	63.000	0.0059
TOTAL			756.00	

(1) SEE IGEB(MOD) FOR ORIENTATION OF DIMENSION. ALL BEARING PADS SHALL BE CIRCULAR.

(2) GIRDER LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

HL93 LOADING

GARVER
3755 S. Capital of Texas Highway
Suite 325
Austin, TX 78704
(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

FRAMING PLAN (SPANS 1 - 3)

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		188
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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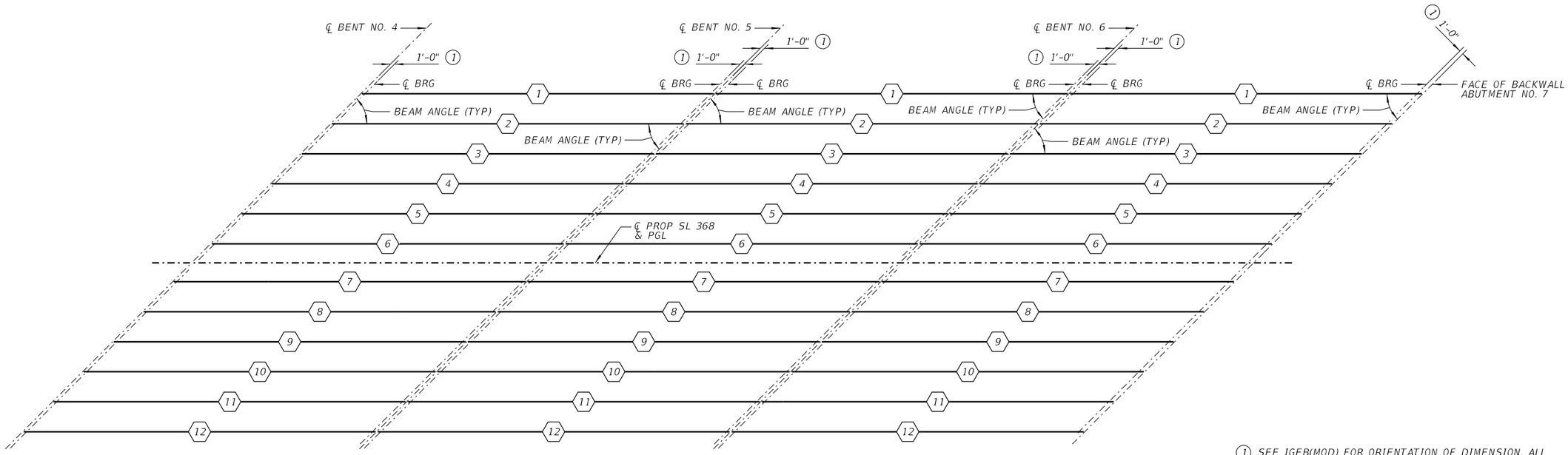


1. SEE IGEB(MOD) FOR ORIENTATION OF DIMENSION. ALL BEARING PADS SHALL BE CIRCULAR.
2. GIRDER LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

BENT REPORT

BENT NO. 4 (N 08° 32' 43" E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 57.747L

		BEAM SPA. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 4	BEAM 1	0.000	45	00	00
	BEAM 2	10.253	45	00	00
	BEAM 3	10.253	45	00	00
	BEAM 4	10.253	45	00	00
	BEAM 5	10.253	45	00	00
	BEAM 6	10.253	45	00	00
	BEAM 7	12.964	45	00	00
	BEAM 8	10.253	45	00	00
	BEAM 9	10.253	45	00	00
	BEAM 10	10.253	45	00	00
	BEAM 11	10.253	45	00	00
	BEAM 12	10.253	45	00	00
	TOTAL	115.494			

BENT NO. 5 (N 08° 32' 43" E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 57.747L

		BEAM SPA. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 4	BEAM 1	0.000	45	00	00
	BEAM 2	10.253	45	00	00
	BEAM 3	10.253	45	00	00
	BEAM 4	10.253	45	00	00
	BEAM 5	10.253	45	00	00
	BEAM 6	10.253	45	00	00
	BEAM 7	12.964	45	00	00
	BEAM 8	10.253	45	00	00
	BEAM 9	10.253	45	00	00
	BEAM 10	10.253	45	00	00
	BEAM 11	10.253	45	00	00
	BEAM 12	10.253	45	00	00
	TOTAL	115.494			
SPAN 5	BEAM 1	0.000	45	00	00
	BEAM 2	10.253	45	00	00
	BEAM 3	10.253	45	00	00
	BEAM 4	10.253	45	00	00
	BEAM 5	10.253	45	00	00
	BEAM 6	10.253	45	00	00
	BEAM 7	12.964	45	00	00
	BEAM 8	10.253	45	00	00
	BEAM 9	10.253	45	00	00
	BEAM 10	10.253	45	00	00
	BEAM 11	10.253	45	00	00
	BEAM 12	10.253	45	00	00
	TOTAL	115.494			

BENT NO. 6 (N 08° 32' 43" E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 57.747L

		BEAM SPA. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 5	BEAM 1	0.000	45	00	00
	BEAM 2	10.253	45	00	00
	BEAM 3	10.253	45	00	00
	BEAM 4	10.253	45	00	00
	BEAM 5	10.253	45	00	00
	BEAM 6	10.253	45	00	00
	BEAM 7	12.964	45	00	00
	BEAM 8	10.253	45	00	00
	BEAM 9	10.253	45	00	00
	BEAM 10	10.253	45	00	00
	BEAM 11	10.253	45	00	00
	BEAM 12	10.253	45	00	00
	TOTAL	115.494			
SPAN 6	BEAM 1	0.000	45	00	00
	BEAM 2	10.253	45	00	00
	BEAM 3	10.253	45	00	00
	BEAM 4	10.253	45	00	00
	BEAM 5	10.253	45	00	00
	BEAM 6	10.253	45	00	00
	BEAM 7	12.964	45	00	00
	BEAM 8	10.253	45	00	00
	BEAM 9	10.253	45	00	00
	BEAM 10	10.253	45	00	00
	BEAM 11	10.253	45	00	00
	BEAM 12	10.253	45	00	00
	TOTAL	115.494			

ABUT NO. 7 (N 08° 32' 43" E)
DISTANCE BETWEEN STATION LINE AND BEAM 1 57.747L

		BEAM SPA. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 6	BEAM 1	0.000	45	00	00
	BEAM 2	10.253	45	00	00
	BEAM 3	10.253	45	00	00
	BEAM 4	10.253	45	00	00
	BEAM 5	10.253	45	00	00
	BEAM 6	10.253	45	00	00
	BEAM 7	12.964	45	00	00
	BEAM 8	10.253	45	00	00
	BEAM 9	10.253	45	00	00
	BEAM 10	10.253	45	00	00
	BEAM 11	10.253	45	00	00
	BEAM 12	10.253	45	00	00
	TOTAL	115.494			

BEAM REPORT

BEAM REPORT, SPAN 4

	HORIZONTAL DISTANCE C-C BENT	C-C BRG	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM 1	85.500	83.500	85.000	-0.0042
BEAM 2	85.500	83.500	85.000	-0.0038
BEAM 3	85.500	83.500	85.000	-0.0033
BEAM 4	85.500	83.500	85.000	-0.0028
BEAM 5	85.500	83.500	85.000	-0.0024
BEAM 6	85.500	83.500	85.000	-0.0019
BEAM 7	85.500	83.500	85.000	-0.0013
BEAM 8	85.500	83.500	85.000	-0.0008
BEAM 9	85.500	83.500	85.000	-0.0004
BEAM 10	85.500	83.500	85.000	0.0001
BEAM 11	85.500	83.500	85.000	0.0006
BEAM 12	85.500	83.500	85.000	0.0011
TOTAL			1020.00	

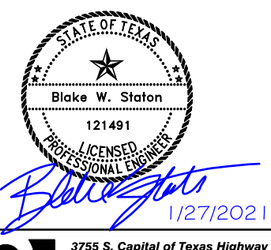
BEAM REPORT, SPAN 5

	HORIZONTAL DISTANCE C-C BENT	C-C BRG	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM 1	85.500	83.500	85.000	-0.0098
BEAM 2	85.500	83.500	85.000	-0.0093
BEAM 3	85.500	83.500	85.000	-0.0088
BEAM 4	85.500	83.500	85.000	-0.0084
BEAM 5	85.500	83.500	85.000	-0.0079
BEAM 6	85.500	83.500	85.000	-0.0074
BEAM 7	85.500	83.500	85.000	-0.0068
BEAM 8	85.500	83.500	85.000	-0.0064
BEAM 9	85.500	83.500	85.000	-0.0059
BEAM 10	85.500	83.500	85.000	-0.0054
BEAM 11	85.500	83.500	85.000	-0.0050
BEAM 12	85.500	83.500	85.000	-0.0045
TOTAL			1020.00	

BEAM REPORT, SPAN 6

	HORIZONTAL DISTANCE C-C BENT	C-C BRG	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM 1	85.500	83.086	84.900	-0.0129
BEAM 2	85.500	83.086	84.900	-0.0128
BEAM 3	85.500	83.086	84.900	-0.0127
BEAM 4	85.500	83.086	84.900	-0.0126
BEAM 5	85.500	83.086	84.900	-0.0124
BEAM 6	85.500	83.086	84.900	-0.0122
BEAM 7	85.500	83.086	84.900	-0.0119
BEAM 8	85.500	83.086	84.900	-0.0116
BEAM 9	85.500	83.086	84.900	-0.0113
BEAM 10	85.500	83.086	84.900	-0.0109
BEAM 11	85.500	83.086	84.900	-0.0105
BEAM 12	85.500	83.086	84.900	-0.0100
TOTAL			1018.80	

HL93 LOADING



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SL 368
AT SALADO CREEK

FRAMING PLAN (SPANS 4 - 6)

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT	SHEET NO.
6	SEE TITLE SHEET	189

STATE	DISTRICT	COUNTY
TEXAS	SAT	BEXAR

CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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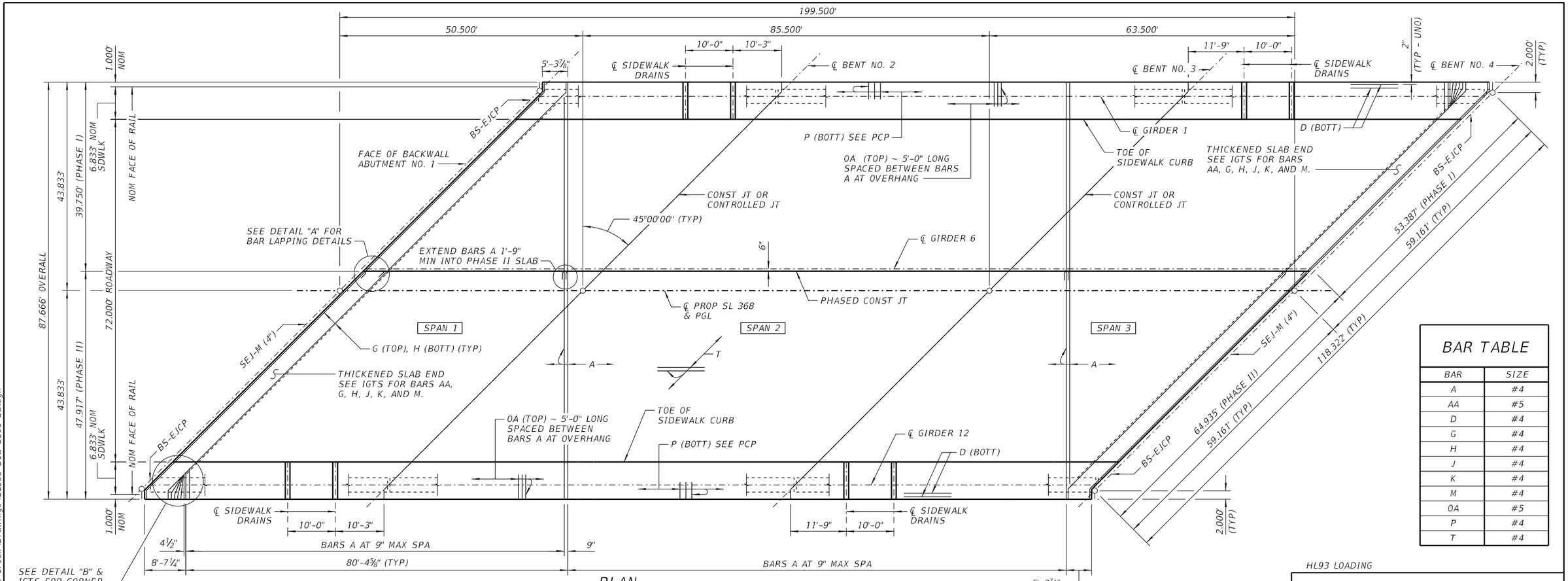
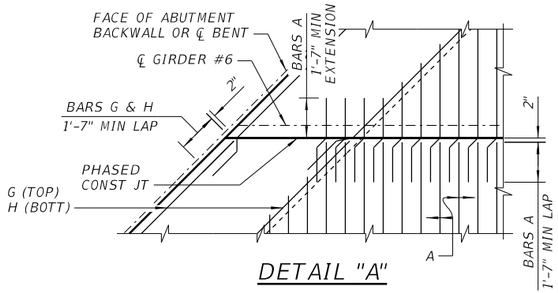


PLAN

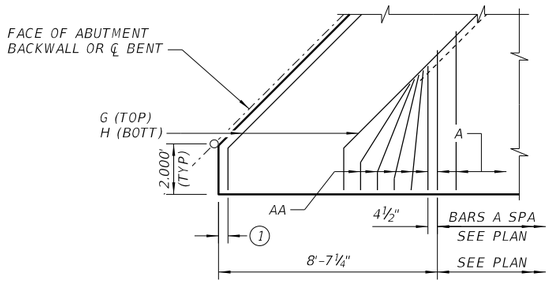
BAR TABLE

BAR	SIZE
A	#4
AA	#5
D	#4
G	#4
H	#4
J	#4
K	#4
M	#4
0A	#5
P	#4
T	#4



DETAIL "A"

① 2" END COVER, BARS D & T (TYP)

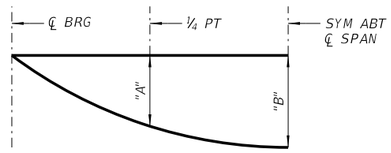


DETAIL "B"

SEE IGTS FOR ADDITIONAL INFORMATION

TABLE OF DEAD LOAD DEFLECTIONS

SPAN NO.	GIRDER NO.	"A"	"B"
		FT	FT
1	1, 12	0.011	0.016
	2-5, 8-11	0.012	0.017
	6	0.007	0.010
	7	0.014	0.020
2	1, 12	0.102	0.145
	2-5, 8-11	0.112	0.159
	6	0.064	0.090
	7	0.127	0.180
3	1, 12	0.030	0.043
	2-5, 8-11	0.033	0.047
	6	0.019	0.027
	7	0.037	0.053



DEAD LOAD DEFLECTION DIAGRAM

DEFLECTIONS SHOWN ARE DUE TO CONCRETE SLAB ONLY (Ec = 5000 KSI). CALCULATED DEFLECTIONS SHOWN ARE THEORETICAL. ACTUAL DIMENSIONS MAY BE LESS.

HL93 LOADING

STATE OF TEXAS
Blake W. Staton
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LICENSED PROFESSIONAL ENGINEER
1/27/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

199.500' PRESTRESSED CONCRETE GIRDER UNIT NO. 1 (SPANS 1 - 3)

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT	SHEET NO.
6	SEE TITLE SHEET	190

STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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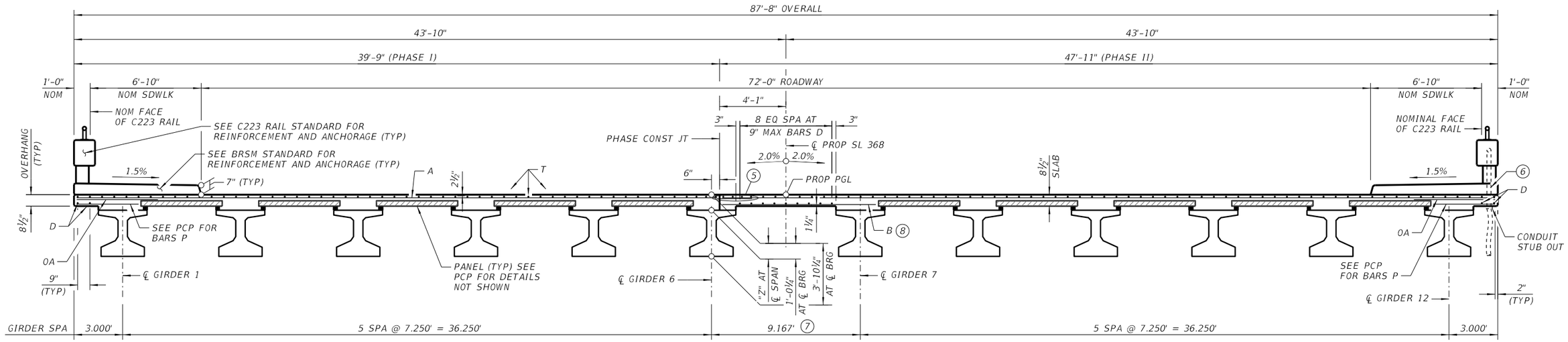

TYPICAL TRANSVERSE SECTION

(SIDEWALK AND RAIL REINFORCEMENT NOT SHOWN FOR CLARITY)

TABLE OF ESTIMATED QUANTITIES (PHASE I)

SPAN NO	REINF CONC SLAB	BRIDGE SIDEWALK	PRESTR CONC GIRDER (1) (Tx34)	STR STEEL (MISC NON-BRIDGE)	TOTAL REINF STEEL (2) (3)
	SF	SF	LF	LB	LB
1	2,008	396	299.40	856	4,619
2	3,399	670	510.00	0	7,818
3	2,525	498	378.00	856	5,808
TOTAL	7,932	1,564	1,187.40	1,712	18,245

TABLE OF ESTIMATED QUANTITIES (PHASE II)

SPAN NO	REINF CONC SLAB	BRIDGE SIDEWALK	PRESTR CONC GIRDER (1) (Tx34)	STR STEEL (MISC NON-BRIDGE)	TOTAL REINF STEEL (2) (3)
	SF	SF	LF	LB	LB
1	2,420	396	299.40	856	5,566
2	4,097	670	510.00	0	9,424
3	3,043	498	378.00	856	6,999
TOTAL	9,560	1,564	1,187.40	1,712	21,989

TABLE OF SECTION DEPTHS

SPAN NO.	GIRDER NO.	"Z" AT ℄ SPAN (4)
1	1-5	1'-0"
	6	11⅞"
	7	1'-0"
	8-9	11⅞"
	10-12	11¾"
2	1, 12	10⅜"
	2-5, 8-11	10½"
	6	9⅞"
	7	10¾"
3	1, 12	11⅛"
	2-5, 7-11	11¾"
	6	11½"

(1) LENGTH SHOWN ARE BOTTOM GIRDER/FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

(2) REINFORCING STEEL WEIGHT IS CALCUALTED USING AN APPROXIMATE FACTOR OF 2.3 LBS/SF. QUANTITY DOES NOT INCLUDE BRIDGE SIDEWALK REINFORCEMENT.

(3) FOR CONTRACTOR'S INFORMATION ONLY.

(4) THEORETICAL DIMENSION.

(5) EXTEND BARS A 1'-9" INTO PHASE II SLAB.

(6) CONDUIT STUB OUT SHOWN IS ONLY AT BENT 2. SEE LIGHTING INSTALLATION PLANS FOR NUMBER AND LOCATION OF CONDUITS. SEE "BRIDGE RAISED SIDEWALK AND MEDIAN DETAILS STANDARD (BRSM(MOD))".

(7) NO PCP'S ALLOWED IN THIS BAY.

(8) BARS B (#4) SPACED AT 9" MAX WITH 2" END COVER.

GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION (2017), WITH CURRENT INTERIMS.

SEE THICKENED SLAB END DETAILS (IGTS) STANDARD FOR THICKNEED SLAB END DETAILS AND QUANTITY ADJUSTMENTS.

SEE MISCELLANEOUS SLAB DETAILS (IGMS) STANDARD FOR MISCELLANEOUS SLAB DETAILS.

SEE PRESTRESSED CONCRETE PANELS (PCP) AND PRESTRESSED CONCRETE PANEL FABRICATION DETAILS (PCP-FAB) STANDARDS FOR PANEL DETAILS NOT SHOWN.

SEE C223 RAIL STANDARD FOR RAIL ANCHORAGE IN SLAB AND RAIL DETAILS NOT SHOWN.

SEE BRIDGE RAISED SIDEWALK AND MEDIAN DETAILS (BRSM) STANDARD FOR SIDEWALK REINFORCEMENT, SIDEWALK DETAILS, AND SIDEWALK DRAIN DETAILS NOT SHOWN.

SEE BRIDGE SIDEWALK EXPANSION JOINT COVER PLATE STANDARD (BS-EJCP) FOR DETAILS NOT SHOWN.

SEE PERMANENT METAL DECK FORMS (PMDF) STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS IF THIS OPTION IS USED.

CONCRETE COVER DIMENSIONS ARE CLEAR DIMENSIONS UNLESS NOTED OTHERSWISE.

MATERIAL NOTES:

PROVIDE CLASS "S" CONCRETE ~ (f'c= 4000 psi).

PROVIDE GRADE 60 REINFORCING STEEL.

PROVIDE BAR LAPS, WHERE REQUIRED, AS FOLLOWS:

UNCOATED ~ #4 = 1'-7"
#5 = 2'-0"

DEFORMED WELDED WIRE REINFORCEMENT (WWR) (ASTM 1064) OF EQUAL SIZE AND SPACING MAY BE SUBSTITUTED FOR BARS A, AA, D, 0A, P OR T UNLESS NOTED OTHERWISE. PROVIDE THE SAME LAPS AS REQUIRED FOR REINFORCING BARS.

HL93 LOADING

STATE OF TEXAS
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1/27/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

199.500' PRESTRESSED CONCRETE GIRDER UNIT NO. 1 (SPANS 1 - 3)

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT	SHEET NO.
6	SEE TITLE SHEET	191

STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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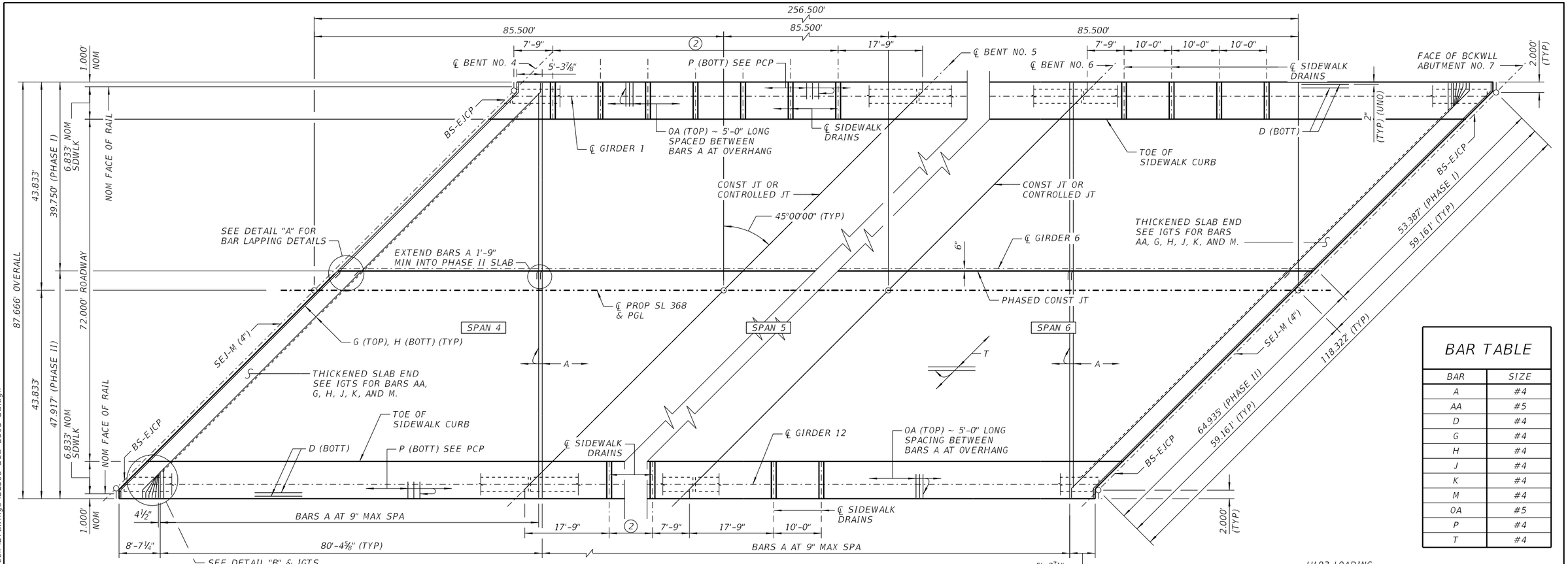
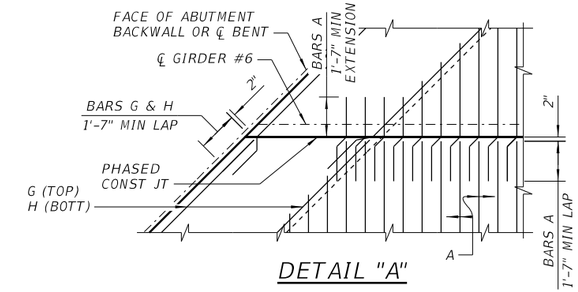


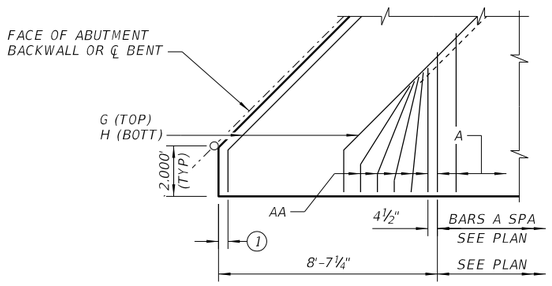
PLAN

BAR TABLE	
BAR	SIZE
A	#4
AA	#5
D	#4
G	#4
H	#4
J	#4
K	#4
M	#4
OA	#5
P	#4
T	#4



DETAIL "A"

① 2" END COVER, BARS D & T (TYP)

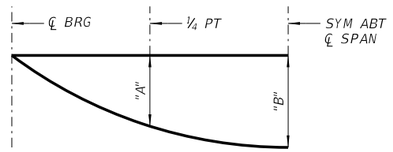


DETAIL "B"

SEE IGTS FOR ADDITIONAL INFORMATION

② SIDEWALK DRAIN 6 SPA AT 10'-0" = 60'-0"

TABLE OF DEAD LOAD DEFLECTIONS			
SPAN NO.	GIRDER NO.	"A"	"B"
		FT	FT
4 & 5	1, 12	0.102	0.145
	2-5, 8-11	0.112	0.159
	6	0.064	0.090
	7	0.127	0.180
6	1, 12	0.100	0.142
	2-5, 8-11	0.110	0.156
	6	0.062	0.089
	7	0.124	0.176



DEAD LOAD DEFLECTION DIAGRAM

DEFLECTIONS SHOWN ARE DUE TO CONCRETE SLAB ONLY (Ec = 5000 KSI). CALCULATED DEFLECTIONS SHOWN ARE THEORETICAL. ACTUAL DIMENSIONS MAY BE LESS.

HL93 LOADING

STATE OF TEXAS
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Texas Department of Transportation

SL 368
AT SALADO CREEK

256.500' PRESTRESSED CONCRETE GIRDER UNIT NO. 2 (SPANS 4 - 6)

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		192
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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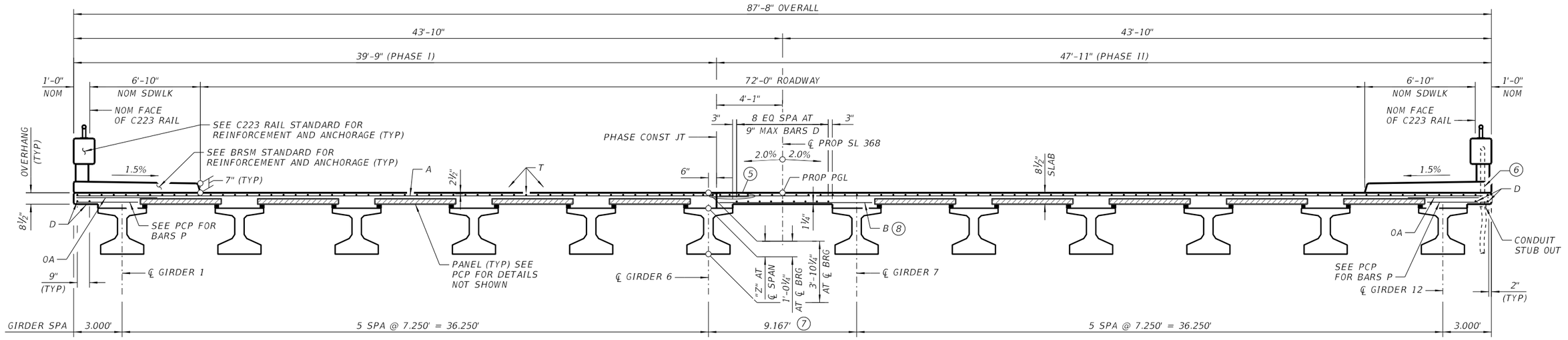

TYPICAL TRANSVERSE SECTION

(SIDEWALK AND RAIL REINFORCEMENT NOT SHOWN FOR CLARITY)

TABLE OF ESTIMATED QUANTITIES (PHASE I)

SPAN NO	REINF CONC SLAB	BRIDGE SIDEWALK	PRESTR CONC GIRDER (1) (Tx34)	STR STEEL (MISC NON-BRIDGE)	TOTAL REINF STEEL (2) (3)
	SF	SF	LF	LB	LB
4	3,399	670	510.00	2,995	7,818
5	3,399	670	510.00	0	7,818
6	3,399	670	509.40	1,711	7,818
TOTAL	10,197	2,010	1,529.40	4,706	23,454

TABLE OF ESTIMATED QUANTITIES (PHASE II)

SPAN NO	REINF CONC SLAB	BRIDGE SIDEWALK	PRESTR CONC GIRDER (1) (Tx34)	STR STEEL (MISC NON-BRIDGE)	TOTAL REINF STEEL (2) (3)
	SF	SF	LF	LB	LB
4	4,097	670	510.00	0	9,424
5	4,097	670	510.00	2,995	9,424
6	4,097	670	509.40	856	9,424
TOTAL	12,291	2,010	1,529.40	3,851	28,272

TABLE OF SECTION DEPTHS

SPAN NO.	GIRDER NO.	"Z" AT ℄ SPAN (4)
4	1, 12	10⅜"
	2-5, 8-11	10½"
	6	9⅞"
	7	10¾"
5	1, 12	10⅜"
	2-5, 8-11	10½"
	6	9⅞"
	7	10¾"
6	1	9⅞"
	2-3	10"
	4-5	10⅛"
	6	9⅝"
	7	10⅝"
	8	10½"
	9-11	10⅝"
	12	10½"

(1) LENGTH SHOWN ARE BOTTOM GIRDER/FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

(2) REINFORCING STEEL WEIGHT IS CALCUALTED USING AN APPROXIMATE FACTOR OF 2.3 LBS/SF. QUANTITY DOES NOT INCLUDE BRIDGE SIDEWALK REINFORCEMENT.

(3) FOR CONTRACTOR'S INFORMATION ONLY.

(4) THEORETICAL DIMENSION.

(5) EXTEND BARS A 1'-9" INTO PHASE II SLAB.

(6) CONDUIT STUB OUT SHOWN IS ONLY AT BENT 2. SEE LIGHTING INSTALLATION PLANS FOR NUMBER AND LOCATION OF CONDUITS. SEE "BRIDGE RAISED SIDEWALK AND MEDIAN DETAILS STANDARD (BRSM(MOD))".

(7) NO PCP'S ALLOWED IN THIS BAY.

(8) BARS B (#4) SPACED AT 9" MAX WITH 2" END COVER.

GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION (2017), WITH CURRENT INTERIMS.

SEE THICKENED SLAB END DETAILS (IGTS) STANDARD FOR THICKNEED SLAB END DETAILS AND QUANTITY ADJUSTMENTS.

SEE MISCELLANEOUS SLAB DETAILS (IGMS) STANDARD FOR MISCELLANEOUS SLAB DETAILS.

SEE PRESTRESSED CONCRETE PANELS (PCP) AND PRESTRESSED CONCRETE PANEL FABRICATION DETAILS (PCP-FAB) STANDARDS FOR PANEL DETAILS NOT SHOWN.

SEE C223 RAIL STANDARD FOR RAIL ANCHORAGE IN SLAB AND RAIL DETAILS NOT SHOWN.

SEE BRIDGE RAISED SIDEWALK AND MEDIAN DETAILS (BRSM) STANDARD FOR SIDEWALK REINFORCEMENT, SIDEWALK DETAILS, AND SIDEWALK DRAIN DETAILS NOT SHOWN.

SEE BRIDGE SIDEWALK EXPANSION JOINT COVER PLATE STANDARD (BS-EJCP) FOR DETAILS NOT SHOWN.

SEE PERMANENT METAL DECK FORMS (PMDF) STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS IF THIS OPTION IS USED.

CONCRETE COVER DIMENSIONS ARE CLEAR DIMENSIONS UNLESS NOTED OTHERSWISE.

MATERIAL NOTES:

PROVIDE CLASS "S" CONCRETE ~ (f'c= 4000 psi).

PROVIDE GRADE 60 REINFORCING STEEL.

PROVIDE BAR LAPS, WHERE REQUIRED, AS FOLLOWS:

UNCOATED ~ #4 = 1'-7"
#5 = 2'-0"

DEFORMED WELDED WIRE REINFORCEMENT (WWR) (ASTM 1064) OF EQUAL SIZE AND SPACING MAY BE SUBSTITUTED FOR BARS A, AA, D, 0A, P OR T UNLESS NOTED OTHERWISE. PROVIDE THE SAME LAPS AS REQUIRED FOR REINFORCING BARS.

HL93 LOADING

STATE OF TEXAS
Blake W. Staton
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1/27/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

256.500' PRESTRESSED CONCRETE GIRDER UNIT NO. 2 (SPANS 4 - 6)

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		193
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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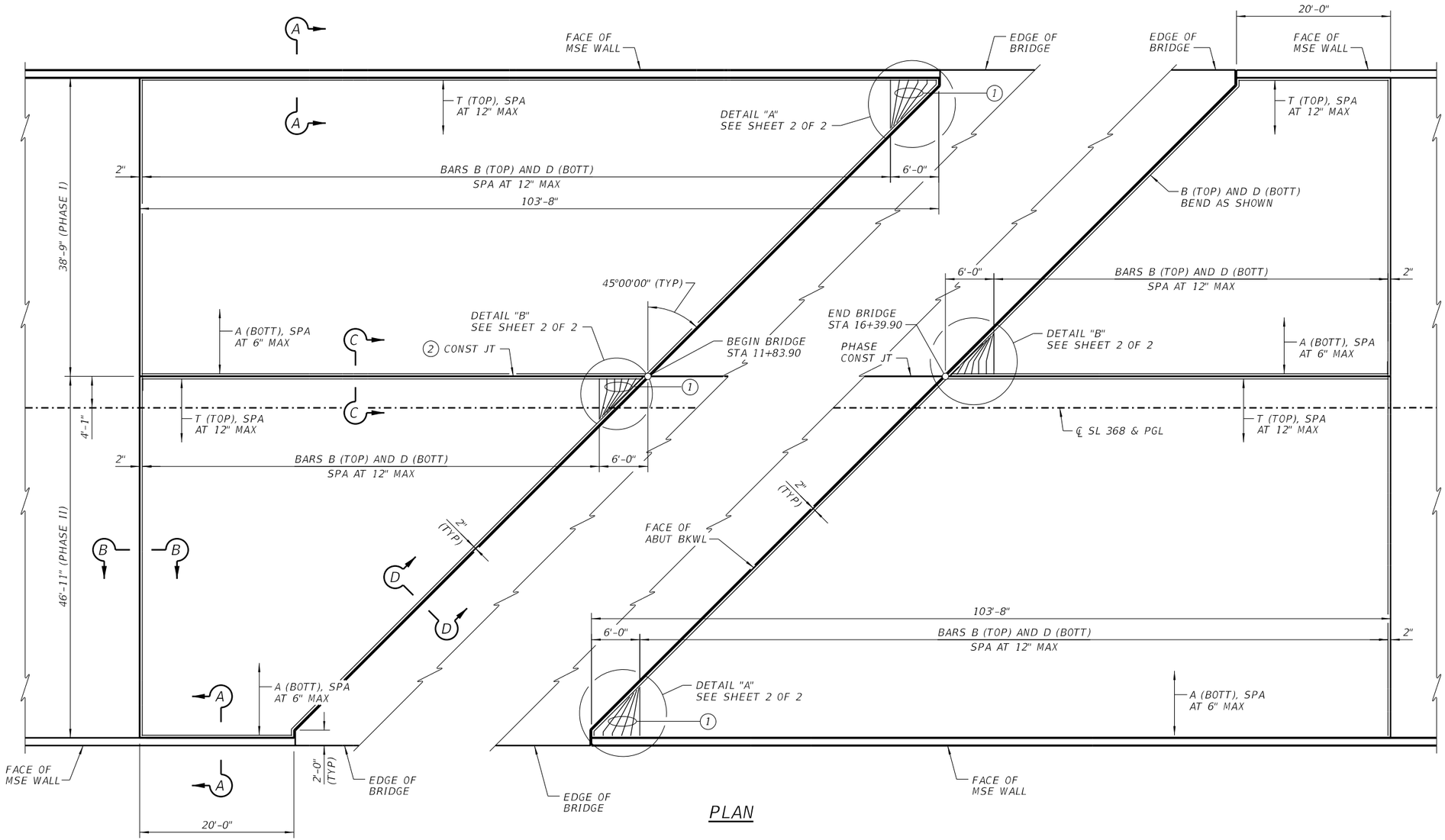
TABLE OF ESTIMATED QUANTITIES (PHASE I)

ABUTMENT	AREA (3)	CLASS "S" CONC	REINF STEEL (3)(4)
NO.	SF	CY	LB
1	3,304	132.6	28,084
7	1,487	59.7	12,640
TOTAL	4,791	192.3	40,724

TABLE OF ESTIMATED QUANTITIES (PHASE II)

ABUTMENT	AREA (3)	CLASS "S" CONC	REINF STEEL (3)(4)
NO.	SF	CY	LB
1	1,993	80.0	16,941
7	3,809	152.8	32,377
TOTAL	5,802	232.8	49,318



PLAN

1. FLARE BARS B AND D IN THIS REGION (1'-6" MAX SPA, 3" MIN SPA). MINIMUM FLARED BAR LENGTH = 2'-6". BEND BARS AS NECESSARY.
2. PROVIDE LONGITUDINAL CONSTRUCTION JOINTS THAT ALIGN WITH LONGITUDINAL CONSTRUCTION JOINTS IN THE BRIDGE SLAB WITH BRIDGES BUILT IN STAGES. OTHER LONGITUDINAL CONSTRUCTION JOINTS MUST RECEIVE APPROVAL OF THE ENGINEER.
3. FOR CONTRACTOR'S INFORMATION ONLY.
4. REINFORCING STEEL WEIGHT BASED ON AN APPROXIMATE FACTOR OF 8.5 LBS/SF OF APPROACH SLAB.

GENERAL NOTES:

CONSTRUCT APPROACH SLAB IN ACCORDANCE WITH ITEM 422.

PROVIDE CLASS "S" CONCRETE WITH A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.

PROVIDE GRADE 60 REINFORCING STEEL.

CONSTRUCT THE SUBGRADE OR SUBBASE FROM THE BRIDGE FOR A MINIMUM DISTANCE OF 100 FEET PRIOR TO THE APPROACH SLAB, UNLESS OTHERWISE INDICATED ON THE PLANS.

COMPACT AND FINISH THE SUBGRADE OR FOUNDATION FOR THE APPROACH SLAB TO THE TYPICAL CROSS-SECTION AND TO THE LINES AND GRADES SHOWN ON THE PLANS.

CURE FOR 4 DAYS USING WATER OR MEMBRANE CURING PER ITEM 422.

SEALANT, BACKER ROD AND PREFORMED BITUMINOUS FIBER MATERIAL ARE SUBSIDIARY TO APPROACH SLAB CONCRETE.

PROVIDE A 1" BONDBREAKER (ASPHALTIC CONCRETE PAVEMENT OR ASPHALT STABILIZED BASE) BETWEEN THE APPROACH SLAB AND CEMENT STABILIZED BACKFILL OR CEMENT TREATED BASE. OTHER BONDBREAKERS MAY BE USED IF APPROVED BY THE ENGINEER.

SEE SHEET 2 OF 2 FOR SECTIONS A-A, B-B, C-C, AND D-D.

COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.

HL93 LOADING

STATE OF TEXAS
Blake W. Staton
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1/27/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

APPROACH SLAB DETAILS

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT	SHEET NO.
6	SEE TITLE SHEET	194

STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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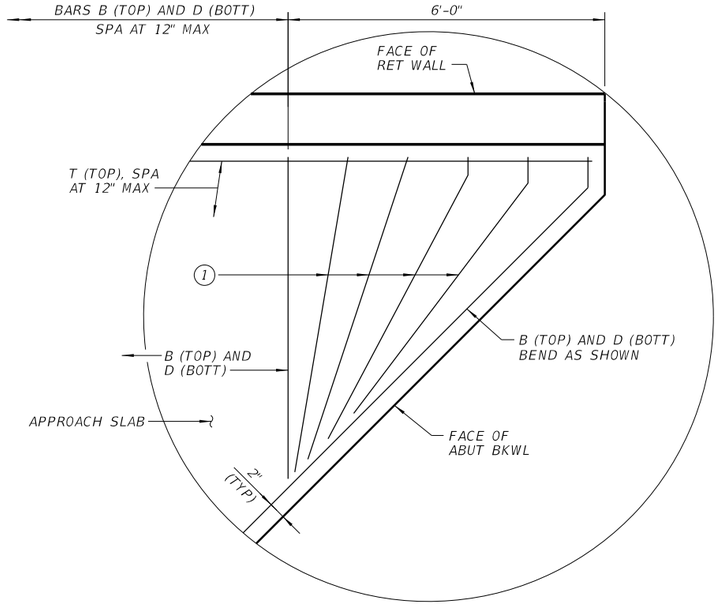
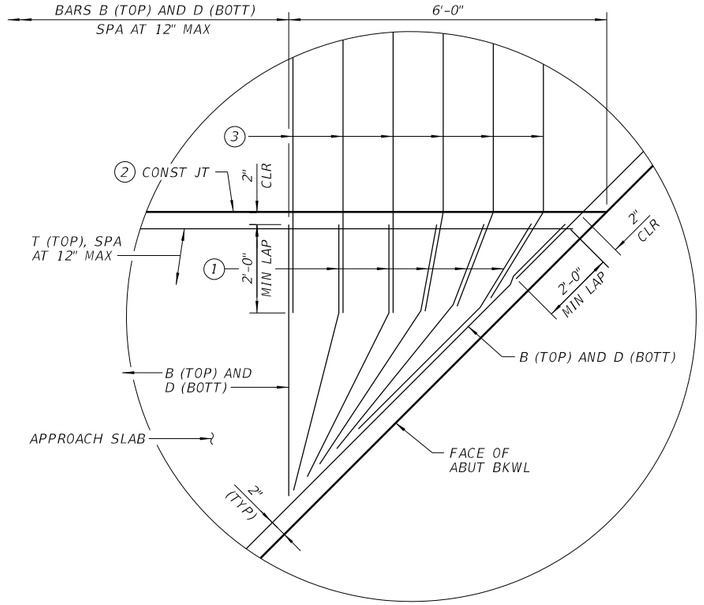


DETAIL "A"



DETAIL "B"

BAR TABLE	
BAR	SIZE
A	#8
B	#5
D	#5
T	#5

1. FLARE BARS B AND D IN THIS REGION (1'-6" MAX SPA, 3" MIN SPA). MINIMUM FLARED BAR LENGTH = 2'-6". BEND BARS AS NECESSARY.
2. PROVIDE LONGITUDINAL CONSTRUCTION JOINTS THAT ALIGN WITH LONGITUDINAL CONSTRUCTION JOINTS IN THE BRIDGE SLAB WITH BRIDGES BUILT IN STAGES. OTHER LONGITUDINAL CONSTRUCTION JOINTS MUST RECEIVE APPROVAL OF THE ENGINEER.
3. PHASE I APPROACH SLAB REINFORCING BARS B AND D TO EXTEND 2'-2" MIN INTO PHASE II APPROACH SLAB, WHERE NECESSARY.
4. MULTIPLE PIECE TIE BARS ARE ACCEPTABLE AT LONGITUDINAL CONSTRUCTION JOINTS PROVIDED MINIMUM LAPS SHOWN ARE ACHIEVED.
5. PLACE IN ACCORDANCE WITH ITEM 438.

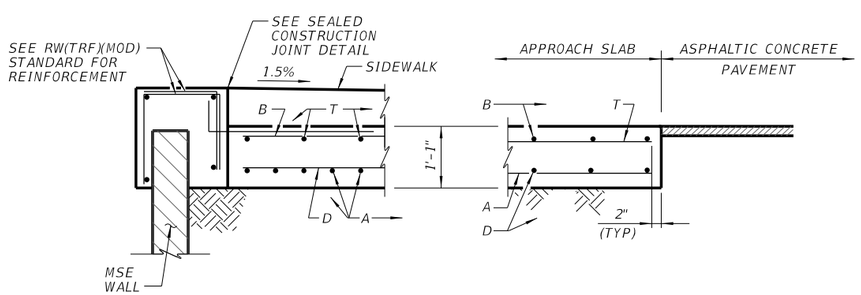
GENERAL NOTES:

SEE SHEET 1 OF 2 FOR SECTION LOCATIONS AND GENERAL NOTES.

SEE BRIDGE RAISED SIDEWALK AND MEDIAN DETAILS (BRSM) STANDARDFOR ADDITIONAL DETAILS.

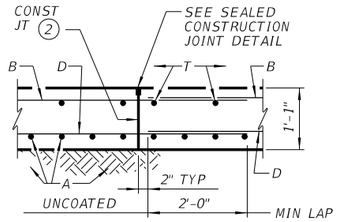
COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.

HL93 LOADING

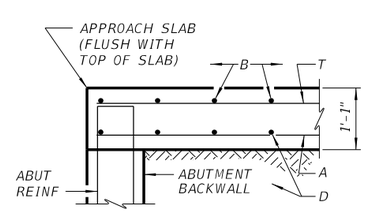


SECTION A-A

SECTION B-B



SECTION C-C 4



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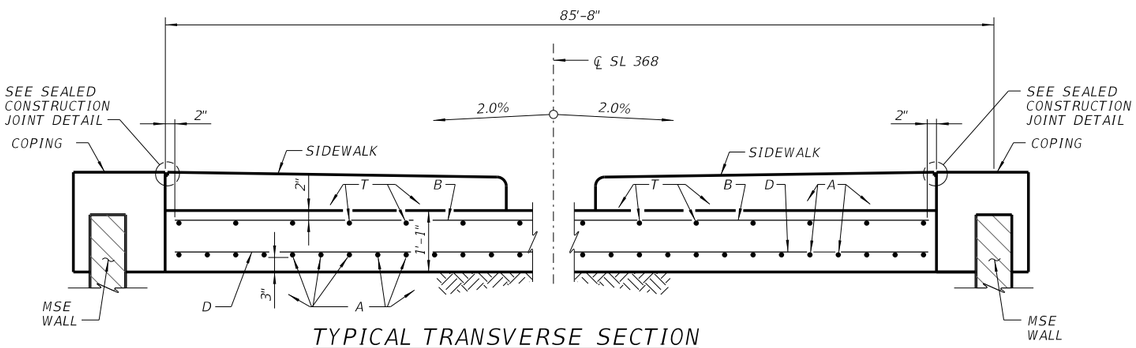
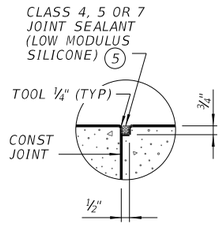


TYPICAL TRANSVERSE SECTION



SEALED CONSTRUCTION JOINT DETAIL

STATE OF TEXAS
Blake W. Staton
121491
LICENSED
PROFESSIONAL ENGINEER
1/27/2021

GARVER
3755 S. Capital of Texas Highway
Suite 325
Austin, TX 78704
(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

APPROACH SLAB DETAILS

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		195
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

DATE: 1/27/2021 12:55:28 PM
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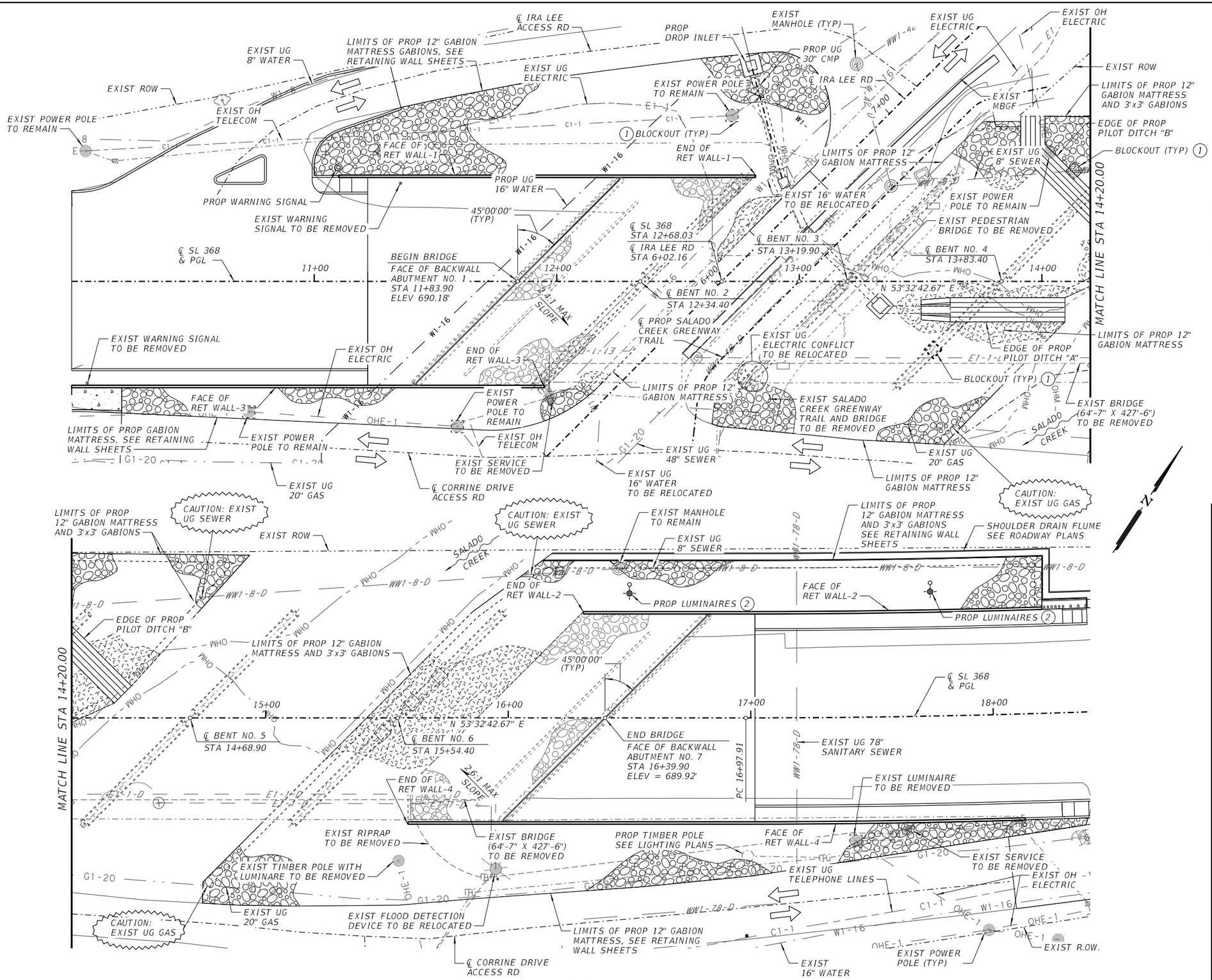
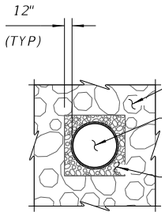




BLOCKOUT DETAIL

(1) BLOCKOUT SHALL BE USED AT ALL MANHOLE, POWER POLES, AND COLUMN LOCATIONS. BLOCKOUTS SHALL BE FILLED WITH FLEXIBLE 12" RIPRAP STONE PROTECTION.

(2) LUMINAIRE SHALL BE INSTALLED AFTER RETAINING WALL CONSTRUCTION IS COMPLETE. SEE ILLUMINATION PLANS FOR NOTES.

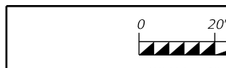
GENERAL NOTES:

DESIGN IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION (2017), WITH CURRENT INTERIMS.

CUT EXISTING FOUNDATIONS 1'-0" (MIN) BELOW PROPOSED GRADE.

3'x3' GABION TOE SHALL BE PLACED ALONG UPSTREAM SIDE OF THE SCOUR PROTECTION AND ALONG BOTH SIDES OF THE CHANNEL ALONG THE LIMITS OF THE 12" GABION MATTRESS. ALL GABIONS AND GABION MATTRESSES SHALL BE PLACED OUTSIDE OF THE ORDINARY HIGH WATER MARK.

CONTRACTOR MUST VERIFY THE EXACT LOCATIONS AND DEPTHS OF ALL UTILIITIES PRIOR TO CONSTRUCTION. NOTIFY ENGINEER OF ANY CONFLICTS PRIOR TO CONSTRUCTION. ALL UNDERGROUND UTILITIES SHALL HAVE A MINIMUM 3 FOOT HORIZONTAL CLEARANCE TO ANY 3'x3' GABION.



SCALE: 1" = 40'

STATE OF TEXAS
Blake W. Staton
121491
LICENSED PROFESSIONAL ENGINEER

1/27/2021

GARVER
3755 S. Capital of Texas Highway
Suite 325
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(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

GABION MATTRESS LAYOUT

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		196
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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STRUCTURE	DESIGNED GIRDERS									DEPRESSED STRAND PATTERN		CONCRETE		OPTIONAL DESIGN				
	SPAN NO.	GIRDER NO.	GIRDER TYPE	PRESTRESSING STRANDS						NO.	TO END (in)	RELEASE STRGTH (1) f'ci (ksi)	MINIMUM 28 DAY COMP STRGTH f'c (ksi)	DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct(ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb(ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (kip-ft)	LIVE LOAD DISTRIBUTION FACTOR (2)	
				NON-STD STRAND PATTERN	TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" ℄ (in)	"e" END (in)								Moment	Shear
SL 368	1	ALL	Tx34		10	0.6	270	13.01	13.01			4.000	5.000	1.357	-1.699	1738	0.650	0.907
	2	ALL	Tx34		34	0.6	270	11.48	7.95	6	26.5	6.000	7.800	3.965	-4.584	4264	0.584	0.933
	3	ALL	Tx34		16	0.6	270	12.76	12.76			5.600	5.600	2.185	-2.641	2596	0.621	0.918
	4-6	ALL	Tx34		34	0.6	270	11.48	7.95	6	26.5	6.000	7.800	3.965	-4.584	4264	0.584	0.933

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER

(1) Based on the following allowable stresses (ksi):

Compression = 0.65 f'ci

Tension = $0.24\sqrt{f'ci}$

Optional designs must likewise conform.

(2) Portion of full HL93.

DESIGN NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

Optional designs for girders 120 feet or longer must have a calculated residual camber equal to or greater than that of the designed girder.

Prestress losses for the designed girders have been calculated for a relative humidity of 65 percent. Optional designs must likewise conform.

FABRICATION NOTES:

Provide Class H concrete.

Provide Grade 60 reinforcing steel bars.

Use low relaxation strands, each pretensioned to 75 percent of fpu.

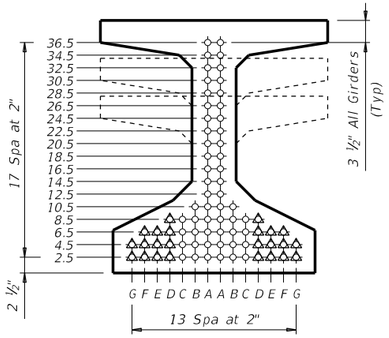
Strand debonding must comply with Item 424.4.2.2.2.4. Full-length debonded strands are only permitted in positions marked Δ. Double wrap full-length debonded strands in outer most position of each row.

When shown on this sheet, the Fabricator has the option of furnishing either the designed girder or an approved optional design. All optional design submittals must be signed, sealed and dated by a Professional Engineer registered in the State of Texas.

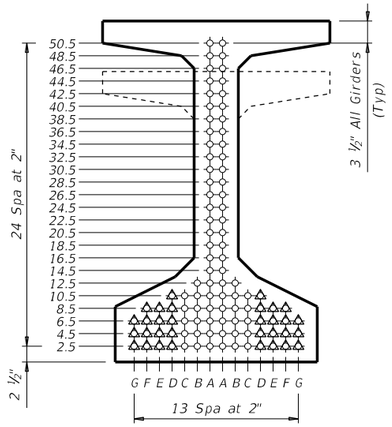
Seal cracks in girder ends exceeding 0.005" in width as directed by the Engineer. The fabricator is permitted to decrease the spacing of Bars R and S by providing additional bars to help limit crack width provided the decreased spacing results in no less than 1" clear between bars. The fabricator must take an approved corrective action if cracks greater than 0.005" form on a repetitive basis.

DEPRESSED STRAND DESIGNS:

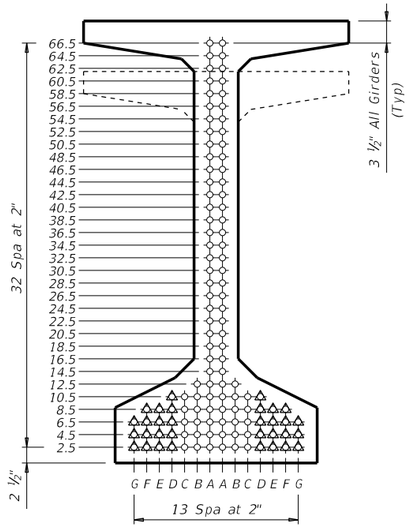
Locate strands for the designed girder as low as possible on the 2" grid system unless a non-standard strand pattern is indicated. Fill row "2.5", then row "4.5", then row "6.5", etc., beginning each row in the "A" position and working outward until the required number of strands is reached. All strands in the "A" position must be depressed, maintaining the 2" spacing so that, at the girder ends, the upper two strands are in the position shown in the table.



TYPE Tx28, Tx34 & Tx40



TYPE Tx46 & Tx54



TYPE Tx62 & Tx70

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

FILE: igndsts1-19.dgn	DN: TxDOT	CK: TxDOT	DW: EFC	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
10-19: Modified for depressed strands only.	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		197

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The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
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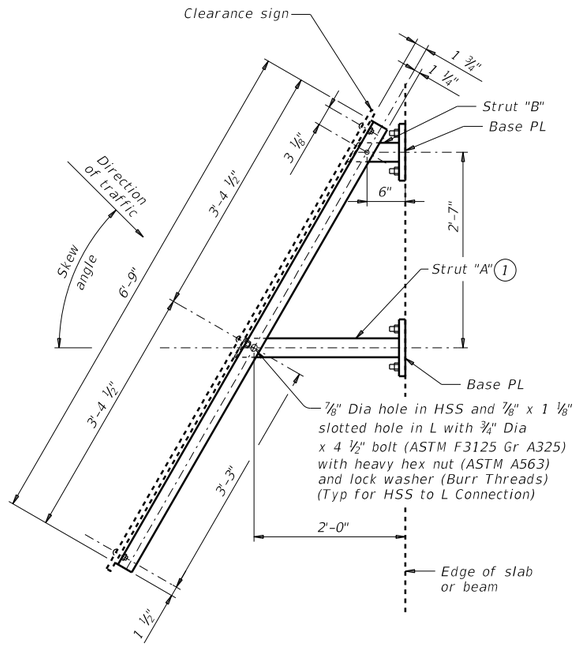
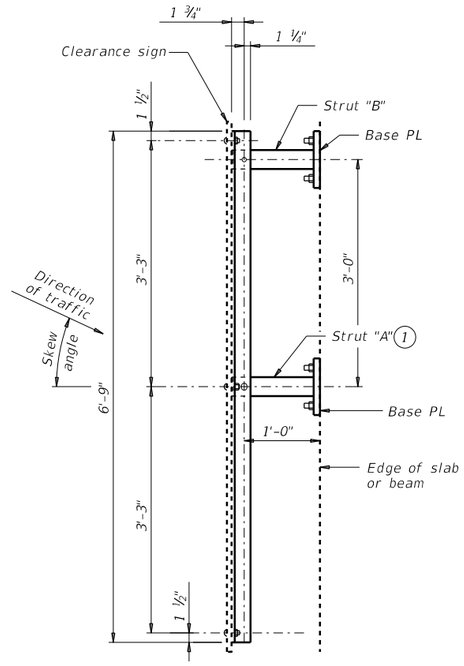


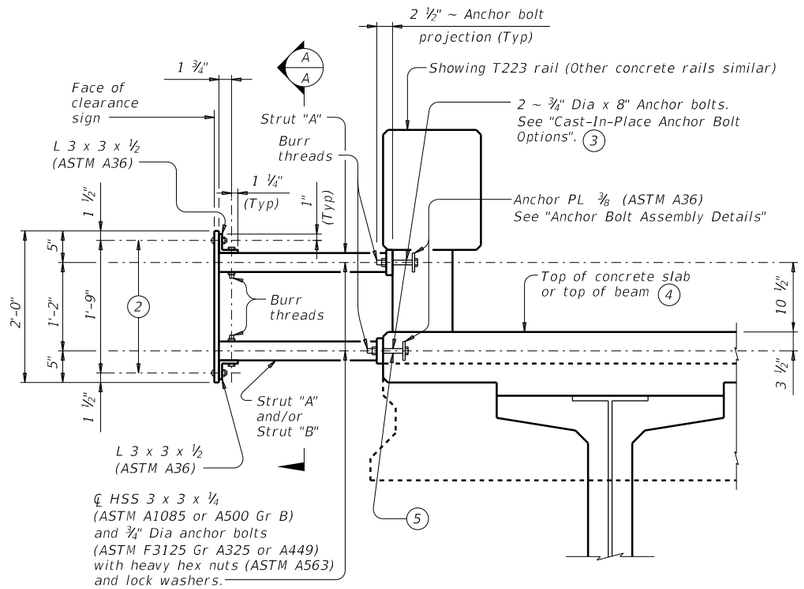
PLAN OF TYPE S MOUNT

(Used for skews over 30°)

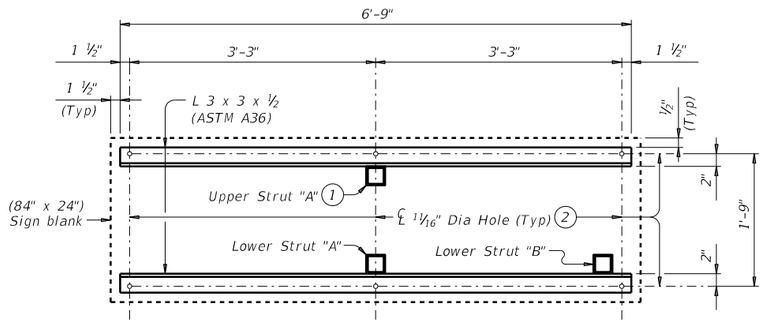


PLAN OF TYPE N MOUNT

(Used for 0° to 30° skews)



SECTION



SECTION A-A

(1) Locate centerline of Strut A no closer than 12" from a vertical concrete edge.

(2) ℄ ⅝" Dia x 2" Hexagon socket button head cap screws (ASTM A574) with hex nuts. Attach hex nuts to L 3 x 3 x ½ by tack welding in two places. Threads must have Class 3A fit tolerance in accordance ASME B1.1. Six screws required.

(3) At the Contractor's option fully threaded adhesive anchors may be use instead of cast-in-place anchor bolts. Expansion anchors are not allowed. Provide adhesive anchors that are ¾" Dia ASTM A193 Gr B7 or F1554 Gr 105 fully threaded rods with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). Embed fully threaded rods using a Type III, Class C, D, E, or F anchor adhesive. Adhesive anchor embedment depth is 8". Anchor adhesive chosen must be able to achieve a factored bond strength in tension of 2.2 kips per anchor (edge distance and spacing must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

(4) For decked slab beams topped with a 2 course surface treatment and ACP overlay.

(5) Anchor bolts to be cast into decked slab beams topped with a 2 course surface treatment or ACP overlay. Anchor bolts with heavy hex nuts, regular lock washers, hardened washers and anchor plate that is embedded in the beam will be provided by the beam Fabricator.

CONSTRUCTION NOTES:

Install the vertical face of clearance sign plumb unless otherwise approved by the Engineer.

Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 1 anchor per bridge mounted clearance sign installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

MATERIAL NOTES:

Galvanize all steel components after fabrication unless otherwise noted.

GENERAL NOTES:

This standard provides details to mount a vertical clearance sign (84" x 24") to bridges. Rail Types T631, T631LS, PR11, PR22 and PR3 are not accommodated.

The Engineer will furnish the clearance to be shown on the sign.

See Bridge Layout for sign location and mounting type (Type N or S).

Cost of furnishing, installing, relocating or removing a clearance sign, including structural steel for sign mount, is included in unit price bid for Item 644, "Small Roadside Sign Assemblies".

One Sign Blank (84" x 24") is 14 SF.

Average steel weight for one complete Type N Mount is 219 Lb.

Average steel weight for one complete Type S Mount is 233 Lb.

SHEET 1 OF 3

Texas Department of Transportation

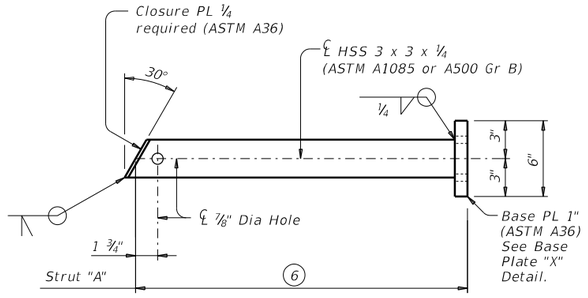
Bridge Division Standard

BRIDGE MOUNTED CLEARANCE SIGN ASSEMBLY

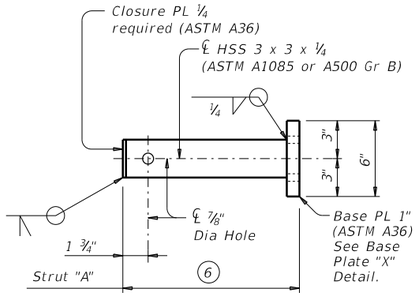
BMCS

FILE: bmcsste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		198

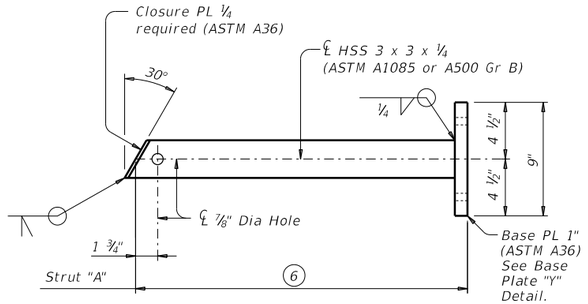
DATE:
FILE:



FOR T411 AND C411 RAIL TYPES



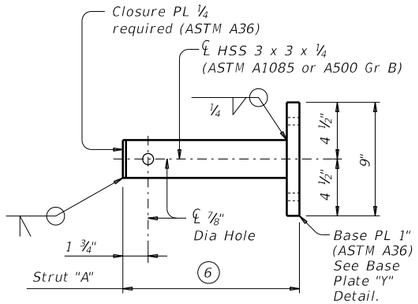
FOR T411 AND C411 RAIL TYPES



FOR T221, C221, T222, T223, C223, T401, T402, C402, T551, T552, T80HT, T80SS AND SSTR RAIL TYPES

UPPER STRUT DETAIL FOR (TYPE S MOUNT)

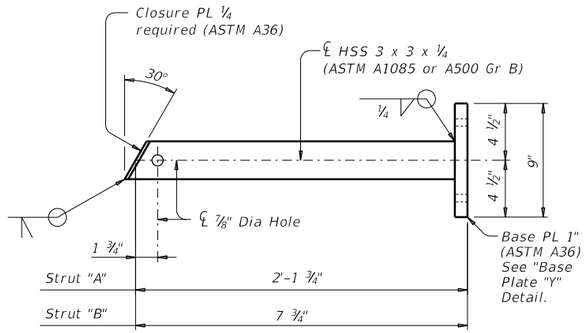
(Used for skews over 30°)



FOR T221, C221, T222, T223, C223, T401, T402, C402, T551, T552, T80HT, T80SS AND SSTR RAIL TYPES

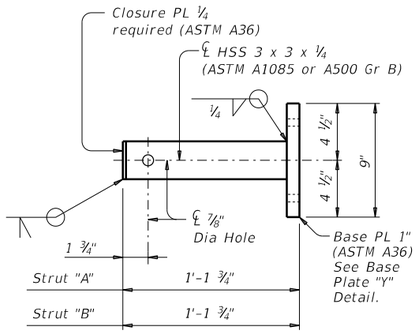
UPPER STRUT DETAIL FOR (TYPE N MOUNT)

(Used for 0° to 30° skews)



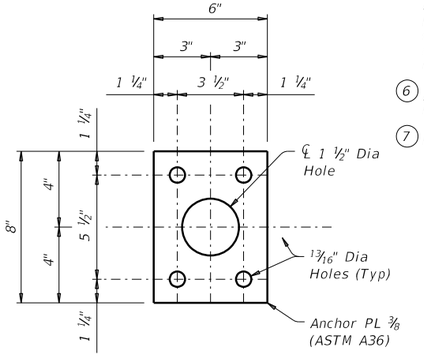
LOWER STRUT DETAILS FOR (TYPE S MOUNT)

(Used for skews over 30°)

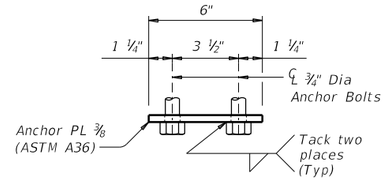


LOWER STRUT DETAILS FOR (TYPE N MOUNT)

(Used for 0° to 30° skews)



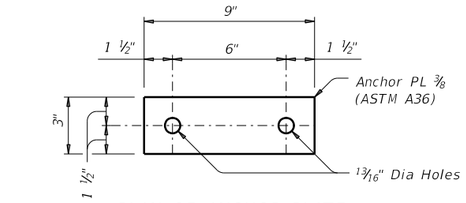
PLAN OF ANCHOR PLATE



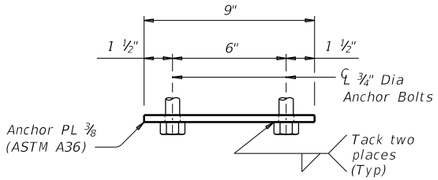
ELEVATION

ANCHOR BOLT ASSEMBLY DETAILS (3)

(Used on Base Plate "X" with T411 and C411 rail types.)



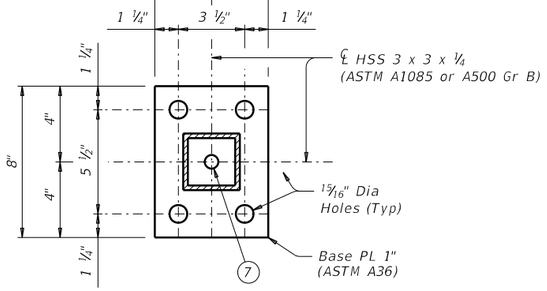
PLAN OF ANCHOR PLATE



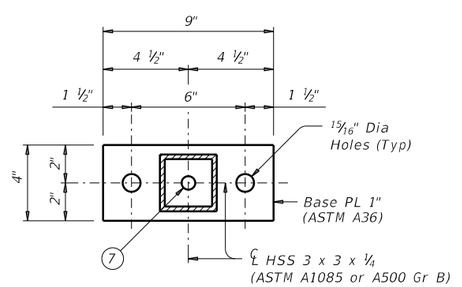
ELEVATION

ANCHOR BOLT ASSEMBLY DETAILS (3)

(Used on Base Plate "Y" and with T1F, T2P, C2P, T1W, C1W, T66 and C66 rail types.)

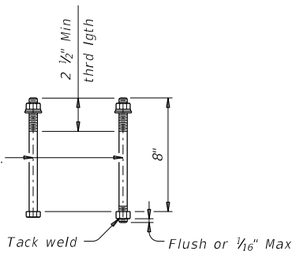


BASE PLATE "X" DETAIL



BASE PLATE "Y" DETAIL

℄ ¾" Dia heavy hex head anchor bolt (ASTM F3125 Gr A325 or A449) or threaded rod (ASTM A193 Gr B7 or F1554 Gr 105) with one hardened washer and one regular lock washer placed under heavy hex nut (ASTM A563). Furnish one additional heavy hex nut for each threaded rod.



CAST-IN-PLACE ANCHOR BOLT OPTIONS (3)

(3) At the Contractor's option fully threaded adhesive anchors may be use instead of cast-in-place anchor bolts. Expansion anchors are not allowed. Provide adhesive anchors that are ¾" Dia ASTM A193 Gr B7 or F1554 Gr 105 fully threaded rods with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). Embed fully threaded rods using a Type III, Class C, D, E, or F anchor adhesive. Adhesive anchor embedment depth is 8". Anchor adhesive chosen must be able to achieve a factored bond strength in tension of 2.2 kips per anchor (edge distance and spacing must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

(6) Adjust length to accommodate edge of slab to back of rail for specific project conditions and to help plumb the vertical face of clearance sign.

(7) Hole required to drain zinc from base plate during galvanizing.

Texas Department of Transportation

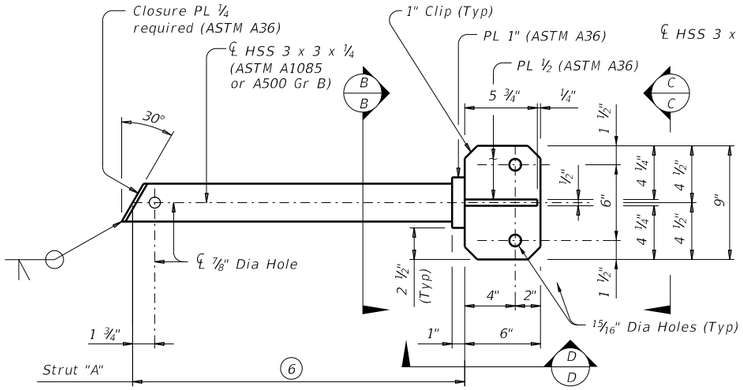
Bridge Division Standard

BRIDGE MOUNTED CLEARANCE SIGN ASSEMBLY

BMCS

FILE: bmcsste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		199

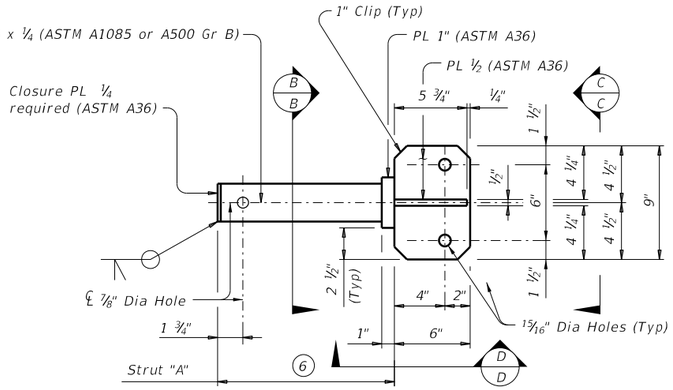
DATE:
FILE:



FOR T1F, T2P, C2P, T1W, C1W, T66 AND C66 RAIL TYPES

UPPER STRUT DETAIL FOR (TYPE S MOUNT)

(Used for skews over 30°)



FOR T1F, T2P, C2P, T1W, C1W, T66 AND C66 RAIL TYPES

UPPER STRUT DETAIL FOR (TYPE N MOUNT)

(Used for 0° to 30° skews)

(2) ℄ ⅜" Dia x 2" Hexagon socket button head cap screws (ASTM A574) with hex nuts. Attach hex nuts to L 3 x 3 x ½ by tack welding in two places. Threads must have Class 3A fit tolerance in accordance ASME B1.1. Six screws required.

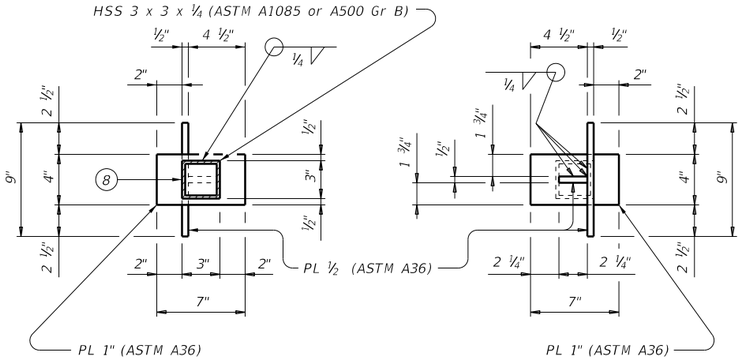
(3) At the Contractor's option fully threaded adhesive anchors may be use instead of cast-in-place anchor bolts. Expansion anchors are not allowed. Provide adhesive anchors that are ¾" Dia ASTM A193 Gr B7 or F1554 Gr 105 fully threaded rods with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). Embed fully threaded rods using a Type III, Class C, D, E, or F anchor adhesive. Adhesive anchor embedment depth is 8". Anchor adhesive chosen must be able to achieve a factored bond strength in tension of 2.2 kips per anchor (edge distance and spacing must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

(4) For decked slab beams topped with a 2 course surface treatment and ACP overlay.

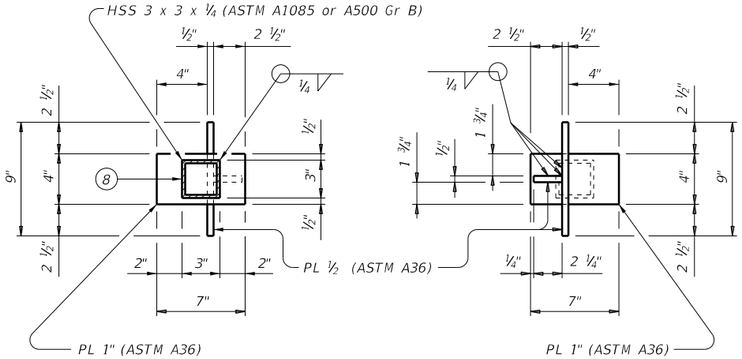
(6) Adjust length to accommodate edge of slab to back of rail for specific project conditions and to help plumb the vertical face of clearance sign.

(8) Hole required in bottom of HSS to drain zinc during galvanizing.

(9) 11" curb is for structures with 2" ACP overlay.



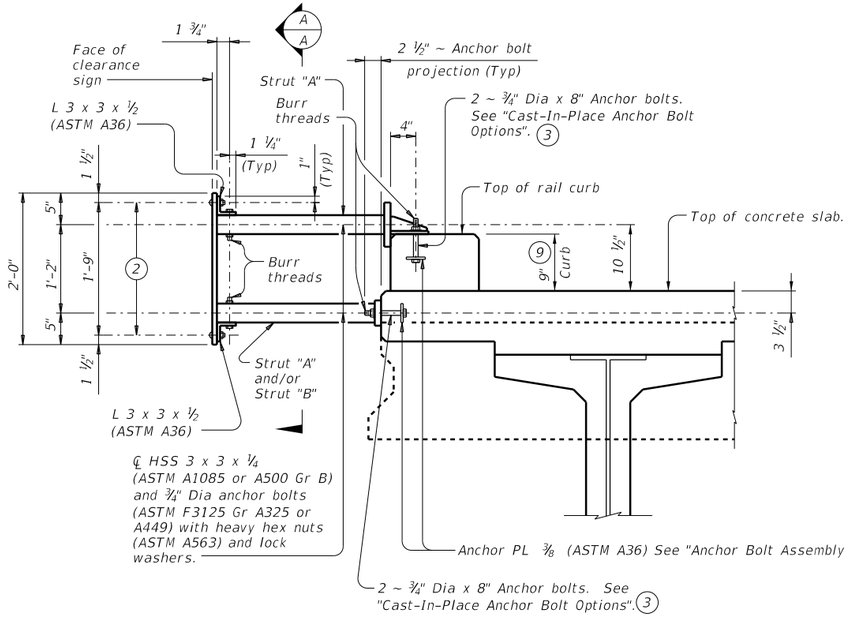
FOR 9" HIGH CURBS



FOR 11" HIGH CURBS

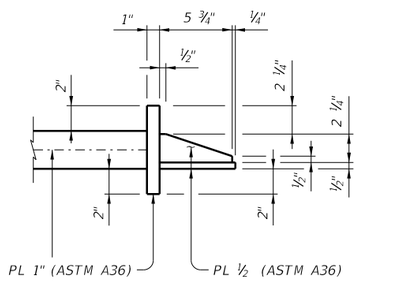
SECTION B-B

VIEW C-C

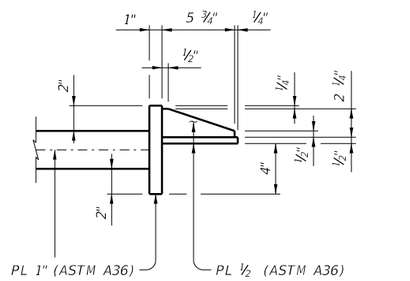


SECTION THRU T1F, T2P, C2P, T1W, C1W, T66 AND C66 RAIL CURB

Showing sign mount on a 9" high curb, 11" high curb similar.



FOR 9" HIGH CURBS



FOR 11" HIGH CURBS

VIEW D-D

SHEET 3 OF 3

Texas Department of Transportation

Bridge Division Standard

BRIDGE MOUNTED CLEARANCE SIGN ASSEMBLY

BMCS

FILE: bmcsste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		200

DATE: 1/27/2021 12:56:10 PM
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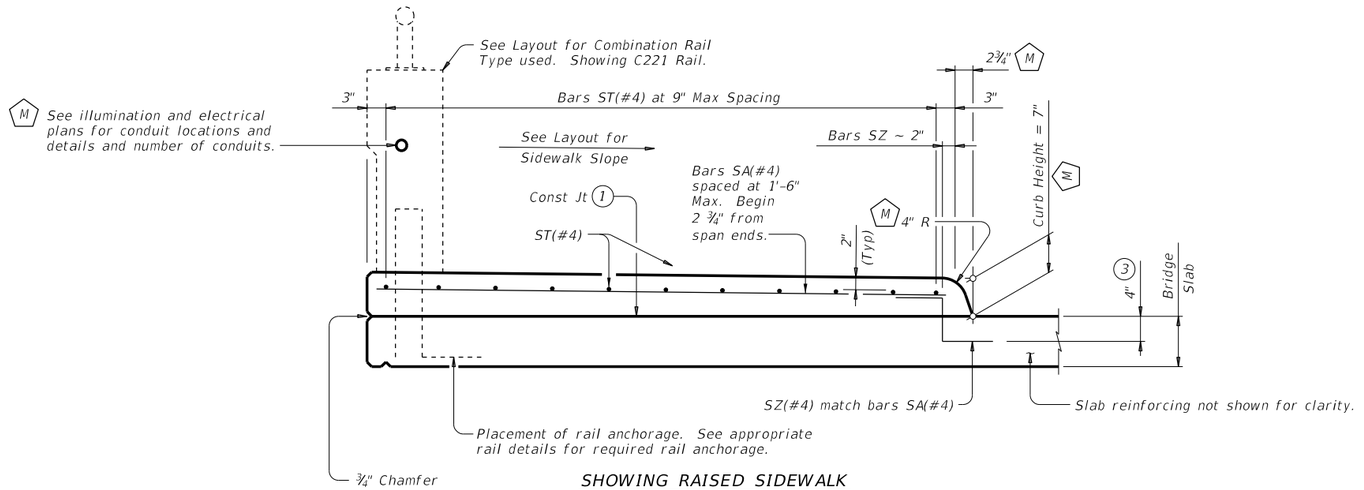
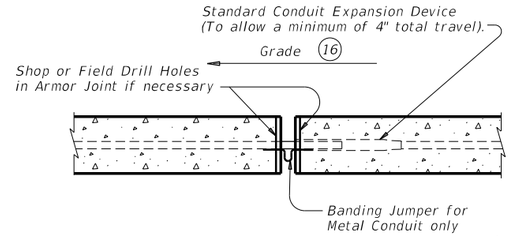


SHOWING RAISED SIDEWALK

TYPICAL TRANSVERSE SECTIONS

See Span Details for dimensions not shown.

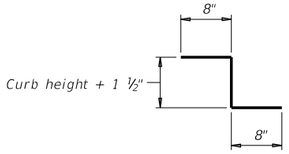


CONDUIT EXPANSION JOINT M

1 Provide broom finish to top of bridge slab where raised sidewalk or raised median area is defined.

2 Unless noted otherwise on the span details.

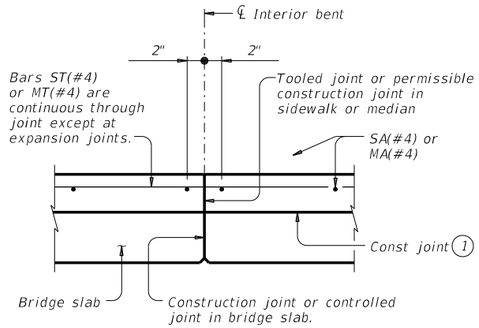
3 Bars may rest on top of PCPs.



BARS SZ(#4) AND MZ(#4)

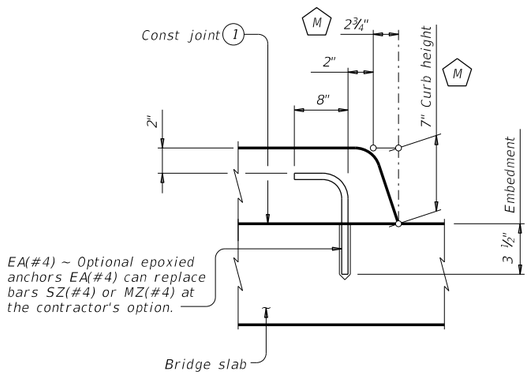
APPROVED SLIP RESISTANT PLATE	
Product	Manufacturer Website
Algrip™, Steel	www.algrip.com
Mebac® #3, Steel	www.harscoikg.com
SlipNOT® Grade 2, Steel	www.slipnot.com

Provide drain cover plates fabricated with a product from this list. No exceptions are permitted.



LONGITUDINAL SECTION AT INTERIOR BENT

At bents with expansion joints, provide an open joint in the sidewalk/median matching the deck's joint width.



OPTIONAL EPOXY ANCHORS

Embed EA(#4) bar into concrete with a Type III (Class C, D, E, or F) epoxy meeting the requirements of DMS-6100, "Epoxies and Adhesives". Follow manufacturer's directions for installing the epoxied anchor bars.

MATERIAL NOTES:

Provide the same concrete required for the bridge deck, Class S or Class S (HPC).

Provide Grade 60 reinforcement. Welded wire reinforcement (WWR) meeting ASTM A1064 of equivalent size and spacing may be substituted for bars SA, ST, MA, and MT.

Epoxy coat reinforcement if bridge deck reinforcement is required to be epoxy coated.

Hot-dip galvanize slip resistant steel plate after fabrication in accordance with Item 445, "Galvanizing". Chamfer or round edges approximately 1/16" prior to galvanizing.

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

Provide the following bar or wire lap lengths when required:
Uncoated, 1'-7" Min
Coated, 2'-1" Min

Submittal and approval of drain cover plate shop drawings is not required if fabrication is accordance with these details.

Raised sidewalks will be paid under Item 422 by the SF of Bridge Sidewalk or Bridge Sidewalk (HPC). Raised medians will be paid under Item 422 by the SF of Bridge Median or Bridge Median (HPC).

Payment for drain cover plates will be by the pound of "Structural Steel (Misc Non-Bridge)" as per Item 442, "Metal for Structures". Weight of one drain cover plate is 58 plf. M

DESIGNER NOTES:

These details do not apply for longitudinal grades exceeding 5 percent.

Cover dimensions are clear dimensions, unless noted otherwise.

Reinforcing bar dimensions shown are out-to-out of bar.

MODIFICATION:

Modified dimensions to be compatible with San Antonio District standard curb. Removed raised median detail. Added conduit to rail and added Conduit Expansion Joint detail. Added keynote for drain cover plate at rail opening.

