INDEX DATA
SHEET ON PAGE 2

EXHIBIT "A' TO PERMIT

HIDALGO COUNTY
PRECINCT No.3

PLANS OF PROPOSED
ROADWAY IMPROVEMENT
LIBERTY BLVD

CSJ: 0921-02-194

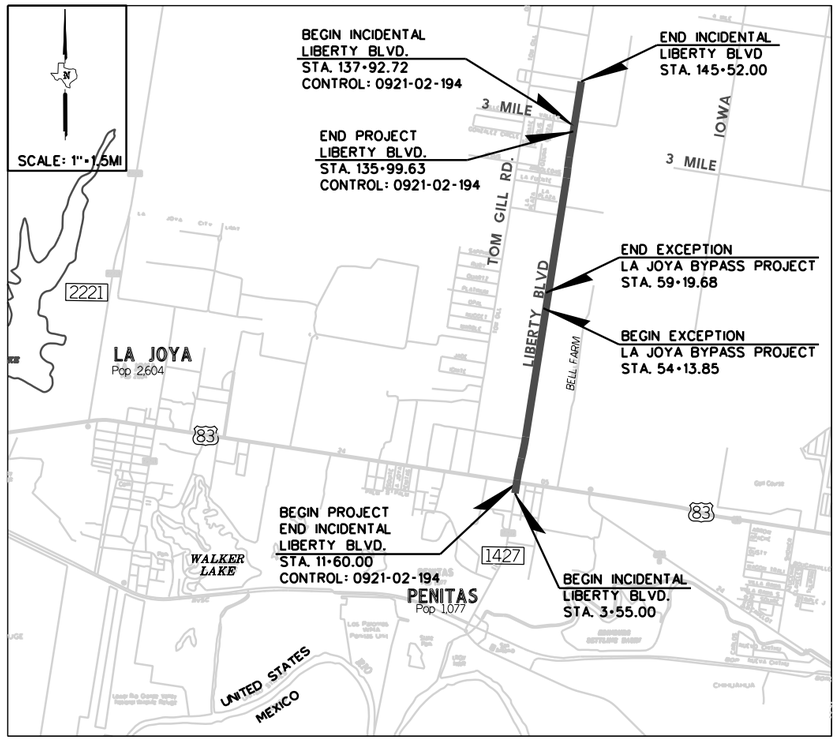
PROJECT LENGTH: 12439.63 FT.= 2.356 MI.
INCIDENTAL LENGTH: 1564.28 FT.= 0.296 MI.
TOTAL LENGTH: 14197 FT.= 2.689 MI.

LIMITS: FROM US 83 TO MILE 3 RD.

RECONSTRUCTION AND WIDENING OF A NON-FREEWAY FACILITY CONSISTING OF GRADING, LIME TREATED SUBGRADE, FLEXIBLE BASE, STRUCTURES ASPHALTIC CONCRETE PAVEMENT, CURB AND GUTTER, DRAINAGE STRUCTURE, STORM SEWER, SIGNING, DELINEATION, AND PAVEMENT MARKINGS.

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6			1
STATE	STATE DIST.NO.	COUNTY	
TEXAS	PHR	HIDALGO	
CONT.	SECT.	JOB	HIGHWAY NO.
0921	02	194	LIBERTY





© 2022 by Texas Department of Transportation; all rights reserved.

LIBERTY BLVD PROJECT DATA
(CSJ: 0921-02-194)

DESIGN SPEED:
LIBERTY RD.: 45 mph

FUNCTION CLASS:
LIBERTY RD.: MAJOR COLLECTOR

EXCEPTIONS:
STA.54+13.85 TO STA.59+19.68

BRIDGE
STA. 40+94.76 -
STA. 41+34.76

RAILROAD CROSSINGS:
NONE

ADT
LIBERTY BLVD: 6,900 (2016)
10,300 (2036)

EQUATIONS:
NONE

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION ON 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 2012).

REGISTERED ACCESSIBILITY SPECIALIST (RAS) INSPECTION REQUIRED TDLR NO. TABS2022013170

LOCAL ENTITIES

HIDALGO COUNTY IRRIG. DISTRICT NO. 6
CONCURRENCE : DATE :
NAME TITLE

HIDALGO COUNTY IRRIG. DISTRICT NO. 16
CONCURRENCE : DATE :
NAME TITLE

HIDALGO CO. DRAINAGE DIST. NO. 1
CONCURRENCE : DATE :
NAME TITLE

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (866) 605-1331

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (866) 605-1331

DATE :
NAME TITLE

© 2022
Texas Department of Transportation
DATE :
NAME TITLE

THE CITY OF PEÑITAS TEXAS FOUNDED 1520
NAME
TITLE
DATE :

THE COUNTY OF HIDALGO TEXAS
NAME
TITLE
DATE :

COUNTY HIDALGO PROJ. NO.
HWY. NO. LIBERTY LETTING DATE
DATE ACCEPTED

LIBERTY BLVD 0921-02-194

5/6/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\01 GENERAL\01 Title Sheet\Liberty Title_A.dgn

GENERAL

1	TITLE SHEET
2	INDEX OF SHEETS
3-4	PROJECT LAYOUT
5-6	HORIZONTAL & VERTICAL CONTROL SHEETS
7-8	EXISTING TYPICAL SECTION
9-11	PROPOSED TYPICAL SECTIONS
12-17	ESTIMATED QUANTITIES
18-19	EARTHWORK QUANTITIES
20	SEAL COAT MATERIAL SELECTION TABLE
21A-21N	GENERAL NOTES

TRAFFIC CONTROL PLAN

22	TRAFFIC CONTROL GENERAL NOTES
23	TRAFFIC CONTROL SEQUENCE OF CONSTRUCTION
24-29	TRAFFIC CONTROL TYPICAL SECTIONS
30-36	TRAFFIC CONTROL PLAN LAYOUT PHASE I
37	TRAFFIC CONTROL PLAN DETOUR PHASE I,II,III AND IV
38-39	TRAFFIC CONTROL PLAN LAYOUT PHASE II
40-41	TRAFFIC CONTROL PLAN LAYOUT PHASE III
42-43	TRAFFIC CONTROL PLAN LAYOUT PHASE IV
44-46	TRAFFIC CONTROL PLAN LAYOUT PHASE V
47	TRAFFIC CONTROL PLAN DETOUR PHASE V
48-50	TRAFFIC CONTROL PLAN LAYOUT PHASE VI
51-62	[S] BC (1-12) - 21
63-65	[S] TCP (2-2), (2-3), (2-4) - 18
66-67	[S] TCP (3-1), (3-2), - 13
68	[S] TCP (3-3) - 14
69	[S] WZ (STPM) - 13
70-71	[S] WZ (BTS-1), (BTS-2) - 13

ROADWAY DETAILS

72	HORIZONTAL ALIGNMENT DATA
73-100	PLAN & PROFILE
101	DRIVEWAY & INTERSECTION TABLE
102-103	[S] CRCP(1)-20
104	[S] GF (31)-19
105	[S] GF (31) MS-19
106	[S] GF (31) DAT-19
107	[S] REACT(N)-21
108	[S] SMTC(N)-16
109	[S] TRF
110	[S] CRASH CUSHION SUMMARY SHEET
111-114	[S] PED-18
115-117	[S] D&OM(1),(2),(3)-20
118A-118C	[S] D&OM(4),(5),(6)-20
119	[S] D&OM (VIA)-20
120	[S] CCCG-21
121	[S] PSET-SP
122	[S] SETP-PD
123	[S] PSET-RP
124	[D] SIDEWALK & WHEELCHAIR RAMP DETAILS
125	[D] DRIVEWAY DETAILS PUBLIC (COUNTY ROAD -CITY STREET)
126	[D] DRIVEWAY DETAILS PRIVATE (RESIDENTIAL-COMMERCIAL)
127	[D] DRIVEWAY PROFILE DETAILS
128	[D] CURB & GUTTER DETAILS
129	[D] SAFETY END TREATMENT DETAILS

DRAINAGE DETAILS

130-132	DRAINAGE AREA MAP
133-143	HYDRAULIC DATA SHEETS
144-172	UTILITY & DRAINAGE
173	OUTFALL DETAILS
174-175	CULVERT LAYOUT
176A	IRRIGATION LAYOUT
176B-C	IRRIGATION BYPASS LAYOUT
176D	MISC. IRRIGATION DETAILS
177A	CUT & RESTORE DETAILS
177B	INLET CAPPING DETAILS
178-179	[S] PCU
180-181	[S] PSL
182	[S] PB
183	[S] PJB
184	[S] PDD
185-186	[S] PCO
187	[D] IRRIGATION CROSSING DETAIL
188	[D] MISCELLANEOUS PIPE DETAILS

TRAFFIC ITEMS

189	BASIS OF ESTIMATE
190-193	LIBERTY BLVD. EXISTING TRAFFIC SIGNAL LAYOUTS
194-208	LIBERTY BLVD. PROPOSED TRAFFIC SIGNAL LAYOUTS
209	LIBERTY BLVD. TEMPORARY SIGNAL LAYOUT PHASE V
210	LIBERTY BLVD. TEMPORARY SIGNAL LAYOUT PHASE VI
211-215	[S] LMA(1)-12, LMA(2)-12, LMA(3)-12, LMA(4)-12, LMA(5)-12
216	[S] LUM-A-12
217	[S] MA-C-12
218	[S] MA-D-12
219-220	[S] RID (LUM1), (LUM2)-07
221-222	[S] SMA-100(1)-12, SMA-100(2)-12
223-224	[S] SP-100(1)-12, SP-100(2)-12
225	[S] LD(1)-03
226	[S] LD(2)-03
227	[S] CFA-12
228-233	[S] ED(1), (3), (4), (5), (6), (8)-14
234-235	[D] TRAFFIC SIGNAL CONSTRUCTION DETAILS (MISC DETAILS)
236	[S] TS-CF-04
237	[S] TS-FD-12
238	[D] TRAFFIC SIGNAL CONSTRUCTION DETAILS

SIGNING

239-244	SIGNING LAYOUTS
245-251	SUMMARY OF SMALL SIGNS
252	SUMMARY OF SMALL SIGNS TO BE REMOVED
253-254	SIGNING DETAILS
255-257	[S] TSR,(3),(4),(5)-13
258	[S] SPRFBA(1)-13
259	[S] SMD(GEN)-08
260-262	[S] SMD(SLIP-1) THRU (SLIP-3)-08

PAVEMENT MARKING

263-268	PAVEMENT MARKINGS LAYOUTS
269-271	[S] PM(1), (2), (3),-20
272	[S] CPM(1)-14

ENVIRONMENTAL

273-277	EPIC
278	SW3P SHEET
279-285	SW3P LAYOUTS
286-288	[S] EC(1), (2), (3)-16
289	[D] TECL-17

BRIDGE

290	BRIDGE LAYOUT
291	BRIDGE TYPICAL
292-293	TEST HOLE DATA
294	BRIDGE ESTIMATED QUANTITIES
295	ABUTMENT NO. 1
296	ABUTMENT NO. 2
297	CAP ELEVATION DETAILS
298	FRAMING PLAN
299	40' PRESTRESSED CONC. SLAB BEAM SPAN
300	{S} PSBND
301-302	[S] CSAB
303-304	[S] FD
305	[S] PSBEB
306	[S] PSB-4SB12
307	[S] PSB-5SB12
308-310	[S] TYPE T223
311-314	[S] TYPE PR11
315	[S] TRF
316	[S] CRR

{D} - DENOTES DISTRICT STANDARD
{S} - DENOTES STATE STANDARD

STANDARD SHEETS 51-71, 102-129, 178-188, 255-262, 269-272 & 286-289 HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL LICENSED ENGINEER
01/04/2022

STANDARD SHEETS 211-238 HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

STATE OF TEXAS
C. SIMEONIDIS
60919
REGISTERED PROFESSIONAL ENGINEER
1/4/2022

STANDARD SHEETS 178-186 & 188 HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
01/04/2022

STANDARD SHEETS 300-313 HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

STATE OF TEXAS
JORGE A. MADRIGAL
97243
LICENSED PROFESSIONAL ENGINEER
01/04/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

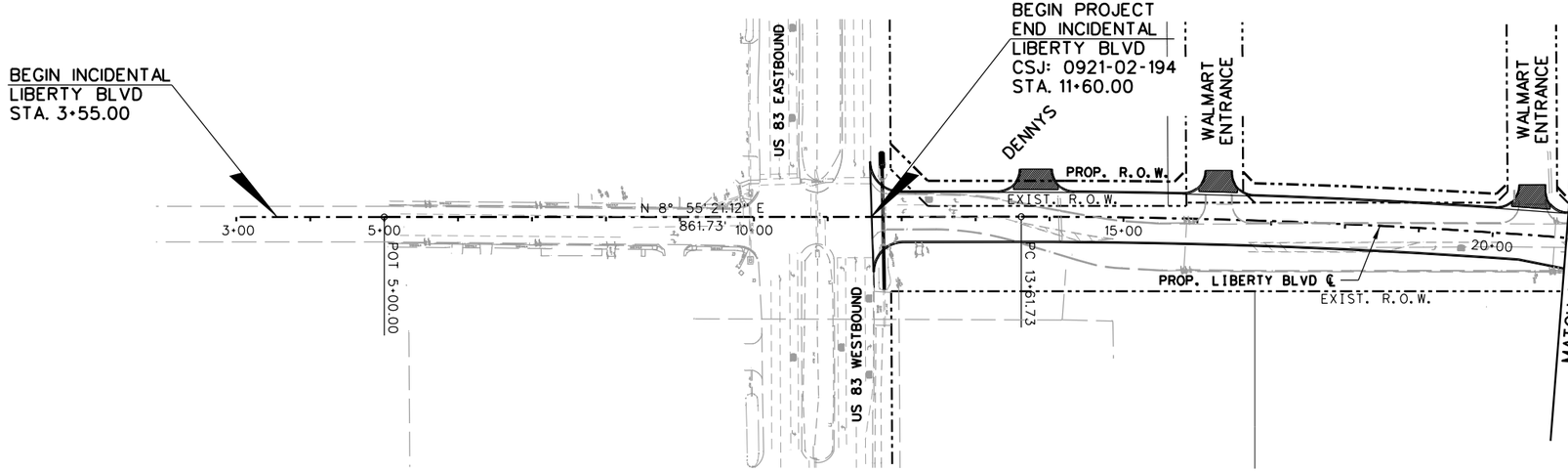
2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

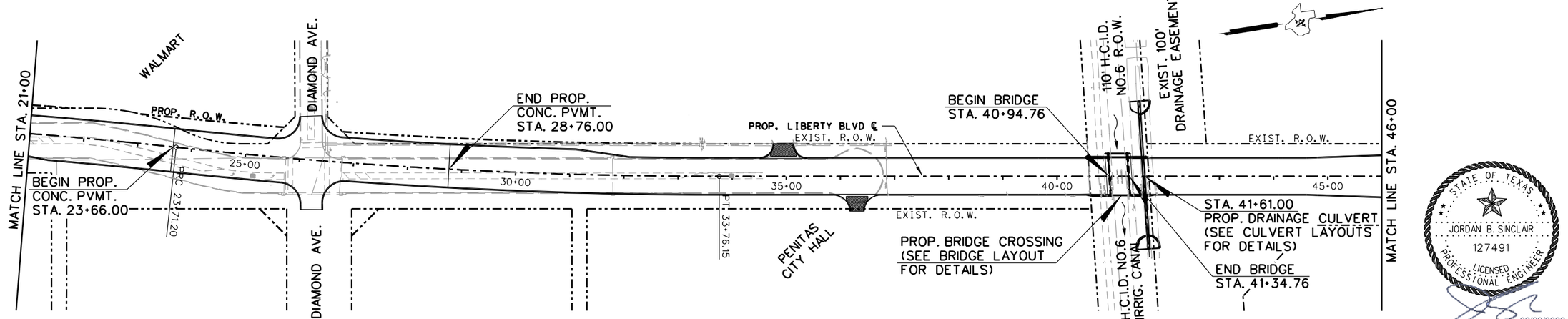
900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