LEGEND:

M Indicates modified detail or area

STATE OF TEXAS
Blake W. Staton
121491
LICENSED PROFESSIONAL ENGINEER
1/27/2021

Texas Department of Transportation | Bridge Division Standard

BRIDGE RAISED SIDEWALK AND MEDIAN DETAILS

BRSM(MOD)

FILE: brsmste1-19.dgn	DN: JMH	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		201

DATE: 1/27/2021 12:56:35 PM
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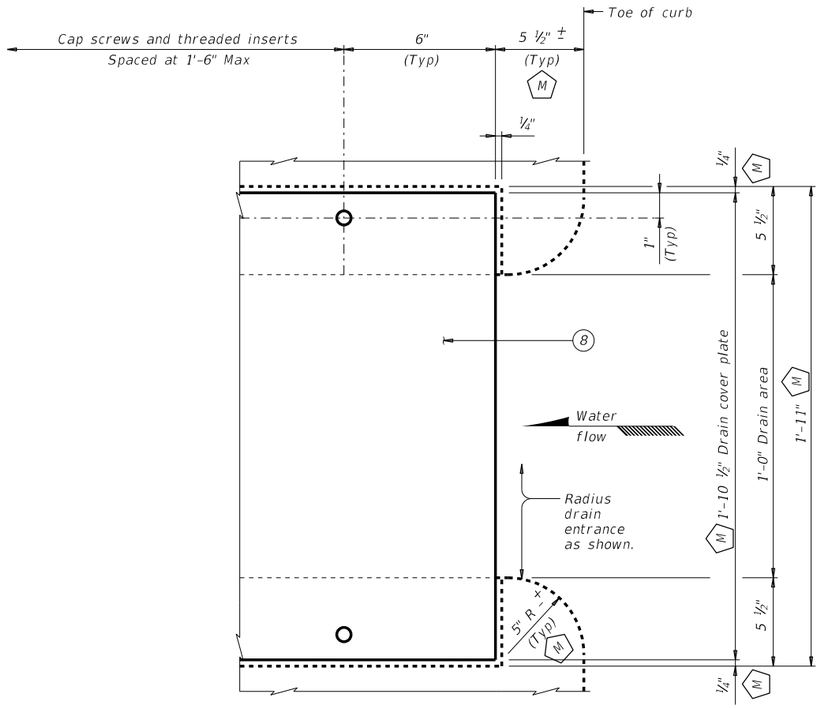
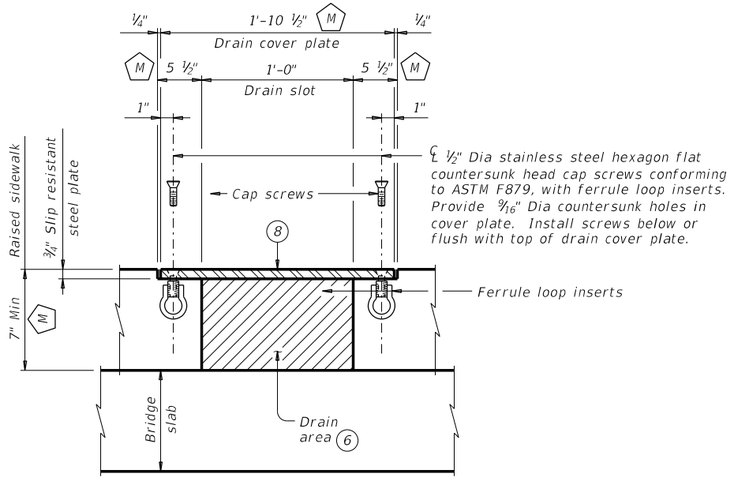


PARTIAL PLAN CURB DRAIN



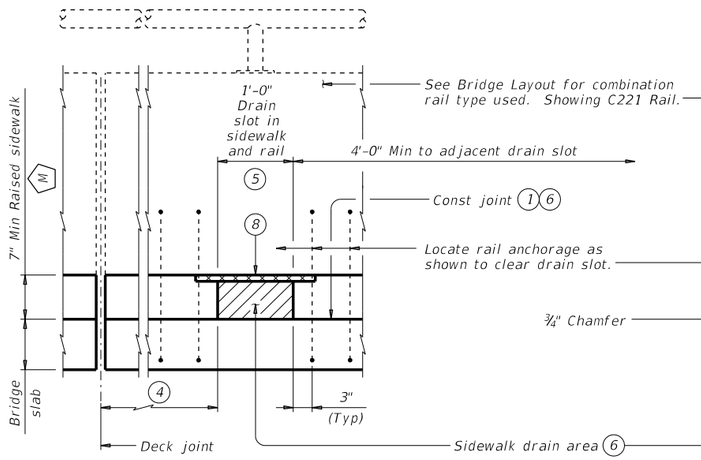
SECTION B-B

Reinforcing not shown for clarity.

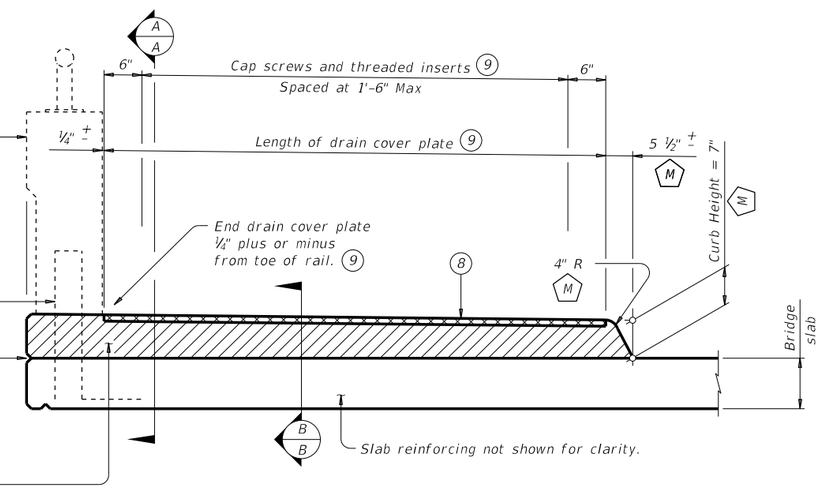
1. Provide broom finish to top of bridge slab where raised sidewalk or raised median area is defined.
4. 3'-0" Min at deck expansion joints, deck construction joints or controlled joints, rail intermediate wall joints or from face of substructure.
5. For rail Type C1W, center drain slots between posts.
6. Steel trowel top surface of bridge deck in drain locations.
7. Provide sidewalk drains where shown elsewhere on the plans or as directed by the Engineer. Do not place drains over railroad tracks, lower roadways, or sidewalks. Place drain and cover plate perpendicular to toe of rail.
M 8. Drain cover plate (PL ¾ x 22 ½ slip resistant steel plate). Install flush with top of sidewalk.
M 9. Extend drain cover plate to 1" plus or minus offset from edge of deck when located at a rail opening.

MODIFICATION:
Modified dimensions to be compatible with San Antonio District standard curb. Removed raised median detail. Added conduit to rail and added Conduit Expansion Joint detail. Added keynote for drain cover plate at rail opening.

LEGEND:
M Indicates modified detail or area



SECTION A-A



SHOWING RAISED SIDEWALK WITH DRAIN SLOT

OPTIONAL DRAIN DETAILS 7

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

BRIDGE RAISED SIDEWALK AND MEDIAN DETAILS

BRSM(MOD)

STATE OF TEXAS
Blake W. Staton
121491
LICENSED PROFESSIONAL ENGINEER
1/27/2021

FILE: brsmste1-19.dgn	DN: JMH	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
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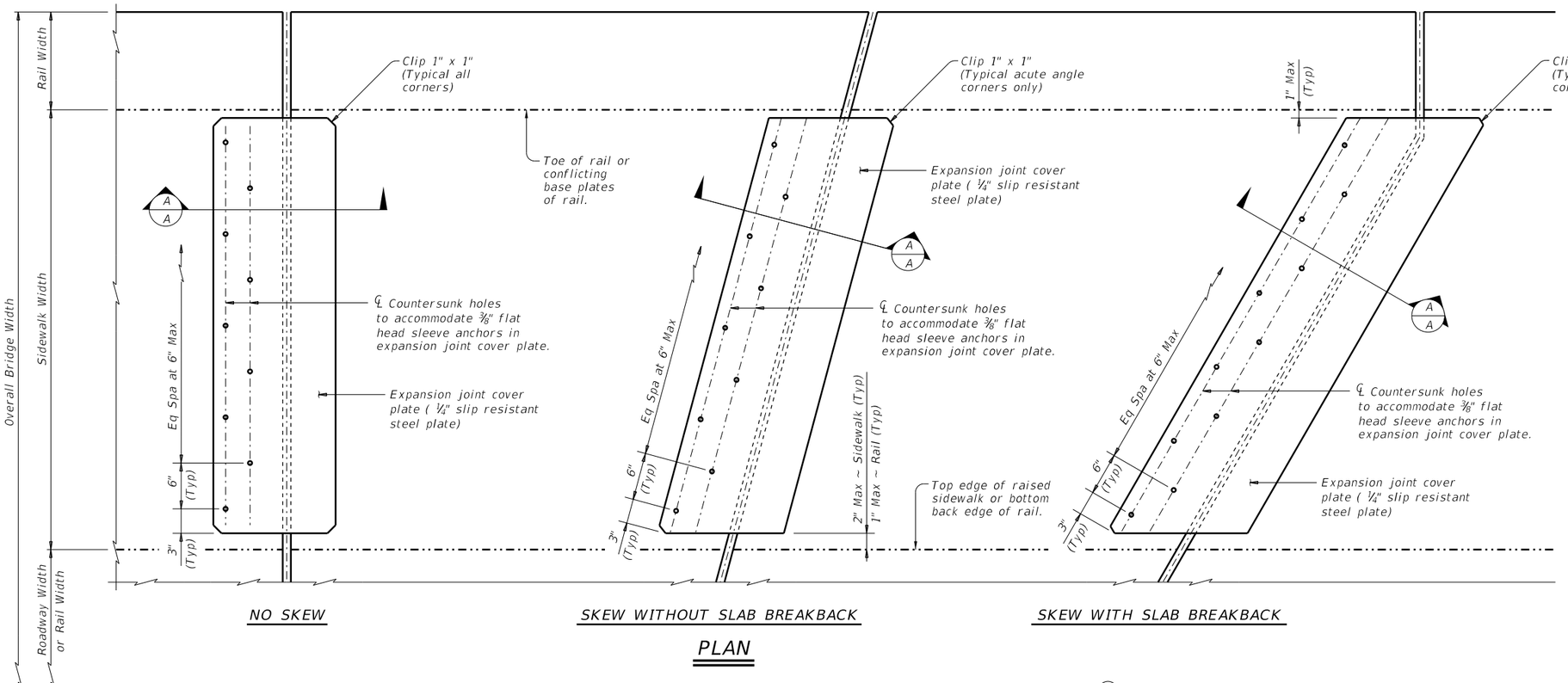
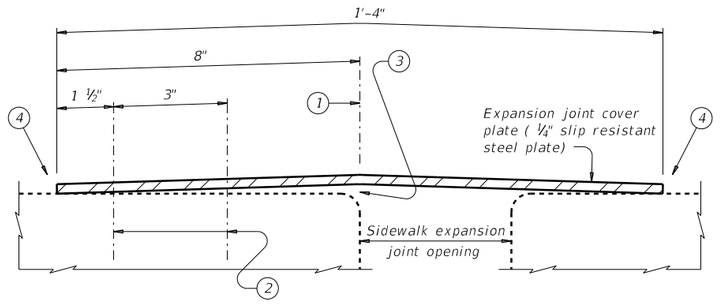
	SAT	BEXAR		202

DATE:
FILE:

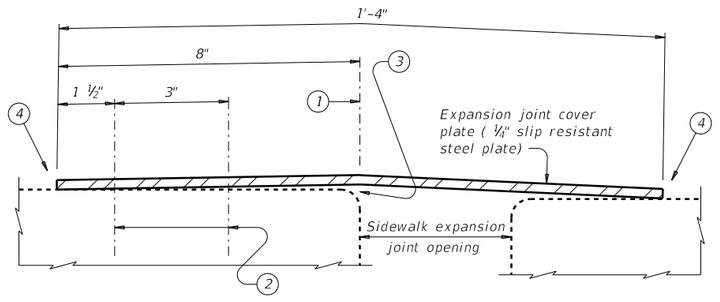


NO SKEW | SKEW WITHOUT SLAB BREAKBACK | SKEW WITH SLAB BREAKBACK

PLAN



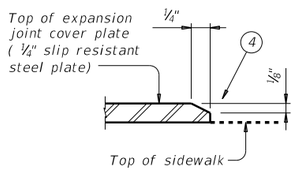
SHOWING LEVEL EXP JOINT



SHOWING UNLEVEL EXP JOINT
(Install sleeve anchors on high side of expansion joint)

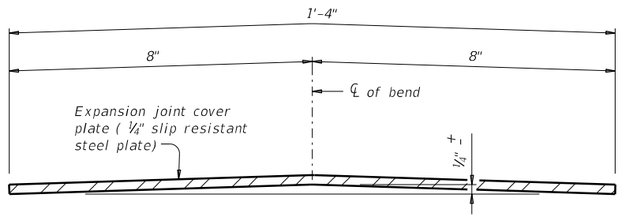
SECTION A-A

1. ℄ Expansion joint cover plate and edge of expansion joint.
2. ℄ ⅜" x 2 ½" Min, Flat Head Sleeve Anchors, Stainless Steel. Countersink Flat Head Sleeve Anchors in ¼" Slip Resistant Steel Plate.
3. It is not necessary to remove plate crown provided the plate is firmly secured to the sidewalk.
4. Transverse edges must be in contact with sidewalk surface after installation.



EXP JOINT COVER PLATE BEVEL DETAIL

Bevel all plate edges as shown.



BENDING DIAGRAM OF EXP JOINT COVER PLATE

APPROVED SLIP RESISTANT PLATE	
Product	Manufacturer Website
Algrip™, Steel	www.algrip.com
Mebac® #3, Steel	www.harscoikg.com
SlipNOT® Grade 2, Steel	www.slipnot.com

Provide cover plates fabricated with a product from this list. No exceptions are permitted.

FABRICATION NOTES:

Shop drawings for the fabrication of Bridge Sidewalk Expansion Joint Cover Plate will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.

A Bridge Sidewalk Expansion Joint Cover Plate Layout which identifies location side of sleeve anchors and orientation of all cover plate sections must be developed by the fabricator. Mark each steel section in accordance with the Bridge Sidewalk Expansion Joint Cover Plate Layout. A copy of the Bridge Sidewalk Expansion Joint Cover Plate Layout is to be provided to the Engineer.

Sidewalk expansion joint cover plates must be hot-dipped galvanized ¼" slip resistant steel plate. Checker plate or diamond plate is not allowed nor are slip resistant tapes, films and non-metallic coatings.

Minimum required yield strength of steel plate is 36 ksi.

Hot-dip galvanize slip resistant steel plate after fabrication in accordance with Item 445, "Galvanizing".

Provide stainless steel flat head sleeve anchors meeting the requirements of ASTM F 593, Group I, Alloy 304. Countersink holes in slip-resistant plate for sleeve anchors. Drill holes in sidewalk as per sleeve anchor manufacturer's recommendations. Install sleeve anchors flush with, or slightly recessed below, top surface of sidewalk expansion joint cover plate.

GENERAL NOTES:

Sidewalk expansion joint cover plates can only accommodate up to a 7" maximum expansion joint opening.

Details provided are applicable to concrete walkway surfaces only.

Payment for sidewalk expansion joint cover plates are by the pound of "Structural Steel (Misc Non-Bridge)" as per Item 442, "Metal for Structures".

Estimated weight of one sidewalk expansion joint cover plate is 14 plf.

Texas Department of Transportation

Bridge Division Standard

BRIDGE SIDEWALK EXPANSION JOINT COVER PLATE (ALL SKEWS)

BS-EJCP

FILE: bsejste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
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8-20: Closer tolerances on cover plate.	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		203

DATE:
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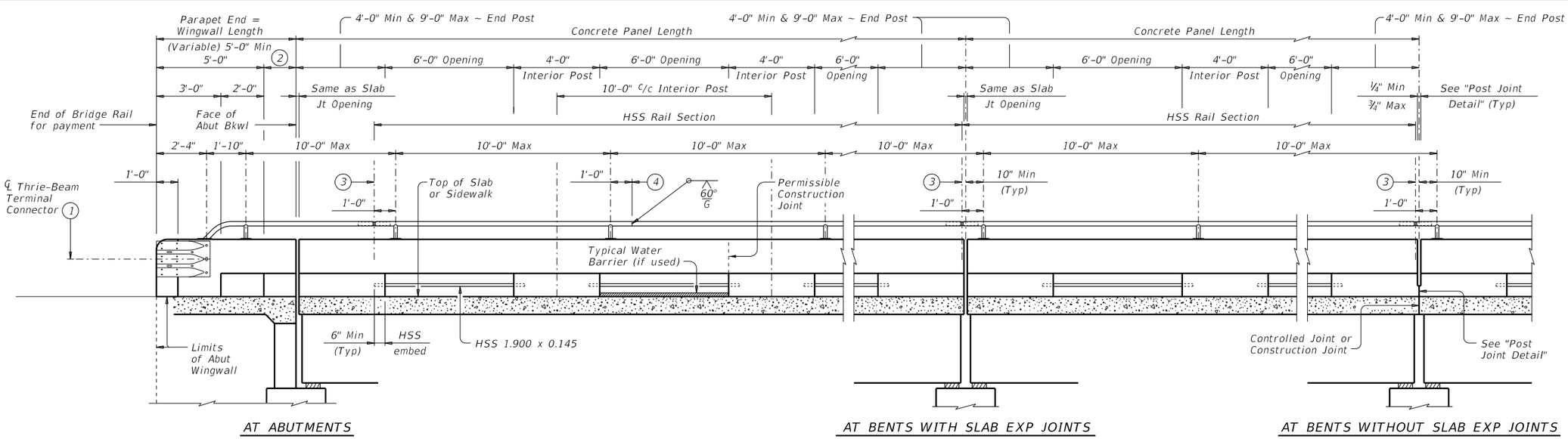


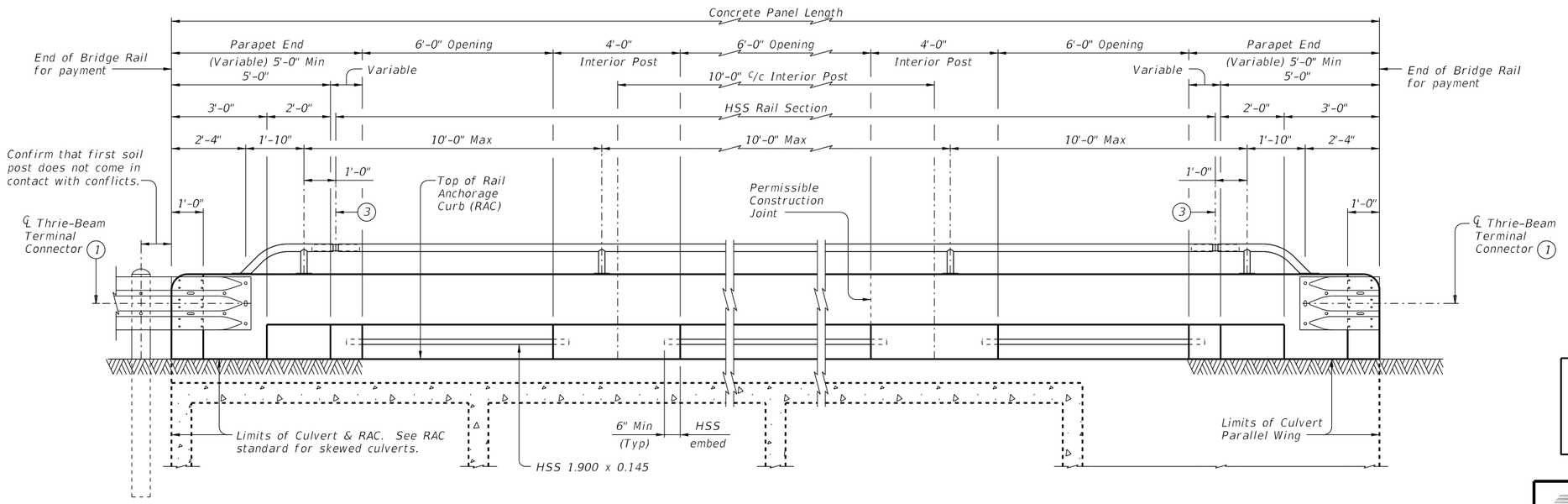
AT ABUTMENTS

AT BENTS WITH SLAB EXP JOINTS

AT BENTS WITHOUT SLAB EXP JOINTS

ROADWAY ELEVATION OF RAIL ON BRIDGE

(Showing without raised sidewalk)



AT STRAIGHT OR FLARED WINGS

AT PARALLEL WINGS

ROADWAY ELEVATION OF RAIL ON BOX CULVERTS

Showing 0° skew culvert. Skewed culverts similar. See RAC standard for details not shown. Vertical joints in concrete rail are not required, unless shown elsewhere.

(1) Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.

(2) Wingwall Length minus 5'-0" (Varies)

(3) ℄ Splice Jt or Exp Jt

(4) One shop splice per HSS rail section is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.

MODIFICATION:
Including conduit in rails where applicable.

LEGEND:
(M) Indicates modified detail or area

Texas Department of Transportation

Bridge Division Standard

COMBINATION RAIL

TYPE C223(MOD)

STATE OF TEXAS
Blake W. Staton
121491
LICENSED PROFESSIONAL ENGINEER
1/27/2021

FILE: rlstd019-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
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DATE:
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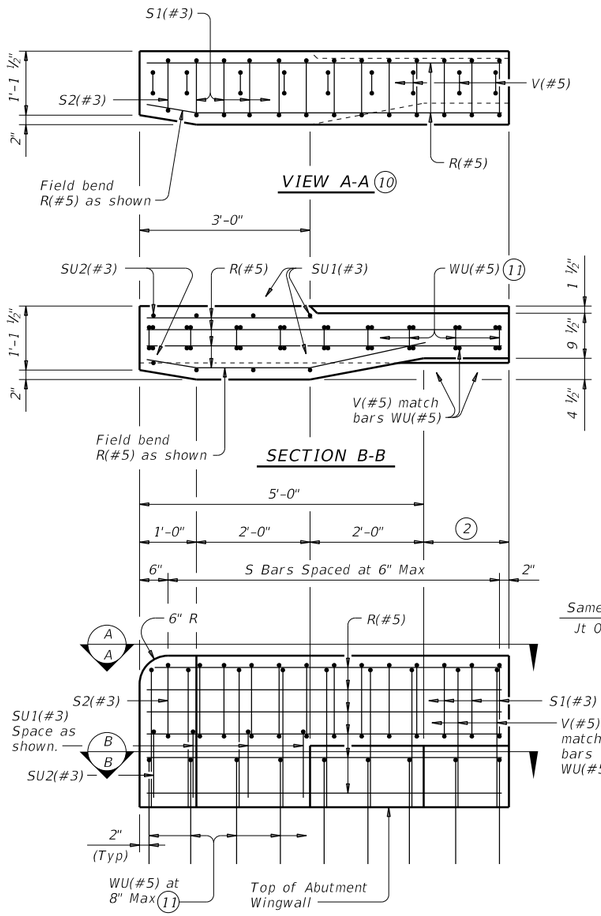
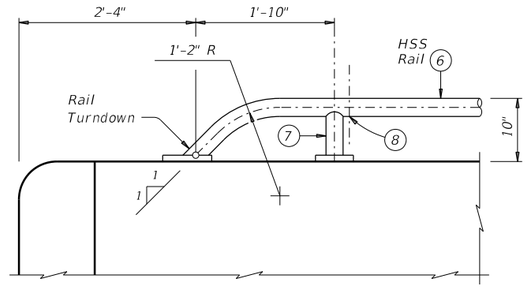
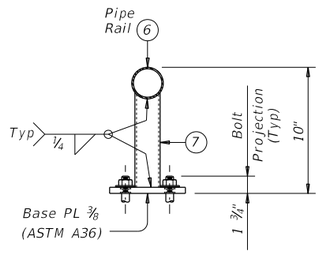


PARAPET END AT ABUT WINGWALL (11)

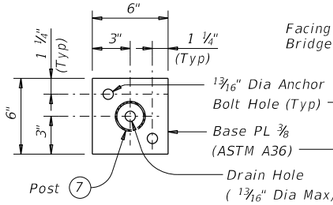


Note that at least two anchor points (as shown) are required for the Bridge Rail on the Abutment Wingwall. Longer Wingwalls may require more than two Rail anchorages.

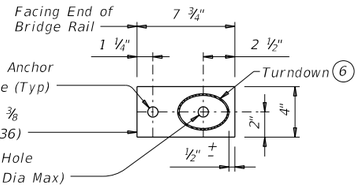
HSS RAIL TERMINAL DETAIL



TRANSVERSE SECTION

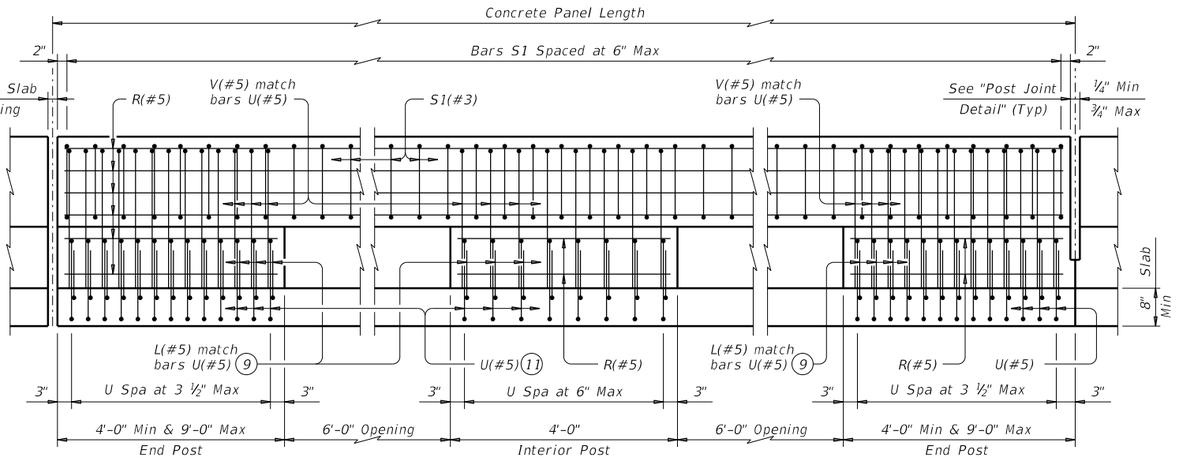


POST BASE PLATE PLAN



RAIL TURNDOWN BASE PLATE PLAN

HSS RAIL DETAILS



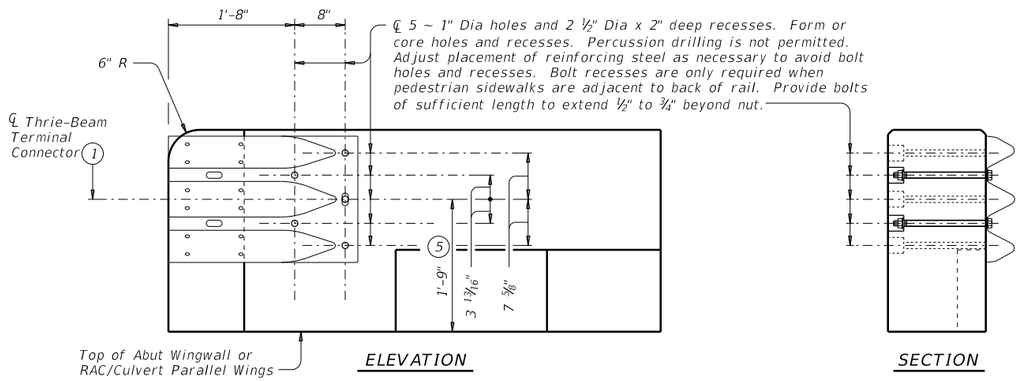
AT BENTS WITH SLAB EXP JOINTS

AT 4' INTERIOR POST

AT BENTS WITHOUT SLAB EXP JOINTS

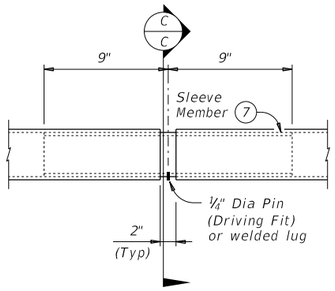
ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

Showing rail on slab and without raised sidewalk. Rail on box culvert similar. HSS not shown for clarity.

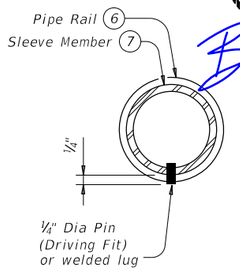


ELEVATION

SECTION



AT SPLICE OR EXP JTS



SECTION C-C

TERMINAL CONNECTION DETAILS

PIPE SPLICE DETAILS

(1) Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.

(2) Wingwall Length minus 5'-0" (Varies)

(5) Increase 2" for structures with overlay.

(6) HSS 2.875 x 0.203

(7) HSS 2.375 x 0.154

(8) ⅜" Dia Hole in bottom of HSS rail (Minimum 1 hole between posts ~ Typ)

(9) Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.

(10) Bars SU1(#3), SU2(#3) and WU(#5) not shown for clarity.

(11) Substitute Bars U(#5) for Bars WU(#5) when parapet end is located on anchorage curb over culvert top slab. Use Bars WU(#5) in culvert parallel wings.

MODIFICATION:
Including conduit in rails where applicable.

LEGEND:
(M) Indicates modified detail or area

STATE OF TEXAS
Blake W. Staton
121491
LICENSED PROFESSIONAL ENGINEER
1/27/2021

Texas Department of Transportation

Bridge Division Standard

COMBINATION RAIL

TYPE C223(MOD)

FILE: rlstd019-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
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REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		205

DATE:
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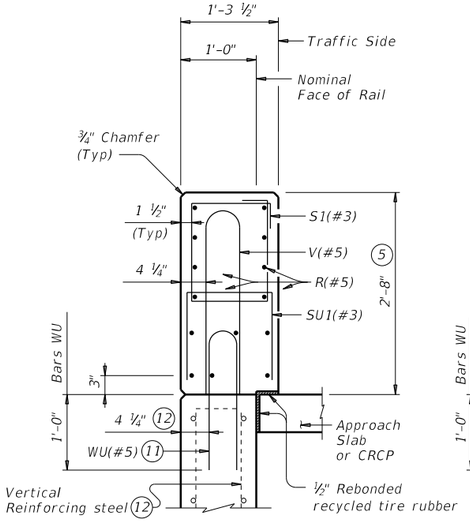
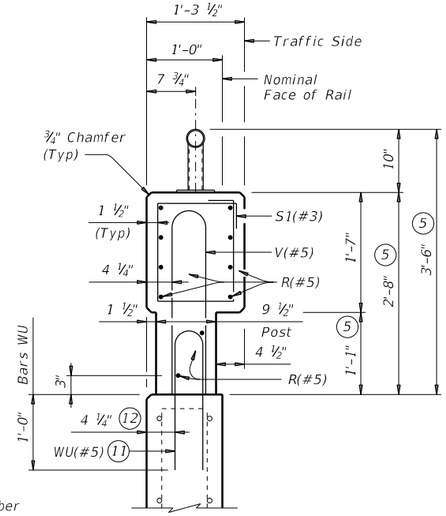
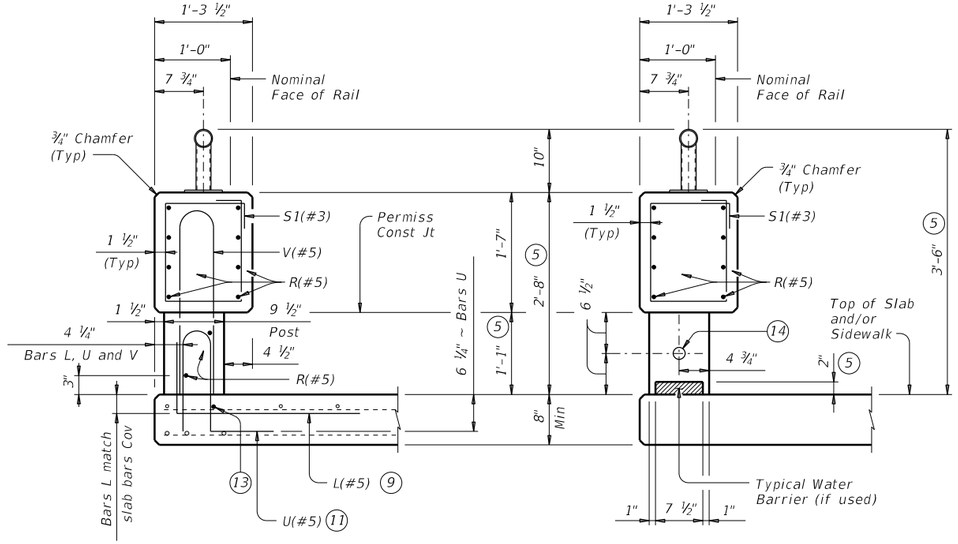


SECTION D-D
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS

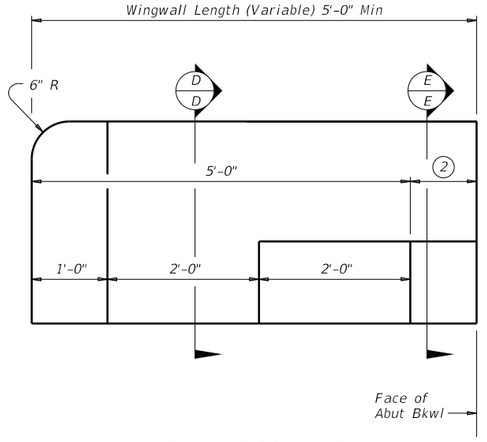


SECTION E-E
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS



AT POST
ON BRIDGE SLAB

AT OPENING
ON BRIDGE SLAB

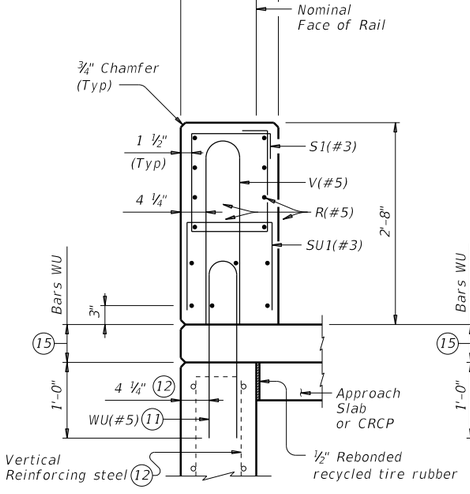


ELEVATION AT
ABUTMENT WINGWALL

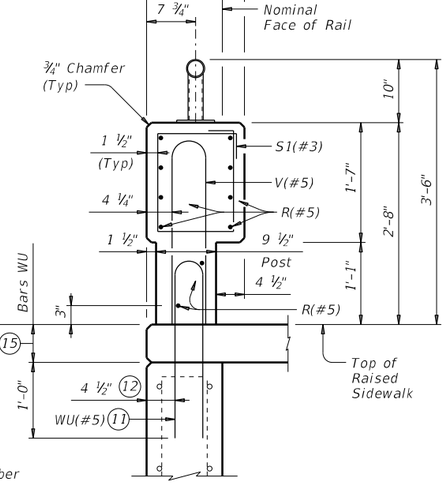
Box culvert parallel wings or rail anchorage curb similar.
HSS rail not shown for clarity.

SECTIONS THRU RAIL WITHOUT RAISED SIDEWALK

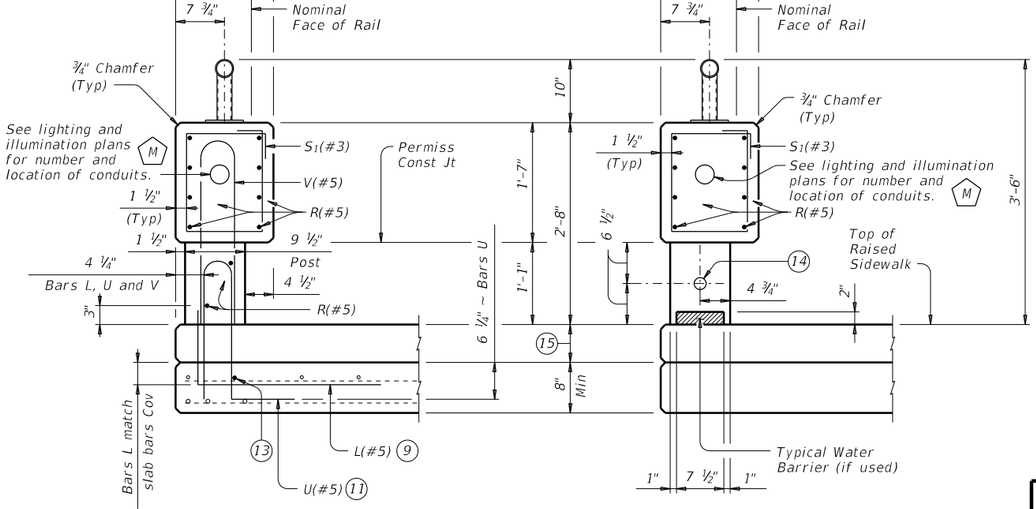
Sections on box culvert similar.



SECTION D-D
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS



SECTION E-E
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS



AT POST
ON BRIDGE SLAB

AT OPENING
ON BRIDGE SLAB

POST JOINT DETAIL

(Showing without raised sidewalk)
Provide at all interior bents without slab expansion joints.

MODIFICATION:
Including conduit in rails where applicable.

LEGEND:
(M) Indicates modified detail or area

SECTIONS THRU RAIL WITH RAISED SIDEWALK

Sections on box culvert similar.

(2) Wingwall Length minus 5'-0" (Varies)

(5) Increase 2" for structures with overlay.

(9) Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.

(11) Substitute Bars U(#5) for Bars WU(#5) when parapet end is located on anchorage curb over culvert top slab. Use Bars WU(#5) in culvert parallel wings.

(12) When vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls on traffic side of wall, move the horizontal wingwall/retaining wall reinforcing to the inside of Bars WU where bars conflict.

(13) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

(14) HSS 1.900 x 0.145

(15) Raised Sidewalk.

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER
1/27/2021

SHEET 3 OF 4

Texas Department of Transportation

Bridge Division Standard

COMBINATION RAIL

TYPE C223(MOD)

FILE:	rlstd019-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
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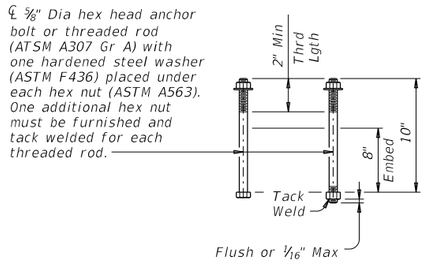
		DIST	COUNTY		SHEET NO.
		SAT	BEXAR		206

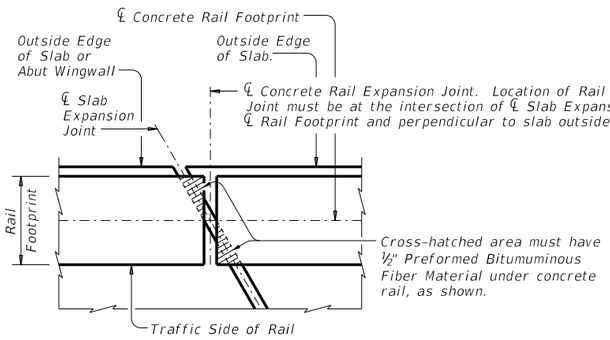
DATE:
FILE:

RAIL DATA FOR HORIZONTAL CURVES

	RADIUS TO FACE OF RAIL	MAX CHORD LENGTH	CONSTRUCT OR FABRICATE
HSS Rail	Over 2800'	29'-0"	Straight rail sections
	Over 1400' thru 2800'	14'-6"	To required radius or to chords shown
	Over 700' thru 1400'	7'-3"	
	Thru 700'	Zero	To required radius



CAST-IN-PLACE ANCHOR BOLT OPTIONS (16)



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

(5) Increase 2" for structures with overlay.

(16) See "Material Notes" for anchor bolt information.

(17) For raised sidewalks, add sidewalk height to total bar height. Use sidewalk height at rail's location.

(18) At the Contractor's option, Bars V may be replaced by extending Bars U to 2'-5 ¼" above the roadway/sidewalk surface without overlay.

CONSTRUCTION NOTES:

Face of rail, posts and parapet must be vertical transversely unless otherwise approved by the Engineer. HSS rail posts and opening end faces must be perpendicular to top of adjacent concrete parapet grade. Use epoxy mortar under HSS rail post base plates if gaps larger than 1/16" exist.

Provide water barriers at openings draining onto undercrossing roadways and sidewalks. They may be cast-in-place or precast in convenient lengths and bonded to the bridge deck with an approved epoxy cement.

HSS rail sections must not include less than two posts, and no more than four (except at Abutments).

Round or chamfer exposed edges of HSS rail and HSS rail posts to approximately 1/16" by grinding.

Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

At the Contractor's option anchor bolts may be cast with the parapet. See "Material Notes".

Chamfer all exposed corners.

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.

Provide ASTM A1085, A500 Gr B or A53 Gr B for all HSS.

Galvanize all metal components of steel rail system. Apply additional coatings when shown elsewhere on the plans. When plans require paint over gavanizing, follow the requirements for painting galvanized steel in Item 445, "Galvanizing" and when field painting, Item 446, "Field Cleaning and Painting Steel". Sleeve members and anchor bolts must receive galvanization prior to installation and only field paint after installation unless directed otherwise by Engineer.

Deformed Welded Wire Reinforcing (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U, V, and WU unless noted otherwise.

Anchor bolts must be ⅝" Dia ASTM A307 Gr A fully threaded rods with one hex nut and one hardened steel washer (ASTM F436) each. Nuts must conform to ASTM A563 requirements. Embed fully threaded rods into parapet wall with a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 3". Anchor adhesive chosen must be able to achieve a nominal bond strength in tension of a single anchor, Na, of 5 kips (edge distance must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

Optional cast-in-place anchor bolts must be ⅝" Dia ASTM A307 Gr A bolts (or threaded rods with one tack welded hex nut each) with one hex nut and one hardened steel washer (ASTM F436) at each bolt. Nuts must conform to ASTM A563 requirements.

Provide bar laps, where required, as follows:
Uncoated or galvanized ~ #5 = 2'-0"
Epoxy coated ~ #5 = 3'-0"

GENERAL NOTES:

This rail has been evaluated by full-scale crash test to meet MASH TL-3 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less.

Do not use this railing on bridges with expansion joints providing more than 5" movement.

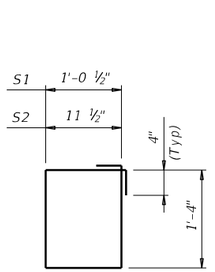
Rail anchorage details shown on this standard may require modification for select structure types.

See appropriate details elsewhere in plans for these modifications.

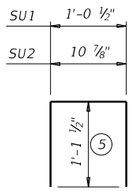
Submit erection drawings showing panel lengths, HSS rail post spacing, and anchor bolt setting to the Engineer for approval.

Average weight of railing with no overlay:
370 plf total
358 plf (Conc)
12 plf (Steel)

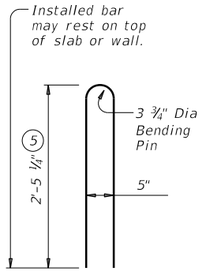
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



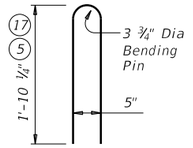
BARS S (#3)



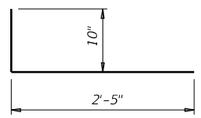
BARS SU (#3)



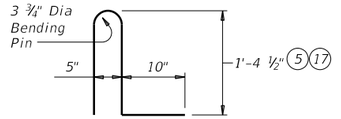
BARS V (#5) (18)



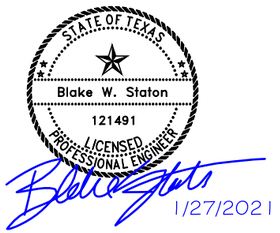
BARS WU (#5)



BARS L (#5)



BARS U (#5) (18)



MODIFICATION:
Including conduit in rails where applicable.

LEGEND:
(M) Indicates modified detail or area

SHEET 4 OF 4

Texas Department of Transportation — Bridge Division Standard

COMBINATION RAIL

TYPE C223(MOD)

FILE: rlstd019-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
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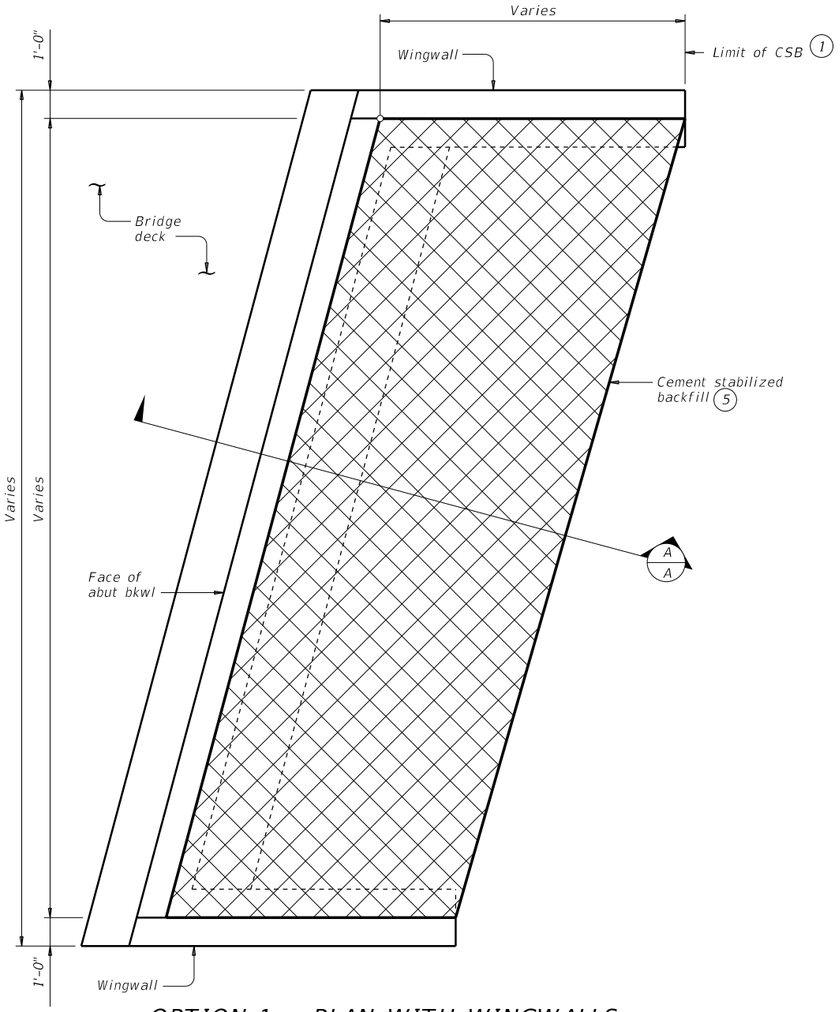
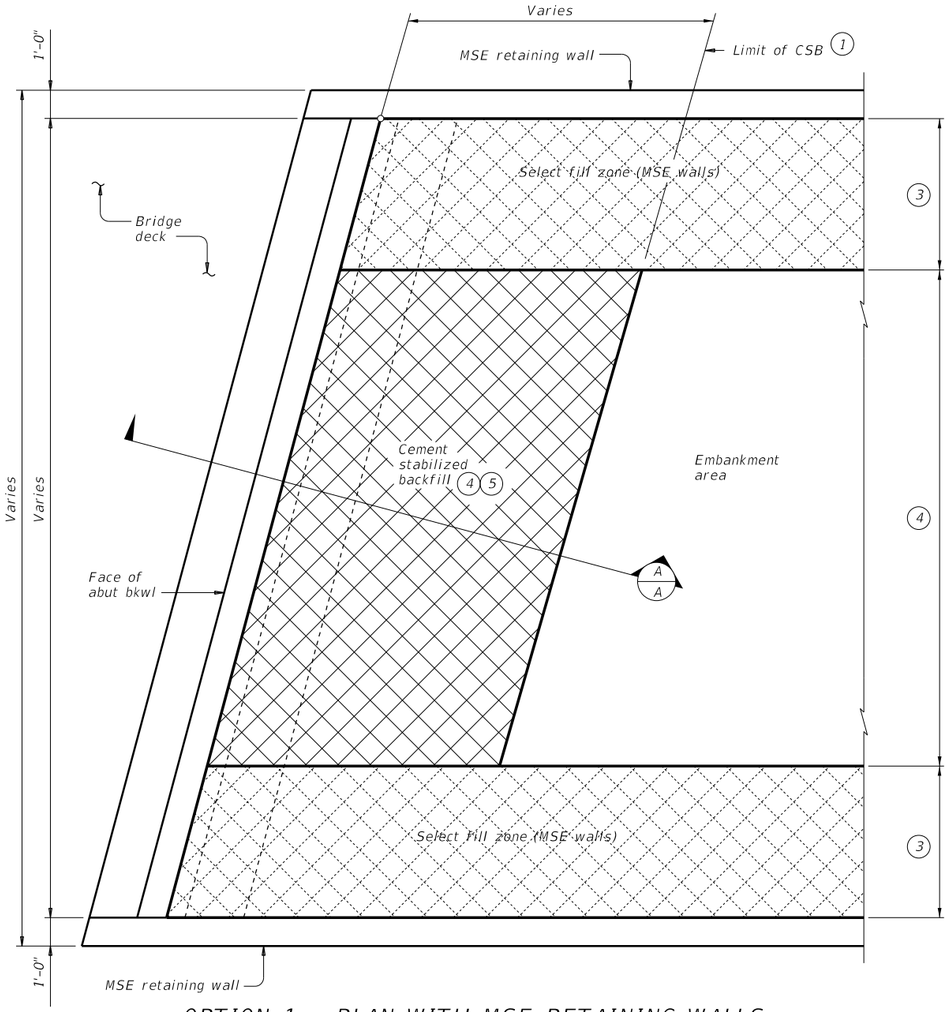
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		207

DATE:
FILE:

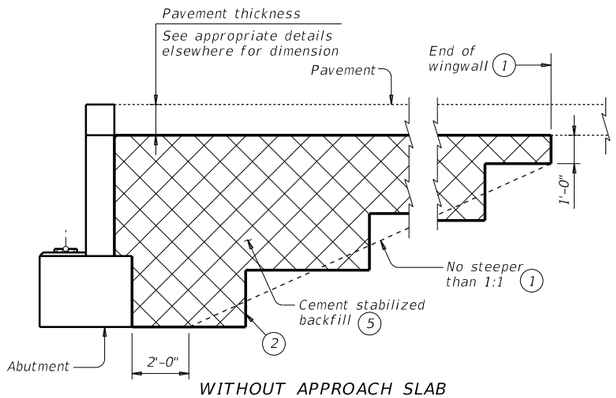


OPTION 1 ~ PLAN WITH WINGWALLS

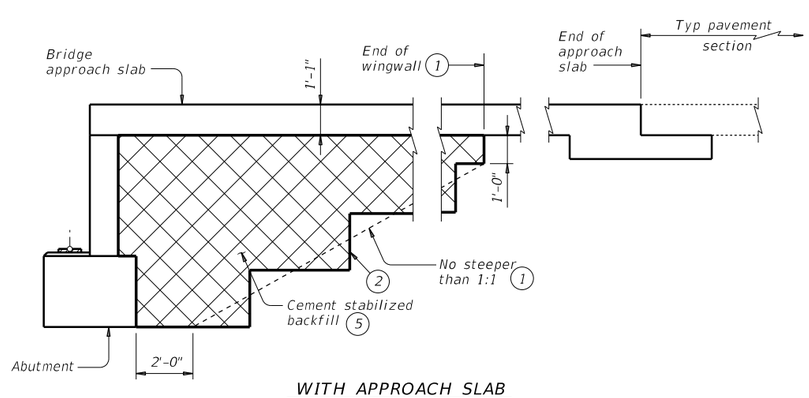
Cast-in-place retaining walls similar.



OPTION 1 ~ PLAN WITH MSE RETAINING WALLS



WITHOUT APPROACH SLAB



WITH APPROACH SLAB

(Showing BAS-C, BAS-A similar.)

SECTION A-A

(1) Usual limit of Cement Stabilized Backfill is at end of wingwall. Extend CSB limits as required to maintain a slope no steeper than 1:1 at bottom of backfill.

(2) Bench backfill as shown with 12" (approximate) bench depths.

(3) Where MSE retaining walls are present, adjust CSB limits to accommodate the select fill zone. See retaining wall details for additional information.

(4) When distance between select fill zones is less than 5'-0", MSE select fill may be substituted for cement stabilized backfill with approval from the Engineer.

(5) If shown in the plans flowable backfill can be used as a substitute for cement stabilized backfill with the following constraints:
a). If flowable backfill is to be placed over MSE backfill then a filter fabric will be placed over the MSE backfill prior to placement of the flowable fill; and
b). Place flowable fill in lifts not exceeding 2 feet in height, place each successive lift when the previous lift has stiffened/hardened (i.e. has lost its flowability).

GENERAL NOTES:

See the Bridge Layout for selected Option. Option 2 is intended for new construction requiring high plasticity embankment fill with a plasticity index (PI) greater than 30 or pavement built in poor native soil. Poor soils are defined as high plasticity clays or expansive clays. Option 1 is intended for construction only requiring PI controlled embankment fill or excavation in competent soils/rocks in order to construct the abutment.

Provide Cement Stabilized Backfill (CSB) meeting the requirements of Item 400, "Excavation and Backfill for Structures", to the limits shown at bridge abutments.

If required elsewhere in the plans, provide Flowable Backfill meeting the requirements of Item 401, "Flowable Backfill", to the limits shown at bridge abutments.

Details are drawn showing left forward skew. See Bridge Layout for actual skew direction.

These details do not apply when Concrete Block retaining walls are used in lieu of wingwalls.

SHEET 1 OF 1

Texas Department of Transportation

Bridge Division Standard

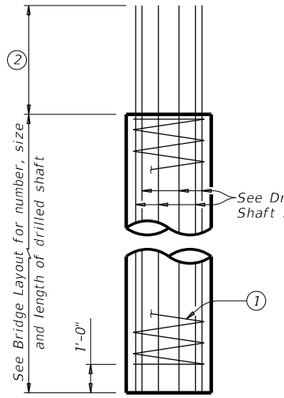
CEMENT STABILIZED ABUTMENT BACKFILL

BRIDGE ABUTMENT

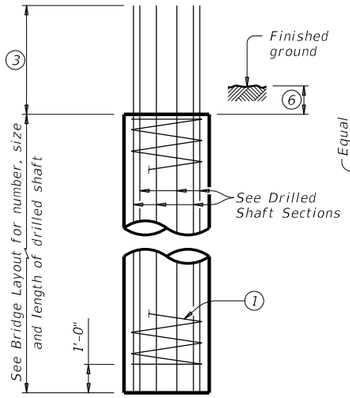
CSAB

FILE: csabste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
02-20: Added Option 2.	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		208

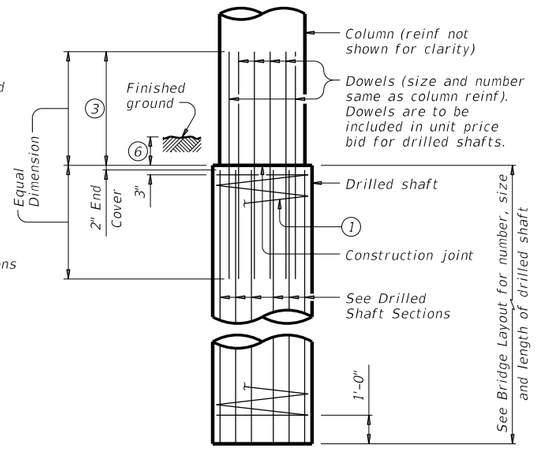
DATE:
FILE:



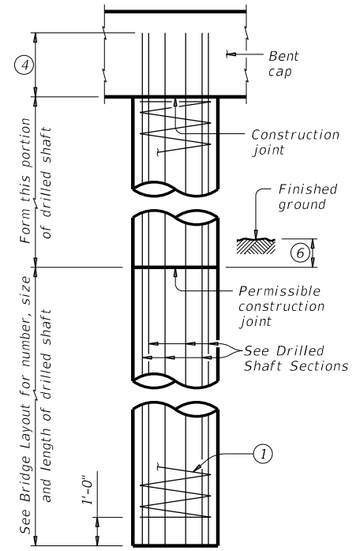
ABUTMENTS, WINGWALLS AND MULTI-DRILLED SHAFT FOOTINGS



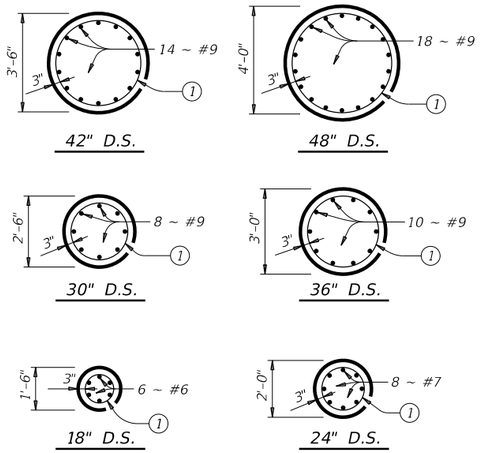
INTERIOR BENTS DRILLED SHAFT DIA EQUAL TO COLUMN DIA



INTERIOR BENTS DRILLED SHAFT DIA GREATER THAN COLUMN DIA



OPTIONAL INTERIOR BENT DRILLED SHAFT DETAIL (5)

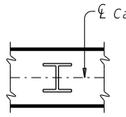


DRILLED SHAFT SECTIONS

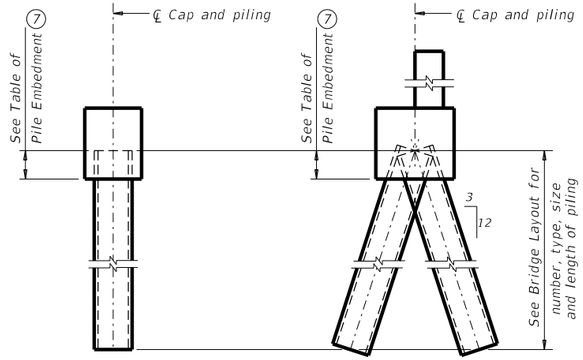
DRILLED SHAFT DETAILS

TABLE OF PILE EMBEDMENT	
Pile Type	Embedment Depth (Ft)
16" Sq Concrete 18" Sq Concrete HP14 Steel HP16 Steel	1'-0"
20" Sq Concrete 24" Sq Concrete HP18 Steel	1'-6"

See Prestressed Concrete Piling (CP) standard for additional details on concrete pile embedment.

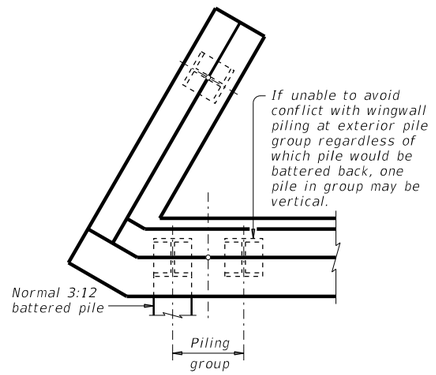


ORIENTATION OF STEEL H-PILING



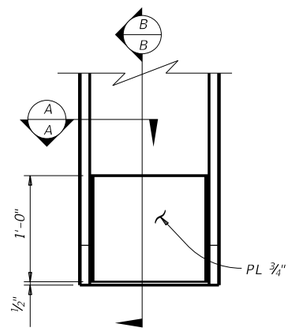
PILING DETAILS

(Concrete or steel H)

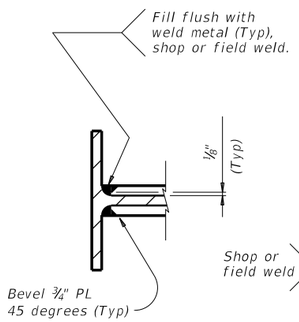


DETAIL "A"

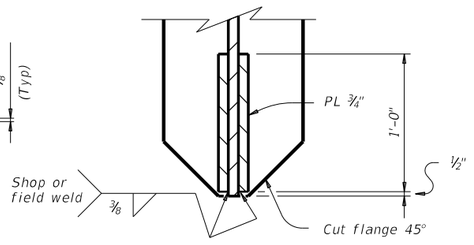
(Showing plan view of a 30° skewed abutment)



ELEVATION



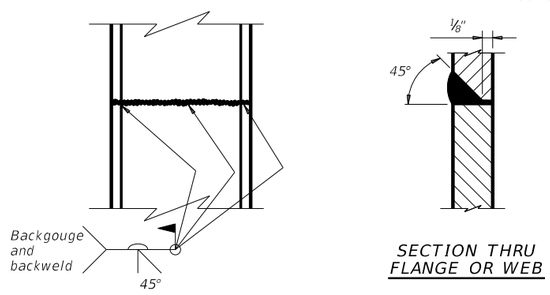
SECTION A-A



SECTION B-B

STEEL H-PILE TIP REINFORCEMENT

See Item 407 "Steel Piling" to determine when tip reinforcement is required and for options to the details shown.



SECTION THRU FLANGE OR WEB

STEEL H-PILE SPLICE DETAIL

Use when required.

(1) #3 spiral at 6" pitch (one and a half flat turns top and bottom).

(2) Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-0"
#9 Bars = 2'-3"

(3) Min lap with column reinf:
#7 Bars = 2'-11"
#9 Bars = 3'-9"
#11 Bars = 4'-8"

(4) Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-3"
#9 Bars = 2'-9"

(5) Drilled shafts may extend to the bottom of bent caps for "H" heights of 6 ft and less (as shown on the Bridge Layout), if approved. This option can only be used when the drilled shaft diameter equals the column diameter. Obtain approval of the forming method above the ground line prior to construction. No adjustments in payment will be made if this option is used.

(6) 1'-0" Min, unless shown otherwise on plans.

(7) Or as shown on plans.

SHEET 1 OF 2

Texas Department of Transportation

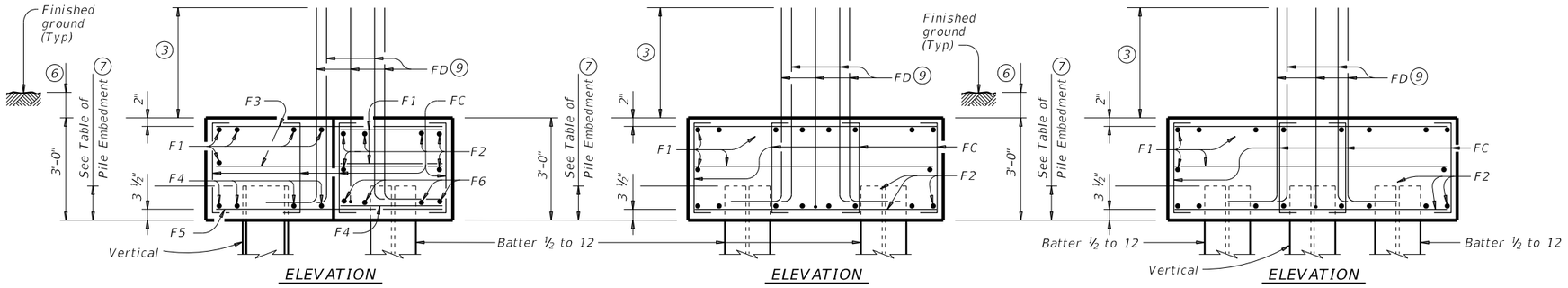
Bridge Division Standard

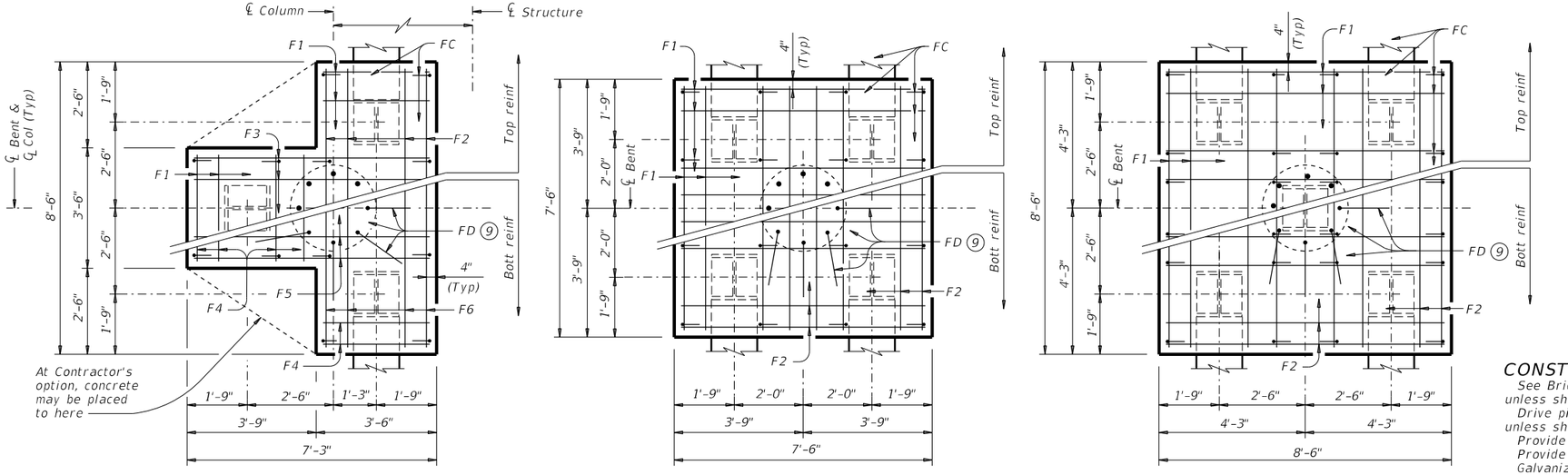
COMMON FOUNDATION DETAILS

FD

FILE: fdstde01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
01-20: Added #11 bars to the FD bars.	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		209

DATE:
FILE:





THREE PILE FOOTING (8)

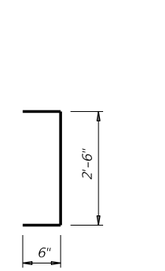
For 36" Dia and smaller columns.

FOUR PILE FOOTING (8)

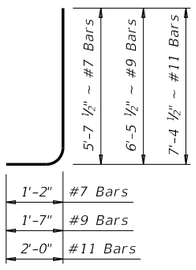
For 42" Dia and smaller columns.

FIVE PILE FOOTING (8)

For 42" Dia and smaller columns.



BARS FC



BARS FD (9)

(3) Min lap with column reinforcing:
#7 Bars = 2'-11"
#9 Bars = 3'-9"
#11 Bars = 4'-8"

(6) 1'-0" Min, unless shown otherwise on plans.

(7) Or as shown on plans.

(8) See Bridge Layout for type, size and length of piling.

(9) Number and size of FD bars must match column reinforcing. Tie FD bars to the top of the bottom reinforcing mat.

(10) Adjust FD quantity, size and weight as needed to match column reinforcing.

TABLE OF FOOTING QUANTITIES FOR 30" COLUMNS

ONE 3 PILE FOOTING				
Bar	No.	Size	Length	Weight
F1	11	#4	3'- 2"	23
F2	6	#4	8'- 2"	33
F3	6	#4	6'- 11"	28
F4	8	#9	3'- 2"	86
F5	4	#9	6'- 11"	94
F6	4	#9	8'- 2"	111
FC	12	#4	3'- 6"	28
FD (10)	8	#9	8'- 1"	220
Reinforcing Steel			Lb	623
Class "C" Concrete			CY	4.8

ONE 4 PILE FOOTING				
Bar	No.	Size	Length	Weight
F1	20	#4	7'- 2"	96
F2	16	#8	7'- 2"	306
FC	16	#4	3'- 6"	37
FD (10)	8	#9	8'- 1"	220
Reinforcing Steel			Lb	659
Class "C" Concrete			CY	6.3

ONE 5 PILE FOOTING				
Bar	No.	Size	Length	Weight
F1	20	#4	8'- 2"	109
F2	16	#9	8'- 2"	444
FC	24	#4	3'- 6"	56
FD (10)	8	#9	8'- 1"	220
Reinforcing Steel			Lb	829
Class "C" Concrete			CY	8.0

CONSTRUCTION NOTES:

See Bridge Layout for foundation type required. Use these foundation details unless shown otherwise.

Drive piling under abutment wingwalls to a minimum resistance of 10 Tons/Pile unless shown otherwise.

Provide Class C Concrete (f'c = 3,600 psi), unless shown otherwise.

Provide Grade 60 reinforcing steel.

Galvanize reinforcing if shown elsewhere in the plans.

Provide bar laps for drilled shaft reinforcing, where required, as follows:

Uncoated or galvanized (#6) ~ 2'-6"
Uncoated or galvanized (#7) ~ 2'-11"
Uncoated or galvanized (#9) ~ 3'-9"

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

DESIGNER NOTES:

Do not use the drilled shaft details shown on this standard for retaining wall, noise wall, barrier, or sign foundations without structural evaluation.

Do not use the footings shown on this standard in direct contact with salt water or exposed to salt water spray.

Maximum allowable pile loads for the footings shown are:

72 Tons/Pile with 24" Dia Columns
80 Tons/Pile with 30" Dia Columns
100 Tons/Pile with 36" Dia Columns
120 Tons/Pile with 42" Dia Columns

Texas Department of Transportation

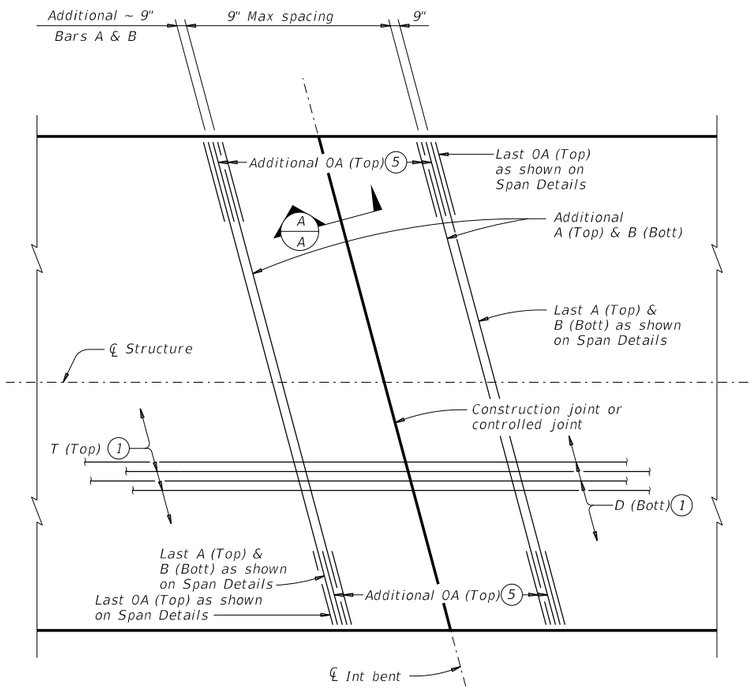
Bridge Division Standard

COMMON FOUNDATION DETAILS

FD

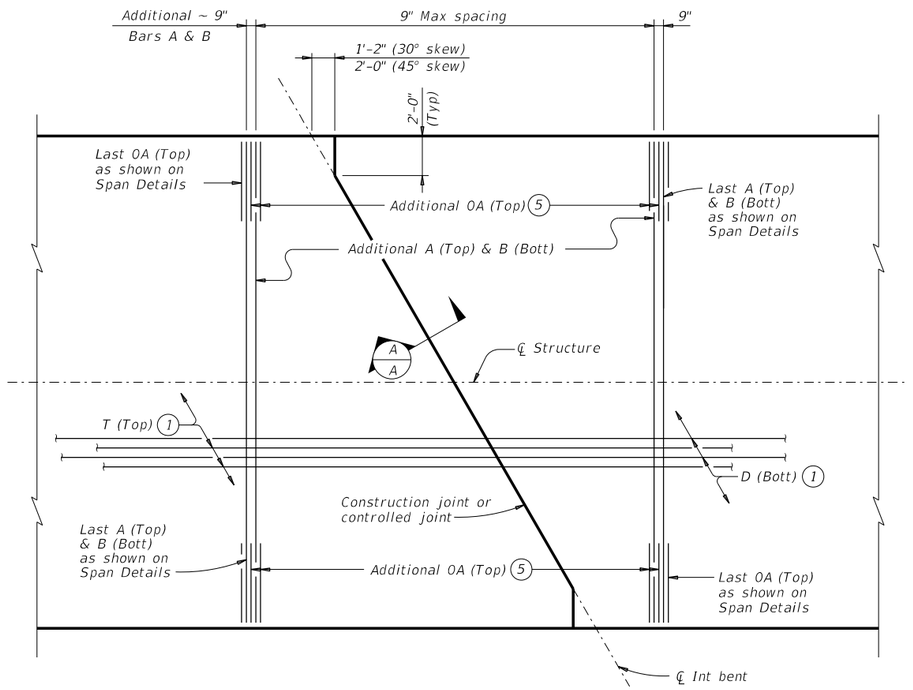
FILE: fdstde01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
01-20: Added #11 bars to the FD bars.	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		210

DATE:
FILE:



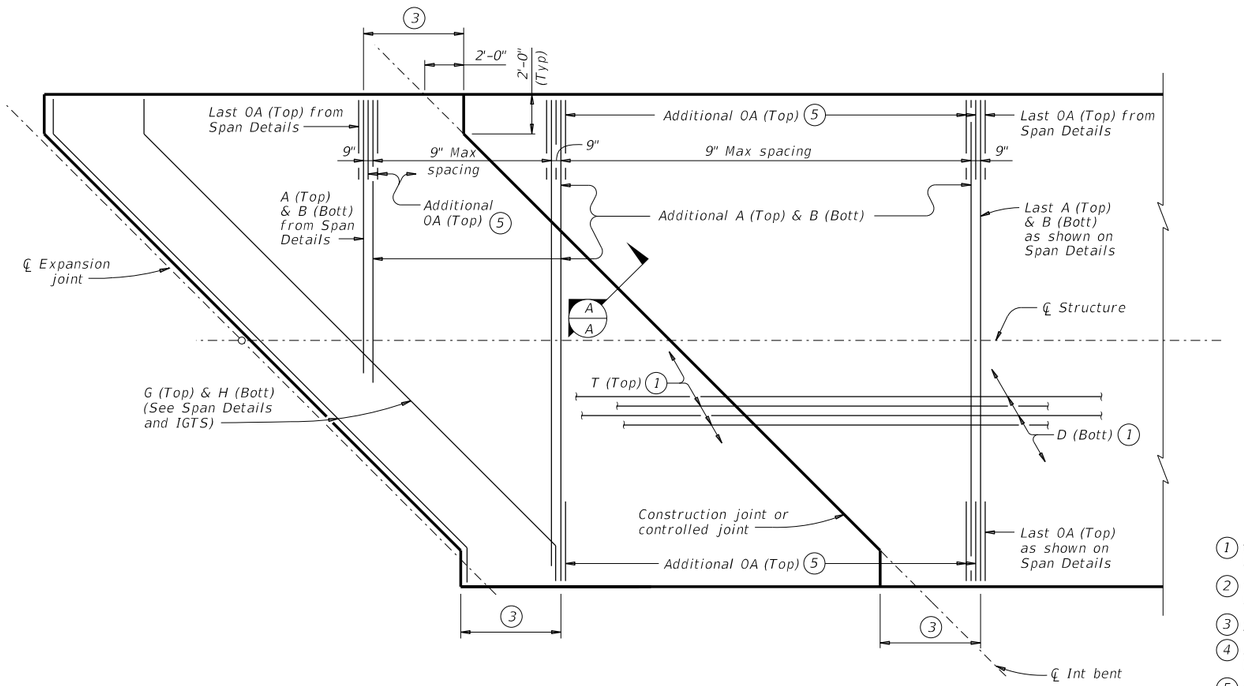
PLAN FOR 0° OR 15° SKEW

(Showing 15° skew)



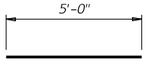
PLAN FOR 30° OR 45° SKEW

(Showing 30° skew)

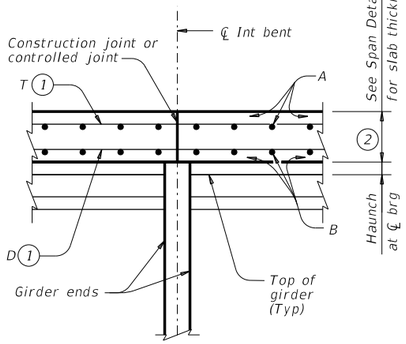


PLAN FOR 45° SKEW 4

(Showing short span condition.)



BARS OA (#5)



SECTION A-A

Bars 0A (Top) not shown for clarity.

1. Top and bottom mats must be continuous through joint.
2. Maintain a constant slab thickness over the bent.
3. 5'-4" as shown on Span Details.
4. Use these details when no full slab width bars A and B are shown on Span Details.
5. Bars 0A (Top) at 9" Max spacing between Bars A (Top).
6. Values in table assume a temperature change of 70° F after erection when calculating thermal movement in one direction (not total).

TABLE OF (6) ALLOWABLE UNIT LENGTH

Max Rdwy Grade, Percent	Unit Length Factor
0.00	4.1
1.00	3.9
2.00	3.7
3.00	3.5
4.00	3.3
5.00	3.1

Unit length must not exceed the length of the shortest end span times the Unit Length Factor shown in table or 400', whichever is less.

BAR TABLE

BAR	SIZE
A	#4
B	#4
D	#4
T	#4
0A	#5

The details shown on this sheet are applicable for two and three span units comprised of the same girder type.
Units may be comprised of different span lengths. See "Table of Allowable Unit Length".

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

This standard is drawn showing right forward skew. See Bridge Layout for actual skew direction.

CONSTRUCTION NOTES:

Where multi-span units are indicated on the Bridge Layout, the thickened slab end details and reinforcement shown on IGTS standard (Bars AA, G, H, J, K, and M) and on the Span Details will be omitted where slabs are continuous over interior bents. At these locations, the slab details and reinforcement will be as shown on this sheet or on PCP standard (if using this option).

Thickened slab end reinforcement and details still apply at expansion joint locations (ends of units).

See Span Details for remainder of slab reinforcement and details.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.

Provide Class "S" concrete (f'c = 4,000 psi). Provide Class "S" (HPC) if shown elsewhere on the plans.

Provide bar laps, where required, as follows:
Uncoated ~ #4 = 1'-7"
Epoxy Coated ~ #4 = 2'-5"

The details shown on this sheet are applicable for use only with the Prestressed Concrete I-Girder Standard Designs shown on standards IGSD-24, IGSD-28, IGSD-30, IGSD-32, IGSD-38, IGSD-40 and IGSD-44.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

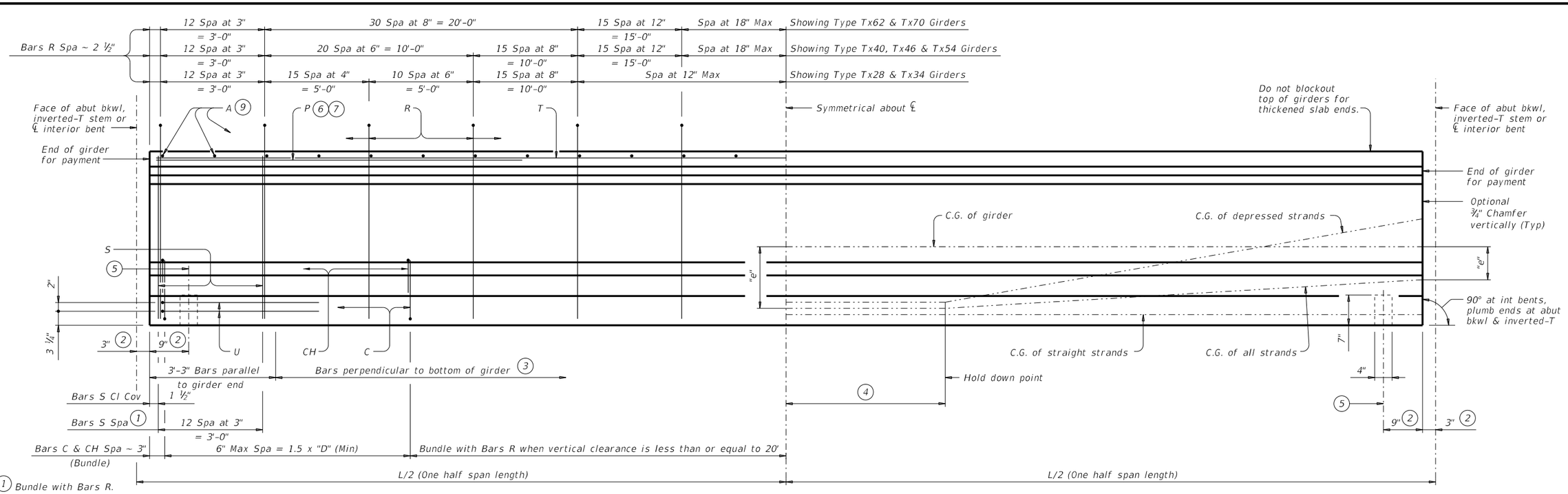
CONTINUOUS SLAB DETAILS

PRESTR CONC I-GIRDER SPANS

IGCS

FILE: igcs1sts-19.dgn	DN: JMH	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
10-19: Added bubble note 6.	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		211

DATE:
FILE:



(1) Bundle with Bars R.

(2) Measured along ℄ Girder at interior bents; perpendicular to abutment bkwl or inverted-T stem.

(3) The average of the top and bottom spacing of Bars R cannot exceed the required spacing.

(4) L/20, but not less than 5'-0" (-0,+2').

(5) ℄ 4" x 1 ½" Vertical Slotted Hole at doweled girder end [labeled (D) on Bridge Layout]. Required for outside girder only or as shown on substructure details. Anchorage holes may be tapered (4 ¾" x 1 ⅝") at base. If holes are formed with sheet metal, forms may be left in place.

GIRDER ELEVATION

(6) Bars P (#6 x 15'-0") required in Tx62 and Tx70 girders. At the fabricator's option bars larger than #6 may be used. When L is less than 50 ft, Bars P are to be the same length as Bars T.

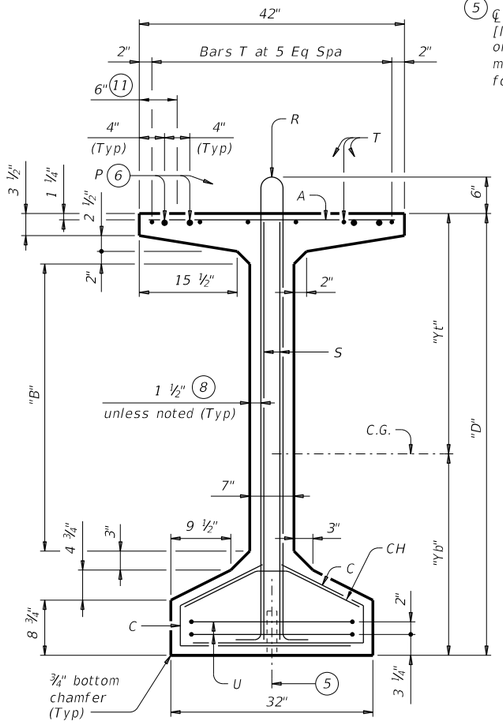
(7) Bars P (#6 x 15'-0") are only required in Tx28, Tx34, Tx40, Tx46, and Tx54 girders when "e" at girder ends exceeds 0.25 x "D". At the fabricator's option bars larger than #6 may be used. When L is less than 50 ft, Bars P are to be the same length as Bars T.

(8) 1 ⅜" Clear Cover to Bars S.

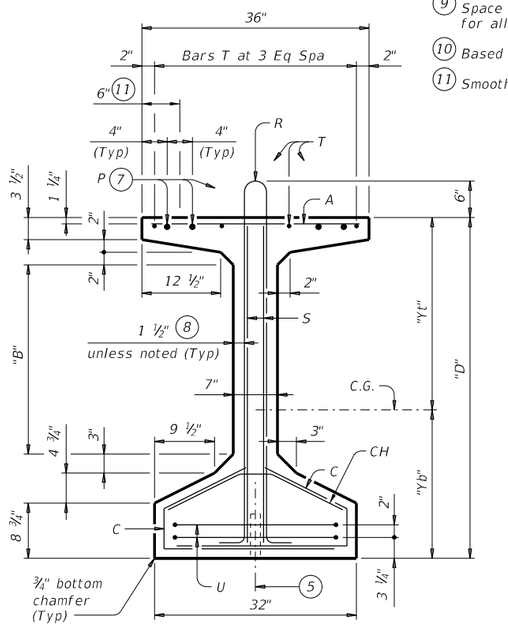
(9) Space Bars A at 6" Max for girders requiring overhang bracket hangers. Space at 12" Max for all other girders. Tie to Bars R as necessary. See standard IGMS for "Deck Forming Notes".

(10) Based on 155 pcf total weight of concrete and reinforcing steel.

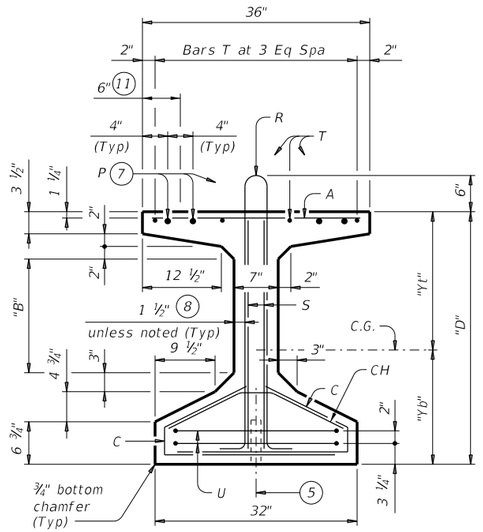
(11) Smooth trowel finish on the slab overhang side of exterior girder.



TYPE Tx62 & Tx70



TYPE Tx46 & Tx54



TYPE Tx28, Tx34 & Tx40

GIRDER DIMENSIONS AND SECTION PROPERTIES

Girder Type	"D" (in.)	"B" (in.)	"Yt" (in.)	"Yb" (in.)	Area (in.²)	"Ix" (in.⁴)	"Iy" (in.⁴)	Weight (10) (plf)
Tx28	28	6	15.02	12.98	585	52,772	40,559	630
Tx34	34	12	18.49	15.51	627	88,355	40,731	675
Tx40	40	18	21.90	18.10	669	134,990	40,902	720
Tx46	46	22	25.90	20.10	761	198,089	46,478	819
Tx54	54	30	30.49	23.51	817	299,740	46,707	880
Tx62	62	37 ½"	33.72	28.28	910	463,072	57,351	980
Tx70	70	45 ½"	38.09	31.91	966	628,747	57,579	1,040

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
Provide Class H concrete.
Provide Grade 60 reinforcing steel.
An equal area of deformed Welded Wire Reinforcement (WWR) (ASTM A1064) may be substituted for Bars A, C, R or T unless otherwise noted.
It is permissible for bars or strands to come in contact with materials used in forming anchor holes.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.

HL93 LOADING

SHEET 1 OF 2

Texas Department of Transportation

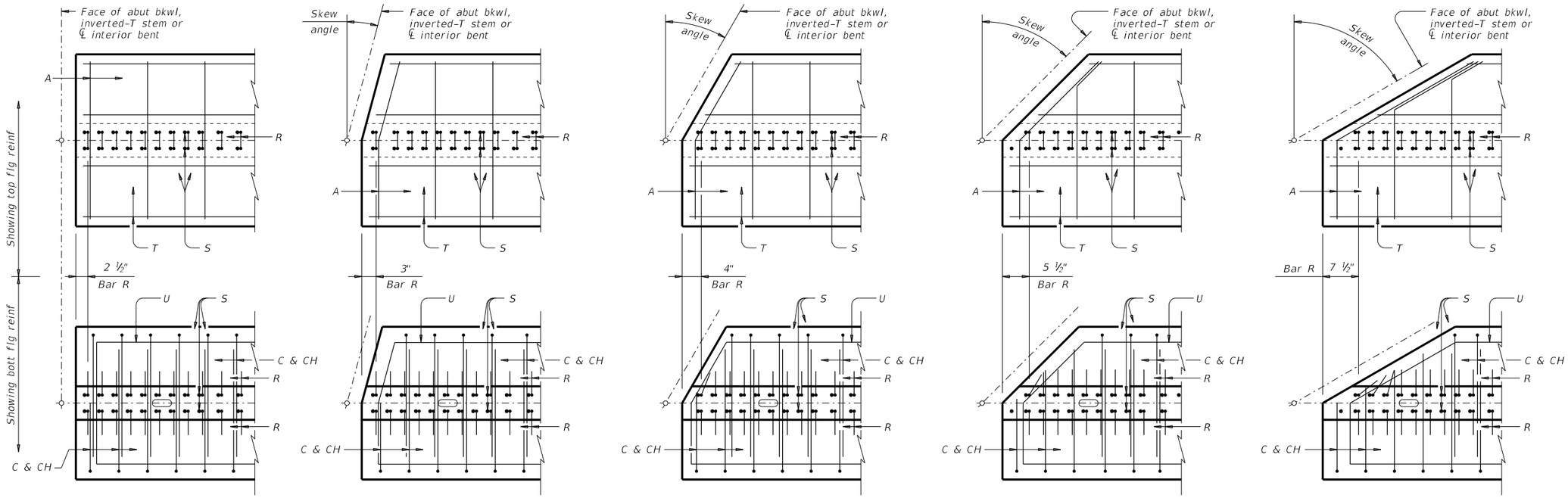
Bridge Division Standard

PRESTRESSED CONCRETE I-GIRDER DETAILS

IGD

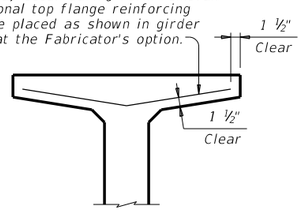
FILE: igdstds1-19.dgn	DN: TxDOT	CK: JMH	DW: JTR	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
10-19: Added Bars C and CH full length for VC<= 20'	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		212

DATE:
FILE:

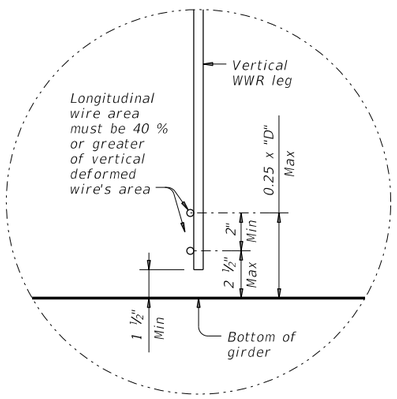


PLAN OF GIRDER ENDS (12)

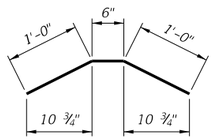
To control top flange cracking that may occur during form removal, additional top flange reinforcing may be placed as shown in girder ends at the Fabricator's option.



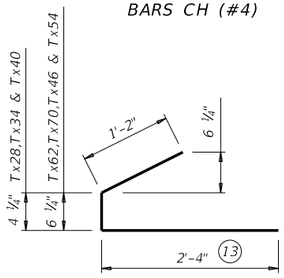
OPTIONAL TOP FLANGE REINFORCING DETAIL



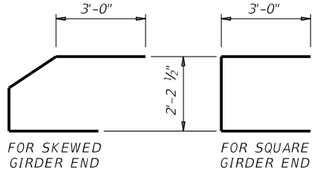
OPTIONAL WELDED WIRE REINFORCEMENT (WWR) DETAIL



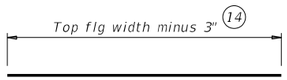
BARS CH (#4)



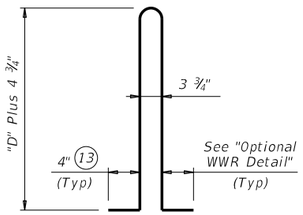
BARS C (#4)



BARS U (#5)

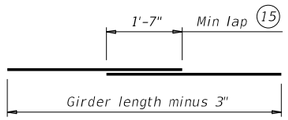


BARS A (#3)



BARS R (#4) (16)

BARS S (#6)



BARS T (#4)

(12) Reinforcing patterns shown are provided as guides to determine reinforcement placement in skewed ends. Place Bars S as close to girder end as cover requirements permit, which may prevent them to be bundled with Bars R.

(13) Bars may be cut or bent at skewed end as required.

(14) Increase as necessary for bars at skewed end.

(15) No portion of bar less than 10 ft.

(16) For Welded Wire Reinforcement (WWR) option, area of Bars R may be reduced in proportion to the increase in reinforcement yield strength over 60 ksi. Yield strength of WWR is limited to 75 ksi.

HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE I-GIRDER DETAILS

IGD

FILE: igdstds1-19.dgn	DN: TxDOT	CK: JMH	DW: JTR	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
10-19: Added Bars C and CH full length for VC<= 20'	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		213

DATE:
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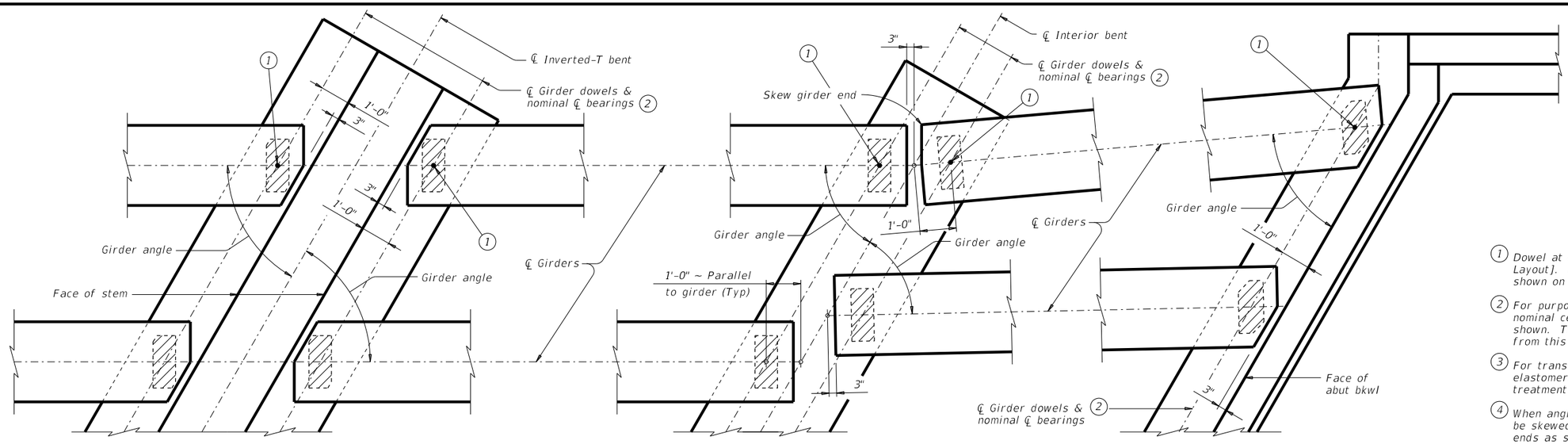


(1) Dowel at doweled girder end [labeled (D) on Bridge Layout]. Required for outside girder only or as shown on substructure details.

(2) For purposes of computing bearing seat elevations, nominal centerline of bearing must be defined as shown. The actual center of bearing pad may vary from this line.

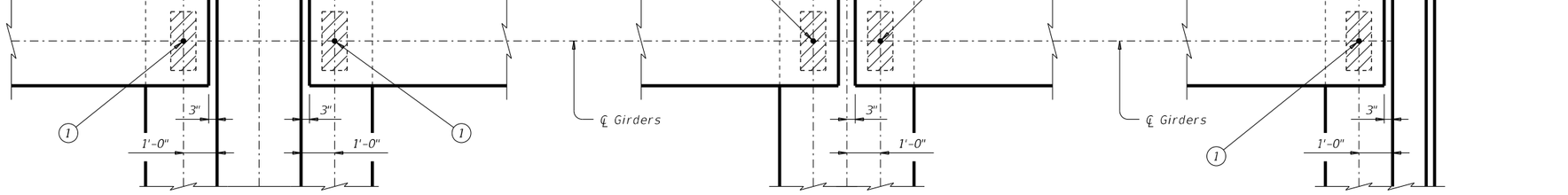
(3) For transition bents with backwall, girder and elastomeric bearings must receive the same treatment as shown for abutments.

(4) When angle exceeds 0°, one or both girders ends must be skewed to maintain the clearance between girder ends as shown in view.

(5) See Table of Bearing Pad Dimensions for bearing size. Girder end skew angles in Table not applicable for this situation. Table reflects girder conflicts of this type on radial bents only.

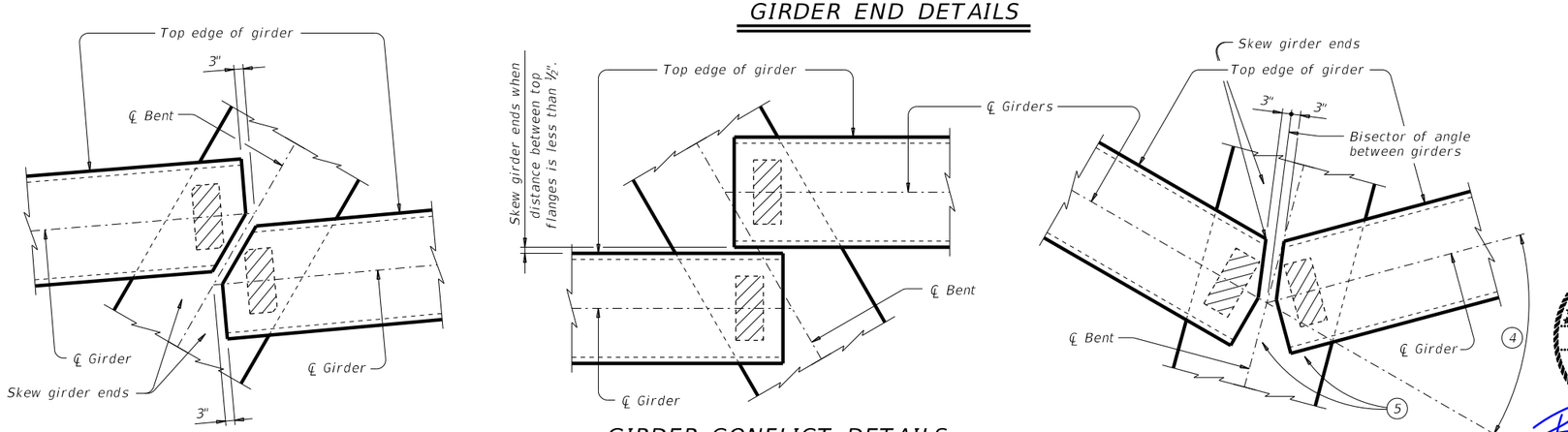
MODIFICATION:
Removed rectangular bearing pad plan view and bearing pad placement diagram for skewed girder ends at conventional interior bents. Modified placement diagrams and table for 15" diameter pads at 30 – 45° skews for Tx28, Tx34, Tx40, Tx46, and Tx54 girders.

LEGEND:
(M) Indicates modified detail or area



GENERAL NOTES:
These details accommodate skew angles up to 60°.
Shop drawings for approval are required.
A bearing layout which identifies location and orientation of all bearings must be developed by the bearing fabricator. Permanently mark each bearing in accordance with the bearing layout. A copy of the bearing layout is to be provided to the Engineer.
Cost of furnishing and installing elastomeric bearings, including beveled and embedded steel plates, must be included in unit price bid for "Prestressed Concrete Girders".

GIRDER END DETAILS



GIRDER CONFLICT DETAILS

HL93 LOADING SHEET 1 OF 3

Texas Department of Transportation — Bridge Division Standard

ELASTOMERIC BEARING AND GIRDER END DETAILS
PRESTR CONCRETE I-GIRDERS

IGEB(MOD)

STATE OF TEXAS
Blake W. Staton
121491
LICENSED PROFESSIONAL ENGINEER
1/27/2021

FILE: igebsts1-17.dgn	DN: AEE	CK: JMH	DW: JTR	CK: TxDOT
©TxDOT August 2017 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0016	08	039	SL 368
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	SAT	BEXAR		214

DATE:
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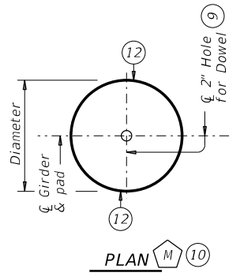
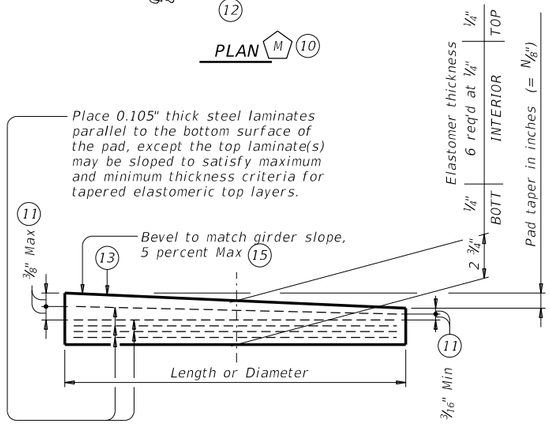


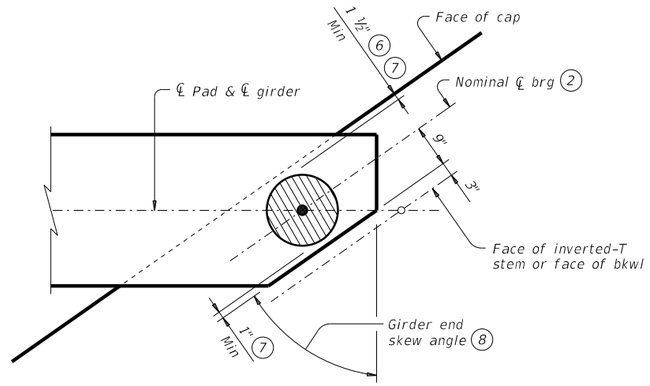
PLAN (M) (10)



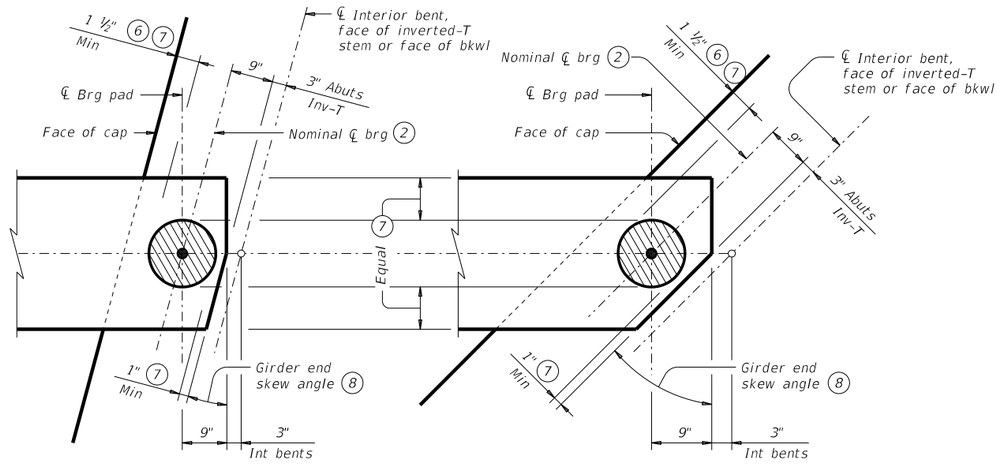
ELEVATION

LAMINATED ELASTOMERIC BEARING PAD

(50 DUROMETER)



ROUND BEARINGS FOR SKEWED GIRDER ENDS AT FACE OF INVERTED-T STEM OR FACE OF BKWL



SKEWED GIRDER ENDS AT INT BENTS, FACE OF INVERTED-T STEM OR FACE OF BKWL

BEARING PAD PLACEMENT DIAGRAMS (M)

TABLE OF MINIMUM SUBSTRUCTURE DIMENSIONS (14)

Girder Type	Abutments	Int Bents	Inv-T Bents
	Face of Bkwl to Face of Cap	Overall Cap Width	Corbel Width
Tx28 thru Tx54	1'-9"	3'-6"	1'-10 ½"
Tx62 & Tx70	2'-0"	4'-0"	2'-1 ½"

TABLE OF BEARING PAD DIMENSIONS

Bent Type	Girder Type	Bearing Type (13)	Girder End Skew Angle Range	Pad Size Lgth x Wdth	Pad Clip Dimensions "A"	Pad Clip Dimensions "B"
ABUTMENTS, INVERTED-T AND TRANSITION BENTS WITH BACKWALLS	Tx28,Tx34, Tx40,Tx46 & Tx54	G-1-"N"	0° thru 21°	8" x 21"	---	---
		G-2-"N"	21°+ thru 30°	8" x 21"	1 ½"	2 ½"
		G-3-"N"	30°+ thru 45°	9" x 21"	4 ½"	4 ½"
		G-4-"N"	45°+ thru 60°	15" Dia	---	---
	Tx62 & Tx70	G-5-"N"	0° thru 21°	9" x 21"	---	---
		G-6-"N"	21°+ thru 30°	9" x 21"	1 ½"	2 ½"
		G-7-"N"	30°+ thru 45°	10" x 21"	4 ½"	4 ½"
		G-8-"N"	45°+ thru 60°	10" x 21"	7 ¼"	4 ¼"
CONVENTIONAL INTERIOR BENTS	Tx28,Tx34, Tx40,Tx46 & Tx54	---	---	---	---	---
		---	---	---	---	---
		G-1-"N"	0° thru 60°	8" x 21"	---	---
	Tx62 & Tx70	G-5-"N"	0° thru 60°	9" x 21"	---	---
CONVENTIONAL INTERIOR BENTS WITH SKEWED GIRDER ENDS (GIRDER CONFLICTS) (16)	Tx28,Tx34, Tx40,Tx46 & Tx54	G-1-"N"	0° thru 18°	8" x 21"	---	---
		G-2-"N"	18°+ thru 30°	8" x 21"	1 ½"	2 ½"
		G-9-"N"	30°+ thru 45°	8" x 21"	3"	3"
		G-10-"N"	45°+ thru 60°	9" x 21"	6"	3 ½"
	Tx62 & Tx70	G-5-"N"	0° thru 18°	9" x 21"	---	---
		G-5-"N"	18°+ thru 30°	9" x 21"	---	---
		G-11-"N"	30°+ thru 45°	9" x 21"	1 ½"	1 ½"
		G-12-"N"	45°+ thru 60°	9" x 21"	3"	1 ¾"

(2) For purposes of computing bearing seat elevations, nominal centerline of bearing must be defined as shown. The actual center of bearing pad may vary from this line.

(6) 3" for inverted-T.

(7) Place centerline pad as near nominal centerline bearing as possible between limits shown.

(8) Girder end skew angle is equal to 90° minus the girder angle except at some conflicting girders.

(9) Provide 2" dia hole only at locations required. See Substructure details for location.

(10) See Table of Bearing Pad Dimensions for dimensions.

(11) Maximum and minimum layer thicknesses shown are for elastomer only, on tapered layers.

(12) Locate Permanent Mark here.

(13) Indicate BEARING TYPE on all pads. For tapered pads, locate BEARING TYPE on the high side. The Fabricator must include the value of "N" (amount of taper in ⅛" increments) in this mark.
Examples: N=0, (for 0" taper)
N=1, (for ⅛" taper)
N=2, (for ¼" taper)
(etc.)
Fabricated pad top surface slope must not vary from plan girder slope by more than $\left(\frac{0.0625"}{\text{Length or Dia}}\right)$ IN/IN.

(14) Substructure dimensions must satisfy the minimums provided to accommodate the elastomeric bearings shown on this standard.

(15) See sheet 3 of 3 for beveled plate use when slopes exceed 5 percent.

(16) If girder end is skewed for a girder conflict at an interior bent and a beveled sole plate is required, use bearing type for abutments at this location. Location of bearing centerline is to be set as for abutments in this case.

STATE OF TEXAS
Blake W. Staton
121491
LICENSED PROFESSIONAL ENGINEER
1/27/2021

MODIFICATION:
Removed rectangular bearing pad plan view and bearing pad placement diagram for skewed girder ends at conventional interior bents. Modified placement diagrams and table for 15" diameter pads at 30 – 45° skews for Tx28, Tx34, Tx40, Tx46, and Tx54 girders.

LEGEND:
(M) Indicates modified detail or area

HL93 LOADING SHEET 2 OF 3

Texas Department of Transportation | Bridge Division Standard

ELASTOMERIC BEARING AND GIRDER END DETAILS
PRESTR CONCRETE I-GIRDERS

IGEB(MOD)

FILE: igebsts1-17.dgn	DN: AEE	CK: JMH	DW: JTR	CK: TxDOT
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	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		215

DATE:
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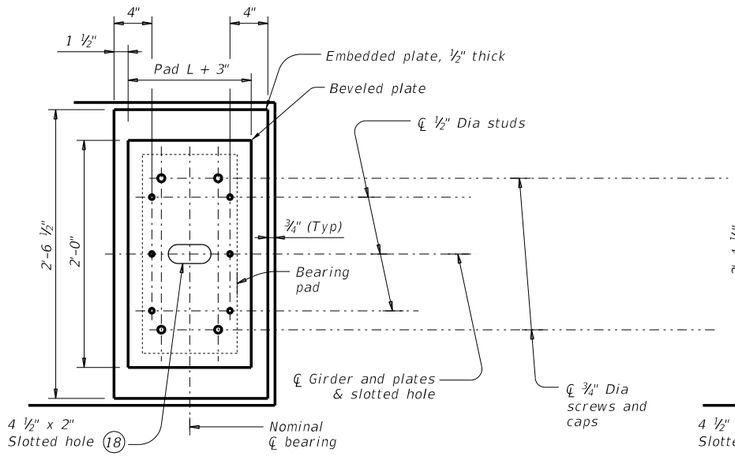
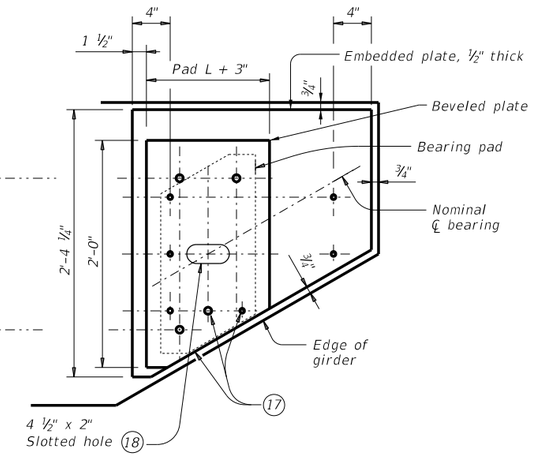
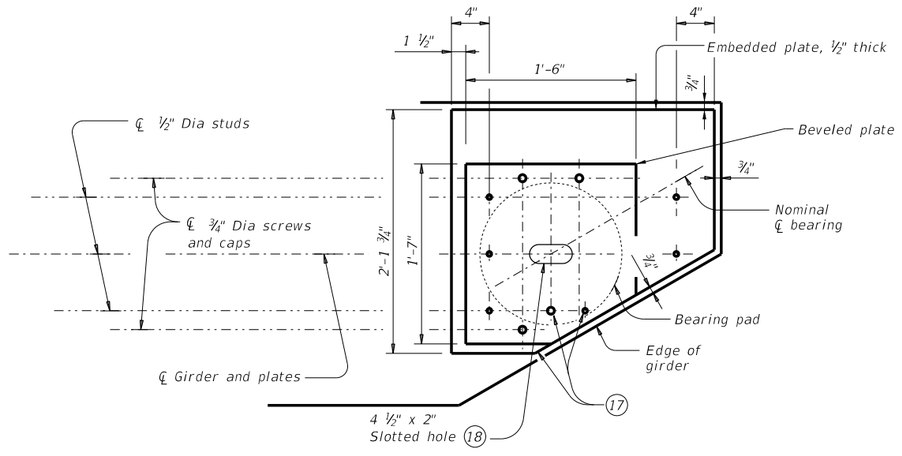


NORMAL GIRDER END
RECTANGULAR BEARING PAD

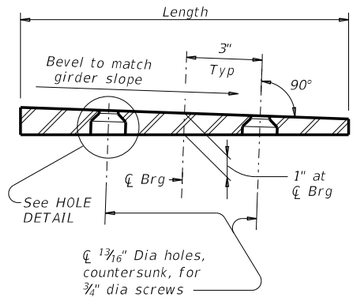


SKEWED GIRDER END
CLIPPED RECTANGULAR BEARING PAD

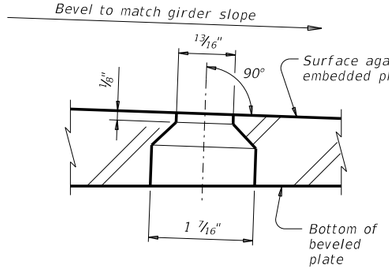


SKEWED GIRDER END
15" DIA BEARING PAD

PLAN VIEW OF SOLE PLATE DETAILS

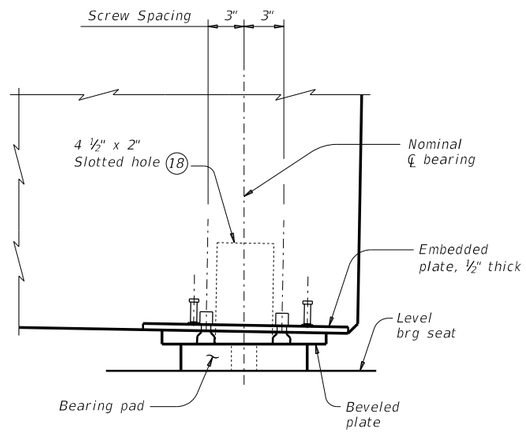


SECTION

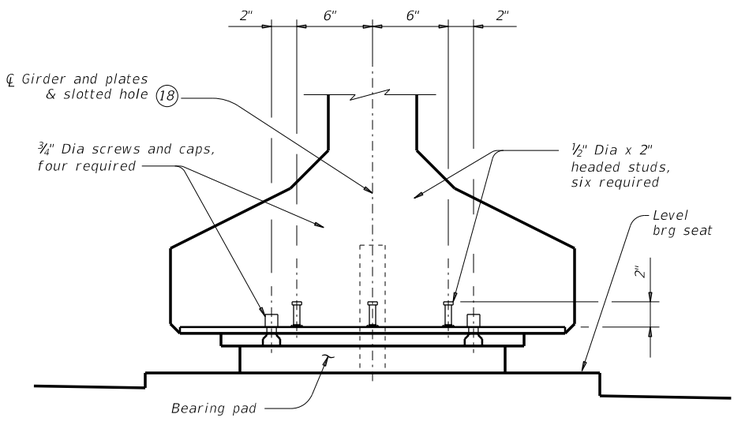


HOLE DETAIL

BEVELED PLATE DETAILS



SIDE ELEVATION



END ELEVATION
Showing normal girder end.

GIRDER DETAILS

(17) Cut beveled and embedded plates to match girder end skew. Adjust location of screw and stud as shown when necessary.

(18) Slotted hole is required at doweled girder end locations.

SOLE PLATE NOTES:

Provide constant thickness elastomeric bearings with beveled and embedded steel sole plates in accordance with these details when the girder slope exceeds 5 percent or if otherwise required in the plans. Provide for all girders in the span.

On the shop drawings, dimension sole plates to the nearest 1/16" based on required thickness at centerline of bearing and slope of girder. Thickness tolerance variation from the approved shop drawings is 1/16"+/-, except variation from a plane parallel to the theoretical top surface can not exceed 1/16" total. Bearing surface tolerances listed in Item 424 apply to embedded and beveled plates.

Steel plate must conform to ASTM A36, A572 Gr 50, or A709 Gr 36 or Gr 50. Hot dip galvanize both the embedded plate and beveled sole plate after fabrication. Seal weld caps to embedded plate before galvanizing.

When determining if relocation of screw holes and studs are necessary for skewed girder ends, minimum clearance from screw or stud centerline to plate edge is 1.25".

Tap threads in the embedded plate only. Drill and tap prior to galvanizing.

¾" Dia screws must be electroplated, socket flat head countersunk cap screws conforming to ASTM F835. Electroplating must conform to ASTM B633, SC 2, Type I. Provide screws long enough to maintain a ¾" minimum embedment into the embedded plate and galvanized cap. Provide galvanized steel caps (16 ga Min) with a nominal 1" inside diameter and deep enough to accommodate the screws, but not less than ½" deep or deeper than 1".

Install beveled sole plates prior to shipping girders. Installed screw heads must not protrude below the bottom of the beveled plate.

STATE OF TEXAS
Blake W. Staton
121491
LICENSED PROFESSIONAL ENGINEER
1/27/2021

MODIFICATION:

Removed rectangular bearing pad plan view and bearing pad placement diagram for skewed girder ends at conventional interior bents. Modified placement diagrams and table for 15" diameter pads at 30 – 45° skews for Tx28, Tx34, Tx40, Tx46, and Tx54 girders.

LEGEND:

(M) Indicates modified detail or area

HL93 LOADING SHEET 3 OF 3

Texas Department of Transportation
Bridge Division Standard

ELASTOMERIC BEARING AND GIRDER END DETAILS
PRESTR CONCRETE I-GIRDERS

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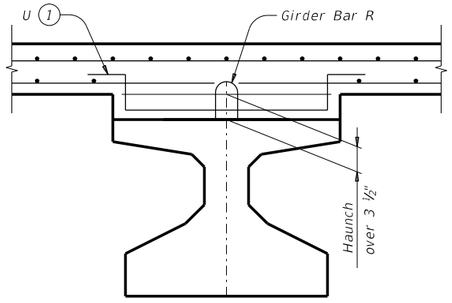
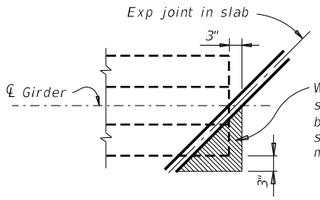
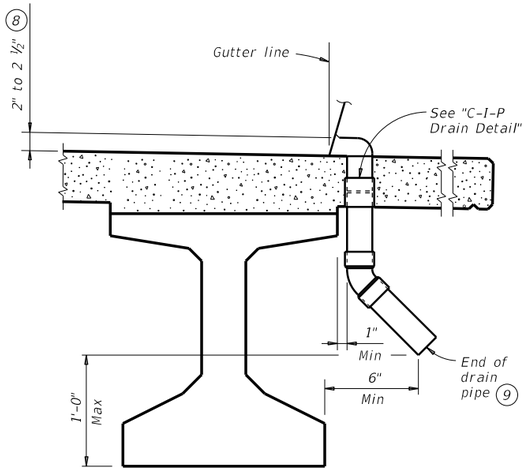


HAUNCH REINFORCING DETAIL

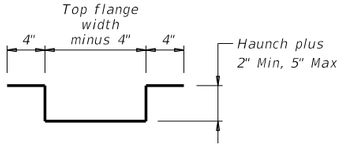


Where flanges project under slab of adjacent span, provide a minimum of ½" clearance between top of girder and bottom of adjacent slab. Polystyrene or other suitable compressible material may be used as a filler.

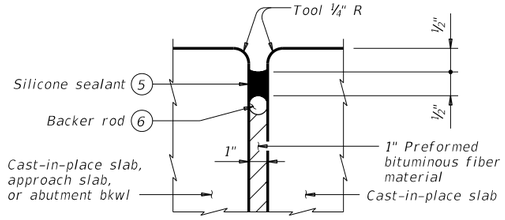
TREATMENT AT GIRDER END FOR SKEWED SPANS



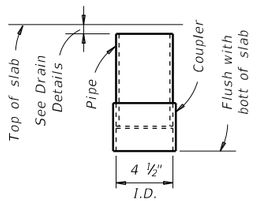
DRAIN DETAIL (10)



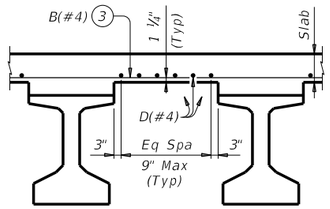
BARS U (#4)



TYPE A JOINT DETAIL (7)



C-I-P DRAIN DETAIL (2)



TYPICAL PART TRANSVERSE SLAB SECTION WITHOUT PCP (4)

Top reinforcing steel not shown for clarity.

(1) Space Bars U with girder Bars R in all areas where measured haunch exceeds 3 ½".

(2) Roughen outside of PVC with coarse rasp or equal to ensure bond with cast-in-place concrete.

(3) Bars B(#4) spaced at 9" Max with 2" end cover. Overhang option, Contractor's may end alternating bars B(#4) at centerline outside girder.

(4) Provide Grade 60 reinforcing steel. Provide bar laps, where required, as follows:
Uncoated ~ #4 = 1'-7"
Epoxy coated ~ #4 = 2'-5"

(5) Class 7 silicone sealant that conforms to DMS-6310. Install when ambient temperature is between 55°F and 85°F and rising. Engineer to determine allowable hours for sealant application.

(6) 1 ¼" backer rod must be compatible with joint sealant. Use of multiple pieces to create a backer rod cross section is not permitted. Top of backer rod must be convex as shown.

(7) The maximum distance between Type A expansion joints is 100'. See Bridge Layout for location of joints.

(8) Drain entrance formed in rail or sidewalk.

(9) Water may not be discharged onto girders.

(10) All drain pipe and fittings to be 4" diameter (Sch 40) PVC. See Item 481 "Pipe for Drains" for pipe, connections and solvent welding. Bend reinforcing steel to clear PVC 1". Drain length and location is as directed by the Engineer. Drains are not permitted over roadways or railways, or within 10'-0" of bent caps. Degrease outside of exposed PVC, apply acrylic water base primer, then coat with same surface finishing material as used for outside girder face. Variations of the above designs, as required for the type of rail used and its location on the structure, may be installed with the approval and direction of the Engineer.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

Payment for Type A joint will be as per Item 454, "Bridge Expansion Joints."

All other items (reinforcing steel, drains, etc.) shown on this sheet are subsidiary to other bid items.

Cover dimensions are clear dimensions, unless noted otherwise.

Reinforcing bar dimensions shown are out-to-out of bar.

DECK FORMWORK NOTES:

Overhang bracket hangers are limited to a safe working load of 3,600 lbs, applied to and along the axis of a coil rod at 45 degrees from vertical, regardless of higher loads permitted by hanger manufacturers. Do not place a hanger less than 12" from girder end. Space hangers accordingly.

Texas Department of Transportation

Bridge Division Standard

MISCELLANEOUS SLAB DETAILS

PRESTR CONCRETE I-GIRDERS

IGMS

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10-19: Modified Note 7. Type A now a pay item.	DIST	COUNTY		SHEET NO.
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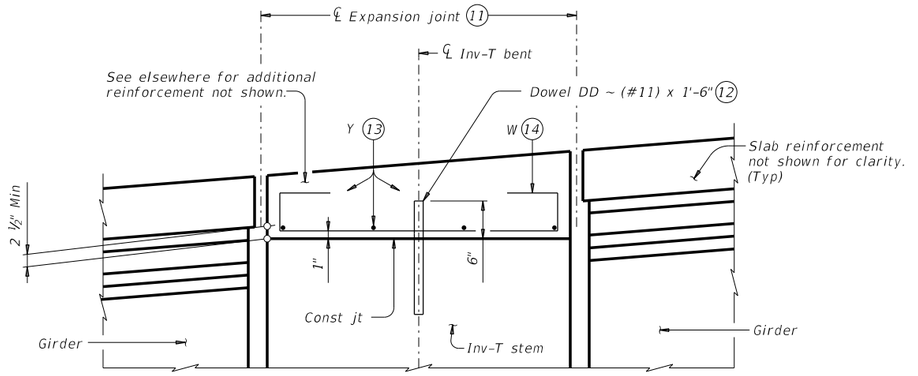
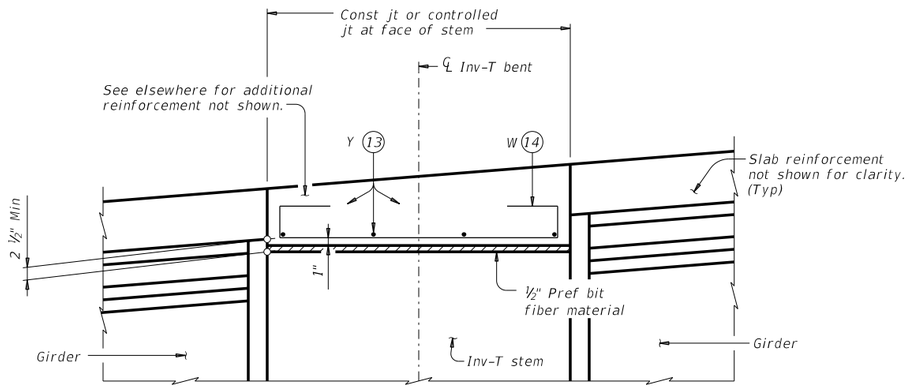
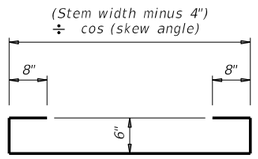


SHOWING EXPANSION JOINTS

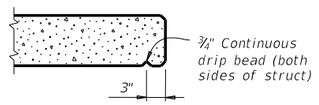


SHOWING CONST JTS OR CONTROLLED JTS

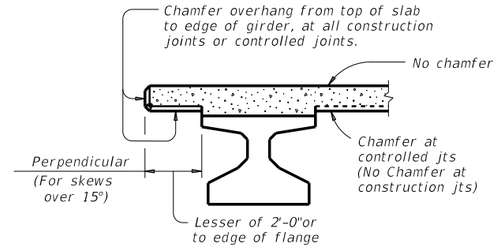
REINFORCEMENT OVER INV-T BENTS



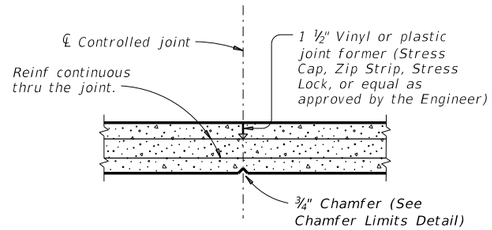
BARS W (#4)



DRIP BEAD DETAIL



CHAMFER LIMITS DETAIL (15)



CONTROLLED JOINT DETAIL

(Saw-cutting is not allowed)

(11) See Layout for joint type.

(12) Dowels DD (#11) spaced at 5 Ft Max. See Inv-T bents for quantity and location.

(13) Space Bars Y (#4) at 12" Max. Use 2" end cover. Number of Bars Y must satisfy spacing limit. Place parallel to bent.

(14) Space Bars W at 12" Max (3" from end of cap). Tilt if necessary to maintain cover requirements. Place parallel to longitudinal slab reinforcement.

(15) See Span details for type of joint and joint locations.

Texas Department of Transportation

Bridge Division Standard

MISCELLANEOUS SLAB DETAILS

PRESTR CONCRETE I-GIRDERS

IGMS

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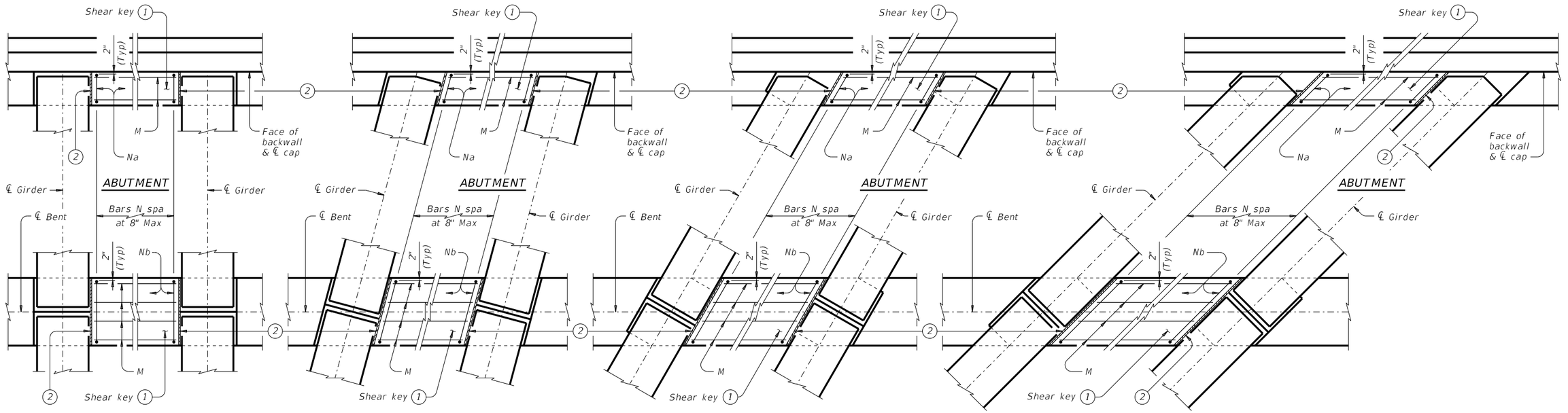


PARTIAL PLANS WITH NO SKEW

Showing shear keys on 3'-6" wide caps. 4'-0" caps similar.

PARTIAL PLANS WITH 15° SKEW

Showing shear keys on 3'-6" wide caps. 4'-0" caps similar.

PARTIAL PLANS WITH 30° SKEW

Showing shear keys on 3'-6" wide caps. 4'-0" caps similar.

PARTIAL PLANS WITH 45° SKEW

Showing shear keys on 3'-6" wide caps. 4'-0" caps similar.

(1) Place shear keys on the upstream side of structure between outside girder and next adjacent girder, unless shown otherwise on plans.

(2) UHMW polyethylene wear pad. (Typ)

(3) Leave a ¼" gap plus or minus between girder and face of wear pad. Cast wear pad with shear key, smooth side facing girder. Care must be taken to keep concrete from flowing under girder. Slope top of shear keys in accordance with Item 420.4.9, "Treatment and Finishing of Horizontal Surfaces."

(4) Measure at higher bearing seat elevation forward or back. Dimension based on typical bearing pad and bearing seat. Increase as necessary to maintain 5" overlap.

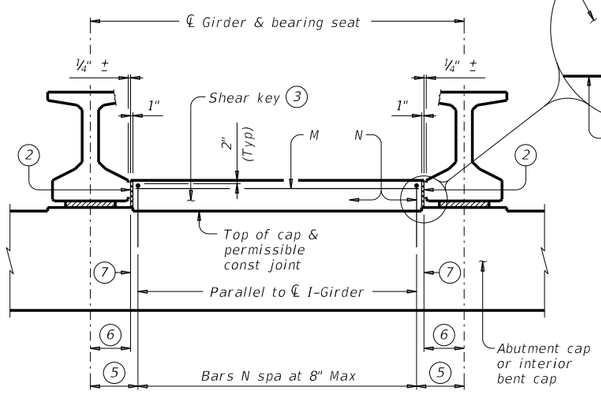
(5) With No Skew = 1'-8 ¼", measured along ℄ cap.
With Skew = 1'-8 ¼" ÷ Cos Skew, measured along ℄ cap.

(6) With No Skew = 1'-4 ¼", measured along ℄ cap.
With Skew = 1'-4 ¼" ÷ Cos Skew, measured along ℄ cap.

(7) Face of UHMW polyethylene wear pad. Smooth side of pad facing girder.

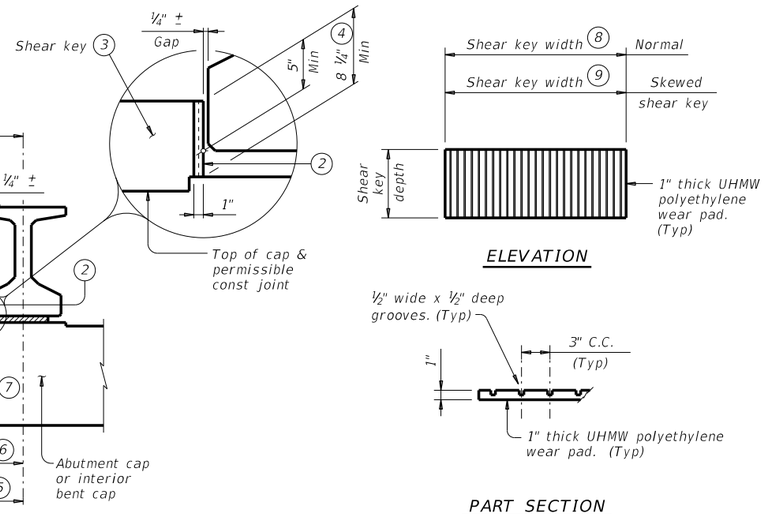
(8) Abutments = ½ Cap width.
Interior bents = Cap width.

(9) Abutments = ½ Cap width ÷ Cos Skew.
Interior bents = Cap width ÷ Cos Skew.

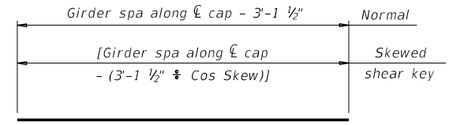


PARTIAL ELEVATION OF ABUTMENT OR INTERIOR BENT CAP (1)

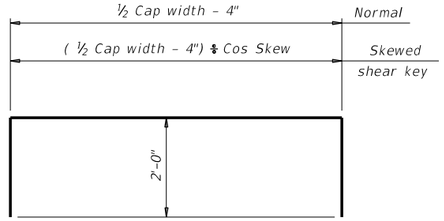
Showing shear key with girder Type Tx46.
Other I-Girder types similar.



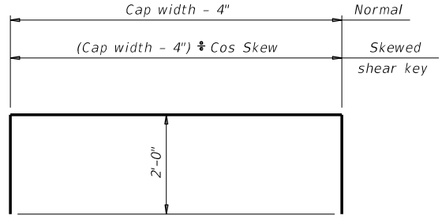
ULTRA HIGH MOLECULAR WEIGHT (UHMW) POLYETHYLENE WEAR PAD DETAILS



BARS M (#5)



BARS Na (#5)
(For abutments)



BARS Nb (#5)
(For interior bents)

CONSTRUCTION NOTES:

Provide Class "C" concrete (f'c = 3,600 psi). Provide Class "C" (HPC) if shown elsewhere on the plans.
Provide Grade 60 reinforcing steel.
Provide epoxy coated reinforcing steel for shear key if abutment or interior bent reinforcing steel is epoxy coated.
Provide Ultra High Molecular Weight (UHMW) polyethylene wear pads in accordance with ASTM D6712.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
Details showing skew are drawn showing right forward skew. See Bridge Layout for actual skew direction.
These details are limited to bridges skewed 45 degrees and less.
This standard is only applicable for I-Girders.
Modify details for bearing conditions, and girder spacing not shown on this standard. Details do not account for sole plate or pedestal bearing seat.
Include shear key concrete in abutment or bent concrete for payment.
UHMW polyethylene wear pads are subsidiary to Class "C" concrete.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

Texas Department of Transportation

Bridge Division Standard

SHEAR KEY DETAILS
PRESTR CONCRETE I-GIRDERS

IGSK

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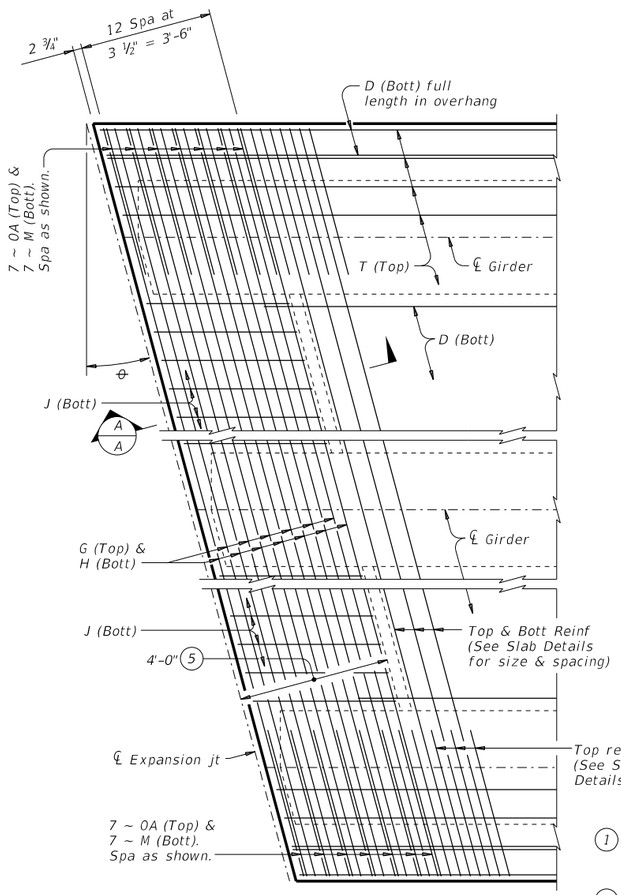
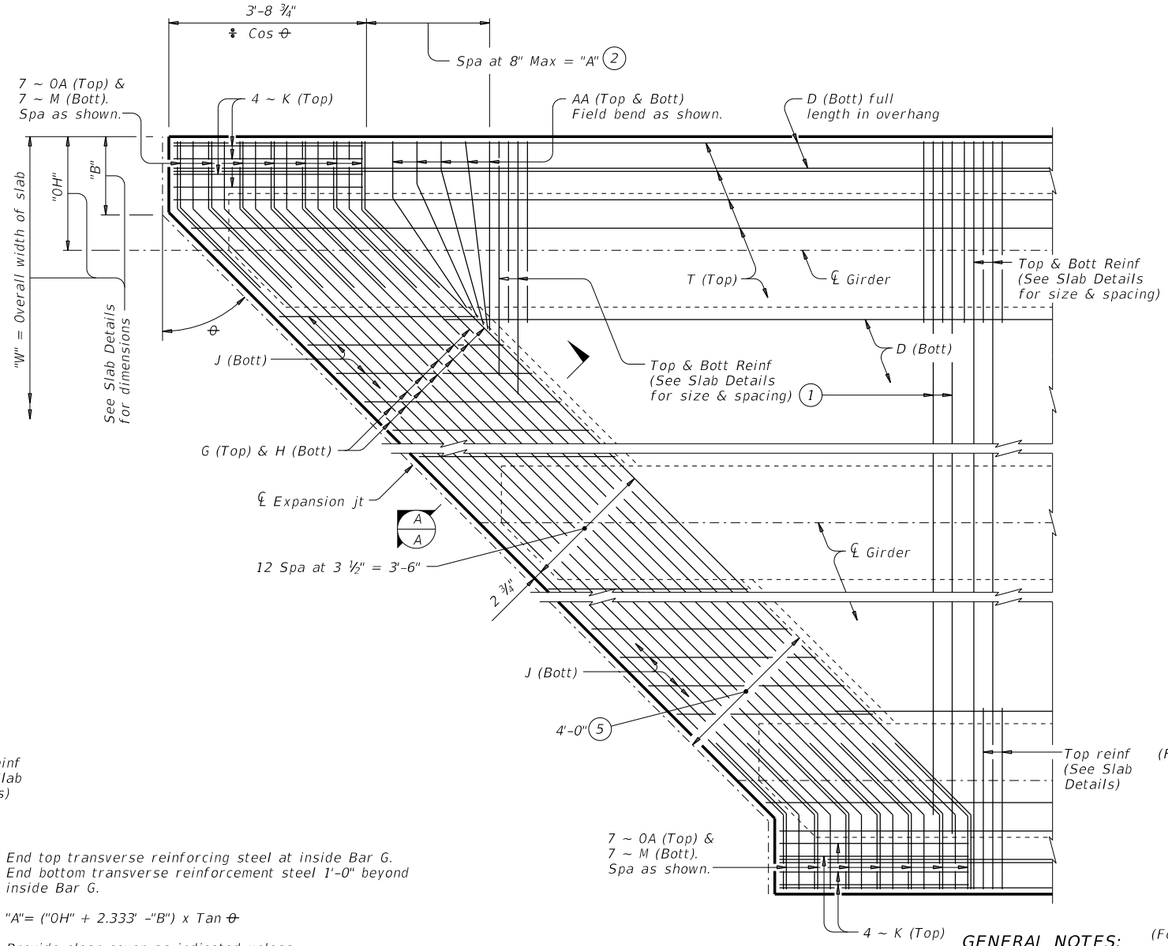


PARTIAL PLAN FOR SLABS WITHOUT BREAKBACK



PARTIAL PLAN FOR SLABS WITH BREAKBACK

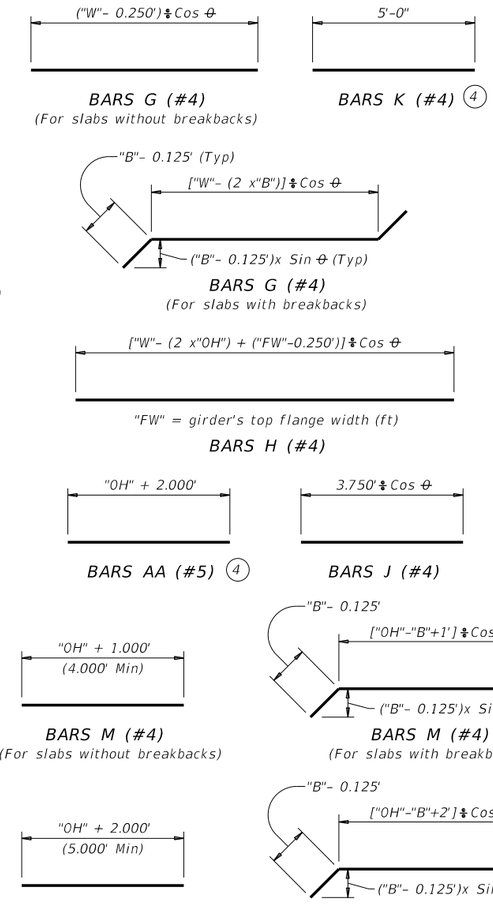
(1) End top transverse reinforcing steel at inside Bar G. End bottom transverse reinforcement steel 1'-0" beyond inside Bar G.

(2) "A"= ("0H" + 2.333' -"B") x Tan θ

(3) Provide clear cover as indicated unless otherwise shown on Span Details.

(4) Only required on slabs with breakbacks.

(5) Thickened slab end dimensioned perpendicular to face of bkwl, centerline interior bent or face of inverted-T stem.



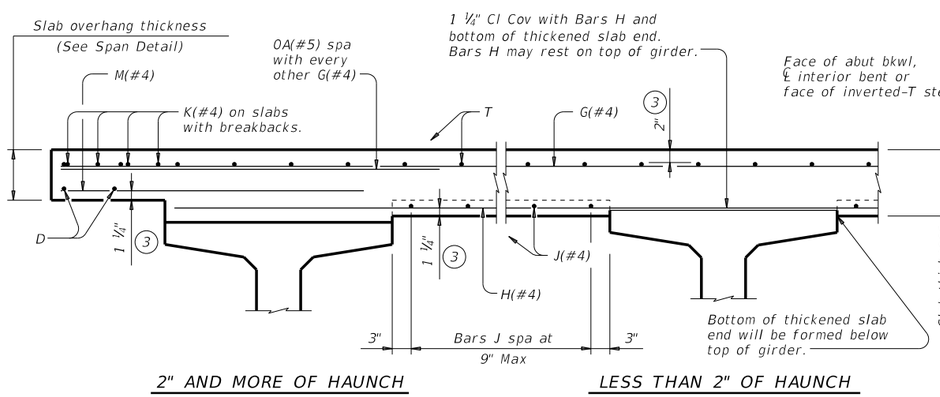
GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
These details are restricted to Prestressed Concrete I-Girder Spans.
These details are to be used in conjunction with the Span Details and PCP standard (if prestressed concrete panels are used).
When Option 2 from PCP standard is used, provide Bars AA, G, K and OA in the slab.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
If slab reinforcing steel is shown on the Slab Details to be epoxy coated, then Bars AA, G, K, H, J, M and OA must be epoxy coated.
Provide bar laps, where required, as follows:
Uncoated ~ #4 = 1'-7"
Epoxy Coated ~ #4 = 2'-5"

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

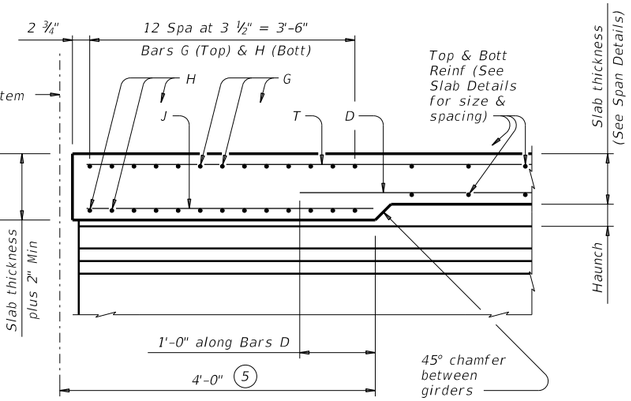


2" AND MORE OF HAUNCH

LESS THAN 2" OF HAUNCH

TYPICAL TRANSVERSE SECTION

(Showing Prestressed Conc I-Girders at ℄ Brg)



SECTION A-A

(Showing with 2" and more of haunch)

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

THICKENED SLAB END DETAILS

PRESTRESSED CONCRETE I-GIRDER SPANS

IGTS

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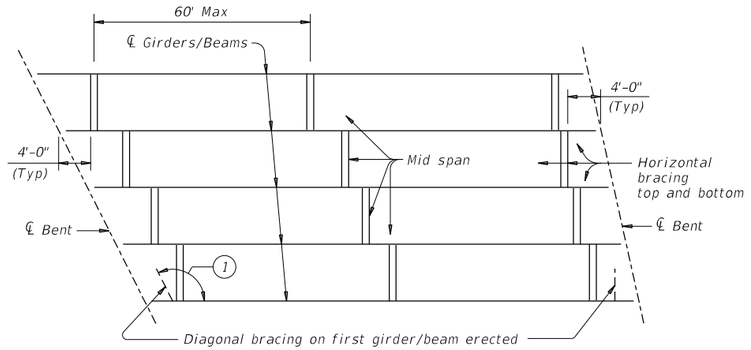
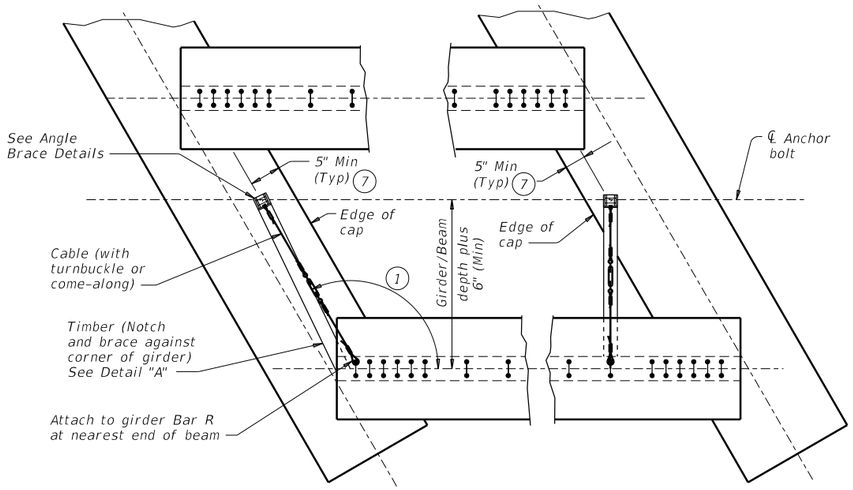
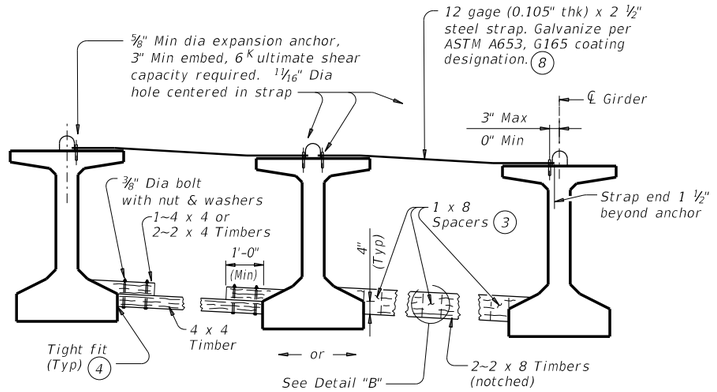


ERECTION BRACING

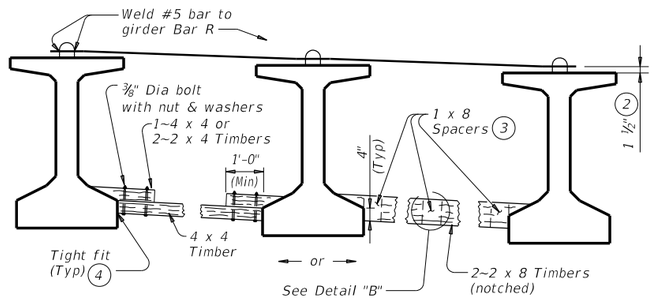


PLAN



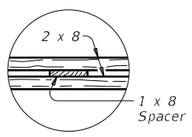
FOR ERECTION BRACING, OPTION 1

(This option is not allowed when slab is formed with PMDF or plywood.)



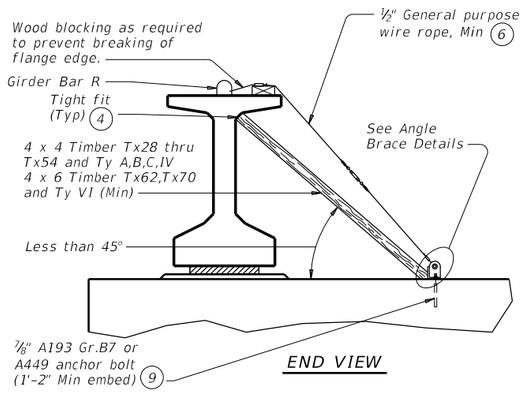
FOR ERECTION BRACING, OPTION 2

HORIZONTAL BRACING DETAILS 5



PLAN

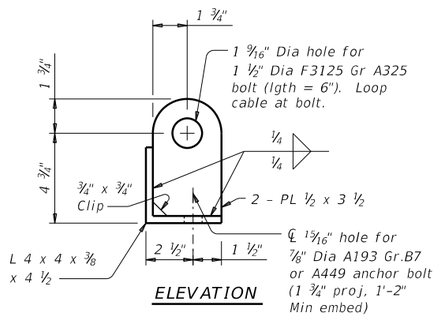
DETAIL "B"



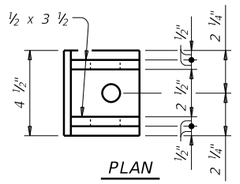
END VIEW

DIAGONAL BRACING DETAILS 5

(To be used on both ends of the first girder/beam erected in the span in each phase.)



ELEVATION



PLAN

ANGLE BRACE DETAILS

HAULING & ERECTION:

The Contractor's attention is directed to the possible lateral instability of prestressed concrete girders and beams over 130' long, especially during hauling and erection. The use of the following methods to improve stability is encouraged: Locate lifting devices at the maximum practical distance from girder ends; use external lateral stiffening devices during hauling and erection; lift with vertical lines using two machines; and take care in handling to minimize inertial and impact forces.

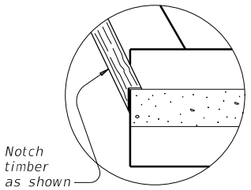
ERECTION BRACING:

Erection bracing details shown are considered the minimum for fulfilling the bracing requirements of Item 425.

Required erection bracing must be placed immediately after erection of each girder and remain in place until additional bracing as required for slab placement is in place. This standard is needed in all cases to meet requirements for Slab Placement Bracing.

PHASED CONSTRUCTION:

Place erection and slab placement bracing for all girders in a phase as shown in these details. For phases after first, also place erection and slab placement bracing between outer girder of completed phase and adjacent girder of current phase. When the phase construction joint is between girders, top bracing can be omitted.



DETAIL "A"

(1) If angle shown exceeds 120 degrees, move diagonal brace to other side of girder/beam and place square to girder/beam. This may prevent exterior girder from being erected first.

(2) Place and weld #5 bars as shown during erection. If forming deck with prestressed panels, bars can be temporarily removed, one at a time, during panel erection. Re-install bar prior to additional panel erection. Bars can rest on panels and be bent down and welded to girder Bars R (See Sheet 2 of 2).

(3) Clear distance between spacers must not exceed 3'. Nail together with 16d nails.

(4) Use wedges as necessary to obtain tight fit. Nail wedges to timbers.

(5) Pressure treated landscape timbers can not be used.

(6) All hardware used with cable must be able to develop a minimum 25 kips breaking strength. Use thimbles at all loops in cable. Install cable clamps with saddles bearing against the live end and U-bolts bearing aginst the dead end.

(7) It is acceptable to tie anchor bolts to cap reinforcement.

(8) Prior to installing, field bend strap to lay flush on both girders' top flange and slope between flange tips.

(9) Anchor bolt may be drilled and epoxied in place. Provide 25k minimum pullout. Core drill hole.

Texas Department of Transportation

Bridge Division Standard

MINIMUM ERECTION AND BRACING REQUIREMENTS
PRESTRESSED CONCRETE I-GIRDERS AND I-BEAMS

MEBR(C)

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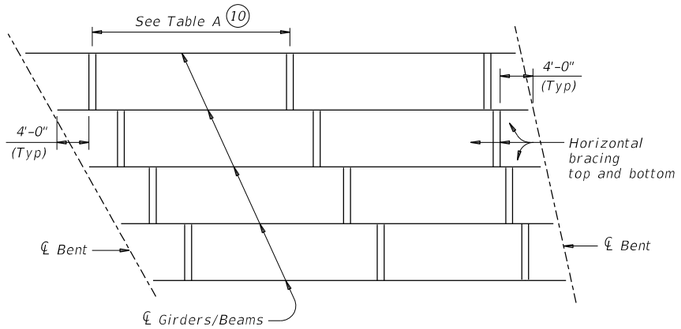


SLAB PLACEMENT BRACING

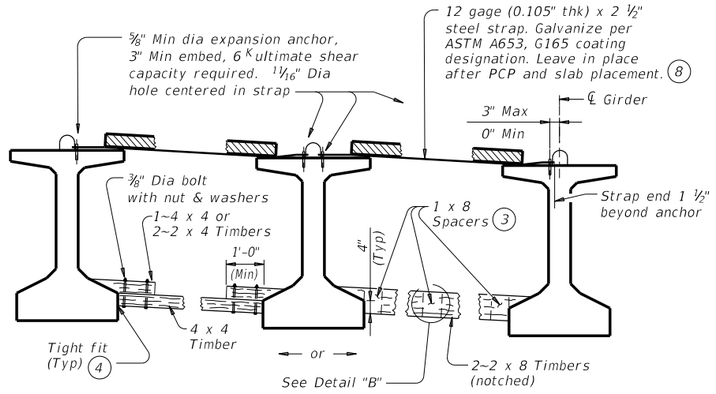
TABLE A

OPTION 1-RIGID BRACING (STEEL STRAP)

Girder or Beam Type	Maximum Bracing Spacing	
	Slab Overhang less than 4'-0" (11)	Slab Overhang 4'-0" and greater (11)
Tx28	¼ points	¼ points
Tx34	¼ points	¼ points
Tx40	¼ points	⅛ points
Tx46	¼ points	⅛ points
Tx54	¼ points	⅛ points
Tx62	¼ points	⅛ points
Tx70	¼ points	⅛ points
A	⅛ points	⅛ points
B	⅛ points	⅛ points
C	⅛ points	⅛ points
IV	¼ points	⅛ points
VI	¼ points	⅛ points

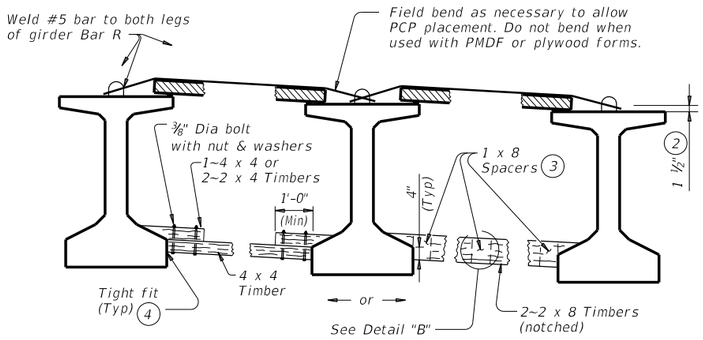
OPTION 2-FLEXIBLE BRACING (NO. 5 OVER PCP)

Girder or Beam Type	Maximum Bracing Spacing	
	Slab Overhang less than 4'-0" (11)	Slab Overhang 4'-0" and greater (11)
Tx28	¼ points	⅛ points
Tx34	¼ points	⅛ points
Tx40	¼ points	⅛ points
Tx46	¼ points	⅛ points
Tx54	¼ points	⅛ points
Tx62	¼ points	⅛ points
Tx70	¼ points	⅛ points
A	2.0 ft	1.5 ft
B	3.0 ft	2.0 ft
C	4.5 ft	2.0 ft
IV	¼ points	4.0 ft
VI	¼ points	4.0 ft



FOR SLAB PLACEMENT BRACING, OPTION 1 - RIGID

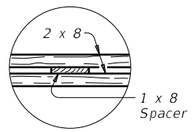
(Showing slab formed with PCP. This option is not allowed when slab is formed with PMDF or plywood.)



FOR SLAB PLACEMENT BRACING, OPTION 2 - FLEXIBLE

(Showing slab formed with PCP.)

HORIZONTAL BRACING DETAILS (5)



PLAN

DETAIL "B"

(2) Place and weld #5 bars as shown during erection. If forming deck with prestressed panels, bars can be temporarily removed, one at a time, during panel erection. Re-install bar prior to additional panel erection. Bars can rest on panels and be bent down and welded to girder Bars R.

(3) Clear distance between spacers must not exceed 3'. Nail together with 16d nails.

(4) Use wedges as necessary to obtain tight fit. Nail wedges to timbers.

(5) Pressure treated landscape timbers can not be used.

(8) Prior to installing, field bend strap to lay flush on both girders' top flange and slope between flange tips.

(10) Bracing spacing (¼ and ⅛ points) measured between first and last typical brace location.

(11) Measure slab overhang from centerline of girder or beam. When overhang varies in span, determine bracing spacing based on largest overhang.

SLAB PLACEMENT BRACING:

The details for slab placement bracing are considered minimum for fulfilling the requirements of Specification Items 422 and 425.

Required slab placement bracing must remain in place until slab concrete has attained a compressive strength of 3000 psi.

GENERAL NOTES:

Bracing details for spans longer than 150' are not provided. The Contractor must submit proposed bracing details for such conditions to the Engineer for approval prior to erection.

Systems equal to or better than those shown may be used provided details of such systems are submitted to and approved by the Engineer prior to erection.

Use of these systems or details does not relieve the Contractor of the responsibility for the adequacy of the bracing and the safety of the structure.

Removal of bracing for short periods of time to align girders and beams is permissible.

All turn-buckles, come-alongs, anchors and other connections must be capable of developing the full strength of the cable shown.

Furnish anchor bolts and nuts in accordance with Item 449, "Anchor Bolts".

Texas Department of Transportation

Bridge Division Standard

MINIMUM ERECTION AND BRACING REQUIREMENTS

PRESTRESSED CONCRETE I-GIRDERS AND I-BEAMS

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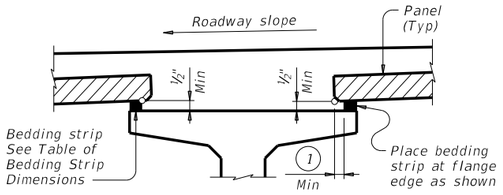
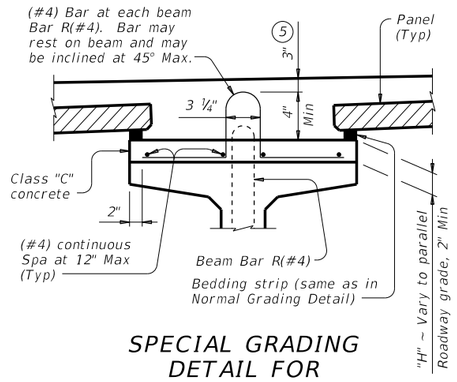


NORMAL GRADING DETAIL (3)

Showing prestressed concrete I-girders.
(Other beam types similar)



SPECIAL GRADING DETAIL FOR CONCRETE BEAMS

Showing prestressed concrete I-girders.
(Other beam types similar)

TABLE OF BEDDING STRIP DIMENSIONS		
WIDTH	HEIGHT (4)	
	Min	Max
1" (Min)	½"	2"
1 ¼"	½"	2 ½"
1 ½"	½"	3"
1 ¾"	½"	3 ½"
2"	½"	4"
2 ¼"	½"	4 ½" (2)
2 ½"	½"	5" (2)
2 ¾"	½"	5 ½" (2)
3" (Max)	½"	6" (2)

(1) 2" Min for I-giders, 1 ½" Min for all other beam types.

(2) Allowed for I-girders, not allowed on other beam types.

(3) To reduce the quantity of cast-in-place concrete, bedding strip thickness may be increased in ¼" increments. Bedding strips must be comprised of one layer. Bond bedding strips to the beams with an adhesive compatible with bedding strips. Bedding strips over 2.5" high may need to be bonded to panels. The same thickness strip must be used under any one panel edge and the maximum change in thickness between adjacent panels is ¼". Alternatively, bedding strips may be cut to grade. Panels may be supported by an alternate method, using a commercial product, if approved by the Engineer of Bridge Design, Bridge Division. If bedding strips exceed 6" high for I-Girders, 4" high for all other beam types, use Special Grading Detail for Concrete Beams or submit an alternate method to the Bridge Division for approval.

(4) Height must not exceed twice the width.

(5) Provide clear cover as indicated unless otherwise shown on Span Details.

(6) See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.

(7) Space Bars UP(#4) with Beam Bars R(#4) in all areas where measured haunch exceeds 3 ½" with I-girders, and 3" for all other beam types. Epoxy coating for Bars UP is not required.

(8) Do not locate construction joints on top of a panel.

(9) Butt adjacent bedding strips together with adhesive. Cut v-notches, approx ¼" deep, in the top of the bedding strips at 8' o.c..

CONSTRUCTION NOTES:

Erected panels must bear uniformly on bedding strips of extruded polystyrene placed along top flange edges.

Placing panels to minimize joint openings is recommended.

If additional blocking is needed, special grading details for supporting the panels and extra reinforcing between beam and slab will be considered subsidiary to deck construction.

Bars U, shown on PCP-FAB, may be bent over or cut off if necessary.

Care must be taken to ensure proper cleaning of construction debris and consolidation of concrete material under the edges of the panels. Bedding strips must be placed at beam flange edges so that adequate space is provided for the mortar to flow a minimum of 1 ½" under the panels as the slab concrete is placed.

To allow the proper amount of mortar to flow between beam and panel, the minimum vertical opening must be at least ½". Roadway cross-slope reduces the opening available for entry of the mortar. Bedding strips varying in thickness across the beam are therefore required.

For clear span between U-beams less than or equal to 18", see Permissible Slab Forming Detail on Miscellaneous Slab Detail sheets, UBMS.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel in the cast-in-place slab. See Table of Reinforcing Steel for size and spacing of reinforcement.

If the top and bottom layer of reinforcing steel is shown on the Span Details to be epoxy coated, then the D, E, P, & Z bars must be epoxy coated.

Provide bar Laps, where required, as follows:

Uncoated ~ #4 = 1'-7"
Epoxy Coated ~ #4 = 2'-5"

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

Panel placement may follow either Option 1 or Option 2 except Option 1 must be used if the skew exceeds 45 degrees.

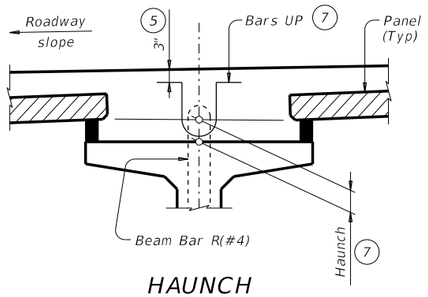
Use of Prestressed Concrete Panels is not permitted for horizontally curved steel plate or tub girders. See Span Details for other possible restrictions on their use.

These details are to be used in conjunction with the Span Details, PCP-FAB and other applicable standard drawings.

When panel support (bedding strips) deviates from what is shown herein, provide details signed and sealed by a professional Engineer.

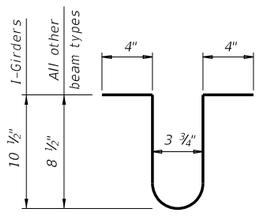
Any additional reinforcement or concrete required on this standard is considered subsidiary to the bid Item "Reinforced Concrete Slab".

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

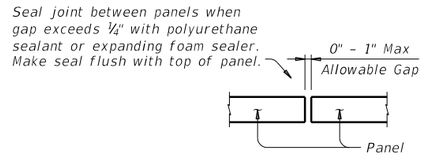


HAUNCH REINFORCING DETAIL

Showing prestressed concrete I-girders.
(Other beam types similar)

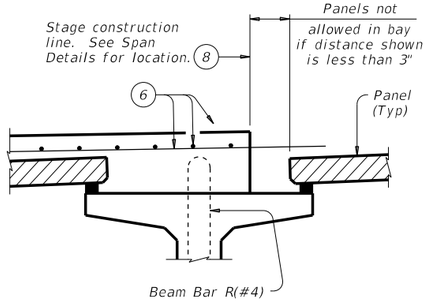


BARS UP (#4) (7)

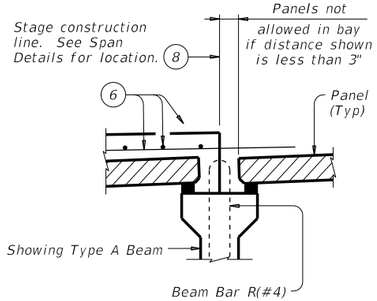


PANEL JOINTS

(Panel reinforcing not shown for clarity.
The gap cannot be considered as a panel fabrication tolerance. Adjust panel placement to minimize joint openings.)



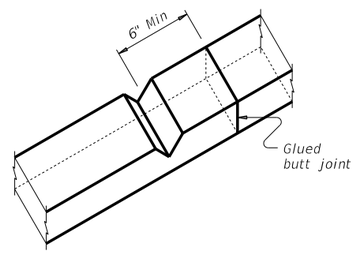
PRESTR CONC I-GIRDERS



PRESTR CONC I-BEAMS

STAGE CONSTRUCTION LIMITATIONS

(Other beam types similar)



BEDDING STRIP DETAIL (9)

HL93 LOADING

SHEET 1 OF 4

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE PANELS DECK DETAILS

PCP

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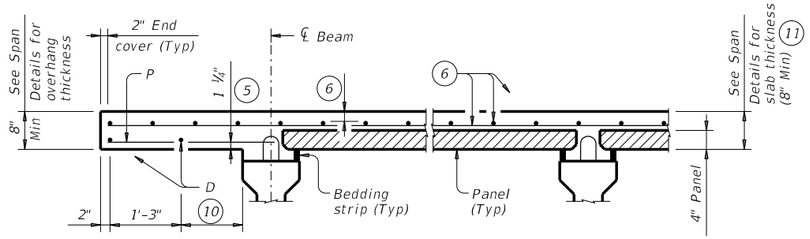
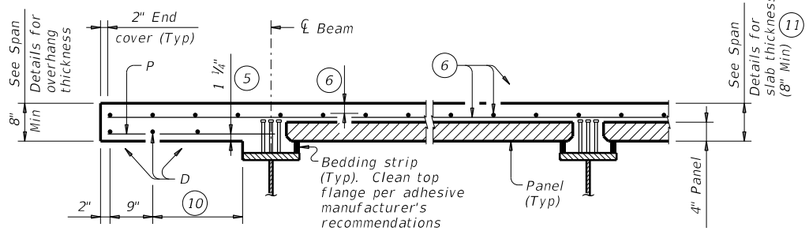
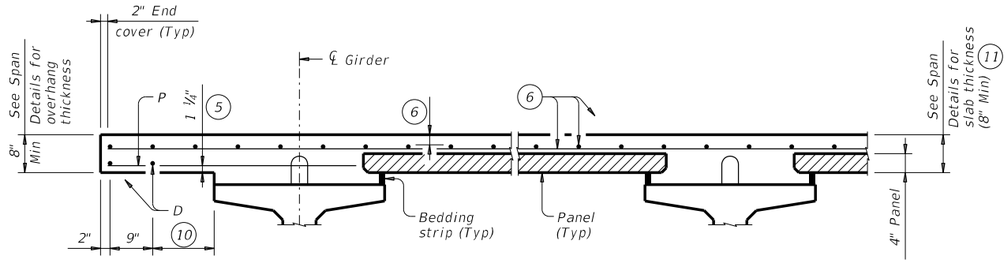


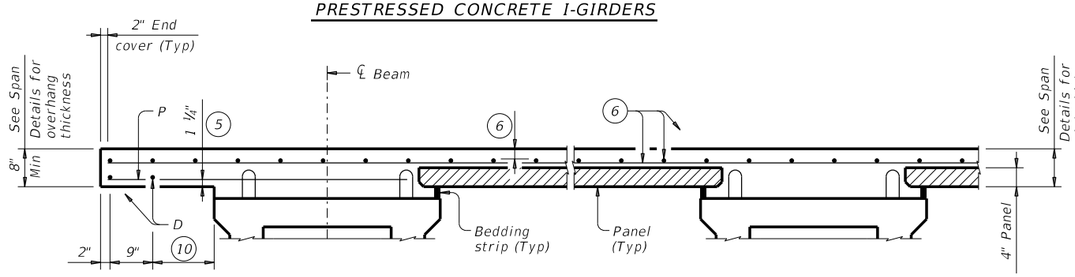
PRESTRESSED CONCRETE I-BEAMS



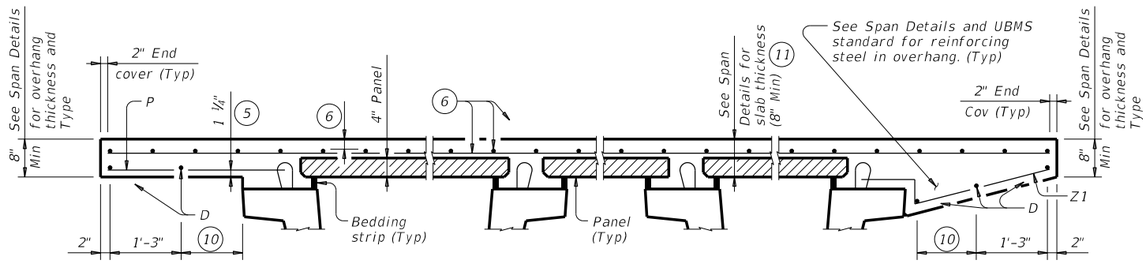
STEEL BEAMS



PRESTRESSED CONCRETE I-GIRDERS



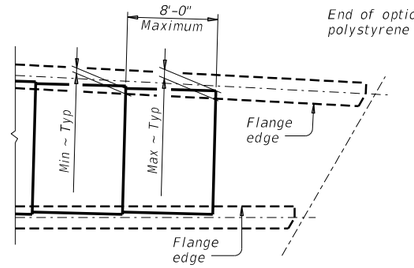
PRESTRESSED CONCRETE X-BEAMS



NORMAL OVERHANG WITH PRESTR CONC U-BEAMS

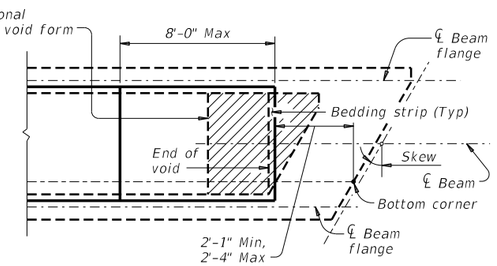
SLOPED OVERHANG WITH PRESTR CONC U-BEAMS

TYPICAL PART TRANSVERSE SECTIONS

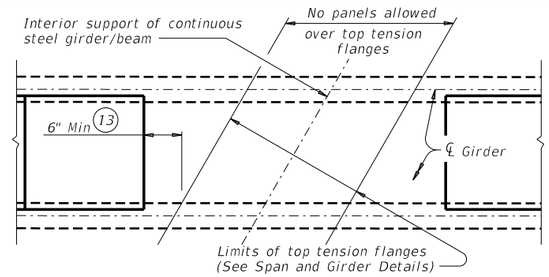


AT FLARED BEAMS OR GIRDERS

See PCP-FAB standard for Min and Max dimensions based on bemm/girder type.



OVER CONC U-BEAMS



AT INT SUPPORTS OF CONTINUOUS STEEL GIRDERS

PART PLANS OF PANEL PLACEMENT

(5) Provide clear cover as indicated unless otherwise shown on Span Details.

(6) See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.

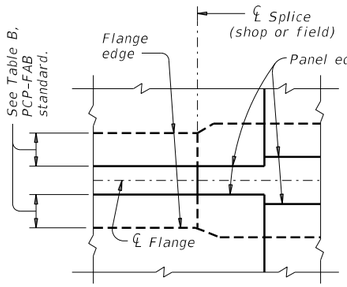
(9) Butt adjacent bedding strips together with adhesive. Cut v-notches, approx ¼" deep, in the top of the bedding strips at 8' o.c..

(10) Equally space additional bar if more than 1'-3" Max.

(11) The actual thickness constructed may exceed the slab thickness shown on the Span Details but the extra thickness may be no more than 2" (1" for prestressed concrete U-beams and steel beams). Bearing seat elevations or finished grade may be adjusted.

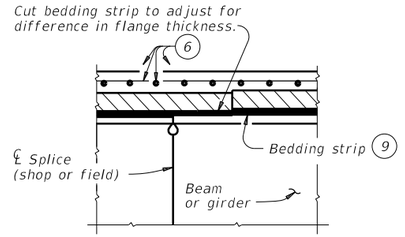
(12) Field adjust Bars Z1(#4) to match actual slope of slab overhangs. Width of slab overhang will vary along span with curved slab edges. Adjust Bar Z1(#4) dimensions to maintain proper cover. Bars Z2(#4) are located at Inverted-Tee stems only.

(13) Location of concrete placement sequence boundaries and bolted field splices should be considered by the contractor in determining panel limits.



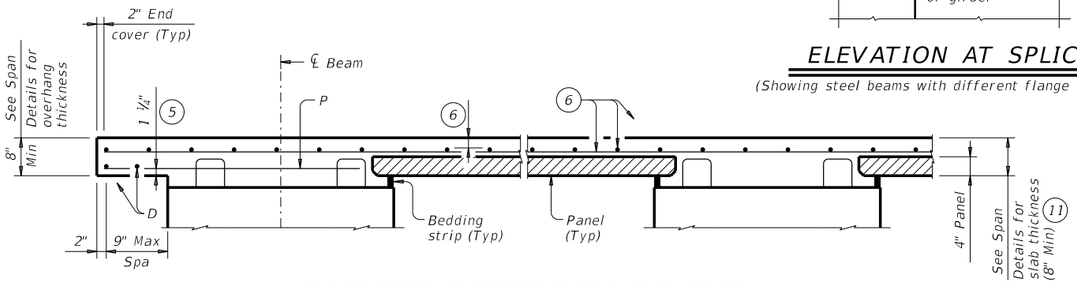
PLAN AT SPLICE

(Showing steel beams with flange width transition)



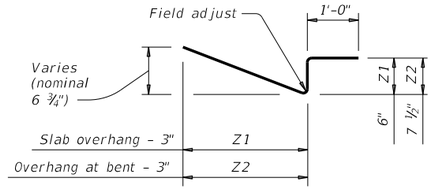
ELEVATION AT SPLICE

(Showing steel beams with different flange thickness)



PRESTRESSED CONCRETE SPREAD SLAB BEAMS

Bars P over exterior beams are still required when no overhang is used. In this case, only one Bar D, 2" from slab edge, is required.