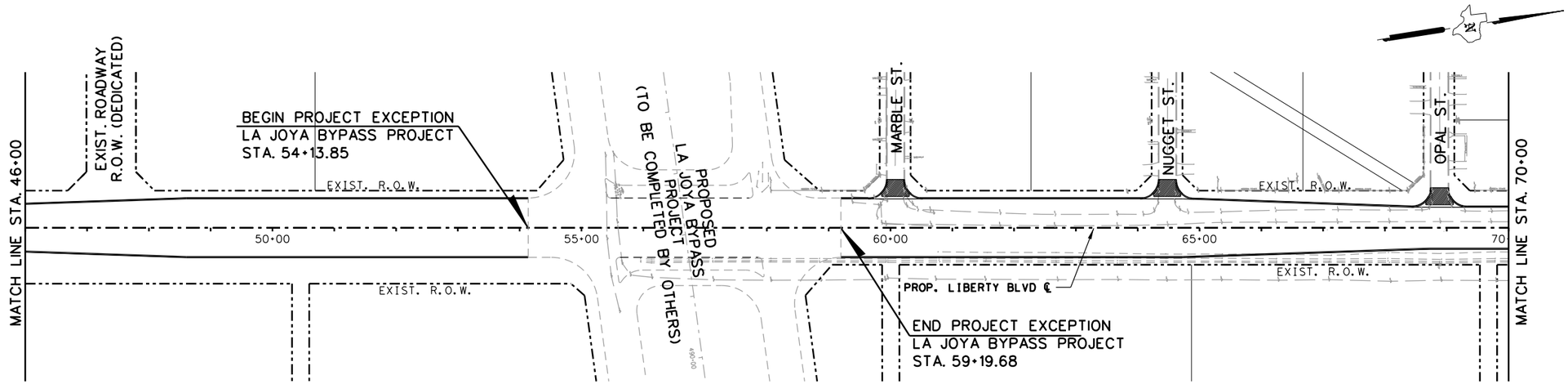
LIBERTY BLVD
INDEX OF SHEETS

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				2
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

12/17/2021 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\01 GENERAL\02 Index\Liberty Blvd_INDEX.dgn







03/28/2022

L&G Engineering

Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

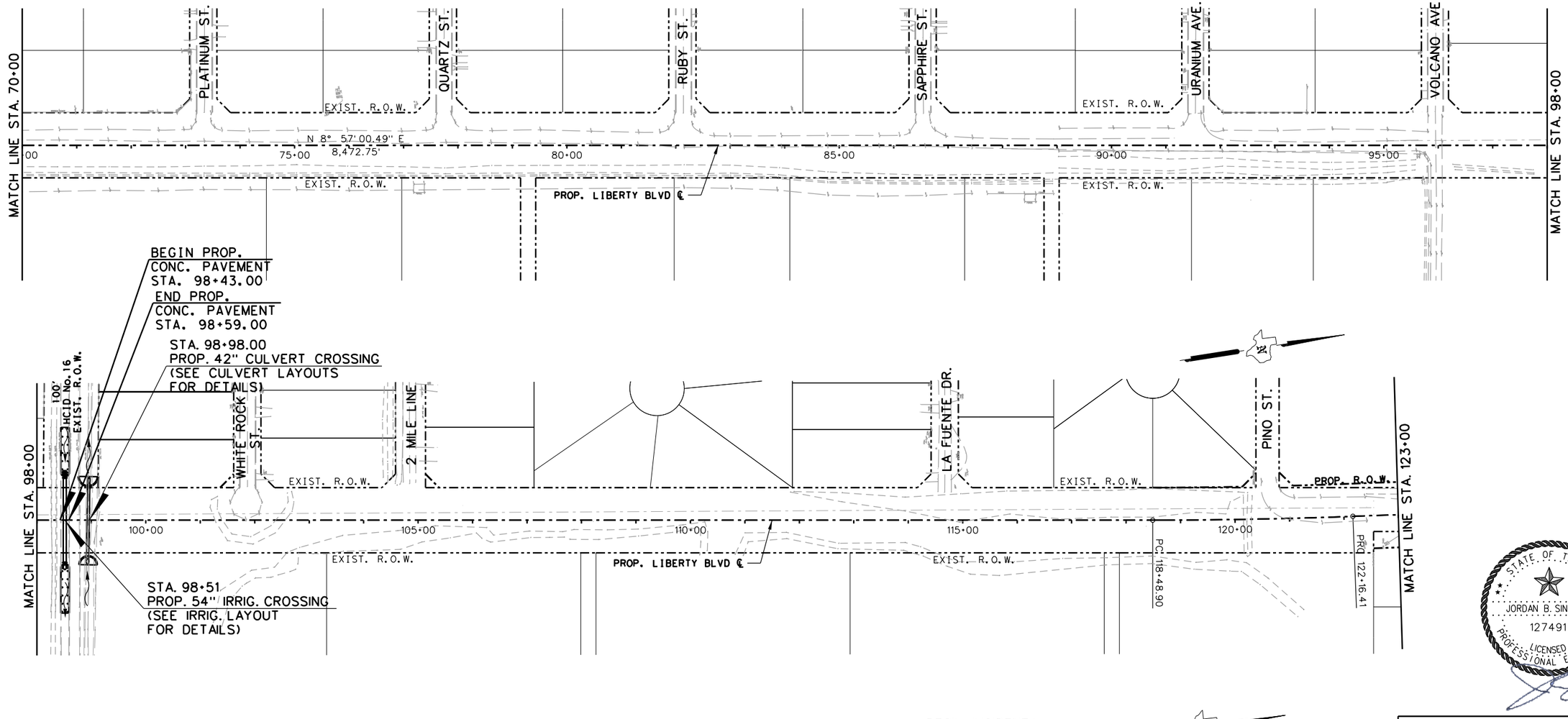
LIBERTY BLVD PROJECT LAYOUT

SCALE 1" = 200'

SHEET 1 OF 2

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				3
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

3/1/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJV01 GENERAL\03 Proj.ayout\Liberty_Playout01.dgn



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
03/28/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

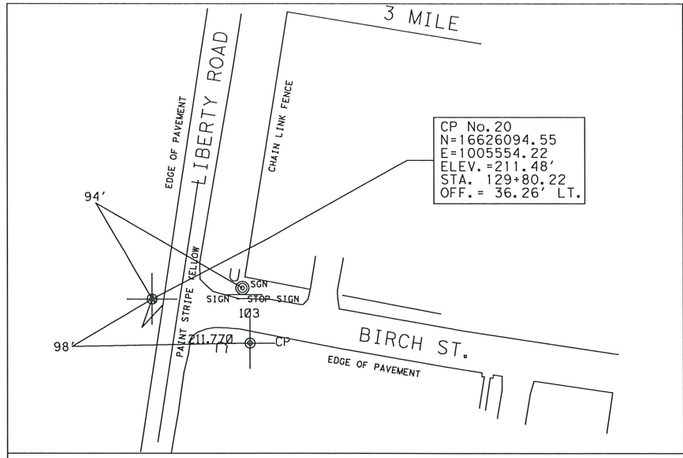
LIBERTY BLVD PROJECT LAYOUT

SCALE 1" = 200'

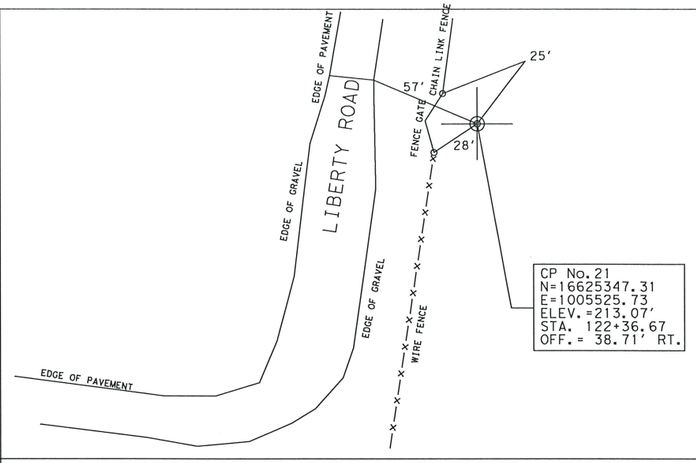
SHEET 2 OF 2

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					4
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

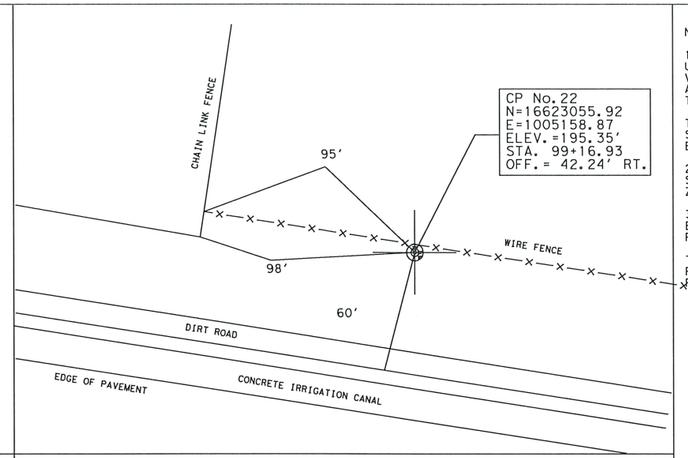
3/1/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\01 GENERAL\03 Proj Layout\Liberty_Playout02.dgn



DESCRIPTION: 5/8" IRON ROD WITH CAP STAMPED, "R.O.W.S. CONTROL" SET IN THE GROUND, LOCATED APPROXIMATELY 710 FT. SOUTH OF INT. OF 3 MILE AND LIBERTY ROAD.



DESCRIPTION: 5/8" IRON ROD WITH CAP STAMPED, "R.O.W.S. CONTROL" SET IN THE GROUND, LOCATED APPROXIMATELY 248 FT. SOUTH OF LIBERTY ROAD AND ASH ST. INTERSECTION.



DESCRIPTION: 5/8" IRON ROD WITH CAP STAMPED, "R.O.W.S. CONTROL" SET IN THE GROUND, LOCATED APPROXIMATELY 61 FT. NORTH OF UNITED IRRIGATION CANAL.

NOTES:

1. COORDINATES AND DISTANCES ARE IN U.S. SURVEY FEET. DISPLAYED IN SURFACE VALUES USING A GRID TO SURFACE ADJUSTMANT FACTOR OF 1.00004 THE FOLLOWING CONTROL POINTS WERE HELD :

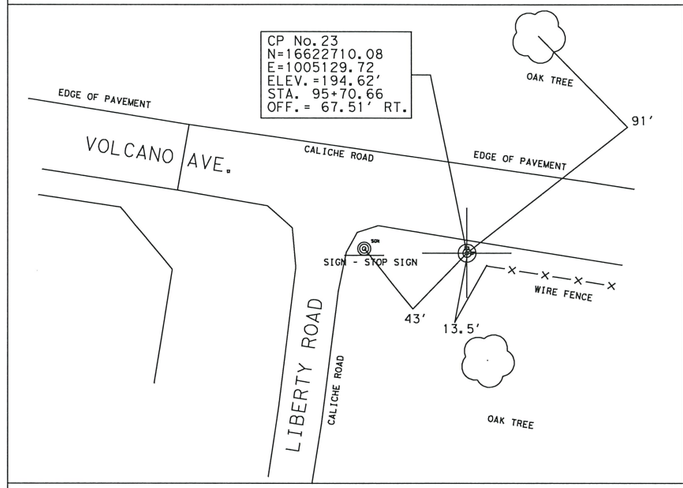
TXDOT HORIZONTAL AND VERTICAL CONTROL STATIONS PANEL 62, PANEL 65 LA JOYA BY-PASS PROJECT

2. ALL HORIZONTAL VALUES ARE NAD 83(2011) STATE PLANE COORDINATES, TEXAS SOUTH ZONE ESTABLISHED BY RTK METHODS.

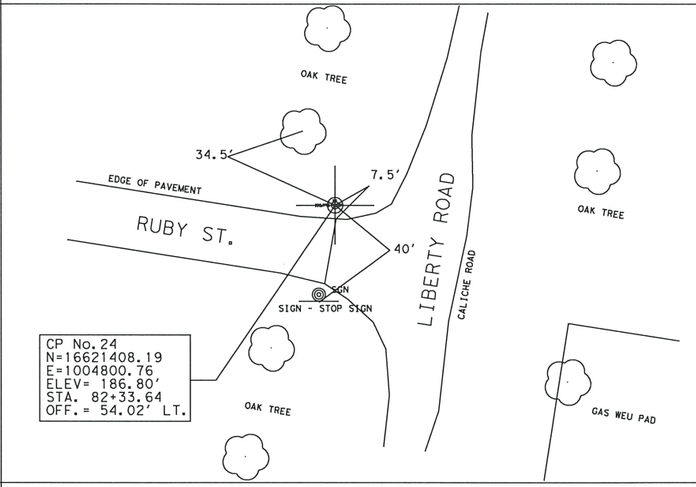
3. VERTICAL DATUM IS NAVD 88 ESTABLISHED BY DIGITAL LEVELS,THE FOLLOWING CONTROL POINTS WERE HELD :

TXDOT CONTROL STATIONS
PANEL 62 ELEV=166.327
PANEL 65 ELEV=195.555

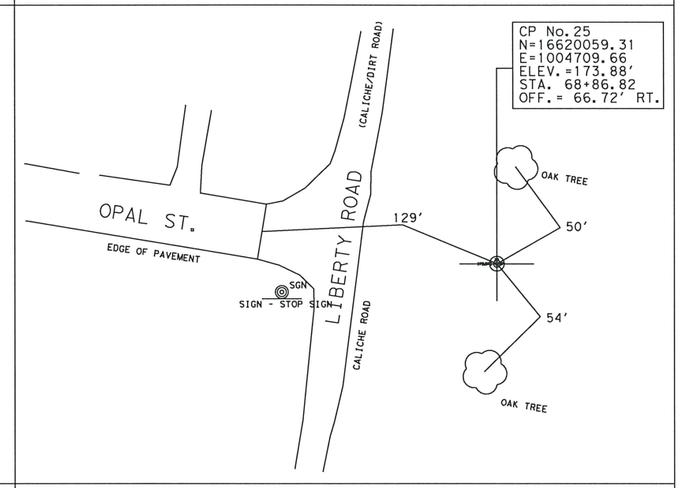
NOT TO SCALE



DESCRIPTION: 5/8" IRON ROD WITH CAP STAMPED, "R.O.W.S. CONTROL" SET IN THE GROUND, LOCATED APPROXIMATELY 47 FT. EAST OF LIBERTY ROAD AND VOLCANO AVE. INTERSECTION

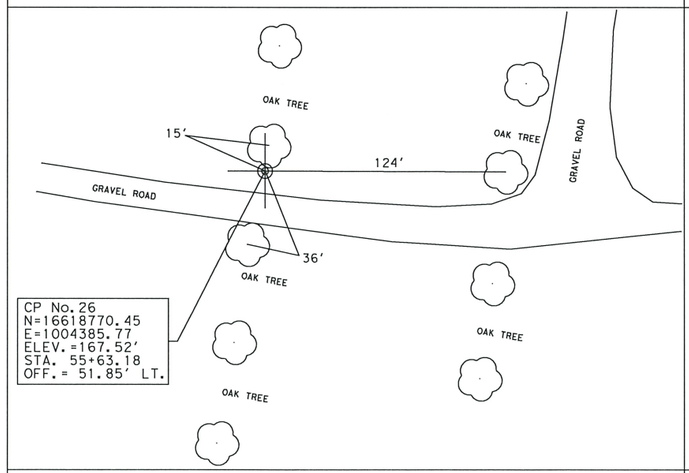


DESCRIPTION: 5/8" IRON ROD WITH CAP STAMPED, "R.O.W.S. CONTROL" SET IN THE GROUND, LOCATED AT N.W QUADRANT OF RUBY ST. AND LIBERTY ROAD.