BARS Z (#4) (12)

HL93 LOADING SHEET 2 OF 4

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE PANELS
DECK DETAILS

PCP

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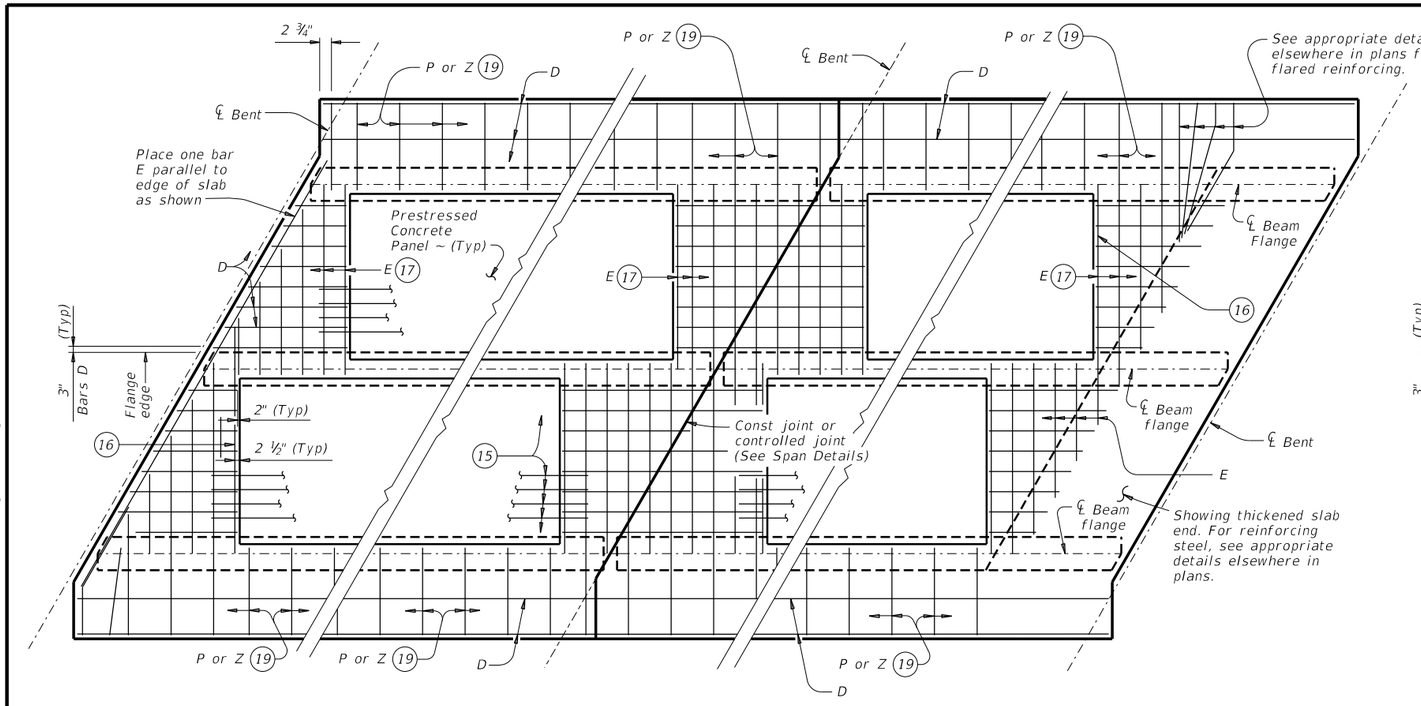
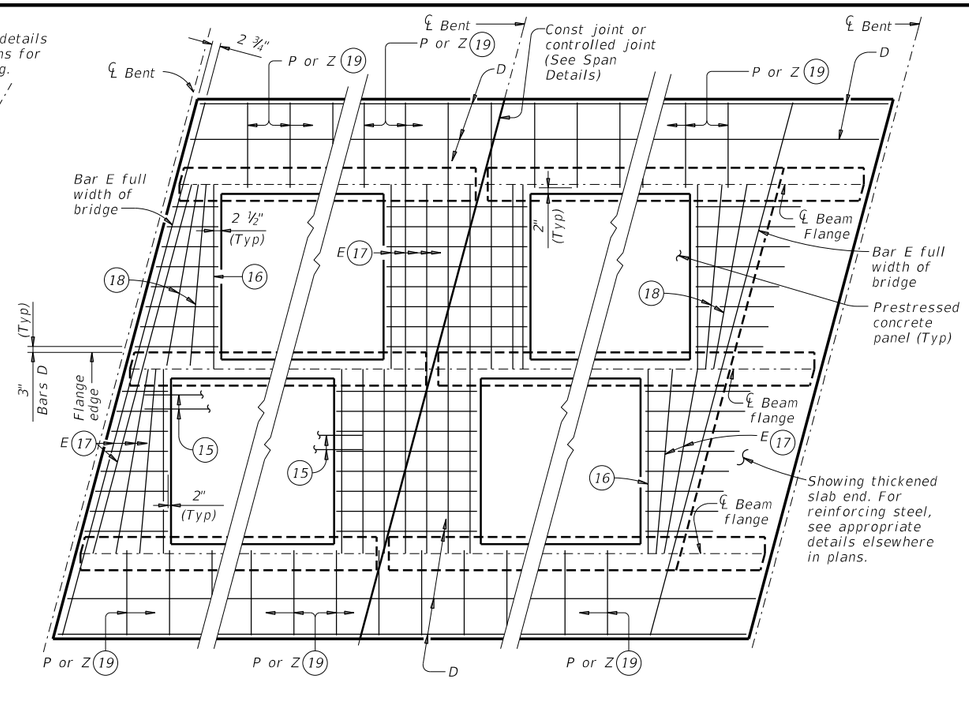
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		224

DATE:
FILE:



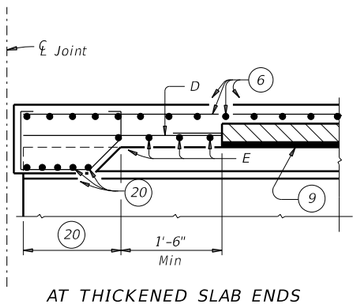
AT ALL SPAN ENDS UNLESS NOTED OTHERWISE | AT INTERIOR BENTS | AT THICKENED END SLABS

OPTION 1 ~ PLAN OF SLABS WITH NORMAL REINFORCEMENT

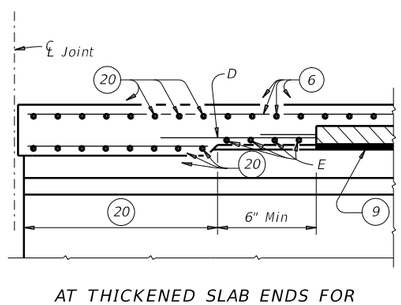


AT ALL SPAN ENDS UNLESS NOTED OTHERWISE | AT INTERIOR BENTS | AT THICKENED END SLABS

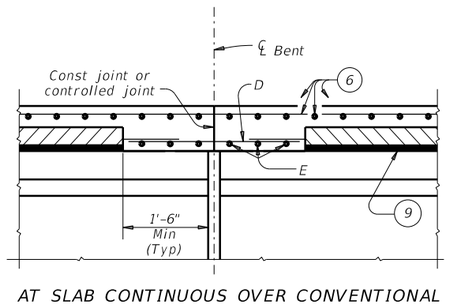
OPTION 1 ~ PLAN OF SLABS WITH SKEWED REINFORCEMENT



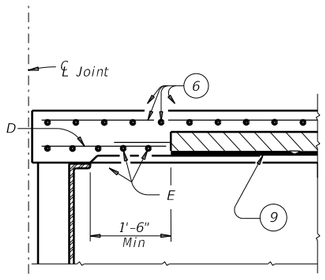
AT THICKENED SLAB ENDS FOR PRESTR CONC U-BMS



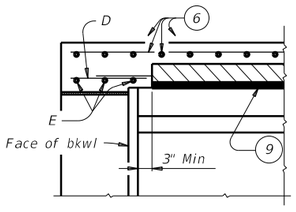
AT THICKENED SLAB ENDS FOR PRESTR CONC I-BMS AND STEEL BMS



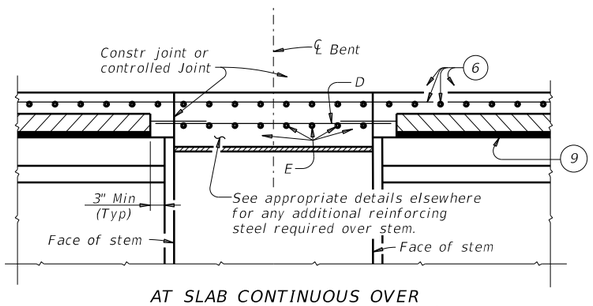
AT SLAB CONTINUOUS OVER CONVENTIONAL INTERIOR BENTS FOR ALL SIMPLE SPAN BMS



AT CONVENTIONAL END DIAPHRAGMS FOR STEEL BMS



AT SLAB OVER ABUTMENT BACKWALL FOR ALL BMS



AT SLAB CONTINUOUS OVER INVERTED-T BENTS FOR ALL BMS

OPTION 1 ~ ELEVATIONS AT BEAM ENDS

(6) See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.

(9) Butt adjacent bedding strips together with adhesive. Cut v-notches, approx ¼" deep, in the top of the bedding strips at 8' o.c.

(14) Max Spacing as listed unless otherwise shown.

(15) At connection with cast-in-place slab, extend longitudinal panel reinforcement. See PCP-FAB for details.

(16) Maintain one Bar E(#4) parallel to panel ends (Typ).

(17) Bars E(#4) not continuous over beam flanges must overlap beam flange 6" Min.

(18) Add flared Bars E(#4) (Min Spa = 6", Max Spa = 12") as required at panel ends.

(19) Where possible, Bars E(#4) may be extended into overhangs to replace Bars P(#4). Bars Z(#4) are required for sloped overhangs with U-Beams.

(20) See appropriate thickened slab end details for reinforcing and limits of thickened slab end.

TABLE OF REINFORCING STEEL (14)

BAR	SIZE	Max Spa (in.)
D	#4	9
E	#4	9
P	#4	18
UP	#4	~
Z	#4	18

HL93 LOADING

SHEET 3 OF 4

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE PANELS
DECK DETAILS

PCP

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	DIST	COUNTY		SHEET NO.
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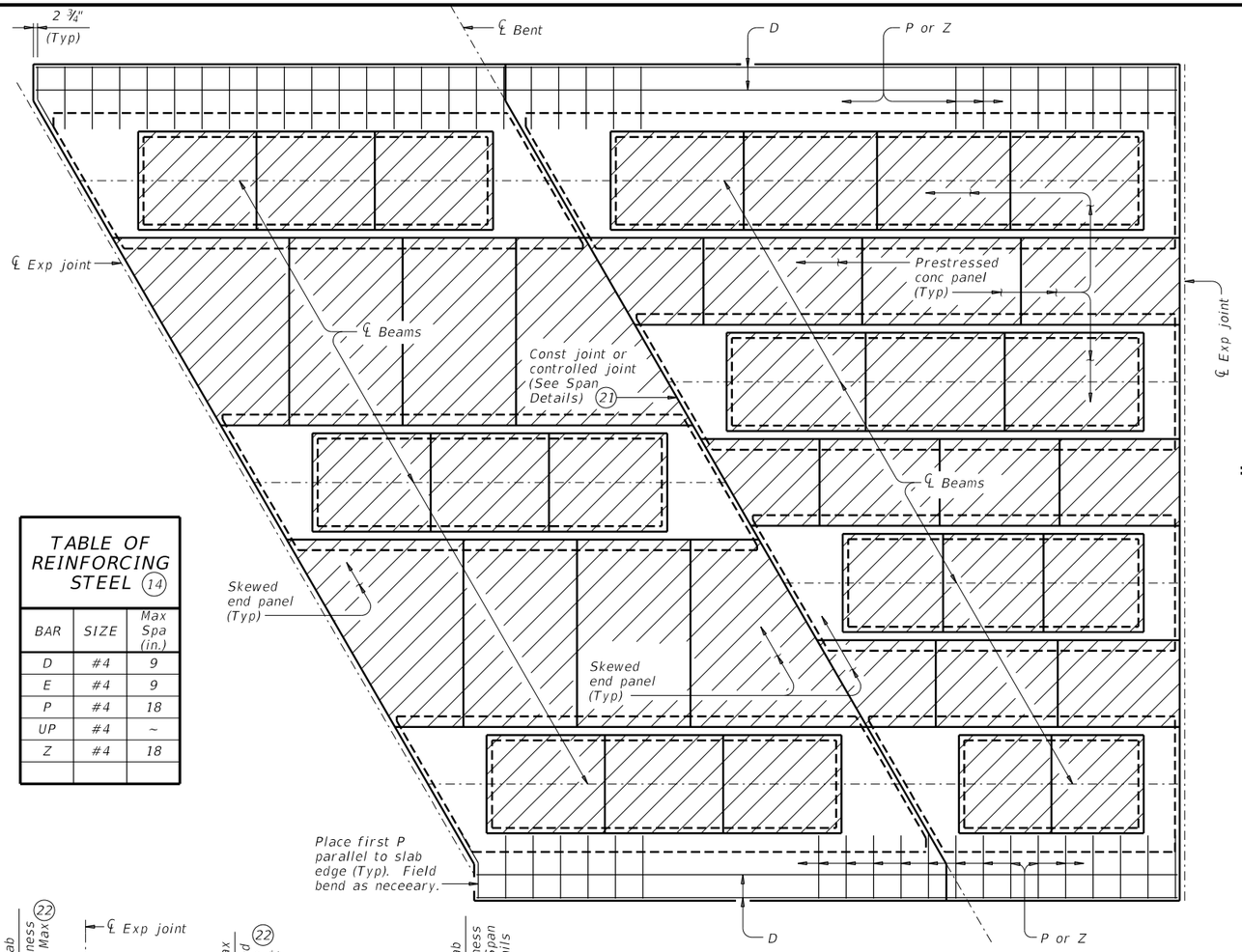
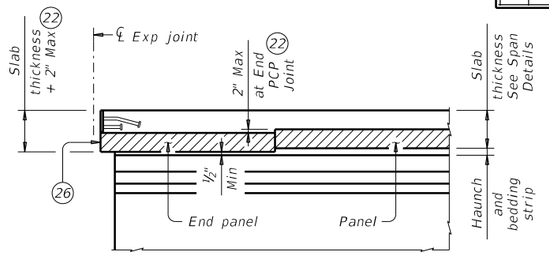


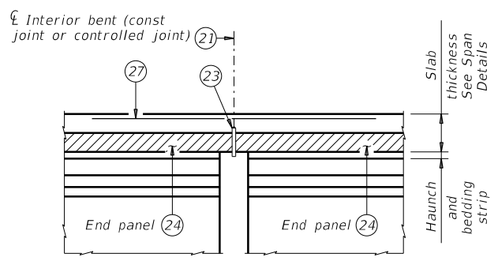
OPTION 2 ~ PLAN OF SLAB

(Showing U-Beams; other beams similar)



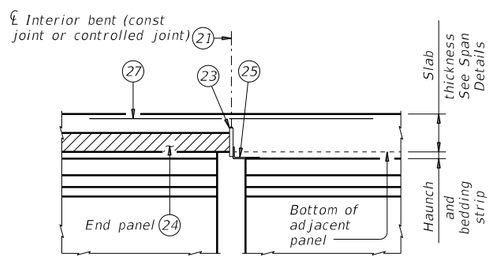
JOINTS (BETWEEN BEAMS/GIRDERS OR AT INV-T STEM)

For SEJ-A, SEJ-S(0), AJ, and Type A expansion joints only.



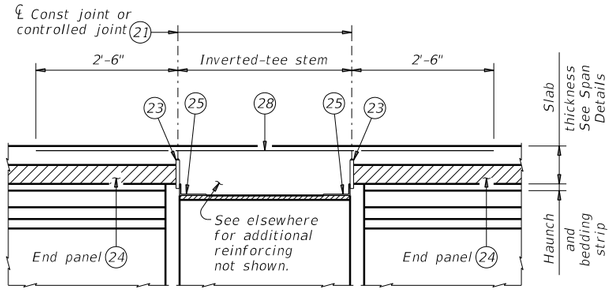
CONVENTIONAL INTERIOR BENT

Panel against panel between beams/girders.



CONVENTIONAL INTERIOR BENT

Panel against beam/girder end in adacent span.

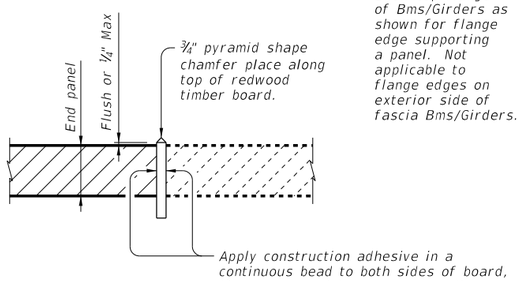


INVERTED-T BENT

Panels against inverted-tee stem

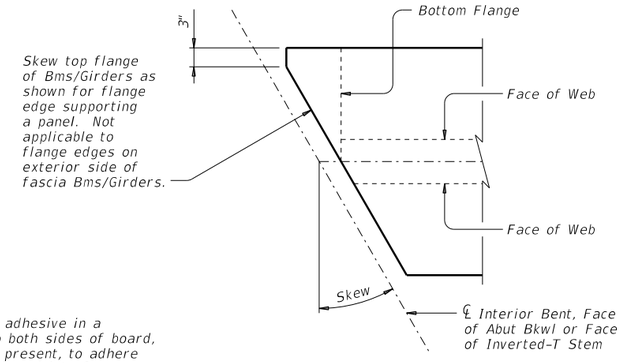
OPTION 2 ~ ELEVATIONS AT BEAM ENDS (6)

TABLE OF REINFORCING STEEL (14)		
BAR	SIZE	Max Spa (in.)
D	#4	9
E	#4	9
P	#4	18
UP	#4	~
Z	#4	18



ELEVATION EXAMPLE OF END PANEL AND TIMBER BOARD (23)

See "Option 2 ~ Elevation At Beam Ends".



OPTION 2 ~ SHOWING MODIFICATION TO BEAM/GIRDER TOP FLANGE FOR SKEWS OVER 5°

Showing I-Bm/I-Girder, U-Bms and Steel Bms similar.

(6) See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.

(14) Max Spacing as listed unless otherwise shown.

(21) 1 ½" Vinyl or plastic joint former at controlled joints (Stress Cap, Zip Strip, Stress Lock, or equal as approved by the Engineer.)

(22) End panel may be set up to 2" lower to accommodate expansion joint hardware, provided bedding strip is not less than ½" thick.

(23) ¾" thick redwood timber board, leave in place. Redwood timber board placed flush with top of panel or within ¼" Max above panel. Place ¾" pyramid shape chamfer along top of timber board. See "Elevation Example of End Panel and Timber Board". Place straight, within ¼" of centerline of bent or face of inverted-tee, across bridge width and end board at exterior flange edge of fascia beams/girders. Do not extend into overhang.

(24) Place panel within ½" of ¾" thick board.

(25) Permanent galvanized steel sheet form. Removable formwork is acceptable.

(26) Place end panel within ½" of expansion joint opening. End panel cannot encroach on required expansion joint opening.

(27) Place additional (#4) bar 5'-0" in length between every slab bars T. Center (#4) bar on Joint.

(28) Place additional (#4) bar continuous 2'-6" beyond each side of Inverted-T Stem between every slab bars T.

SPECIAL OPTION 2 CONSTRUCTION NOTES:

When Option 2 is chosen bottom mat of thickened end slab reinforcing is not required. Use the same top mat as shown on the Thickened Slab End Details sheet.

Placing panels adjacent to expansion joints and bent centerlines prior to completing interior panel placement is recommended. Saw cutting panels to fit is acceptable when approved by the Engineer. Minimum distance from a saw cut edge to a panel strand is 1 ½".

Do not extend the longitudinal panel reinforcement into the cast-in-place slab.

Top flanges of beams and girders on skewed bridges must be modified as shown on this drawing. The Contractor is responsible for coordinating this modification with the beam fabricator prior to submitting shop drawings for approval.

Fabricator may optionally skew the whole end. When electing to skew whole end, girder end details and bearing type at conventional interior bent must be changed to use condition at abutment. Fabricator must coordinate change in bearing type, bearing centerline location, and dowel location with Engineer and Contractor. Show appropriate changes on girder and bearing shop drawings.

Bending of anchor studs of expansion joints shown on standards AJ, SEJ-A and SEJ-S(0) is permissible if necessary to clear top of end panels. The Contractor is responsible for coordinating modifications with the joint fabricator. Submit shop drawings for approval when modifications to expansion joint hardware are made.

Bedding strips under skewed end panels must conform to the requirements of Item 422 except their minimum compressive strength must be 60 psi.

Provide Bars AA, G, K and OA from standard IGTS in the slab.

HL93 LOADING SHEET 4 OF 4

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE PANELS
DECK DETAILS

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	SAT	BEXAR		226

DATE:
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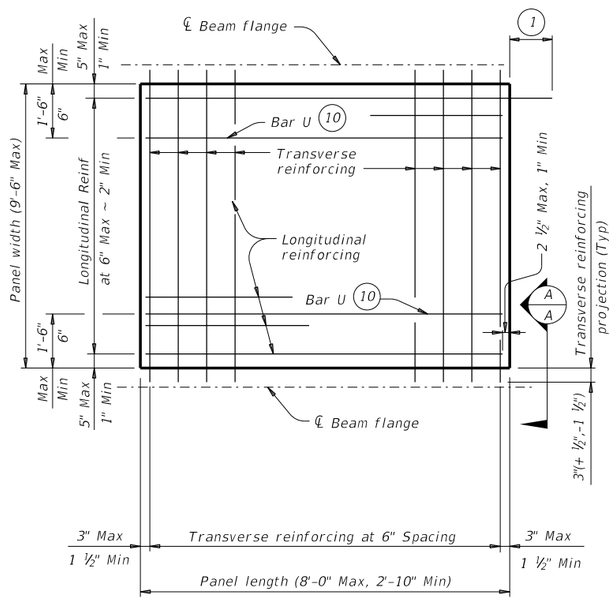
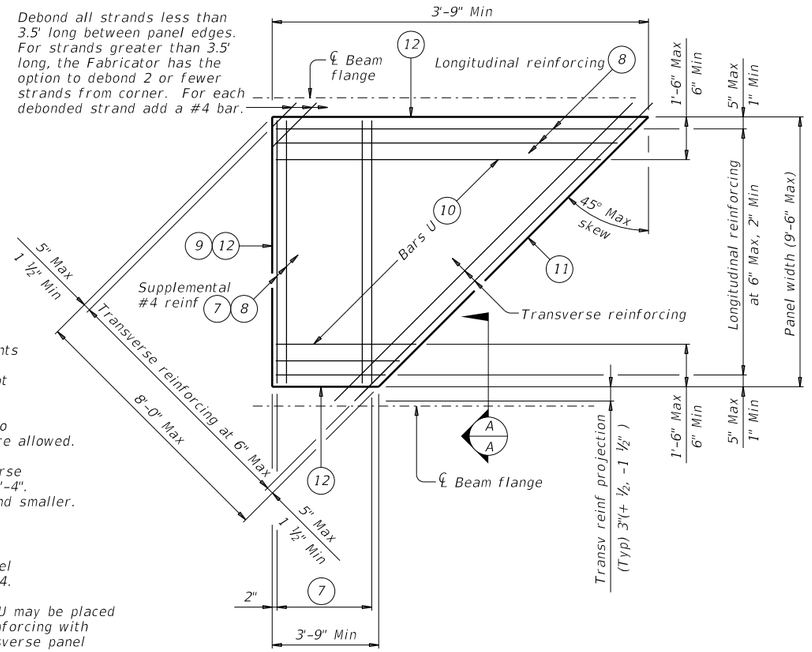


TYPICAL NON-SKEWED PANEL PLAN



TYPICAL SKEWED END PANEL PLAN

(Only to be used with details shown elsewhere in the plans.)

1. At connection with cast-in-place slab, extend longitudinal panel reinforcement 1'-0" (+2",-0") past panel end. Alternatively, provide (#3) x 2'-0" dowels at 6" Max Spacing and extend dowels 1'-0" past panel end.
2. Four loops required per panel.
3. Four loops required per panel. ⅜" or ½" strands may be used.
4. Normal dimensions must be used on spans with parallel beams. Maximum and Minimum dimensions apply only to spans with flared beams.
5. See Normal Grading Detail on PCP standard for lap requirements and bedding strip dimensions. Some laps shown in tables cannot utilize all bedding strip widths.
6. One Splice allowed per panel. No more than two sheets of WWR are allowed.
7. Provide (#4) bars under transverse reinforcing, 10 Spaces at 4" = 3'-4". Omit for 5 degree (1:12) skew and smaller.
8. End Cover 2 ½" Max, 1" Min.
9. Recess strands on indicated panel edge in accordance with Item 424.
10. At the fabricator's option, Bars U may be placed parallel to transverse panel reinforcing with horizontal legs in plane of transverse panel reinforcing.
11. Use length of indicated panel edge as panel width for purpose of determining type of transverse reinforcing.
12. Timber form work permissible this edge.

Debond all strands less than 3.5' long between panel edges. For strands greater than 3.5' long, the Fabricator has the option to debond 2 or fewer strands from corner. For each debonded strand add a #4 bar.

TABLE A (4) (5)			
Beam Type	Normal (In.)	Min (In.)	Max (In.)
A	3	2 ½	3 ½
B	3	2 ½	3 ½
C	4	3	4 ½
IV	6	4	7 ½
VI	6 ½	4 ½"	8 ½
U40 – 54	5 ½	5 ½	7
Tx28-70	6	5	7 ½
XB20 – 40	4	3	4 ½
XSB12 – 15	4	3	4 ½

TABLE B (4) (5)			
Top Flange Width	Normal (In.)	Min (In.)	Max (In.)
11" to 12"	2 ¾	2 ½	2 ¾
Over 12" to 15"	3 ¼	3	3 ¼
Over 15" to 18"	4	3	4 ¾
Over 18"	5	3 ½	6 ¼

GENERAL NOTES:

Provide Class H concrete for panels. Release strength f'ci=3,500 psi. Minimum 28 day strength f'c=5,000 psi.

Provide ¾" chamfer along bottom edge of panel on beam side.

Do not use epoxy-coated reinforcing steel bar or strand in panels.

Remove laitance from top panel surface.

Finish top of panel to a roughness between a No. 6 and No. 9 concrete surface profile, inclusive, as specified by the International Concrete Repair Institute (ICRI).

Shop drawings for the fabrication of panels will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.

A panel layout which identifies location of each panel must be developed by the Fabricator. Permanently mark each panel in accordance with the panel layout. A copy of the layout is to be provided to the Engineer.

TRANSVERSE PANEL REINFORCEMENT:

For panel widths over 5', use ⅜" or ½" Dia (270k) prestressing strands with a tension of 14.4 kips per strand.

For panel widths over 3'-6" up to and including 5', use ⅜" or ½" Dia (270k) prestressing strands with a tension of 14.4 kip per strand. Optionally, (#4) Grade 60 reinforcing bars may be used in lieu of prestressed strands.

For panel widths up to 3'-6", use (#4) Grade 60 reinforcing bars (prestressed strands alone are not allowed).

Place transverse panel reinforcement at panel centroid and space at 6" Max.

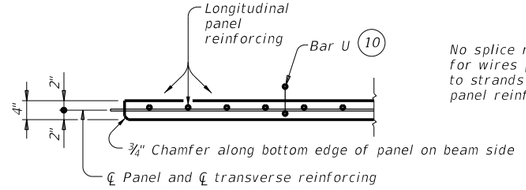
LONGITUDINAL PANEL REINFORCEMENT:

Any of the following options may be used for longitudinal panel reinforcement:

1. (#3) Grade 60 reinforcing steel at 6" Max Spacing. No splices allowed.
2. ⅜" Dia prestressing strands at 4 ½" Max Spacing (unstressed). No splices allowed.
3. ½" Dia prestressing strands at 6" Max Spacing (unstressed). No splices allowed.
4. Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) providing 0.22 sq in per foot of panel width. Wires larger than D11 not permitted. Provide transverse wires to ensure proper handling of reinforcing. One splice per panel is allowed. See WWR Splice Detail.

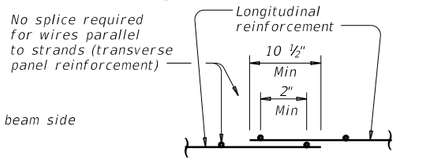
No combination of longitudinal reinforcement options in a panel is allowed.

Place longitudinal panel reinforcement above or below transverse panel reinforcement. Must be placed above transverse panel reinforcement for skewed end panels with supplemental (#4) reinforcement.

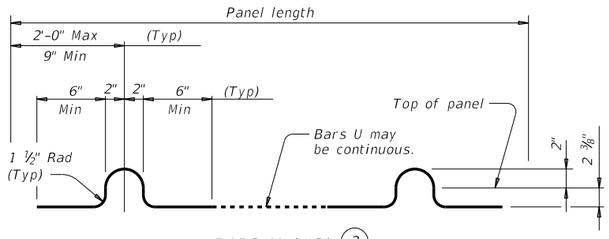


SECTION A-A

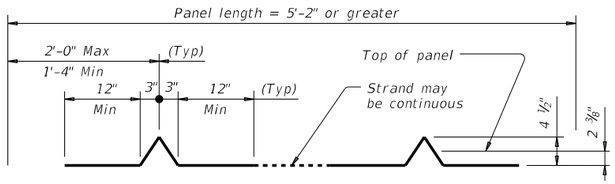
(Not showing supplemental #4 bars for skewed end panels.)



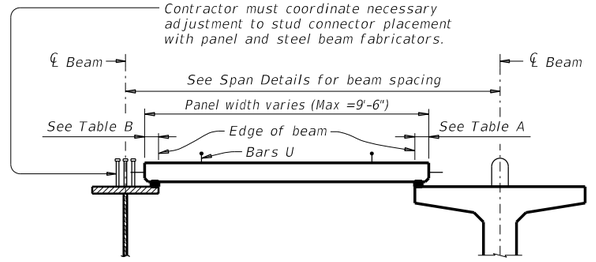
WELDED WIRE REINFORCEMENT (WWR) SPLICE DETAIL (6)



BARS U (#3) (2)



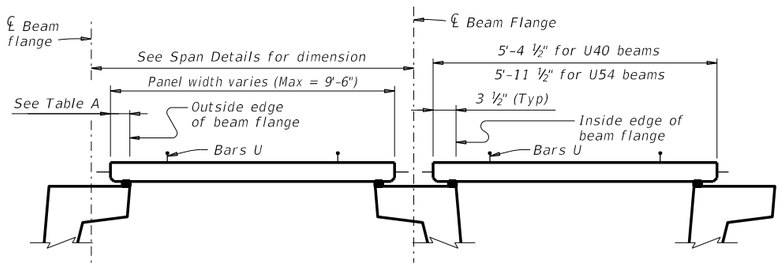
OPTIONAL STRAND FOR BARS U (3)



STEEL BEAMS

PRESTRESSED CONCRETE BEAMS OR GIRDERS

Typ unless noted otherwise



PRESTRESSED CONCRETE U-BEAMS

TYPICAL SECTIONS FOR DETERMINING PANEL WIDTH

HL93 LOADING

Texas Department of Transportation

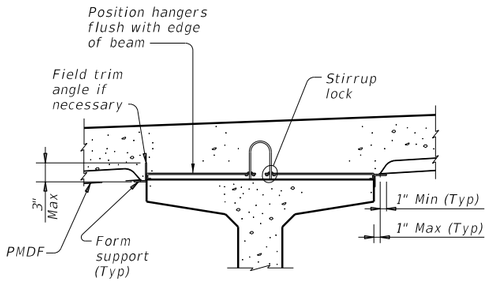
Bridge Division Standard

PRESTRESSED CONCRETE PANEL FABRICATION DETAILS

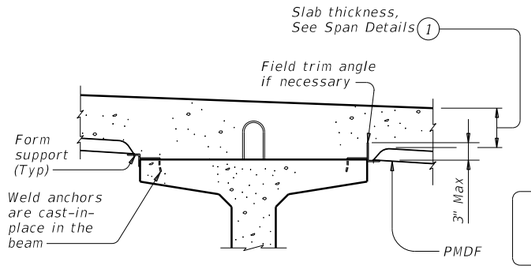
PCP-FAB

FILE: pcpstde2-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT April 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		227

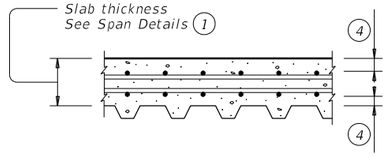
DATE:
FILE:



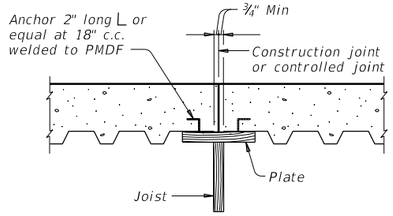
PRESTR CONC I-BEAMS AND I-GIRDERS WITH STIRRUP LOCKS



PRESTR CONC I-BEAMS AND I-GIRDERS WITH WELD ANCHORS

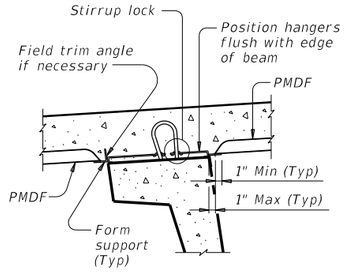


TYP LONGITUDINAL SLAB SECTION

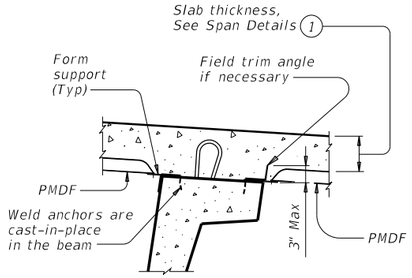


Note: In spans where PMD forms are used, timber forms must be used at construction joints. Adequate provision must be made to support edge of metal form and to provide anchorage of metal form to slab concrete where joined to wood forms.

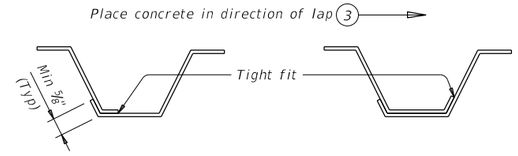
SECTION THRU CONSTRUCTION JOINT



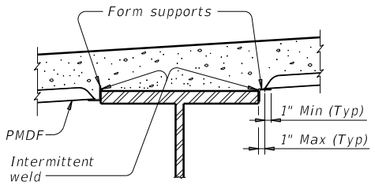
U-BEAMS WITH STIRRUP LOCKS



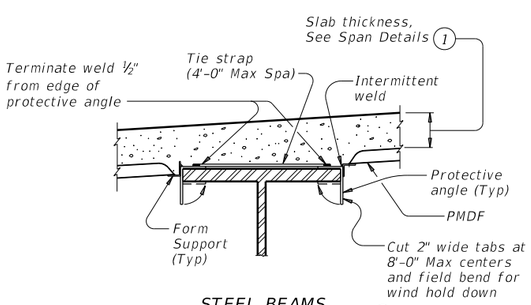
U-BEAMS WITH WELD ANCHORS



SIDE LAP DETAILS

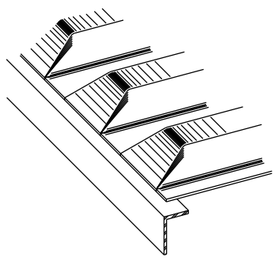


STEEL BEAMS AT COMPRESSION FLANGES

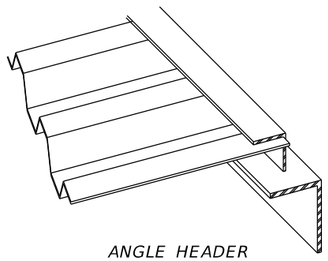


STEEL BEAMS AT TENSION FLANGES (2)

TYPICAL TRANSVERSE SECTIONS



PRECLOSED



ANGLE HEADER

NOTE: This type is to be used for skewed ends only.

TYPES OF END CLOSURES

(1) Slab thickness minus 5/8" if corrugations match reinforcing bars.

(2) Welding of form supports to tension flanges will not be permitted. Other methods of providing wind hold down resistance for PMDF in tension flange zones will be considered. At least one layer of sheet metal must be provided between the flange and the weld joint.

(3) The direction of concrete placement will be such that the upper layer of the form overlap is loaded first.

(4) See Span details for cover requirements.

GENERAL NOTES:

Steel for Permanent Metal Deck Forms (PMDF) and support angles shall conform to ASTM A653, structural steel (SS), with coating designation G165. Steel must have a minimum yield strength of 33 ksi. Minimum thickness of PMDF is 20 gage and that of support angles and protective angles is 12 gage.

Submit two copies of forming plans for PMDF to the Engineer. These plans must show all essential details of proposed form sheets, closures, fasteners, supports, connectors, special conditions and size and location of welds. These plans must clearly show areas of tension flanges for steel beams and provisions for protecting the tension flanges from welding notch effects by inclusion of separating sheet metal or other positive method. These plans must be designed, signed, and sealed by a licensed professional engineer. Department approval of these plans is not required, but the Department reserves the right to require modifications to the plans. The Contractor is responsible for the adequacy of these plans.

The details and notes shown on this standard are to be used as a guide in preparation of the forming plans.

All material, labor, tools and incidentals necessary to form a bridge deck with Permanent Metal Deck Forms is considered subsidiary to Item 422, "Concrete Superstructures".

FOR PRESTR CONC U-BEAM AND STEEL GIRDER BRIDGES:
Unless shown elsewhere in the plans, size, spacing, and orientation of bottom mat of slab reinforcement must match the top mat of reinforcing shown on the span details except all bottom mat bars are to be #5. Bottom mat reinforcement and additional concrete is subsidiary to Item 422 "Concrete Superstructures."

FOR PRESTR CONC TX-GIRDER BRIDGES:
See Miscellaneous Slab Details, Prestr Concrete I-Girders (IGMS) standard sheet for bottom mat reinforcing.

DESIGN NOTES:

As a minimum, PMDF and support angles must be designed for the dead load of the form, reinforcement and concrete plus 50 psf for construction loads. Flexural stresses due to these design loads must not exceed 75 percent of the yield strength of the steel. Allowable stress for weld metal must be 12,400 psi.

Maximum deflection under the weight of forms, reinforcement and concrete or 120 psf, whichever is greater, shall not exceed the following:

1/180 of the form design span, but not more than 0.50", for design spans of 10' or less.

1/240 of the form design span, but not more than 0.75", for design spans greater than 10'.

The form design span must not be less than the clear distance between beam flanges, measured parallel to the form flutes, minus 2".

CONSTRUCTION NOTES:

Form sheets must not be permitted to rest directly on the top of beam flanges. Form sheets must be securely fastened to form supports and must have a minimum bearing length of one inch at each end. Form supports must be placed in direct contact with beam flanges.

All attachments must be made by permissible welds, screws, bolts, clips or other means shown on the the forming plans. All sheet metal assembly screws must be installed with torque-limiting devices to prevent stripping. Only welds or bolts must be used to support vertical loads.

Welding and welds must be in accordance with the provisions of Item 448, "Structural Field Welding", pertaining to fillet welds. All welds must be made by a qualified welder in accordance with Item 448.

All permanently exposed form metal, where the galvanized coating has been damaged, must be thoroughly cleaned and repaired in accordance with Item 445, "Galvanizing". Minor heat discoloration in areas of welds need not be touched up.

Flutes must line up uniformly across the entire width of the structure where main reinforcing steel is located in the flute.

Construction joints will not be permitted unless shown on the plans. The location of and forming details for any construction joint used must be shown on the forming plans. Forms below a construction joint must be removed after curing of the slab.

A sequence for uniform vibration of concrete must be approved by the Engineer prior to concrete placement. Attention must be given to prevent damage to the forms, yet provide proper vibration to prevent voids or honeycomb in the flutes and at headers and/or construction joints.

Texas Department of Transportation

Bridge Division Standard

PERMANENT METAL DECK FORMS

PMDF

FILE: pmdfste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0016	08	039	SL 368
02-20: Modified box note by adding steel beams/girders and subsidiary.	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		228

DATE:
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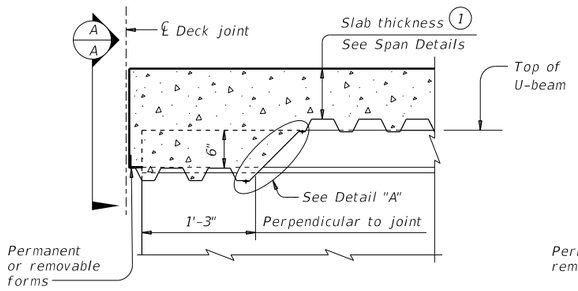
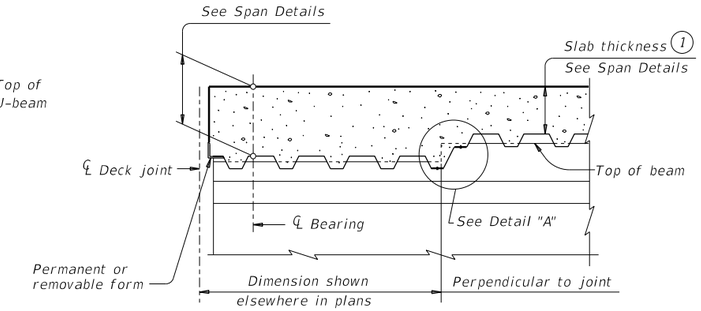
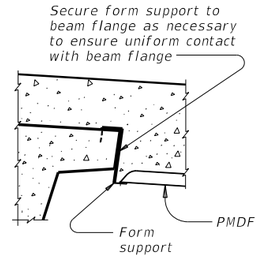


AT THICKENED SLAB END FOR U-BEAMS

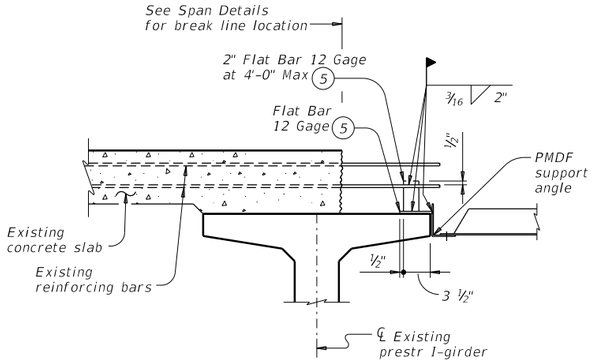


AT THICKENED SLAB END FOR PRESTRESSED I-BEAMS, I-GIRDERS AND STEEL BEAMS

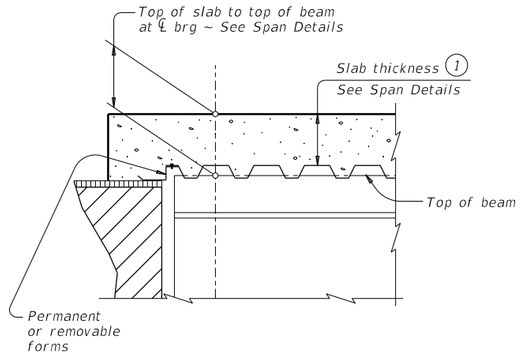
Showing I-beam block-out. No block-out for I-girders or steel beams.



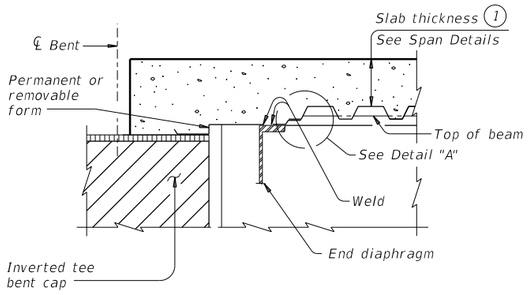
SECTION A-A



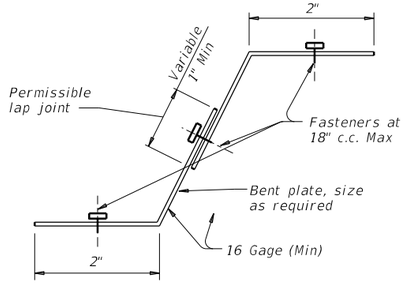
SHOWING PRESTRESSED CONCRETE I-BEAMS, I-GIRDERS AND U-BEAMS



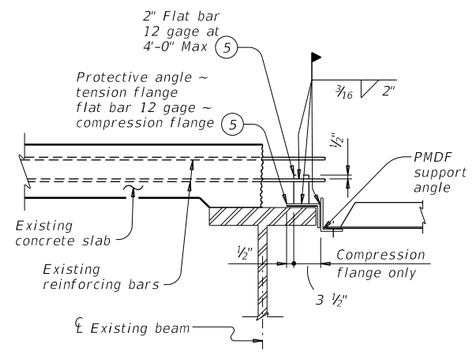
AT SLAB OVER ABUT BKWL OR INV TEE STEM FOR CONC BEAMS WITHOUT THICKENED SLAB END



AT SLAB OVER INV TEE STEM FOR STEEL BEAMS WITHOUT THICKENED SLAB END

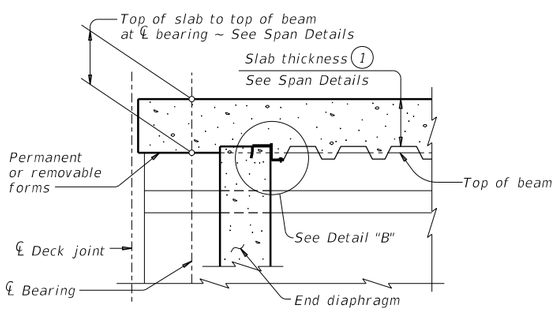


DETAIL "A"

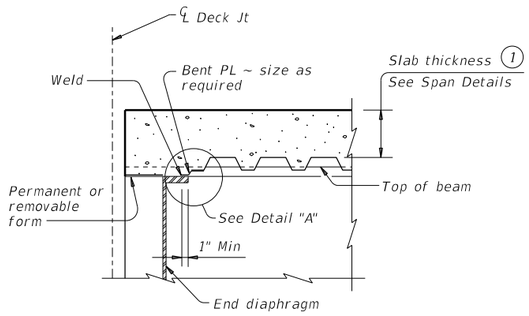


SHOWING STEEL BEAMS

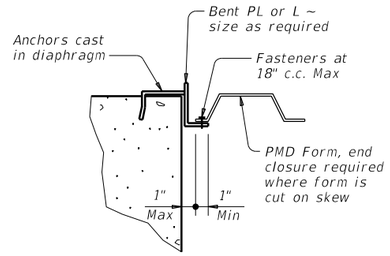
WIDENING DETAILS



AT CONC END DIAPHRAGM FOR PRESTRESSED I-BEAMS AND STEEL BEAMS



AT END DIAPHRAGM FOR STEEL BEAMS WITHOUT THICKENED SLAB END



DETAIL "B"

(1) Slab thickness minus 3/8" if corrugations match reinforcing bars

(5) Minimum yield stress of 12 gage bars shall be 40 ksi

DETAILS AT ENDS OF BEAMS

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

PERMANENT METAL DECK FORMS

PMDF

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REVISIONS	0016	08	039	SL 368
02-20: Modified box note by adding steel beams/girders and subsidiary.	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		229

DATE:
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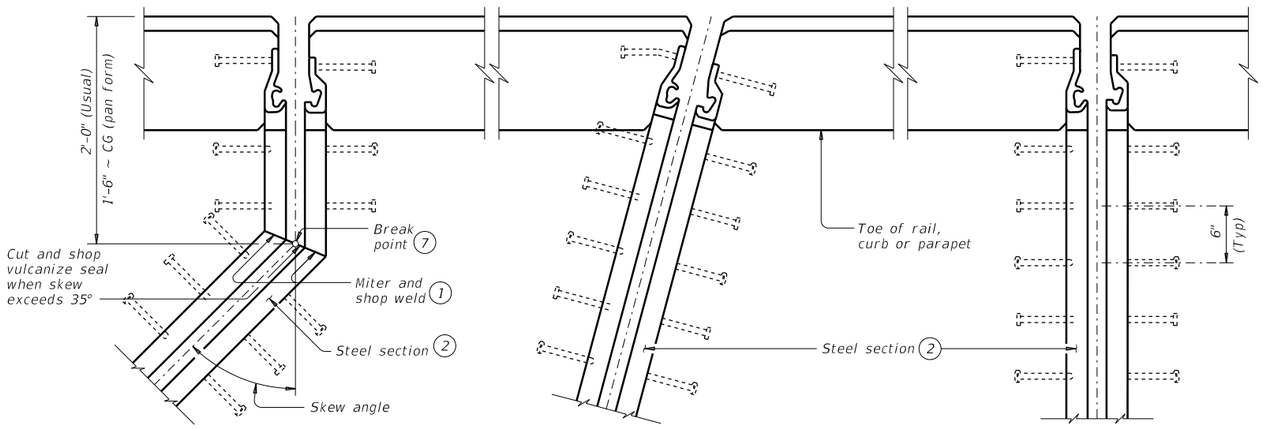
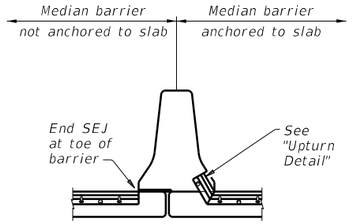


SHOWING SKEWS WITH SLAB BREAKBACKS

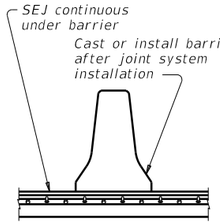
SHOWING SKEWS WITHOUT SLAB BREAKBACKS

SHOWING WITHOUT SKEWS AND SLAB BREAKBACKS

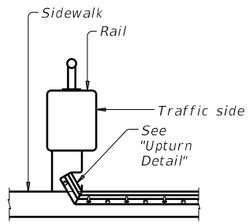
PLANS OF END CONDITIONS



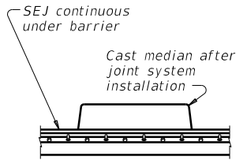
WITH OPEN DECK JOINT BELOW MEDIAN BARRIER



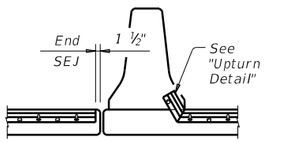
AT MEDIAN BARRIER



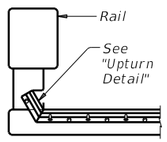
AT SIDEWALK BEHIND BRIDGE RAIL



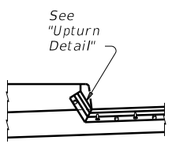
AT RAISED MEDIAN



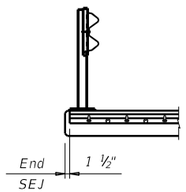
WITH OPEN DECK JOINT ADJACENT TO MEDIAN BARRIER



AT CONCRETE BRIDGE RAIL

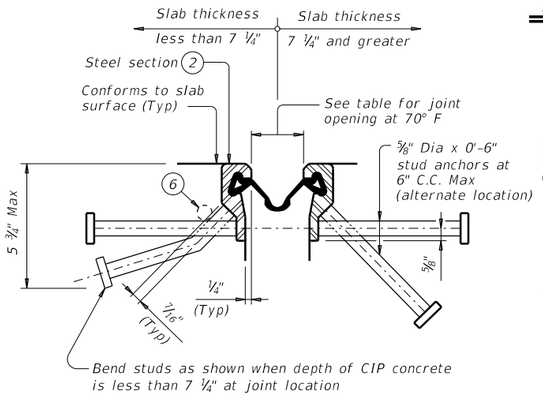


AT SIDEWALK

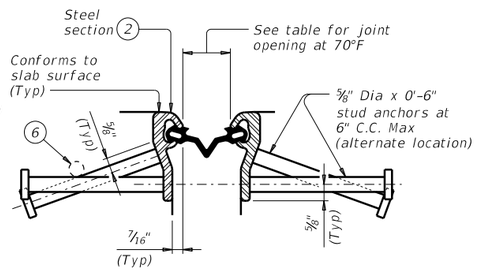


AT STEEL POST BRIDGE RAIL

TYPICAL SECTIONS (5)



SECTION THRU WATSON BOWMAN ACME (SE-400 OR SE-500) JOINTS



SECTION THRU D.S. BROWN (A2R-400 OR A2R-XTRA) JOINTS

TABLE OF SEALED EXPANSION JOINT INFORMATION					
MANUFACTURER	STEEL SECTION (2)	STRIP SEAL			
		4" JOINT		5" JOINT	
		Seal Type	Joint Opening (3)	Seal Type	Joint Opening (3)
D.S. Brown	Type SSCM2	A2R-400	1 ¾"	A2R-XTRA	2"
Watson Bowman Acme	Type R	SE-400	1 ¾"	SE-500	2"

REDUCED LONGITUDINAL MOVEMENT RANGE		
SKEW (deg)	JOINT SIZE	
	4"	5"
0	4.0"	5.0"
15	4.0"	5.0"
30	3.5"	4.3"
45	2.8"	3.5"

DESIGN NOTES:

Joints installed on a skew have reduced ability to accommodate longitudinal movement. Use table values to determine the correct joint size for skewed installations.

For other skews over 25 degrees, calculate reduced movement range by multiplying joint size by cosine (skew).

(1) Remove all burrs which will be in contact with seal prior to making splice.

(2) Shape of steel section shown is typical. Variations in sections must be approved by the Engineer.

(3) These openings are also the recommended minimum installation openings.

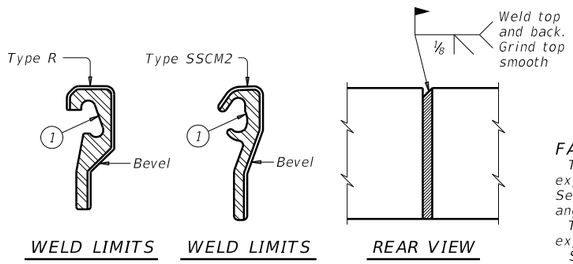
(4) Reduce for sidewalk or parapet heights less than 6".

(5) Other conditions affecting the joint profile should be noted elsewhere.

(6) Move transverse bars that are in conflict with SEJ studs, in either the bridge slab or approach slab, to rest at the junction of the studs.

(7) See Span details for location of break point.

(8) Align shipping angle perpendicular to joint.



WELD LIMITS WELD LIMITS REAR VIEW

FIELD SPLICE DETAIL

FABRICATION NOTES:

Temporarily shop assemble corresponding sections of sealed expansion joints (SEJ), check for fit, and match mark for shipment. Secure corresponding sections together for shipment with shipping angle. Do not use erection bolts.

The seal must be continuous and included in the price bid for sealed expansion joint.

Ship steel sections in convenient lengths of 10'-0" Min and 24'-0" Max unless necessary for staged construction or widenings. One shop splice is permitted in each shipping length provided no piece is less than 2'-0" long and sufficient studs are added to limit the stud to shop splice distance to 2" Min and 4" Max.

Weld studs in accordance with AWS D1.1.

Butt weld all shop and field splices and grind smooth areas in contact with seal. Make all necessary field splice joint preparations in the shop.

Paint the entire steel section with System II or IV primer in accordance with Item 446, "Feild Cleaning and Painting Steel", unless required to galvanize when shown in the plans. Provide galvanizing in accordance with Item 445, "Galvanizing". Provide paints in accordance with Item 446.2. Prepare steel and apply paint in accordance with Item 446.4.7.3 and 446.4.7.4.

Shop drawings for the fabrication of sealed expansion joints will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.

CONSTRUCTION NOTES:

Secure the sealed expansion joint in position and place to the proper grade and alignment by welding braces to adjacent reinforcing steel, to prestressed beam stirrups, or to anchors cast in concrete diaphragms. Include cost of temporary bracing in the price bid for sealed expansion joint.

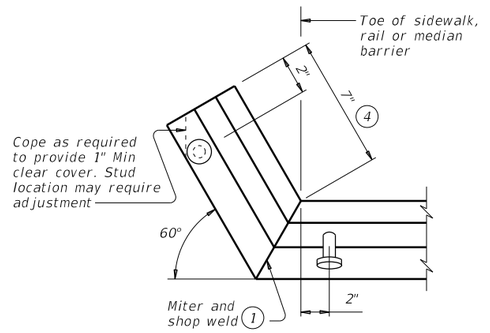
Remove shipping angle immediately after each joint half is secured in place. Grind smooth, and touch up with organic zinc-rich paint.

Clean and prepare seal cavity for seal installation as per the Manufacturer's installation procedures.

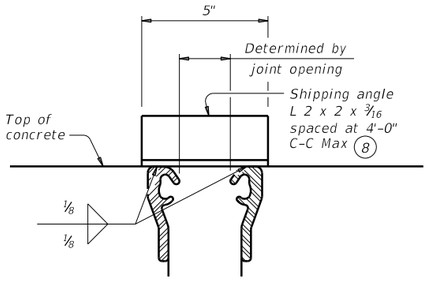
GENERAL NOTES:

Provide sealed expansion joints in the size and at locations shown on the plans.

Minimum slab and overhang thickness required for the use of SEJ-M is 6 ½".



UPTURN DETAIL



SHOWING D.S. BROWN (Ty SSCM2)
(All joints are similar.) (Studs are not shown for clarity.)

SHIPPING ANGLE

An alternate method of securing joint sections may be used if approved by the Bridge Division. Erection bolts are not allowed.

Texas Department of Transportation

Bridge Division Standard

SEALED EXPANSION JOINT TYPE M WITHOUT OVERLAY

SEJ-M

FILE: sejmste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
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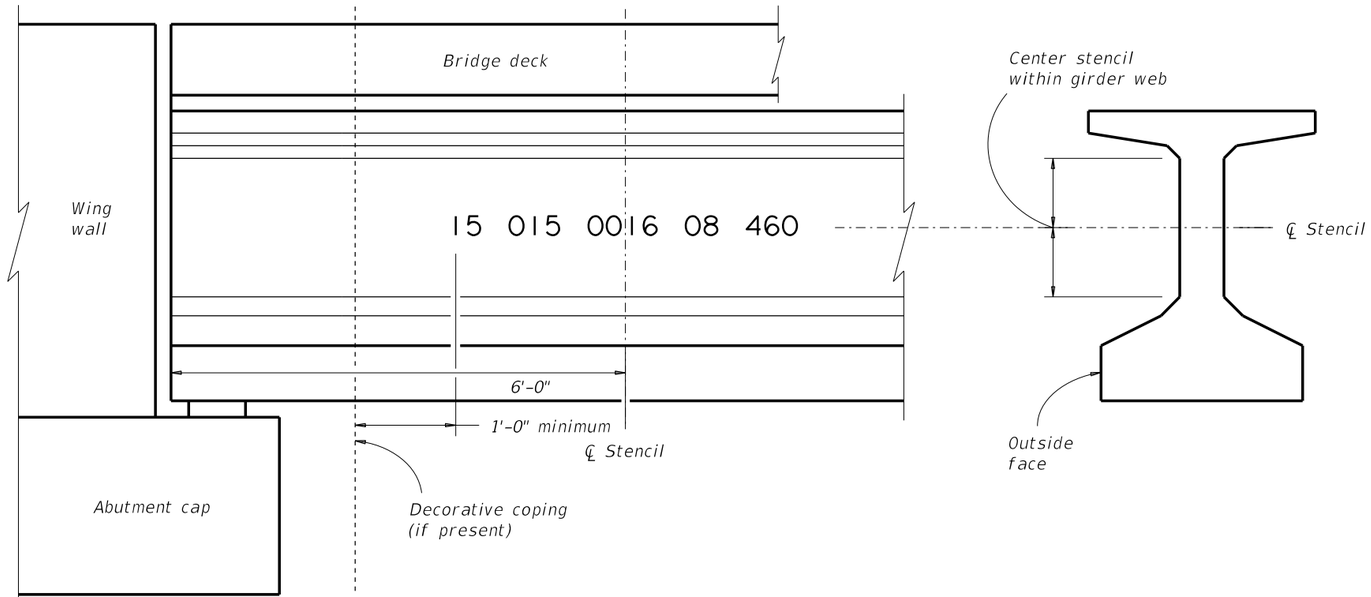
	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		230

15 015 0016 08 460

San Antonio District designation	County designation	Control number	Section nunber	Structure number

PAINTED STRUCTURE NUMBER DETAIL



TYPICAL BRIDGE CORNER (ELEVATION)

SAN ANTONIO DISTRICT COUNTY DESIGNATIONS

Atascosa 007
Bandera 010
Bexar 015
Comal 046
Frio 083
Guadalupe 095
Kendall 131
Kerr 133
McMullen 162
Medina 163
Uvalde 232
Wilson 247

GENERAL NOTES:
Apply stucture number in accordance with Special Specification for Stenciling Permanent Structure Numbers.

SAN ANTONIO DISTRICT STANDARD

Texas Department of Transportation
San Antonio District (Structural Design)
Prepared by and for the use of TxDOT

BRIDGE NBI NUMBER STENCIL

DN: BCL	CK: TxDOT	FILENAME: SA District Stencil.dgn	
DW: SRF	CK: TxDOT	ORIGINAL DRAWING DATE: August 2019	
DIST	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	COUNTY
SAT	6	SEE TITLE SHEET	BEXAR
CONTROL	SECTION	JOB	SHEET NO. / ROUTE
0016	08	039	231 / SL 368

REVISIONS:

ABBREVIATIONS

A	AMP
ABC	ABOVE COUNTER
ACS	ACCESS CONTROL SYSTEM
ACU	AIR CONDITIONING UNIT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMPS INTERRUPTING CAPACITY
AM	AMP-METER
ANN	ANNUNCIATOR
AP	AERIAL PRIMARY
AS	AERIAL SECONDARY
ATS	AUTOMATIC TRANSFER SWITCH
AUX	AUXILIARY
BFI	BLOWN FUSE INDICATOR
BI	BYPASS ISOLATION
BKR	BREAKER
C	CONDUIT
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CGRS	PVC COATED GALVANIZED RIGID STEEL
CFCI	CONTRACTOR FURNISHED/ CONTRACTOR INSTALLED
CKT	CIRCUIT
CL	CENTERLINE
COM	COMMON
CONT	CONTINUOUS
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CRI	COLOR RENDERING INDEX
CS	CORD SET
CU	COEFFICIENT OF UTILIZATION
DEB	DIRECT EARTH BURIED
EC	EMPTY OR EMBEDDED CONDUIT
EF	EXHAUST FAN
EG	EQUIPMENT GROUND
EL	ELEVATION
EMT	ELECTRICAL METALLIC TUBING
ETM	ELASPED TIME METER
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FC	FAN COIL
FDS	FUSED DISCONNECT SWITCH
FLR	FLOOR
FOC	FIBER OPTIC CABLE
FS	FLOAT SWITCH
FT	FEET
FVNR	FULL VOLTAGE NON-REVERSING STARTER
FVR	FULL VOLTAGE REVERSING STARTER
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
GRS	GALVANIZED RIGID STEEL
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTO
HP	HORSEPOWER OR HEAT PUMP
IDS	INTRUSION DETECTION SYSTEM
HR	HOUR
IG	ISOLATED GROUND
ISP	INDIVIDUALLY SHIELDED PAIR
JB	JUNCTION BOX
kVA	KILOVOLT-AMPERE
kVAR	KILOVOLT-AMPERE, REACTIVE
kW	KILOWATT
LA	LIGHTNING ARRESTER
LLF	LIGHT LOSS FACTOR
LO	LUGS ONLY
LOR	LOCAL-OFF-REMOTE
LV	LOW VOLTAGE
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MFR	MANUFACTURER
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MS	MOTOR STARTER
MTD	MOUNTED
MTS	MANUAL TRANSFER SWITCH
N	NEUTRAL
NFDS	NON-FUSED DISCONNECT SWITCH
NL	NIGHT LIGHT
NTS	NOT TO SCALE
OC	ON CENTER
OFCI	OWNER FURNISHED/ CONTRACTOR INSTALLED
OH	OVERHEAD
OHP	OVERHEAD PRIMARY
OHS	OVERHEAD SECONDARY
OL	OVERLOAD
PB	PUSH BUTTON
PE	POLYETHYLENE CONDUIT
PEC	PHOTO ELECTRIC CELL
PF	POWER FACTOR
PFCC	POWER FACTOR CORRECTION CAPACITOR
PL	PILOT LIGHT
PMR	PHASE MONITOR RELAY
PNL	PANEL
PTT	PUSH-TO-TEST
PTZ	PAN-TILT-ZOOM
PVC	SCHEDULE 40 POLYVINYL CONDUIT
RECPT	RECEPTACLE
RM	ROOM
RVAT	REDUCED VOLTAGE AUTO-TRANSFORMER STARTER
S	SECOND
SA	SURGE ARRESTER
SDBC	SOFT DRAWN BARE COPPER
SE	SERVICE ENTRANCE
SHT	SHEET
SN	SOLID NEUTRAL
SPD	SURGE PROTECTIVE DEVICE
SS	STAINLESS STEEL
STA	STATION
SW	SWITCH
TEL	TELEPHONE
TD	TIME DELAY
TDD	TIME DELAY ON DE-ENERGIZATION
TDE	TIME DELAY ON ENERGIZATION
THD	TOTAL HARMONIC DISTORTION
TMB	TELECOMMUNICATION MOUNTING BOARD
TYP	TYPICAL
TC	TIME CLOCK
TR	TAMPER RESISTANT
UG	UNDER GROUND
UGE	UNDER GROUND ELECTRIC
UGP	UNDERGROUND PRIMARY
UGS	UNDERGROUND SECONDARY
UH	UNIT HEATER
UON	UNLESS OTHERWISE NOTED
UTP	UNSHIELDED TWISTED PAIR
V	VOLT
VA	VOLT-AMP
VFD	VARIABLE FREQUENCY DRIVE
VM	VOLT-METER
W	WATT OR WIRE
WH	WEATHER HEAD
WM	WATT METER
WP	WEATHERPROOF
W/	WITH
XMFR	TRANSFORMER

2 SETS ((3#8 + 1#8N + 1#10EG) 1" GRS)

- 2 — NUMBER OF SETS
- (3#8 — PHASE (HOT) CONDUCTOR, NUMBER AND SIZE
- 1#8N — GROUNDED (NEUTRAL) CONDUCTOR, NUMBER AND SIZE
- 1#10EG — GROUNDING (GROUND) CONDUCTOR, NUMBER AND SIZE
- 1" — CONDUIT SIZE
- GRS — CONDUIT TYPE (SEE ABBREVIATIONS) REFER TO SPECIFICATIONS IF NOT SHOWN

LIGHTING, POWER & SYSTEM LEGEND

- ELECTRICAL PANEL OR EQUIPMENT CABINET, SURFACE MOUNTED, 5'-6" TO TOP OF ENCLOSURE
- OR — OR — 3/4" x 10' COPPER CLAD GROUND ROD
- POLYMER CONCRETE PULL BOX
- 20A/3P — CIRCUIT BREAKER, TRIP RATING SHOWN, 3-POLE UNLESS NOTED OTHERWISE
- 20A — FUSE, CURRENT LIMITING, AMPERE RATING AS SHOWN OR REQUIRED, "BFI" INDICATES "BLOWN FUSE INDICATOR" TYPE
- SPD — SURGE PROTECTIVE DEVICE WITH INDICATING LIGHTS
- WEATHERHEAD
- DEFLECTION AND EXPANSION CONDUIT FITTING
- WALL MOUNTED TRAIL LIGHT FIXTURE

GENERAL NOTES:

1. SOME SYMBOLS OR ABBREVIATIONS MAY APPEAR ON THIS SHEET BUT NOT BE UTILIZED ON THE PROJECT.
2. LIGHTING LEGEND SHOWS EXAMPLE IDENTIFIERS.

EQUIPMENT LINE TYPES

- ———— PROPOSED OR NEW EQUIPMENT
- — — — — EXISTING EQUIPMENT

LUMINAIRE INSTALLATION AND REMOVAL NOTES:

1. CONTRACTOR SHALL CONTACT CPS ENERGY AT THE BEGINNING OF THE PROJECT AND GIVE NOTIFICATION OF EXPECTED DATES FOR WHEN CONDITIONS WILL BE READY TO INSTALL PROP LUMINAIRES. REFER TO TCP NARRATIVE AND LIGHTING INSTALLATION PLAN FOR ADDITIONAL INFORMATION. ANY CHANGES IN SCHEDULE SHALL BE IMMEDIATELY COMMUNICATED TO CPS.
2. CPS SHALL BE GIVEN A MINIMUM OF 2 MONTHS NOTICE FOR WHEN THEIR WORK CAN BEGIN.
3. IT IS THE CONTRACTOR'S RESPONSIBLITY TO OBTAIN CPS ENERGY'S START DATE AND WORK DURATION FOR THE INSTALLATION AND REMOVAL OF LUMINAIRES, AND ACCOUNT FOR THOSE ACCORDINGLY IN THE EXECUTION OF THE CONTRACTOR'S WORK.

UTILITY SERVICE COORDINATION NOTES:

1. CONTRACTOR SHALL OBTAIN FROM THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT AND THE PARKS AND RECREATION DEPARTMENT DOCUMENTATION ALLOWING THE CONTRACTOR TO REQUEST A REMOVAL OF EXISTING SERVICE FROM CPS ENERGY.
2. THE REQUEST FOR REMOVAL OF SERVICE FROM CPS ENERGY SHALL BE SUBMITTED A MINIMUM OF 2 MONTHS PRIOR TO THE PLANNED DISCONNECT DATE.
3. DURING CONSTRUCTION, CONTRACTOR SHALL OBTAIN THE NEW ADDRESSES FOR THE TWO PROPOSED SERVICES FROM THE CITY OF SAN ANTONIO DEVELOPMENT SERVICES DEPARTMENT. THESE ADDRESSES MUST BE ESTABLISHED BEFORE SUBMITTING TO CPS ENERGY FOR A NEW SERVICE.
4. AFTER THE INSTALLATION OF THE NEW SERVICE PEDESTALS, THE CONTRACTOR SHALL OPEN NEW SERVICES WITH CPS ENERGY. THIS SHALL BE DONE A MINIMUM OF 2 MONTHS PRIOR TO THE PLANNED ELECTRICAL ACTIVATION DATE.
5. UNTIL COMPLETION AND ACCEPTANCE OF THE PROJECT, THE CONTRACTOR SHALL TAKE OWNERSHIP OF AND BE RESPONSIBLE FOR THESE NEW SERVICES. THIS INCLUDES PAYING FOR ELECTRICAL USAGE ONCE THE NEW TRAIL LIGHTING AND FLOOD DETECTION EQUIPMENT ARE PLACED IN SERVICE. REFER TO ITEM NO. 628 FOR MORE INFORMATION CONCERNING REIMBURSEMENTS.
6. AT COMPLETION OF PROJECT, THE CONTRACTOR SHALL CONTACT THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT AND THE PARKS AND RECREATION DEPARTMENT TO TRANSFER OWNERSHIP OF THESE ELECTRICAL SERVICES BACK TO THE CITY DEPARTMENTS.

FLOOD DETECTION COORDINATION NOTES:

1. CONTRACTOR SHALL PROVIDE A MINIMUM OF 2 MONTHS NOTICE FOR THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARMENT TO REMOVE THE EXISTING FLOOD DETECTION EQUIPMENT BEFORE THE PROPOSED REMOVAL DATE.
2. AFTER THE EXISTING ELECTRICAL SERVICES HAVE BEEN DISCONNECTED, THE CONTRACTOR IS RESPONSIBLE FOR CLOSING THE ROADS AND INSTALLING BARRICADES EACH TIME FLOODING OCCURS UNTIL THE FLOOD DETECTION EQUIPMENT IS REINSTALLED AND OPERATIONAL.
3. CONTRACTOR SHALL PROVIDE A MINIMUM OF 2 MONTHS NOTICE FOR THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT TO REINSTALL AND RECONNECT THE EXISTING FLOOD DETECTION EQUIPMENT BEFORE THE PROPOSED REINSTALLATION DATE.

CITY OF SAN ANTONIO DEPARTMENT AND CPS ENERGY CONTACTS:

1. PUBLIC WORKS DEPARTMENT, ROBERT ESPARZA, (210-207-0766)
2. PARKS AND RECREATION DEPARTMENT, BRANDON ROSS, (210-207-6101)
3. DEVELOPMENT SERVICES DEPARTMENT, RICHARD CHAMBERLIN, (210-207-8281)
4. CPS ENERGY, JENNIFER HENRIQUEZ, (210-353-2814)

STATE OF TEXAS
JAMES K. SCHMITT
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Digitally Signed 01/26/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

ELECTRICAL LEGEND AND NOTES

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		232
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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REMOVAL KEYED NOTES:

1. REMOVE EXISTING LIGHT FIXTURE AND ASSOCIATED EQUIPMENT MOUNTED TO SIDE OF BRIDGE.
2. REMOVE EXISTING LIGHT FIXTURE AND ASSOCIATED EQUIPMENT MOUNTED TO UNDERSIDE OF BRIDGE.
3. CONTRACTOR SHALL CONTACT THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARMENT FOR REMOVAL OF EXISTING WATER LEVEL DETECTION EQUIPMENT.
4. REMOVE EXISTING CONDUCTORS AND/OR COMMUNICATION CABLES FROM EXISTING UNDERGROUND CONDUIT. CONDUIT TO BE ABANDONED IN PLACE.
5. REMOVE EXISTING CONDUCTORS AND/OR COMMUNICATION CABLES FROM EXISTING SURFACE MOUNTED CONDUIT. REMOVE CONDUIT.
6. REMOVE EXISTING SERVICE POLE, UTILITY METER, MAIN DISCONNECT, POWER PANEL, AND ASSOCIATED EQUIPMENT. COORDINATE WITH OWNER AND UTILITY ON SERVICE DISCONNECTION AND METER REMOVAL.
7. REMOVE AND STORE EXISTING FLOOD WARNING SIGN AND DEMOLISH FOUNDATION FULL DEPTH.
8. CONTRACTOR SHALL CONTACT CPS ENERGY FOR REMOVAL OF EXISTING OVERHEAD UTILITY CONDUCTORS.
9. REMOVE EXISTING CONDUCTORS AND/OR COMMUNICATION CABLES FROM EXISTING UNDERGROUND CONDUIT. CONDUIT TO REMAIN TO BE RE-USED DURING CONSTRUCTION.
10. EXISTING FLOOD WARNING SIGN TO REMAIN.
11. REMOVE EXISTING UTILITY METER, MAIN DISCONNECT, POWER PEDESTAL, AND ASSOCIATED EQUIPMENT. COORDINATE WITH OWNER AND UTILITY ON CONDUCTOR REMOVAL.
12. EXISTING PULLBOX TO REMAIN.
13. DEMOLISH EXISTING PULLBOX.
14. DEMOLISH EXISTING TIMBER POLE. CONTRACTOR SHALL CONTACT THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT FOR REMOVAL OF EXISTING POLE MOUNTED COMMUNICATION EQUIPMENT. WORK SHALL NOT BE MEASURED FOR SEPARATE PAYMENT BUT SHALL BE SUBSIDIARY TO ITEM 100.6002 PREPARING ROW.
15. REMOVE EXISTING CONDUCTORS AND/OR COMMUNICATION CABLES TO EXISTING FLOOD WARNING SIGN. ABANDON CONDUIT TO ASSOCIATED PULLBOX.
16. EXISTING FLOOD WARNING SIGN AND ASSOCIATED PULLBOX TO REMAIN.
17. EXISTING LUMINAIRE, POLE, AND OH ELECTRIC SERVICE LINE TO BE REMOVED BY CPS DURING TCP PHASE II STEP 1 AFTER PROPOSED LUMINAIRES ARE OPERATIONAL.

INSTALLATION KEYED NOTES:

1. INSTALL NEW IP67 RATED LIGHT FIXTURE MOUNTED TO THE BENT CAP OF THE NEW BRIDGE. LIGHT FIXTURE SHALL BE NEMALUX INDUSTRIAL MR-GEN LED FIXTURE MR3-WW-T3F-GY-GN-AC OR APPROVED EQUAL. CONDUIT SHALL CONNECT TO NEW LIGHT FIXTURE MOUNTING BRACKET.
2. INSTALL NEW 1-WAY 1" GRSC CONDUIT, MOUNTED TO BRIDGE COLUMN CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S) FOR FLOOD DETECTION EQUIPMENT. CONDUIT SHALL CONNECT TO NEW CONDUIT WITHIN BRIDGE RAIL. CONTRACTOR SHALL CONTACT THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT FOR RE-INSTALLATION OF EXISTING FLOOD DETECTION EQUIPMENT.
3. INSTALL NEW TYPE B ELECTRICAL PULLBOX WITH APRON.
4. INSTALL NEW SERVICE PEDESTAL CONTAINING NEW UTILITY METER, MAIN DISCONNECT, POWER PANEL, AND PEC.
5. INSTALL NEW 1-WAY 1-1/2"C SCHEDULE 40 PVC CONDUIT CONTAINING NEW UTILITY SECONDARY CONDUCTORS. SECONDARY CONDUCTORS TO BE INSTALLED BY UTILITY.
6. STUB-UP NEW 1-WAY 1-1/2"C CONDUIT AT EXISTING UTILITY POLE. UTILITY TO CONNECT NEW SECONDARY CONDUCTORS TO NEW POLE MOUNTED TRANSFORMER.
7. RE-INSTALL EXISTING FLOOD WARNING SIGN ON NEW SCREW-IN TYPE ANCHOR FOUNDATION. CONTRACTOR SHALL CONTACT THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT FOR CONNECTION OF EXISTING FLOOD WARNING SIGNS TO COMMUNICATION CABLES AND POWER CONDUCTORS INSTALLED BY CONTRACTOR.
8. INSTALL NEW 2-WAY 1"C SCHEDULE 40 PVC CONDUIT CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S).
9. SAWCUT EXISTING PAVEMENT AND INSTALL NEW 1-WAY 1"C SCHEDULE 80 PVC CONDUIT CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S).
10. INSTALL NEW 1-WAY 1"C GRSC CONDUIT IN NEW BRIDGE RAIL CONTAINING NEW LIGHTING CIRCUIT.
11. INSTALL NEW 1-WAY 1/2"C & 2-WAY 1"C GRSC CONDUIT IN NEW BRIDGE COLUMN CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S).
12. INSTALL NEW 1-WAY 1"C GRSC CONDUIT MOUNTED TO EXTERIOR OF NEW BENT CAP CONTAINING NEW LIGHTING CIRCUIT.
13. INSTALL NEW 1-WAY 1-1/2"C & 2-WAY 1"C GRSC CONDUIT IN NEW BRIDGE RAIL CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S).
14. INSTALL NEW 1-WAY 1-1/2"C & 1-WAY 1"C GRSC CONDUIT IN NEW BRIDGE RAIL CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S).
15. CONNECT NEW CONDUIT TO EXISTING PULLBOX.
16. INSTALL NEW 1-WAY 1"C SCHEDULE 40 PVC CONDUIT CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S).
17. CONTRACTOR SHALL CONTACT THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT FOR CONNECTION OF EXISTING FLOOD WARNING SIGNS TO COMMUNICATION CABLES AND POWER CONDUCTORS INSTALLED BY CONTRACTOR.
18. INSTALL NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S) IN EXISTING CONDUIT.
19. INSTALL NEW SERVICE PEDESTAL CONTAINING NEW UTILITY METER, MAIN DISCONNECT, AND POWER PANEL.
20. INSTALL NEW 1-WAY 1-1/2"C & 1-WAY 1"C SCHEDULE 40 PVC CONDUIT CONTAINING NEW COMMUNICATION CABLE(S) AND/OR ELECTRICAL CIRCUIT(S).
21. SAWCUT EXISTING PAVEMENT AND INSTALL NEW 3-WAY 1"C SCHEDULE 80 PVC CONDUIT CONTAINING NEW ELECTRICAL CIRCUIT(S).
22. INSTALL NEW 2-WAY 1-1/2"C SCHEDULE 40 PVC CONDUIT CONTAINING NEW COMMUNICATION CABLE(S).
23. INSTALL NEW SERVICE POLE AND STUB-UP NEW CONDUITS. CONTRACTOR SHALL CONTACT THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARMENT FOR RE-INSTALLATION OF EXISTING COMMUNICATION EQUIPMENT AND CONNECTION TO COMMUNICATION CABLES AND POWER CONDUCTORS INSTALLED BY CONTRACTOR. SERVICE POLE SHALL NOT BE INSTALLED UNTIL AFTER COMPLETION OF BRIDGE AND RETAINING WALLS.
24. INSTALL NEW 1-WAY 1"C SCHEDULE 40 PVC CONDUIT CONNECTING TO EXISTING PULLBOX NEAR EXISTING FLOOD WARNING SIGN. INSTALL NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S) TO EXISTING FLOOD WARNING SIGN. CONTRACTOR SHALL CONTACT THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT FOR CONNECTION OF EXISTING FLOOD WARNING SIGNS TO COMMUNICATION CABLES AND POWER CONDUCTORS INSTALLED BY CONTRACTOR.
25. INSTALL NEW TYPE D ELECTRICAL PULLBOX WITH APRON.
26. INSTALL NEW 1-WAY 1"C SCHEDULE 40 PVC CONDUIT CONTAINING NEW LIGHTING CIRCUIT(S).
27. SAWCUT EXISTING PAVEMENT AND INSTALL NEW 1-WAY 1"C SCHEDULE 80 PVC CONDUIT CONTAINING NEW LIGHTING CIRCUIT.
28. INSTALL NEW IP67 RATED LIGHT FIXTURE MOUNTED TO THE BRIDGE RAIL OF THE NEW BRIDGE. LIGHT FIXTURE SHALL BE NEMALUX INDUSTRIAL MR-GEN LED FIXTURE MR3-WW-T3F-GY-GN-AC OR APPROVED EQUAL. CONDUIT SHALL CONNECT TO NEW LIGHT FIXTURE MOUNTING BRACKET.
29. INSTALL NEW 2-WAY 1-1/2"C GRSC CONDUIT IN NEW BRIDGE RAIL CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S).
30. INSTALL NEW 2-WAY 1-1/2"C & 1-WAY 1"C SCHEDULE 40 PVC CONDUIT CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S).
31. EXISTING LUMINAIRE, POLE, AND OH ELECTRIC SERVICE LINE TO BE REMOVED BY CPS DURING TCP PHASE II STEP 1 AFTER PROPOSED LUMINAIRES ARE OPERATIONAL.
32. PROPOSED LUMINAIRE TO BE INSTALLED BY CPS IN TCP PHASE I STEP 2. THIS WORK SHALL OCCUR AFTER PHASE I RETAINING WALLS ARE COMPLETE AND AREA IN FRONT OF WALLS HAS BEEN GRADED, BUT PRIOR TO INSTALLING GABIONS AND CONCRETE FLUME. THE CONTRACTOR SHALL ENSURE AREA IS CLEARED AND ACCESSIBLE BY CPS EQUIPMENT.

STATE OF TEXAS
JAMES K. SCHMITT
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PROFESSIONAL ENGINEER

Digitally Signed 01/26/2021

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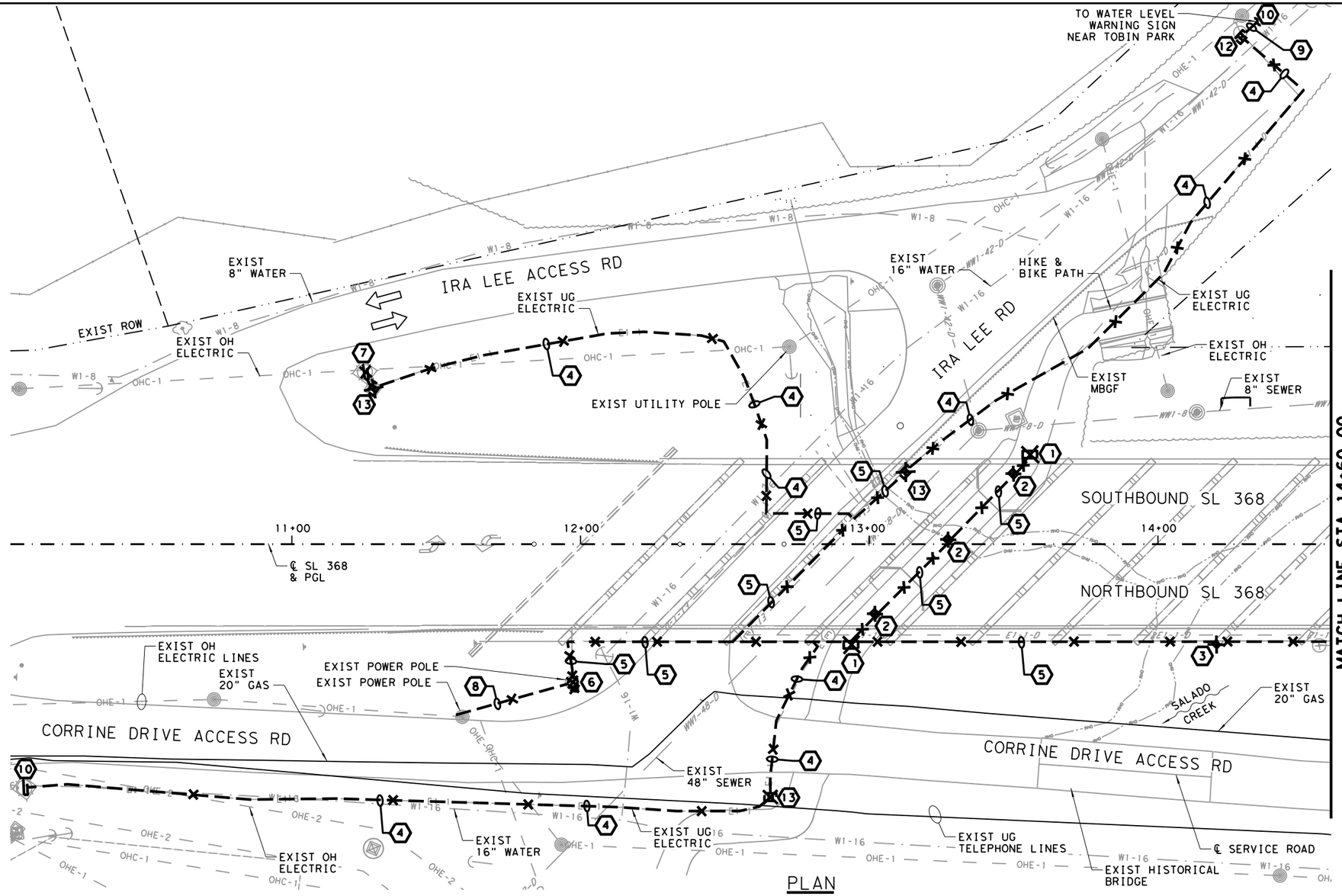
Texas Department of Transportation

SL 368
AT SALADO CREEK

ELECTRICAL KEYED NOTES

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		233
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368



PLAN

ITEM NO.	DESCRIPTION	UNIT	QTY
0610 6010	REMOVE RD IL ASM (U/P)	EA	5
0624 6028	REMOVE GROUND BOX	EA	3
0628 6002	REMOVE ELECTRICAL SERVICES	EA	1
0685 6002	RELOCATE RDSD FLASH BEACON ASSEMBLY	EA	1

GENERAL NOTES:

1. SEE SYMBOLS, ABBREVIATIONS, AND KEYED NOTES ON ELECTRICAL LEGEND PLAN SHEET.
2. ALL EQUIPMENT TO REMAIN SHALL BE PROTECTED DURING CONSTRUCTION.
3. ALL CABLE REMOVAL SHALL BE SUBSIDIARY TO ASSOCIATED LIGHT OR SIGN REMOVAL PAY ITEM.
4. SEE ELECTRICAL LEGEND FOR ELECTRICAL UTILITY COORDINATION NOTES.

LEGEND

- EXISTING INFRASTRUCTURE
- NEW INFRASTRUCTURE

REMOVAL KEYED NOTES:

1. REMOVE EXISTING LIGHT FIXTURE AND ASSOCIATED EQUIPMENT MOUNTED TO SIDE OF BRIDGE.
2. REMOVE EXISTING LIGHT FIXTURE AND ASSOCIATED EQUIPMENT MOUNTED TO UNDERSIDE OF BRIDGE.
3. CONTRACTOR SHALL CONTACT THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARMENT FOR REMOVAL OF EXISTING WATER LEVEL DETECTION EQUIPMENT.
4. REMOVE EXISTING CONDUCTORS AND/OR COMMUNICATION CABLES FROM EXISTING UNDERGROUND CONDUIT. CONDUIT TO BE ABANDONED IN PLACE.
5. REMOVE EXISTING CONDUCTORS AND/OR COMMUNICATION CABLES FROM EXISTING SURFACE MOUNTED CONDUIT. REMOVE CONDUIT.
6. REMOVE EXISTING SERVICE POLE, UTILITY METER, MAIN DISCONNECT, POWER PANEL, AND ASSOCIATED EQUIPMENT. COORDINATE WITH OWNER AND UTILITY ON SERVICE DISCONNECTION AND METER REMOVAL.
7. REMOVE AND STORE EXISTING FLOOD WARNING SIGN AND DEMOLISH FOUNDATION FULL DEPTH.
8. CONTRACTOR SHALL CONTACT CPS ENERGY FOR REMOVAL OF EXISTING OVERHEAD UTILITY CONDUCTORS.
9. REMOVE EXISTING CONDUCTORS AND/OR COMMUNICATION CABLES FROM EXISTING UNDERGROUND CONDUIT. CONDUIT TO REMAIN TO BE RE-USED DURING CONSTRUCTION.
10. EXISTING FLOOD WARNING SIGN TO REMAIN.
12. EXISTING PULLBOX TO REMAIN.
13. DEMOLISH EXISTING PULLBOX.

0 20′ 40′

SCALE: 1" = 40′

STATE OF TEXAS
JAMES K. SCHMITT
125073
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PROFESSIONAL ENGINEER

Digitally Signed 01/26/2021

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TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

LIGHTING REMOVAL PLAN

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		234
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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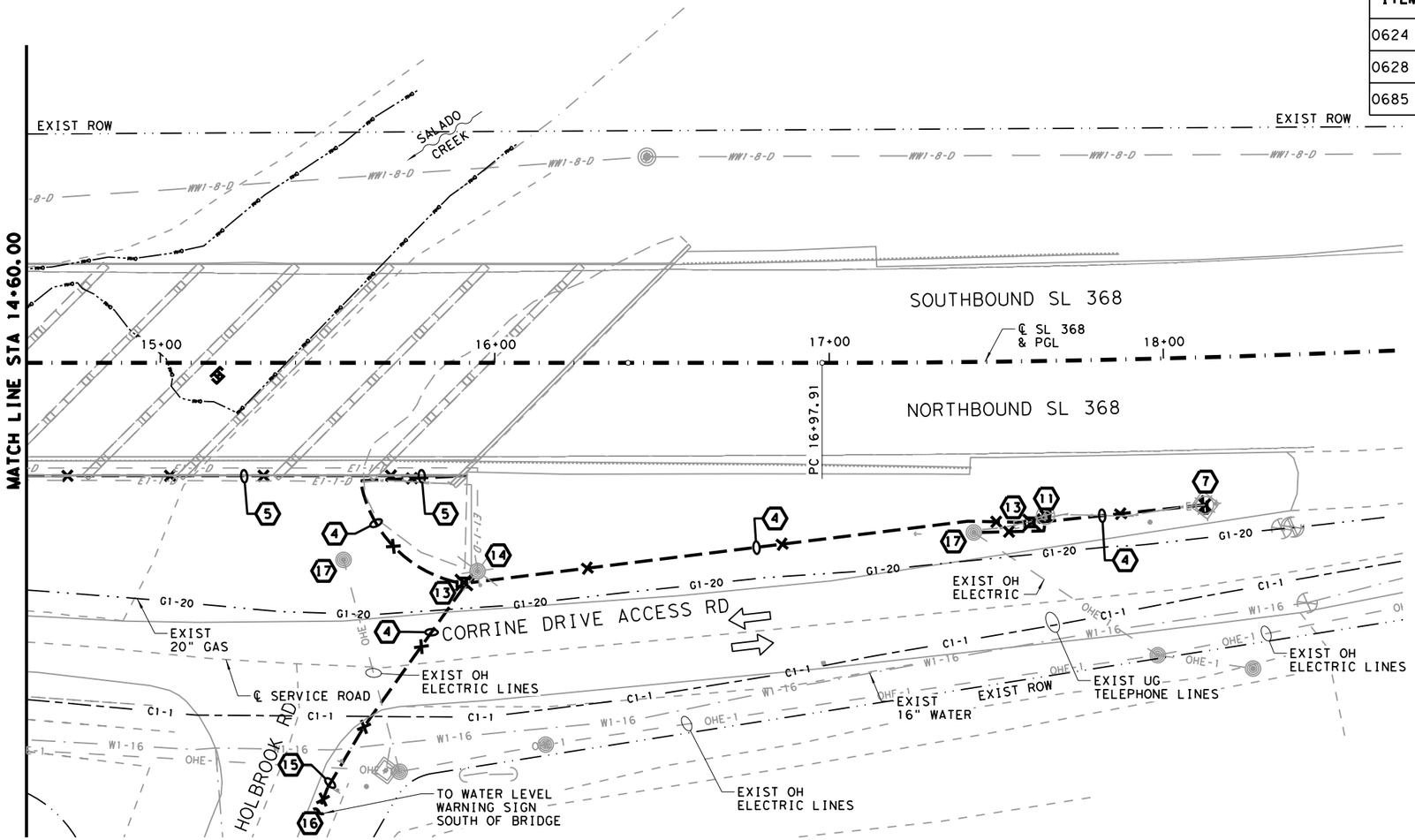
ITEM NO.	DESCRIPTION	UNIT	QTY
0624 6028	REMOVE GROUND BOX	EA	2
0628 6002	REMOVE ELECTRICAL SERVICES	EA	1
0685 6002	RELOCATE RDSD FLASH BEACON ASSEMBLY	EA	1



PLAN

LEGEND

EXISTING INFRASTRUCTURE

NEW INFRASTRUCTURE

0 20′ 40′

SCALE: 1" = 40′

REMOVAL KEYED NOTES:

(4) REMOVE EXISTING CONDUCTORS AND/OR COMMUNICATION CABLES FROM EXISTING UNDERGROUND CONDUIT. CONDUIT TO BE ABANDONED IN PLACE.