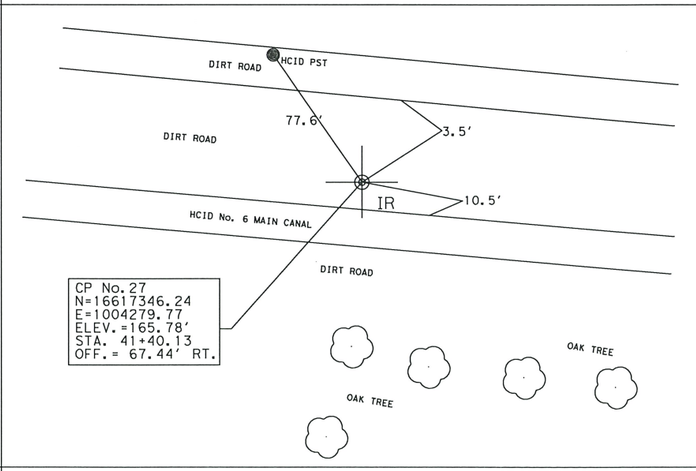


DESCRIPTION: 5/8" IRON ROD WITH CAP STAMPED, "R.O.W.S. CONTROL" SET IN THE GROUND, LOCATED WITHIN EXISTING LIBERTY ROAD R.O.W

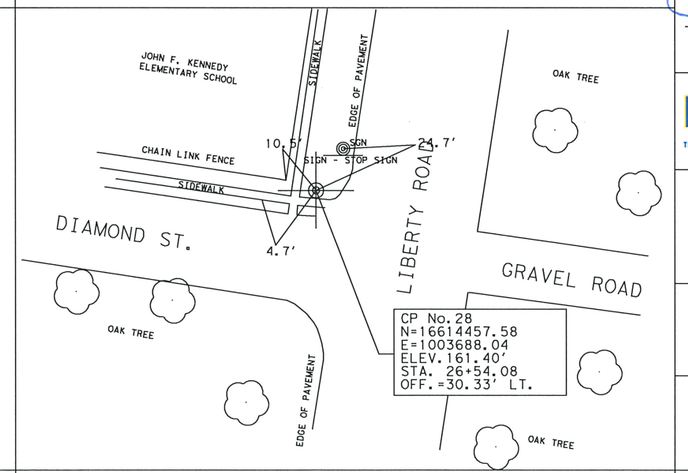
THE SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PLAN SPECIFICATION AND ESTIMATE



DESCRIPTION: 5/8" IRON ROD WITH CAP STAMPED, "R.O.W.S. CONTROL" SET IN THE GROUND, LOCATED APPROXIMATELY 1445 FT. NORTH OF HCID No. 6 CANAL.



DESCRIPTION: 5/8" IRON ROD WITH CAP STAMPED, "R.O.W.S. CONTROL" SET IN THE GROUND, LOCATED APPROXIMATELY 15 FT. NORTH OF HCID No. 6 CANAL



DESCRIPTION: 5/8" IRON ROD WITH CAP STAMPED, "R.O.W.S. CONTROL" SET IN THE GROUND, LOCATED AT N.W QUADRANT OF DIAMOND ST. AND LIBERTY ROAD.

STATE OF TEXAS
REGISTERED
JUAN E. GALVAN
4011
PROFESSIONAL
LAND SURVEYOR

JUAN E. GALVAN, R.P.L.S. #4011
05/29/2020

ROW SURVEYING SERVICES, LLC.
900 S. STEWART RD, SUITE 13
MISSION, TEXAS 78572
TEL.: (956) 424-3335
FAX.: (956) 424-3132
TBPLS REG. FIRM- 10193886

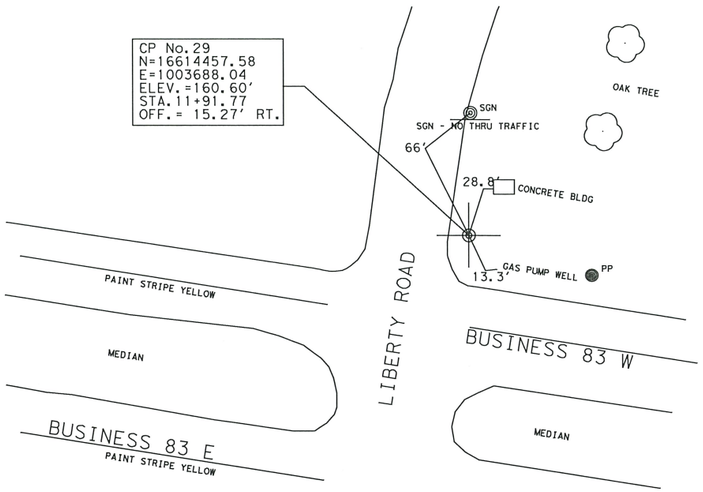
THE COUNTY OF HIDALGO TEXAS

© 2014

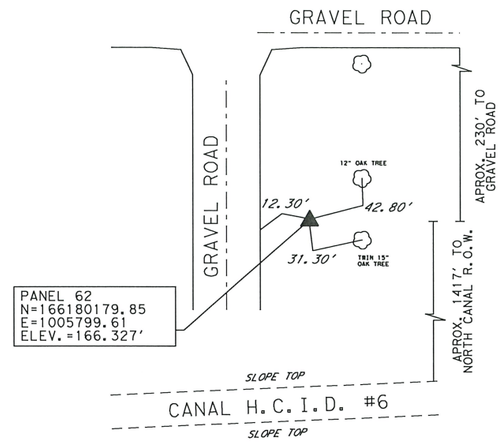
TEXAS DEPARTMENT OF TRANSPORTATION

U.S. 83 TO 3 MILE
LIBERTY ROAD PH. 2
HORIZONTAL & VERTICAL CONTROL

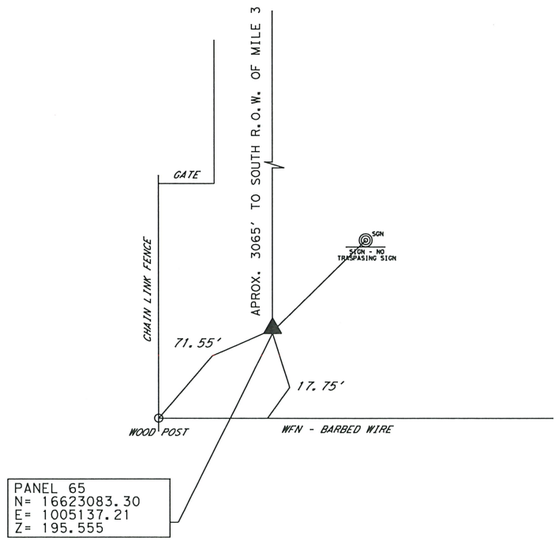
SHEET No. 5



DESCRIPTION: 5/8" IRON ROD WITH CAP STAMPED, "R.O.W.S. CONTROL" SET IN THE GROUND, LOCATED APPROXIMATELY 29 FT. NORTH EXPRESSWAY 83 AND LIBERTY ROAD.



DESCRIPTION: FOUND 5/8" IRON, LOCATED APPROXIMATELY 1417 FT. NORTH FROM THE NORTH R.O.W. OF H.C.I.D. #6 MAIN CANAL.



DESCRIPTION: FOUND 5/8" IRON, LOCATED APPROXIMATELY 3065 FT. SOUTH FROM THE SOUTH R.O.W. OF 3 MILE.

NOTES:

1. COORDINATES AND DISTANCES ARE IN U.S. SURVEY FEET. DISPLAYED IN SURFACE VALUES USING A GRID TO SURFACE ADJUSTMANT FACTOR OF 1.00004 THE FOLLOWING CONTROL POINTS WERE HELD :

TXDOT HORIZONTAL AND VERTICAL CONTROL STATIONS PANEL 62, PANEL 65 LA JOYA BY-PASS PROJECT

2. ALL HORIZONTAL VALUES ARE NAD 83(2011) STATE PLANE COORDINATES, TEXAS SOUTH ZONE ESTABLISHED BY RTK METHODS.

3. VERTICAL DATUM IS NAVD 88 ESTABLISHED BY DIGITAL LEVELS, THE FOLLOWING CONTROL POINTS WERE HELD :

TXDOT CONTROL STATIONS
PANEL 62 ELEV=166.327
PANEL 65 ELEV=195.555

N

NOT TO SCALE

THE SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PLAN SPECIFICATION AND ESTIMATE

STATE OF TEXAS
REGISTERED
JUAN E. GALVAN
4011
PROFESSIONAL
LAND SURVEYOR

JUAN E. GALVAN, R.P.L.S. #4011
05/29/2020

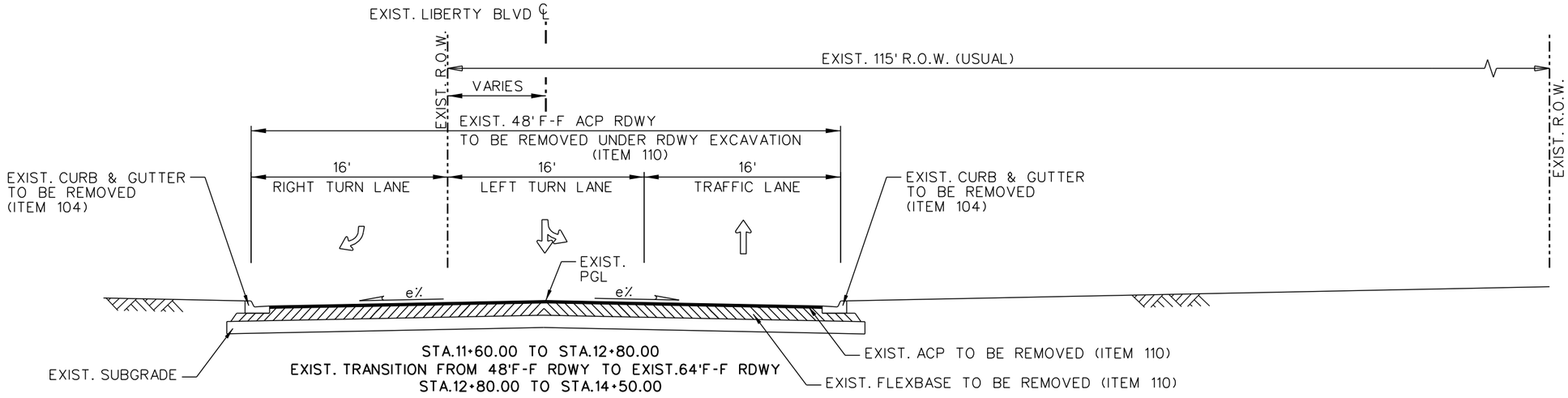
ROW SURVEYING SERVICES, LLC.
900 S. STEWART RD. SUITE 13
MISSION, TEXAS 78572
TEL.: (956) 424-3335
FAX.: (956) 424-3132
TBPLS REG. FIRM# 10193886

THE COUNTY OF HIDALGO TEXAS

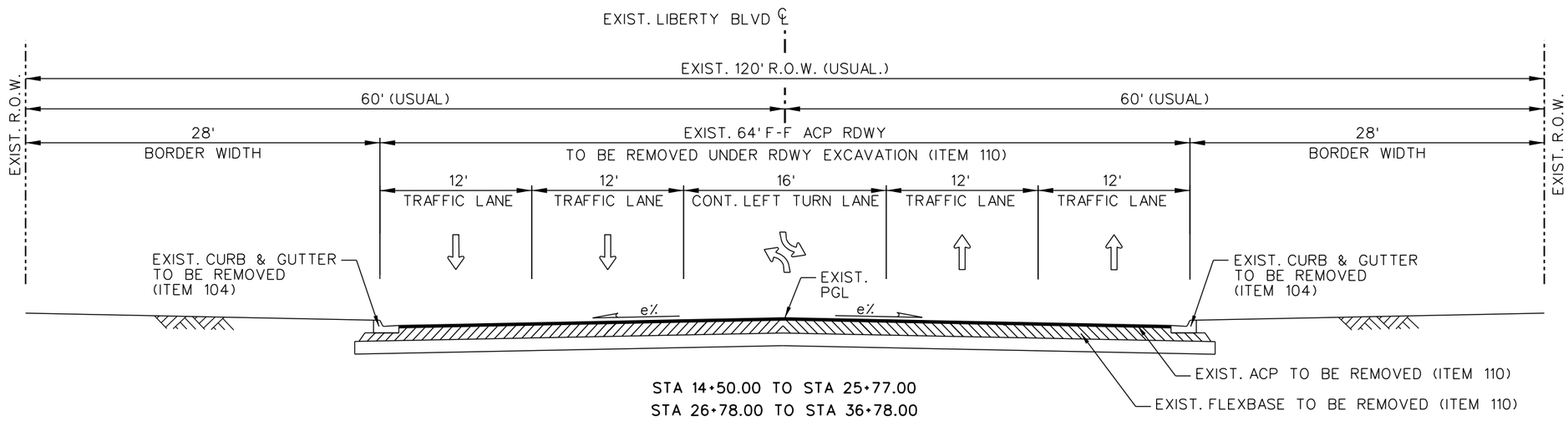
© 2014
TEXAS DEPARTMENT OF TRANSPORTATION

U.S. 83 TO 3 MILE
LIBERTY ROAD PH. 2
HORIZONTAL & VERTICAL CONTROL

SHEET No. 6



STA.11+60.00 TO STA.12+80.00
EXIST. TRANSITION FROM 48'F-F RDWY TO EXIST.64'F-F RDWY
STA.12+80.00 TO STA.14+50.00



STA 14+50.00 TO STA 25+77.00
STA 26+78.00 TO STA 36+78.00

8/4/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\01 GENERAL\04 Typical Sections\LIBERTY_EXIST TYP SECT.dgn

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED
PROFESSIONAL ENGINEER
08/04/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

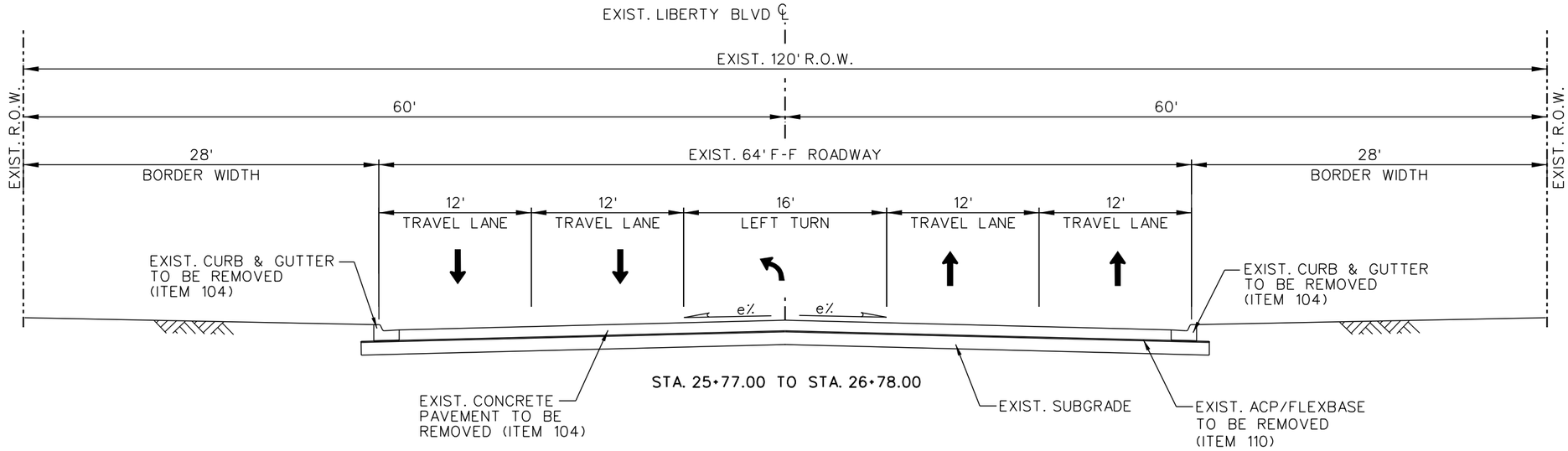
2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

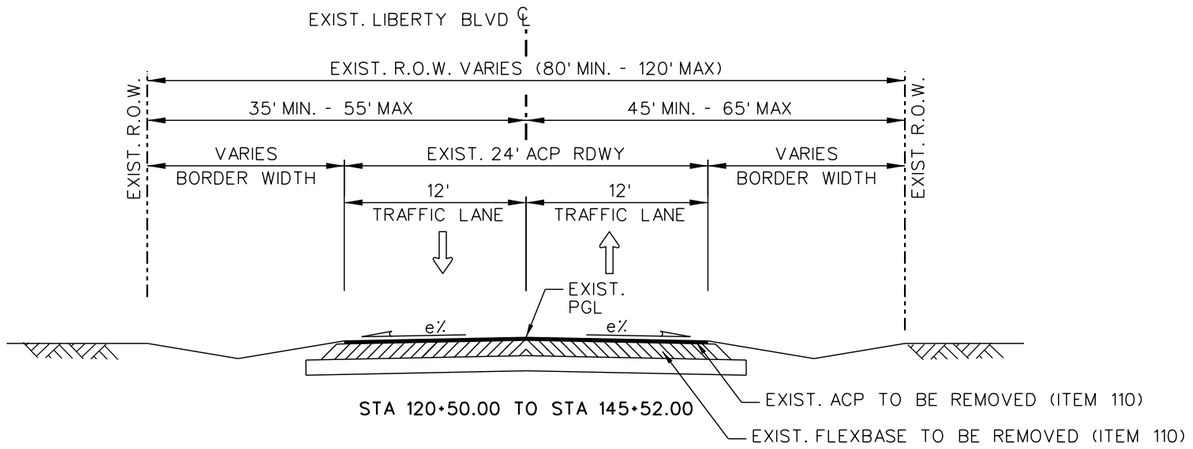
900 S. Stewart Rd. Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
EXISTING TYPICAL SECTIONS