(5) REMOVE EXISTING CONDUCTORS AND/OR COMMUNICATION CABLES FROM EXISTING SURFACE MOUNTED CONDUIT. REMOVE CONDUIT.

(7) REMOVE AND STORE EXISTING FLOOD WARNING SIGN AND DEMOLISH FOUNDATION FULL DEPTH.

(11) REMOVE EXISTING UTILITY METER, MAIN DISCONNECT, POWER PEDESTAL, AND ASSOCIATED EQUIPMENT. COORDINATE WITH OWNER AND UTILITY ON CONDUCTOR REMOVAL.

(13) DEMOLISH EXISTING PULLBOX.

(14) DEMOLISH EXISTING TIMBER POLE. CONTRACTOR SHALL CONTACT THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT FOR REMOVAL OF EXISTING POLE MOUNTED COMMUNICATION EQUIPMENT.

(15) DEMOLISH EXISTING TIMBER POLE. CONTRACTOR SHALL CONTACT THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT FOR REMOVAL OF EXISTING POLE MOUNTED COMMUNICATION EQUIPMENT. WORK SHALL NOT BE MEASURED FOR SEPARATE PAYMENT BUT SHALL BE SUBSIDIARY TO ITEM 100.6002 PREPARING ROW.

(16) EXISTING FLOOD WARNING SIGN AND ASSOCIATED PULLBOX TO REMAIN.

(17) EXISTING LUMINAIRE, POLE, AND OH ELECTRIC SERVICE LINE TO BE REMOVED BY CPS DURING TCP PHASE II STEP 1 AFTER PROPOSED LUMINAIRES ARE OPERATIONAL.

GENERAL NOTES:

1. SEE SYMBOLS, ABBREVIATIONS, AND KEYED NOTES ON ELECTRICAL LEGEND PLAN SHEET.
2. ALL EQUIPMENT TO REMAIN SHALL BE PROTECTED DURING CONSTRUCTION.
3. ALL CABLE REMOVAL SHALL BE SUBSIDIARY TO ASSOCIATED LIGHT OR SIGN REMOVAL PAY ITEM.
4. SEE ELECTRICAL LEGEND FOR ELECTRICAL UTILITY COORDINATION NOTES.

STATE OF TEXAS
JAMES K. SCHMITT
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SL 368
AT SALADO CREEK

LIGHTING REMOVAL PLAN

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		235
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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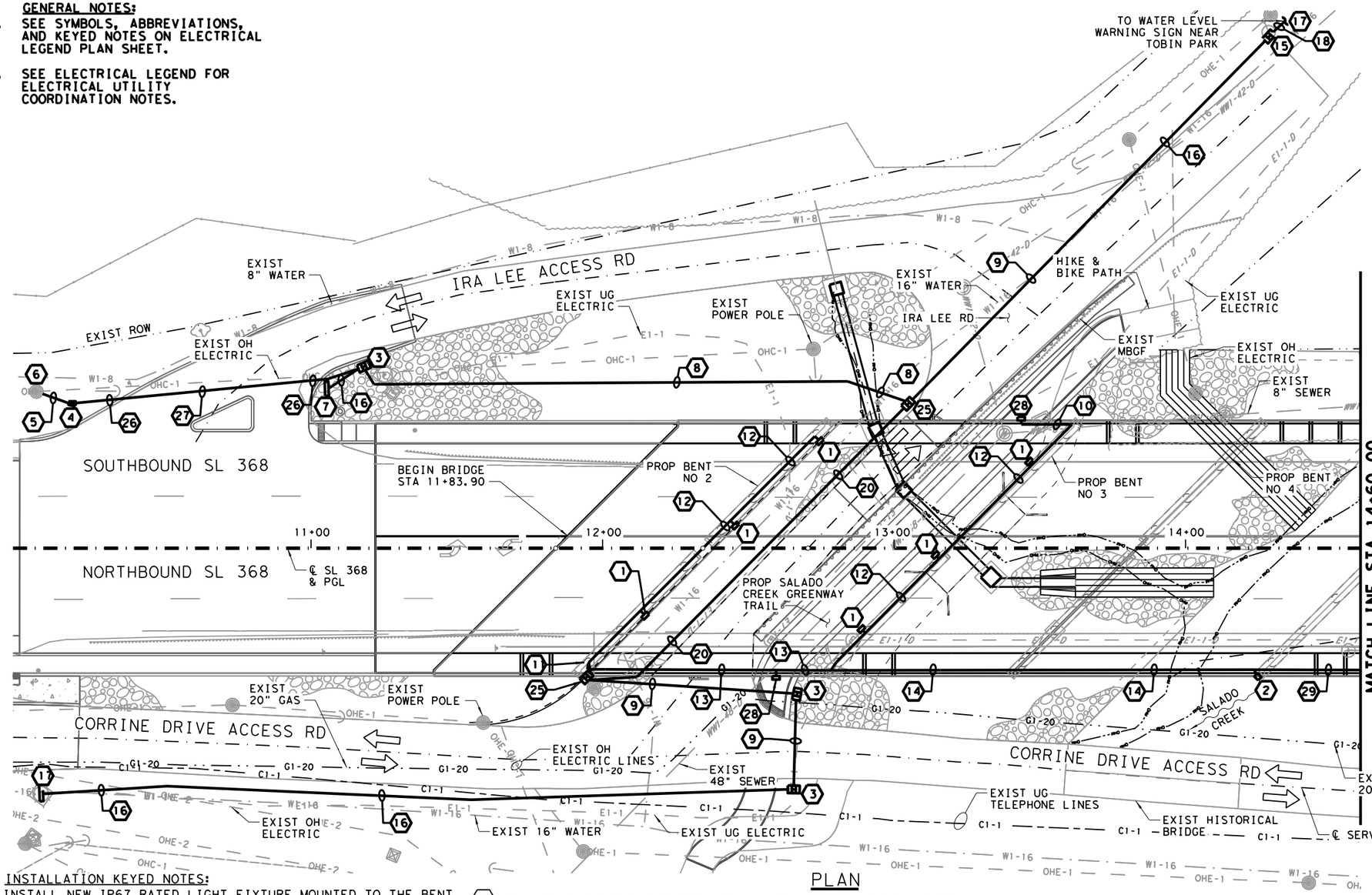
GENERAL NOTES:

1. SEE SYMBOLS, ABBREVIATIONS, AND KEYED NOTES ON ELECTRICAL LEGEND PLAN SHEET.
2. SEE ELECTRICAL LEGEND FOR ELECTRICAL UTILITY COORDINATION NOTES.



PLAN

INSTALLATION KEYED NOTES:

1. INSTALL NEW IP67 RATED LIGHT FIXTURE MOUNTED TO THE BENT CAP OF THE NEW BRIDGE. LIGHT FIXTURE SHALL BE NEMALUX INDUSTRIAL MR-GEN LED FIXTURE MR3-WW-T3F-GY-GN-AC OR APPROVED EQUAL. CONDUIT SHALL CONNECT TO NEW LIGHT FIXTURE MOUNTING BRACKET.
2. INSTALL NEW 1-WAY 1" GRSC CONDUIT, MOUNTED TO BRIDGE COLUMN CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S) FOR FLOOD DETECTION EQUIPMENT. CONDUIT SHALL CONNECT TO NEW CONDUIT WITHIN BRIDGE RAIL. CONTRACTOR SHALL CONTACT THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT FOR RE-INSTALLATION OF EXISTING FLOOD DETECTION EQUIPMENT.
3. INSTALL NEW TYPE B ELECTRICAL PULLBOX WITH APRON.
4. INSTALL NEW SERVICE PEDESTAL CONTAINING NEW UTILITY METER, MAIN DISCONNECT, POWER PANEL, AND PEC.
5. INSTALL NEW 1-WAY 1-1/2"C SCHEDULE 40 PVC CONDUIT CONTAINING NEW UTILITY SECONDARY CONDUCTORS. SECONDARY CONDUCTORS TO BE INSTALLED BY UTILITY.
6. STUB-UP NEW 1-WAY 1-1/2"C CONDUIT AT EXISTING UTILITY POLE. UTILITY TO CONNECT NEW SECONDARY CONDUCTORS TO NEW POLE MOUNTED TRANSFORMER.
7. RE-INSTALL EXISTING FLOOD WARNING SIGN ON NEW SCREW-IN TYPE ANCHOR FOUNDATION. CONTRACTOR SHALL CONTACT THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT FOR CONNECTION OF EXISTING FLOOD WARNING SIGNS TO COMMUNICATION CABLES AND POWER CONDUCTORS INSTALLED BY CONTRACTOR.
8. INSTALL NEW 2-WAY 1"C SCHEDULE 40 PVC CONDUIT CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S).
9. SAWCUT EXISTING PAVEMENT AND INSTALL NEW 1-WAY 1"C SCHEDULE 80 PVC CONDUIT CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S).
10. INSTALL NEW 1-WAY 1"C GRSC CONDUIT IN NEW BRIDGE RAIL CONTAINING NEW LIGHTING CIRCUIT.
11. INSTALL NEW 1-WAY 1/2"C & 2-WAY 1"C GRSC CONDUIT IN NEW BRIDGE COLUMN CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S).
12. INSTALL NEW 1-WAY 1"C GRSC CONDUIT MOUNTED TO EXTERIOR OF NEW BENT CAP CONTAINING NEW LIGHTING CIRCUIT.
13. INSTALL NEW 1-WAY 1-1/2"C & 2-WAY 1"C GRSC CONDUIT IN NEW BRIDGE RAIL CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S).
14. INSTALL NEW 1-WAY 1-1/2"C & 1-WAY 1"C GRSC CONDUIT IN NEW BRIDGE RAIL CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S).
15. CONNECT NEW CONDUIT TO EXISTING PULLBOX.
16. INSTALL NEW 1-WAY 1"C SCHEDULE 40 PVC CONDUIT CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S).
17. CONTRACTOR SHALL CONTACT THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT FOR CONNECTION OF EXISTING FLOOD WARNING SIGNS TO COMMUNICATION CABLES AND POWER CONDUCTORS INSTALLED BY CONTRACTOR.
18. INSTALL NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S) IN EXISTING CONDUIT.
20. INSTALL NEW 1-WAY 1-1/2"C & 1-WAY 1"C SCHEDULE 40 PVC CONDUIT CONTAINING NEW COMMUNICATION CABLE(S) AND/OR ELECTRICAL CIRCUIT(S).
25. INSTALL NEW TYPE D ELECTRICAL PULLBOX WITH APRON.
26. INSTALL NEW 1-WAY 1"C SCHEDULE 40 PVC CONDUIT CONTAINING NEW LIGHTING CIRCUIT(S).
27. SAWCUT EXISTING PAVEMENT AND INSTALL NEW 1-WAY 1"C SCHEDULE 80 PVC CONDUIT CONTAINING NEW LIGHTING CIRCUIT.
28. INSTALL NEW IP67 RATED LIGHT FIXTURE MOUNTED TO THE BRIDGE RAIL OF THE NEW BRIDGE. LIGHT FIXTURE SHALL BE NEMALUX INDUSTRIAL MR-GEN LED FIXTURE MR3-WW-T3F-GY-GN-AC OR APPROVED EQUAL. CONDUIT SHALL CONNECT TO NEW LIGHT FIXTURE MOUNTING BRACKET.
29. INSTALL NEW 2-WAY 1-1/2"C GRSC CONDUIT IN NEW BRIDGE RAIL CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S).

ITEM NO.	DESCRIPTION	UNIT	QTY
0400 6008	CUT & RESTORE ASPH PAVING	SY	38
0610 6104	IN RD IL (U/P) (TY 1 (150W EQ) LED)	EA	8
0618 6016	CONDT (PVC) (SCH 40) (1")	LF	1042
0618 6021	CONDT (PVC) (SCH 40) (1 1/2")	LF	175
0618 6040	CONDT (PVC) (SCH 80) (1")	LF	243
0618 6064	CONDT (RM) (1")	LF	677
0618 6068	CONDT (RM) (1 1/2")	LF	349
0620 6006	ELEC CONDR (NO.10) INSULATED	LF	10559
0620 6014	ELEC CONDR (NO.3) INSULATED	LF	42
0624 6004	GROUND BOX TY B (122322)W/APRON	EA	3
0624 6010	GROUND BOX TY D (162922)W/APRON	EA	2
0628 6237	ELC SRV TY D 120/240 100(NS)SS(E)EX(U)	EA	1
0684 6057	TRF SIG CBL (TY A)(18 AWG)(7 CONDR)	LF	2819

LEGEND

- EXISTING INFRASTRUCTURE
- NEW INFRASTRUCTURE

0 20′ 40′

SCALE: 1" = 40′

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SL 368
AT SALADO CREEK

LIGHTING INSTALLATION PLAN

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		236
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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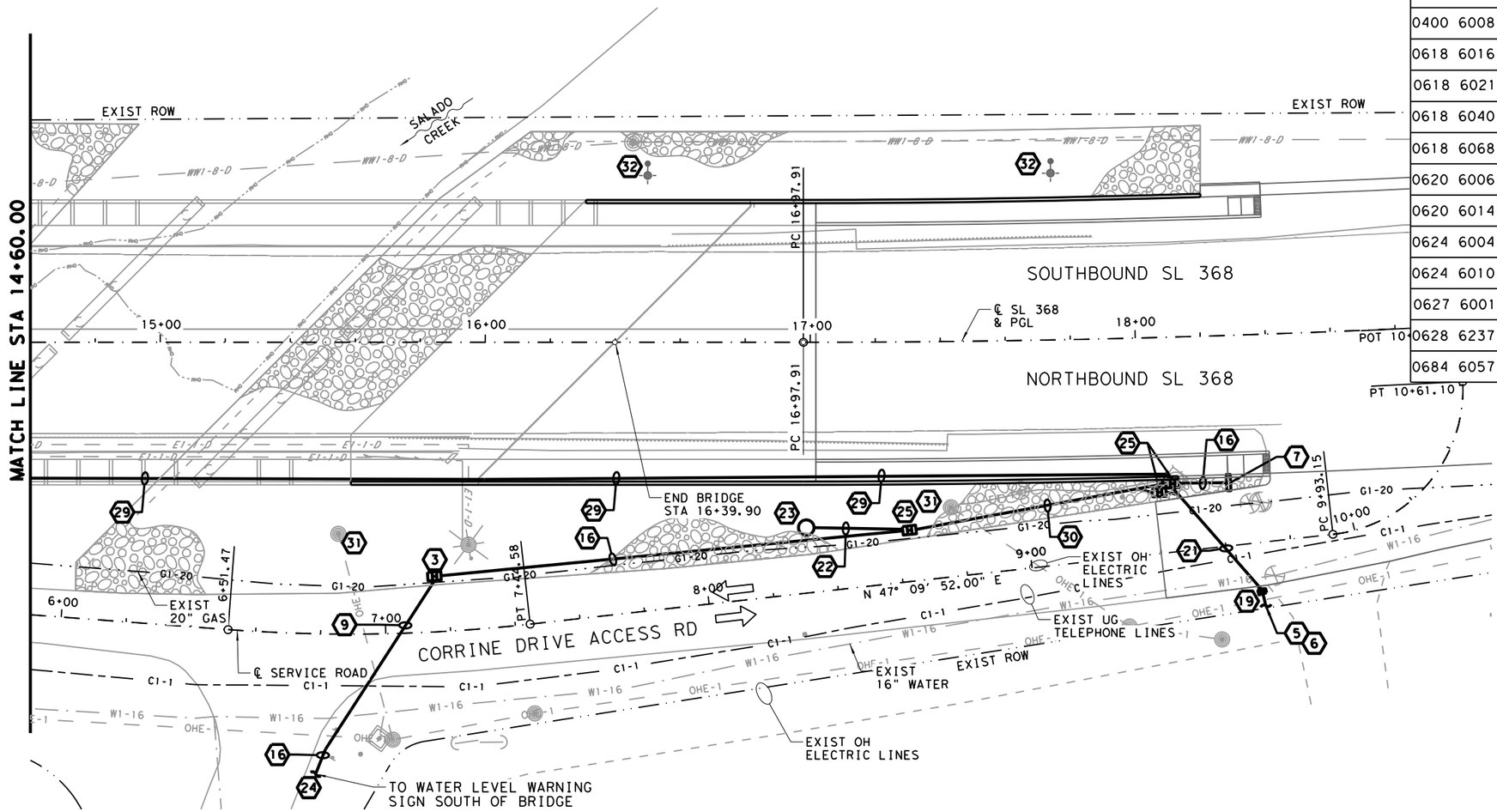

ITEM NO.	DESCRIPTION	UNIT	QTY
0400 6008	CUT & RESTORE ASPH PAVING	SY	18
0618 6016	CONDT (PVC) (SCH 40) (1")	LF	555
0618 6021	CONDT (PVC) (SCH 40) (1 1/2")	LF	261
0618 6040	CONDT (PVC) (SCH 80) (1")	LF	155
0618 6068	CONDT (RM) (1 1/2")	LF	763
0620 6006	ELEC CONDR (NO.10) INSULATED	LF	6603
0620 6014	ELEC CONDR (NO.3) INSULATED	LF	56
0624 6004	GROUND BOX TY B (122322)W/APRON	EA	1
0624 6010	GROUND BOX TY D (162922)W/APRON	EA	3
0627 6001	TIMBER POLE (CL 2) 30 FT	EA	1
0628 6237	ELC SRV TY D 120/240 100(NS)SS(E)EX(U)	EA	1
0684 6057	TRF SIG CBL (TY A)(18 AWG)(7 CONDR)	LF	3041

GENERAL NOTES:

1. SEE SYMBOLS, ABBREVIATIONS, AND KEYED NOTES ON ELECTRICAL LEGEND PLAN SHEET.
2. SEE ELECTRICAL LEGEND FOR ELECTRICAL UTILITY COORDINATION NOTES.

LEGEND

EXISTING INFRASTRUCTURE

NEW INFRASTRUCTURE

0 20′ 40′

SCALE: 1" = 40′

INSTALLATION KEYED NOTES:

PLAN

(3) INSTALL NEW TYPE B ELECTRICAL PULLBOX WITH APRON.

(5) INSTALL NEW 1-WAY 1-1/2"C SCHEDULE 40 PVC CONDUIT CONTAINING NEW UTILITY SECONDARY CONDUCTORS. SECONDARY CONDUCTORS TO BE INSTALLED BY UTILITY.

(6) STUB-UP NEW 1-WAY 1-1/2"C CONDUIT AT EXISTING UTILITY POLE. UTILITY TO CONNECT NEW SECONDARY CONDUCTORS TO NEW POLE MOUNTED TRANSFORMER.

(7) RE-INSTALL EXISTING FLOOD WARNING SIGN ON NEW SCREW-IN TYPE ANCHOR FOUNDATION. CONTRACTOR SHALL CONTACT THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT FOR CONNECTION OF EXISTING FLOOD WARNING SIGNS TO COMMUNICATION CABLES AND POWER CONDUCTORS INSTALLED BY CONTRACTOR.

(9) SAWCUT EXISTING PAVEMENT AND INSTALL NEW 1-WAY 1"C SCHEDULE 80 PVC CONDUIT CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S).

(16) INSTALL NEW 1-WAY 1"C SCHEDULE 40 PVC CONDUIT CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S).

(19) INSTALL NEW SERVICE PEDESTAL CONTAINING NEW UTILITY METER, MAIN DISCONNECT, AND POWER PANEL.

(21) SAWCUT EXISTING PAVEMENT AND INSTALL NEW 3-WAY 1"C SCHEDULE 80 PVC CONDUIT CONTAINING NEW ELECTRICAL CIRCUIT(S).

(22) INSTALL NEW 2-WAY 1-1/2"C SCHEDULE 40 PVC CONDUIT CONTAINING NEW COMMUNICATION CABLE(S).

(23) INSTALL NEW SERVICE POLE AND STUB-UP NEW CONDUITS. CONTRACTOR SHALL CONTACT THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT FOR RE-INSTALLATION OF EXISTING COMMUNICATION EQUIPMENT AND CONNECTION TO COMMUNICATION CABLES AND POWER CONDUCTORS INSTALLED BY CONTRACTOR. SERVICE POLE SHALL NOT BE INSTALLED UNTIL AFTER COMPLETION OF BRIDGE AND RETAINING WALLS.

(24) INSTALL NEW 1-WAY 1"C SCHEDULE 40 PVC CONDUIT CONNECTING TO EXISTING PULLBOX NEAR EXISTING FLOOD WARNING SIGN. INSTALL NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S) TO EXISTING FLOOD WARNING SIGN. CONTRACTOR SHALL CONTACT THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT FOR CONNECTION OF EXISTING FLOOD WARNING SIGNS TO COMMUNICATION CABLES AND POWER CONDUCTORS INSTALLED BY CONTRACTOR.

(25) INSTALL NEW TYPE D ELECTRICAL PULLBOX WITH APRON.

(29) INSTALL NEW 2-WAY 1-1/2"C GRSC CONDUIT IN NEW BRIDGE RAIL CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S).

(30) INSTALL NEW 2-WAY 1-1/2"C & 1-WAY 1"C SCHEDULE 40 PVC CONDUIT CONTAINING NEW COMMUNICATION CABLE(S) AND ELECTRICAL CIRCUIT(S).

(31) EXISTING LUMINAIRE, POLE, AND OH ELECTRIC SERVICE LINE TO BE REMOVED BY CPS DURING TCP PHASE II STEP 1 AFTER PROPOSED LUMINAIRES ARE OPERATIONAL.

(32) PROPOSED LUMINAIRE TO BE INSTALLED BY CPS IN TCP PHASE I STEP 2. THIS WORK SHALL OCCUR AFTER PHASE I RETAINING WALLS ARE COMPLETE AND AREA IN FRONT OF WALLS HAS BEEN GRADED, BUT PRIOR TO INSTALLING GABIONS AND CONCRETE FLUME. THE CONTRACTOR SHALL ENSURE AREA IS CLEARED AND ACCESSIBLE BY CPS EQUIPMENT.

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SL 368
AT SALADO CREEK

LIGHTING INSTALLATION PLAN

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		237
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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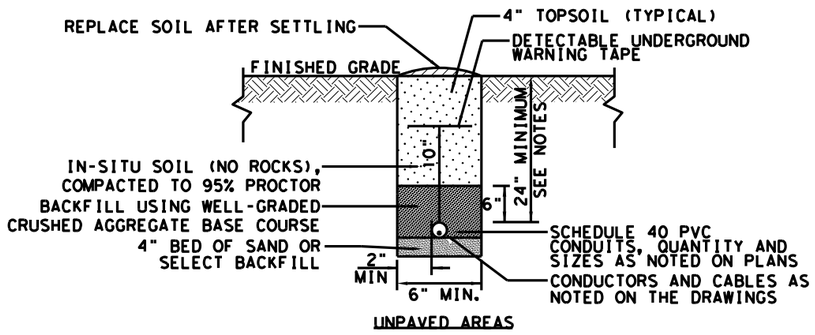
GENERAL NOTES:

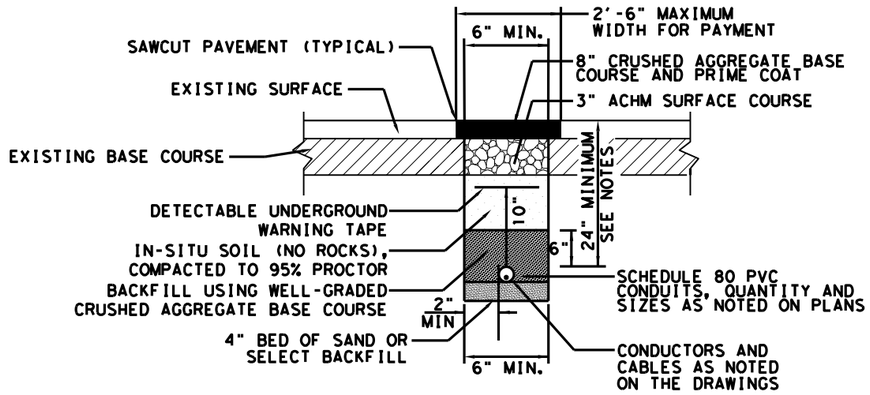
1. POWER MARKING TAPES SHALL BE DETECTABLE TYPE CONSTRUCTION WITH RED BACKGROUND AND BLACK LETTERING.
2. TAPE SHALL BE DETECTABLE, DURABLE, HIGHLY VISIBLE, RESISTANT TO ELEMENTS, MEETING AND/OR EXCEDDING ALL INDUSTRY STANDARDS.
3. PROVIDE MULTIPLE AND/OR WIDER TAPES FOR WIDER DUCT BANKS. COORDINATE WITH ENGINEER.

1 UNDERGROUND DETECTABLE WARNING TAPE

SCALE: NONE



UNPAVED AREAS



ASPHALT PAVEMENT REPAIR

ELECTRICAL DUCT NOTES:

1. CONTRACTOR SHALL STAKE THE DUCT INSTALLATION IN PLAN AND ELEVATION FOR NEW ELECTRICAL DUCTS TO AVOID EXISTING UTILITIES. STAKING PLAN SHALL BE APPROVED BY OWNER AND ENGINEER PRIOR TO WORK.
2. CONTRACTOR SHALL ADJUST THE DEPTH OF THE ELECTRICAL DUCTS AS REQUIRED TO MAINTAIN THE MINIMUM COVER REQUIREMENT INDICATED AND AVOID EXISTING UTILITIES.
3. NO PVC SHALL EMERGE FROM THE GROUND OR CONCRETE SLAB OR ENCASEMENT, PVC SHALL CONVERT TO GALVANIZED RIGID STEEL CONDUIT PRIOR TO ITS EMERGENCE.
4. INSTALL CONDUCTORS AND CABLES AS NOTED ON DRAWING.
5. MINIMUM COVER REQUIREMENT FOR DUCT BANKS UNDER ROADS, DRIVEWAYS AND PARKING LOTS SHALL BE 24".
6. ROCK REMOVAL SHALL BE CONSIDERED SUBSIDIARY TO DUCT INSTALLATION.

2 NON-ENCASED ELECTRICAL DUCT DETAIL

SCALE: NONE

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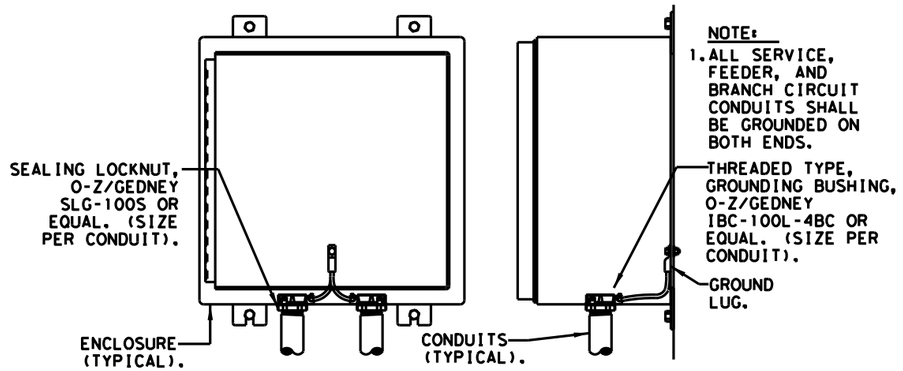
SL 368
AT SALADO CREEK

ELECTRICAL DETAILS

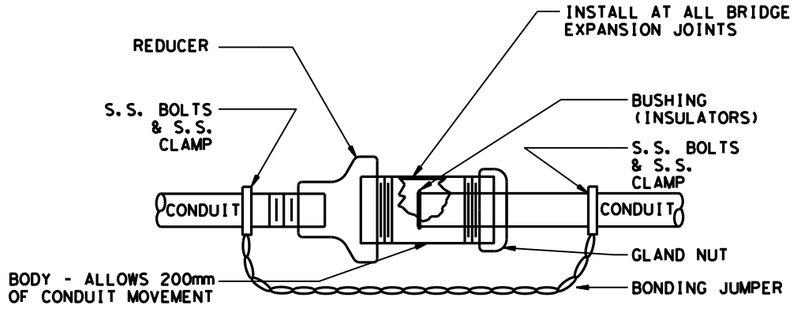
SHEET 1 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		238
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368



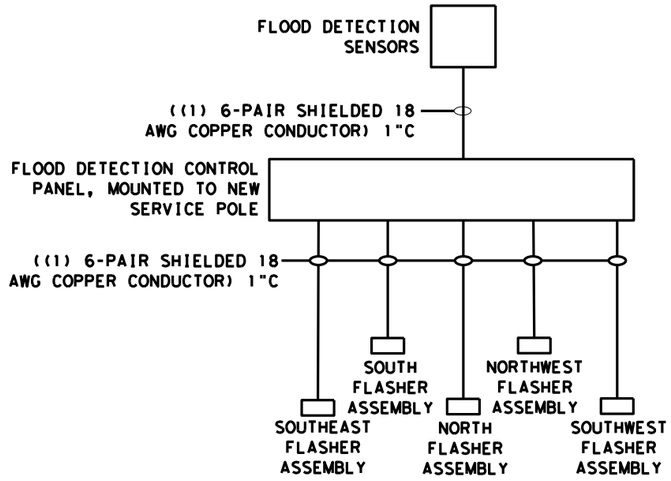
1 CONDUIT GROUNDING

SCALE: NONE



2 EXPANSION FITTING

SCALE: NONE



3 COMMUNICATION ONE-LINE DIAGRAM

SCALE: NONE

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SL 368
AT SALADO CREEK

ELECTRICAL DETAILS

SHEET 2 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		239
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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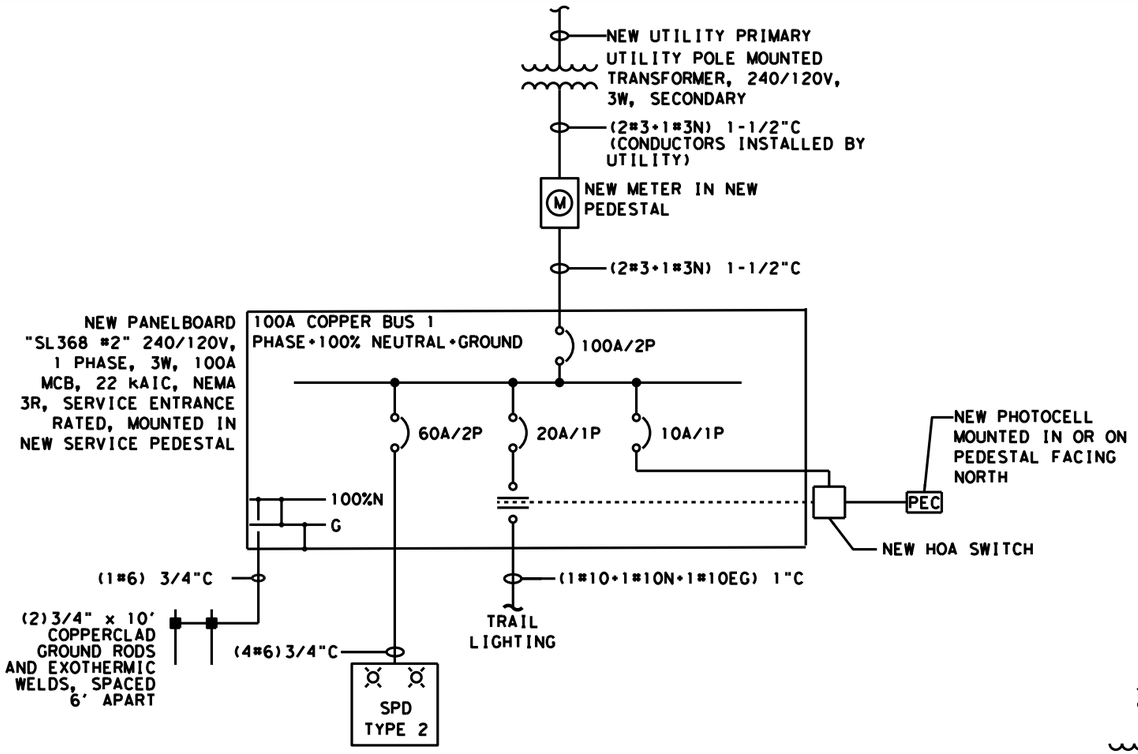
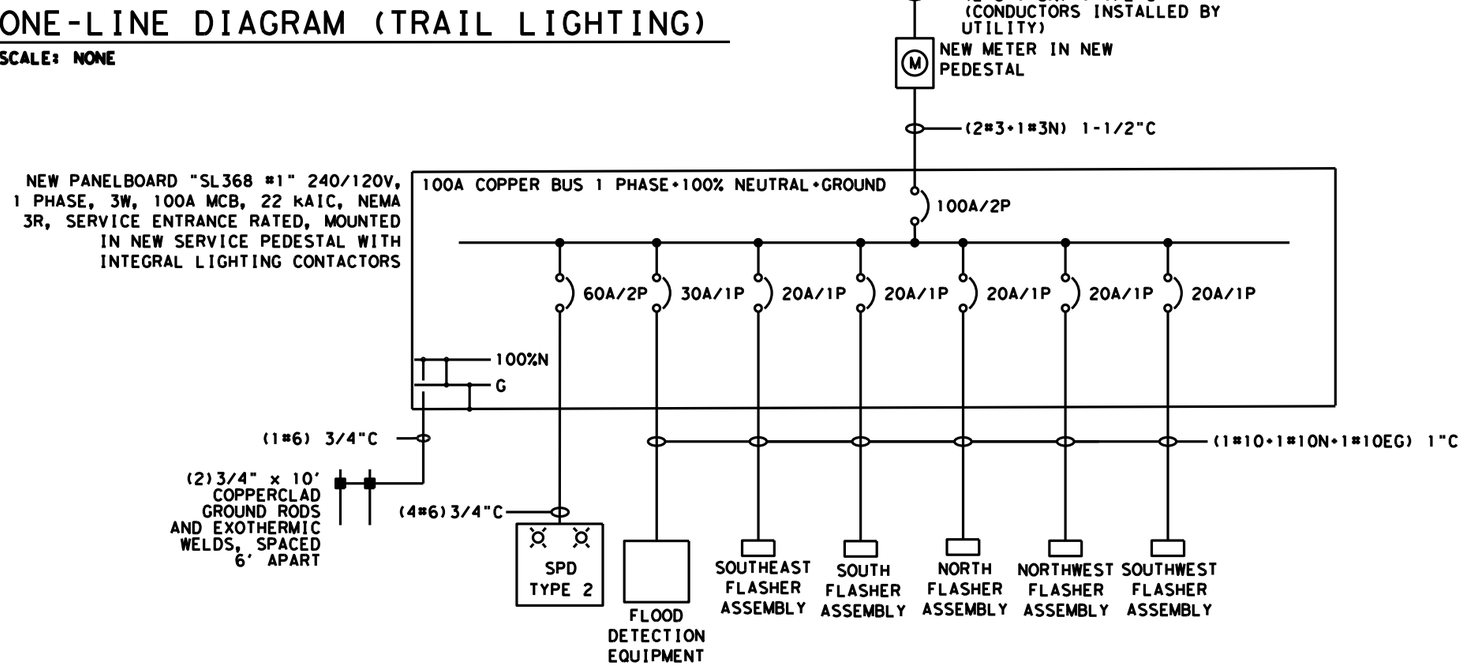


1 ONE-LINE DIAGRAM (TRAIL LIGHTING)

SCALE: NONE



2 ONE-LINE DIAGRAM (FLOOD DETECTION EQUIPMENT)

SCALE: NONE

ONE-LINE DIAGRAM NOTES:

1. ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE NFPA 70 (2020) NATIONAL ELECTRICAL CODE, NFPA 101 (2018) LIFE SAFETY CODE, STATE ELECTRICAL CODE, AND LOCAL ELECTRICAL CODE.
2. COORDINATE ELECTRICAL POWER SUPPLY WITH EQUIPMENT SUPPLIED.
3. COORDINATE ALL ELECTRICAL WORK AND POWER OUTAGES WITH OWNER AND POWER UTILITY.
4. FOR ELECTRICAL WORK OF 600V OR LESS, ALL CONDUCTORS, TERMINATIONS, TERMINAL BLOCKS, LUGS, CONNECTORS, DEVICES AND EQUIPMENT SHALL BE LISTED, MARKED, AND RATED 75 DEGREES C MINIMUM UNLESS OTHERWISE NOTED.
5. UNDERGROUND FEEDER AND BRANCH CIRCUIT WIRING SHALL BE A MINIMUM TYPE XHHW.
6. ABOVE GROUND FEEDER AND BRANCH CIRCUIT WIRING SHALL BE MINIMUM TYPE XHHW.
7. ALL WIRING SHALL BE COPPER.
8. EQUIPMENT SHORT CIRCUIT CURRENT RATINGS AND AVAILABLE INTERRUPTING CURRENT RATINGS SHALL BE FULLY RATED TO INTERRUPT SYMMETRICAL SHORT CIRCUIT CURRENT AVAILABLE AT TERMINALS. SERIES RATED SYSTEMS SHALL NOT BE USED.
9. INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL FEEDER AND BRANCH CIRCUITS.
10. INSTALL ALL CONDUCTORS AND CABLES IN CONDUIT UNLESS OTHERWISE NOTED.
11. INSTALL LUGS AND JUNCTION BOXES AS REQUIRED TO FIT WIRING.
12. INSTALL NEW TYPED PANEL SCHEDULES IN ALL ELECTRICAL PANELS INDICATING WORK PERFORMED.
13. MAKE ELECTRICAL CONNECTIONS TO EVERYTHING FURNISHED OR INSTALLED BY THIS CONTRACT, WHETHER INDICATED OR NOT ON THE ELECTRICAL DRAWINGS.
14. TRACE AND IDENTIFY ALL EXISTING CIRCUITS AND CABLES TO REMAIN PRIOR TO ANY WORK.
15. PROTECT ANY OTHER EXISTING CABLES WITHIN THE DUCT AND PULLBOX SYSTEM. TYPICAL FOR ALL MANHOLES, HANDHOLES, AND PULLBOXES.

3 ONE-LINE DIAGRAM NOTES

SCALE: NONE

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AT SALADO CREEK

ELECTRICAL DETAILS

SHEET 3 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		240
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.

2. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.

3. Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is ½ in. or less in diameter.

4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.

5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.

6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.

2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.

3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.

5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.

6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.

7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.

9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.

10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.

2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.

3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.

4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.

5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."

6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.

7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.

8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.

9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.

10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.

11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.

12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).

13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.

14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

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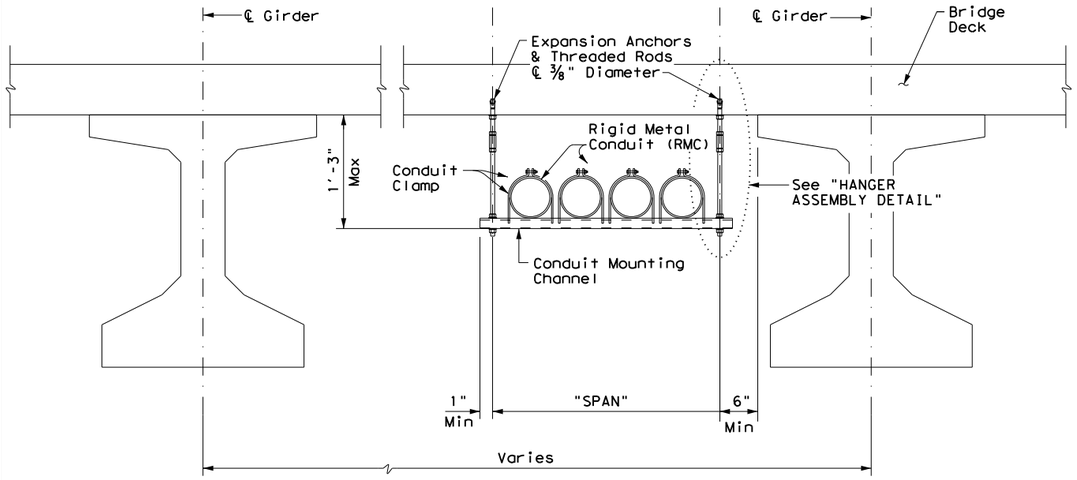
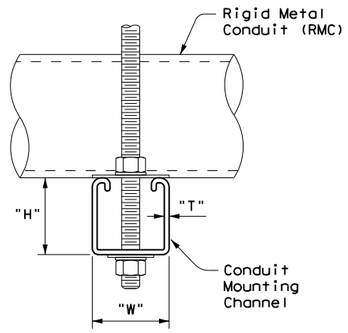
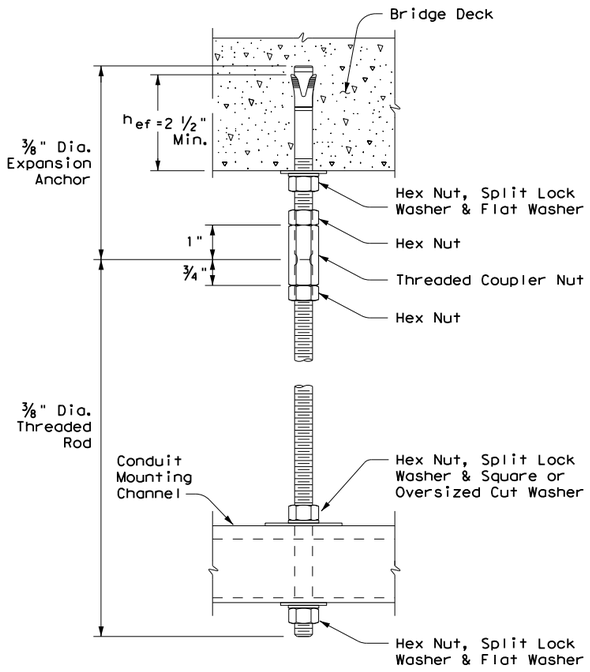


CONDUIT HANGING DETAIL

CONDUIT MOUNTING CHANNEL		
"SPAN"	"W" x "H"	"T"
less than 2'	1 5/8" x 1 3/8"	12 Ga.
2'-0" to 2'-6"	1 5/8" x 1 5/8"	12 Ga.
>2'-6" to 3'-0"	1 5/8" x 2 7/16"	12 Ga.

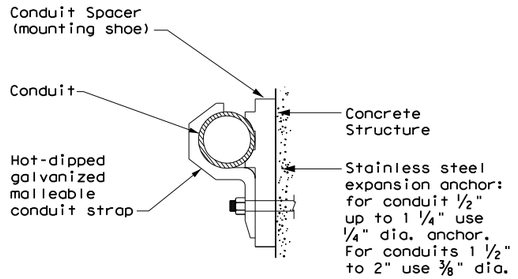
Channels with round or short slotted hole patterns are allowed, if the load carrying capacity is not reduced by more than 15%.

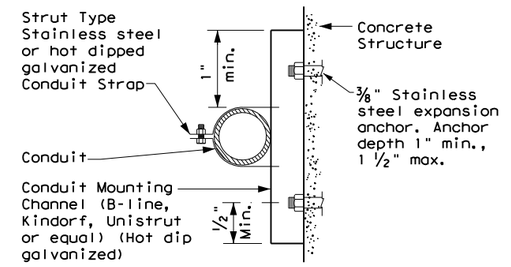




HANGER ASSEMBLY DETAIL

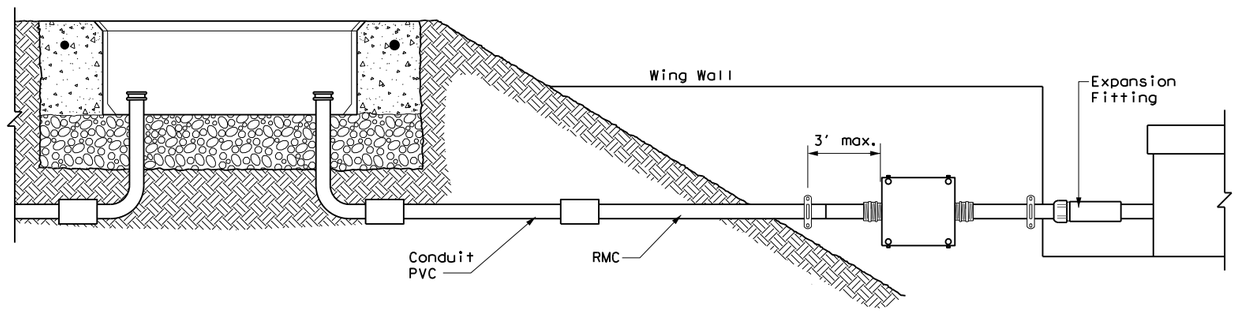
ELECTRIC CONDUIT TO BRIDGE DECK ATTACHMENT





CONDUIT MOUNTING OPTIONS

Attachment to concrete surfaces
See ED(1)B.2



TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL

EXPANSION ANCHOR NOTES FOR BRIDGE DECK ATTACHMENT

1. Use torque controlled mechanical expansion anchors that are approved for use in cracked concrete by the International Code Council, Evaluation Service (ICC-ES). The chosen anchor product shall have a designated ICC-ES Evaluation Report number, and its approval status shall be maintained on the ICC-ES website under Division 031600 for Concrete Anchors.
2. Unless otherwise approved by the Engineer: do not use adhesive anchors; do not use expansion anchors that are not included in the ICC-ES approval list; and do not use expansion anchors that are only approved for use in uncracked concrete.
3. Use anchors manufactured with stainless steel expansion wedges. Anchors manufactured with carbon steel expansion wedges are not allowed. Anchor bodies can be either zinc-plated carbon steel or stainless steel. For application in marine environment, both the anchor body and expansion wedge shall be stainless steel.
4. Install anchors as shown on the plans and in accordance with the anchor manufacturer's published installation instructions. Arrange a field demonstration test to evaluate the procedures and tools. The test shall be witnessed and approved by the Engineer prior to furnishing anchors on the structure.
5. Prior to hole drilling, use rebar locator to ensure clearing of existing deck strands or reinforcement. Install anchors to ensure a minimum effective embedment depth, (h_{ef}), as shown. Increase (h_{ef}) as needed to ensure sufficient thread length for proper torqueing and tightening of anchors.
6. Use anchors of minimum 1600 Lbs tensile capacity (minimum of steel, concrete breakout, and concrete pullout strengths as determined by ACI 318 Appendix D) at the required minimum embedment depth (h_{ef}). No lateral loads shall be introduced after conduit installation.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
CONDUIT SUPPORTS

ED(2)-14

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ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS)11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.

2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.

3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.

4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.

2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.

3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned, or overheated, is considered defective and must be replaced.

4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.

5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.

6. Support conductors in illumination poles with a J-hook at the top of the pole.

7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.

8. Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.

9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.

10. Do not terminate more than one conductor under a single connector, unless the connector is rated for multiple conductors. Do not exceed the pressure connector's listing for maximum number and size of conductors allowed.

11. Install breakaway connectors on conductors bid under Item 620 whenever those conductors pass through a breakaway support device. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.

12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.

2. Provide a ground fault circuit interrupter (GFCI) for power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.

3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.

4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. Where installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.

5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in specific locations including electrical service, see individual plan sheets.

B. CONSTRUCTION METHODS

1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.

2. Do not place ground rods in the same drilled hole as a timber pole.

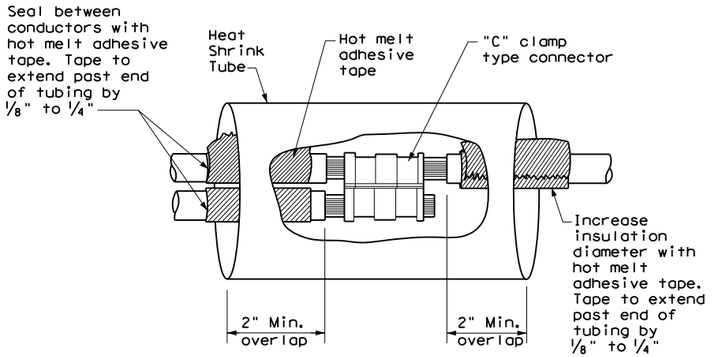
3. Install ground rods so the imprinted part number is at the upper end of the rod.

4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.

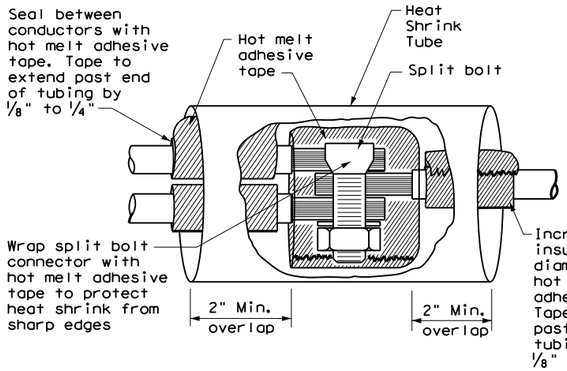
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding type bushing and properly sized bonding jumper on each end of the metal conduit.

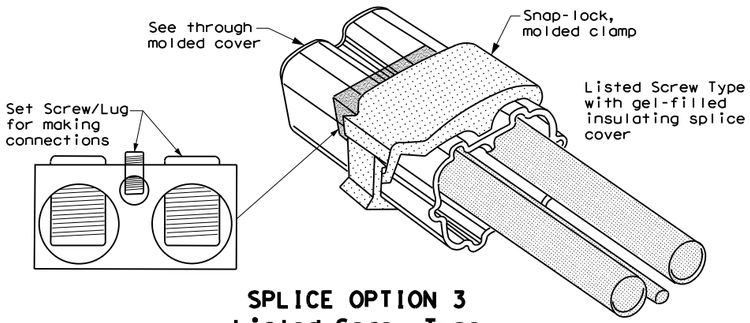
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type



SPLICE OPTION 3
Listed Screw Type

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Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUCTORS

ED(3)-14

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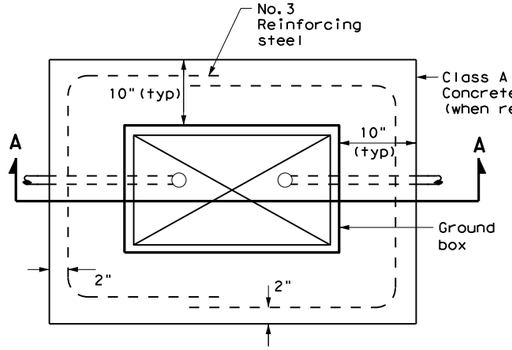
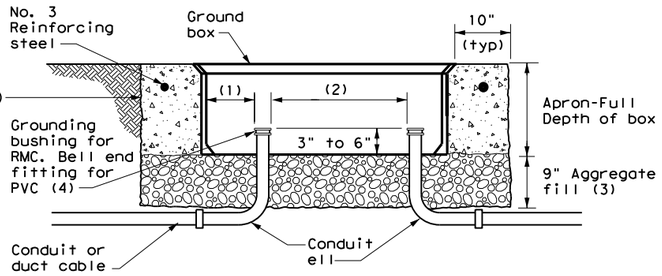


PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

(1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.

(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

(3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.

(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2

GROUND BOXES

A. MATERIALS

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."

2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.

3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.

4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.

2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.

3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.

4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.

5. Temporarily seal all conduits in the ground box until conductors are installed.

6. Permanently seal conduits immediately after the completion of conductor installation and pull tests. Permanently seal the ends of all conduits with duct seal, expandable foam, or other method as approved. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a sealant.

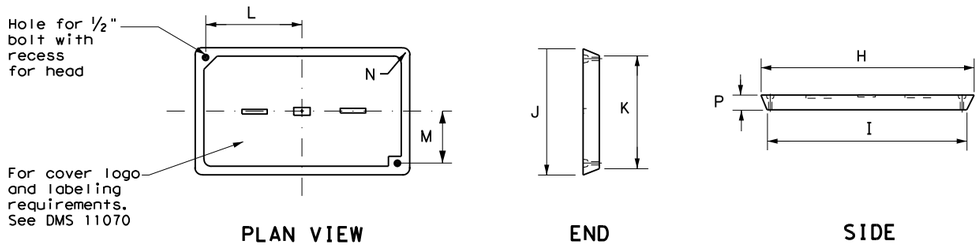
7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.

8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.

9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.

10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.

11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.



PLAN VIEW | END | SIDE

GROUND BOX COVER

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS GROUND BOXES

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ELECTRICAL SERVICES NOTES

1. Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.

2. Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services,"DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.

3. Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.

4. Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.

5. The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.

6. Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.

7. When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.

8. Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.

9. All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.

10. Provide rigid metal conduit (RMC) for all conduits on service, except for the ½ in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.

11. Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.

12. Ensure all mounting hardware and installation details of services conform to utility company specifications.

13. For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.

14. When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.

15. Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

SERVICE ASSEMBLY ENCLOSURE

1. Provide threaded hub for all conduit entries into the top of enclosure.

2. Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photocell or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.

3. Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.

4. Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

1. Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.

2. When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

PHOTOELECTRIC CONTROL

1. Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

*ELECTRICAL SERVICE DATA

Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 ¼"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
							30		Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 ¼"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.

** Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National ELectrical Code.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X XXX/XXX XXX (XX) XX (X) XX (X)

Schematic Type

Service Voltage V / V

Disconnect Amp Rating
000 indicates main lug only/
Typically Type T

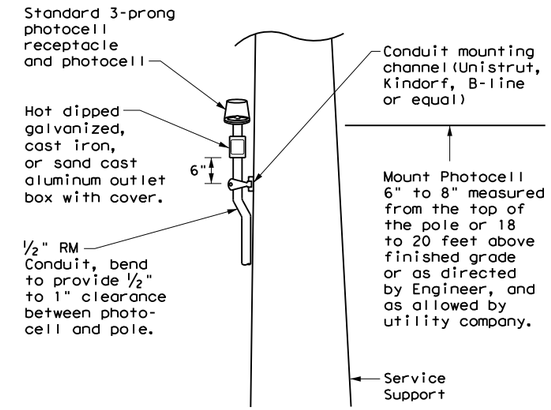
(SS)= Safety Switch Ahead of Meter-Check with Utility
(NS)= No safety Switch Ahead of Meter-Check with Utility

Enclosure Type
GS= Galvanized steel("off the shelf")
SS= Stainless steel(Custom Enclosure)See MPL
AL= Aluminum (Custom Enclosure)See MPL

Photocell Mounting Location
(E)= Inside Service/Enclosure Mounted
(T)= Top of pole
(L)= Luminaire mounted
(N)= None/No Photocell or Lighting Contactor Required

Service Support Type
GC= Granite concrete
OC= Other concrete
TP= Timber pole
SP= Steel pole
SF= Steel frame
OT= Pole by others or paid for separately
EX= Existing pole
TS= Service on traffic signal pole
PS= Pedestal Service

O= Overhead Service Feed from Utility
U= Underground Service Feed from Utility



TOP MOUNTED PHOTOCELL

Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE NOTES & DATA

ED(5)-14

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©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
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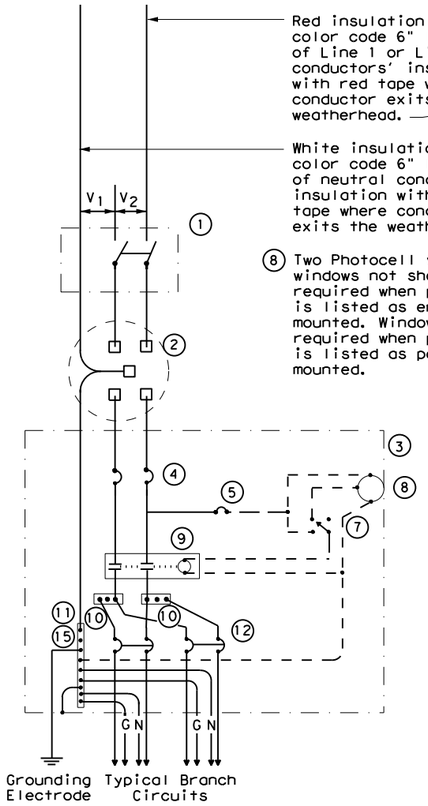
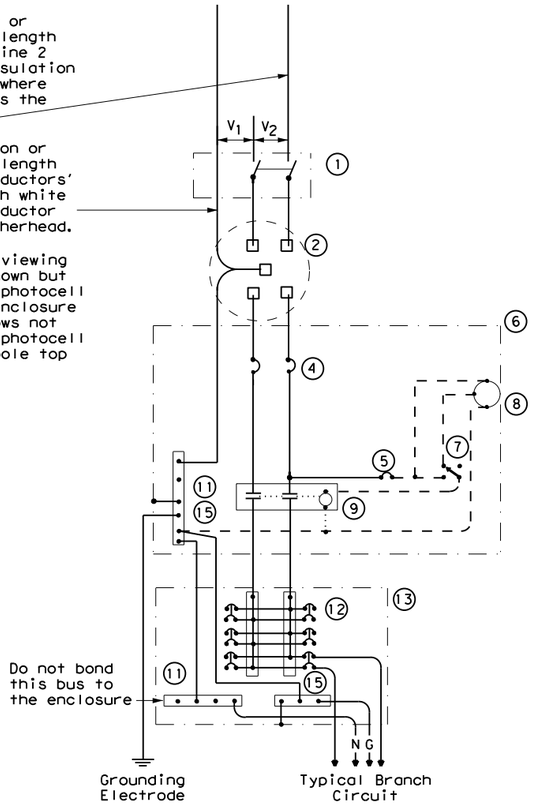
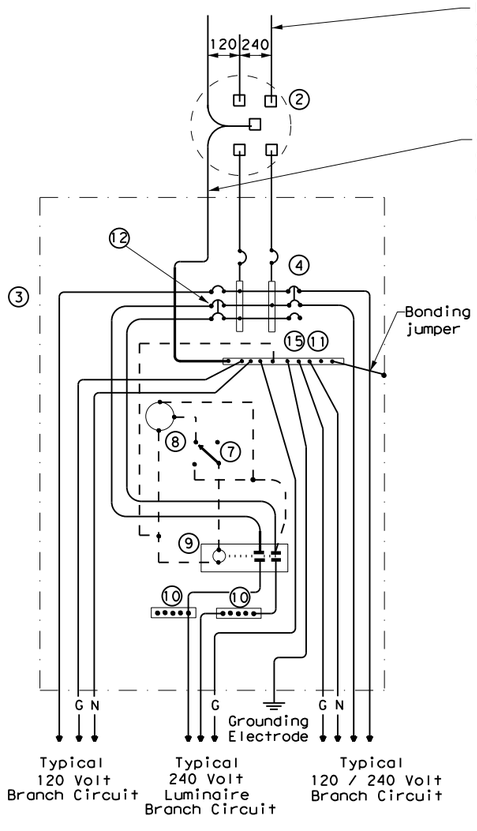


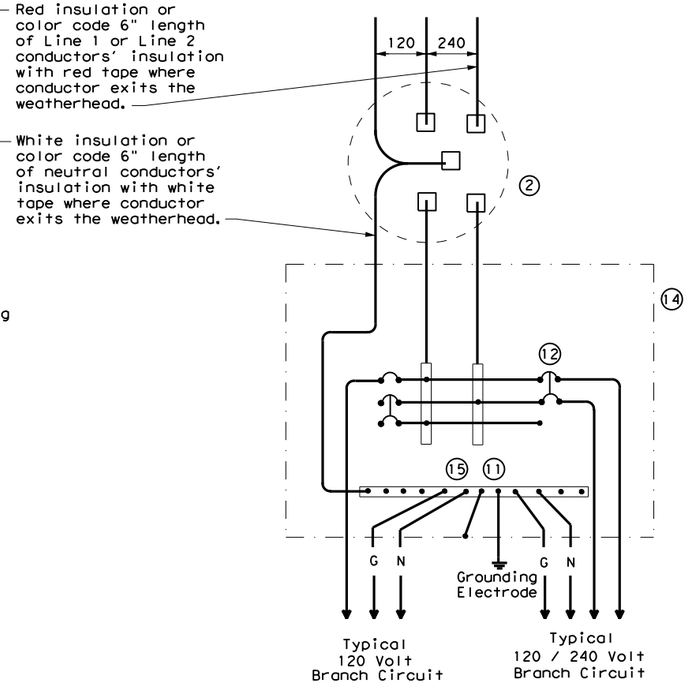
SCHEMATIC TYPE A
THREE WIRE



SCHEMATIC TYPE C
THREE WIRE



SCHEMATIC TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE



SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE

Galvanized steel-"Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

WIRING LEGEND	
———	Power Wiring
- - - -	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required

SCHEMATIC LEGEND	
1	Safety Switch (when required)
2	Meter (when required-verify with electric utility provider)
3	Service Assembly Enclosure
4	Main Disconnect Breaker (See Electrical Service Data)
5	Circuit Breaker, 15 Amp (Control Circuit)
6	Auxiliary Enclosure
7	Control Station ("H-O-A" Switch)
8	Photo Electric Control (enclosure-mounted shown)
9	Lighting Contactor
10	Power Distribution Terminal Blocks
11	Neutral Bus
12	Branch Circuit Breaker (See Electrical Service Data)
13	Separate Circuit Breaker Panelboard
14	Load Center
15	Ground Bus

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES

ED(6)-14

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PEDESTAL SERVICE NOTES

1. Manufacture pedestal electrical services in accordance with Departmental Material Specifications (DMS)11080 "Electrical Services", 11085 "Electrical Services-Pedestal (PS)" and Item 628 "Electrical Services. "Provide pedestal electrical services as listed on the Material Producers list (MPL) on the Department's web site under "Roadway Illumination and Electrical Supplies," Item 628. Ensure all mounting hardware and installation details of services meet utility company specifications. Contact the local utility company for approval of pedestal details prior to installing the electrical pedestal service. Submit any changes required by the utility company prior to manufacturing the pedestal enclosure.

2. When a meter socket is required, provide a socket with a minimum 100 amp rating that complies with local utility requirements.

3. Provide Class A or C concrete for pedestal service foundations in accordance with Item 420, "Concrete Substructures," except that concrete will not be paid for directly but is considered subsidiary to Item 628.

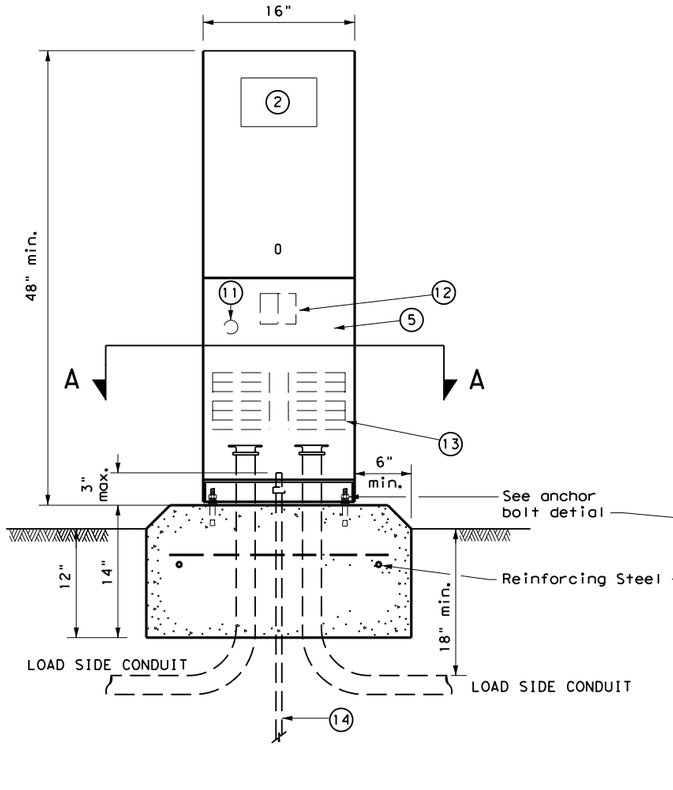
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."

5. Install ½ in. X 2 ⅛ in. minimum length concrete single expansion type anchors for mounting pedestal enclosure to foundation. Anchor location to match mounting holes in each corner of enclosure. Secure each of the four corners of the pedestal enclosure to the anchors in the foundation with a ½ in. galvanized or stainless steel machine thread bolt, a properly sized locknut and a flat washer.

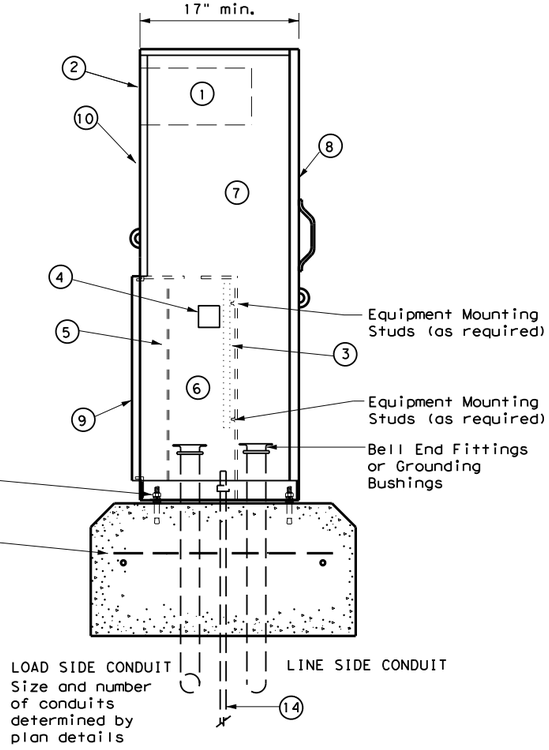
6. Finish top of concrete foundation in a neat and workmanlike manner. If leveling washers are used, ensure no more than ⅛ in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of ⅛ in. per foot. When properly installed, ensure the top of the service enclosure is level front to back and side to side within ¼ in. Repair rocking or movement of the service enclosure at no additional cost to the department.

7. Do not use liquidtight flexible metal conduit (LFMC) on pedestal type services.

8. Ensure all elbows in the foundation are sized as per utility provider's conduit requirements for underground conduit and feeders. PVC extensions may be installed provided the ends of the rigid metal conduits are more than 2 in. below the top of the concrete foundation. Where extension conduits are metal, grounding bushings must be installed with a bonding jumper properly terminated.

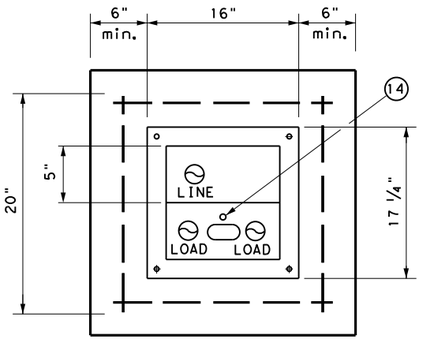


FRONT VIEW

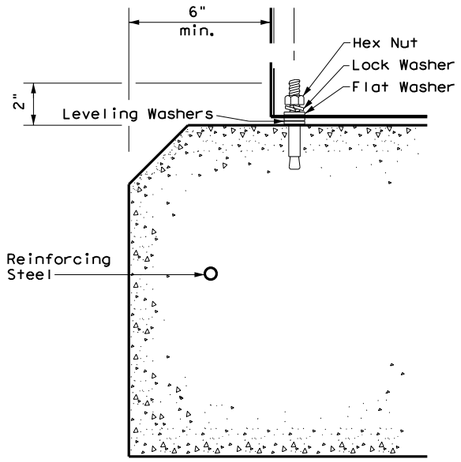


SIDE VIEW

TYPE C shown, TYPE A similar except that TYPE A shall have individual circuit breakers (CB) mounted on an equipment mounting panel. CB Handles shall protrude through hinged deadfront trim.



SECTION A-A



ANCHOR BOLT DETAIL

LEGEND	
1	Meter Socket, (when required)
2	Meter Socket Window, (when required)
3	Equipment Mounting Panel
4	Photo Electric Control Window, (When required)
5	Hinged Deadfront Trim
6	Load Side Conduit Trim
7	Line Side Conduit Area
8	Utility Access Door, with handle
9	Pedestal Door
10	Hinged Meter Access
11	Control Station (H-O-A Switch)
12	Main Disconnect
13	Branch Circuit Breakers
14	Copper Clad Ground Rod - 5/8" X 10'

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
ELECTRICAL SERVICE SUPPORT
PEDESTAL SERVICE TYPE PS

ED(9)-14

FILE: ed9-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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DUCT CABLE & HDPE CONDUIT NOTES

1. Provide duct cable in accordance with Departmental Material Specification (DMS) 11060 "Duct Cable" and Item 622 "Duct Cable." Provide duct cable as listed on the Material Producer List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 622.

2. Provide High-Density Polyethylene (HDPE) conduit in accordance with DMS 11060 and Item 618, "Conduit." Provide HDPE as listed on the MPL on the Department web site under "Roadway Illumination and Electrical Supplies," Item 618.

3. Supply duct cable with a minimum 2 in. diameter, unless otherwise shown in the plans. Provide duct cable and HDPE conduit as shown by descriptive code or on the plans. Bend duct cable and HDPE conduit as recommended by the manufacturer, with a minimum bending radius of 26 in. for 2 in. duct. Follow manufacturers' recommendations when handling duct cable and HDPE conduit reels and during installation of duct cable and HDPE conduit.

4. Do not splice conductors within duct cable or HDPE conduit. Couple duct cable and HDPE entering a ground box or foundation to a PVC elbow. When galvanized steel RMC elbows are called for in the plans and any portion of the RMC elbow is buried less than 18" from possible contact, ground the RMC elbow.

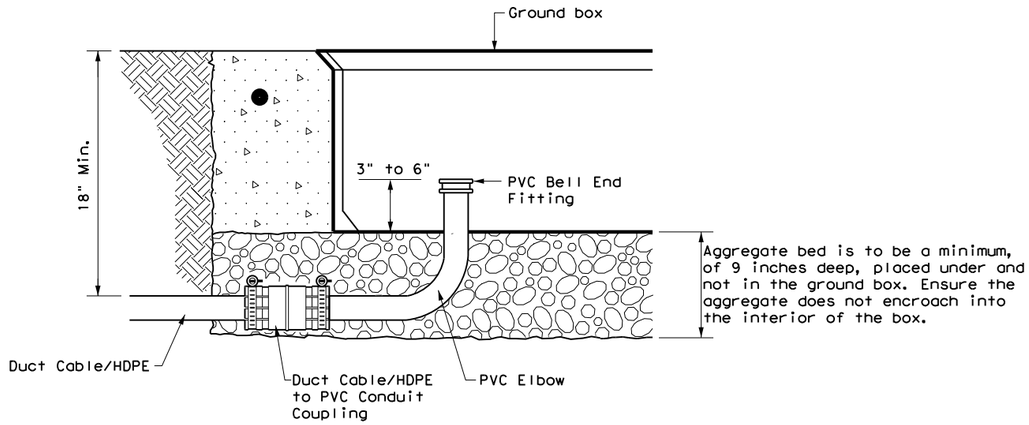
5. Furnish and install duct cable with factory installed conductors, sized as shown in the plans and as required by the National Electrical Code (NEC). The NEC contains specific requirements for duct cable in Article, "Nonmetallic Underground Conduit with Conductors: Type NUCC."

6. When conduit casing is called for in the plans, extend duct cable or HDPE conduit through the conduit casing in one continuous length without connection to the casing.

7. Seal the ends of duct cable or HDPE conduit with duct seal, expandable foam, or other approved method after completing the pull tests required by Item 622.

8. Provide minimum cover of 24 in. under roadways, 18 in. in other locations, or as shown on the plans.

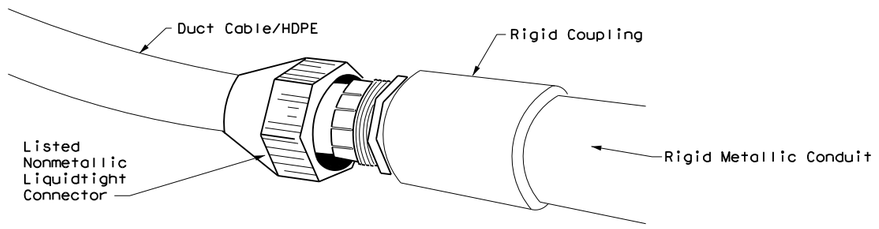
9. Furnish and install listed fittings to couple duct cable or HDPE conduit to other types of conduit. Duct cable and HDPE conduit may be field-threaded and spliced with PVC or RMC threaded couplings; connected with listed tie-wrap fittings; connected using listed coupling made of HDPE with stainless steel external banding clamps and locking rings; connected with approved electrofusion conduit couplings; or connected using an approved chemical fusion method using an epoxy or adhesive specifically designed for HDPE couplings and connectors all installed in accordance with their manufacturer's instructions. Do not use PVC glue on HDPE. Do not use water pipe fittings, or connect conduit with heat shrink tubing.



DUCT CABLE/HDPE AT GROUND BOX

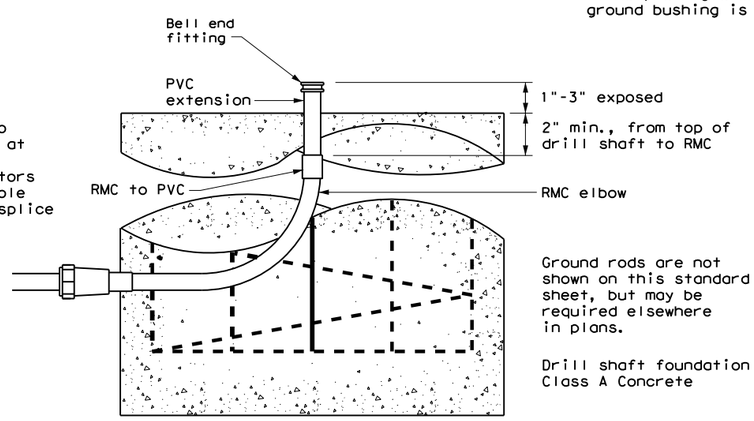
When the upper end of an RMC Ell does not enter the ground box, it may be extended with a SCH-40 PVC conduit nipple and bell end, provided there is a minimum of 18" of cover over all parts of the elbow. If not, a rigid extension and ground bushing is required.

DUCT CABLE/HDPE TO PVC

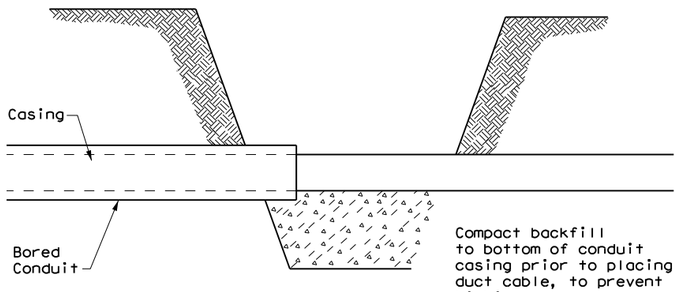


DUCT CABLE/HDPE TO RMC

Couple duct to conduit elbow at foundations. Ensure conductors extend into pole base. Do not splice conductors in conduit.



DUCT CABLE / HDPE AT FOUNDATION



BORE PIT DETAIL

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
DUCT CABLE/ HDPE CONDUIT

ED(11)-14

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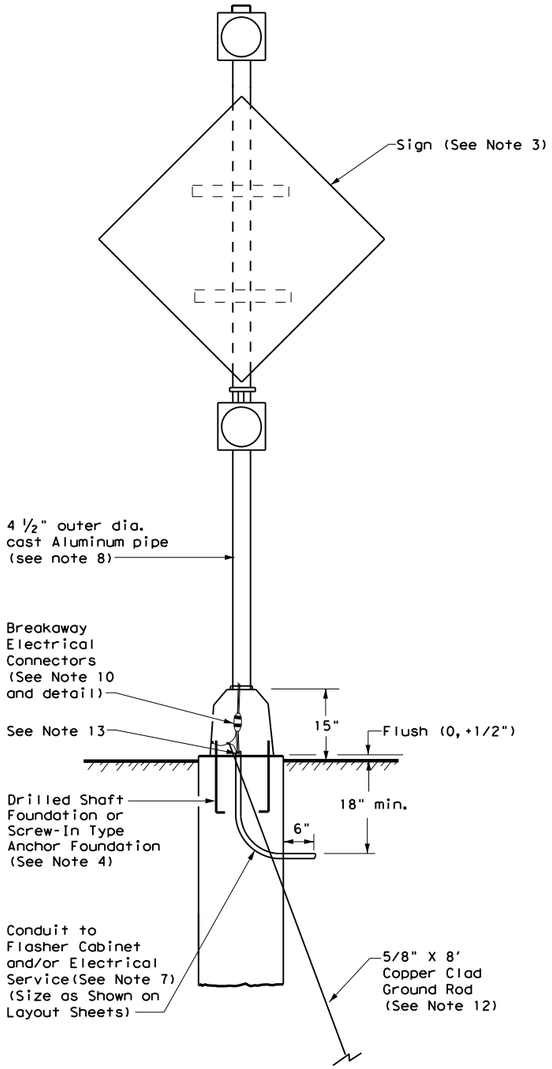
GENERAL NOTES:

1. Details show a typical warning sign with two flashing beacon heads, other arrangements are possible. When only one beacon is required, install the upper beacon.
2. See Item 685, "Roadside Flashing Beacon Assemblies" for further requirements.
3. See SMD standard sheets for lateral and vertical clearances and sign mounting details. Install signs as shown on the sign layout sheets.
4. Use either a Screw-In Type Anchor Foundation or a Drilled Shaft Foundation as shown elsewhere in the plans. When plans require a Drilled Shaft Foundation, see standard sheet TS-FD. Install the Screw-In Type Anchor Foundation as per manufacturer's recommendations. On a slope, install one edge at ground level. Screw-In/Drilled Shaft Foundation is subsidiary to Item 685. Installation of a ground rod is not required for solar powered flashing beacon assemblies.
5. When used, provide Screw-In Type Anchor Foundations as shown on TxDOT's Material Producer List (MPL) in the file "Highway Traffic Signals".
6. Install beacon heads as shown here, as shown elsewhere on the plans, or as directed. Use hardware specifically designed for mounting beacon heads on poles.
7. Conduit in foundation and within 6 in. of foundation is subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies."
8. Unless otherwise shown on the plans, pole shaft shall be one piece, Schedule 40 Aluminum pipe, ASTM B429 or B221 (Alloy 6061-T6 only). Aluminum conduit will not develop the necessary strength and will not be allowed.
9. Per manufacturer's recommendations, engage all threads on the pedestal pole base and pipe unless the pipe is fully seated into base. In high winds, use a pole and base collar assembly to add strength and prevent loosening of connection.
10. Provide single pole non-fused watertight breakaway electrical connectors for frangible pedestal pole bases, as shown on TxDOT's MPL in the file "Roadway Illumination and Electrical Supplies." Approved models are listed under Item 685. For ungrounded (hot) conductors, install a breakaway connector with a dummy fuse slug). For grounded (neutral) conductors, install a breakaway connector with a white colored marking and a permanently installed dummy fuse (slug).
11. Provide clearance as shown above the sidewalk or pavement grade at the edge of the road. When a bottom beacon is not used, mount the bottom of the sign at least 7 ft. above the sidewalk or pavement grade at the edge of the road.
12. Make connections to ground rods according to NEC. Ground rod clamps shall be listed for their intended purpose.
13. Ensure height of conduit and ground rod is below top of anchor bolts.



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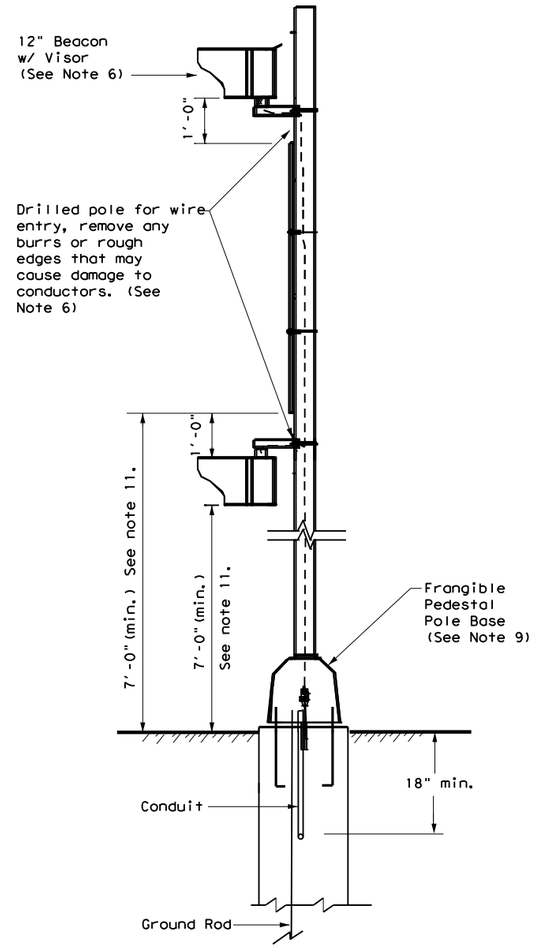

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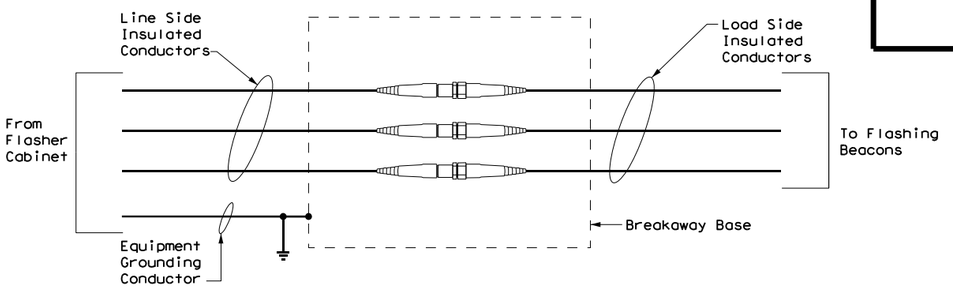
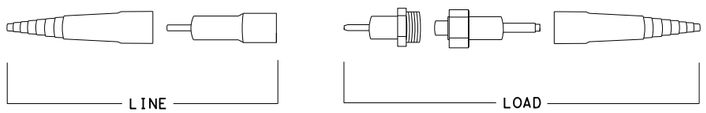


NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS



NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS
EXPLODED VIEW

Texas Department of Transportation

Traffic Operations Division Standard

ROADSIDE FLASHING BEACON ASSEMBLY

RFBA-13

FILE: rfba-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS 5-93 12-04 10-93 3-13 4-98	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		249

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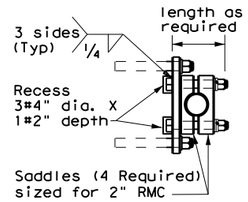
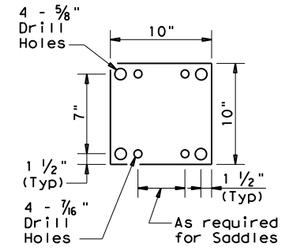
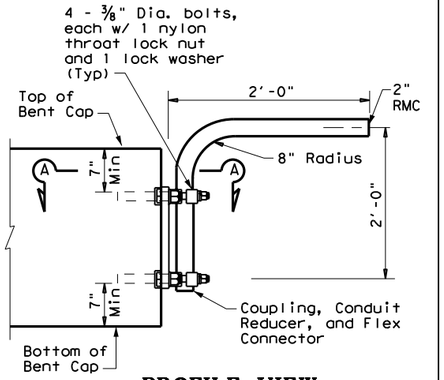


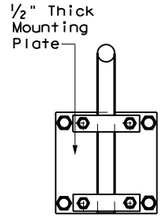
SECTION A-A



MOUNTING PLATE
(ASTM A-36 or better)

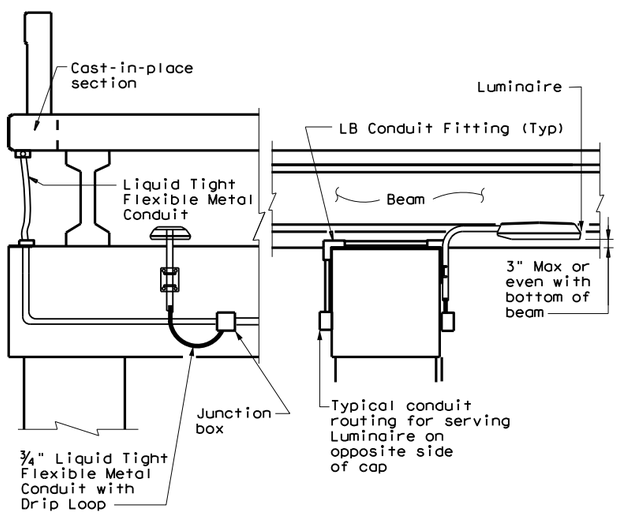


PROFILE VIEW
Or as Required
(See Note A.3)



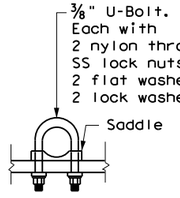
END VIEW

UNDERPASS LIGHTING ARM

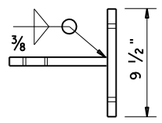


IN RD IL AM (U/P)(TY 1)
If bridge has pre-cast panels under deck, run circuit under deck edge.

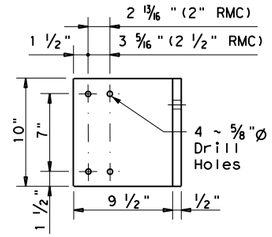
UNDERPASS LIGHTING TYPE 1



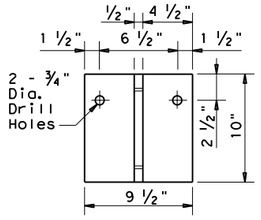
CLAMP DETAIL
(2 Req'd)



PLAN VIEW

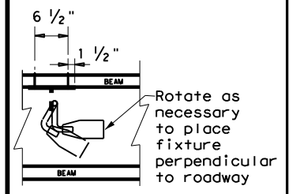


FRONT



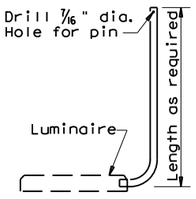
SIDE

BRACKET DETAIL
Make from 1/2" plate (ASTM A-36 or better)

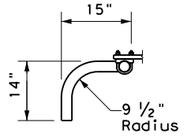


PLAN VIEW

FIXTURE ORIENTATION

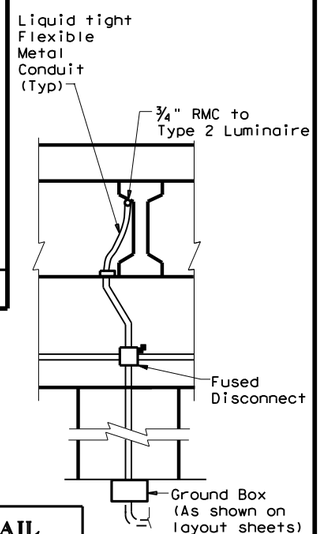


SIDE



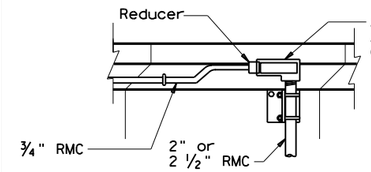
PLAN VIEW

ARM DETAIL



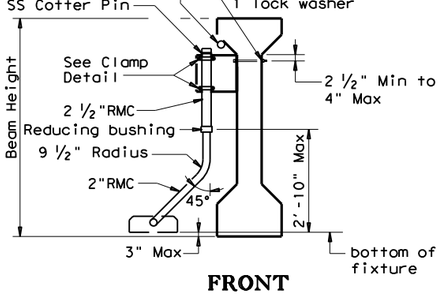
3 - No. 12 XHHW in 3/4" RMC for Branch Circuit runs from fused disconnect to underpass Luminaires

CONDUIT DETAIL



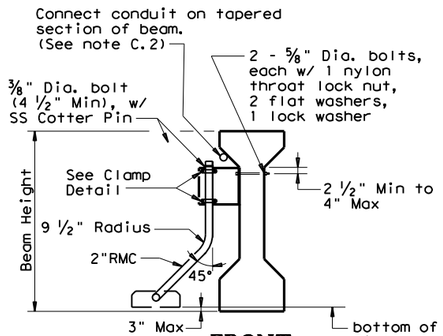
CONDUIT CONNECTION PROFILE

Connect conduit on tapered section of beam. (See note C.2)



FRONT
(Beam height greater than 54")

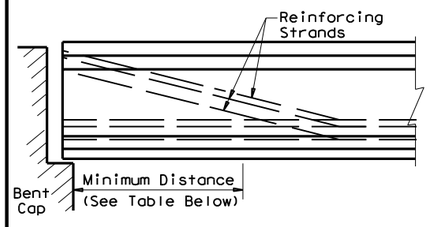
Connect conduit on tapered section of beam. (See note C.2)



FRONT
(Beam height equal to or less than 54")

IN RD IL AM (U/P)(TY 2)

UNDERPASS LIGHTING TYPE 2



LOCATION OF UNDERPASS LIGHT MOUNTING BRACKET

TABLE 5

LOCATION OF UNDERPASS LIGHT MOUNTING BRACKET TABLE

SPAN LENGTH	MINIMUM DISTANCE
≤ 50'	10'-0"
50' - 70'	15'-0"
70' - 90'	20'-0"
> 90'	25'-0"

GENERAL NOTES:

A. ALL 150 watt HPS and 150 watt equivalent LED Luminaires

1. Luminaire locations, conduit and conductor sizes and routing are typical and diagrammatic only. See project layout sheets for specific details.
2. Conduit will be paid for under Item 618, "Conduit" and conductors will be paid for under Item 620, "Electrical Conductors," unless otherwise shown on the plans.
3. Adjust conduit in saddles to place fixture height and orientation as required. See fixture orientation detail and plans. Where practicable, place luminaires so the bottom of luminaire is above the bottom of the beam, maximum of 3 in. (See detail UNDERPASS LIGHTING ARM TYPE 2)
4. Except as noted, galvanize all structural steel and exposed bolts, nuts, and washers in accordance with Item 445 "Galvanizing".
5. Fabrication of brackets and support arms will not be paid for directly but is subsidiary to Item 610, "Roadway Illumination Assemblies."
6. Install a heavy duty NEMA 3R fused disconnect or breaker enclosure rated at 30 amps and 480 volts to switch underpass luminaires as shown on plans, with at least one per bridge circuit. Install 20 amp time-delay fuses or inverse-time circuit breakers. Mount disconnect or breaker enclosure 10 ft.(min) above grade on columns or bent caps as approved by the Department. Modify disconnect to allow padlocking in the "ON" and "OFF" positions. Padlocks and disconnect switches or circuit breakers for underpass fixtures will not be paid for directly but are subsidiary to the various bid items of the contract.
7. Conduit on columns, caps, and slab is shown surface mounted. For new columns and caps, embed PVC conduit in concrete. Bond and ground metal junction boxes and conduit.

B. TYPE 1

1. Provide 2 in. rigid metal conduit (2.375" O.D., 0.146" wall) for Type 1 arm shaft.
2. Use 3/8 in. stainless steel bolt or stud non-epoxy type expansion anchors for concrete for Type 1 mounting. Except as noted, provide an allowable 2650 lbs minimum pull-out force (after consideration of adjustment factors for edge distance and bolt spacing) for each anchor. Install each anchor to the embedment depth recommended by the manufacturer.
3. Attach conduit to plate with 4 saddles, four - 3/8 in. diameter bolts, nylon throat lock nuts, and lock washers.

C. TYPE 2

1. Provide 2 in. rigid metal conduit (2.375" O.D., 0.146" wall) or provide a combination of 2 1/2 in. (2.875" O.D., 0.193" wall) and 2 in. (2.375" O.D., 0.146" wall) rigid metal conduits with a reducing bushing as beam height stipulated for Type 2 arm shaft. Field cutting and threading will be permitted. Paint cut and threaded areas with zinc rich paint after conduit is connected to adjacent fitting.
2. Connecting conduit may be strapped to tapered section only of precast beams as shown. Anchor as approved by the Engineer. Maximum anchor depth is 1 in.
3. Indiscriminate drilling into precast concrete beams may result in reduced beam strength. Use drilling location and method as directed by the Engineer. See Location of Underpass Lighting Mounting Bracket detail. The locations shown in the table are such that reinforcing strands will not be damaged.

Texas Department of Transportation

Traffic Operations Division Standard

ROADWAY ILLUMINATION DETAILS

(UNDERPASS LIGHT FIXTURES)

RID(3)-17

FILE: rid3-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 2013	CONT	SECT	JOB	HIGHWAY
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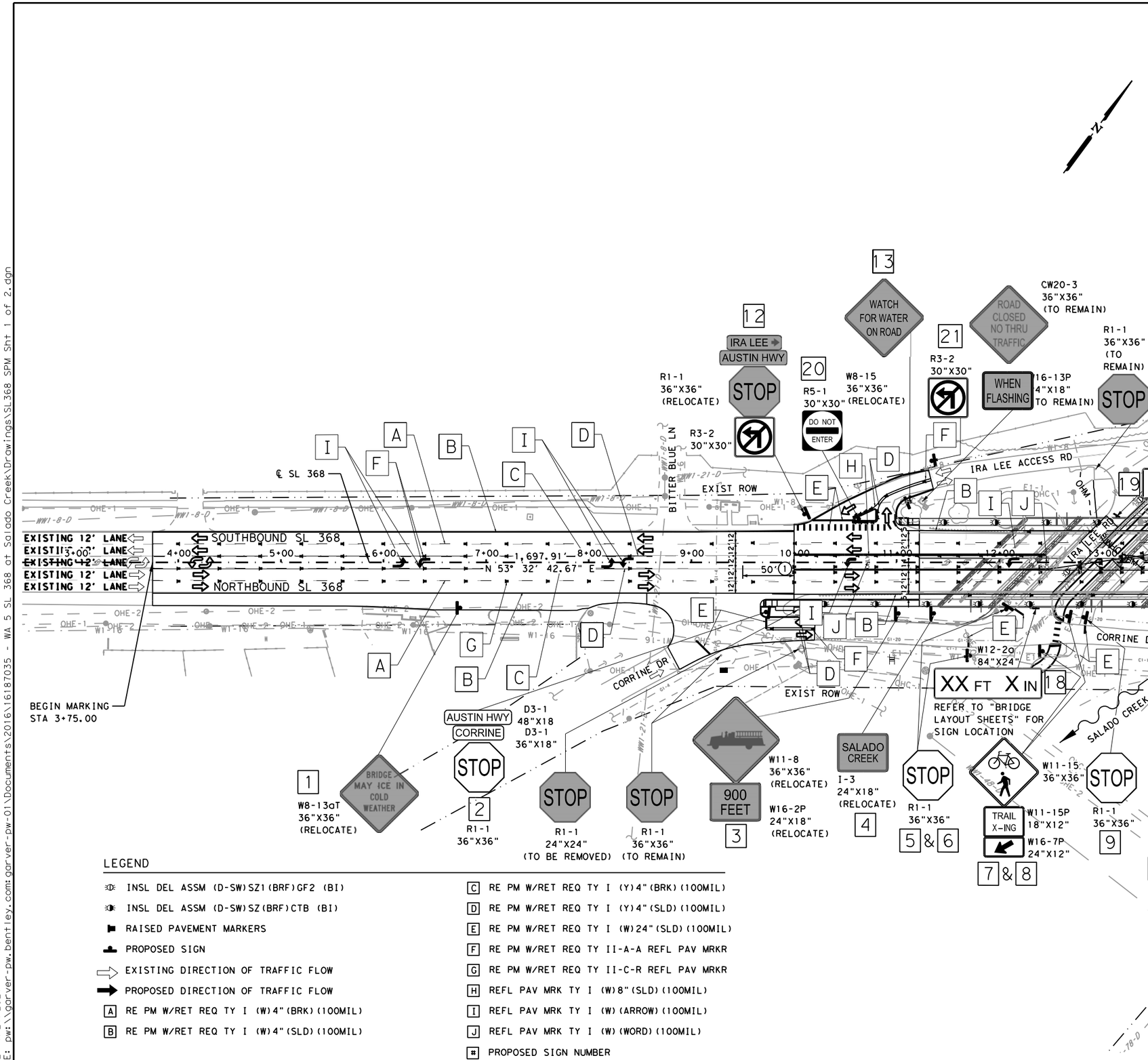
2-14	DIST	COUNTY		SHEET NO.
7-17	SAT	BEXAR		250

72C



LEGEND

- INSL DEL ASSM (D-SW)SZ1(BRF)GF2 (BI)
- INSL DEL ASSM (D-SW)SZ(BRF)CTB (BI)
- RAISED PAVEMENT MARKERS
- PROPOSED SIGN
- EXISTING DIRECTION OF TRAFFIC FLOW
- PROPOSED DIRECTION OF TRAFFIC FLOW
- [A] RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)
- [B] RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)
- [C] RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)
- [D] RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)
- [E] RE PM W/RET REQ TY I (W)24"(SLD)(100MIL)
- [F] RE PM W/RET REQ TY II-A-A REFL PAV MRKR
- [G] RE PM W/RET REQ TY II-C-R REFL PAV MRKR
- [H] REFL PAV MRK TY I (W)8"(SLD)(100MIL)
- [I] REFL PAV MRK TY I (W)(ARROW)(100MIL)
- [J] REFL PAV MRK TY I (W)(WORD)(100MIL)
- [#] PROPOSED SIGN NUMBER

LEGEND	ITEM NO.	DESCRIPTION	UNIT	QTY
	644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	15
	644 6064	IN BRIDGE MNT CLEARANCE SGN ASSM (TY N)	EA	1
	644 6065	IN BRIDGE MNT CLEARANCE SGN ASSM (TY S)	EA	1
	658 6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	16
	658 6062	INSL DEL ASSM (D-SW)SZ1(BRF)GF2 (BI)	EA	4
[H]	666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	245
[E]	666 6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	105
[I]	666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	6
[J]	666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	2
	666 6224	PAVEMENT SEALER 4"	LF	7650
	666 6226	PAVEMENT SEALER 8"	LF	245
	666 6230	PAVEMENT SEALER 24"	LF	105
	666 6231	PAVEMENT SEALER (ARROW)	EA	6
	666 6232	PAVEMENT SEALER (WORD)	EA	2
[A]	666 6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	2118
[B]	666 6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	1963
[C]	666 6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	984
[D]	666 6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	2340
[F]	672 6009	REFL PAV MRKR TY II-A-A	EA	85
[G]	672 6010	REFL PAV MRKR TY II-C-R	EA	78
	678 6033	PAV SURF PREP FOR MRK (RPM)	EA	163

(1) TRANSITION CENTER LANE WIDTHS FROM 12' TO 14' BETWEEN STATIONS 10+00 AND 10+50.

NOTES:
1. SEE TXDOT STD D&OM FOR ADDITIONAL INFORMATION ON DELINEATOR PLACEMENT.
2. CTB REFLECTORS TO BE INSTALLED ALONG BRIDGE RAILS.

0 50' 100'
SCALE: 1" = 100'

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED
PROFESSIONAL ENGINEER
1/27/2021

GARVER
3755 S. Capital of Texas Highway
Suite 325
Austin, TX 78704
(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

SIGNING & PAVEMENT MARKING LAYOUT

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		251
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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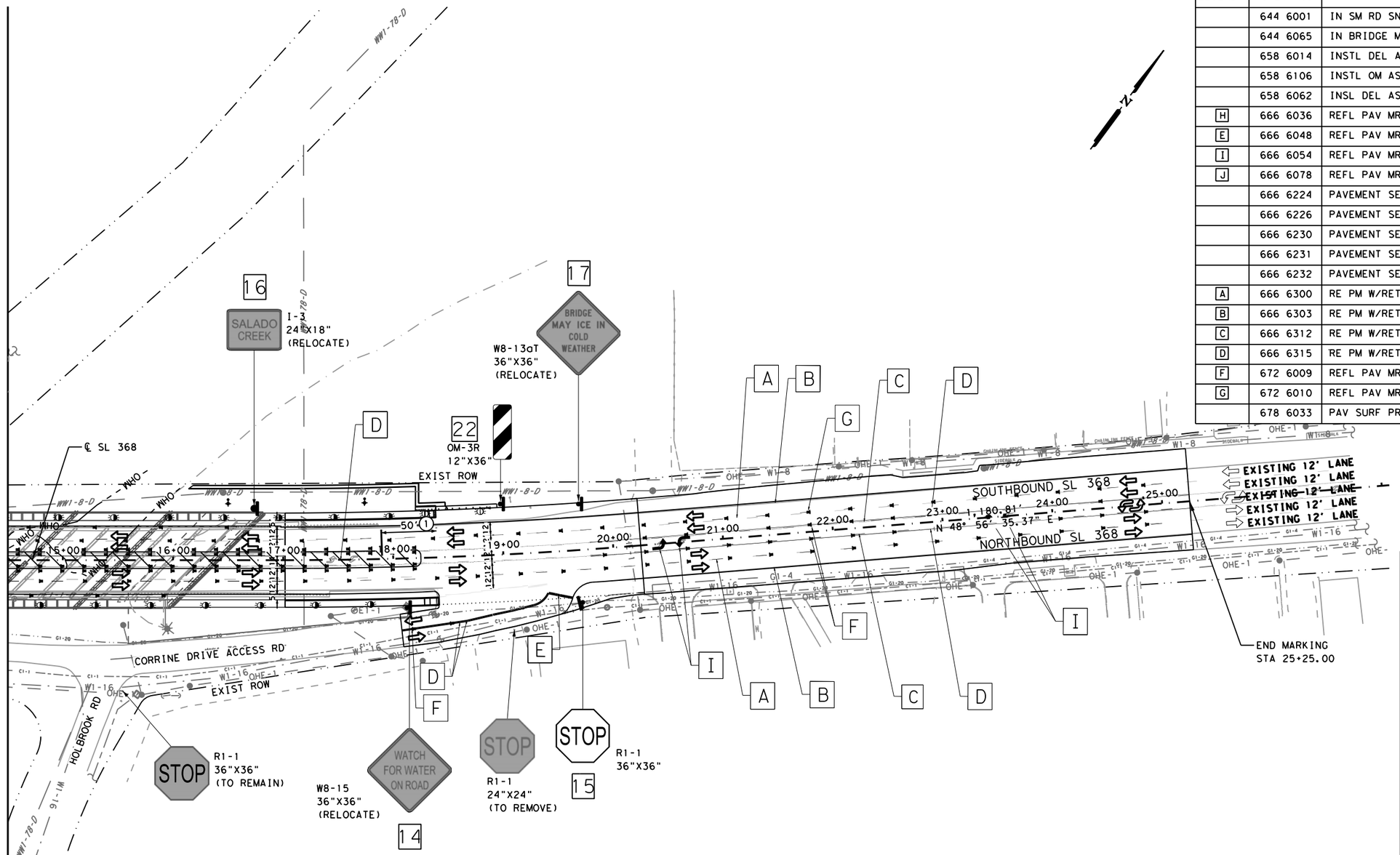

LEGEND	ITEM NO.	DESCRIPTION	UNIT	QTY
	644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	4
	644 6065	IN BRIDGE MNT CLEARANCE SGN ASSM (TY S)	EA	
	658 6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	14
	658 6106	INSTL OM ASSM (OM-3R)(WFLX)GND	EA	1
	658 6062	INSL DEL ASSM (D-SW)SZ1(BRF)GF2 (BI)	EA	2
H	666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	
E	666 6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	22
I	666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	4
J	666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	
	666 6224	PAVEMENT SEALER 4"	LF	8344
	666 6226	PAVEMENT SEALER 8"	LF	
	666 6230	PAVEMENT SEALER 24"	LF	22
	666 6231	PAVEMENT SEALER (ARROW)	EA	4
	666 6232	PAVEMENT SEALER (WORD)	EA	
A	666 6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	2150
B	666 6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	2151
C	666 6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	1313
D	666 6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	2730
F	672 6009	REFL PAV MRKR TY II-A-A	EA	85
G	672 6010	REFL PAV MRKR TY II-C-R	EA	82
	678 6033	PAV SURF PREP FOR MRK (RPM)	EA	167

① TRANSITION CENTER LANE WIDTHS FROM 14' TO 12' BETWEEN STATIONS 17+90 AND 18+40.

0 50' 100'

SCALE: 1" = 100'

LEGEND

- INSL DEL ASSM (D-SW)SZ1(BRF)GF2 (BI)
- INSL DEL ASSM (D-SW)SZ(BRF)CTB (BI)
- RAISED PAVEMENT MARKERS
- PROPOSED SIGN
- EXISTING DIRECTION OF TRAFFIC FLOW
- PROPOSED DIRECTION OF TRAFFIC FLOW
- [A] RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)
- [B] RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)
- [C] RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)
- [D] RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)
- [E] RE PM W/RET REQ TY I (W)24"(SLD)(100MIL)
- [F] RE PM W/RET REQ TY II-A-A REFL PAV MRKR
- [G] RE PM W/RET REQ TY II-C-R REFL PAV MRKR
- [H] REFL PAV MRK TY I (W)8"(SLD)(100MIL)
- [I] REFL PAV MRK TY I (W)(ARROW)(100MIL)
- [J] REFL PAV MRK TY I (W)(WORD)(100MIL)
- [#] PROPOSED SIGN NUMBER

NOTES:

1. SEE TXDOT STD D&OM FOR ADDITIONAL INFORMATION ON DELINEATOR PLACEMENT.

2. CTB REFLECTORS TO BE INSTALLED ALONG BRIDGE RAILS.

STATE OF TEXAS
GLENN G. GREGORY, JR.
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3/9/2021

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3755 S. Capital of Texas Highway
Suite 325
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(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

SIGNING & PAVEMENT MARKING LAYOUT

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		252
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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TRAFFIC SIGNAL NOTES

1. SIGNAL HEADS SHALL HAVE A MINIMUM OF 18.5 FEET CLEARANCE ABOVE ROADWAY SURFACE.
2. FURNISH VEHICLE AND PEDESTRIAN SIGNALS WITH LIGHT EMITTING DIODE (LED) SIGNAL LAMP UNITS.
3. FURNISH MOUNTING HARDWARE REQUIRED FOR ATTACHING VEHICLE SIGNAL HEADS TO THE TOP AND BOTTOM SWAY CABLES.
4. USE TYPE C HIGH SPECIFIC IINTENSITY GRADE SHEETING FOR SIGNS MOUNTED UNDER OR ADJACENT TO THE SIGNAL HEADS.
5. ROUTE CABLE FOR LUMINAIRES (#12/4C TRAY CABLE) TO THE SERVICE ENCLOSURE. SEE ELECTRICAL DETAIL SHEETS.
6. ASSUME OWNERSHIP OF THE REMOVED EXISTING SIGNS.
7. FUNISH AND INSTALL URETHANE FOAM TO ENCLOSE THE ENDS OF ALL CONDUITS CONTAINING SINGAL CABLES AND ELECTRICAL CONDUCTORS.
8. CAP SPARE CONDUITS INSTALLED IN POLE FOUNDATIONS AND GROUND BOXES USING APPROVED CAPING DEVICES.
9. DO NOT PLACE SIGNAL HEADS OVER THE ROADWAY UNTIL ALL NECESSARY MATERIALS ARE ON HAND AS APPROVED.
10. INSTALL TOW SET SCREWS ON ALL VEHICLE SIGNAL HEAD MOUNTING HARDWARE FITTINGS.
11. INSTALL A 5/8-IN. (MINIMUM) EYE BOLT FOR THE POINT OF ATTACHMENT BELOW THE SERVICE ENTRANCE WEATHERHEAD FOR THE SERVICE DROP TO STEEL OR WOOD POLE.
12. AIM LUMINAIRE ARMS MOUNTED ON STRAIN POLES PERPENDICULAR TO THE CENTERLINE OF THE ROADWAY IT IS INTENDED TO COVER, TO DEVELOP THE PROPER ILLUMINATION PATTERN FOR THE INTERSECTION.
13. PROVIDE 250 WATT LIGHT EMITTING DIODE (LED) LAMP LUMINAIRES OPERATING AT 240 VOLTS.
14. WRAP SIGNAL HEADS WITH DARK PLASTIC OR SUITABLE MATERIAL TO CONCEAL THE SIGNAL FACES FROM THE TIME OF INSTALLATION UNTIL PLACING INTO OPERATION.
15. GROUND STEEL MAST ARM POLE ASSEMBLIES IN ACCORDANCE WITH THE REQUIREMENTS SHOWN ON THE LATEST TRAFFIC SIGNAL POLE FOUNDATION STANDARD. USE THE GROUNDING LUG ON THE POLE TO GROUND THE POLE TO THE GROUND CONDUCTORS FROM THE CONDUITS.
16. INSTALL A CLOSE NIPPLE WITH LOCK NUT AND BRUSHING (SIZE AS REQUIRED) WHERE THE CABLE ENTERS THE UPPER PORTION OF THE SIGNAL POLE.
17. REFER TO TXDOT'S WEBSITE FOR PREQUALIFIED PRODUCTS LIST REGARDING VEHICLE LED SIGNAL HEADS, SYMBOLIC TRAFFIC SIGNAL LAMP UNIT, CONDUIT, CONDUCTORS, GROUND BOXES, AND ELECTRICAL SERVICE. CHECK WEBSITE PERIODICALLY FOR CURRENT UPDATES.
18. RIGHT OF WAY, EASEMENTS, OR OTHER MATTERS OF RECORD MAY EXIST WHERE NONE ARE SHOWN.
19. THE EXISTING PAVEMENT MARKINGS, UTILITIES, AND OTHER APPURTENANCES ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR TO VERIFY LOCATION OF ADJACENT UNDERGROUND UTILITIES PRIOR TO DIGGING AND PROTECT THEM DURING CONSTRUCTION.
20. THE CONTRACTOR SHALL CONNECT ALL FIELD WIRING TO THE CONTROLLER.
21. TRAY CABLE AND ILSN CABLE SHALL BE RUN IN 2-IN. CONDUIT SEPARATE FROM THE SIGNAL CABLE.
22. MINIMUM CLEARANCE OF 10' RADIUS FROM THE NEUTRAL AND 10' RADIUS FROM PRIMARY SHALL BE MAINTAINED BETWEEN PROPOSED TRAFFIC SIGNAL EQUIPMENT. INCLUDING EXISTING OVERHEAD ELECTRICAL LINES.
23. IT IS THE INTENTION OF THESE PLANS TO PROVIDE A FULLY OPERATIONAL FLASHING BEACON. ANY ITEMS REQUIRED, BUT OMITTED, ARE THE RESPONSIBILITY OF THE CONTRACTOR AND WILL BE SUBSIDIARY TO THE PROPER BID ITEM.
24. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE ALL UTILITIES (PUBLIC AND PRIVATE) PRIOR TO COMMENCING WORK. THE CONTRACTOR IS FULLY RESONSIBLE FOR ANY DAMAGES CAUSED BY HIS FAILURE TO LOCATE, PRESERVE, AND PROTECT THESE UTILITIES, WHETHER UNDERGROUND, ABOVE GROUND, OR OVERHEAD.
25. CONTRACTOR SHALL EXERCISE CAUTION WHEN EXCAVATING IN THE VICINITY OF UNDERGROUND UTILITIES.
26. CONTRACTOR WILL NOTIFY THE STATE'S UTILITIES LOCATOR AT 800-344-8377 WITH 48 HOURS ADVANCE NOTICE PRIOR TO ANY EXCAVATION, BORING, TRENCHING, OR PUSHING PIPING IN THE AREA.
27. ALL CONSTRUCTION SIGNS AND BARRICADES WILL CONFORM TO THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND BE CONSISTENT WITH TXDOT TCP STANDARDS.
28. EXACT LOCATION OF STRAIN POLES, GROUND BOXES, AND ELECTRICAL SERVICE WILL BE DETERMINED IN THE FIELD SUBJECT TO FINAL APPROVAL BY TXDOT INSPECTOR. IT IS THE CONTRACTOR'S RESONSIBILITY TO VERIFY THE EXACT LOCATIONS FROM INSPECTING ENGINEER, PRIOR TO CONSTRUCTION.
29. ALL CONDUITS IN NATURAL GROUND WILL BE TRENCHED AND BURIED. THE CONTRACTOR WILL BACKFILL, COMPACT, AND RESTORE TRENCH AREA TO ORIGINAL CONDITIONS AND MATCH EXISTING SURFACE CONDITIONS TO THE DENSITY OF THE ADJACENT AREA.
30. ALL CONDUITS UNDER ROADWAYS AND PAVED SHOULDERS WILL BE BORED.
31. ALL PVC CONDUIT WILL BE SCHEDULE 80.
32. ALL POLES AND GROUND BOXES WILL BE GROUNDED.
33. ALL DRILL SHAFT LOCATIONS ARE APPROXIMATE AND WILL BE FIELD VERIFIED PRIOR TO CONSTRUCTION. ANY ADJUSTMENTS WILL BE APPROVED BY THE INSPECTING ENGINEER.
34. CONTRACTOR WILL RESTORE THE CONSTRUCTION AREA TO ORIGINAL CONDITIONS PRIOR TO FINAL INSPECTION.
35. ANY EXISTING PAVEMENT, CURBS, SIDEWALKS, AND DRIVEWAYS DAMAGED OR REMOVED DURING CONSTRUCTION WILL BE REPLACED TO TXDOT STANDARDS.
36. SIGNAL HEADS WILL BE LED AND HAVE RED, YELLOW, GREEN, RED ARROW, YELLOW ARROW, GREEN ARROW, WHERE SPECIFIED INDICATORS WITH 12-IN. LENS. ALL SIGNAL HEADS WILL HAVE BLACK BACKPLATES.
37. FURNISH MATERIALS NECESSARY TO INSTALL ACCESSIBLE PEDESTRIAN SIGNAL UNITS AND SIGNS AS SHOWN IN THE PLANS.
38. CABINET ASSEMBLY SHALL BE EQUIPPED WITH A MANUAL CONTROL SWITCH AND INTERNAL ADVANCE BUTTON IN THE POLICE PANEL FOR MANUAL CONTROL OF SIGNAL.
39. TXDOT HAS THE AUTHORITY TO STOP CONSTRUCTION OF FLASHING BEACON, IF THE STATE INSPECTIONS ARE NOT BEING FOLLOWED.
40. FURNISH SYMBOL TYPE PEDESTRIAN COUNTDOWN SIGNALS. INSTALL USING MOUNTING HEIGHT IN ACORDANCE WITH THE LATEST TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
41. REPAIR OR REPLACE PAVEMENT DAMAGED BY THE CONTRACTOR'S FORCES DURING CONSTRUCTION AT NO COST TO THE DEPARTMENT.

NOTES FOR TXDOT MAINTAINED AND OPERATED SIGNALS:

1. CONTRACTOR SHALL FURNISH AND DELIVER TS TYPE 2 CONTROLLER CABINET AND ASSEMBLY TO THE TXDOT SAN ANTONIO DISTRICT SIGNAL SHOP FOR PROGRAMMING AND TESTING TWO WEEKS PRIOR TO CONTRACTOR INSTALLING EQUIPMENT IN THE FIELD. COORDINATE DROP OFF AND PICK UP WITH CRAIG WILLIAMS 210-731-5143.
2. CONTRACTOR SHALL REMOVE AN DELIVER ANY EQUIPMENT DEEMED SALVAGABLE TO TXDOT SIGNAL SHOP LOCATED AT NW LOOP 410 SAN ANTONIO, TEXAS 78229. CONTACT CRAIG WILLIAMS AT 210-731-5143.

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

1-26-2021

Texas Department of Transportation

SL 368
AT SALADO CREEK

FLASHING BEACON SIGNAL NOTES

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		253
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

ITEM NO.	DESC CODE	DESCRIPTION	UNIT	TOTAL
416	6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	13
621	6005	TRAY CABLE (4 CONDR) (12 AWG)	LF	435
625	6004	ZINC-COAT STL WIRE STRAND (5/16")	LF	185
680	6002	INSTALL HWY TRF SIG (FLASH BEACON)	EA	1
682	6003	VEH SIG SEC (12")LED(YEL)	EA	4
682	6005	VEH SIG SEC (12")LED(RED)	EA	8
684	6009	TRF SIG CBL (TY A)(12 AWG)(4 CONDR)	LF	865
686	6008	INS TRF SIGN PL AM (S)STR(TY B)LUM	EA	1
686	*	RDW LUM ON TRAF SIG POLE (LED)	EA	1
690	6009	REMOVAL OF CABLES	LF	155
690	6016	REMOVAL OF SPAN CABLE ASSM	LF	515
690	6024	REMOVAL OF SIGNAL HEAD ASSM	EA	6
690	6033	REMOVAL OF TRAFFIC SIGNAL POLE FND	LF	26
690	6051	REMOVAL OF SIGNAL POLE ASSM	EA	2
6027	6003	CONDUIT (PREPARE)	LF	35
6027	6008	GROUND BOX (PREPARE)	EA	2

*SUBSIDIARY TO ITEM 686

1-26-2021

Texas Department of Transportation

SL 368
AT SALADO CREEK

FLASHING BEACON MODIFICATION QUANTITIES

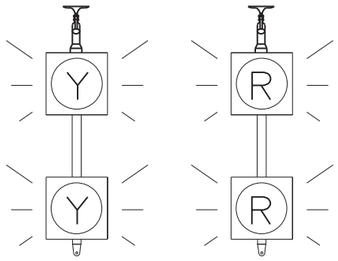
SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		254
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

$TIME$

$DATE$

EXISTING LED SIGNAL HEADS (TO BE REMOVED)



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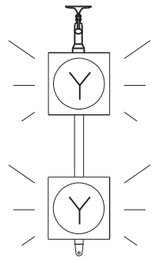
EXISTING LED SIGNAL HEADS (TO REMAIN)



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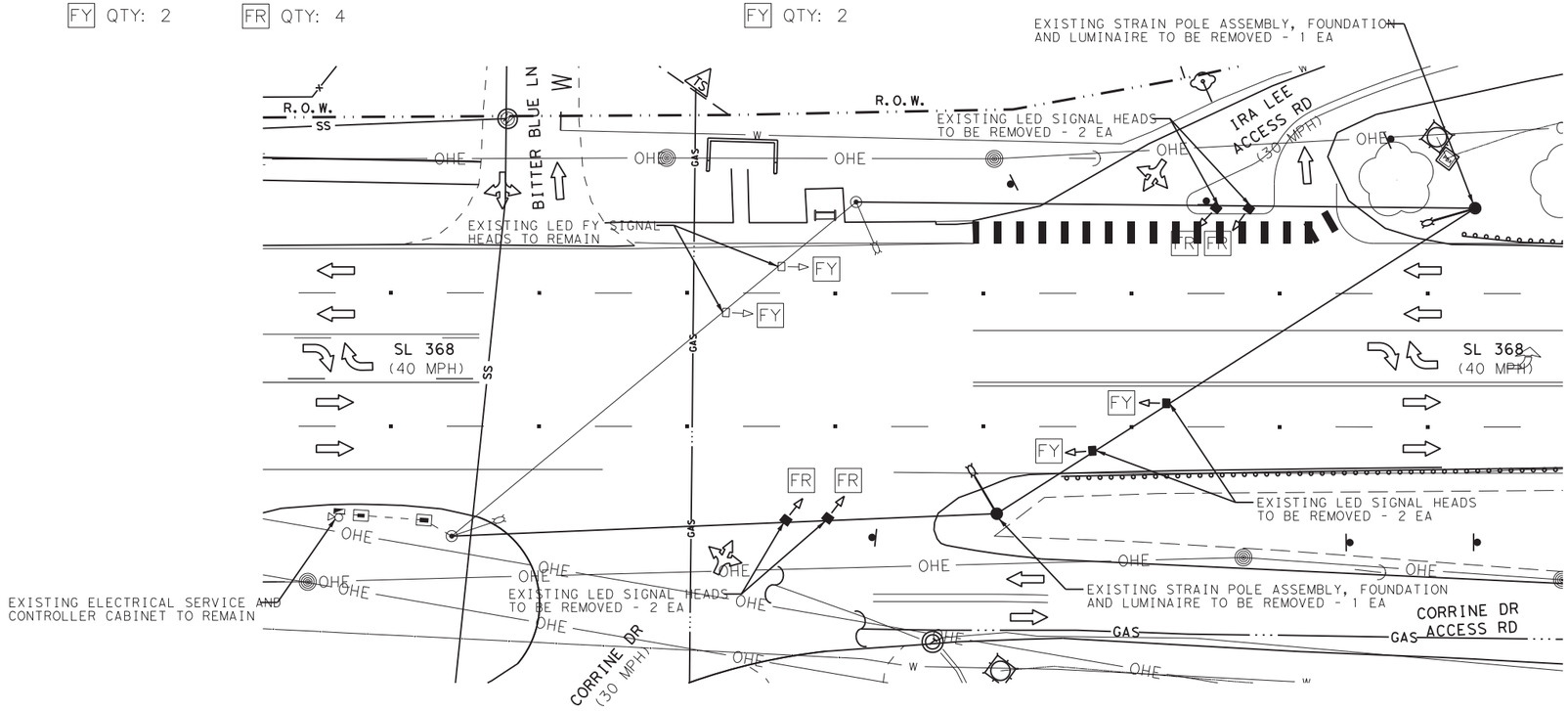


EXISTING LEGEND

- EXISTING STRAIN POLE W/ SPAN WIRE TO REMAIN
- EXISTING STRAIN POLE W/ SPAN WIRE TO BE REMOVED
- EXISTING LUMINAIRE TO REMAIN
- EXISTING LUMINAIRE TO BE REMOVED
- EXISTING VERTICAL SIGNAL HEAD TO REMAIN
- EXISTING VERTICAL SIGNAL HEAD TO BE REMOVED
- EXISTING TYPE D GROUND BOX W/ APRON
- EXISTING TYPE A GROUND BOX W/ APRON
- EXISTING POLE MOUNTED CONTROLLER CABINET
- EXISTING SERVICE METER AND DISCONNECT
- EXISTING CONDUIT
- EXISTING POST MOUNTED SIGN
- OHE — OVERHEAD ELECTRIC LINE
- GAS — GAS LINE
- SS — SEWER LINE
- W — WATER LINE
- F — FIBER LINE
- DIRECTION OF TRAFFIC
- RIGHT OF WAY (R.O.W.)

NOTES

1. THE CONTRACTOR SHALL VERIFY AND DETERMINE THE EXACT LOCATION OF UTILITIES PRIOR TO CONSTRUCTION.
2. THE CONTRACTOR SHALL CALL UTITILITY LOCATOR SERVICE AT LEAST 48 HOURS PRIOR TO COMMENCING WORK TEXAS "ONE-CALL" SYTEM: 1-800-345-4545.
3. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY THE FAILURE TO LOCATE AND PRESERVE THE UNDERGROUND FACILITIES.
4. CONTRACTOR SHALL REMOVE AND DELIVER ANY EQUIPMENT DEEMED SALVAGABLE TO TXDOT SIGNAL SHOP LOCATED AT 4615 NW LOOP 410, SAN ANTONIO, TEXAS 78229. CONTACT CRAIG WILLIAMS AT 210-731-5143.

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

1-26-2021

SCALE 1" = 40'

Texas Department of Transportation

SL 368
AT SALADO CREEK

EXISTING CONDITIONS AND REMOVALS

SHEET 1 OF 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		255
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	08	039	SL 368

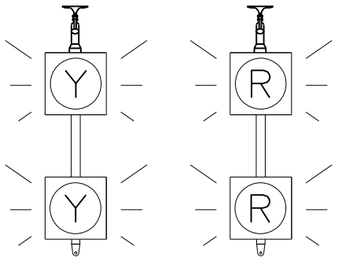
$FILE$

$TIME$

$DATE$

PROPOSED LED SIGNAL HEADS

SIGNAL FACES
12" LED SIGNAL SECTIONS



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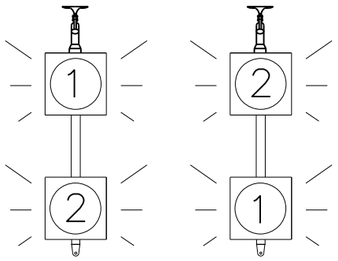
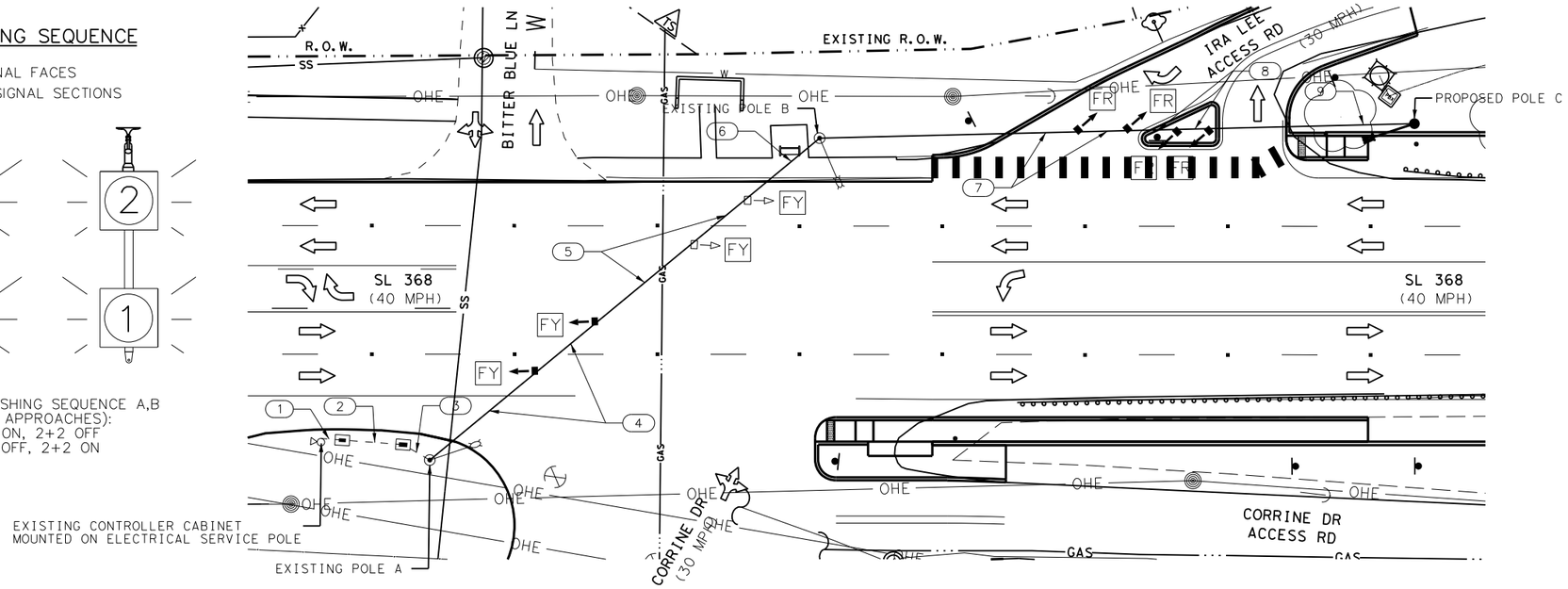
FLASHING SEQUENCE

SIGNAL FACES
12" LED SIGNAL SECTIONS



ALTERNATING FLASHING SEQUENCE A,B
(TYP, ALL APPROACHES):
A: 1+1 ON, 2+2 OFF
B: 1+1 OFF, 2+2 ON



EXISTING LEGEND

- EXISTING STRAIN POLE W/ SPAN WIRE
- PROPOSED STRAIN POLE W/ SPAN WIRE
- EXISTING LUMINAIRE
- PROPOSED LUMINAIRE
- EXISTING VERTICAL SIGNAL HEAD
- PROPOSED VERTICAL SIGNAL
- EXISTING TYPE D GROUND BOX W/ APRON
- EXISTING TYPE A GROUND BOX W/ APRON
- EXISTING POLE MOUNTED CONTROLLER CABINET
- EXISTING SERVICE METER AND DISCONNECT
- EXISTING CONDUIT
- EXISTING POST MOUNTED SIGN
- OHE — OVERHEAD ELECTRIC LINE
- GAS — GAS LINE
- SS — SEWER LINE
- W — WATER LINE
- F — FIBER LINE
- DIRECTION OF TRAFFIC
- RIGHT OF WAY (R.O.W.)

NOTES:

1. THE CONTRACTOR SHALL VERIFY AND DETERMINE THE EXACT LOCATION OF UTILITIES PRIOR TO CONSTRUCTION.
2. THE CONTRACTOR SHALL CALL UTITILITY LOCATOR SERVICE AT LEAST 48 HOURS PRIOR TO COMMENCING WORK TEXAS "ONE-CALL" SYTEM: 1-800-345-4545.
3. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY THE FAILURE TO LOCATE AND PRESERVE THE UNDERGROUND FACILITIES.
4. LOCATION OF STRAIN POLES, CABINET, AND ELECTRICAL SERVICE SHALL BE VERIFIED AND APPROVED BY TXDOT PRIOR TO CONSTRUCTION.
5. CONTRACTOR SHALL CONNECT FIELD WIRING TO CONTROLLER.
6. SIGNAL HEADS SHALL HAVE A MINIMUM OF 18.5 FEET CLEARANCE ABOVE ROADWAY SURFACE.
7. TRAY CABLE SHALL BE RUN IN 2" CONDUIT SEPARATE FROM THE SIGNAL CABLE.
8. TOP OF DRILL SHAFT FOUNDATIONS (POLE C) SHALL BE 3" HIGHER THAN THE EXISTING SL 368 CROWN OF ROADWAY. THE FOUNDAITON LENGTH ABOVE GROUND LEVEL IS IN ADDITION TO THE REQUIRED SHAFT LENGTH GIVEN ON THE TRAFFIC SIGNAL POLE FOUNDATION STANDARD.
9. CONTRACTOR SHALL POTHOLE ALL SIGNAL POLE FOUNDATION LOCATIONS NEAR UNDERGROUND UTILITIES PRIOR TO INSTALLING POLE FOUNDATIONS.
10. NEATLY CAP/COIL ALL WIRES AND CABLES IN GROUND OR AT TERMINATION.
11. CONTRACTOR SHALL CONTACT TXDOT TRAFFIC ENGINEER A MINIMUM OF SEVEN (7) DAYS PRIOR TO BEGINNING OF CONSTRUCTION.

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

1-26-2021

SCALE 1" = 40'

Texas Department of Transportation

SL 368
AT SALADO CREEK

PROPOSED FLASHING BEACON LAYOUT

SHEET 1 OF 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		256
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0016	08	039	SL 368

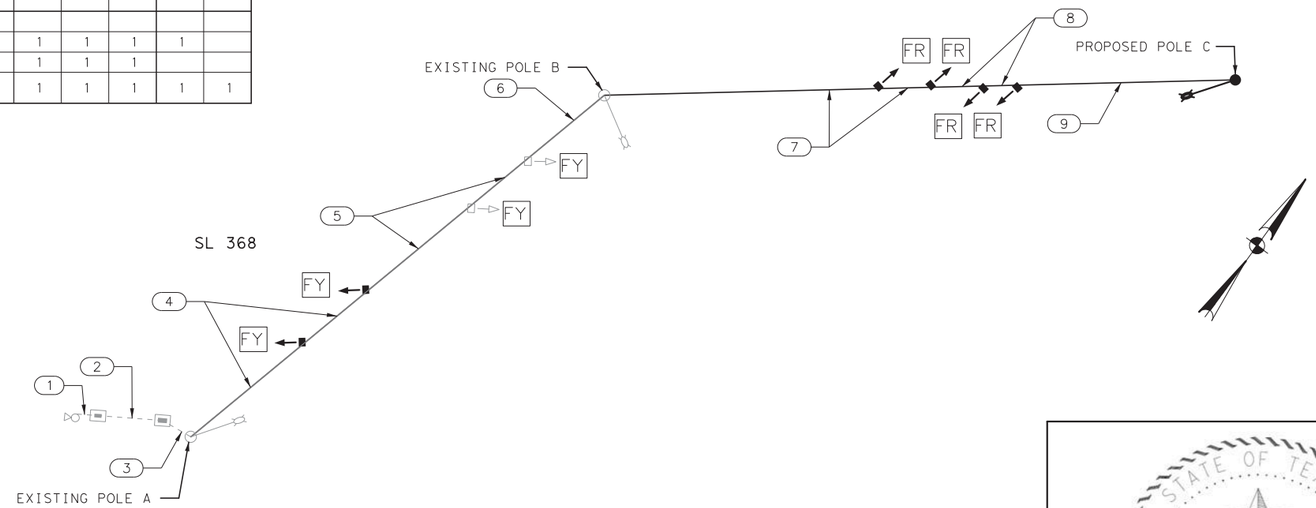
$FILE$

CONDUCTOR AND CONDUIT SCHEDULE													
CONDUIT/ SPAN RUN NUMBER		1	1	2	2	3	3	4	5	6	7	8	9
NUMBER OF CONDUITS								1	1	1	1	1	1
CONDUIT SIZE IN INCHES													
CONDUIT/ SPAN LENGTH (LF)		10	10	25	25	10	10	65	55	30	85	25	60
RUN TYPE, B = BORE, T = TRENCH, E = EXISTING, A = AERIAL		E	E	E	E	E	E	E	E	E	A	A	A
CABLE	CIRCUIT	NUMBER OF CONDUCTORS											
#6 THHN/THWN	120 POWER HOT & COMMON												
BARE BOND GROUND	(POWER) BARE #6												
	(CONDUIT) BARE #6												
4/C - #12 CABLE (SIGNAL)	FLASHING YELLOW - EB	1		1		1		1					
	FLASHING RED - NB	1		1		1		1	1	1	1	1	
	FLASHING RED - SB	1		1		1		1	1	1	1		
4/C - #12 TRAY CABLE (LUMINAIRE)	POLE C - LUMINAIRE		1		1		1	1	1	1	1	1	1

TRAFFIC POLE SCHEDULE			
POLE	A	B	C
FOUNDATION	EXISTING	EXISTING	36-A
MOUNTING HEIGHT	EXISTING	EXISTING	30'
ATTACHMENTS			LUMINAIRE

LEGEND

- PROPOSED STRAIN POLE W/ SPAN WIRE
- PROPOSED VERTICAL SIGNAL HEAD
- EXISTING CONDUIT (TRENCH)
- EXISTING SIGNAL POLE W/ SPAN WIRE
- EXISTING LUMINAIRE
- PROPOSED LUMINAIRE
- EXISTING VERTICAL SIGNAL HEAD
- EXISTING TYPE D GROUND BOX
- EXISTING TYPE A GROUND BOX
- EXISTING POLE MOUNTED CONTROLLER CABINET
- EXISTING SERVICE METER AND DISCONNECT



EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

1-26-2021

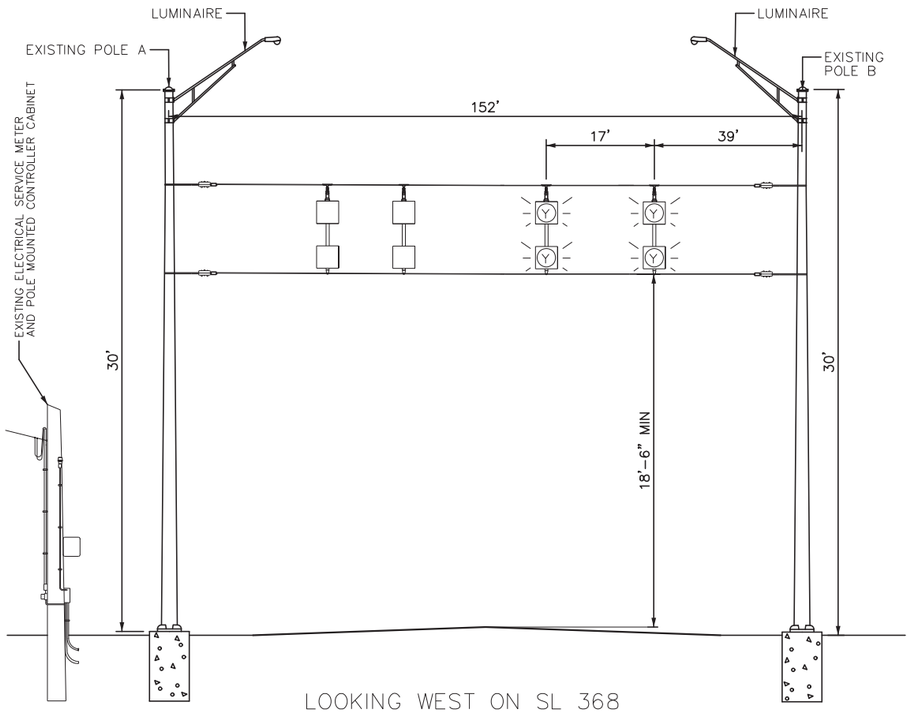
Texas Department of Transportation

SL 368
AT SALADO CREEK

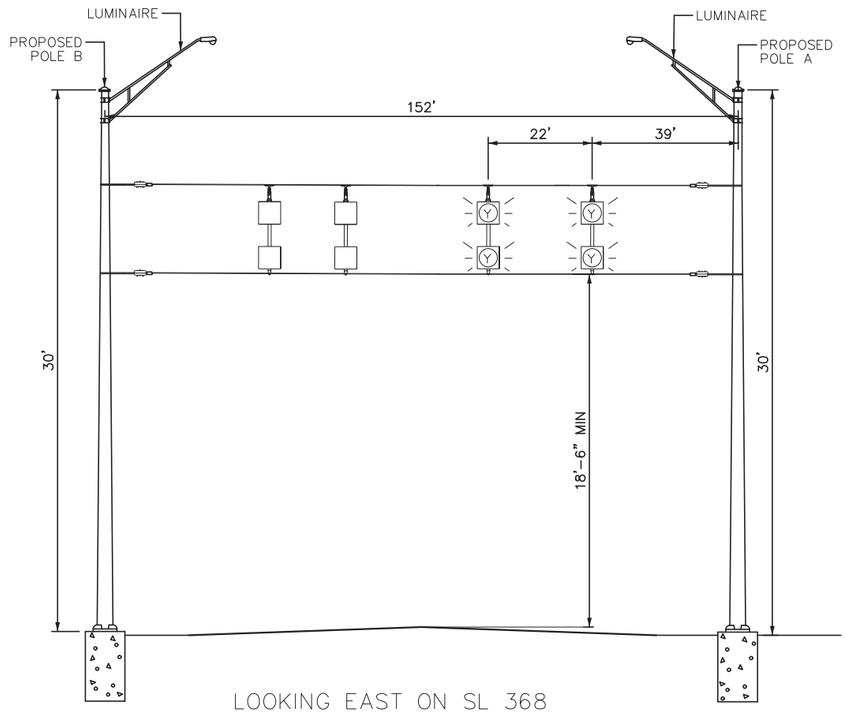
PROPOSED FLASHING BEACON WIRING LAYOUT

SHEET # OF #

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		257
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368



LOOKING WEST ON SL 368



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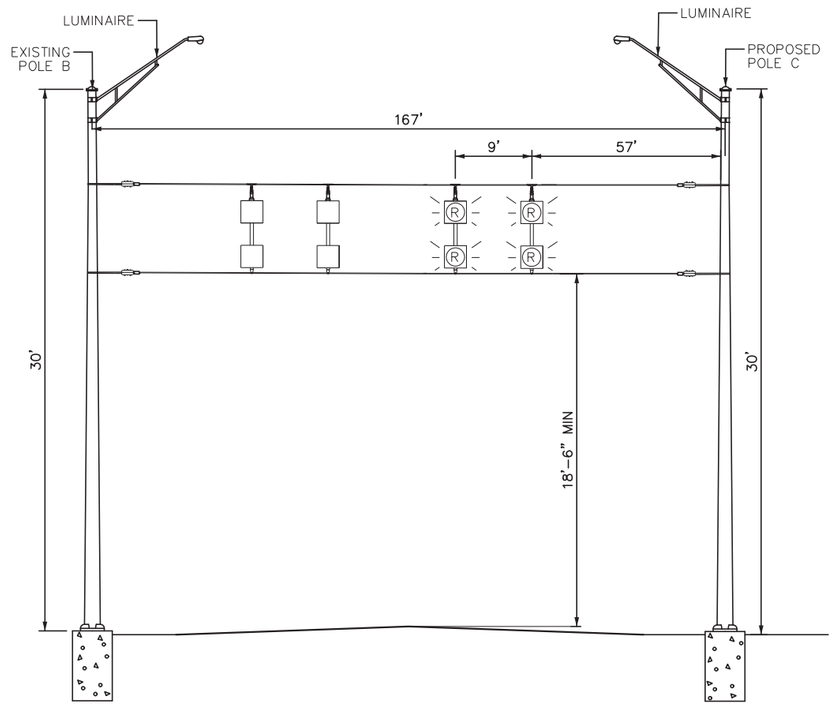
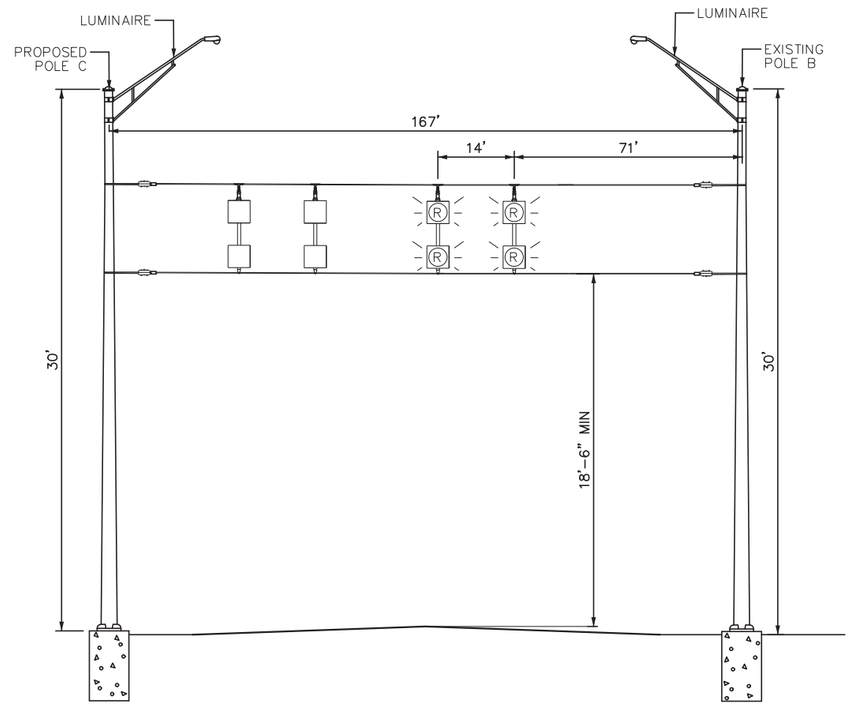


LOOKING NORTH ON CORRINE



LOOKING SOUTH ON CORRINE

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

1-26-2021

Texas Department of Transportation

SL 368
AT SALADO CREEK

PROPOSED FLASHING BEACON ELEVATIONS

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		258
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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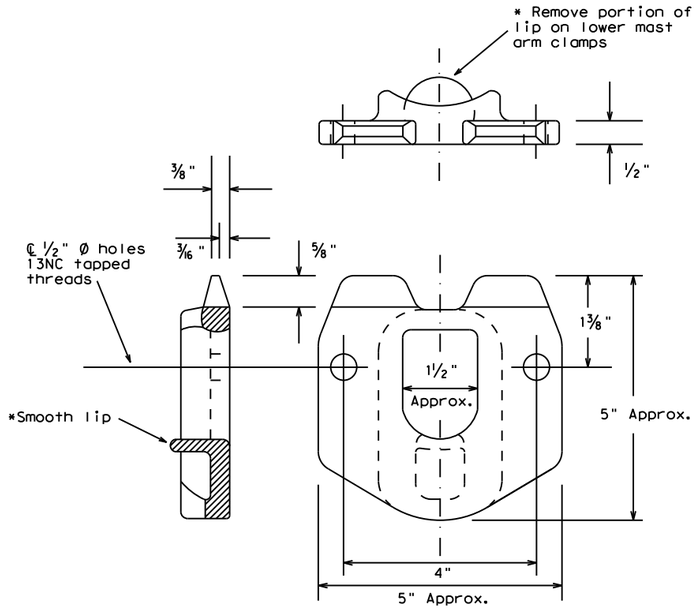
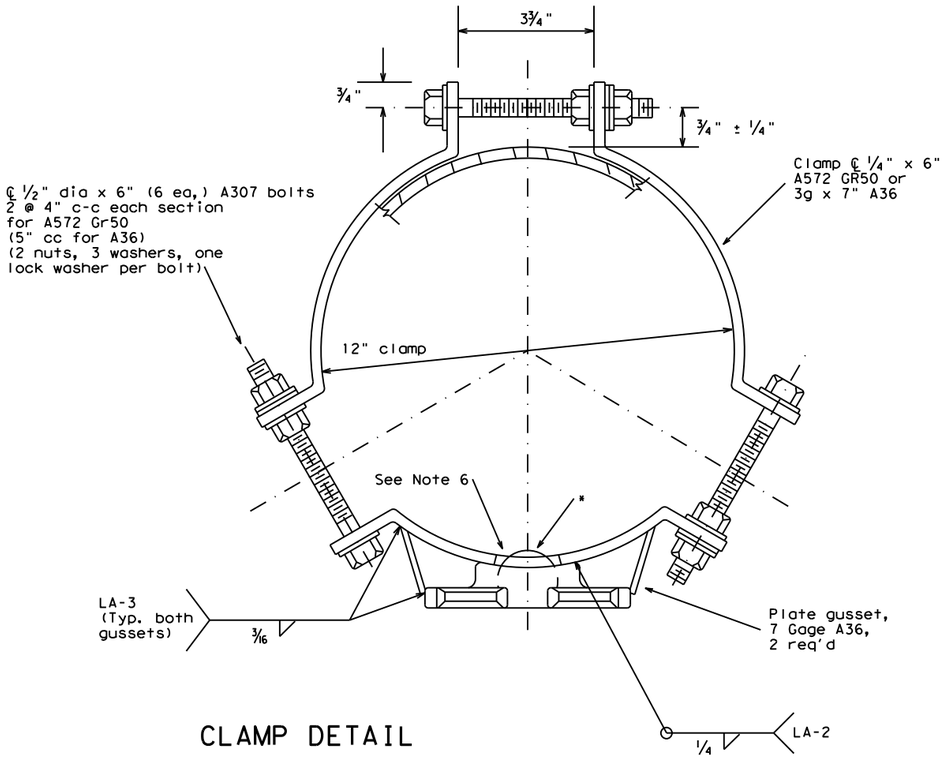


POLE SIMPLEX DETAILS



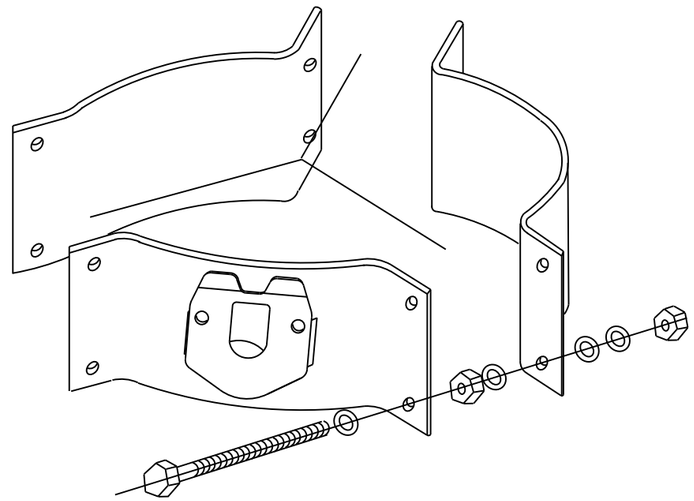
CLAMP DETAIL

OTHER MATERIALS:

1. Pole simplex shall be ASTM A27 GR65-35 or A148 GR80-50 or A576 GR1021. ASTM A576 must be suitable for forging and also meet minimum tensile of 65ksi, minimum yield of 35ksi, and a minimum elongation of 22 percent in 2 inches.
2. Welded tabs and backplates shall be ASTM A-36 steel or better.
3. Nylon insert locknuts shall conform to ASTM A563.

GENERAL NOTES:

1. Materials and fabrication shall be in accordance with Standard Sheet "MA-C" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absence of specified fabrication tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.
2. All parts shall be galvanized after fabrication in accordance with Item 445, "Galvanizing". The throat of the Simplex shall be made free of all rough or sharp edges resulting from the galvanizing process.
3. Each simplex fitting shall be supplied with 2 ASTM A325 bolts, 1/2in. X 1 1/2in. and 2 lock washers. The bolts and lock washers shall be secured to the clamp with the other hardware items. The Fabricator shall ship clamp assembly together in a single package, including all bolts, nuts, and washers required for the clamp and simplex fitting.
4. Design conforms to 1994 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals" and interim revisions thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor. Clamps are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq.ft.,12 ft. maximum arm length.
5. Each assembly shall consist of one upper piece simplex fitting having a smooth lip and one lower piece simplex fitting with the lip removed.
6. Approximately 2 in. diameter hole in upper mast arm clamp.



PROJECTION

For 8.9 - 12 inch diameter Signal Poles
(Two req'd for each mast arm)

Texas Department of Transportation
Traffic Operations Division

CLAMP ON FITTING ASSEMBLY FOR LUMINAIRE MAST ARM

CFA-12

© TxDOT	DN: KAB	CK: RES	DW: FDN	CK: CAL
REVISIONS	CONT	SECT	JOB	HIGHWAY
11-99	0016	08	039	SL 368
1-12	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		259

DATE: 2/18/2021 3:24:40 PM
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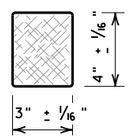
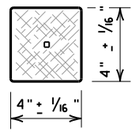
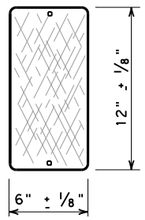
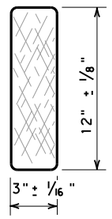
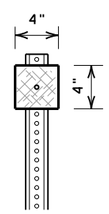
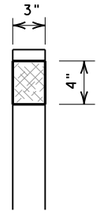
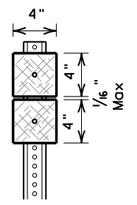
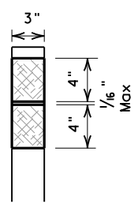
REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.			

DELINEATORS

	SINGLE		DOUBLE	
DEVICE				
	1-Size 2 reflector unit	1-Size 1 reflector unit	2-Size 2 reflector units	2-Size 1 reflector units
SHEETING	Yellow, White or Red Type B or C Reflective Sheeting			
POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

D & OM DESCRIPTIVE CODES

INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX)

NUMBER OF REFLECTORS
S = Single
D = Double

COLOR OF REFLECTORS
W = White
Y = Yellow
R = Red

REFLECTOR UNIT SIZE
1 or 2

TYPE OF POST OR DELINEATOR
WC = Wing Channel Post
YFLX = Yellow Flexible Post
WFLX = White Flexible Post
BRF = Barrier Reflector

TYPE OF MOUNT
GND = Embedded (drivable or set in concrete)
CTB = Concrete Barrier Mount
GF1 or GF2 = Guard Fence Attachment
SRF = Surface Mount

DIRECTION
If Required
BI = Bi-Directional
BR = Bi-Directional with red on back

INSTL OM ASSM (OM-XX) (XXXX)XXX(XX)

TYPE OF OBJECT MARKER
1, 2, 3, or 4

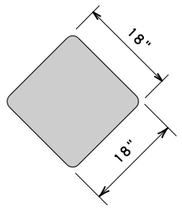
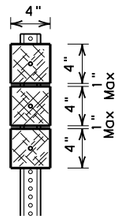
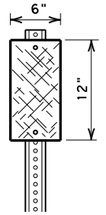
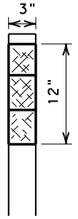
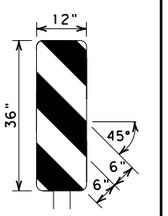
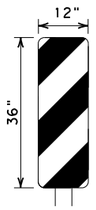
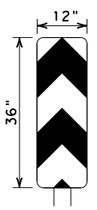
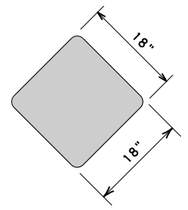
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

TYPE OF POST
WC = Wing Channel Post
WFLX = White Flexible Post
TWT = Thin Walled Tubing

TYPE OF MOUNT
GND = Embedded (drivable)
SRF = Surface Mount
WAS = Wedge Anchor Steel
WAP = Wedge Anchor Plastic

DIRECTION
If Required
BI = Bi-Directional

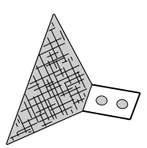
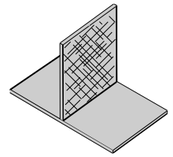
OBJECT MARKERS

	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE								
		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B_{FL} or C_{FL} Sheeting			Red -Type B_{FL} or C_{FL} Sheeting
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

DEPARTMENTAL MATERIAL SPECIFICATIONS

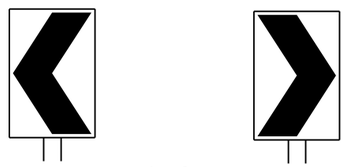
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.		

CHEVRONS

DEVICE

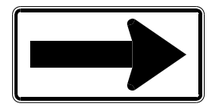


SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

NOTE
1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies).
2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).

ONE DIRECTION LARGE ARROW

DEVICE



SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

NOTE:

Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	SAT	BEXAR		260

20A

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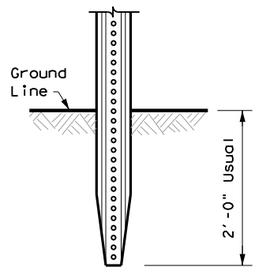
FILE: pw:\\garver-pw.bentley.com:garver-pw-01\Documents\2016\16187035 - WA of SD 1000 Dom2 Revision\Design\Traffic\Standards\ANDRIOS\dom2-20.dgn

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

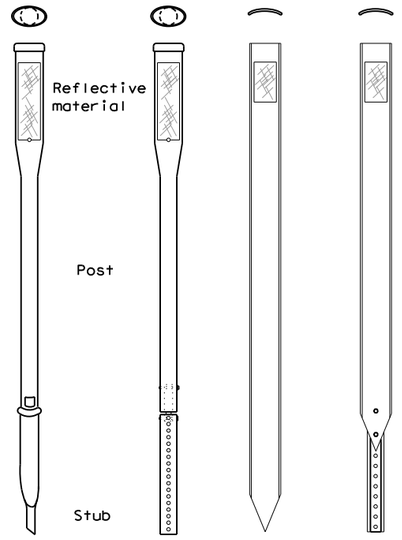


NOTES

1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

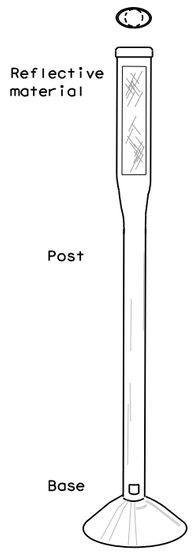
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



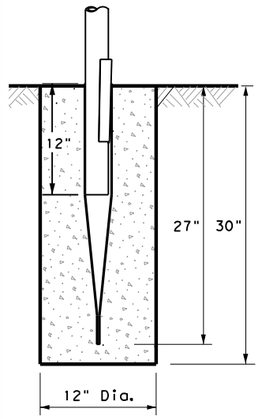
SURFACE MOUNT

NOTES

1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.

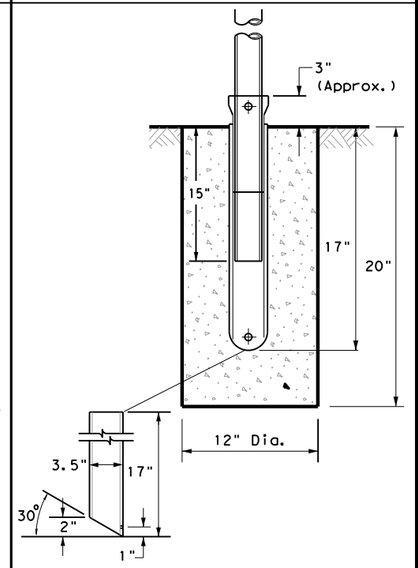
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

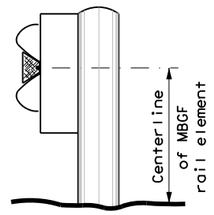
NOTE

1. Install per manufacturer's recommendations.

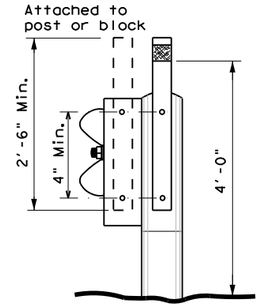
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

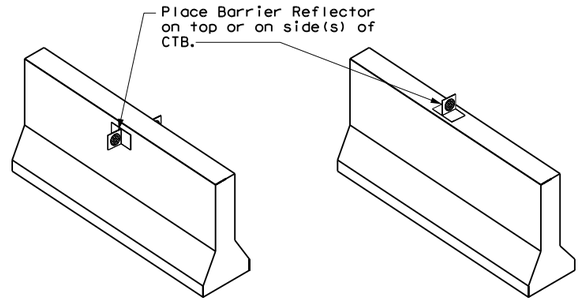
GF1



GF2



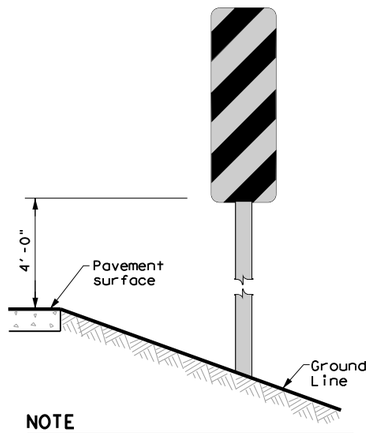
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

1. Place delineators on a section of roadway at a consistent distance from the edge of pavement.
2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction.
3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible.
4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation.
5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface.
6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.

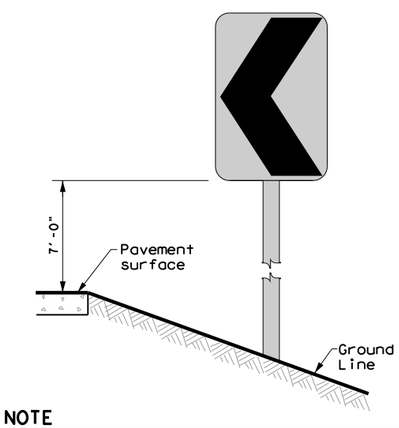
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)

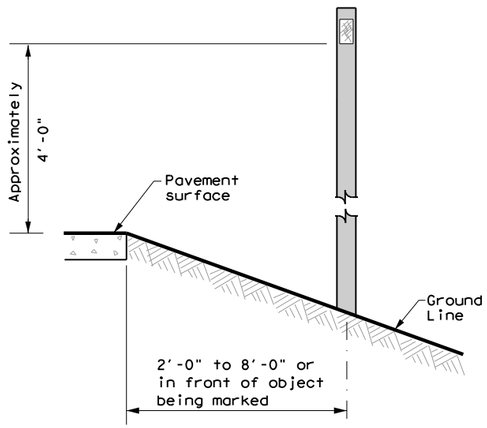
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
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10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	SAT	BEXAR		261

20B

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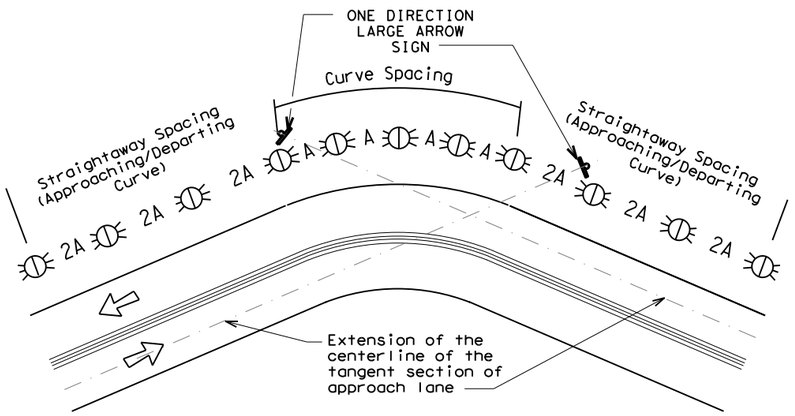
MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	• RPMs	• RPMs
15 MPH & 20 MPH	• RPMs and One Direction Large Arrow sign	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	• RPMs and Chevrons

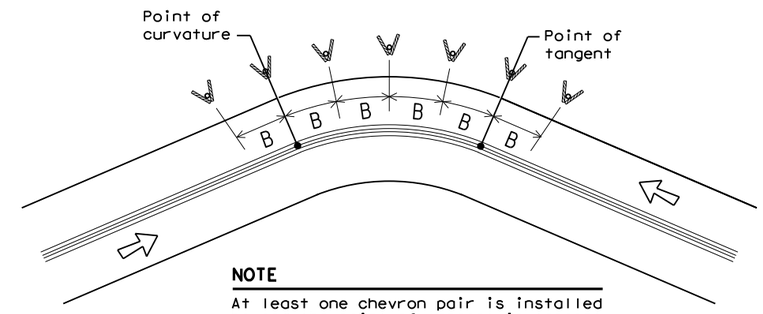
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

At least one chevron pair is installed beyond the point of tangent in tangent section.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

Degree of Curve	FEET			
	Radius of Curve	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
		A	2A	B
1	5730	225	450	—
2	2865	160	320	—
3	1910	130	260	200
4	1433	110	220	160
5	1146	100	200	160
6	955	90	180	160
7	819	85	170	160
8	716	75	150	160
9	637	75	150	120
10	573	70	140	120
11	521	65	130	120
12	478	60	120	120
13	441	60	120	120
14	409	55	110	80
15	382	55	110	80
16	358	55	110	80
19	302	50	100	80
23	249	40	80	80
29	198	35	70	40
38	151	30	60	40
57	101	20	40	40

Curve delineator approach and departure spacing should include 3 delineators spaced at 2A. This spacing should be used during design preparation or when the degree of curve is known.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp.Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/Deceleration Lane	Double delineators (see Detail 3 on D&OM(4))	100 feet (See Detail 3 on D & OM (4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete)and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100'max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line	Every 5th cable barrier post (up to 100'max)
Guard Rail Terminus/Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5) and D & OM (6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM (4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

NOTES

1. Unless indicated otherwise, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
2. Barrier reflectors may be used to replace required delineators.
3. Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND

	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

FILE: dom3-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
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3-15 8-15	DIST	COUNTY		SHEET NO.
8-15 7-20	SAT	BEXAR		262

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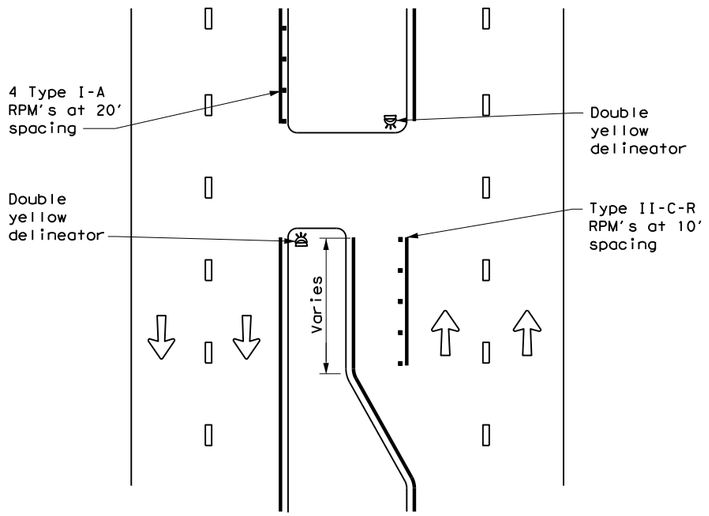
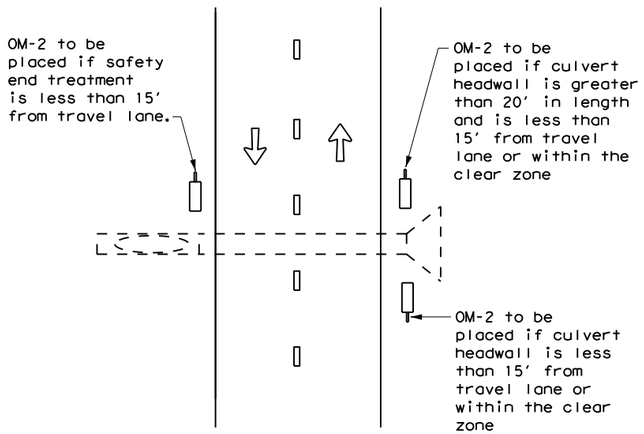
CROSSOVERS



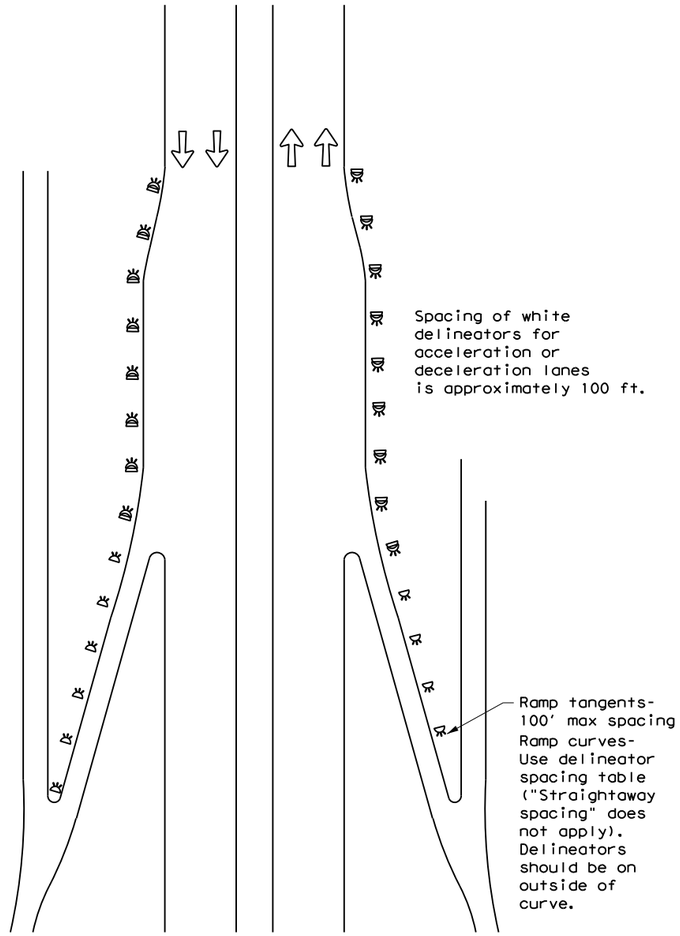
DETAIL 1

FOR CULVERTS WITHOUT MBGF



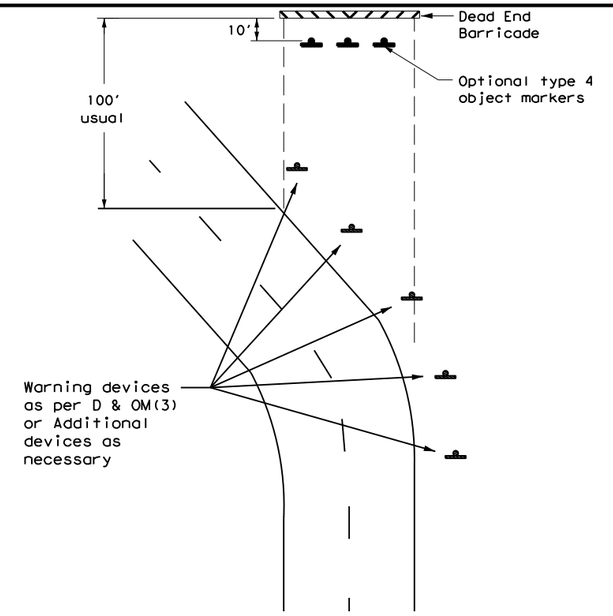
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



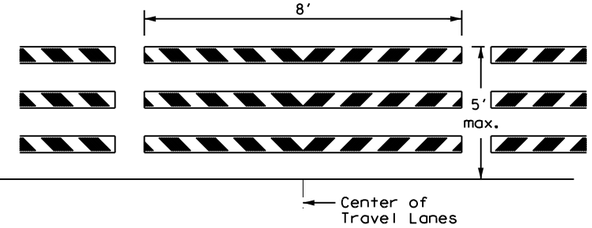
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

1. Barricade striping shall be red and white reflective sheeting for all permanent road closures.
2. Barricade striping is red and white sloping toward the center of the roadway.
3. Type 3 Barricade Supports should be anchored to soil or pavement as described in compliant Work Zone Traffic Control Devices List, section D.2.f and D.2.g.

DETAIL 5

LEGEND	
	Bidirectional Delineator
	Delineator
	OM-3
	Barricade
	Sign
	OM-2
	Double Delineator

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4)-20

FILE: dom4-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
3-15 7-20	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		263

20D

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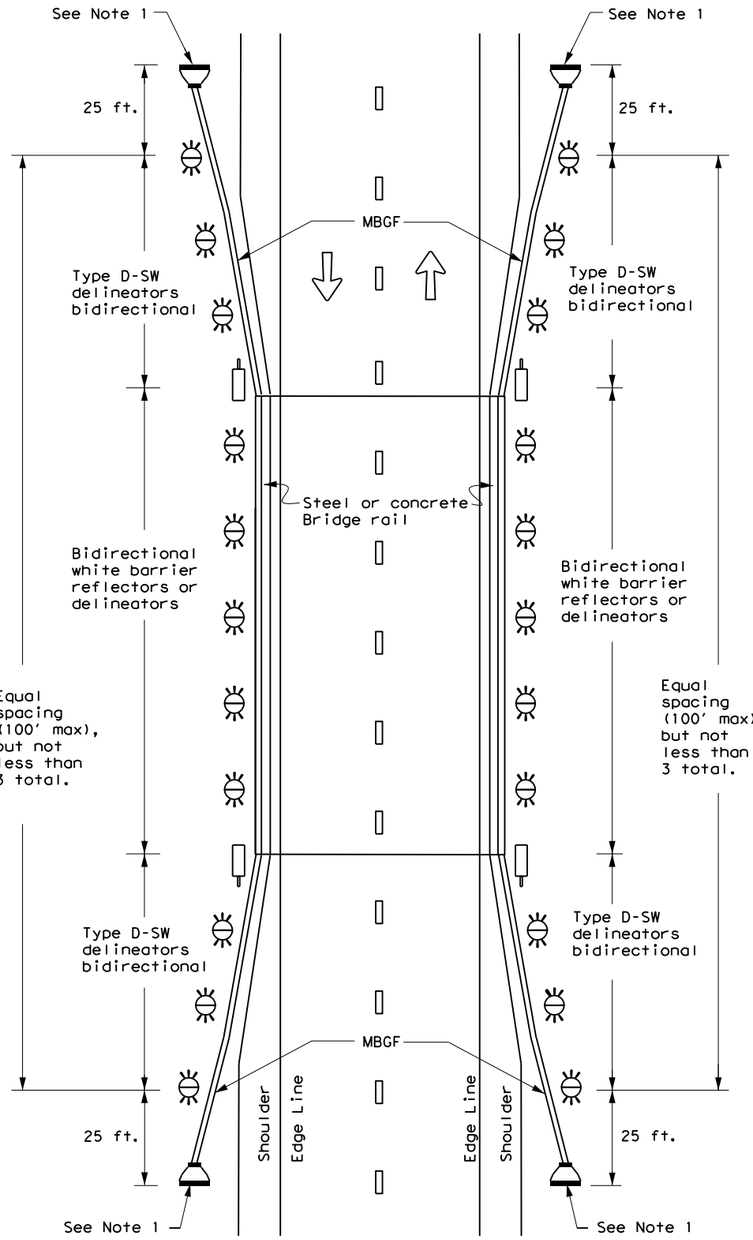
FILE: pw:\\garver-pw.bentley.com:garver-pw-01\Documents\2016\16187035 - WA of SD's for Proposal\DWG Files\Standards\DOM5-20.dgn

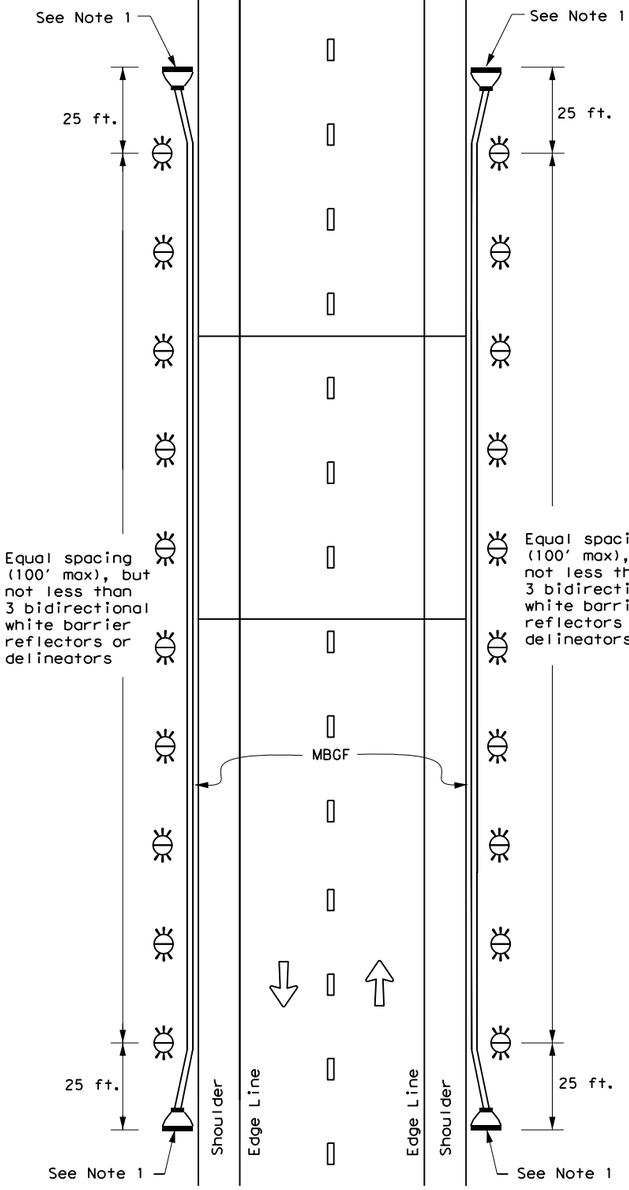
TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH RAIL



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

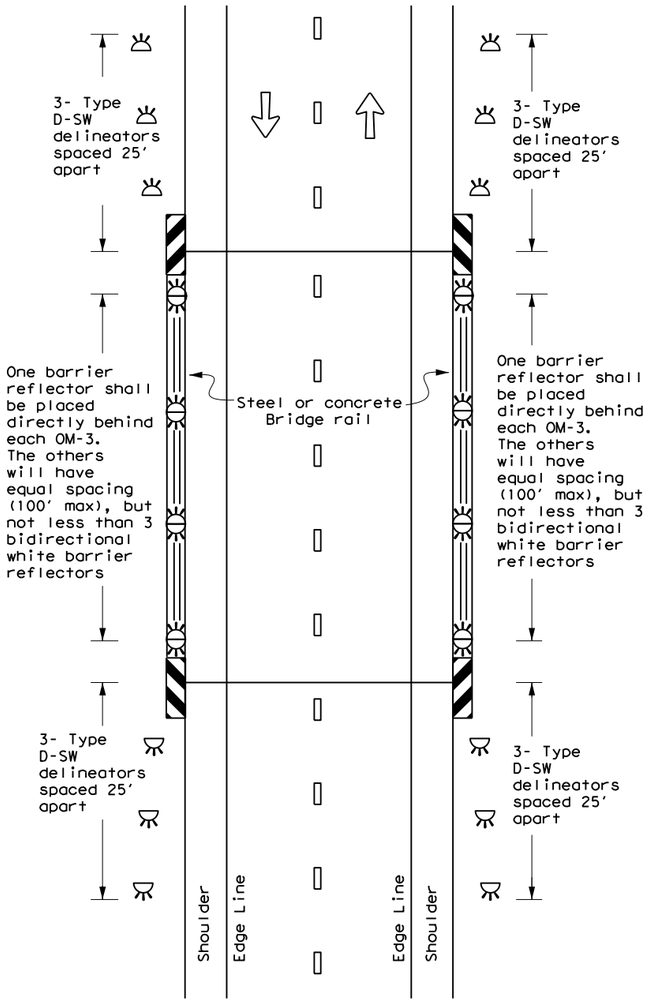
TWO-WAY, TWO LANE ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

TWO-WAY, TWO LANE ROADWAY BRIDGE WITH NO APPROACH RAIL



LEGEND

	Bidirectional Delineator
	Delineator
	OM-3
	OM-2
	Terminal End
	Traffic Flow

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(5)-20

FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
7-20	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		264

20E

DATE: 2/18/2021 3:26:48 PM
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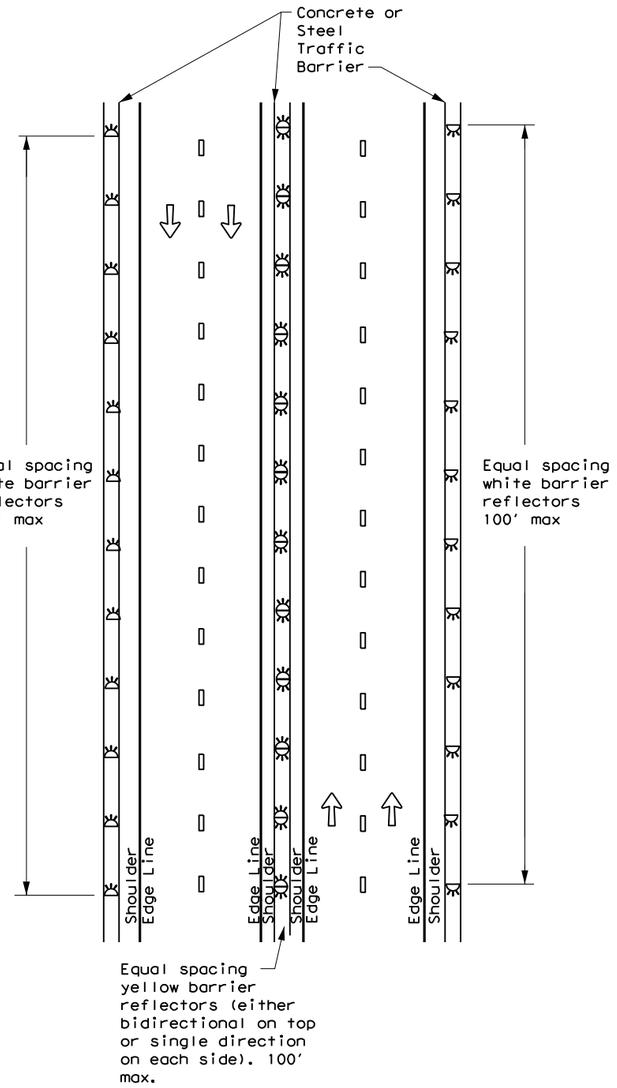
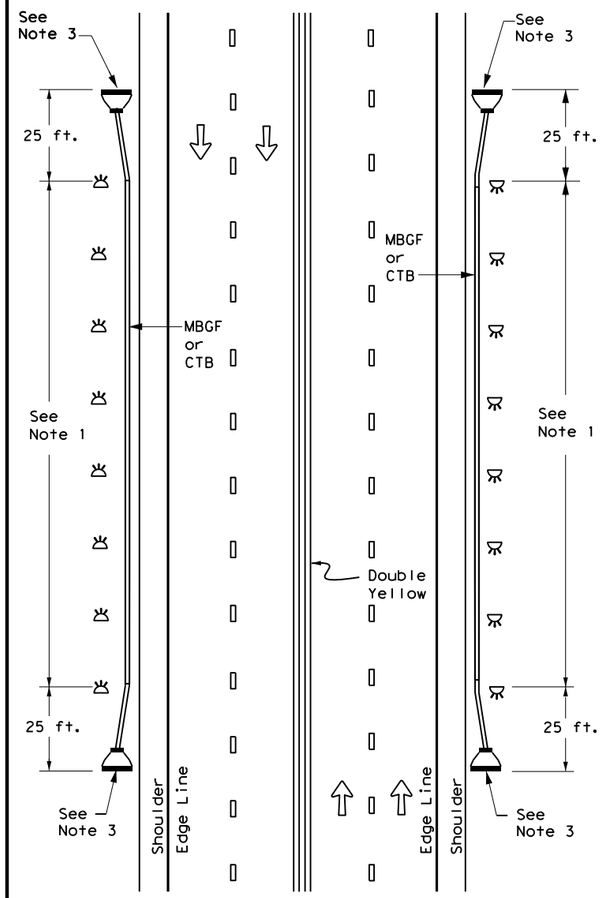
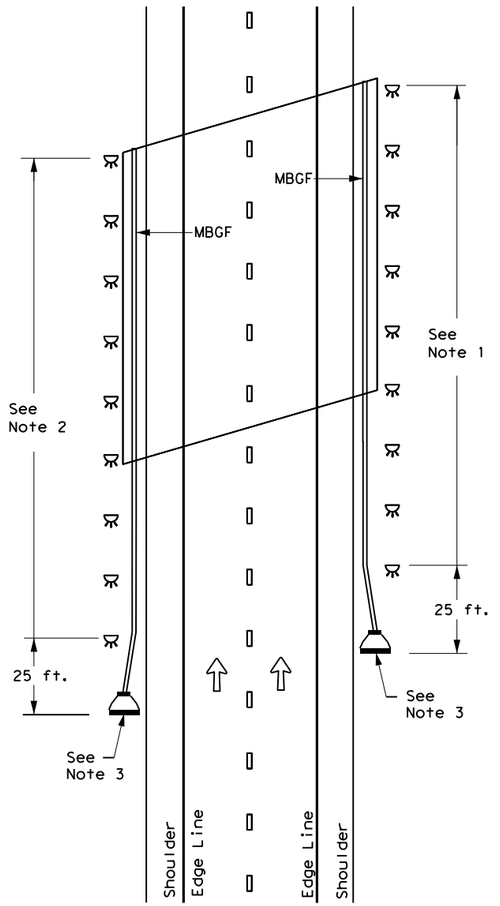
CONTINUOUS CONCRETE OR STEEL BARRIER



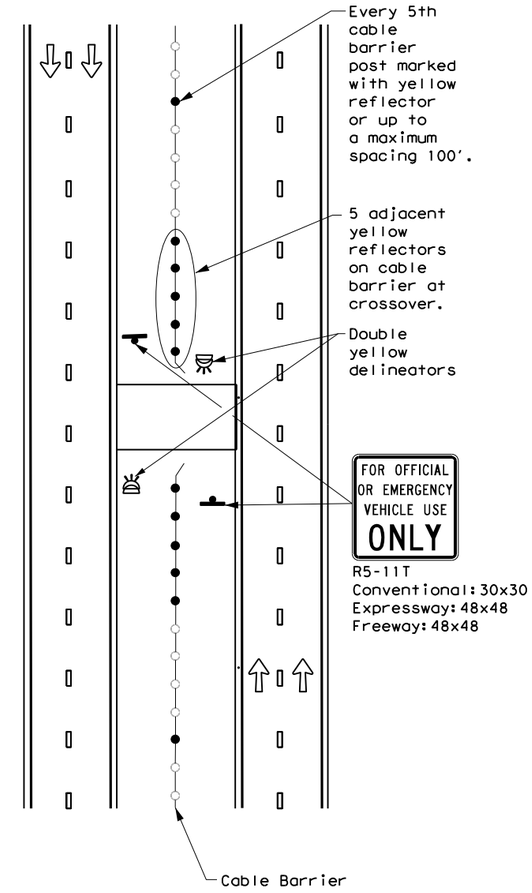
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



DIVIDED ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



EMERGENCY CROSSOVER



NOTES

1. Equal spacing (100' max), but not less than 3 single directional white barrier reflectors or delineators. On Continuos Barrier, equal spacing (100' max.)
2. Equal spacing (100' max), but not less than 3 single directional yellow barrier reflectors or delineators.
3. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3)in front of the terminal end.