NTS

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					7
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								





STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
08/04/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

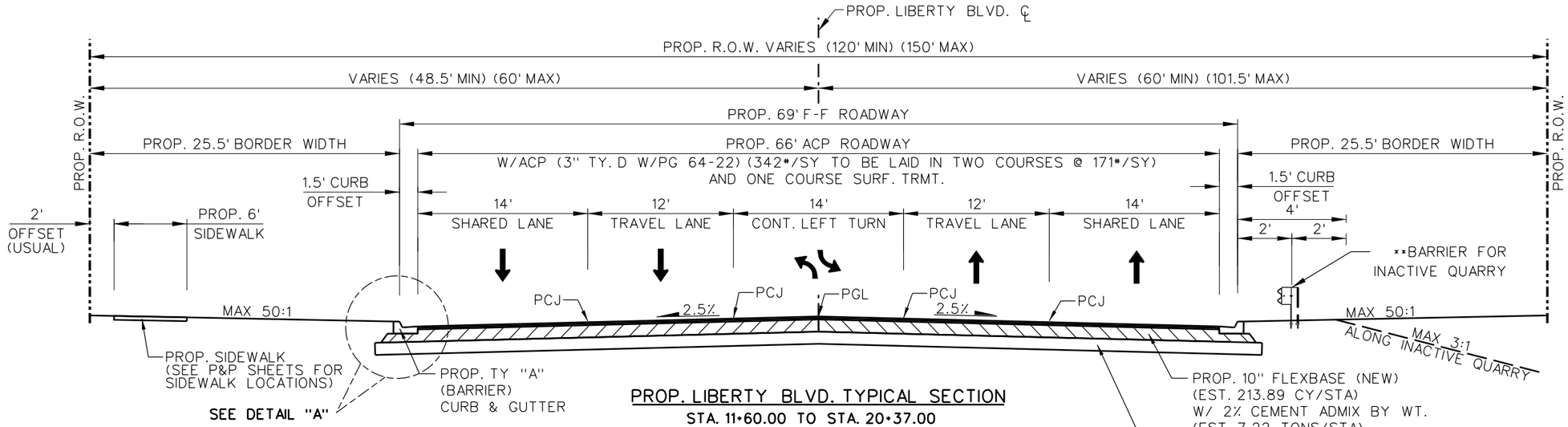
900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
EXISTING TYPICAL SECTIONS

NTS

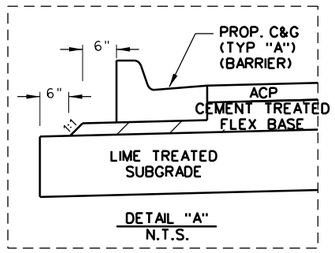
DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					8
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

8/4/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\01 GENERAL\04 Typical Sections\LIBERTY_EXIST TYP SECT.dgn



PROP. LIBERTY BLVD. TYPICAL SECTION

STA. 11+60.00 TO STA. 20+37.00
STA. 20+37.00 TO STA. 21+38.00 (TRANSITION 69' F-F TO 81' F-F RDWY)
STA. 32+10.00 TO STA. 40+96.66
STA. 40+94.76 TO STA. 41+34.76 (PROP. BRIDGE LAYOUT)
STA. 41+34.76 TO STA. 44+61.00
STA. 44+61.00 TO STA. 48+61.00 (TRANSITION 69' F-F TO 96' F-F RDWY)
STA. 68+73.00 TO STA. 98+43.00
STA. 98+59.00 TO STA. 135+99.63
STA. 135+99.63 TO STA 137+92.72 (EXIST. MILE 3 RD./SKIP AREA)



DETAIL "A"
N.T.S.

GENERAL NOTES:

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY BE VARIED WHEN SPECIFICALLY DIRECTED BY THE ENGINEER.

THE TOP 4 INCHES (MIN.) OF THE PROP. FLEXBASE SHALL BE NEW MATERIAL.

WHERE POSSIBLE AND UNLESS OTHERWISE DIRECTED BY THE ENGINEER, PERMISSIBLE CONSTR. JOINTS SHALL FALL ON STRIPING LINES AS SHOWN ON STRIPING DETAILS.

ALL GRADING SHALL BE WITHIN THE R.O.W. LIMITS.

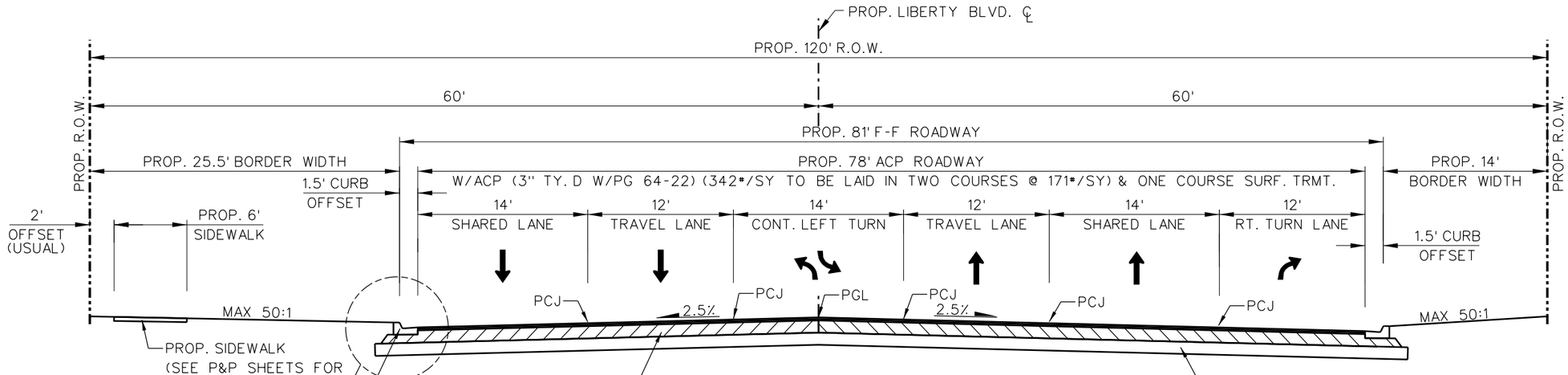
114#/SY OF ACP IS EQUIVALENT TO 1" DEPTH OF ACP.

PGL - DENOTES PROFILE GRADE LINE

PCJ - DENOTES PERMISSIBLE CONSTRUCTION JOINT

A STATION IS EQUIVALENT TO 100 FT.

LIMITS OF BARRIER
STA. 100+00.00 TO STA. 121+50.00



PROP. LIBERTY BLVD. TYPICAL SECTION

STA. 21+38.00 TO STA. 23+66.00
STA. 28+76.00 TO STA. 31+10.00
STA. 31+10.00 TO STA. 32+10.00 (TRANSITION 81' F-F TO 69' F-F RDWY)

JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

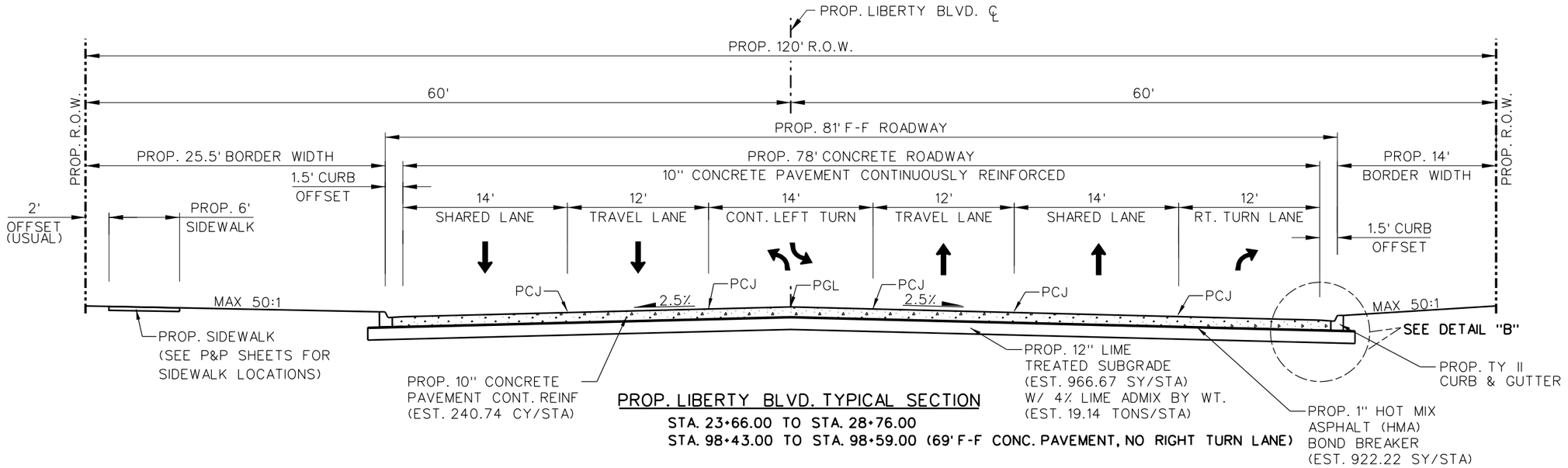
LIBERTY BLVD
PROPOSED TYPICAL SECTIONS

NTS

SHEET 1 OF 3

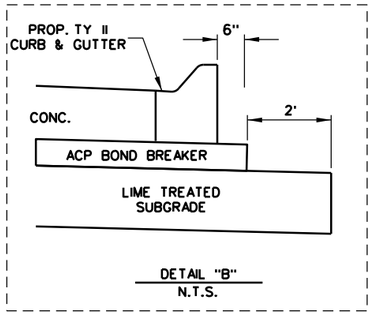
DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					9
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

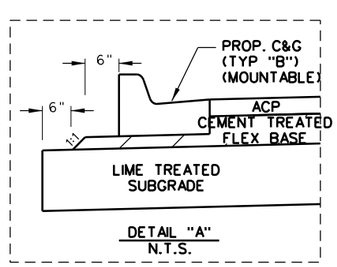
5/6/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GD\01 GENERAL\04 Typical Sections\LIBERTY_PROP TYP SECT_A.dgn



PROP. LIBERTY BLVD. TYPICAL SECTION

STA. 23+66.00 TO STA. 28+76.00
STA. 98+43.00 TO STA. 98+59.00 (69' F-F CONC. PAVEMENT, NO RIGHT TURN LANE)





GENERAL NOTES:

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY BE VARIED WHEN SPECIFICALLY DIRECTED BY THE ENGINEER.

THE TOP 4 INCHES (MIN.) OF THE PROP. FLEXBASE SHALL BE NEW MATERIAL.

WHERE POSSIBLE AND UNLESS OTHERWISE DIRECTED BY THE ENGINEER, PERMISSIBLE CONSTR. JOINTS SHALL FALL ON STRIPING LINES AS SHOWN ON STRIPING DETAILS.

ALL GRADING SHALL BE WITHIN THE R.O.W. LIMITS.

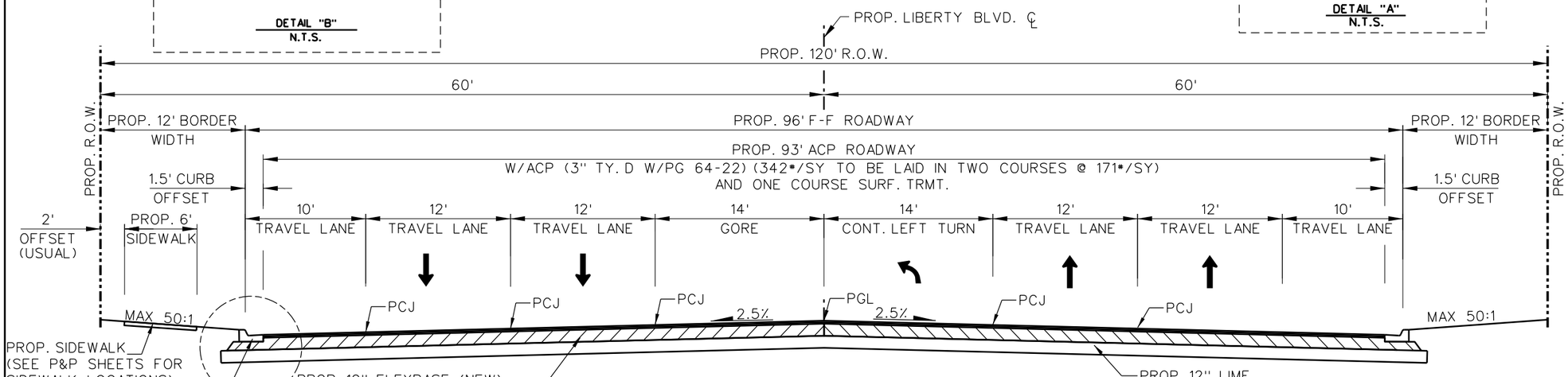
114*/SY OF ACP IS EQUIVALENT TO 1" DEPTH OF ACP.

PGL - DENOTES PROFILE GRADE LINE

PCJ - DENOTES PERMISSIBLE CONSTRUCTION JOINT

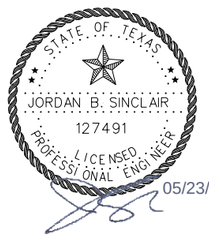
A STATION IS EQUIVALENT TO 100 FT.

LIMITS OF BARRIER
STA. 99+00.00 TO STA. 122+00.00



PROP. LIBERTY BLVD. TYPICAL SECTION

STA. 48+61.00 TO STA. 54+13.85
STA. 54+13.85 TO STA. 59+19.68 (LA JOYA BYPASS PROJECT EXCEPTION)
STA. 59+19.68 TO STA. 64+73.00
STA. 64+73.00 TO STA. 68+73.00 (TRANSITION 96' F-F TO 69' F-F RDWY)



L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PROPOSED TYPICAL SECTIONS

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					10
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	322		LIBERTY
TR:								
CK TR:								

5/6/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GD\01 GENERAL\04 Typical Sections\LIBERTY_PROP TYP SECT_A.dgn

GENERAL NOTES:

WHERE REQUIRED BY FIXTURES OR UNUSUAL CONDITIONS, THE GOVERNING SLOPES MAY BE VARIED WHEN SPECIFICALLY DIRECTED BY THE ENGINEER.

THE TOP 4 INCHES (MIN.) OF THE PROP. FLEXBASE SHALL BE NEW MATERIAL.

WHERE POSSIBLE AND UNLESS OTHERWISE DIRECTED BY THE ENGINEER, PERMISSIBLE CONSTR. JOINTS SHALL FALL ON STRIPING LINES AS SHOWN ON STRIPING DETAILS.

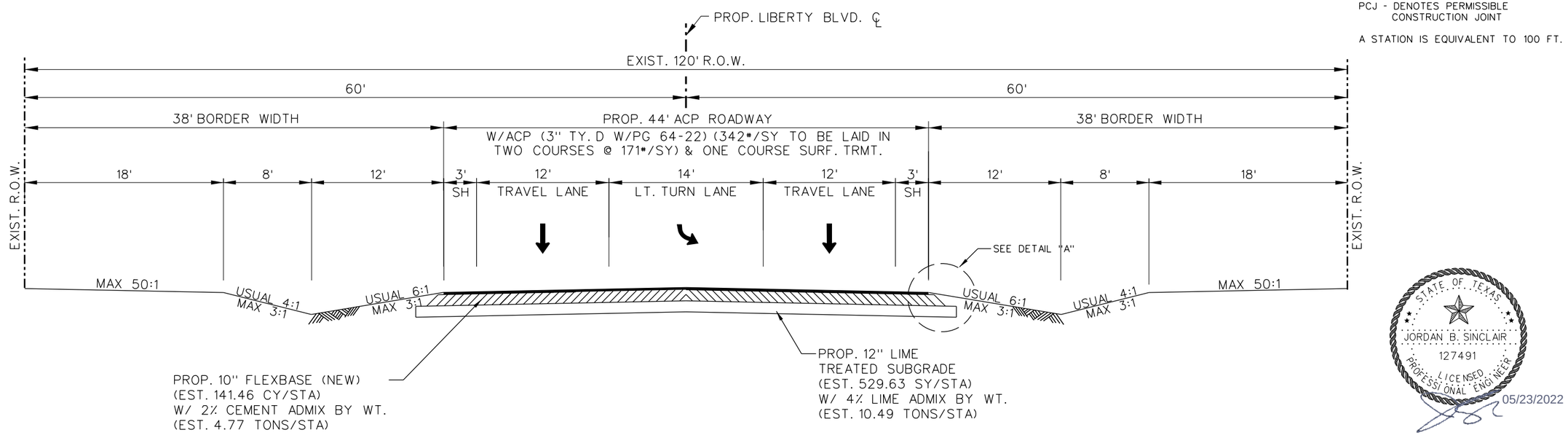
ALL GRADING SHALL BE WITHIN THE R.O.W. LIMITS.

114#/SY OF ACP IS EQUIVALENT TO 1" DEPTH OF ACP.

PGL - DENOTES PROFILE GRADE LINE

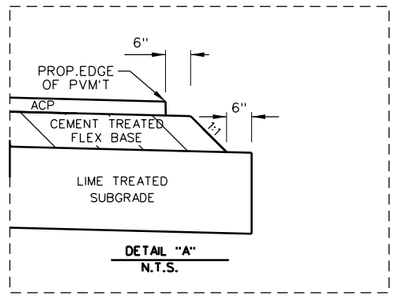
PCJ - DENOTES PERMISSIBLE CONSTRUCTION JOINT

A STATION IS EQUIVALENT TO 100 FT.



PROP. LIBERTY BLVD. TYPICAL SECTION

STA. 137+92.72 TO STA. 142+37.00
STA. 142+37.00 TO STA. 145+52.00 (TRANSITION 44' TO 24' RDWY)



DETAIL "A"
N.T.S.

STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PROPOSED TYPICAL SECTIONS

SHEET 3 OF 3

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					11
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	322	LIBERTY	
TR:								
CK TR:								

5/6/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GD\01 GENERAL\04 Typical Sections\LIBERTY_PROP TYP SECT_A.dgn

SUMMARY OF ROADWAY ITEMS

LOCATION	LENGTH	100	CUT 110	FILL 132	204	SUBGRADE 260	✕ 260	FLEXIBLE BASE 247	✕ 275	275	PRIME COAT 310	310	SEAL COAT 316	316	ASPH. CONC. PAV. 3076	3076	3076	3076	3084	CONC. PAV. 360
		6002	6001	6006	6003	6011	6043	6225	6001	6031	INFO-ONLY	6009	6005	6486	INFO-ONLY	6036	6036	6036	6001	6004
		PREPARING ROW	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL) (DENS CONT) (TY C)	SPRINK DUST CONTROL 8MG/STA	LIME TREAT (EXIST MATL) (12")	LIME HYD,COM OR QK(SLRY) 4.0% BY WT.	FLEX. BASE (RDWY DEL) TY"E" GR.4 (FINAL POS)	CEMENT 2.0% BY WT.	CEMENT TREAT (NEW BASE) (10")	AREA ⊕	PRIME COAT (MC-30) 0.2 GAL/SY	ASPH (TIER II) 0.32 GAL/SY	AGGR (TY-D GR-4P) (SAC-B) 1 CY/120 SY	AREA ⊕	D-GR HMA TY-D SAC-A PG 64-22 342 #/SY	D-GR HMA TY-D SAC-A PG 64-22 114#/SY	D-GR HMA TY-D SAC-A PG 64-22 171#/SY	BONDING CRSE 0.12 GAL/SY	CONC PVMT (CONT REINF-CRCP) (10")
	(FT)	(STA)	(CY)	(CY)	(MG)	(SY)	(TON)	(CY)	(TON)	(SY)	(SY)	(GAL)	(GAL)	(CY)	(SY)	(TON)	(TON)	(TON)	(GAL)	(SY)
		EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.		EST.	EST.	EST.	EST.	EST.
LIBERTY BLVD																				
STA 3+55 TO 10+07 (48' F-F)											3260				3260			279		
STA 11+60 TO 20+37 (69' F-F)	877.00	8.77			70	7113	141	1876	63	7016	6431	1286	2058	54	6431	1100			772	
STA 20+37 TO 21+38 (69' TO 81' F-F TRANS)	101.00	1.01			8	887	18	235	8	875	808	162	259	7	808	138			97	
STA 21+38 TO 23+66 (81' F-F)	228.00	2.28			18	2153	43	572	19	2128	1976	395	632	16	1976	338			238	
STA 23+66 - 28+76 (81' F-F) CONC. SECTION	510.00	5.10			41	4930	98	0	0	0	4704	941	0	0	4704		268		564	5002
STA 28+76 TO 31+10 (81' F-F)	234.00	2.34			19	2210	44	587	20	2184	2028	406	649	17	2028	347			244	
STA 31+10 TO 32+10 (81' TO 69' F-F TRANS)	100.00	1.00			8	878	17	232	8	867	800	160	256	7	800	137			96	
STA 32+10 TO 40+94.76 (69' F-F)	884.76	8.85			71	7197	143	1898	64	7098	6507	1301	2082	54	6507	1113			781	
STA. 41+34.76 TO 44+61 (69' F-F)	326.24	3.26			26	2666	53	703	24	2630	2411	482	772	20	2411	412			289	
STA 44+61 TO 48+61 (69' TO 96' F-F)	400.00	4.00			32	3844	76	1022	34	3800	3533	707	1131	29	3533	604			424	
STA 48+61 TO 54+13.85 (96' F-F)	552.85	5.53			44	6143	122	1643	55	6081	5713	1143	1828	48	5713	977			685	
STA 59+19.68 TO 64+73 (96' F-F)	553.32	5.53			44	6148	122	1645	56	6087	5718	1144	1830	48	5718	978			686	
STA 64+73 TO 68+73 (96' TO 69' F-F)	400.00	4.00			32	3844	76	1022	34	3800	3533	707	1131	29	3533	604			424	
STA 68+73 TO 98+43 (69' F-F)	2970.00	29.70			238	24090	477	6353	214	23760	21780	4356	6970	182	21780	3724			2614	
STA 98+43 TO 98+59 (69' F-F) CONC. SECTION	16.00	0.16			1	126	2	0	0	0	117	23	0	0	117		7		14	118
STA 98+59 TO 135+99.63 (69' F-F)	3740.63	37.41			299	30341	601	8001	270	29926	27431	5486	8778	229	27431	4691			3292	
STA 137+92.72 TO 142+37 (44' RDWY)	444.28	4.44			36	2553	47	628	21	2304	2172	434	695	18	2172	371			260	
STA 142+37 TO 145+52 (44' TO 24' RDWY)	315.00	3.15			25	1318	26	348	12	1283	1190	238	381	10	1190	203			143	
GRAND TOTAL	12655.58	126.53	50505	33387	1012	106441	2106	26765	902	99839	100112	19371	29452	768	100112	15737	275	279	11623	5120

EST. WT. OF SUBGRADE = 2970 #/CY (COMPACTED)

EST. WT. OF FLEXIBLE BASE (NEW & SALVAGED) = 3375 #/CY COMPACTED DRY WEIGHT

✕ PERCENT OF LIME/CEMENT MAY BE VARIED WHERE REQUIRED OR AS DIRECTED BY THE ENGINEER

⊕ FOR CONTRACTOR'S INFORMATION ONLY. (NON-PAY)

SUMMARY OF SMALL ROAD SIGNS

LOCATION	636 6001 ALUMINUM SIGNS (TY A) (SF)	644 6027 INS SM RD SN SUP&AM TY S80 (1) SA (P) (EA)	6033 INS SM RD SN SUP&AM TY S80 (1) SA (U) (EA)	6030 INS SM RD SN SUP&AM TY S80 (1) SA (T) (EA)	6076 REMOVE SM RD SN SUP & AM (EA)	685 6004 INSTL RDSD FLSH BCN ASSM (SOLAR PWRD) (EA)	6006 REMOVE RDSD FLSH BCN AM (SOLAR PWRD) (EA)
	EST.	EST.	EST.	EST.	EST.	EST.	EST.
SIGNING LAYOUT							
1 OF 6		10	2	3	9	1	1
2 OF 6		5	1			1	
3 OF 6		7	1	4	3		
4 OF 6		6		4	4		
5 OF 6		4		4	2		
6 OF 6		6	2	6	7		
SIGNING DETAILS	56.4						
GRAND TOTAL	56.4	38	6	21	25	2	1

SUMMARY OF DRIVEWAYS

LOCATION	⊙ 530 6002 INTERSECTIONS (ACP) (TY PBS-2) (SY)	6004 DRIVEWAYS (CONC) (SY)	6005 DRIVEWAYS (ACP) (TY PB-1) (SY)
	EST.	EST.	EST.
LIBERTY BLVD	2593	638	1165
GRAND TOTAL	2593	638	1165

⊙ SEE DRIVEWAY TABLE SHEET FOR PRIVATE & INTERSECTION LOCATIONS. "INTERSECTIONS" SHALL BE CONSTRUCTED TO THE PROPOSED ROADWAY ACP, FLEXBASE, AND SUBGRADE THICKNESSES.

SUMMARY OF DEDUCTIVE ALTERNATIVES

ALTERNATIVE NO.	SEAL COAT 316 6005 ASPH (TIER II) 0.32 GAL/SY (GAL)	316 6486 AGGR (TY-D GR-4P) (SAC B) 1 CY/120 SY (CY)	SIDEWALK 531 6001 CONC SIDEWALKS (4") (SY)
	EST.	EST.	EST.
LIBERTY RD.			
DEDUCTIVE ALTERNATIVE NO. 1	29452	768	
DEDUCTIVE ALTERNATIVE NO. 2			7396
TOTAL	29452	768	7396

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY ROAD ESTIMATED QUANTITIES

SHEET 1 OF 6

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					12
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\01 GENERAL\05 E&Q\LIBERTY_EQ.dgn
4/7/2022

SUMMARY OF REFLECTORIZED PVMT. MARKINGS, PREFAB. PVMT. MARKINGS, & REFLECTORIZED PVMT. MARKERS (ITEM 666, 668, & 672)

	666	666	666	666	666	666	666	666	666	668	668	668	668	668	672	672
	6300	6303	6500	6036	6042	6048	6147	6312	6315	6005	6077	6085	6124	6125	6007	6009
PAVEMENT	RE PM W/	RE PM W/	RE PM W/	REFL PAV	REFL PAV	REFL PAV	REFL PAV	RE PM W/	RE PM W/	PREFAB PAV	PREFAB PAV	PREFAB PAV	PREFAB PAV	PREFAB PAV	REFL PAV	REFL PAV
MARKING	RET REQ TY I	RET REQ TY I	RET REQ TY I	MRK TY I	MRK TY I	MRK TY I	MRK TY I	RET REQ TY I	RET REQ TY I	MRK TY B	MRK TY C	MRK TY C	MRK TY C	MRK TY C	MRKR	MRKR
SHEET	(W) 4" (BRK)	(W) 4" (SLD)	(W) 4" (DOT)	(W) 8" (SLD)	(W) 12" (SLD)	(W) 24" (SLD)	(Y) 24" (SLD)	(Y) 4" (BRK)	(Y) 4" (SLD)	(W) 4"(BRK)	(W) (ARROW)	(W) (WORD)	(W) (WORD)	(W) (ARROW)	TY I-C	TY II-A-A
	(100MIL)	(100MIL)	(100MIL)	(100MIL)	(100MIL)	(100MIL)	(100MIL)	(100MIL)	(100MIL)	(CONTST)			(CONTST)	(CONTST)		
	(LF)	(LF)	(LF)	(LF)	(LF)	(LF)	(LF)	(LF)	(LF)	(LF)	(EA)	(EA)	(EA)	(EA)	(EA)	(EA)
	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.
LIBERTY BLVD.																
SHEET 1 OF 6	1134	1160	292	2605	1073	486			5537	200	14	14	4	6	178	252
SHEET 2 OF 6	1345	2027		415	489	111	500	540	5408	40	6	2			79	254
SHEET 3 OF 6	1106	1888		444	1021	216	500	345	4578						92	160
SHEET 4 OF 6	1650					60		1385	3696						54	96
SHEET 5 OF 6	1650					48		1380	3680						54	92
SHEET 6 OF 6	837	2100		1118	1354	385		626	5122		6	6			83	224
GRAND TOTAL	7722	7175	292	4582	3937	1306	1000	4276	28021	240	26	22	4	6	540	1078

SUMMARY OF TRAFFIC CONTROL ITEMS (ITEM 508, 662, & 677)

	508	662	662	662	662	662	662	662	662	662	662	662	662	677
	6001	6004	6012	6016	6094	6034	6048	6050	6063	6095	6109	6111		6001
TCP PHASE	CONSTRUCTING DETOURS	WK ZN PAV MRK NON-REMOV (W) 4" (SLD)	WK ZN PAV MRK NON-REMOV (W) 8" (SLD)	WK ZN PAV MRK NON-REMOV (W) 24" (SLD)	WK ZN PAV MRK REMOV (Y) 4" (DOT)	WK ZN PAV MRK NON-REMOV (Y) 4" (SLD)	WK ZN PAV MRK REMOV (REFL) TY I-C	WK ZN PAV MRK REMOV (REFL) TY II-A-A	WK ZN PAV MRK REMOV (W) 4" (SLD)	WK ZN PAV MRK REMOV (Y) 4" (SLD)	WK ZN PAV MRK SHT TERM (TAB) TY W	WK ZN PAV MRK SHT TERM (TAB) TY Y-2		ELIM EXT PAV MRK & MRKS (4")
	(SY)	(LF)	(LF)	(LF)	(LF)	(LF)	(EA)	(EA)	(EA)	(EA)	(EA)	(EA)		(LF)
	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.		EST.
LIBERTY BLVD.														
PHASE II - SHEET 1 OF 2	341													
PHASE II - SHEET 2 OF 2	2395													
PHASE III - SHEET 1 OF 2		4100	24			4100		52						56
PHASE III - SHEET 2 OF 2		1924				1924		25						158
PHASE IV - SHEET 1 OF 2		1853				3786		48						
PHASE IV - SHEET 2 OF 2								10		844				
PHASE V - SHEET 1 OF 3	148	81												
PHASE V - SHEET 2 OF 3		972		72		300		5						
PHASE V - SHEET 3 OF 3		750				1500		20						
PHASE VI - SHEET 1 OF 3		1942	207	96	177	2596		58						2119
PHASE VI - SHEET 2 OF 3		2400	14			1892		30		508				
PHASE VI - SHEET 3 OF 3		1156				1156		10	344	344				
PHASE VII											2130	3550		
GRAND TOTAL	2884	15178	245	168	177	17254	0	258	344	1696	2130	3550		2333

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

THE COUNTY OF HIDALGO TEXAS

LIBERTY ROAD
ESTIMATED QUANTITIES

SHEET 2 OF 6

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					13
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:								
TR:		PHR	HIDALGO	0921	02	194		LIBERTY
CK TR:								

12/7/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\01 GENERAL\05 E&Q\LIBERTY_EQ.dgn