LEGEND

	Bidirectional Delineator
	Delineator
	OM-3
	OM-2
	Terminal End
	Traffic Flow

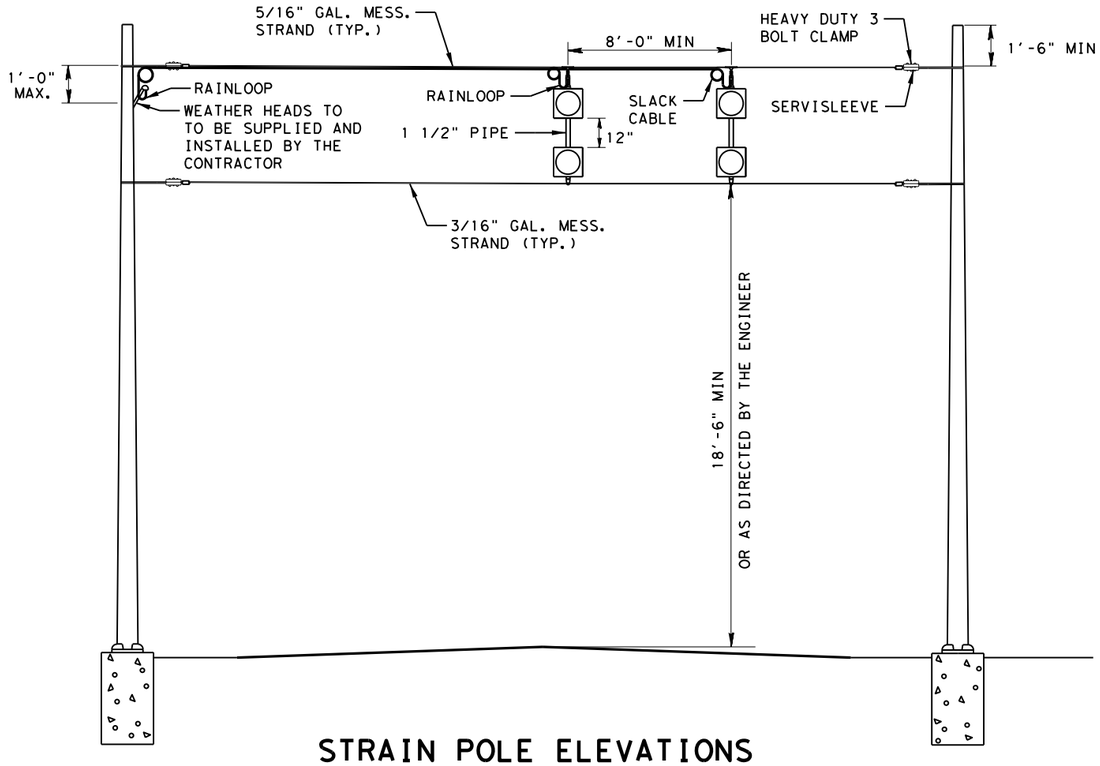
Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(6)-20

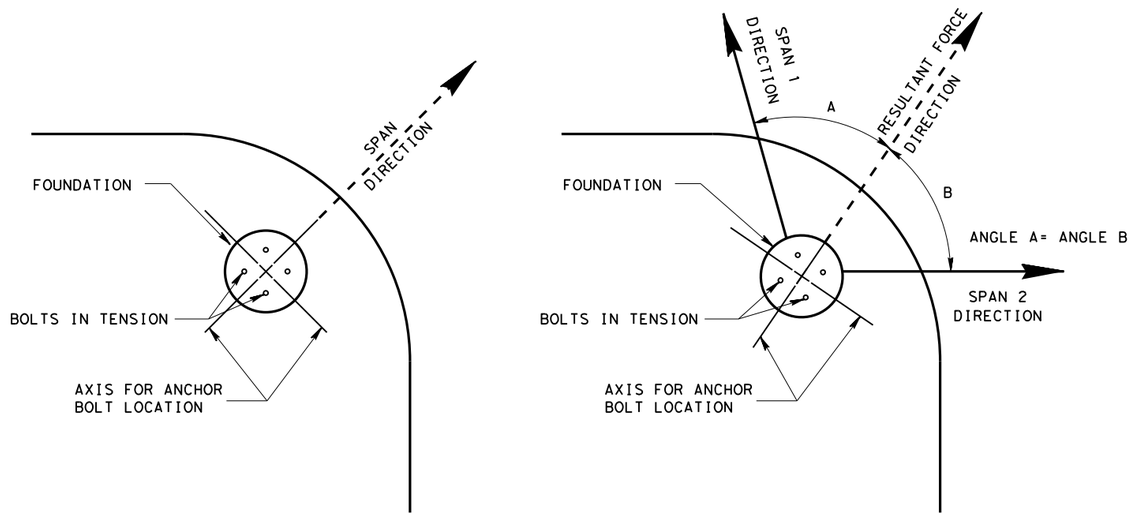
FILE: dom6-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
7-20	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		265



STRAIN POLE ELEVATIONS
FLASHING BEACONS

NOTES:

1. 5/16" AND 3/16" MESSENGER CABLE SHALL BE USED FOR SPANS.
2. ALL LOOSE ENDS OF MESSENGER CABLE SHALL BE SERVED WITH SERVISLEEVE.
3. SIGNAL CABLE AND DETECTOR CABLE SHALL BE ATTACHED TO MESSENGER (SPAN) CABLE WITH LASHING WIRE USING THE CABLE SPINNING METHOD WITH A MINIMUM OF ONE TURN PER FOOT.
4. DETERMINE THE MOUNTING HEIGHT OF THE SIGNAL SPAN AND THE PLACEMENT OF THE WEATHER HEADS.
5. ALL SLACK CABLE COILS SHALL BE A MINIMUM OF 6"IN DIAMETER AND SHALL HAVE A MINIMUM OF TWO TURNS.
6. WEATHER HEADS INSTALLED ON THE STRAIN POLE SHALL EQUAL THE SIZE AND NUMBER OF CONDUIT INSTALLED IN THE SIGNAL POLE FOUNDATION.



TYPICAL ANCHOR BOLT ALIGNMENT

Texas Department of Transportation

San Antonio District Standard

FLASHING BEACON STEEL STRAIN POLE INSTALLATION DETAILS

SCALE: NS

FBSP-18

REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
FEB 2006	6	$FAP-NO$		266
OCT 2006	STATE	DIST.	COUNTY	
MAY 2018	TEXAS	SAT	BEXAR	
	CONT.	SECT.	JOB	HIGHWAY NO.
	0016	08	039	SL 368

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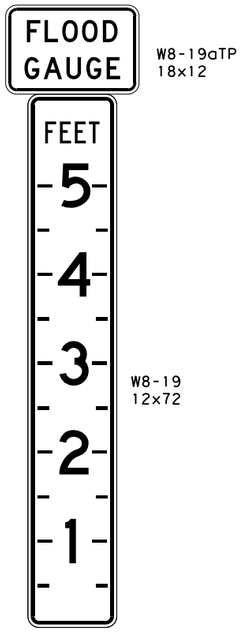


W8-19aTP
18x12

W8-19
12x72

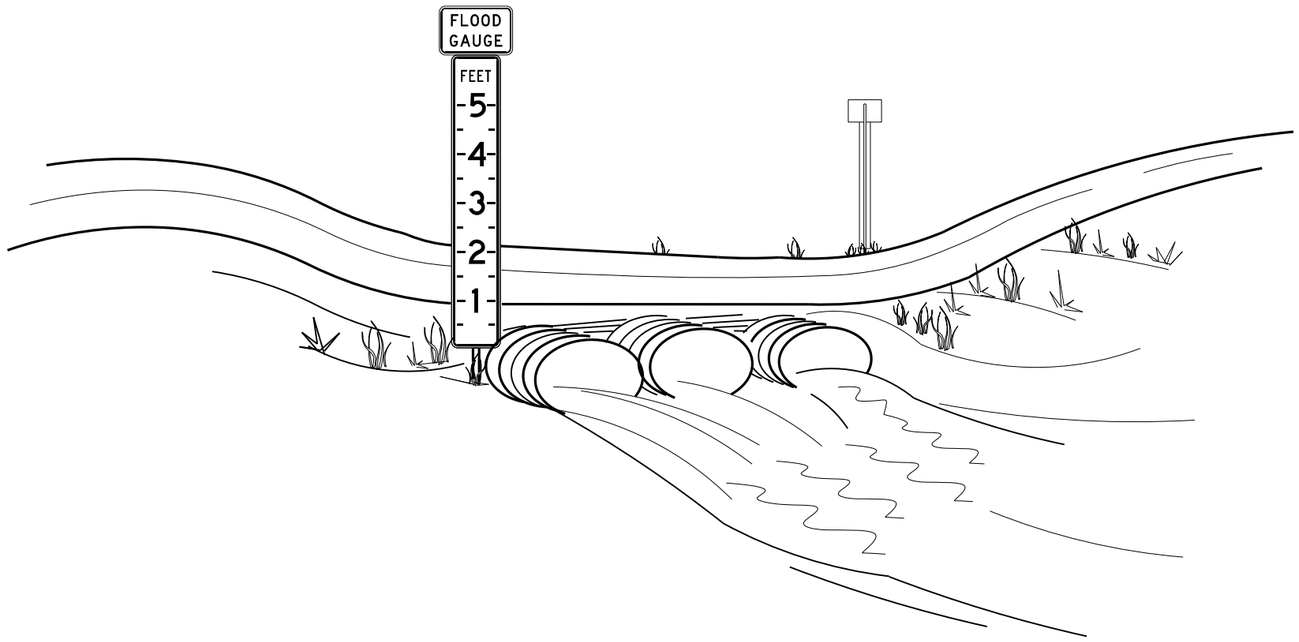
W8-18
36x36

W16-4P
18x12

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLUORESCENT YELLOW	TYPE B_{FL} & C_{FL} SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM



GENERAL NOTES

1. Each flood gauge assembly shall consist of the FLOOD GAUGE sign (W8-19aTP) and DEPTH MARKER (W8-19). Two assemblies should be erected, one along each approach, at the low water crossing location on the right side of the roadway.

2. The flood gauge assembly should be of sufficient height to register depth of water to a minimum of five (5) Feet above the lowest travel lane pavement surface. Actual height of depth marker required for each location is shown elsewhere in the plans, but should not be in excess of ten (10) feet.

3. The flood gauge assembly should be located not more than ten (10) feet from the pavement edge. Consideration should be given to placement with regard to the following factors:

   a) Accurate register of depth of water over roadway.

   b) Daytime and nighttime visibility of the flood gauge assembly along roadway approaches.

   c) Outside the main flow of water during both normal and flood conditions.

4. In areas where flood conditions would likely obscure the flood gauge assembly, a second pair of gauges, one on each approach, registering depths greater than shown on the first flood gauge assembly, is recommended.

5. The Engineer will approve all flood gauge assembly locations before installation.

6. The alphabets and lateral spacing between letters and numerals shall conform with the Texas "Manual on Uniform Traffic Control Devices for Streets and Highways", latest edition, and any approved changes thereto. Lateral Spacing of text shall provide a balanced appearance. All materials shall conform to Department Specifications.

7. FLOOD GAUGE signs and depth marker shall be mounted in accordance with Standard SMD (series). The recommended mounting is three (3) inch fiberglass reinforced pipe (FRP) pipe as shown on Standard SMD(GEN) and SMD(FRP). ROAD MAY FLOOD sign (W8-18) along the approach roadway may be required in areas where rainfall causes frequent roadway flooding.

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

FLOOD GAUGE ASSEMBLY

FGA-15

FILE: fga-15.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT January 1997	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
3-15	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		267

10F

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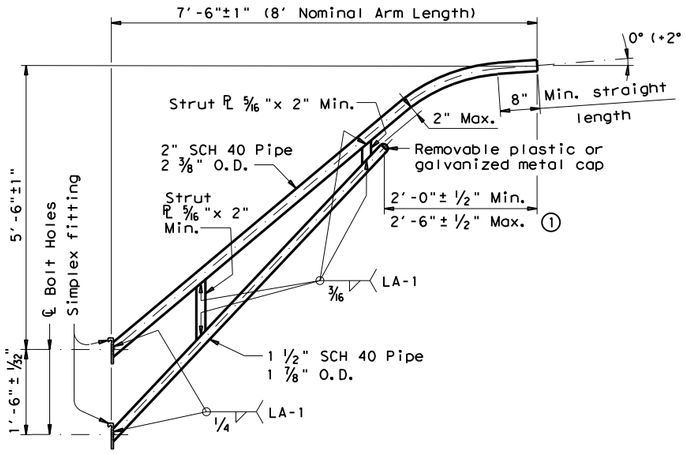
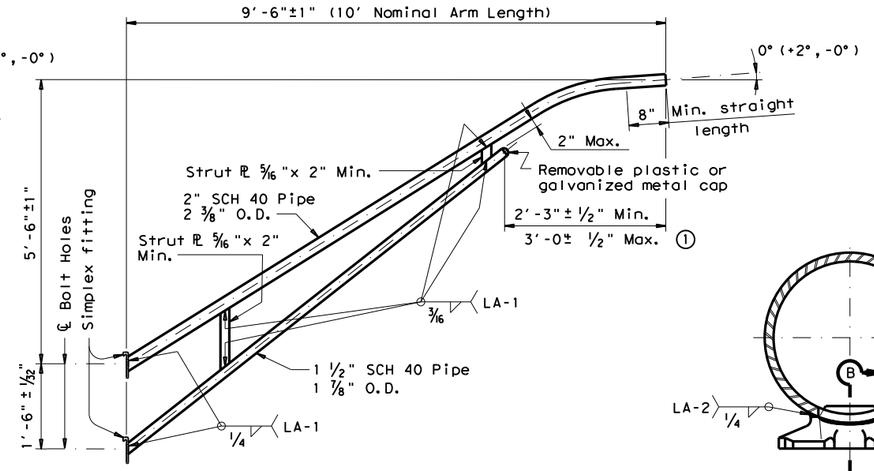
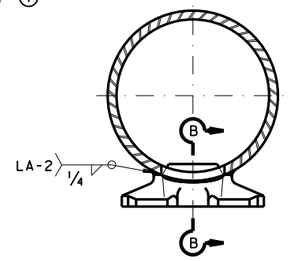


8-FOOT LUMINAIRE ARM



10-FOOT LUMINAIRE ARM



DIRECT ATTACHMENT DETAIL

MATERIALS	
Pole or Arm Simplex	ASTM A27 Gr.65-35 or A148 Gr.80-50, A576 Gr.1021 (3), or A36 (Arm only)
Arm Pipes	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50 (4), or A1011 HSLAS-F Gr.50 (4)
Arm Strut Plates (2)	ASTM A36, A572 Gr.50 (4), or A588
Misc.	ASTM designations as noted

(1) Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.

(2) Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.

(3) A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.

(4) ASTM A572, A1008 HSLAS-F, and A1011 HSLAS-F may have higher yield strengths but shall not have less elongation than the grade indicated.

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto. Design Wind Speed equals 90 mph plus a 1.3 gust factor. Arms are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq. ft.

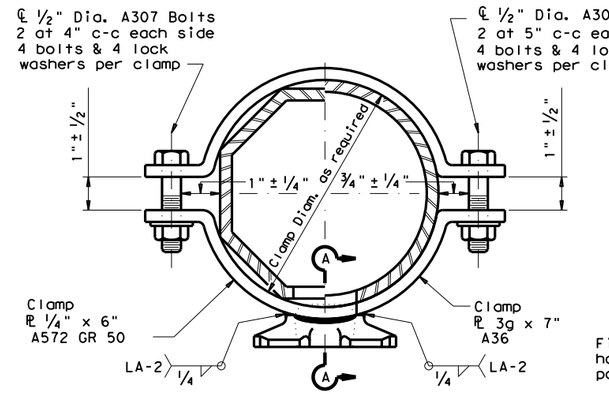
Materials and fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absense of specified Fabricaton tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.

Unless otherwise noted, all parts shall be galvanized after fabrication in accordance with Item 445, "Galvanizing".

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

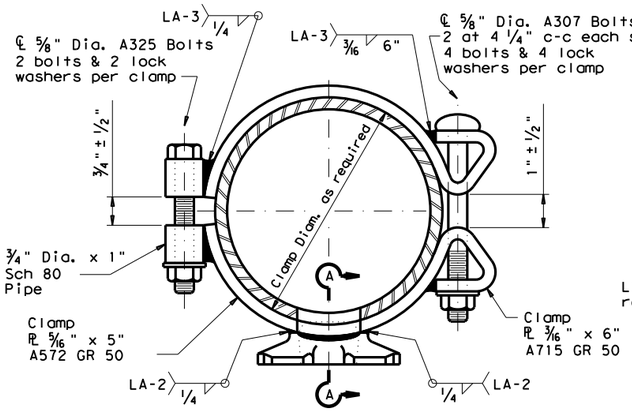
Each pole simplex fitting shall be supplied with 2 ASTM A325 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans. When clamp attachment is specified, the Fabricator shall ship the clamp assembly securely attached to the pole at the location shown on the plans.

If clamp assemblies are ordered without poles, the Fabricator shall ship one upper and one lower clamp assembly together in a single package, including all nuts and washers required for the clamps and simplex fittings.



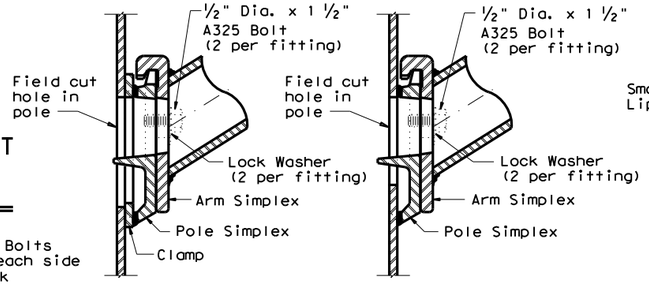
CLAMP ATTACHMENT DETAIL NO. 1 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 2 (HALF SECTION)



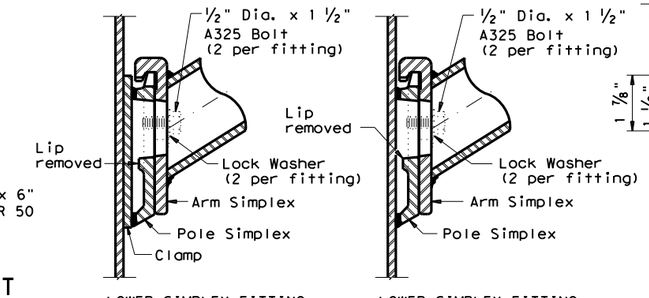
CLAMP ATTACHMENT DETAIL NO. 3 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 4 (HALF SECTION)



UPPER SIMPLEX FITTING

UPPER SIMPLEX FITTING

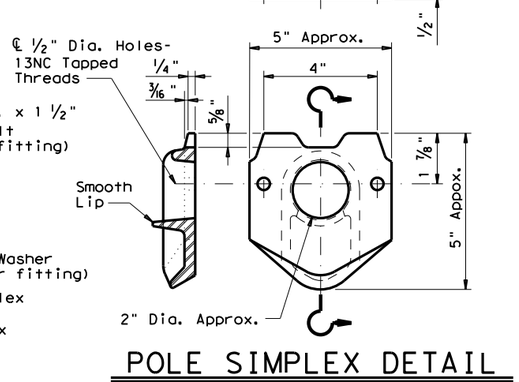


LOWER SIMPLEX FITTING

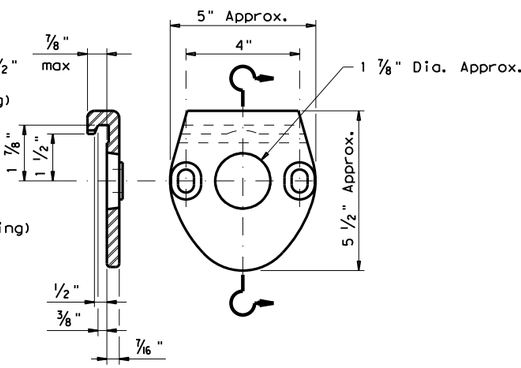
SECTON A-A

LOWER SIMPLEX FITTING

SECTON B-B



POLE SIMPLEX DETAIL



ARM SIMPLEX DETAIL

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY DRAWINGS FOR LUMINAIRE SUPPORT STRUCTURES

ARM DETAILS

LUM-A-12

DN: LEH	CK: JSY	DW: LTT	CK: TEB

REVISIONS
5-96
1-99
1-12

CONT	SECT	JOB	HIGHWAY
0016	08	039	SL 368

DIST	COUNTY	SHEET NO.
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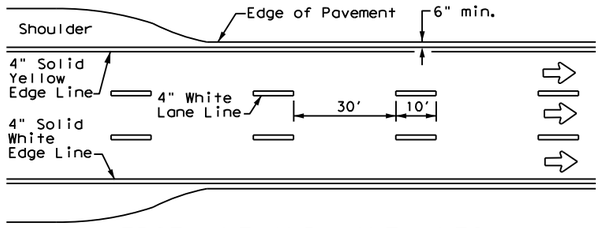
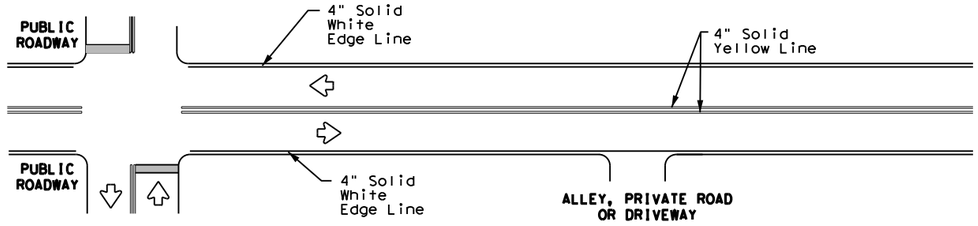
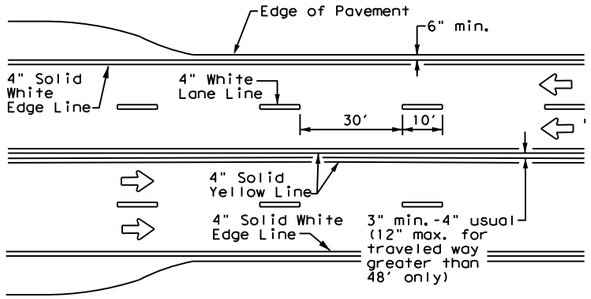


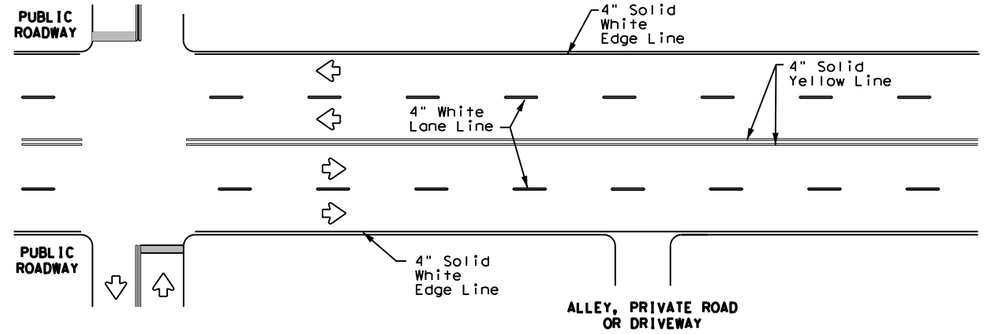
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



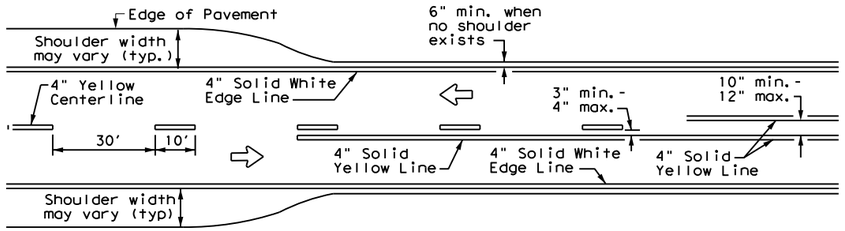
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



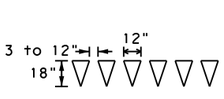
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



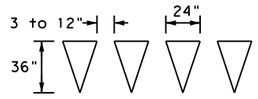
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

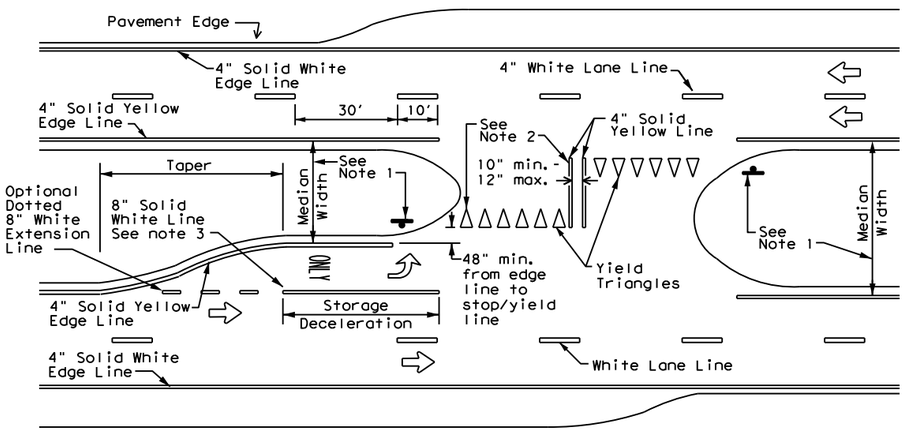


For posted speed on road being marked equal to or less than 40 MPH.



For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.

2. Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield traingles shall only be used with yield signs.

3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

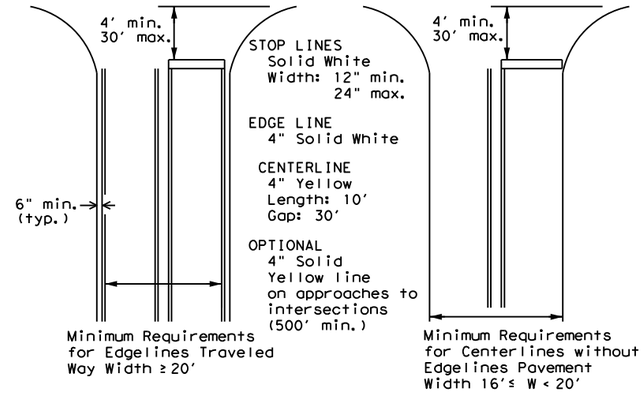
GENERAL NOTES

1. Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.

2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to the inside of edgeline of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

Texas Department of Transportation

Traffic Safety Division Standard

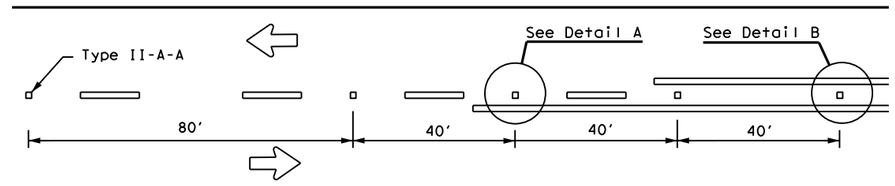
TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-20

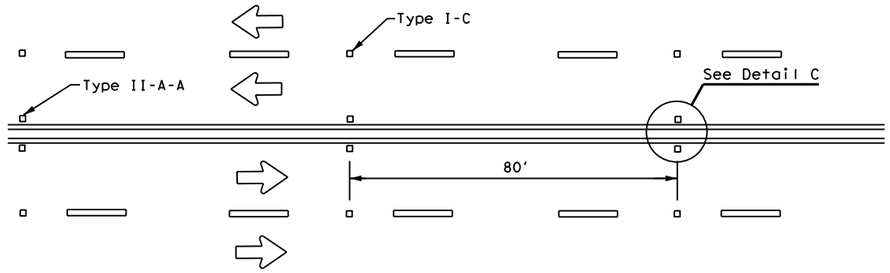
FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0016	08	039	SL 368
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	SAT	BEXAR		269

22A

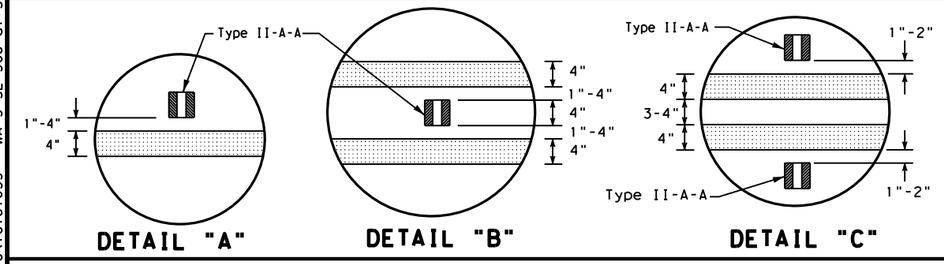
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



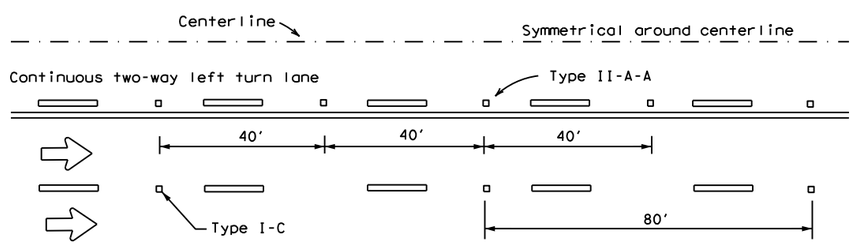
CENTERLINE FOR ALL TWO LANE ROADWAYS



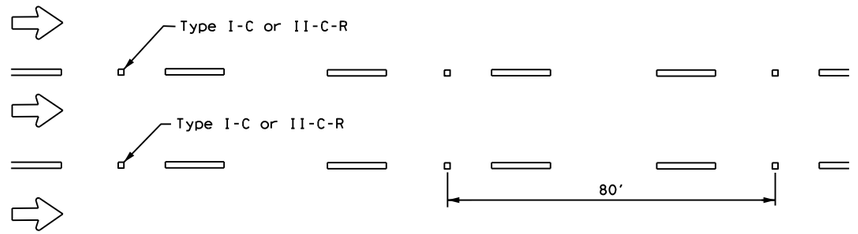
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



DETAIL "A" **DETAIL "B"** **DETAIL "C"**

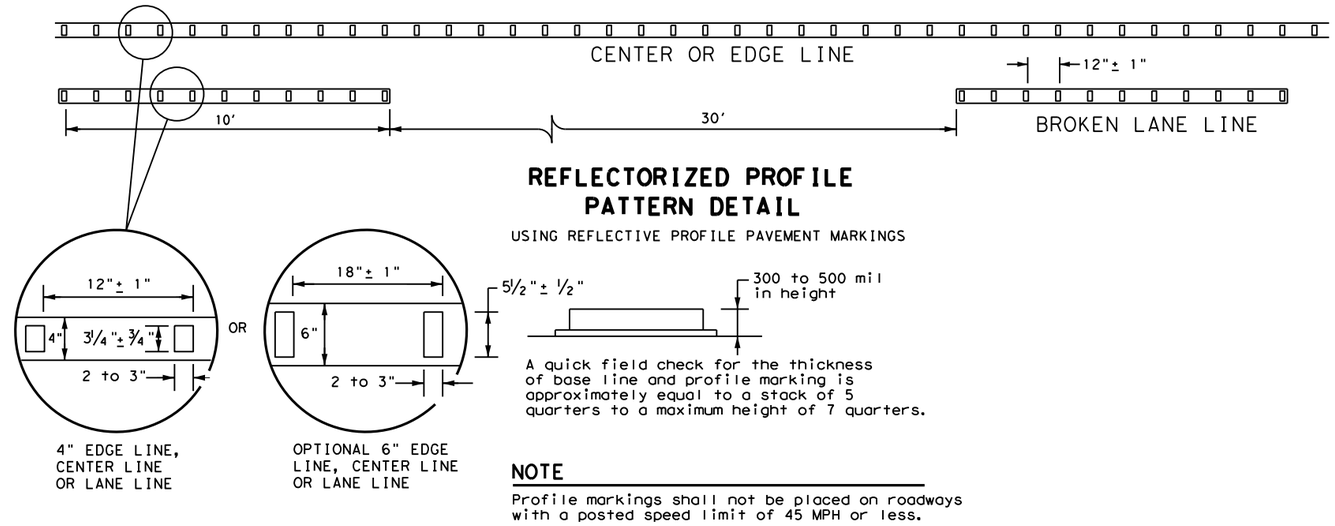


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTE

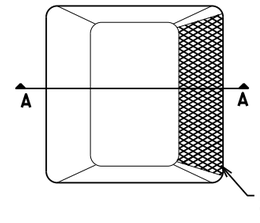
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

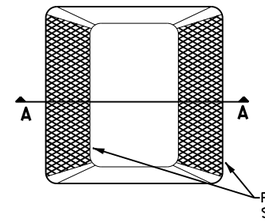
1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

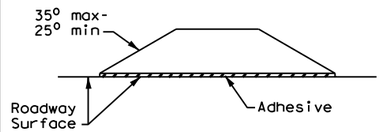
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation

Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-20

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10	0016	08	039	SL 368
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	SAT	BEXAR		270

22B

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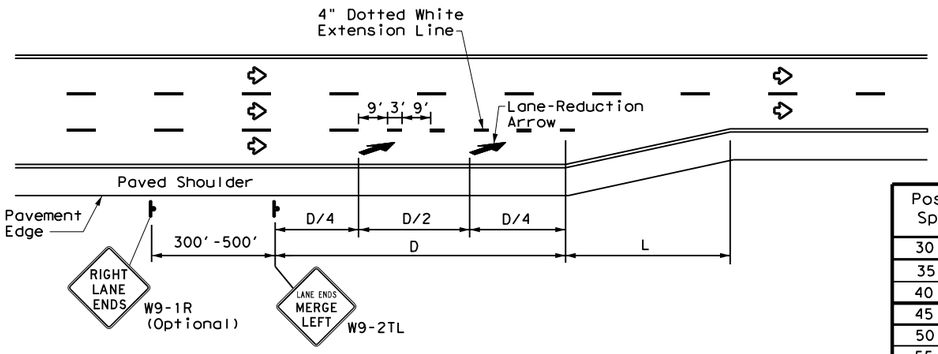
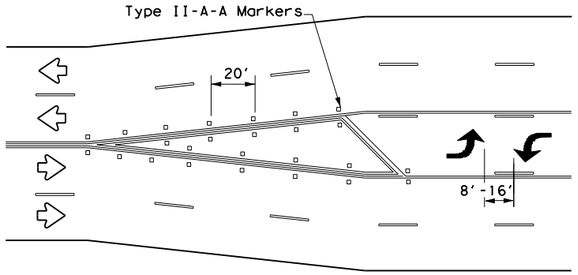


LANE REDUCTION

Posted Speed	D (ft)	L (ft)
30 MPH	460	$L=\frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional W9-1R "RIGHT LANE ENDS" sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.



A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

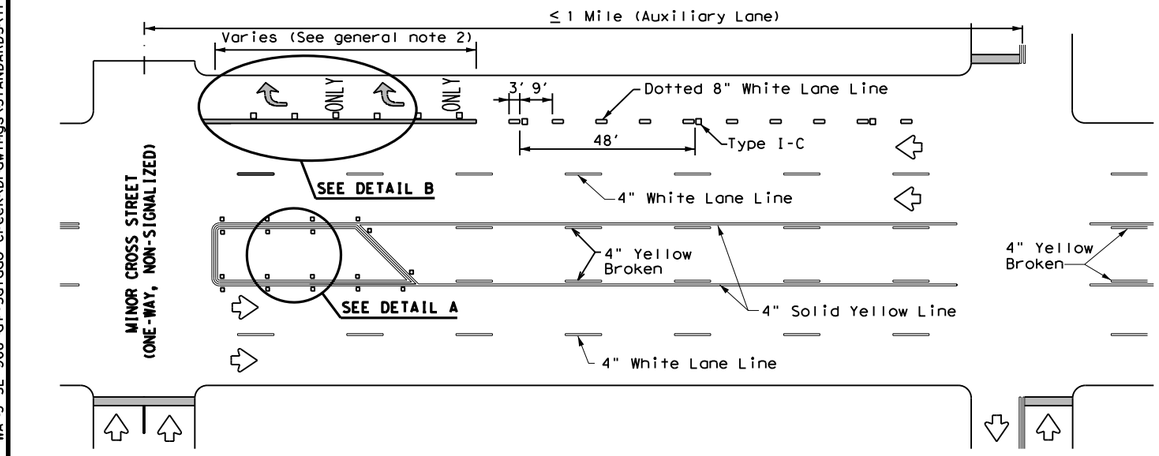
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

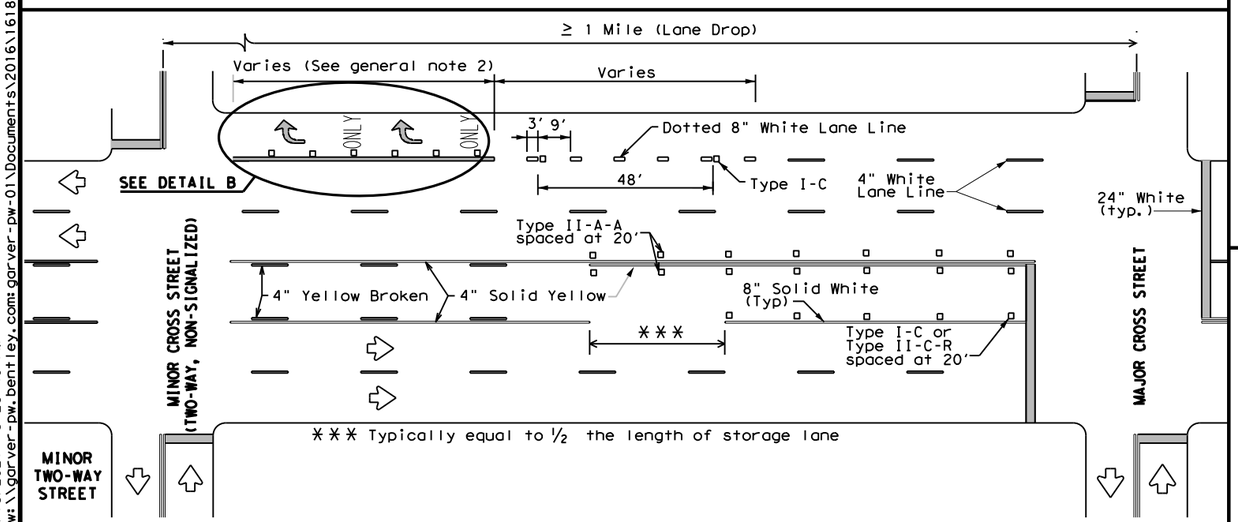
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

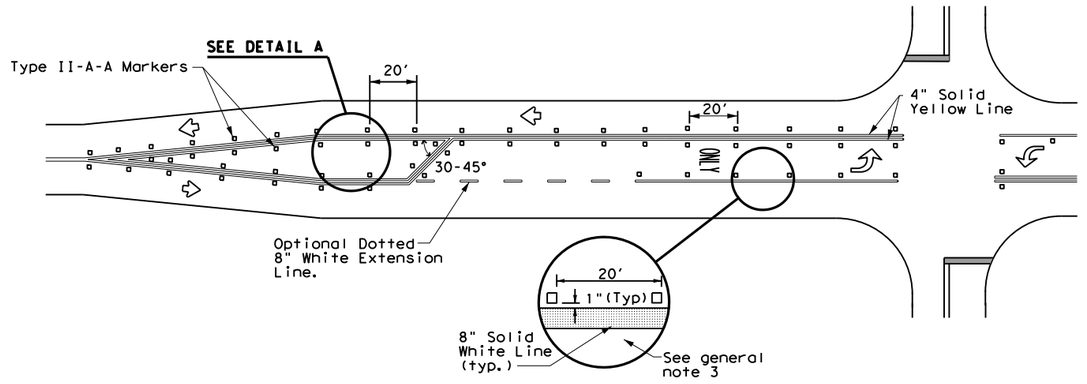
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



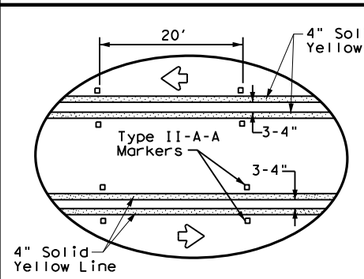
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



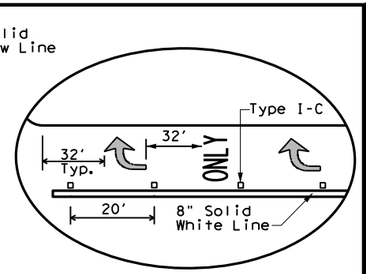
TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A



DETAIL B

Texas Department of Transportation

Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-20

FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
5-00 2-10	DIST	COUNTY		SHEET NO.
8-00 2-12	SAT	BEXAR		271
3-03 6-20				

22C

DATE: 1/27/2021 3:57:29 PM
FILE: pw:\\garver-pw.bentley.com:garver-pw-01\Documents\2016\16187035 - WA 5 SL 368 at Salado Creek\Drawings\STANDARDS\Traffic\smdgen.dgn

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

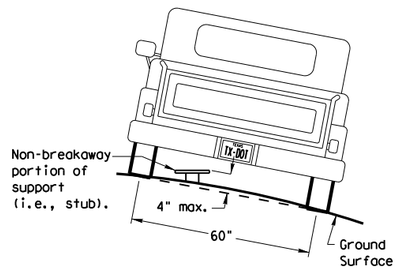
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-3))

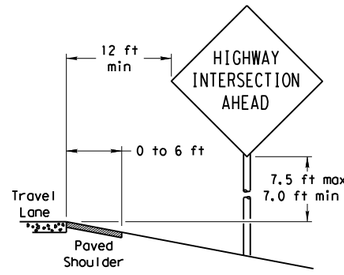
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

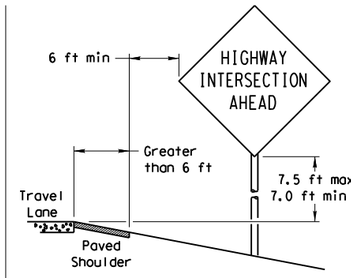
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

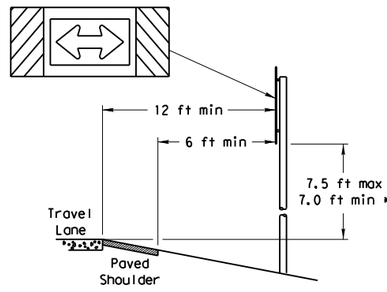
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



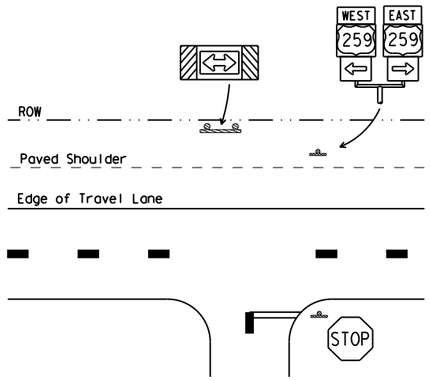
GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

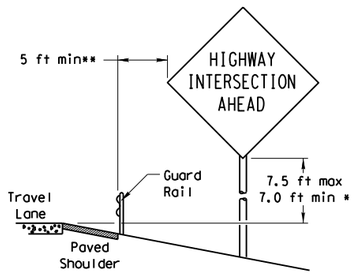
T-INTERSECTION



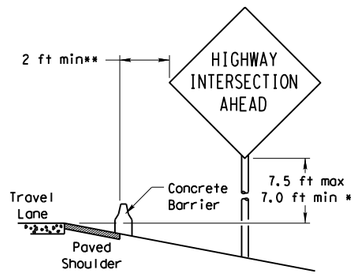
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



BEHIND GUARDRAIL

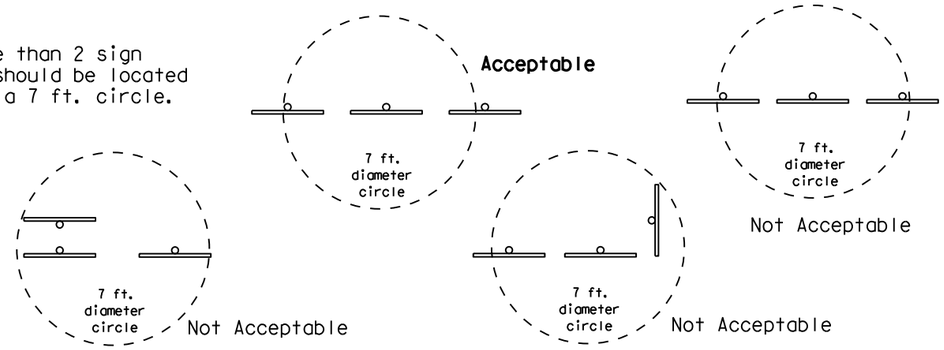


BEHIND CONCRETE BARRIER

**When 6 ft min. is not possible.)

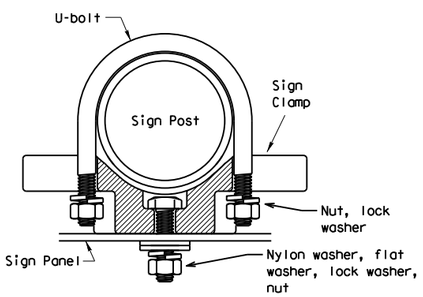
**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

No more than 2 sign posts should be located within a 7 ft. circle.



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

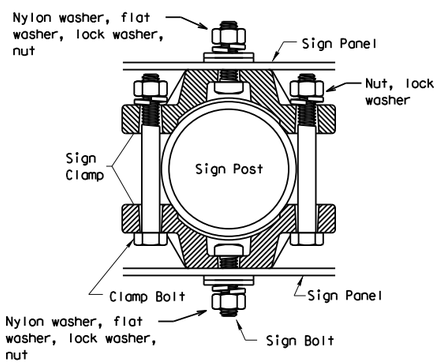


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

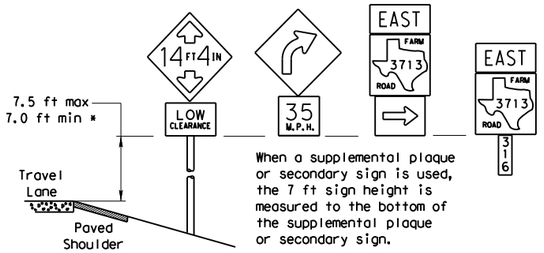
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



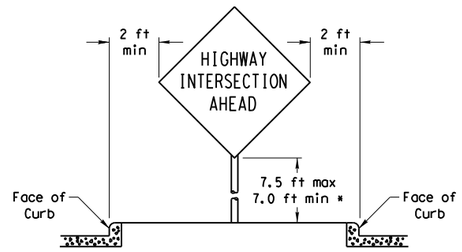
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



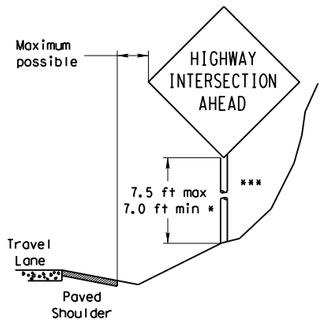
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

REVISIONS
9-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
0016	08	039	SL 368

DIST	COUNTY	SHEET NO.
SAT	BEXAR	272

DATE: 1/27/2021 3:57:31 PM
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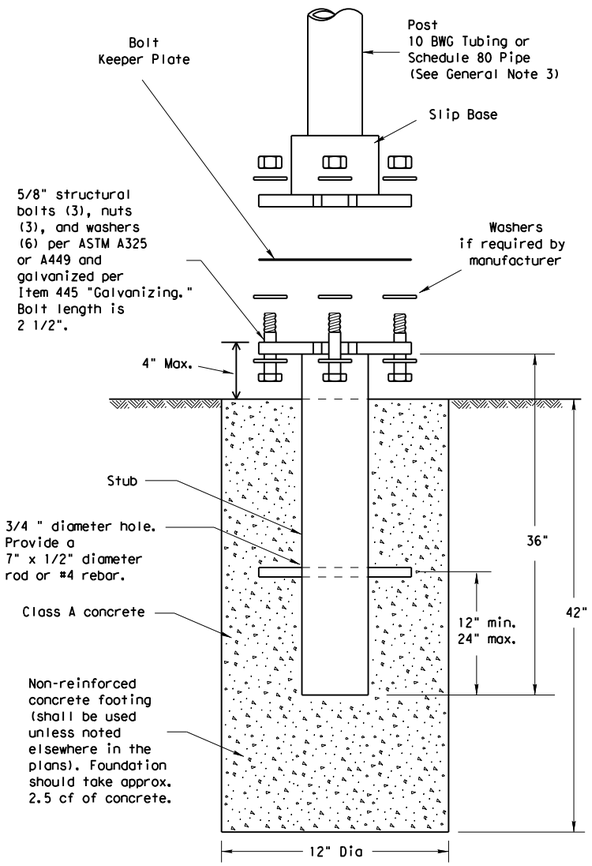
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



SM RD SGN ASSM TY XXXXX(X)SA(X-XXXX)

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

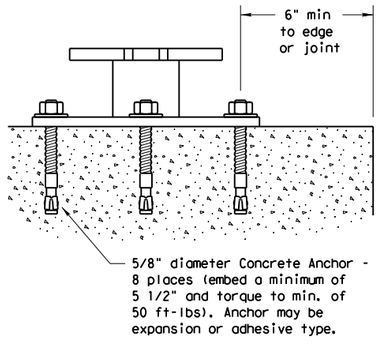
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



SM RD SGN ASSM TY XXXXX(X)SB(X-XXXX)

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0016	08	039	SL 368

DIST	COUNTY	SHEET NO.
SAT	BEXAR	273

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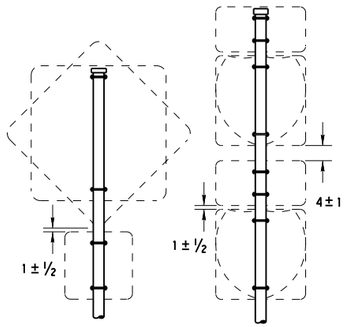
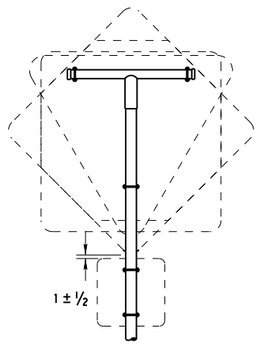


SM RD SGN ASSM TY XXXXX(1)XX(P)



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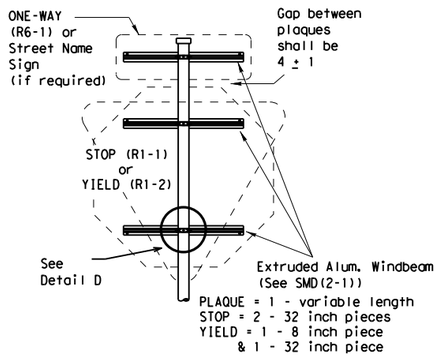

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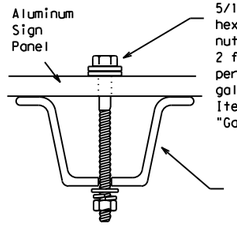
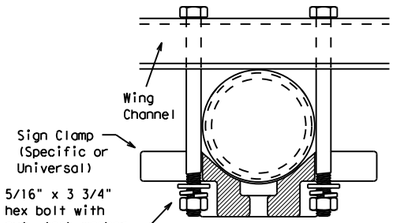


Top View

Detail A



Top View

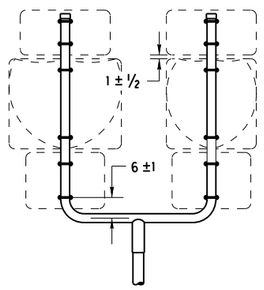
Detail B

GENERAL NOTES:

1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.



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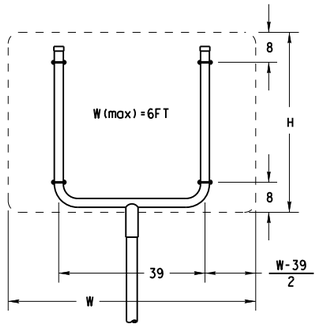

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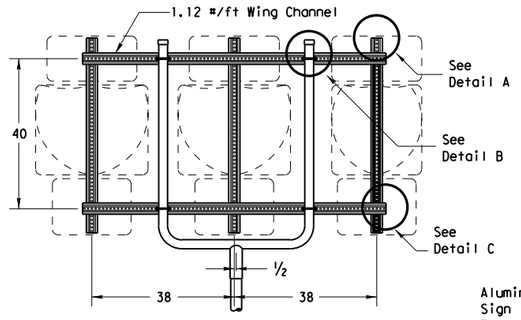
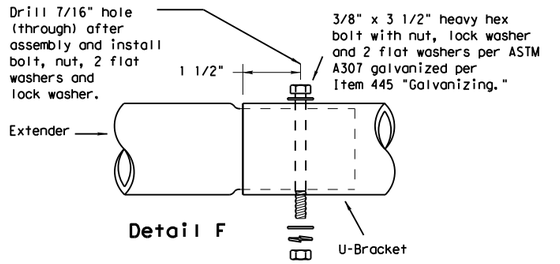
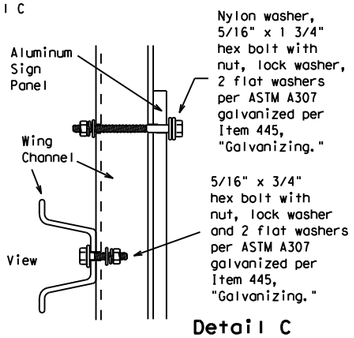


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

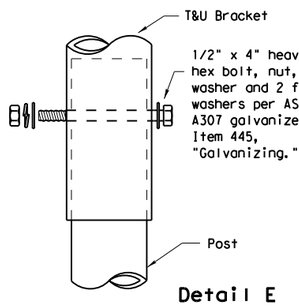


Detail F

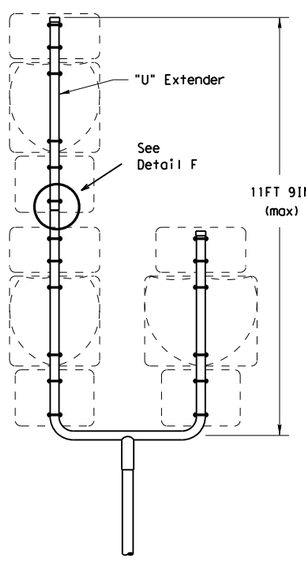
Splices shall only be allowed behind the sign substrate.



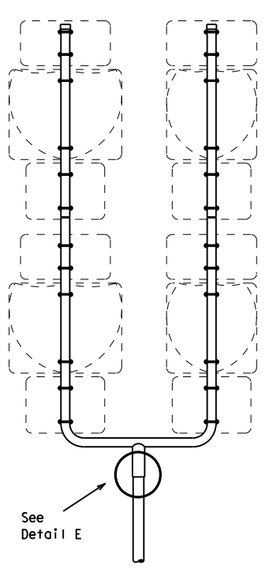
Detail C



Detail E



SM RD SGN ASSM TY S80(1)XX(U-1EXT)



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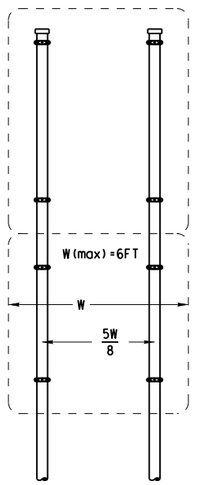
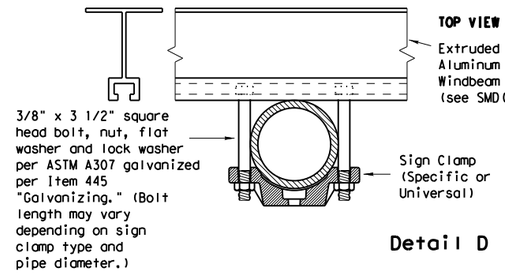
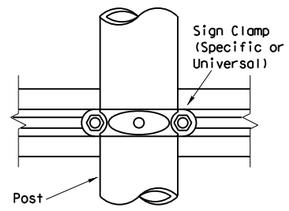


SM RD SGN ASSYM TY XXXXX(2)XX(P)

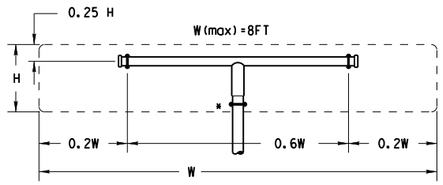
SIDE VIEW



Detail D



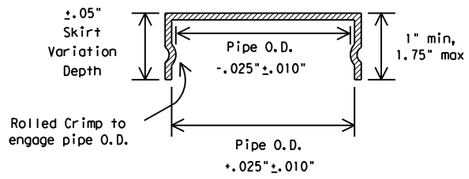
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)



SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		274

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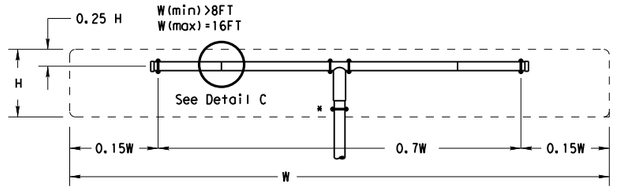
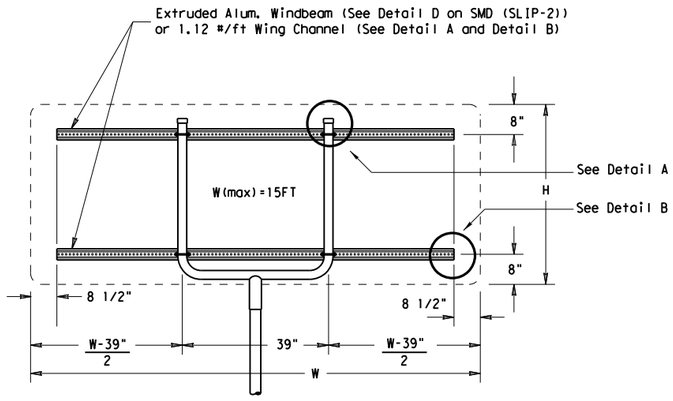
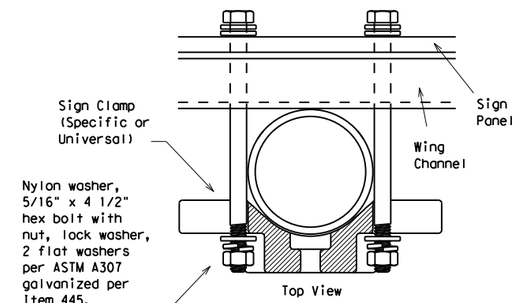


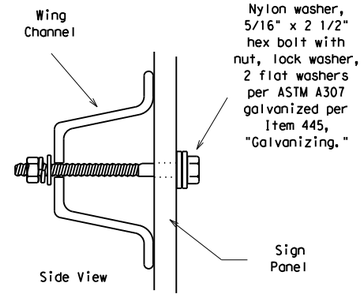
SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



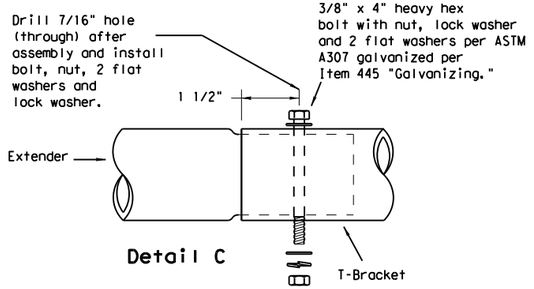
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



Detail A



Detail B



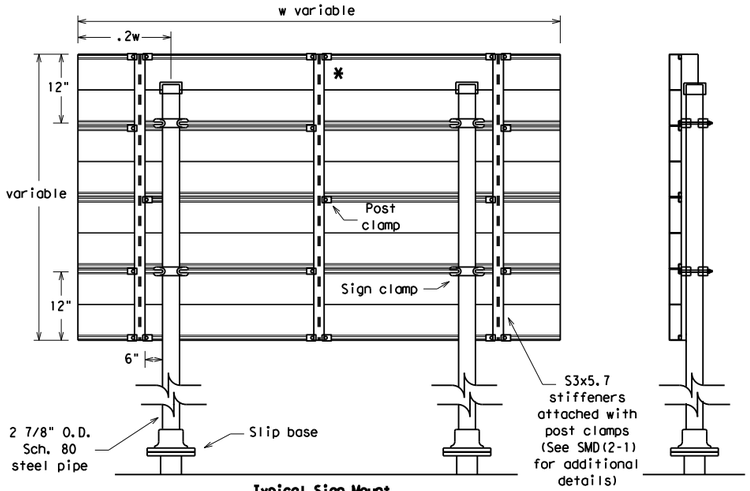
Detail C

Splices shall only be allowed behind the sign substrate.

GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

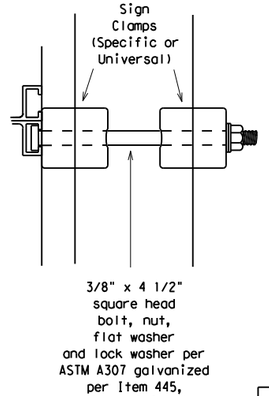
1. See table above.
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Sign blanks shall be the sizes and shapes shown on the plans.
11. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.



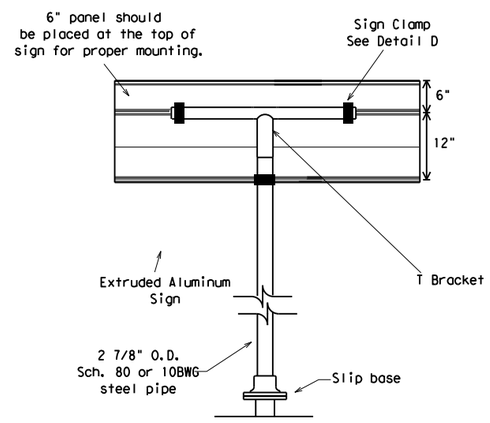
Typical Sign Mount

SM RD SGN ASSM TY S80(2)XX(P-EXAL)

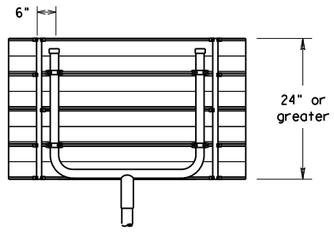
* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



Detail E

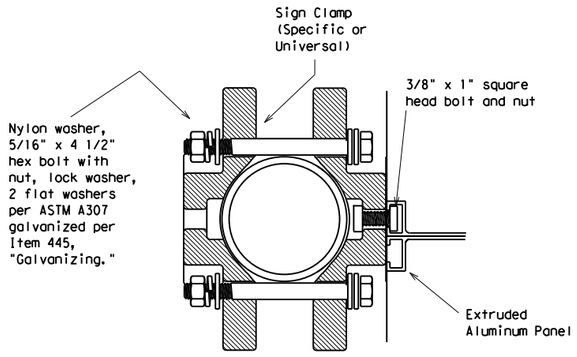


Extruded Aluminum Sign
With T Bracket



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0016	08	039	SL 368

DIST	COUNTY	SHEET NO.
SAT	BEXAR	275

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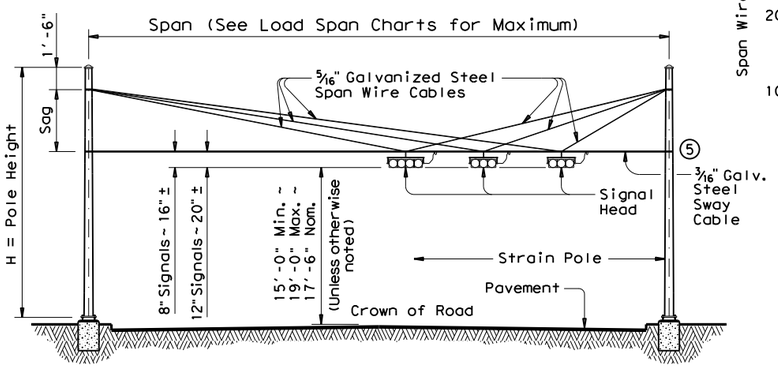
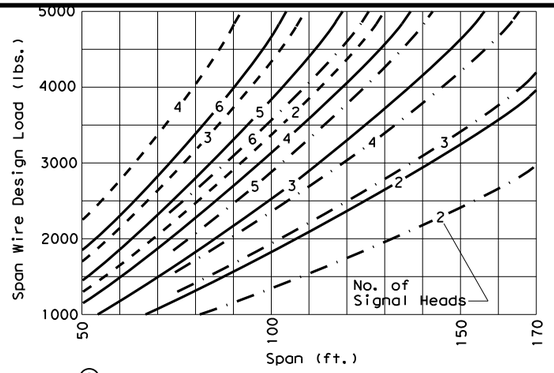
STRAIN POLE DESCRIPTION	Pole Type	Found-ation Type	Maximum Permissible Span Wire Load (lbs.)
26' Pole	A	36-A	5200
30' Pole	B	36-A	4600
30' Pole with Lum.	B	36-A	4400
30' Pole with 20' Mast Arm	C	36-B	5600
30' Pole with 24' Mast Arm	C	36-B	5500
30' Pole with 28' Mast Arm	C	36-B	5300
30' Pole with 32' Mast Arm	C	36-B	5100
30' Pole with 36' Mast Arm	C	36-B	4900
30' Pole with 20' Mast Arm & Lum.	C	36-B	5300
30' Pole with 24' Mast Arm & Lum.	C	36-B	5200
30' Pole with 28' Mast Arm & Lum.	C	36-B	5000
30' Pole with 32' Mast Arm & Lum.	C	36-B	4800
30' Pole with 36' Mast Arm & Lum.	C	36-B	4500
34' Pole	D	36-B	5600
34' Pole with Lum.	D	36-B	5400

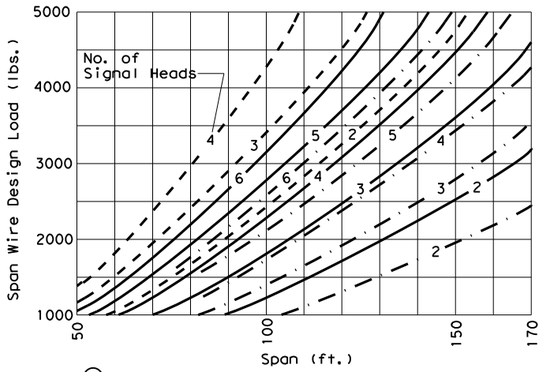
② Numbers on Load Span Charts indicate the number of signal heads on the span. The total span wire design load is based on one 5-section head and one or more additional 3-section head(s). Design wind pressures on cables are assumed as 1.0 lb/ft. Weight of span wire cables (one per signal head) is assumed as 0.65 lb/ft which includes an allowance for conductor cables and miscellaneous hardware. The effect of the sway cable on load distribution is ignored as it is assumed to break at design wind conditions. When a pole supports 2 spans, the span wire design loads for both spans should be added vectorially to determine the design load for that pole.



STRAIN POLE ELEVATIONS HORIZONTAL SIGNALS



② SIGNALS WITH 12-INCH LENS

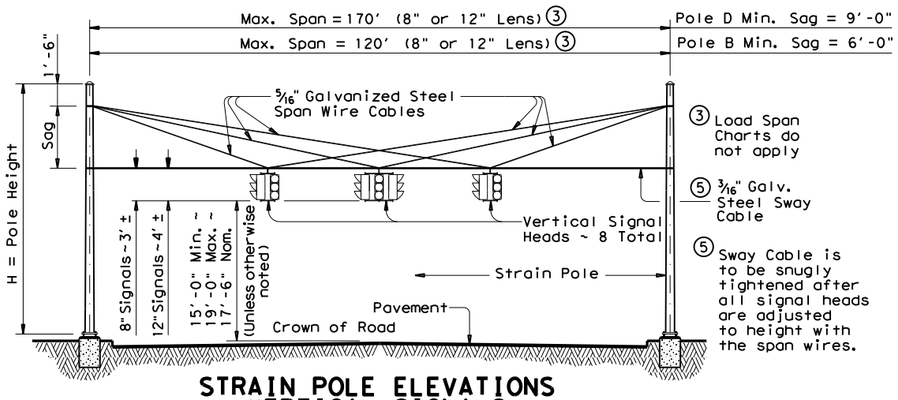


② SIGNALS WITH 8-INCH LENS

Signal Head Type	Wt. Per Head	Wind Area ◈
5-Section, 12" Lens	125 lbs	9.6 sq. ft.
5-Section, 8" Lens	70 lbs	4.8 sq. ft.
3-Section, 12" Lens	75 lbs	5.64 sq. ft.
3-Section, 8" Lens	45 lbs	3.0 sq. ft.

◈ Effective projected design wind area (actual area times drag coefficient)

- - - - - - Sag = 4'-6" (26' or 30' Pole)
——— Sag = 8'-0" (30' or 34' Pole)
— · — · — Sag = 11'-6" (34' Pole)



③ Load Span Charts do not apply

⑤ 3/16" Galv. Steel Sway Cable

⑤ Sway Cable is to be snugly tightened after all signal heads are adjusted to height with the span wires.

STRAIN POLE ELEVATIONS VERTICAL SIGNALS

(Mast arms are not used with vertical signals)

SHIPPING PARTS LIST

Poles (Without Traffic Signal Arm)

Pole Type	Strain poles with Luminaire: Ship each pole with the following hardware attached: handhole at base, pole cap, 2 clamp-on simplex and 1 pipe plug.			Strain poles without Luminaire: Ship each pole with the following hardware attached: handhole at base, pole cap and 1 pipe plug.		
	Description	Designation	Quantity	Description	Designation	Quantity
A				26' Strain Pole	SP 26 A-80	
B	30' Strain Pole	SPL 30 B-80		30' Strain Pole	SP 30 B-80	
D	34' Strain Pole	SPL 34 D-80		34' Strain Pole	SP 34 D-80	

Poles (With Traffic Signal Arm)

Pole Type	Strain poles with Luminaire: Ship each pole with the following hardware attached: handhole at base, pole cap, clamp-on simplex and 3 pipe plugs.			Strain poles without Luminaire: Ship each pole with the following hardware attached: handhole at base, pole cap and 3 pipe plugs.		
	Description	Designation	Quantity	Description	Designation	Quantity
C	30' SPw/TS Arm	SPL 30 C-80		30' SPw/TS Arm	SP 30 C-80	

Traffic Signal Arms (For Type C poles)

Nominal Arm Length	Type I Arm (1 Signal): Ship each Type I Arm with the following hardware attached: 2 CGB Connectors, 1 clamp with bolts and washers		Type II Arm (2 Signals): Ship each Type II Arm with the following hardware attached: 1 Bracket Assembly ①, 3 CGB Connectors and 1 clamp with bolts and washers		Type III Arm (3 Signals): Ship each Type III Arm with the following hardware attached: 2 Bracket Assemblies ①, 4 CGB Connectors and 1 clamp with bolts and washers	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24 II -80			
28	28I-80		28 II -80			
32			32 II -80		32 III -80	
36			36 II -80		36 III -80	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Templates may be removed for shipment. Quantity
1 ¾"	3'-10"	
2"	4'-3"	

Each Anchor Bolt Assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, and 4 nut anchor devices (Type 2) per Standard Drawing "TS-FD".

Luminaire Arms

Nominal Arm Length	Quantity
8' Arm	

① See Sheet "DMA-80"

Pole Type	ROUND POLES				POLYGONAL POLES			
	D_B in.	D_T in.	④thk in.	H ft.	D_B in.	D_T in.	④thk in.	H ft.
A	12.5	8.9	.239	26	13.0	9.0	.239	26
B	13.5	9.3	.239	30	14.0	9.0	.239	30
C	15.5	11.3	.239	30	16.0	11.0	.239	30
D	15.5	10.7	.239	34	16.0	11.0	.239	34

④ Thickness shown are minimum, thicker materials may be used.

D_B = Pole Base O.D. D_T = Pole Top O.D. H = Pole Height

SHEET 1 OF 2

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES STRAIN POLE ASSEMBLIES

(80 MPH WIND ZONE)

SP-80(1)-12

REVISIONS	DN: MS	CK: JSY	DW: BR	CK: JSY
6-96 1-12	CONT	SECT	JOB	HIGHWAY
	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		276

120A

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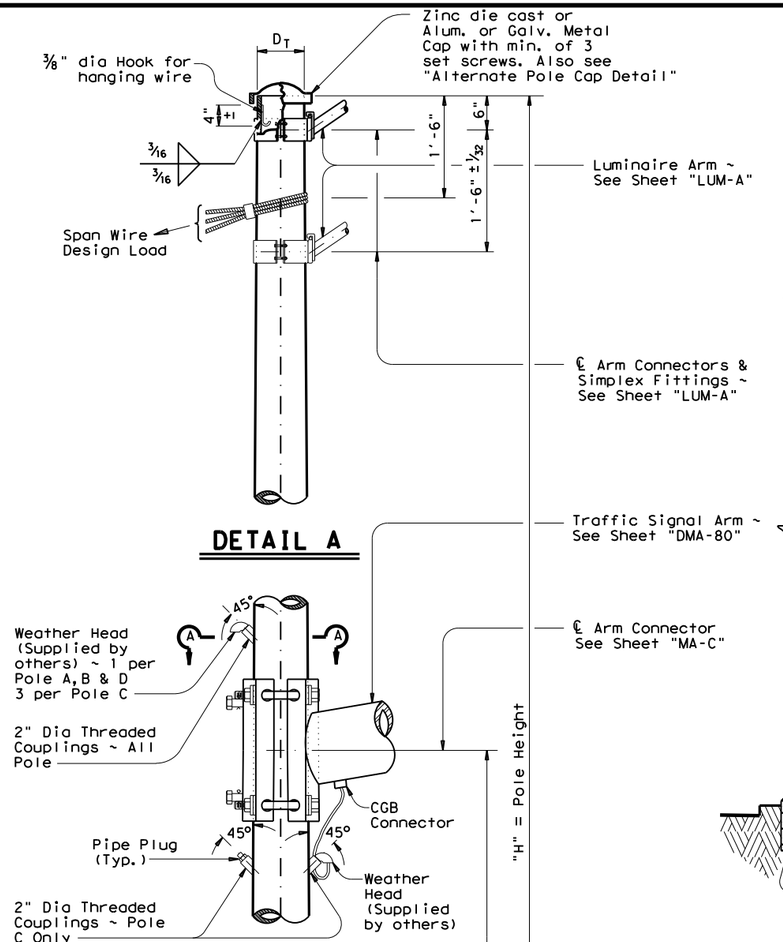
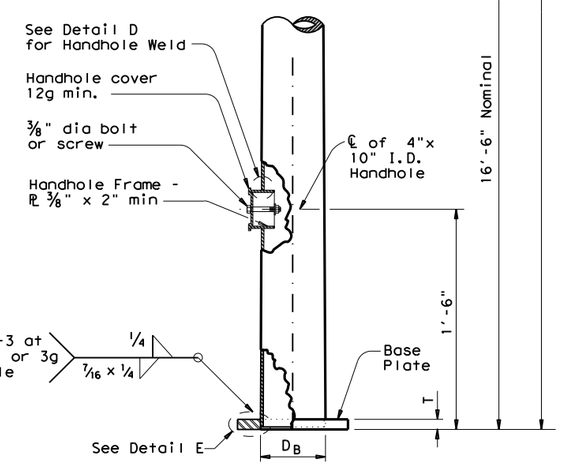


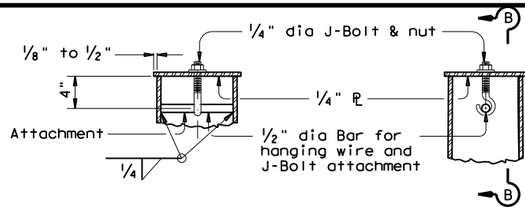
DETAIL A

DETAIL B



DETAIL C

POLE ELEVATION



ALTERNATE POLE CAP DETAIL

SECTION B-B

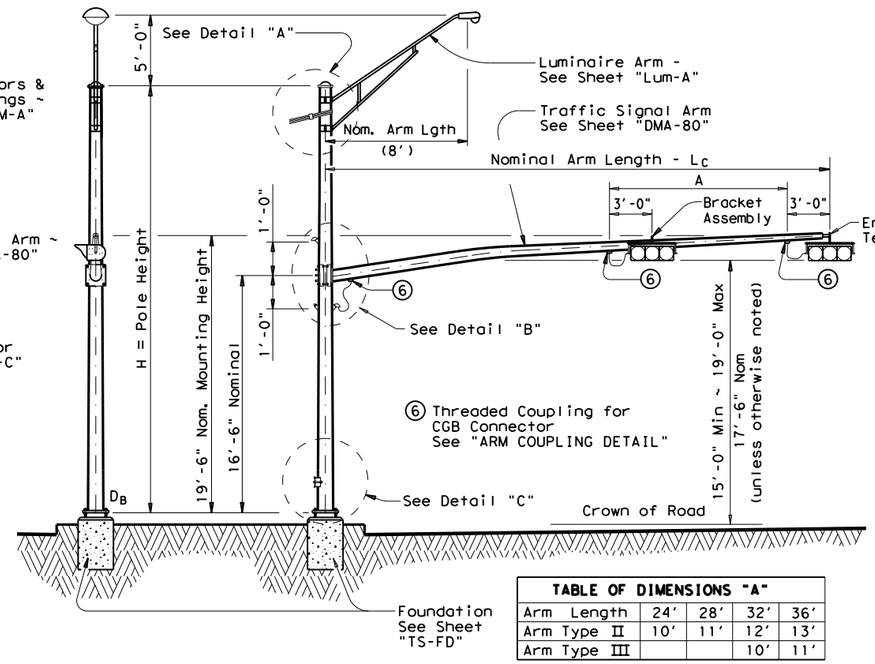
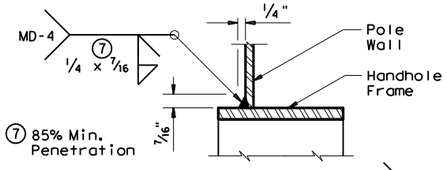
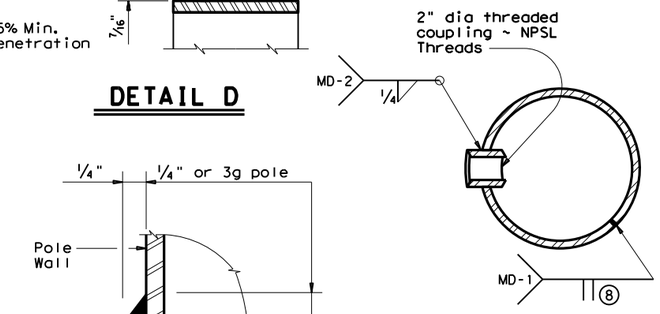


TABLE OF DIMENSIONS "A"				
Arm Length	24'	28'	32'	36'
Arm Type II	10'	11'	12'	13'
Arm Type III			10'	11'

STRUCTURE ASSEMBLY

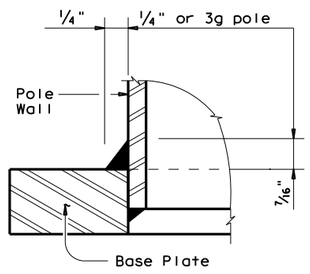


DETAIL D



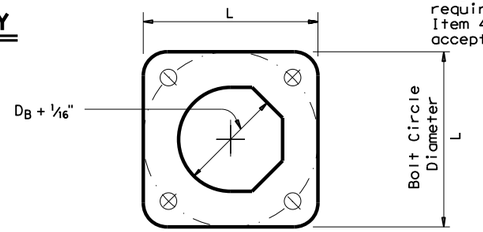
SECTION A-A

(Pole Coupling and Seam Weld Details)

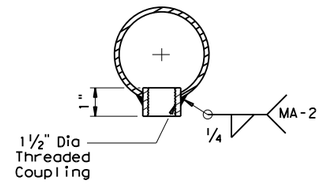


DETAIL E

8 60% Min. penetration, except 100% penetration within 6" of circumferential base welds.



BASE PLATE PLAN



ARM COUPLING DETAIL

MATERIALS	
Round Shafts or Polygonal Shafts 9	ASTM A595 Gr.A, A588, A1008 HSLAS Gr.50 Class 2, A1011 HSLAS Gr.50 Class 2, A572 Gr.50 or A1011 SS Gr.50 10
Plates 9	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325 except where noted
Pin Bolts	ASTM A325
Pipe 9	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Steel Cable	ASTM A475, 7 Wire Utilities Grade
Misc. Hardware	Galvanized steel or stainless steel or as noted

9 ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F, or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

10 ASTM A1011 SS Gr.50 shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 SS will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.

GENERAL NOTES

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor. The maximum permissible span wire design loads tabulated are calculated at a stress load of 1.4 times the basic allowable stress. A simultaneous wind on the pole, mast arm, and luminaire is also included.

See standard sheet "DMA-80" for details of clamp-on traffic signal arms, sheet "MA-C" for traffic signal arm connection details, sheet "LUM-A" for luminaire arm and connection details, and sheet "TS-FD" for anchor bolt and foundation details.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing", after fabrication.

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

Foundation Type	Anchor Bolt Diameter	Bolt Hole Diameter	Bolt Circle Diameter	Base ℞ Dim. L x T
36-A	1 3/4"	2"	19"	19" x 1 3/4"
36-B	2"	2 1/4"	21"	21" x 2"

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES STRAIN POLE ASSEMBLIES

(80 MPH WIND ZONE)

SP-80(2)-12

DN: MS	CK: JSY	DW: BR	CK: JSY

REVISIONS
6-96
1-12

CONT	SECT	JOB	HIGHWAY
0016	08	039	SL 368
DIST	COUNTY		SHEET NO.
SAT	BEXAR		277

120B

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FOUNDATION DESIGN TABLE

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		EMBEDDED DRILLED SHAFT LENGTH-ft ④, ⑤, ⑥			ANCHOR BOLT DESIGN ①				FOUNDATION DESIGN LOAD ②		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft 10	15	40	ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	¾"	36	12 ¾"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 ½"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 ¾"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 ¼"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

NOTES:

① Anchor bolt design develops the foundation capacity given under Foundation Design Loads.

② Foundation Design Loads are the allowable moments and shears at the base of the structure.

③ Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

④ Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

⑤ If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

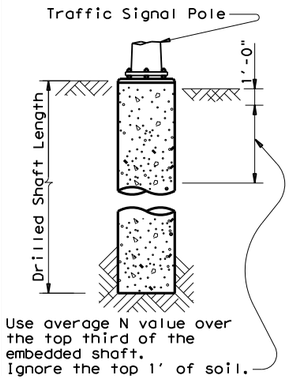
⑥ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

FOUNDATION SUMMARY TABLE ③

LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH ⑥ (FEET) 24-A	30-A	36-A	36-B	42-A
TOTAL DRILLED SHAFT LENGTHS								

FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)

		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32'	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'	32' X 32'		
			36' X 36'		
			40' X 36'		
			44' X 28'	44' X 36'	
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH		36'	44'	
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS		24' X 24'		
			28' X 28'		
			32' X 24'	32' X 32'	
				36' X 36'	
				40' x24'	40' X 36'
					44' x 36'



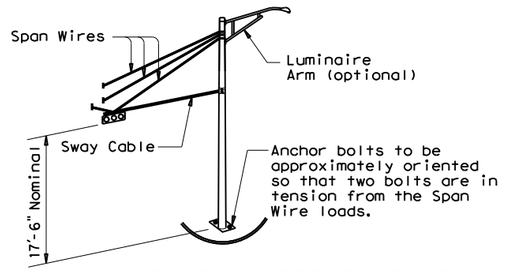
Use average N value over the top third of the embedded shaft. Ignore the top 1' of soil.

ANCHOR BOLT & TEMPLATE SIZES

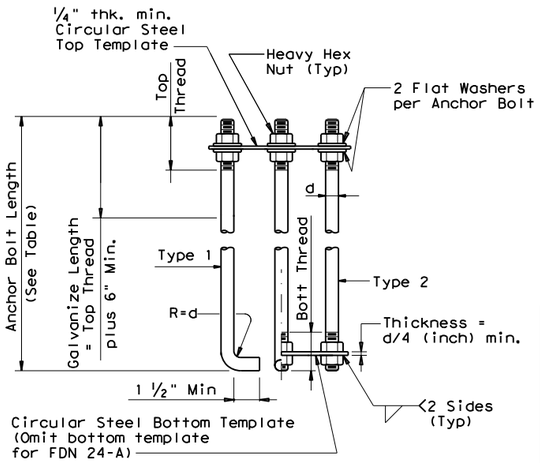
BOLT DIA IN.	⑦ BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	R1
¾"	1'-6"	3"	—	12 ¾"	7 ⅛"	5 ⅝"
1 ½"	3'-4"	6"	4"	17"	10"	7"
1 ¾"	3'-10"	7"	4 ½"	19"	11 ¼"	7 ¾"
2"	4'-3"	8"	5"	21"	12 ½"	8 ½"
2 ¼"	4'-9"	9"	5 ½"	23"	13 ¾"	9 ¼"

⑦ Min dimensions given, longer bolts are acceptable.

EXAMPLE:
1. For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
2. For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.



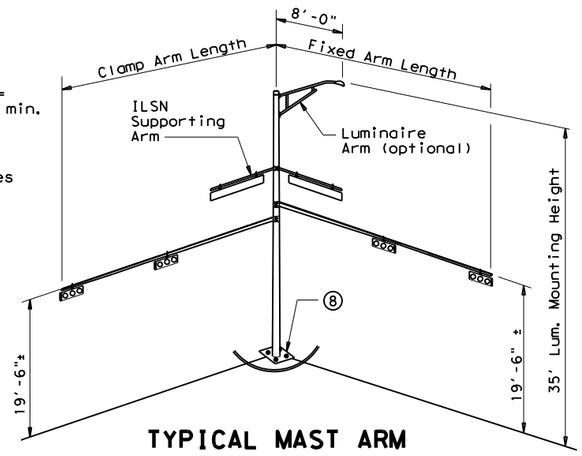
TYPICAL STRAIN POLE ASSEMBLY



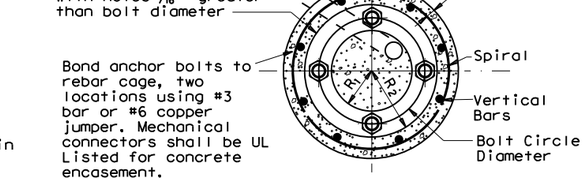
HOOKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY

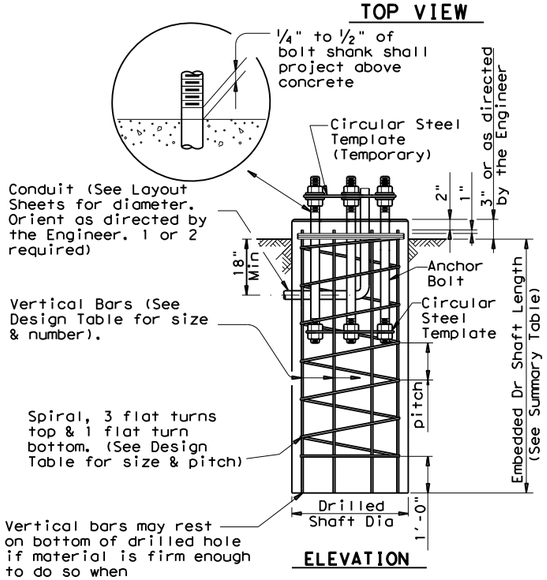
⑧ Orient anchor bolts orthogonal with the fixed arm direction to ensure that two bolts are in tension under dead load.



TYPICAL MAST ARM ASSEMBLY



TOP VIEW



ELEVATION

FOUNDATION DETAILS

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto.

Reinforcing steel shall conform to Item 440, "Reinforcing Steel".

Concrete shall be Class "C".

Threads for anchor bolts and nuts shall be rolled or cut threads of 8UN series up to 2" in diameter or UNC series for all sizes. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.

Anchor bolts that are larger than 1" in diameter shall conform to "alloy steel" or "medium-strength mild steel" per Item 449, "Anchor Bolts". Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Galvanize a minimum of the top end thread length plus 6" for all anchor bolts unless otherwise noted. Exposed washers and exposed nuts shall be galvanized. All galvanizing shall be in accordance with Item 445, "Galvanizing".

Templates and embedded nuts need not be galvanized. Lubricate and tighten anchor bolts when erecting the structure in accordance with Item 449, "Anchor Bolts".

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

REVISIONS	DN: MS	CK: JSY	DW: MAO/MMF	CK: JSY/TEB
5-96 1-99 1-12	CONT	SECT	JOB	HIGHWAY
	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		278

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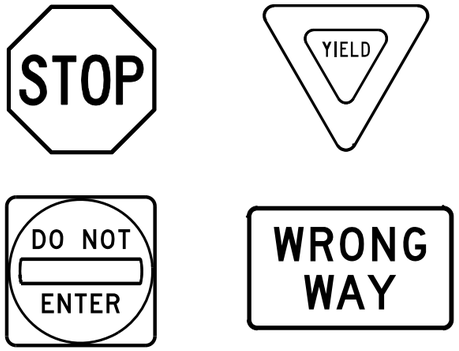
REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

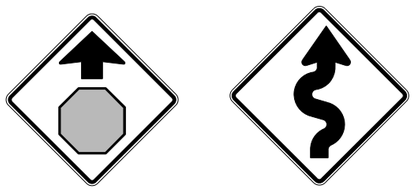
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND, BORDERS AND SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLOURESCENT YELLOW	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	FLOURESCENT YELLOW GREEN	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
8. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	SAT	BEXAR		279

Note To Designer:
1. Do not alter Sheet Design or Font style, size or weight - match text attributes.
2. If additional space is needed for a numbered section, fence and adjust sections up or down as needed for proportioning and readability but do not relocate from it's relative position.

A. GENERAL SITE DATA

1. PROJECT LIMITS: *SL 368 AT SALADO CREEK*

2. PROJECT SITE MAPS:

- *Project Latitude 29°30'00.08"N Project Longitude 98°25'18.08"W*
- *Project Location Map: Shown on Title Sheet*
- *Drainage Patterns: Shown on Drainage Area Maps*
- *Approx. Slopes Anticipated After Major Gradings and Areas of Soil Disturbance: Shown on Typical Sections*
- *Major Controls and Locations of Stabilization Practices: Shown on SW3P Sheets*
- *Project Specific Locations: Off-site waste, borrow, or storage areas are not part of this SW3P.*
- *Surface Waters and Discharge Locations: Shown on Drainage and Culvert Layout Sheets*

3. PROJECT DESCRIPTION: *REPLACE BRIDGE AND APPROACHES*

Non-Joint Bid Utilities are not part of this SW3P.

4. FOR MAJOR SOIL DISTURBING ACTIVITIES SEQUENCE OF EVENTS:

1. *Install controls down-slope of work area and initiate inspection and maintenance activities.*
2. *Begin phased construction with interim stabilization practices. Adjust erosion and sedimentation controls during construction to meet requirements and changing conditions and as directed/approved by the Engineer.*
3. *Major soil disturbing activities may include but are not limited to: right-of-way preparation, cut and/or fill to improve roadway profile, final grading and placement of topsoil and the following (if marked):*

- [X] *Placement of road base*
- [X] *Extensive ditch grading*
- [X] *Upgrading or replacing culverts or bridges*
- [ ] *Temporary detour road(s)*
- [ ] *Other: _____*

5. EXISTING AND PROPOSED CONDITIONS:

Description of existing vegetative cover: THIN PATCHES OF GRASSES & WEEDS W/ SOME BUSHES
Percentage of existing vegetative cover: 60%
Existing vegetative cover: (mark one)
- [X] *Thick or uniformly established*
- [ ] *Thin and Patchy*
- [ ] *None or minimal cover*

Description of soils:
Site Acreage: 2.12 *Acreage disturbed: 2.50*
Site runoff coefficient (pre-construction): *Site runoff coefficient (post-construction):*

6. RECEIVING WATERS:

- [ ] *A classified stream does not pass through project.*
- [X] *A classified stream passes through project. Name SALADO CREEK Segment Number _____*

Name of receiving waters that will receive discharges from disturbed areas of the project: SALADO CREEK

Site is in a Municipal Separate Storm Sewer System (MS4).
MS4 Operator (name): _____

B. BEST MANAGEMENT PRACTICES

General timing or sequence for implementation of BMPs shall be as required and/or as directed/approved by the Engineer to provide adequate controls. BMPs shown on plan sheets are to be considered "proposed" unless/until install date is shown. BMPs are to reduce sediments from road construction activities.

1. SOIL STABILIZATION PRACTICES: (Select T = Temporary or P = Permanent, as applicable)

- [T/P] SEEDING
- [ ] MULCHING (Hay or Straw)
- [ ] BUFFER ZONES
- [ ] PLANTING
- [ ] COMPOST/MULCH FILTER BERM
- [ ] SODDING
- [ ] PRESERVATION OF NATURAL RESOURCES
- [ ] FLEXIBLE CHANNEL LINER
- [ ] RIGID CHANNEL LINER
- [T/P] SOIL RETENTION BLANKET
- [T/P] COMPOST MANUFACTURED TOPSOIL
- [ ] OTHER: (Specify Practice)

2. STRUCTURAL PRACTICES: (Select T = Temporary or P = Permanent, as applicable)

- [T] SILT FENCES
- [ ] HAY BALES
- [ ] ROCK FILTER DAMS
- [ ] DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- [ ] DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- [ ] DIVERSION DIKE AND SWALE COMBINATIONS
- [ ] PIPE SLOPE DRAINS
- [ ] PAVED FLUMES
- [T] ROCK BEDDING AT CONSTRUCTION EXIT
- [ ] TIMBER MATTING AT CONSTRUCTION EXIT
- [ ] CHANNEL LINERS
- [ ] SEDIMENT TRAPS
- [ ] SEDIMENT BASINS
- [T] STORM INLET SEDIMENT TRAP
- [ ] STONE OUTLET STRUCTURES
- [ ] CURBS AND GUTTERS
- [P] STORM SEWERS
- [ ] VELOCITY CONTROL DEVICES
- [ ] OTHER: *(Specify Practice)*

3. STORM WATER MANAGEMENT:

The proposed facility was designed in consideration of hydraulic design standards to convey stormwater in a manner that is protective of public safety and property. The control of erosion from the facility is inherent to the design. Additional factors affecting post-construction stormwater at the project location include: (mark all that apply)

- [X] *Existing or new vegetation provides natural filtration.*
- [ ] *The design includes provisions for permanent erosion controls provided by strategically placed pervious and impervious surfaces.*
- [ ] *Project includes permanent sedimentation controls (other than grass).*
- [X] *Velocities do not require dissipation devices.*
- [ ] *Velocity-dissipation devices included in the design.*
- [ ] *Other : _____*

4. NON-STORM WATER DISCHARGES:

Off-site discharges are prohibited except as follows:

1. *Discharges from fire fighting activities and/or fire hydrant flushings.*
2. *Vehicle, external building, and pavement wash water where detergents and soaps are not used and where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed).*
3. *Plain water used to control dust.*
4. *Plain water originating from potable water sources.*
5. *Uncontaminated groundwater, spring water or accumulated stormwater.*
6. *Foundation or footing drains where flows are not contaminated with process materials such as solvents.*
7. *Other: _____*

Concrete truck wash water discharges on the site should be prohibited or minimized. If allowed by the Engineer, they must be managed in a manner so as not to contaminate surface water. They must not be located in areas of concentrated flow. Concrete truck wash-out locations must be shown on the SW3P Layout and included in the inspections.

Hazardous material spill/leak shall be prevented or minimized. At a minimum, this includes asphalt products, fuels, oils, lubricants, solvents, paints, acids, concrete curing compounds and chemical additives for soil stabilization. BMPs shall be implemented to the storage areas of these products. All spills must be cleaned and disposed properly and reported to the Engineer. Report any release at or above the reportable quantity during a 24 hour period to the National Response Center at 1-800-424-8802.

C. OTHER REQUIREMENTS & PRACTICES

1. MAINTENANCE:

All erosion and sediment controls shall be maintained in good working order. If a repair is necessary, it shall be performed before the next anticipated storm event but no later than 7 calendar days after the surrounding exposed ground has dried sufficiently to prevent further damage from equipment. If maintenance prior to the next anticipated storm event is impracticable, maintenance must be scheduled and accomplished as soon as practicable. Disturbed areas on which construction activities have ceased, temporarily or permanently, shall be stabilized within 14 calendar days unless they are scheduled to and do resume within 21 calendar days. The areas adjacent to creeks and drainageways shall have priority followed by protecting storm sewer inlets.

2. INSPECTION:

For areas of the construction site that have not been finally stabilized, areas used for storage of materials, structural control measures, and locations where vehicles enter or exit the site, personnel provided by the permittee and familiar with the SW3P must inspect disturbed areas at least once every seven (7) calendar days. An Inspection and Maintenance Report shall be prepared for each inspection and the controls shall be revised on the SW3P within seven (7) calendar days following the inspection.

3. WASTE MATERIALS:

All non-hazardous municipal waste materials such as litter, rubbish, trash and garbage located on or originating from the project shall be collected and stored in a securely lidded metal dumpster, provided by the Contractor. The dumpster shall be emptied as necessary or as required by local regulation and the trash shall be hauled to a permitted disposal facility. The burying of non-hazardous municipal waste on the project shall not be permitted. Construction material waste sites, stockpiles and haul roads shall be constructed to minimize and control the amount of sediment that may enter receiving waters. Construction material waste sites shall not be located in any wetland, water body or stream bed. Construction staging areas and vehicle maintenance areas shall be constructed in a manner to minimize the runoff of pollutants.

4. OFFSITE VEHICLE TRACKING:

Off-site vehicle tracking of sediments and the generation of dust must be minimized. Excess sediments on road shall be removed on a regular basis as directed/approved by the Engineer.

5. OTHER:

See the EPIC sheet for additional environmental information.

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TBPE Firm 5713

 Texas Department of Transportation

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED PROFESSIONAL ENGINEER

1/27/2021
, P.E.
Signature of Registrant & Date

REVISION DATE: 10/12

STORM WATER POLLUTION PREVENTION PLAN (SW3P)

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		SL 368
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	SHEET NO.
0016	08	039	280

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

Texas Pollutant Discharge Elimination System (TPDES) TXR 150000: Stormwater Discharge Permit or Construction General Permit (CGP) required for projects with 1 or more acres distrubed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000.
2. Comply with the Storm Water Pollution Prevention Plan (SW3P) and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and Texas Commission on Environmental Quality (TCEQ), Environmental Protection Agency (EPA) or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, Contractor shall submit Notice of Intent (NOI) to TCEQ and the Engineer.
5. NOI required: ☐Yes ☒ No

Note: If amount of soil disturbance changes, permit requirements may change.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

US Army Corps of Engineers (USACE) Permit required for filling, dredging, excavating or other work in any potential USACE jurisdictional water, such as, rivers, creeks, streams, or wetlands.

The Contractor shall adhere to all of the terms and conditions associated with the following permit(s):

☐ No Permit Required
☒ Nationwide Permit (NWP) 14 - Pre-construction Notice (PCN) not Required
☐ Nationwide Permit 14 - PCN Required
☐ Individual 404 Permit Required
☐ Other Nationwide Permit Required: NWP# _____

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices (BMPs) planned to control erosion, sedimentation and post-project total suspended solids (TSS).

1. Salado Creek, NWP 14 - No PCN
2.
3.
4.

401 Best Management Practices: (Not applicable if no USACE permit)

Erosion	Sedimentation	Post-Construction TSS
☒ Temporary Vegetation	☒ Silt Fence	☐ Vegetative Filter Strips
☒ Blankets/Matting	☐ Rock Berm	☐ Retention/Irrigation Systems
☐ Mulch	☐ Triangular Filter Dike	☐ Extended Detention Basin
☐ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost
☐ Erosion Control Compost	☐ Erosion Control Compost	☒ Mulch Filter Berm and Socks
☐ Mulch Filter Berm and Socks	☐ Mulch Filter Berm and Socks	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☐ Vegetation Lined Ditches
	☐ Stone Outlet Sediment Traps	☐ Sand Filter Systems
	☐ Sediment Basins	☐ Sedimentation Chambers
		☐ Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☐ No Action Required ☒ Required Action

To minimize potential damage to historic granite markers, contractor must:

1. If contractor needs to remove sidewalk or pavement adjacent to historic markers, contractor shall saw cut 8 to 12 inches away from marke(s and remove remaining material by hand.

2. Contractor must prevent damage to historic markers during the entire construction project, especially during removal of existing pavement, curb, or sidewalk. This may require contractor to physically protect markers and to avoid having heavy equipment near them.

3. Contractor must repair or replace in kind, at his or her own expense, any historic materials damaged in the course of executing the work. Contractor shall locate replacement source for historic materials damaged in the course of the work. TxDOT-Environmental Affairs Division shall be informed of proposed repairs to facilitate consultation with Texas Historical Commission prior to execution of repair work.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical. Contractor must adhere to Construction Specification Requirements Specs 162,164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☒ No Action Required ☐ Required Action

Action No.

1.

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

☐ No Action Required ☒ Required Action

Action No.

1. MIGRATORY BIRD NESTS: Schedule construction activities as needed to meet the following requirements:

   A. Do not remove or destroy any active migratory bird nests (nests containing eggs and/or flightless birds) at any time of year. If there are any active nests, they shall not be removed until the nests become inactive.

   B. On/in structures, if there are any active nests, they shall not be removed until all nests become inactive. After inactive nests are removed and/or before nest activity begins, deterrent materials may be applied to the structures to prevent future nest building.

2. PLAINS SPOTTED SKUNK: Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered, and to avoid unncessary impacts to dens

3. See Item 5 in General Notes.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediated area, and contact the Engineer immediately.

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropiate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

No asbestos and/or lead based paint are found on the bridges for this project. Contact the Engineer if any of the follwing are detected:

* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

Hazardous Materials or Contamination Issues Specific to this Project:

☐ No Action Required ☒ Required Action

Action No.

1. The paint system on the steel bridge column(s) contain lead paint. If requested by the contractor the Department will remove paint containing hazardous materials from the steel during the Contract in accordance with the following:
   Remove a four inch wide strip around the rails at the proposed torch cut locations. Locations requiring paint removal must be identify a minimum of 30 days prior to start of steel structure removal.

2. 180 linear feet of asbestos cement (AC) water line is in conflict with proposed construction on this project. If requested by the contractor, TxDOT will provide a specialty contractor to remove the pipe. The roadway contractor (or the utility subcontractor) must excavate to the top of the pipe. The District Environmental Section must be notified 10 working days before the pipe needs to be removed from the ground.

Does the project involve the demolition of a span bridge?

☒ Yes ☐ No (No further action required)

If "Yes", a pre- demolition notification must be submitted to the Texas Department of State Health Services. The contractor shall contact TxDOT's Project Engineer 25 calendar days prior to the demolition of the bridges(s) on the project to assist with the notification.

VII. OTHER ENVIRONMENTAL ISSUES

(includes regional issues such as Edwards Aquifer District, etc.)

☒ No Action Required

Action No.

1.

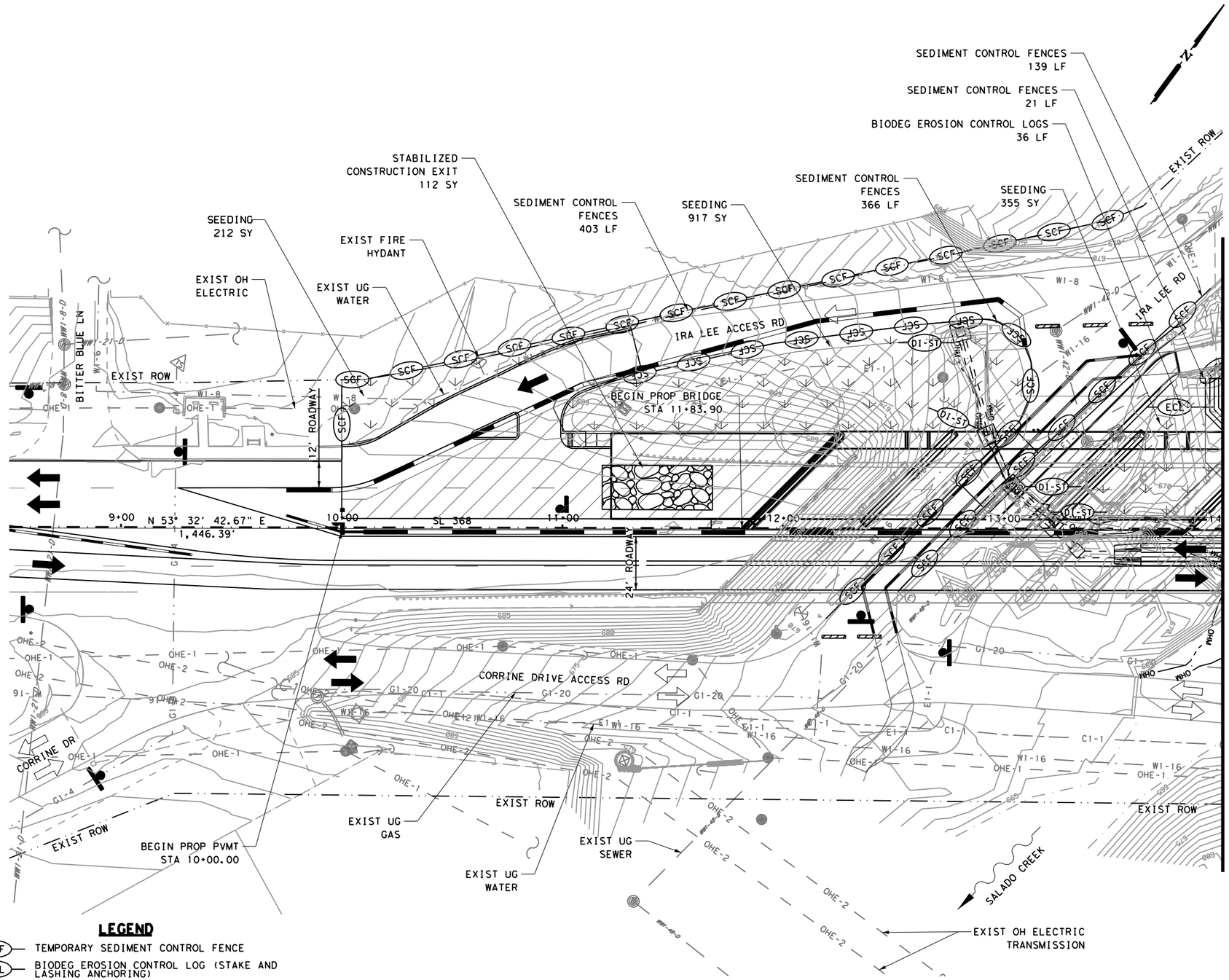
☐ Required Action

Texas Department of Transportation
San Antonio District Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic_2015-10-09_SAT.dgn	DN: TxDOT	CK:	DW:	CK:		
©TxDOT OCTOBER 2015	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0016	08	039		SL 368	
	DIST	COUNTY			SHEET NO.	
	SAT	BEXAR			281	



ITEM NO.	DESCRIPTION	UNIT	QTY
161 6017	COMPOST MANUF TOPSOIL (4")	SY	1484
164 6027	CELL FBR MLCH SEED (PERM) (URBAN) (CLAY)	SY	1484
164 6029	CELL FBR MLCH SEED (TEMP) (WARM)	SY	742
164 6031	CELL FBR MLCH SEED (TEMP) (COOL)	SY	742
166 6001	FERTILIZER	AC	0.3
168 6001	VEGETATIVE WATERING	MG	23
169 6001	SOIL RETENTION BLANKETS (CL1) (TY A)	SY	1484
506 6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	112
506 6024	CONSTRUCTION EXITS (REMOVE)	SY	112
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	929
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	
506 6042	BIODEG EROSN CONT LOGS (INSTL) (18")	LF	36
506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	
506 6047	TEMP SDMT CONT FENCE (INLET PROTECTION)	LF	80
730 6107	FULL - WIDTH MOWING	CYC	2
734 6002	LITTER REMOVAL	CYC	7
738 6318	CLEAN/SWEEP AREA 1	CYC	7

0 25′ 50′

SCALE: 1" = 50′

LEGEND

- SCF — TEMPORARY SEDIMENT CONTROL FENCE
- ECL — BIODEG EROSION CONTROL LOG (STAKE AND LASHING ANCHORING)
- DI-ST — TEMP SDMT CONT FENCE (INLET PROTECTION) EST @ 20 LF EACH LOCATION UNLESS OTHERWISE NOTED
- TEMPORARY SEEDING AND SOIL RETENTION BLANKET
- STABILIZED CONSTRUCTION EXIT (TYPE I)
- EXIST DIRECTION OF TRAFFIC
- PROP DIRECTION OF TRAFFIC
- PH1 — PHASE UNDER WHICH TREATMENT WAS INSTALLED
- FLOW ARROW
- ROADWAY CONSTRUCTION IN THIS PHASE
- PERMANENT PAVEMENT PREVIOUS PHASE

GENERAL NOTES

1. REFER TO SW3P NARRATIVE SHEET FOR OTHER NOTES.
2. REFER TO SW3P STANDARD SHEETS FOR DETAILS.
3. EXISTING STORM DRAINS/CULVERTS ARE SHOWN AS DASHED.
4. INSTALLED MEASURES SHALL REMAIN IN PLACE AND SHALL BE MAINTAINED THROUGHOUT DURATION OF PROJECT OR AS DIRECTED BY THE ENGINEER.
5. BACKHOE WORK ESTIMATED AT 2 HOURS PER SEDIMENT CONTROL FENCE AND ROCK DAM INSTALLATION.
6. SW3P MEASURES SHOWN ARE MINIMUM REQUIREMENTS BASED UPON PROJECT DESIGN. INSTALLATION OF SW3P MEASURES WILL BE AS SHOWN AND MODIFIED TO ACCOMODATE ACTUAL FIELD CONDITIONS.
7. CONSTRUCTION EXITS ARE SHOWN FOR ESTIMATING PURPOSES ONLY. ALL CONSTRUCTION EXITS WILL BE MOVED AND RESET DURING EACH CONSTRUCTION PHASE.
8. DROP INLET SEDIMENT TRAP (DI-ST) AND CURB INLET SEDIMENT TRAP (CI-ST) ARE EROSION CONTROL LOGS AND WILL BE MEASURED AND PAID BY THE LF.

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED
PROFESSIONAL ENGINEER

1/27/2021

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TBPELS Firm 5713

SL 368
AT SALADO CREEK

SW3P LAYOUT
PHASE I

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		282
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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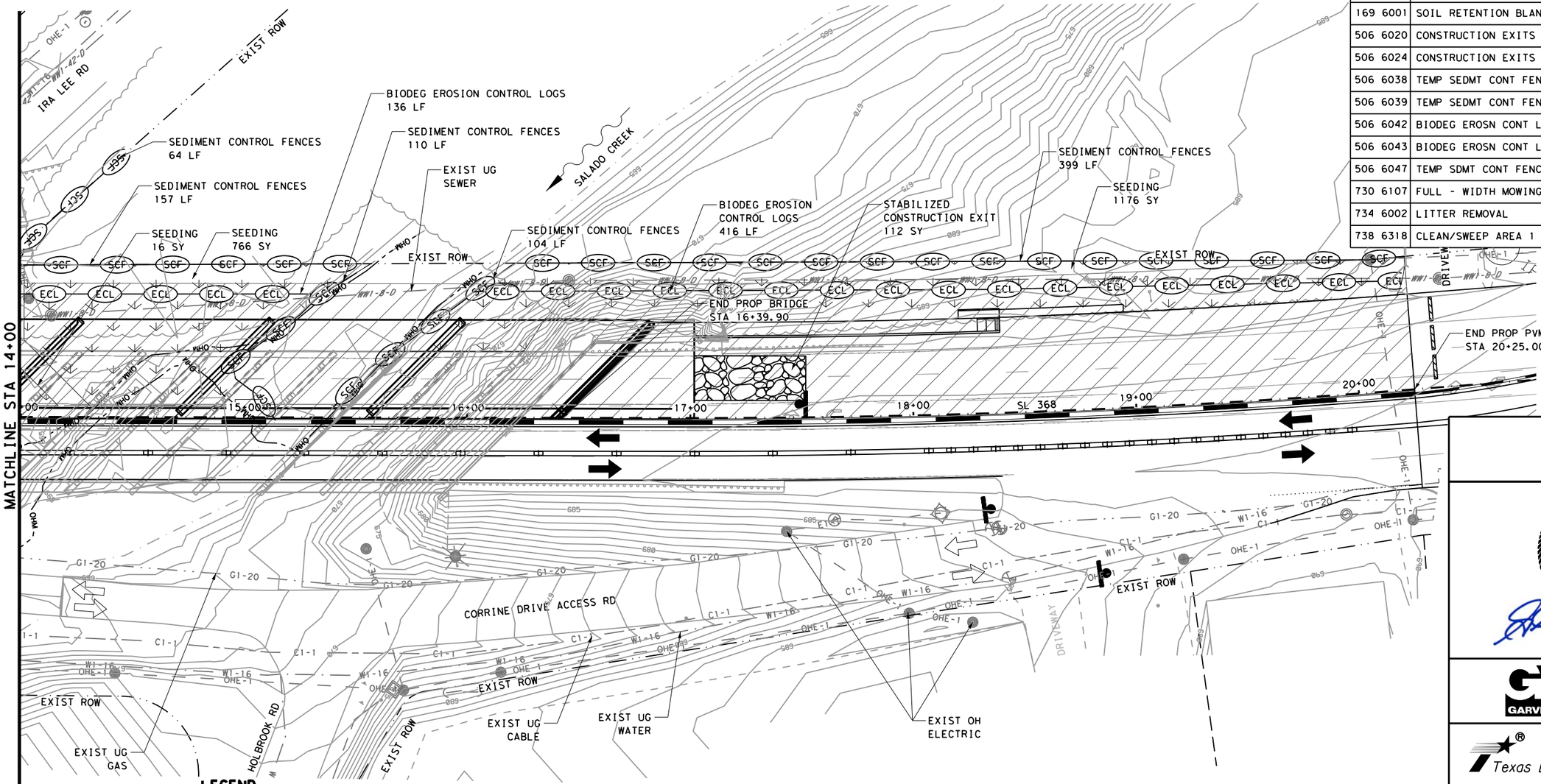

ITEM NO.	DESCRIPTION	UNIT	QTY
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164 6031	CELL FBR MLCH SEED (TEMP) (COOL)	SY	979
166 6001	FERTILIZER	AC	0.4
168 6001	VEGETATIVE WATERING	MG	31
169 6001	SOIL RETENTION BLANKETS (CL1) (TY A)	SY	1958
506 6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	112
506 6024	CONSTRUCTION EXITS (REMOVE)	SY	112
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	834
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	
506 6042	BIODEG EROSN CONT LOGS (INSTL) (18")	LF	552
506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	
506 6047	TEMP SDMT CONT FENCE (INLET PROTECTION)	LF	
730 6107	FULL - WIDTH MOWING	CYC	2
734 6002	LITTER REMOVAL	CYC	7
738 6318	CLEAN/SWEEP AREA 1	CYC	7

0 25′ 50′

SCALE: 1" = 50′

LEGEND

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- ECL — BIODEG EROSION CONTROL LOG (STAKE AND LASHING ANCHORING)
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- TEMPORARY SEEDING AND SOIL RETENTION BLANKET
- STABILIZED CONSTRUCTION EXIT (TYPE I)
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- FLOW ARROW
- ROADWAY CONSTRUCTION IN THIS PHASE
- PERMANENT PAVEMENT PREVIOUS PHASE

GENERAL NOTES

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STATE OF TEXAS
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Texas Department of Transportation

SL 368
AT SALADO CREEK

SW3P LAYOUT PHASE I

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		283
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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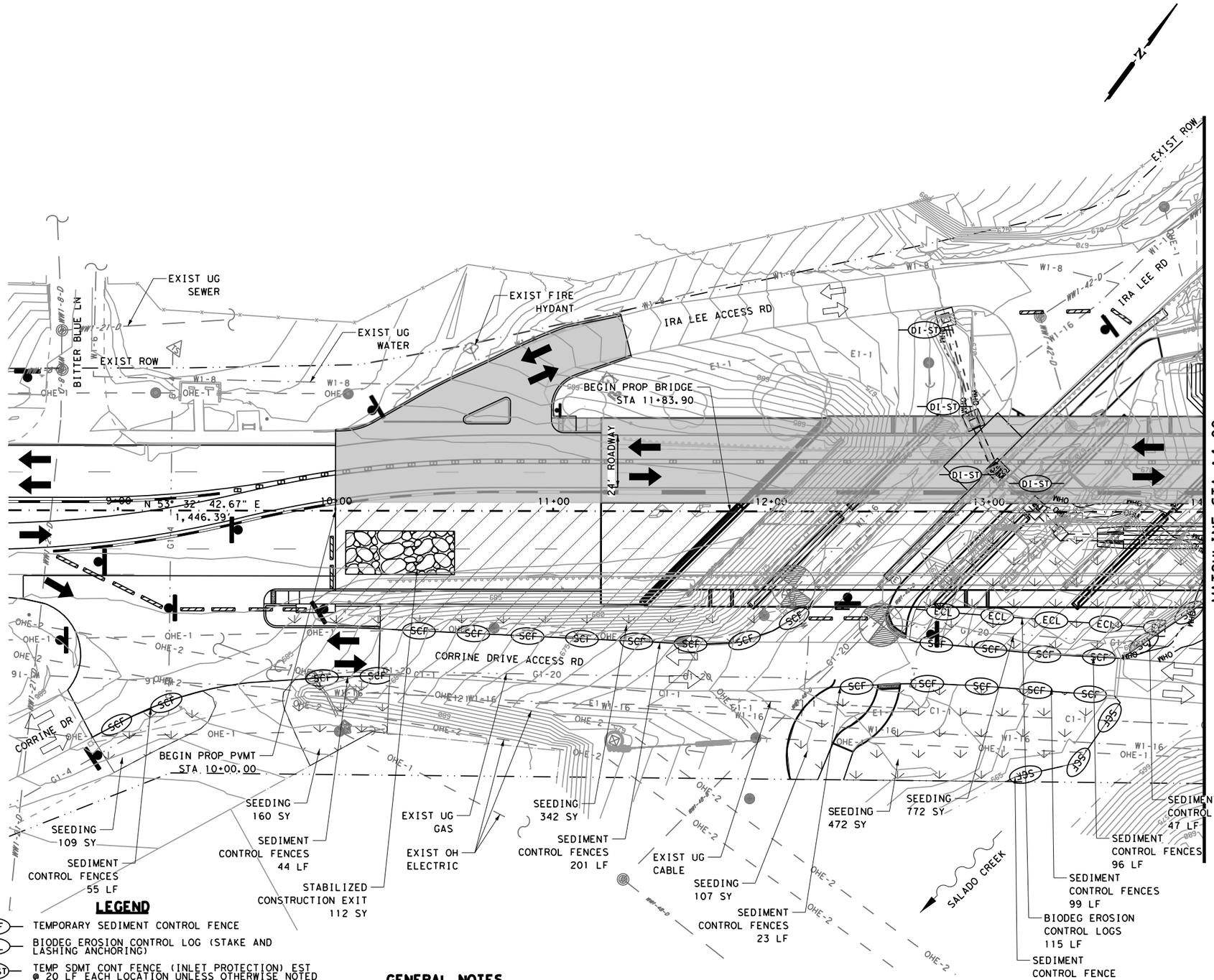

LEGEND

- SCF — TEMPORARY SEDIMENT CONTROL FENCE
- ECL — BIODEG EROSION CONTROL LOG (STAKE AND LASHING ANCHORING)
- DI-ST — TEMP SDMT CONT FENCE (INLET PROTECTION) EST @ 20 LF EACH LOCATION UNLESS OTHERWISE NOTED
- TEMPORARY SEEDING AND SOIL RETENTION BLANKET
- STABILIZED CONSTRUCTION EXIT (TYPE I)
- EXIST DIRECTION OF TRAFFIC
- PROP DIRECTION OF TRAFFIC
- PH1 — PHASE UNDER WHICH TREATMENT WAS INSTALLED
- FLOW ARROW
- ROADWAY CONSTRUCTION IN THIS PHASE
- PERMANENT PAVEMENT PREVIOUS PHASE

GENERAL NOTES

1. REFER TO SW3P NARRATIVE SHEET FOR OTHER NOTES.
2. REFER TO SW3P STANDARD SHEETS FOR DETAILS.
3. EXISTING STORM DRAINS/CULVERTS ARE SHOWN AS DASHED.
4. INSTALLED MEASURES SHALL REMAIN IN PLACE AND SHALL BE MAINTAINED THROUGHOUT DURATION OF PROJECT OR AS DIRECTED BY THE ENGINEER.
5. BACKHOE WORK ESTIMATED AT 2 HOURS PER SEDIMENT CONTROL FENCE AND ROCK DAM INSTALLATION.
6. SW3P MEASURES SHOWN ARE MINIMUM REQUIREMENTS BASED UPON PROJECT DESIGN. INSTALLATION OF SW3P MEASURES WILL BE AS SHOWN AND MODIFIED TO ACCOMODATE ACTUAL FIELD CONDITIONS.
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8. DROP INLET SEDIMENT TRAP (DI-ST) AND CURB INLET SEDIMENT TRAP (Ci-ST) ARE EROSION CONTROL LOGS AND WILL BE MEASURED AND PAID BY THE LF.

ITEM NO.	DESCRIPTION	UNIT	QTY
161 6017	COMPOST MANUF TOPSOIL (4")	SY	1961
164 6027	CELL FBR MLCH SEED (PERM) (URBAN) (CLAY)	SY	1961
164 6029	CELL FBR MLCH SEED (TEMP) (WARM)	SY	981
164 6031	CELL FBR MLCH SEED (TEMP) (COOL)	SY	981
166 6001	FERTILIZER	AC	0.4
168 6001	VEGETATIVE WATERING	MG	31
169 6001	SOIL RETENTION BLANKETS (CL1) (TY A)	SY	1961
506 6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	112
506 6024	CONSTRUCTION EXITS (REMOVE)	SY	112
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	637
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	
506 6042	BIODEG EROSN CONT LOGS (INSTL) (18")	LF	115
506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	
506 6047	TEMP SDMT CONT FENCE (INLET PROTECTION)	LF	
730 6107	FULL - WIDTH MOWING	CYC	2
734 6002	LITTER REMOVAL	CYC	7
738 6318	CLEAN/SWEEP AREA 1	CYC	7

0 25′ 50′

SCALE: 1" = 50′

STATE OF TEXAS
GLENN G. GREGORY, JR.
87288
LICENSED
PROFESSIONAL ENGINEER

1/27/2021

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Austin, TX 78704
(512) 485-0009
TBPELS Firm 5713

Texas Department of Transportation

SL 368
AT SALADO CREEK

SW3P LAYOUT PHASE II

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		284
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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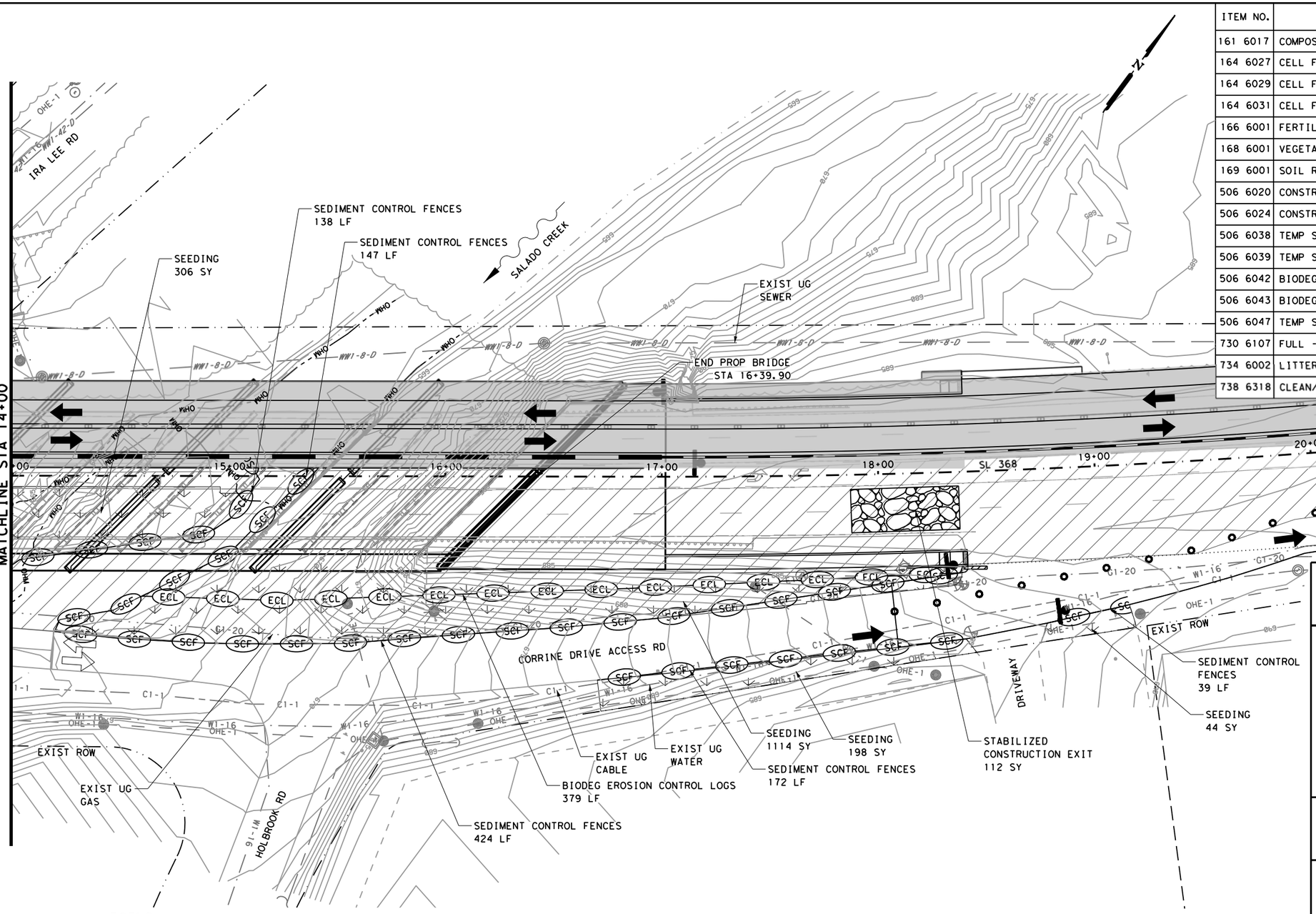
ITEM NO.	DESCRIPTION	UNIT	QTY
161 6017	COMPOST MANUF TOPSOIL (4")	SY	1662
164 6027	CELL FBR MLCH SEED (PERM) (URBAN) (CLAY)	SY	1662
164 6029	CELL FBR MLCH SEED (TEMP) (WARM)	SY	831
164 6031	CELL FBR MLCH SEED (TEMP) (COOL)	SY	831
166 6001	FERTILIZER	AC	0.3
168 6001	VEGETATIVE WATERING	MG	26
169 6001	SOIL RETENTION BLANKETS (CL1) (TY A)	SY	1662
506 6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	112
506 6024	CONSTRUCTION EXITS (REMOVE)	SY	112
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	920
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	
506 6042	BIODEG EROSN CONT LOGS (INSTL) (18")	LF	379
506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	
506 6047	TEMP SDMT CONT FENCE (INLET PROTECTION)	LF	
730 6107	FULL - WIDTH MOWING	CYC	2
734 6002	LITTER REMOVAL	CYC	7
738 6318	CLEAN/SWEEP AREA 1	CYC	7



LEGEND

- SCF — TEMPORARY SEDIMENT CONTROL FENCE
- ECL — BIODEG EROSION CONTROL LOG (STAKE AND LASHING ANCHORING)
- DI-ST — TEMP SDMT CONT FENCE (INLET PROTECTION) EST @ 20 LF EACH LOCATION UNLESS OTHERWISE NOTED
- TEMPORARY SEEDING AND SOIL RETENTION BLANKET
- STABILIZED CONSTRUCTION EXIT (TYPE I)
- EXIST DIRECTION OF TRAFFIC
- PROP DIRECTION OF TRAFFIC
- PH1 — PHASE UNDER WHICH TREATMENT WAS INSTALLED
- FLOW ARROW
- ROADWAY CONSTRUCTION IN THIS PHASE
- PERMANENT PAVEMENT PREVIOUS PHASE

GENERAL NOTES

1. REFER TO SW3P NARRATIVE SHEET FOR OTHER NOTES.
2. REFER TO SW3P STANDARD SHEETS FOR DETAILS.
3. EXISTING STORM DRAINS/CULVERTS ARE SHOWN AS DASHED.
4. INSTALLED MEASURES SHALL REMAIN IN PLACE AND SHALL BE MAINTAINED THROUGHOUT DURATION OF PROJECT OR AS DIRECTED BY THE ENGINEER.
5. BACKHOE WORK ESTIMATED AT 2 HOURS PER SEDIMENT CONTROL FENCE AND ROCK DAM INSTALLATION.
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8. DROP INLET SEDIMENT TRAP (D1-ST) AND CURB INLET SEDIMENT TRAP (Ci-ST) ARE EROSION CONTROL LOGS AND WILL BE MEASURED AND PAID BY THE LF.

0 25′ 50′
SCALE: 1" = 50′

STATE OF TEXAS
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1/27/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

SW3P LAYOUT
PHASE II

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		285
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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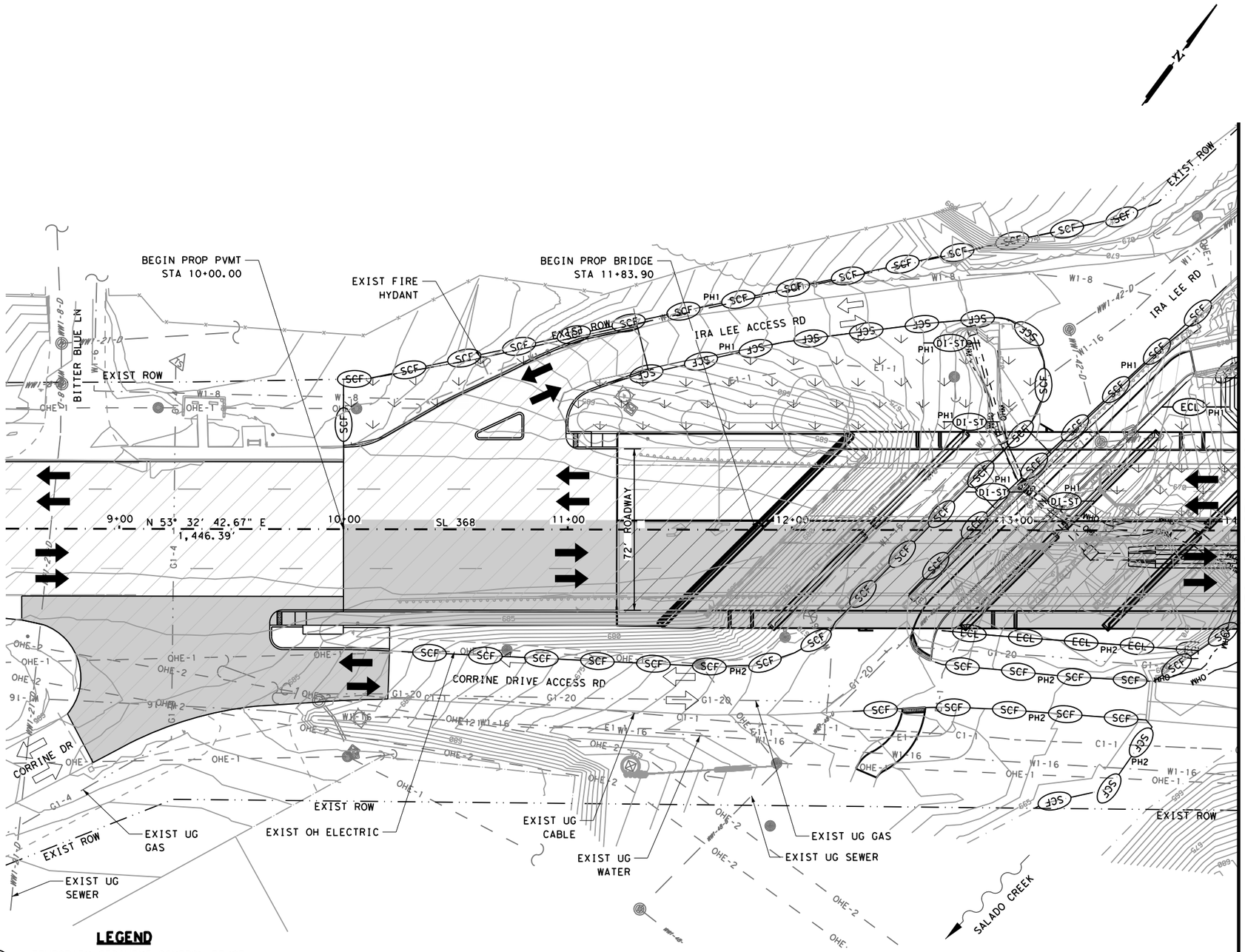

ITEM NO.	DESCRIPTION	UNIT	QTY
161 6017	COMPOST MANUF TOPSOIL (4")	SY	
164 6027	CELL FBR MLCH SEED (PERM) (URBAN) (CLAY)	SY	
164 6029	CELL FBR MLCH SEED (TEMP) (WARM)	SY	
164 6031	CELL FBR MLCH SEED (TEMP) (COOL)	SY	
166 6001	FERTILIZER	AC	
168 6001	VEGETATIVE WATERING	MG	
169 6001	SOIL RETENTION BLANKETS (CL1) (TY A)	SY	
506 6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	
506 6024	CONSTRUCTION EXITS (REMOVE)	SY	
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1566
506 6042	BIODEG EROSN CONT LOGS (INSTL) (18")	LF	
506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	151
506 6047	TEMP SDMT CONT FENCE (INLET PROTECTION)	LF	
730 6107	FULL - WIDTH MOWING	CYC	1
734 6002	LITTER REMOVAL	CYC	1
738 6318	CLEAN/SWEEP AREA 1	CYC	1

LEGEND

- SCF — TEMPORARY SEDIMENT CONTROL FENCE
- ECL — BIODEG EROSION CONTROL LOG (STAKE AND LASHING ANCHORING)
- DI-ST — TEMP SDMT CONT FENCE (INLET PROTECTION) EST @ 20 LF EACH LOCATION UNLESS OTHERWISE NOTED
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0 25' 50'

SCALE: 1" = 50'

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LICENSED PROFESSIONAL ENGINEER

1/27/2021

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Texas Department of Transportation

SL 368
AT SALADO CREEK

SW3P LAYOUT
PHASE III

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT	SHEET NO.
6	SEE TITLE SHEET	286

STATE	DISTRICT	COUNTY
TEXAS	SAT	BEXAR

CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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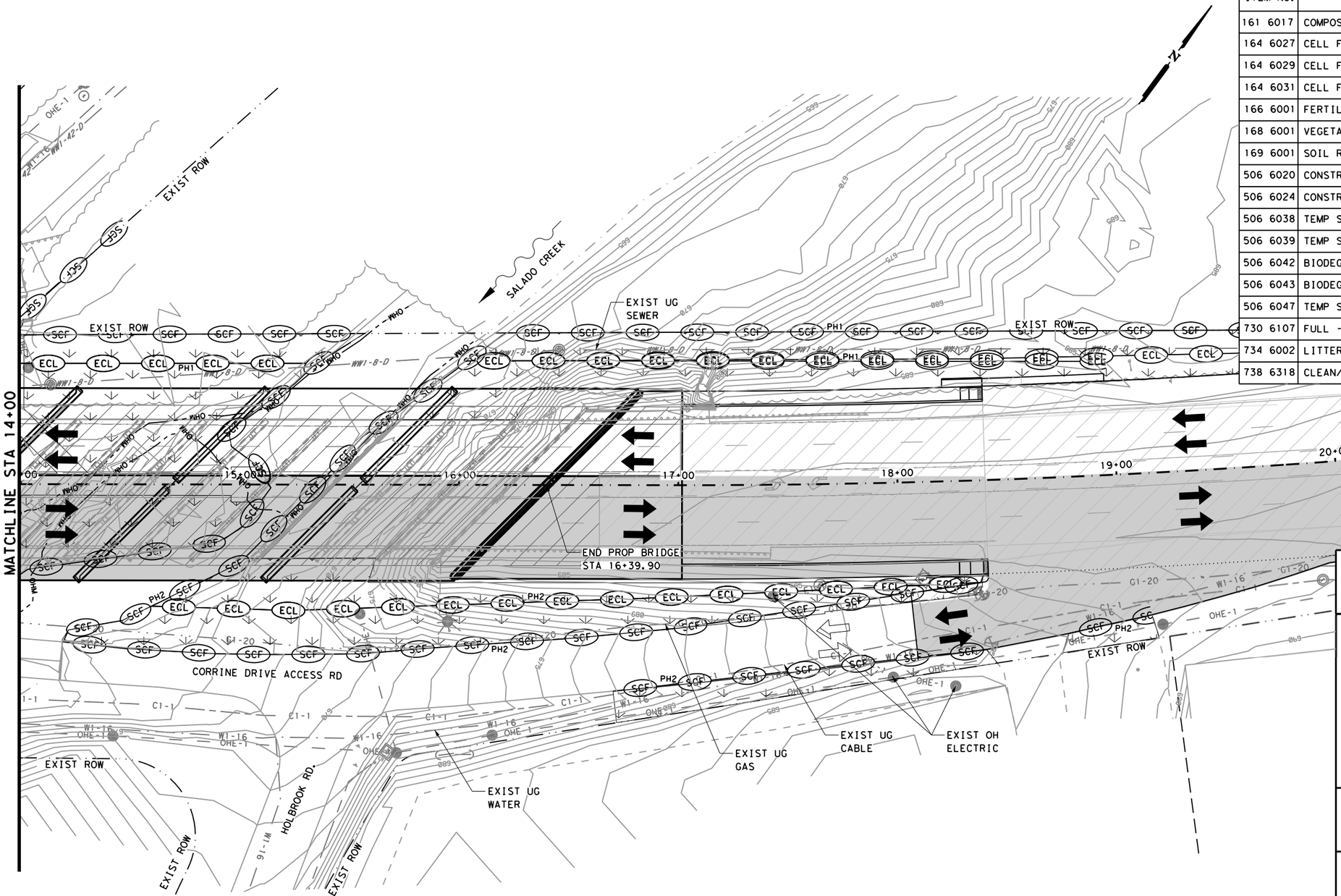

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161 6017	COMPOST MANUF TOPSOIL (4")	SY	
164 6027	CELL FBR MLCH SEED (PERM) (URBAN) (CLAY)	SY	
164 6029	CELL FBR MLCH SEED (TEMP) (WARM)	SY	
164 6031	CELL FBR MLCH SEED (TEMP) (COOL)	SY	
166 6001	FERTILIZER	AC	
168 6001	VEGETATIVE WATERING	MG	
169 6001	SOIL RETENTION BLANKETS (CL1) (TY A)	SY	
506 6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	
506 6024	CONSTRUCTION EXITS (REMOVE)	SY	
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1754
506 6042	BIODEG EROSN CONT LOGS (INSTL) (18")	LF	
506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	931
506 6047	TEMP SDMT CONT FENCE (INLET PROTECTION)	LF	
730 6107	FULL - WIDTH MOWING	CYC	1
734 6002	LITTER REMOVAL	CYC	1
738 6318	CLEAN/SWEEP AREA 1	CYC	1

LEGEND

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SL 368
AT SALADO CREEK

SW3P LAYOUT PHASE III

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		287
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY
0016	08	039	SL 368

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DATE: 2021
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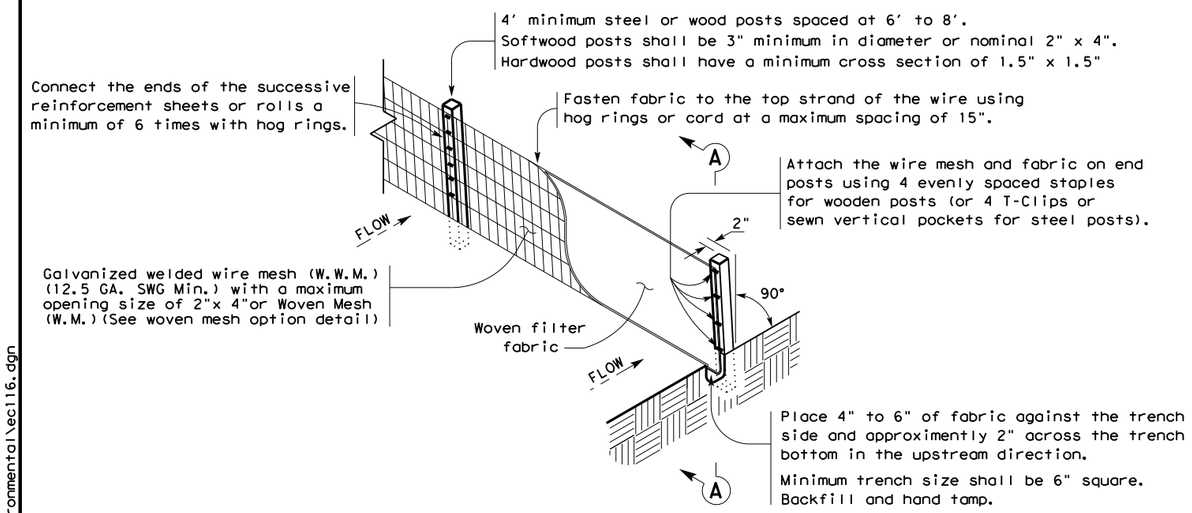
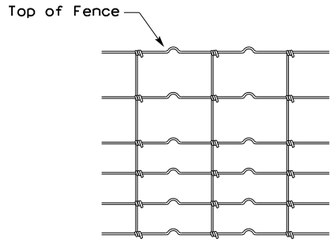
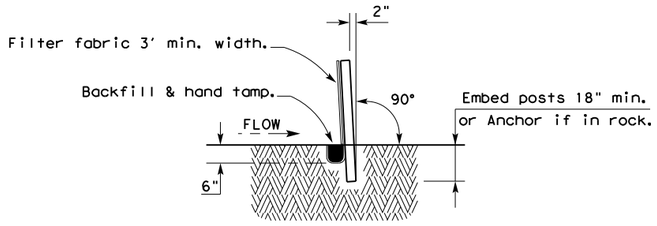


TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

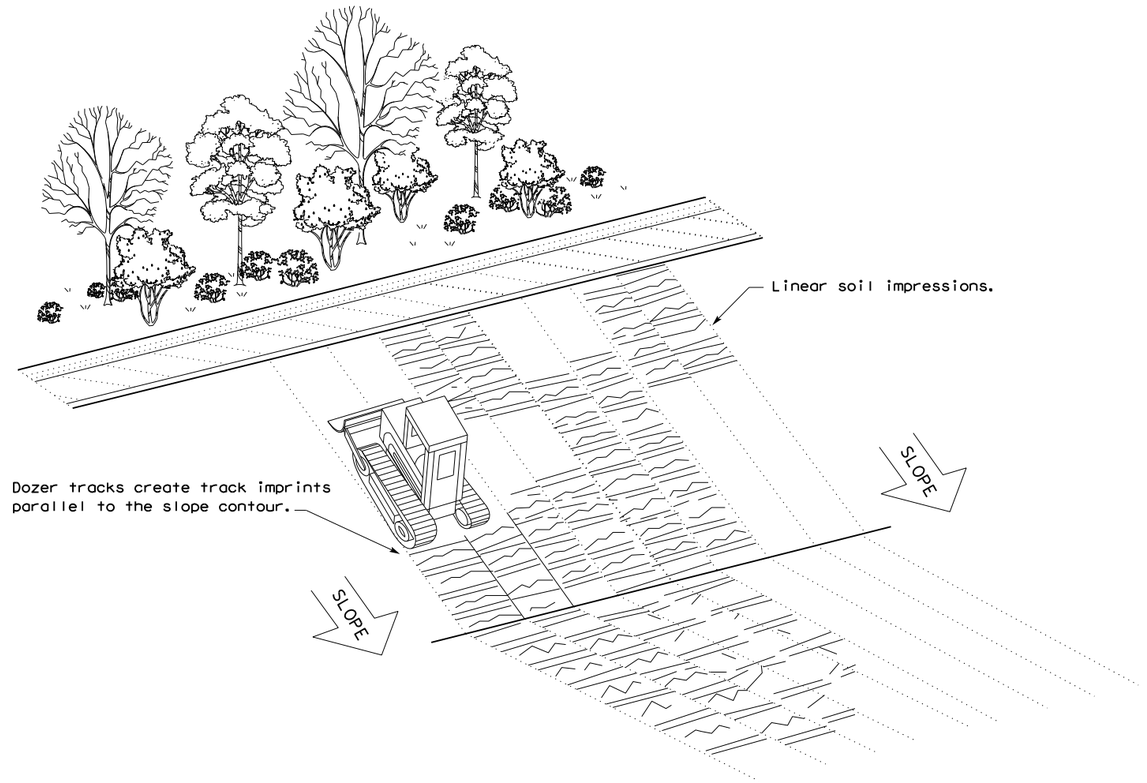
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		288

DATE: 1/27/2021
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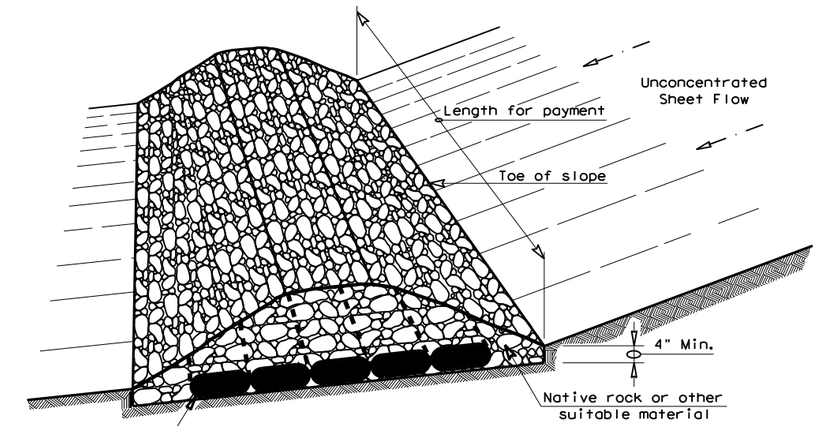
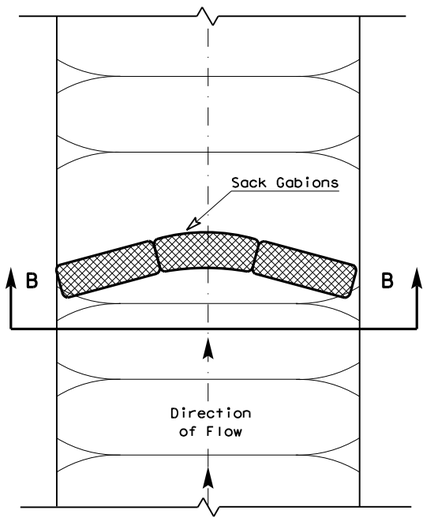
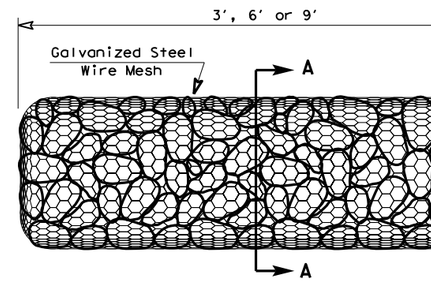


FILTER DAM AT TOE OF SLOPE

RFD1

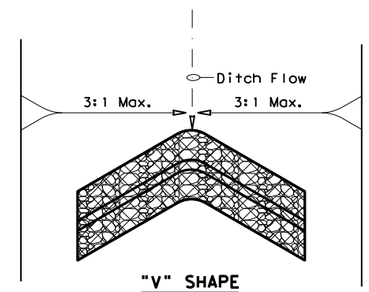


PLAN VIEW

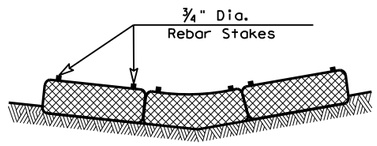


TYPE 4 (SACK GABIONS)

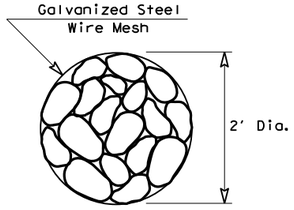
RFD4



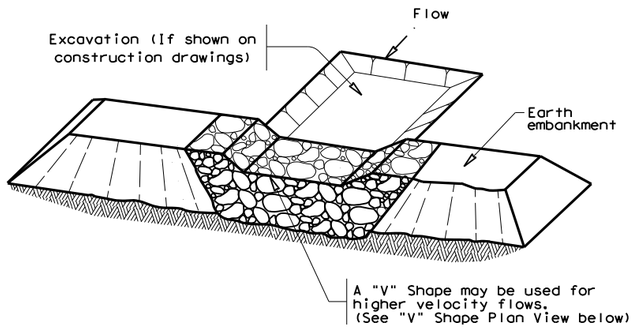
"V" SHAPE
PLAN VIEW



SECTION B-B

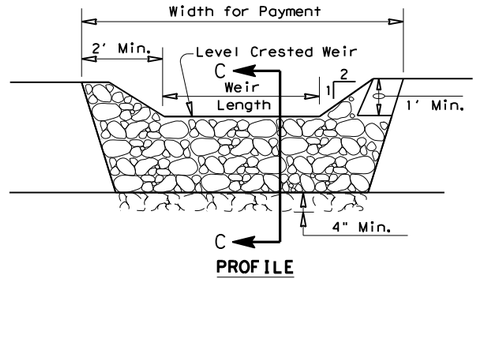


SECTION A-A

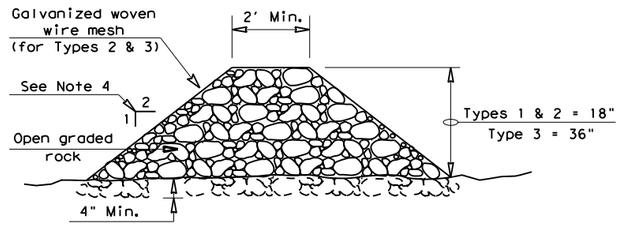


FILTER DAM AT SEDIMENT TRAP

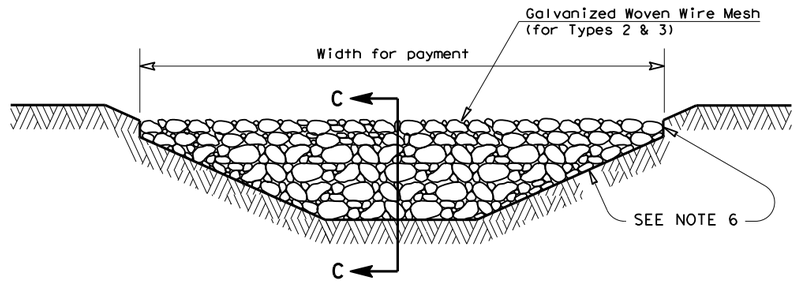
RFD1 — OR — RFD2



PROFILE



SECTION C-C



FILTER DAM AT CHANNEL SECTIONS

RFD1 — OR — RFD2 — OR — RFD3

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT^2 of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximently 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.

PLAN SHEET LEGEND

Type 1 Rock Filter Dam	RFD1
Type 2 Rock Filter Dam	RFD2
Type 3 Rock Filter Dam	RFD3
Type 4 Rock Filter Dam	RFD4

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

EC(2)-16

FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		289

DATE: 1/27/2021
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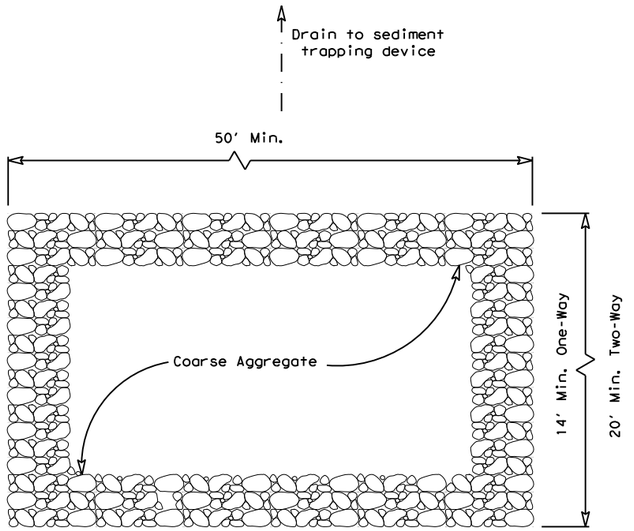
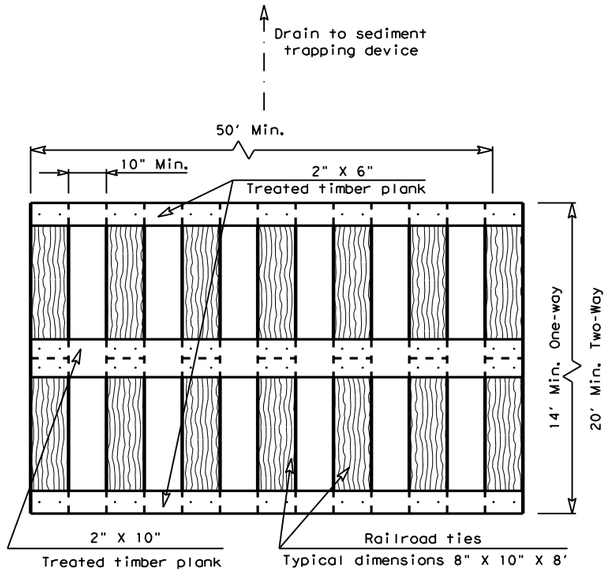


PLAN VIEW



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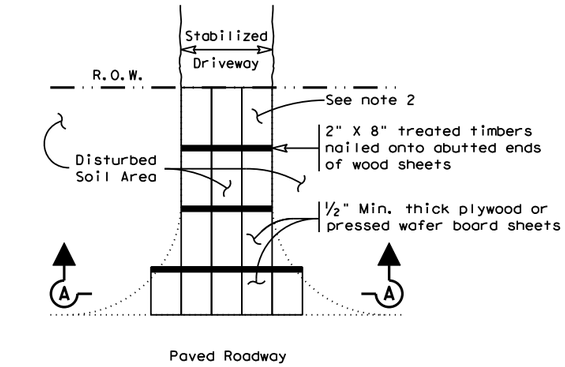

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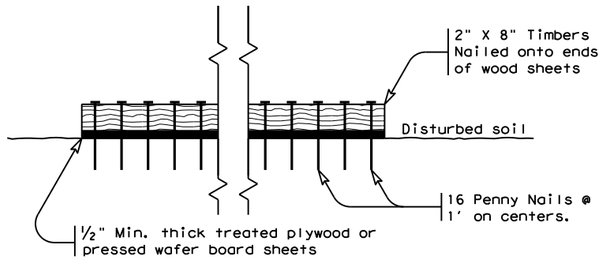
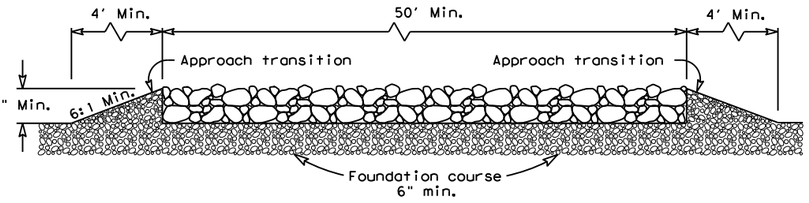


SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

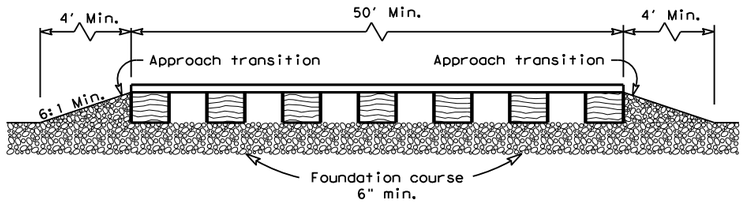
SHORT TERM



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materialas approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0016	08	039	SL 368
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		290

DATE: 1/27/2021
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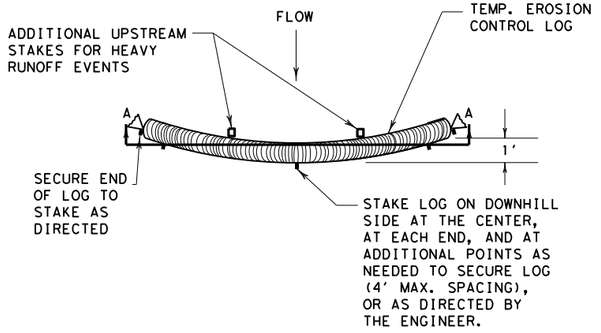
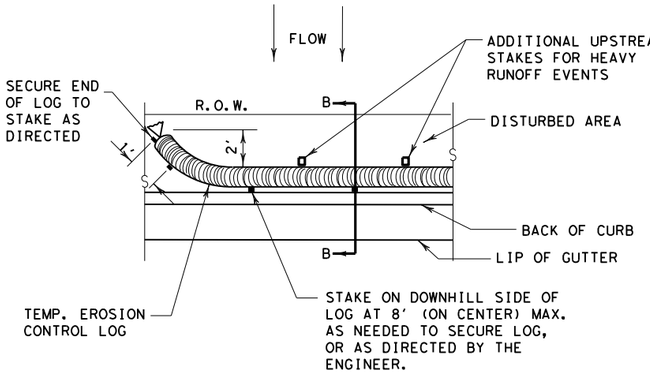


PLAN VIEW



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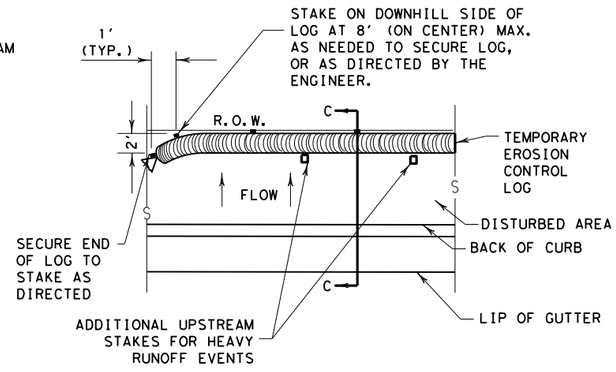
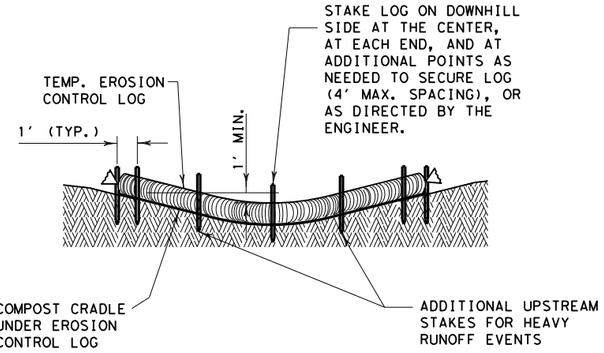


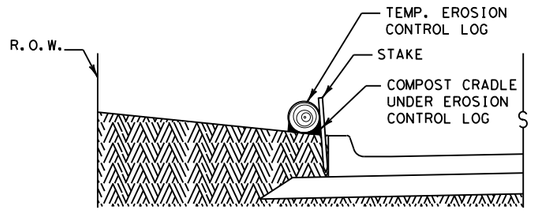
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

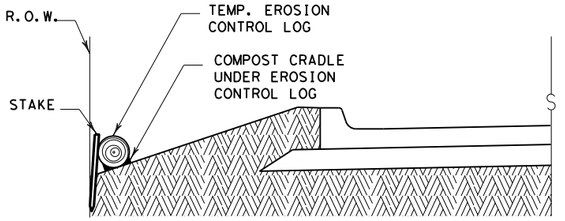
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

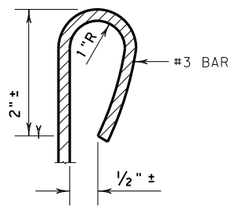
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL

LEGEND

- CL-D — EROSION CONTROL LOG DAM
- CL-BOC — EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST — EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL — EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI — EROSION CONTROL LOG AT DROP INLET
- CL-CI — EROSION CONTROL LOG AT CURB INLET
- CL-GI — EROSION CONTROL LOG AT CURB & GRATE INLET

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

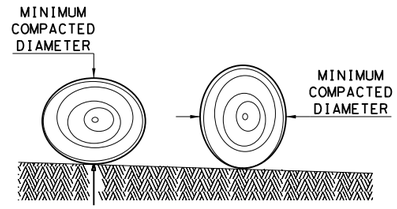
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0016	08	039		SL 368		
	DIST	COUNTY				SHEET NO.	
	SAT	BEXAR				291	

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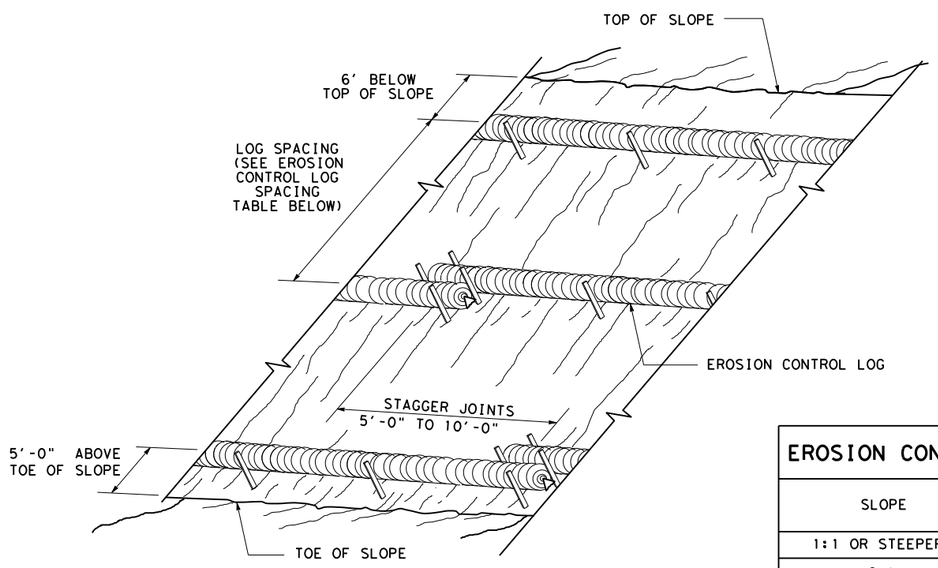
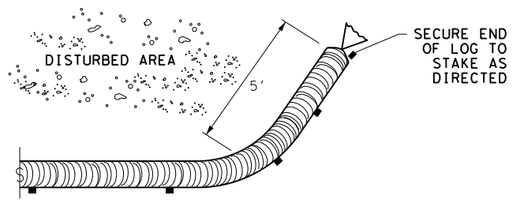


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

CL-SST

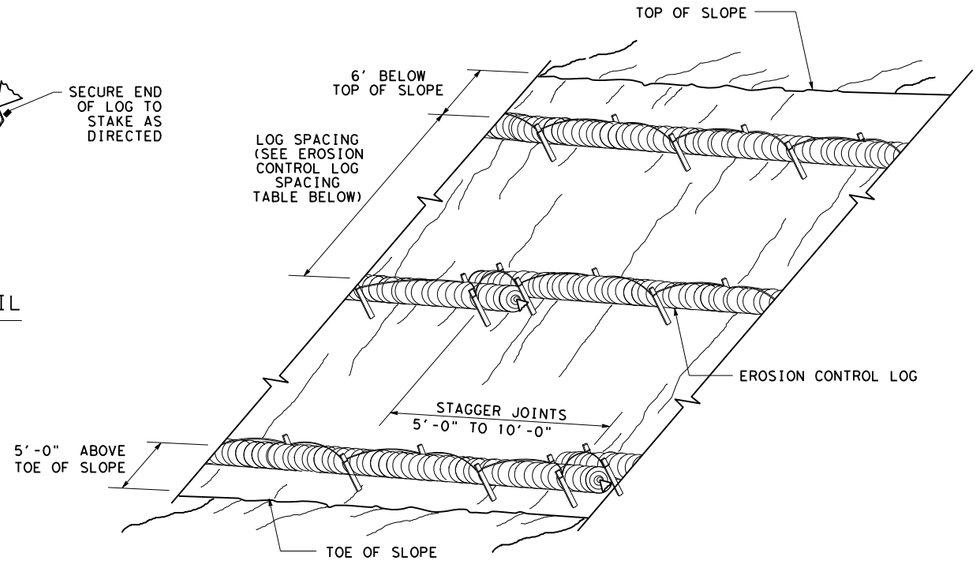


END SECTION RAP DETAIL

EROSION CONTROL LOG SPACING TABLE

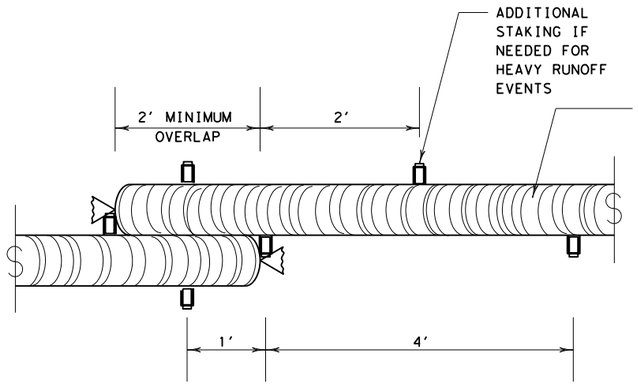
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

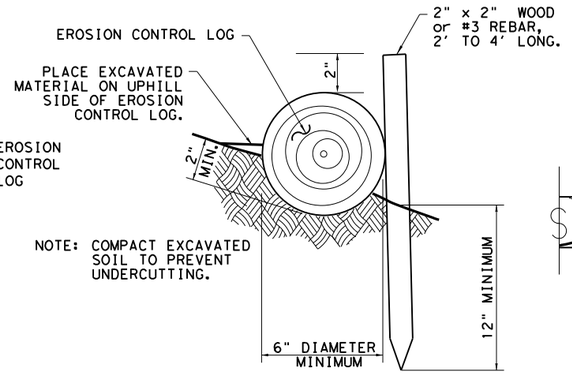
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL



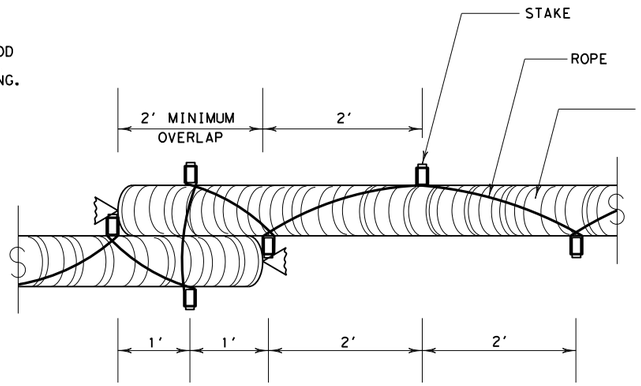


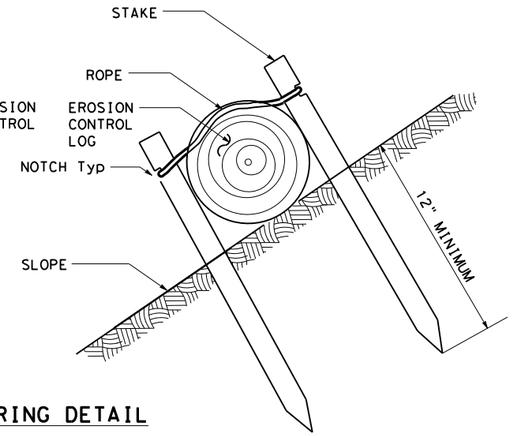
STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

TRENCH DEPTH TABLE

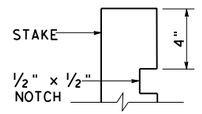
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
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	SAT	BEXAR		292

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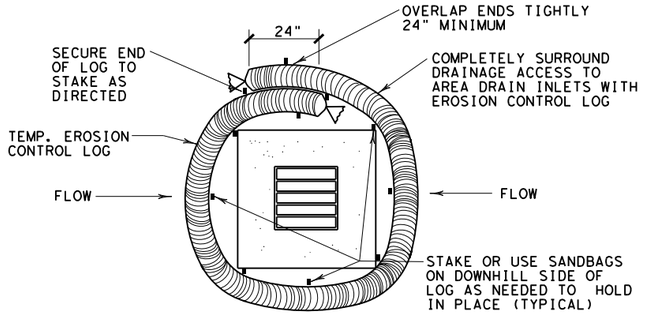
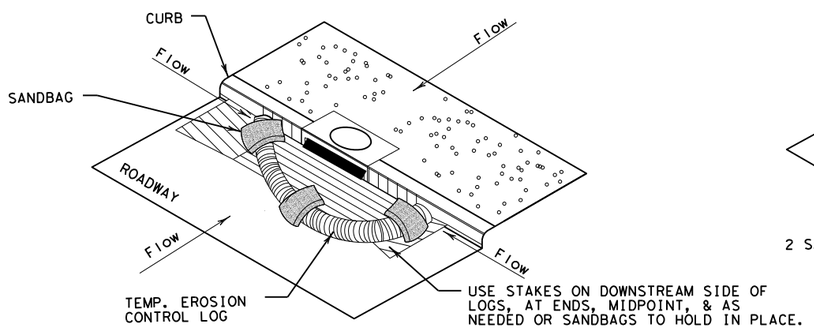


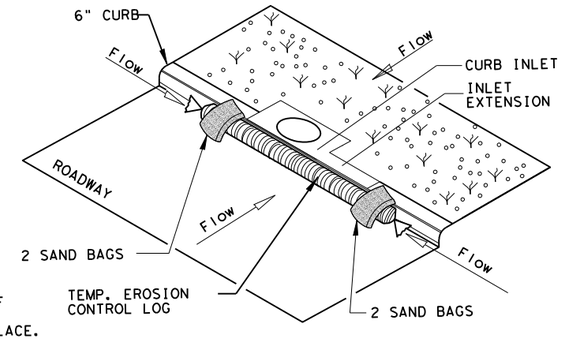
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

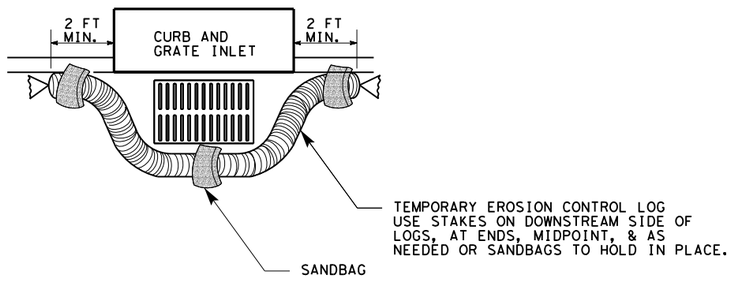
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

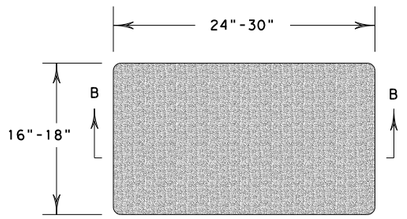
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

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