SUMMARY OF PLAN & PROFILE SHEETS

PLAN & PROFILE SHEET	104 6001 REMOVING CONC (PAV) (SY) EST.	104 6017 REMOVING CONC (DRIVEWAYS) (SY) EST.	104 6022 REMOVING CONC (CURB & GUTTER) (LF) EST.	104 6036 REMOVING CONC (SIDEWALK OR RAMP) (SY) EST.	354 6051 PLANE ASPH CONC PAV (0" TO 1 1/2") (SY) EST.	420 6066 CL C CONC (RAIL ROUNDATION) (CY) EST.	432 6045 RIPRAP (MOW STRIP) (4") (CY) EST.	432 6054 RIPRAP (PNEUM PLAC CONC) (2.5IN) (CY) EST.	464 6003 RC PIPE (CL III) (18") (LF) EST.	464 6004 RC PIPE (CL III) (24") (LF) EST.	467 6363 SET (TY II) (18") (RCP) (6:1)(P) (EA) EST.	467 6395 SET (TY II) (24") (RCP) (6:1)(P) (EA) EST.	479 6006 ADJUST INLET (CAP) (EA) EST.	496 6002 REMOV STR (INLET) (EA) EST.	496 6004 REMOV STR (SET) (EA) EST.	496 6007 REMOV STR (PIPE) (LF) EST.	529 6030 CONC CURB & GUTTER (VALLEY GUTTER) (LF) EST.	529 6008 CONC CURB & GUTTER (TY II) (LF) EST.	529 6029 CONC CURB & GUTTER (TY A) (LF) EST.	531 6010 CURB RAMPS (TY 7) (EA) EST.	531 6013 CURB RAMPS (TY 10) (EA) EST.	531 6001 CONC SIDEWALKS (4") (SY) EST.	540 6001 MTL W-BEAM GD REN (TIM POST) (LF) EST.	540 6016 DOWNSTREAM ANCHOR TERMINAL SECTION (EA) EST.	544 6001 GUARDRAIL END TREATMENT (INSTALL) (EA) EST.	545 6001 CRASH CUSH ATTEN (INSTL) (EA) EST.
LIBERTY BLVD																										
P & P SHEET																										
1 OF 28					4677																					
2 OF 28		251	848							170		1		3	2	433	112		916	5		216				
3 OF 28		272	1019											2		588	208		1007	4		285				
4 OF 28			1101											3		500		448	532	4		324				
5 OF 28	888		1090	211										3		656		448	1009	4		299				
6 OF 28		159	991	200										2		141	86		990		2	300				
7 OF 28			211	40		4											160		1000			333				2
8 OF 28						4		27									66		1000			306				2
9 OF 28																			1000			334				
10 OF 28																			622			207				
11 OF 28																	97		367		2	85				
12 OF 28																	97		1006		2	274				
13 OF 28																	97		1005	2		312				
14 OF 28																	97		1005	2		312				
15 OF 28																	97		1004	2		311				
16 OF 28																	97		1001	2		309				
17 OF 28																	97		1006	2		312				
18 OF 28																	241		1000	3		294				
19 OF 28							10											32	984	1		326	100		1	
20 OF 28							25										190		1016	4		293	500			
21 OF 28							25												939			333	500			
22 OF 28							25										97		1007	2		313	500			
23 OF 28							25										100		1002	2		310	500			
24 OF 28							1						1	1	6	180	98		973			334		1		
25 OF 28															2	50	98		1004			333				
26 OF 28															2	50	98		1005			333				
27 OF 28																			12			14				
28 OF 28									78		4				2	52										
GRAND TOTAL	888	682	5260	451	4677	8	111	27	78	170	4	1	1	14	14	2650	2233	928	23412	39	6	7402	2100	1	1	4

SUMMARY OF SEDIMENT CONTROL DEVICES (ITEM 160, 164, 166, 168 & 506)

SW3P LAYOUT SHEET	160 6005 FURNISHING AND PLACING TOPSOIL (CY) EST.	164 6030 CELL FBR MLCH SEED (TEMP)(WARM) (ACRE) EST.	164 6026 CELL FBR MLCH SEED (PERM)(RURAL) (SANDY) (ACRE) EST.	166 6002 FERTILIZER **NON-PAY** ⊕ (TON) EST.	168 6001 VEGETATIVE WATERING (MG) EST.	169 6006 SOIL RETENTION BLANKETS (CL 2)(TY F) (SY) EST.	506 6001 ROCK FILTER DAMS (INSTALL) (TY 1) (LF) EST.	506 6011 ROCK FILTER DAMS (REMOVE) (LF) EST.	506 6021 CONSTRUCTION EXIT (INSTALL) (TY 2) (SY) EST.	506 6024 CONSTRUCTION EXIT (REMOVE) (SY) EST.	506 6031 FRONT END LOADER WORK ERSN & SEDM CONT) (HR) EST.	506 6041 BIODEGRADABLE EROSION CONT LOGS (12" DIA) (INSTALL) (LF) EST.	506 6043 BIODEGRADABLE EROSION CONT LOG (REMOVE) (LF) EST.	506 6038 TEMPORARY SEDIMENT CONT FENCE (INSTALL) (LF) EST.	506 6039 TEMPORARY SEDIMENT CONT FENCE (REMOVE) (LF) EST.
LIBERTY BLVD															
1 OF 7		2.47	2.47	0.61	376				156	156	5	180	180		
2 OF 7		2.30	2.30	0.55	335		15	15	234	234	5	170	170		
3 OF 7		1.63	1.63	0.41	249				156	156	7	230	230		
4 OF 7		2.02	2.02	0.51	309						7	240	240		
5 OF 7		2.19	2.19	0.54	329	493	20	20			8	295	295		
6 OF 7		2.12	2.12	0.53	324	501			234	234	9	295	295		
7 OF 7		2.34	2.34	0.59	358				156	156	5	205	205		
MISC.	50													100	100
GRAND TOTAL	50	15.07	15.07	3.74	2280	994	35	35	936	936	46	1615	1615	100	100

⊕ FOR CONTRACTOR'S INFORMATION ONLY. (NON-PAY)

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY ROAD
ESTIMATED QUANTITIES

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					14
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

5/23/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJV01 GENERAL\05 E&Q\LIBERTY_EQ_A.dgn

SUMMARY OF PROP. DRAINAGE STRUCTURES

SHEET NO.	ITEM 104	ITEM 132	ITEM 400					ITEM 402	ITEM 432		ITEM 464						ITEM 476	ITEM 496	ITEM 4024		ITEM 4122
	6009	6006	NON-PAY	6005	6006	6010	6011	6001	6001	6002	6038	6039	6040	6041	6042	6043	6026	6007	6006	6007	6001
	REMOVING CONC (RIP RAP)	EMBKMT (FINAL) (DENS CONT) (TY C)	STRUCT EXCAV (CY)	CEMENT STABIL BKFL (CY)	CUT & RESTORE PAV (CY)	STRUCT EXCAV (SPL) (CY)	SAND BACKFILL (CY)	TRENCH EXCAVATION PROTECTIO (LF)	RIRRAP (CONC) (4") (CY)	RIPRAP (CONC) (5") (CY)	RC PIPE (CL III) (18") (SPL) (LF)	RC PIPE (CL III) (24") (SPL) (LF)	RC PIPE (CL III) (30") (SPL) (LF)	RC PIPE (CL III) (36") (SPL) (LF)	RC PIPE (CL III) (42") (SPL) (LF)	RC PIPE (CL III) (48") (SPL) (LF)	JACK BORE OR TUN PIPE (36") (RC)(CL V) (LF)	REMOVE STRUCT. (PIPE) (LF)	RC LOW HEAD PRSSR PIPE (CL III) (42") (LF)	RC LOW HEAD PRSSR PIPE (CL III) (54") (LF)	THERMOPLASTIC PIPE (30 IN) (HDPE) (LF)
			EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.
LIBERTY RD																					
U&D SHEETS																					
1 OF 27			441		23		271	475			265	65	131	14							
2 OF 27			853		90		508	566			64				502						
3 OF 27			1287				756	784			33	77		437	67	170					
4 OF 27			771		62		452	613			39	77	189	308							
5 OF 27			629		38		365	582			131	151	300								
6 OF 27			383				155	321			321										
7 OF 27			917			24	358	511			65		343	103							
8 OF 27			576				335	599			175	424									
9 OF 27			389				208	431			431										
10 OF 27			1000			73	246	402			91		25		286						
11 OF 27			1360			106	343	530			88				442						
12 OF 27			1423			100	339	579			135			211	233		64				
13 OF 27			1306			103	325	640			130		295	215							
14 OF 27			1490			114	324	655			65		590								
15 OF 27			1167			57	302	683			130	258	295								
16 OF 27			679				203	525			198	327									
17 OF 27			658				219	656			656										
18 OF 27			55				22	66			66										
19 OF 27			985				441	728			132	388	208								
20 OF 27			529				294	607			607										
21 OF 27			584				308	637			637										
22 OF 27			212		21		97	201			201										
23 OF 27			2257		45	82	700	859			199	64			596						
24 OF 27			1107		40		545	637			128				509						
25 OF 27			879		28		516	631			130	40		371	130						
26 OF 27			619		157		382	250			64	295	250								
27 OF 27			32				31				64										
OUTFALL DETAILS										90											
CULVERT 41•61				77		47	187	264	20					264							
CULVERT 98•88		111	809	275		28			20						140						
IRRIGATION 98•51	490	56	72			33		178	66											178	
IRRIGATION BYPASS																		375			375
RRIGATION BYPASS 98•24.50								352										352	352		
TOTAL	490	167	23469	352	504	767	9232	14962	106	90	5245	2166	2626	1923	2905	170	64	727	352	178	375

SUMMARY OF DRAINAGE ALTERNATIVES (ITEM 400, 460, & 464)

ALTERNATIVE No.	ITEM 400	ITEM 460				ITEM 464			
	6010	6025	6026	6027	6028	6039	6040	6041	6042
	STRUCT. EXCAV. (SPL) (CY)	SRCMP (POLYMER COAT) (GAL STL 24") (LF)	SRCMP (POLYMER COAT) (GAL STL 30") (LF)	SRCMP (POLYMER COAT) (GAL STL 36") (LF)	SRCMP (POLYMER COAT) (GAL STL 42") (LF)	RC PIPE (CL III) (24") (SPL) (LF)	RC PIPE (CL III) (30") (SPL) (LF)	RC PIPE (CL III) (36") (SPL) (LF)	RC PIPE (CL III) (42") (SPL) (LF)
	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.
ALTERNATIVE 1									
GRAND TOTAL	1992	1883	2310	984	2672	283	316	675	93

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY ROAD
ESTIMATED QUANTITIES

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					15
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

5/24/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJV\01 GENERAL\05 E&Q\LIBERTY_EQ_A.dgn

SUMMARY OF DELINEATORS AND OBJECT MARKERS

	ITEM 658			
	6013	6049	6064	6080
	INSTL DEL ASSM (D-SW)SZ (4'X4') (EA)	INSTL DEL ASSM (OM-2Z) (FLX)GRD(BI) (EA)	INSTL DEL ASSM (D-SY)SZ1 (BRF)GF2 (EA)	INSTL DEL ASSM (D-SW)SZ1 (WFLX)GND (EA)
	EST.	EST.	EST.	EST.
LIBERTY BLVD.				
STA.				
39+90 (LT)				1
39+90 (RT)				1
40+15 (LT)				1
40+15 (RT)				1
40+40 (LT)				1
40+40 (RT)				1
40+95 (LT)	1			
40+95 (RT)	1			
41+15 (LT)	1			
41+15 (RT)	1			
41+35 (LT)	1			
41+35 (RT)	1			
41+90 (LT)				1
41+90 (RT)				1
42+15 (LT)				1
42+15 (RT)				1
42+40 (LT)				1
42+40 (RT)				1
100+50 (RT)			1	
101+50 (RT)			1	
102+50 (RT)			1	
103+50 (RT)			1	
104+50 (RT)			1	
105+50 (RT)			1	
106+50 (RT)			1	
107+50 (RT)			1	
108+50 (RT)			1	
109+50 (RT)			1	
110+50 (RT)			1	
111+50 (RT)			1	
112+50 (RT)			1	
113+50 (RT)			1	
114+50 (RT)			1	
115+50 (RT)			1	
116+50 (RT)			1	
117+50 (RT)			1	
118+50 (RT)			1	
119+50 (RT)			1	
120+50 (RT)			1	
132+50 (RT)		1		
138+50 (LT)		1		
138+50 (RT)		1		
141+50 (LT)		1		
141+50 (RT)		1		
GRAND TOTAL	6	5	21	12

SUMMARY OF PROP. DRAINAGE AND IRRIGATION STRUCTURES CONTINUED

	ITEM 465																	
SHEET NO.	6006	6009	6024	6030	6031	6032	6029	6034	6035	6036	6037	6038	6039	6040	6070	6074	6076	6126	6133
	JCTBOX (COMPL) (PJB) (4'X4') (EA)	JCTBOX (COMPL) (PJB) (5'X5') (EA)	INLET (COMPL) (PCO)(5') (BOTH) (EA)	INLET (COMPL) (PCU)(3') (LEFT) (EA)	INLET (COMPL) (PCU)(3') (RIGHT) (EA)	INLET (COMPL) (PCU)(3') (BOTH) (EA)	INLET (COMPL) (PCU)(3') (NONE) (EA)	INLET (COMPL) (PCU)(4') (LEFT) (EA)	INLET (COMPL) (PCU)(4') (RIGHT) (EA)	INLET (COMPL) (PCU)(4') (BOTH) (EA)	INLET (COMPL) (PCU)(5') (RIGHT) (EA)	INLET (COMPL) (PCU)(5') (LEFT) (EA)	INLET (COMPL) (PCU)(5') (RIGHT) (EA)	INLET (COMPL) (PCU)(5') (BOTH) (EA)	INLET (COMPL) (PSL)(RC) (3'X3') (EA)	INLET (COMPL) (PSL)(RC) (5'X5') (EA)	INLET (COMPL) (PSL)(RC) (6'X6') (EA)	INLET (COMPL) (PSL)(FG) (3'X3')(3'X3') (EA)	INLET (COMPL) (PSL)(FG) (4'X5')(3'X5') (EA)
	EST.	EST.	EST.	EST.	EST.	EST.		EST.	EST.	EST.									
U&D SHEETS																			
1 OF 27	2	1			2	1				1									
2 OF 27		1												2					
3 OF 27	1				1	1				1							2		
4 OF 27				1		1				1						2			
5 OF 27				1	1	1				1									
6 OF 27				1	1														
7 OF 27		1			1			1											
8 OF 27				1	1	1				1									
9 OF 27				1	1		2												
10 OF 27		1	1	1									1	1					
11 OF 27						1													
12 OF 27				1		1				1									
13 OF 27				2						2									
14 OF 27				1						1									
15 OF 27				2					2										
16 OF 27				2	2	2													
17 OF 27				1	1														
18 OF 27				1	1														
19 OF 27				1	1	3	1												
20 OF 27				2		2													
21 OF 27				2		2													
22 OF 27				1	1														
23 OF 27				2		1					2			1	1		1		
24 OF 27					1	1						1		1					
25 OF 27		1			1		1			2								1	
26 OF 27																			2
27 OF 27																			2
OUTFALL DETAILS																			
CULVERT 41+61																			
CULVERT 98+98																			
IRRIGATION 98+51																			
IRRIGATION BYPASS																			
GRAND TOTAL	3	5	1	24	16	18	4	1	2	11	2	1	1	7	1	2	3	1	4

SUMMARY OF BRIDGE STRUCTRUES

BRIDGE STATIONS	400	416	420	422	425	425	432	450	450	454
	6005	6002	6013	6007	6009	6010	6010	6006	6032	6021
	CEMENT STABILIZED BACKFILL (CY)	DRILL SHAFT (24 IN) (LF)	CL C CONC (ABUT) (CY)	REINF CONC SLAB (SLAB BEAM) (SF)	PRESTR CONC SLAB BEAM (TX 4SB12) (LF)	PRESTR CONC SLAB BEAM (TX 5SB12) (LF)	RIPRAP (CONC)(CL B) (5 IN) (TY RR8) (CY)	RAIL (TY T223) (LF)	RAIL (TY C223) (LF)	TY A JOINT (LF)
	EST.	EST.	EST.	EST.	EST.	EST.		EST.	EST.	EST.
LIBERTY BLVD										
STA 40+97.26 TO STA 41+32.26	115.40	320	53	3120	395	276.5	29.6	120	60	156
GRAND TOTAL	115.4	320	53	3120	395	276.5	29.6	120	60	156

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY ROAD
ESTIMATED QUANTITIES

SHEET 5 OF 6

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					16
DW:		STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\01 GENERAL\05 E&Q\LIBERTY_EQ.dgn
4/7/2022

Project Number: **Sheet A**

County: Hidalgo **Control:** 0921-02-194

Highway: Liberty Blvd

2014 SPECS GENERAL NOTES:

USE THE TEXAS DEPARTMENT OF TRANSPORATION'S "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES" (NOVEMBER 2014) FOR ITEM SPECIFICATIONS, INFORMATION, AND REQUIREMENTS. THE SPECIFICATION BOOK SHALL READ "HIDALGO COUNTY" IN LIEU OF "THE TEXAS DEPARTMENT OF TRANSPORTATION" AND/OR "THE DEPARTMENT."

****

GENERAL REQUIREMENTS AND COVENANTS TO ITEMS 1L THRU 9L

FOR ALL PITS OR QUARRIES, COMPLY WITH THE "TEXAS AGGREGATE QUARRY AND PIT SAFETY ACT."

PROVIDE ON A WEEKLY BASIS A LIST OF EQUIPMENT, INCLUDING IDLE EQUIPMENT, UTILIZED ON THE PROJECT
THAT WEEK.

THE 1-800 CALL SERVICES FOR UTILITY LOCATIONS DO NOT INCLUDE TXDOT FACILITIES. CONTACT THE PHARR DISTRICT SIGNAL SECTION (956-702-6225) FOR COORDINATION REGARDING TXDOT UNDERGROUND LINES.

ITEM 5L: CONTROL OF THE WORK

THE RESPONSIBILITY FOR THE CONSTRUCTION SURVEYING ON THIS CONTRACT WILL BE IN ACCORDANCE WITH ARTICLE 5.9.1., "METHOD A."

PRIOR TO CONTRACT LETTING, BIDDERS MAY OBTAIN A FREE COMPUTERIZED TRANSFER OF FILES (FROM THE ENGINEER'S OFFICE) THAT CONTAINS THE EARTHWORK INFORMATION. IF COPIES OF THE ACTUAL CROSS-SECTIONS IN ADDITIONAL TO,
OR INSTEAD OF THE ELECTRONIC FILES ARE REQUESTED, THEY WILL BE AVAILABLE AT THE ENGINEERS OFFICE FOR BORROWING BY COPYING COMPANIES FOR THE PURPOSE OF MAKING COPIES FOR THE BIDDER AT THE BIDDERS EXPENSE.

Project Number: **Sheet B**

County: Hidalgo **Control:** 0921-02-194

Highway: Liberty Blvd

ITEM 7L: LEGAL RELATIONS AND RESPONSIBILITIES

NO SIGNIFICANT TRAFFIC GENERATOR EVENTS IDENTIFIED.

ITEM 8L: PROSECUTION AND PROGRESS

WHERE ROAD CLOSURES OR DETOURS AROUND STRUCTURES ARE NECESSARY TO ACCOMPLISH PROPOSED WORK, THE REMOVAL OF EXISTING STRUCTURES AND/OR CUTTING OF EXISTING PAVEMENT WILL NOT BE PERMITTED UNTIL ALL PRE-CAST MEMBERS FOR THE PROPOSED STRUCTURE HAVE BEEN CAST, TESTED AND APPROVED FOR USE.

PREPARE PROGRESS SCHEDULES USING THE CRITICAL PATH METHOD (CPM).

ITEM 100: PREPARING RIGHT OF WAY

CLEARING & GRUBBING SHALL BE EXECUTED IN ACCORDANCE WITH THE DISTRICT CLEARING AND GRUBBING DETAIL SHEETS.

PREPARATION OF RIGHT OF WAY WILL BE DONE IN ACCORDANCE WITH THE CONSTRUCTION PHASING SHOWN ON THE TRAFFIC CONTROL PLANS. PERFORMANCE OF THIS ITEM WILL NOT BE ALLOWED OUTSIDE OF THE PROJECT'S CURRENT CONSTRUCTION PHASE WITHOUT PRIOR APPROVAL BY THE ENGINEER.

ITEM 132: EMBANKMENT

EMBANKMENT (DENS CONT) SHALL BE TYPE C WITH A MAX. PI OF 40. MATERIAL USED AS EMBANKMENT MATERIAL IN THE TOP TWO FEET BELOW THE BOTTOM OF FLEXIBLE BASE SHALL MEET THE FOLLOWING REQUIREMENTS BASED ON PRELIMINARY TESTS AND SUCH OTHER TESTS FOUND NECESSARY BY THE ENGINEER.

1. THE MATERIAL SHALL BE SUCH AS TO PRODUCE A WELL-BONDED EMBANKMENT AND SHALL HAVE A MINIMUM PI OF 8 AND A MAXIMUM PI OF 30.

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD GENERAL NOTES

SHEET 1 OF 14

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				21A
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

4/11/2022 K:\Counties\HDO\Liberty Rd (US83 to Mile 3)\GDJ\01 GENERAL\07 General Notes\Liberty_General Notes_Revised.dgn

Project Number: **Sheet C**

County: Hidalgo **Control:** 0921-02-194

Highway: Liberty Blvd

IT IS THE CONTRACTOR'S RESPONSIBILITY TO ADVISE THE ENGINEER OF THE LOCATION OF THE SOURCE SUFFICIENTLY IN ADVANCE TO AVOID DELAY.

ITEM 160: TOPSOIL

USE TOPSOIL AS NEEDED AND DIRECTED BY THE PROJECT ENGINEER FOR SELECT PROBLEM AREAS. UNLESS OTHERWISE APPROVED BY THE PROJECT ENGINEER, USE TOPSOIL FROM APPROVED SOURCES OUTSIDE THE RIGHT OF WAY AS PER STANDARD SPECIFICATIONS. EXISTING TOPSOIL IS TO BE SALVAGED AND RETAINED FOR RE-USE ON THE PROJECT AS TOPSOIL.

ITEM 164: SEEDING FOR EROSION CONTROL

DURING DRILL SEEDING OPERATIONS, APPLICATION METHODS SHALL BE IN ACCORDANCE WITH THE METHOD SHOWN IN THE STANDARD SPECIFICATION BOOK.

SS-1 TACKING AGENT SHALL BE A RATIO OF 2:1, TWO (EMULSION) TO ONE (WATER) AND APPLIED AT A RATE OF 0.05 GALLONS PER SQUARE YARD. THE SS-1 TACKING AGENT REQUIRED FOR DRILL SEED OPERATIONS, WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE SUBSIDIARY TO ITEM 164 "DRILL SEEDING." WATERING SHALL NOT BE USED WITH THE DRILL SEED METHOD. A BIODEGRADABLE TACKING AGENT MAY BE USED IN LIEU OF THE SS-1 TACKING AGENT IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS WHEN APPROVED BY THE ENGINEER.

COOL SEASON OR WARM SEASON GRASSES SHALL BE INCLUDED AS PART OF ITEM 164 (SEE TABLE 3 AND/OR TABLE 4 IN THE STANDARD SPECIFICATION BOOK OR DATES AND SEED TYPE).

SEED MIXTURE SHALL BE AS SPECIFIED UNDER ITEM 164.

ITEM 166: FERTILIZER

FERTILIZER RATE IS BASED ON A RATE OF 100 LBS. OF NITROGEN PER ACRE. THE NITROGEN-PHOSPHOROUS POTASSIUM (NPK) RATIO SHALL INCLUDE A MINIMUM OF 5% PHOSPHOROUS AND 5% POTASSIUM.

FERTILIZER SHALL BE HOMOGENIZED.

Project Number: **Sheet D**

County: Hidalgo **Control:** 0921-02-194

Highway: Liberty Blvd

ITEM 169: SOIL RETENTION BLANKETS

IN AREAS DESIGNATED FOR SOIL RETENTION BLANKETS (SRB) IN THE PLANS, FURNISH ONLY SPRAY-ON PRODUCTS LISTED ON THE APPROVED PRODUCT LIST FOR EROSION CONTROL PRODUCTS BASED UPON THE CLASS AND TYPE SPECIFIED IN THE PLANS OR FROM THE FOLLOWING LIST: AEC PREMIER STRAW DOUBLE NET FIBRENET, AMERICAN EXCELSIOR CURLEX I FIBRENET, EROSION CONTROL BLANKET S31BD, CURLEX II FIBRENET, KOIRMAT 700, AEC PREMIER COCONUT FIBRENET, AND AEC PREMIER STRAW-COCONUT FIBRENET.

ITEM 247: FLEXIBLE BASE

FLEXIBLE BASE TYPE E WILL BE COMPOSED OF CALICHE (ARGILLACEOUS LIMESTONE, CALCAREOUS OR CALCAREOUS CLAY PARTICLES) AND MAY CONTAIN STONE, CONGLOMERATE, GRAVEL, SAND OR GRANULAR MATERIALS WHEN THESE MATERIALS ARE IN SITU WITH THE CALICHE.

FLEXIBLE BASE (TY E GR 4) CALICHE SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

RETAINED ON SQ. SIEVE:	PERCENT RETAINED
2"	0
½"	20-60
NO. 4	40-75
NO. 40	70-90
MAX. PI	15
MAX. WET BALL PI	15
WET BALL MILL MAX. AMOUNT	50
MIN. COMP. STRENGTH PSI	150 AT 15 PSI LATERAL PRESSURE
TRIAXIAL TEST	TEX-117-E

THE WET BALL TEST (TEX-116-E) SHALL BE RUN AND THE PLASTICITY INDEX OF THE MATERIAL PASSING THE NO.40 SIEVE SHALL BE DETERMINED (WET BALL PI).

THE PERCENT OF DENSITY AS DETERMINED BY COMPACTION RATIO (TEX-113-E) FOR THE NEW FLEXIBLE BASE SHALL BE A MINIMUM OF 98%.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT CERTAIN EXISTING AND/OR PROPOSED STRUCTURES MAY BE WITHIN THE LIMITS OF THE

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
GENERAL NOTES

SHEET 2 OF 14

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK. DN:		6	TEXAS					21B
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK. DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK. TR:								

4/11/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GD\01 GENERAL\07 General Notes\Liberty_General Notes_Revised.dgn

FLEXIBLE BASE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM CONSTRUCTION OPERATIONS WITHOUT DAMAGE TO THESE STRUCTURES.

FOR WATER ADDED UNDER ITEM 247, THE SULFATE CONTENT WILL NOT EXCEED 3000-PPM AND THE CHLORIDE CONTENT WILL NOT EXCEED 3000-PPM.

ITEM 260: LIME TREATMENT (ROAD-MIXED)

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT CERTAIN EXISTING AND/OR PROPOSED STRUCTURES ARE WITHIN THE LIMITS OF THE LIME-TREATED SUBGRADE. UNLESS OTHERWISE DIRECTED BY THE ENGINEER, THESE STRUCTURES SHALL BE INSTALLED BEFORE THE FINAL ROLLING OF THIS SUBGRADE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM THE PROPER LIME TREATING OPERATION WITHOUT DAMAGE TO THESE STRUCTURES.

THE SLURRY METHOD OF APPLYING LIME WILL BE REQUIRED, EXCEPT WHEN THE LIME IS TO BE ADDED TO NATURALLY WET MATERIALS AS DIRECTED BY THE ENGINEER.

FOR THIS PROJECT, THE ENGINEER WILL DIRECT A RANDOM NUMBER OF LIME TRUCKS TO BE CHECK WEIGHED.

THE PERCENT OF DENSITY AS DETERMINED BY TEX-121-E FOR THE NEW AND SALVAGE FLEXIBLE BASE SHALL BE A MINIMUM OF 98% FOR ALL COURSES.

PROOF ROLL ALL CONSTRUCTED LIME TREATED SUBGRADE AND BASES COURSES IN ACCORDANCE WITH ITEM 216, "PROOF ROLLING." CORRECT SOFT SPOTS AS DIRECTED. CORRECTION OF SOFT SPOTS IN THE SUBGRADE OR BASE COURSES WILL BE AT THE CONTRACTOR'S EXPENSE.

CONTRACTOR IS TO PLACE AN UNDERSEAL AND/OR PAVEMENT COURSE AS INDICATED ON PLANS WITHIN 14 CALENDAR DAYS OF INITIAL PRIME COAT APPLICATION. OTHERWISE, REAPPLY PRIME COAT AS DIRECTED BY THE ENGINEER. REAPPLICATION OF THE PRIME COAT WILL BE AT THE CONTRACTOR'S EXPENSE.

"ALLOW THE MIXTURE TO MELLOW FOR A MINIMUM PERIOD OF 48 HOURS FOR ALL TYPES OF LIME UTILIZED. ADDITIONAL TIME MIGHT BE REQUIRED DUE TO SULFATE AND ORGANIC TESTING REQUIREMENTS, AS DIRECTED BY ENGINEER."

ITEM 275: CEMENT TREATMENT (ROAD-MIXED)

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT CERTAIN EXISTING AND/OR PROPOSED STRUCTURES ARE WITHIN THE LIMITS OF THE CEMENT-TREATED SUBGRADE. UNLESS OTHERWISE DIRECTED BY THE ENGINEER, THESE STRUCTURES SHALL BE INSTALLED BEFORE THE FINAL ROLLING OF THIS SUBGRADE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM THE PROPER CEMENT TREATING OPERATION WITHOUT DAMAGE TO THESE STRUCTURES.

THE PERCENT OF DENSITY AS DETERMINED BY TEX-120-E FOR THE NEW AND SALVAGE FLEXIBLE BASE SHALL BE A MINIMUM OF 98% FOR ALL COURSES.

PROOF ROLL ALL CONSTRUCTED CEMENT TREATED SUBGRADE AND BASES COURSES IN ACCORDANCE WITH ITEM 216, "PROOF ROLLING." CORRECT SOFT SPOTS AS DIRECTED. CORRECTION OF SOFT SPOTS IN THE SUBGRADE OR BASE COURSES WILL BE AT THE CONTRACTOR'S EXPENSE.

CONTRACTOR IS TO PLACE AN UNDERSEAL AND/OR PAVEMENT COURSE AS INDICATED ON PLANS WITHIN 14 CALENDAR DAYS OF INITIAL PRIME COAT APPLICATION. OTHERWISE, REAPPLY PRIME COAT AS DIRECTED BY THE ENGINEER. REAPPLICATION OF THE PRIME COAT WILL BE AT THE CONTRACTOR'S EXPENSE.

ITEM 300: ASPHALTS, OILS, AND EMULSIONS

TEMPORARY RAMPS/DETOURS AND DRIVEWAYS MAY USE PERFORMANCE GRADE BINDER 64-22.

ITEM 302: AGGREGATES FOR SURFACE TREATMENTS

LOC.	COUNTY	CSJ	HIGHWAY	BINDER	SAC
1	HIDALGO	0921-02-194	LIBERTY BLVD	SPG 64-22	A

THE AGGREGATE FOR THE SURFACE TREATMENT SHALL BE SURFACE DRY BEFORE APPLICATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
GENERAL NOTES

SHEET 3 OF 14

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					21C
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

4/11/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GD\01 GENERAL\07 General Notes\Liberty_General Notes_Revised.dgn

ITEM 301: ASPHALT ANTISTRIPPING AGENTS

HYDRATED LIME SHALL BE ADDED AS AN ANTISTRIPPING ADDITIVE BETWEEN THE RATES OF 1% MINIMUM AND 2.0% MAXIMUM BY WEIGHT FOR ITEMS 292, 346, 3076 AND 3077. IF THE HAMBURG WHEEL TEST CANNOT BE MET WITHIN THESE LIMITS, LIQUID ANTISTRIPPING AGENTS AS APPROVED BY THE ENGINEER MAY BE USED IN CONJUNCTION WITH LIME FOR ITEMS 346, 3076, AND 3077.

ITEM 310: PRIME COAT

THE CONTRACTOR SHALL EXERCISE DILIGENCE IN THE APPLICATION OF ASPHALT BY THE USE OF FLAGGING AND ROLLING PROCEDURES TO KEEP FROM SPRAYING OR SPLATTERING THE TRAVELING PUBLIC WITH ASPHALTIC MATERIAL.

DO NOT APPLY SUBSEQUENT COURSES OVER THE INITIAL PRIME COAT ANY EARLIER THAN THE DAY AFTER THE PRIME COAT WAS APPLIED, UNLESS OTHERWISE AUTHORIZED OR DIRECTED BY THE ENGINEER.

ITEM 316: SEAL COAT

IN ADDITION TO CLEANING BY BROOMING OF PAVED SURFACES TO BE SEALED AS REQUIRED BY THIS ITEM, BLADING MAY ALSO BE NECESSARY TO CLEAN DIRT AND GRASS FROM EDGES OF THE PAVEMENT AND/OR TURNOUT AREAS. THE COST OF THIS BLADING WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS OF THE PROJECT.

WHEN APPLYING SURFACE TREATMENT AT RAILROAD CROSSINGS, A STRIP OF PAPER SHALL BE PLACED OVER THE RAIL AND FLANGE AREAS ACROSS THE PAVEMENT.

THE TYPE AND GRADE OF ASPHALT AS SHOWN ON THE PLANS AND/OR AS DIRECTED BY THE ENGINEER, SHALL BE USED ON THESE PROJECTS. ASPHALT CEMENT WILL BE USED DURING THE WARM SEASON. AN EMULSIFIED ASPHALT WILL BE USED DURING THE COOLER SEASON IF PERMITTED IN WRITING BY THE ENGINEER. THE EMULSIFIED ASPHALT, IF USED, SHALL BE HFRS 2P. ESTIMATED QUANTITIES SHOWN FOR THE BID ITEM IS BASED ON AN AVERAGE OF THE ESTIMATED RATES OF APPLICATION FOR ASPHALTIC CEMENT AND EMULSIFIED ASPHALT. THESE RATES SHOULD BE USED FOR ESTIMATING AND COMPARISON PURPOSES ONLY.

THE ONE OR TWO-COURSE SURFACE TREATMENT SHALL BE IN PLACE FOR A SUFFICIENT PERIOD OF TIME IN THE OPINION OF THE ENGINEER, FOR THE SURFACE TREATMENT TO PROPERLY DRY AND CURE BEFORE PLACING THE ASPHALTIC CONCRETE PAVEMENT.

TRAFFIC WILL NOT BE PERMITTED ON THE SURFACE TREATMENT UNLESS AUTHORIZED BY THE ENGINEER.

WHEN EMULSIFIED ASPHALT IS USED, DO NOT APPLY SUBSEQUENT COURSES OVER THE SURFACE TREATMENT ANY EARLIER THAN THE DAY AFTER THE SURFACE TREATMENT WAS APPLIED, UNLESS OTHERWISE AUTHORIZED OR DIRECTED BY THE ENGINEER.

CONTRACTOR IS TO PLACE ACP LAYER(S) AS INDICATED ON PLANS WITHIN 14-CALENDAR DAYS OF SEAL COAT PLACEMENT UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

ITEM 3076: DENSE-GRADED HOT-MIX ASPHALT

THE CONTRACTOR SHALL EXERCISE DILIGENCE IN THE APPLICATION OF "BONDING COURSE" BY THE USE OF FLAGGING AND ROLLING PROCEDURES TO KEEP FROM SPRAYING OR SPLATTERING THE TRAVELING PUBLIC WITH ASPHALTIC MATERIAL.

BLADING (NOT TO EXCEED MORE THAN 3-FT FROM THE PAVEMENT EDGE) MAY ALSO BE NECESSARY TO CLEAN DIRT AND GRASS FROM PAVEMENT EDGES AND TURNOUT AREAS AS WORK UNDER THIS BID ITEM. THE COST OF THIS BLADING WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO THIS BID ITEM.

ALL SURPLUS RAP FROM THIS PROJECT WILL REMAIN THE PROPERTY OF THE CONTRACTOR.

LEVEL-UP WILL BE PLACED BEFORE THE SURFACE COURSE. AN ASPHALTIC CONCRETE SPREADING AND FINISHING MACHINE AND/OR MOTOR GRADERS; WHEN APPROVED BY THE ENGINEER MAY BE USED TO PLACE THE ACP LEVEL-UP.

ALL UNCONFINED LONGITUDINAL JOINTS SHALL BE CONSTRUCTED WITH A JOINT MAKER PROVIDING A MAXIMUM ½-INCH VERTICAL EDGE AND A MINIMUM 6:1 EDGE TAPER OR AS APPROVED BY THE ENGINEER. THE ENGINEER

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

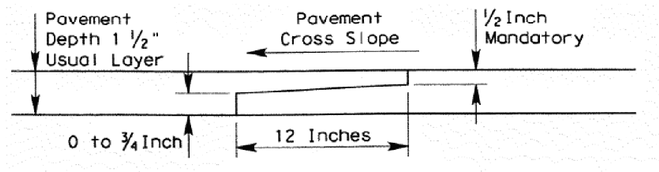
LIBERTY BLVD
GENERAL NOTES

SHEET 4 OF 14

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK. DN:		6	TEXAS					21D
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK. DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK. TR:								

4/11/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GD\01 GENERAL\07 General Notes\Liberty_General Notes_Revised.dgn

MAY WAIVE THIS REQUIREMENT WHEN NO IMPACTS TO THE TRAVELING PUBLIC ARE FORESEEN.



NOTCHED WEDGE JOINT

The engineer may allow for variances to the dimensions shown.

THE HAMBURG WHEEL TEST REQUIREMENT FOR PG 64 BINDER WILL BE 5,000 PASSES @ 0.5-INCH RUT DEPTH.

DESIGN MIXTURE USING A SUPERPAVE GYRATORY COMPACTOR.

PUBLIC AND PRIVATE DRIVEWAYS NEED TO HAVE A SMOOTH VERTICAL TRANSITION BETWEEN THE EDGE OF PAVEMENT AND THE EXISTING DRIVEWAYS. THE CONTRACTOR IS TO ADD A VERTICAL TAPER IF NEEDED WHICH WILL BE SUBSIDIARY TO ITEM 3076.

THE USE OF RAP AND RAS (RECYCLED ASPHALT SHINGLES) WILL NOT BE ALLOWED AS PART OF THE MIX DESIGN FOR THE FINAL RIDING SURFACE.

USE A RELEASE AGENT FROM THE DEPARTMENT'S MPL TO CLEAN AND TO COAT THE INSIDE OF TRUCK BEDS FOR HAULING EQUIPMENT. HAULING EQUIPMENT SHALL BE CLEANED PRIOR TO HAULING MATERIAL TO JOB SITE. SUBMIT A COPY OF THE BILL OF LADING TO THE ENGINEER AS PART OF THE QCP. ENSURE THE PAVEMENT IS FREE FROM ANY SPILLAGE OF HYDRAULIC OIL OR DIESEL FROM CONSTRUCTION EQUIPMENT. THE DEPARTMENT MAY REJECT TRUCKS THAT CONTAIN ANY FOREIGN MATERIAL AND SUSPEND PRODUCTION IF THE PAVEMENT IS CONTAMINATED BY ANY POLLUTANTS MENTIONED ABOVE.

THE PERCENTAGE OF RAS USED IN THE TOTAL MIX SHALL NOT EXCEED 3% WHEN ALLOWED.

WHEN SAC B AGGREGATE IS USED, MATERIAL PROPERTIES ARE REQUIRED TO BE 10 OR LESS ON THE MAGNESIUM SULFATE SOUNDNESS TEST AND 20 OR LESS ON THE MICRO-DEVAL TEST.

ITEM 3084 – Bonding Course

THE MINIMUM APPLICATION RATES ARE LISTED IN TABLE BC.

THE TARGET SHEAR BOND STRENGTHS ARE LISTED IN TABLE BCS. THE INFORMATIONAL TEST CORES SHALL BE TAKEN ONCE A SHIFT FOR FIRST 5 LOTS OF PLACEMENT OR A CHANGE TO PLACEMENT METHOD OF BONDING COURSE, BONDING MATERIAL, OR HOT MIX MATERIAL. THE REMAINING INFORMATIONAL TEST CORES SHALL BE TAKEN ONCE EVERY 3 LOTS FOR SURFACE MIX. INFORMATIONAL TESTS ARE NOT REQUIRED FOR NON-SURFACE MIX BEYOND THE FIRST 5 LOTS UNLESS THERE IS A CHANGE TO PLACEMENT METHOD OF BONDING COURSE, BONDING MATERIAL, OR HOT MIX MATERIAL. RESULTS FROM THESE INFORMATIONAL TESTS WILL NOT BE USED FOR SPECIFICATION COMPLIANCE.

Table BC

Material	Minimum Application Rate (gal. per square yard)
TRAIL – Emulsified Asphalt	0.06
TRAIL – Hot Asphalt	0.12
Spray Applied Underseal Membrane	0.10

Table BCS (For Informational Tests)

Material	Target Shear Bond Strength (Tex-249-F psi)
SMA – Stone-Matrix Asphalt	60.0
All Other Materials	40.0

ITEM 354: PLANING AND TEXTURING PAVEMENT

CONTRACTOR IS TO PLACE SEAL COAT OR ACP LAYER(S) AS INDICATED ON PLANS WITHIN 14-CALENDAR DAYS OF PLANING/MILLING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

ALL PLANING/MILLING OPERATION DROP OFFS GREATER THAN 1-INCH NEED TO HAVE A 3:1 SLOPE TAPER UNLESS OTHERWISE DIRECTED BY THE ENGINEER. THE COST OF THE 3:1 SLOPE TAPER IS SUBSIDIARY TO ITEM 354.

FOR FULL WIDTH PLANING/MILLING LOCATIONS, CONTRACTOR IS TO PLACE SEAL COAT OR ACP LAYER(S) AS INDICATED ON THE PLANS WITHIN 2-CALENDAR DAYS OF THE PLANING/MILLING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER. CONTRACTOR WILL NOT BE ALLOWED TO MOVE ONTO THE NEXT

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
GENERAL NOTES

SHEET 5 OF 14

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				21E
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

4/11/2022 K:\Counties\HDG\Liberty Rd (US83 to Mile 3)\GDJ\01 GENERAL\07 General Notes\Liberty_General Notes_Revised.dgn

PLANING/MILLING LOCATION OR SEAL COAT/ACP OVERLAY LOCATION UNTIL THE EXPOSED AREA IS COVERED AS PER ABOVE. CONTRACTOR CANNOT GET PAID FOR THE PLANING/MILLING OPERATION UNTIL EXPOSED AREA IS COVERED AS PER ABOVE.

ITEM 400: EXCAVATION AND BACKFILL FOR STRUCTURES

IF THE CONTRACTOR ELECTS TO CUT PAVEMENT (EXISTING/DETOUR) FOR STRUCTURAL WORK BEYOND THAT REQUIRED BY THE CONSTRUCTION PHASING SHOWN IN THE PLANS AND APPROVED BY THE ENGINEER, IT SHALL BE RESTORED AT HIS EXPENSE AND BACKFILLED TO ITS ORIGINAL CONDITION OR BETTER IN ACCORDANCE WITH ITEM 400.

UNLESS SHOWN OTHERWISE IN THE PLANS, USE A 1-FT DEPTH FOR ITEM 400 STRUCTURAL EXCAVATION (SPECIAL) FOR GRAVEL BEDDING NEEDED BELOW DRAINAGE STRUCTURES WITH UNSTABLE MATERIAL.

STRUCTURAL EXCAVATION SPECIAL (GRAVEL):

USE DURABLE NATURAL STONE WHEN TESTED IN ACCORDANCE WITH TEX-411-A, HAS WEIGHT LOSS OF NO MORE THAN 18% AFTER 5 CYCLES OF MAGNESIUM SULFATE SOLUTION. PROVIDE GRAVEL CONFORMING TO AN AGGREGATE GRADE NO. 1 AS SHOWN ON TABLE 4 OF ARTICLE 421.2.

ITEM 416: DRILLED SHAFT FOUNDATIONS

PAYMENT FOR FURNISHING AND INSTALLING ANCHOR BOLTS MOUNTED IN DRILL SHAFTS WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE VARIOUS DIAMETER DRILL SHAFTS.

THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO VERIFY UTILITY LOCATIONS BEFORE DRILLING FOUNDATIONS.

THE CONTRACTOR SHALL FORM, OR PROVIDE A SMOOTH FINISH, THE PORTIONS OF DRILLED SHAFT THAT PROJECT ABOVE THE GROUND LINE. PLACE A ¾ INCH CHAMFER ON THE TOP EDGE OF EACH POLE FOUNDATION. THIS WORK WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE CONSIDERED SUBSIDIARY TO THIS BID ITEM.

ALL DRILLED SHAFT FOUNDATIONS WILL BE BASED ON THE LENGTHS SHOWN ON THE PLANS OR THOSE ESTABLISHED IN WRITING. ADEQUATE CALCULATIONS FOR MEASUREMENTS OF FOUNDATIONS HAVE BEEN MADE IN ACCORDANCE WITH ARTICLE 9.1. OF THE STANDARD SPECIFICATIONS. INCREASES OR DECREASES IN THE QUANTITIES REQUIRED BY CHANGE IN DESIGN WILL BE MEASURED AS SPECIFIED AND THE REVISED QUANTITIES WILL BE THE BASIS FOR PAYMENT.

IN THE PRESENCE OF EXCESS GROUND WATER AND/OR UNSTABLE CONDITIONS IN SUB-GRADE SOILS PREVENTS EXCAVATION TO THE LINE AND DEPTHS INDICATED ON THE PLANS FOR "DRILLED SHAFT FOUNDATION", OTHER PROPOSED METHODS OF FOUNDATION INSTALLATION SUCH AS CASING, ETC. SHALL BE SUBMITTED FOR REVIEW AND APPROVED BY THE ENGINEER.

ITEM 420: CONCRETE SUBSTRUCTURES

PAY BENT CONCRETE AS PLAN QUANTITY.

ITEM 421: HYDRAULIC CEMENT CONCRETE

PROVIDE EQUIPMENT AT THE BATCH PLANT FOR DETERMINING THE FREE MOISTURE AND/OR ABSORPTION OF AGGREGATES IN ACCORDANCE WITH APPLICABLE TXDOT TEST.

PROVIDE THE FOLLOWING ITEMS FOR CONCRETE BATCH INSPECTION IN ACCORDANCE WITH SPECIFICATIONS OUTLINED IN DMS-10101, "COMPUTER EQUIPMENT":

(1) ONE DESKTOP MICROCOMPUTER OR ONE LAPTOP MICROCOMPUTER
(2) ONE INTEGRATED PRINTER/SCANNER/COPIER/FAX UNIT
(3) CONTRACTOR-FURNISHED SOFTWARE
(4) HARDWARE

SUBMIT TO THE ENGINEER FOR APPROVAL THE PROJECT LOCATIONS FOR ALL PORTLAND CEMENT CONCRETE WASHOUT AREAS PRIOR TO STARTING ANY CONCRETE WORK.

USE MEMBRANE CURING, TYPE 2, FOR CONCRETE CURB, GUTTER AND COMBINED CURB AND GUTTER, CONCRETE MEDIANS, DIRECTIONAL ISLANDS AND SIDEWALKS.

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
GENERAL NOTES

SHEET 6 OF 14

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				21F
DW:		STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

4/11/2022 K:\Counties\HD\Liberty Rd (US83 to Mile 3)\GDJ\01 GENERAL\07 GeneralNotes\Liberty_GeneralNotes_Revised.dgn

ITEM 427: SURFACE FINISHES FOR CONCRETE

PROVIDE SURFACE FINISHES FOR CONCRETE AS FOLLOWS:

(1) BRIDGE OVERPASS AND UNDERPASS STRUCTURES – SURFACE AREA I, OPAQUE SEALER COATING (COLOR TO BE DETERMINED BY THE ENGINEER).

(2) BRIDGE WATERWAY CROSSINGS AND BRIDGE CLASS BOX CULVERT STRUCTURES – SURFACE AREA II, OPAQUE SEALER COATING (COLOR TO BE DETERMINED BY THE ENGINEER).

CONCRETE TRAFFIC BARRIER/RAILING (ROADWAY AND BRIDGE), AND RETAINING WALL COPING - OPAQUE SEALER COATING (COLOR TO BE DETERMINED BY THE ENGINEER) TO ALL EXPOSED SURFACES.

ITEM 432: RIPRAP

PROVIDE CLASS "A" CONCRETE MINIMUM FOR RIPRAP APRONS PLACED AROUND ALL BOX CULVERT AND PIPE SAFETY END TREATMENTS. PROVIDE ¼-INCH THICK DUMMY JOINTS AT LEAST EVERY 15-FT FOR RIPRAP APRONS PLACED AROUND BOX AND PIPE CULVERTS.

DO NOT USE FIBER REINFORCED CONCRETE RIPRAP ON SIDE SLOPES EQUAL TO OR STEEPER THAN 6:1 UNLESS APPROVED BY THE ENGINEER.

ITEM 464: REINFORCED CONCRETE PIPE

USE TONGUE AND GROOVE PIPE WHERE THE RCP EXTENDS INTO THE LIME TREATED SUBGRADE. THE 4-FOOT DEPTH RESTRICTION FOR HEAVY EQUIPMENT PASSAGE OVER PIPE STRUCTURES IS VOIDED. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY CONSTRUCTION DAMAGE TO THESE FACILITIES.

DO NOT USE MORTAR JOINTS.

ALL REINFORCED CONCRETE PIPE SHALL INCLUDE RUBBER GASKETS UNLESS SHOWN OTHERWISE ON THE PLANS OR DIRECTED BY THE ENGINEER.

ITEM 465: JUNCTION BOXES, MANHOLES, AND INLETS

FOR TY PSL WITH RG, FG, OR SFG LID INLETS, PROVIDE CLASS B CONCRETE RIPRAP WITH (6"X6" W3XW3
(NO. 6 GAUGE) WELDED WIRE FABRIC) FOR ANY SIDE THAT IS TOUCHING THE NATURAL GROUND. THE RIPRAP WILL BE 4-IN THICK AND 3-FT WIDE WITH AN 8-IN DEEP BY 6-IN WIDE TOE UNLESS OTHERWISE SHOWN IN THE PLANS. THE COST WILL BE SUBSIDIARY TO ITEM 465, UNLESS OTHERWISE SHOWN IN THE PLANS.

FOR ALL INLET EXTENSIONS, PROVIDE A TEMPORARY CIRCULAR CURB/INLET EXTENSION OPENING FOR DRAINAGE DURING CONSTRUCTION. THE CIRCULAR OPENING WILL BE A 4-IN DIAMETER BY 2-IN DEEP SLOT THAT MATCHES THE STATEWIDE PCO STANDARD. FILL CURB CIRCULAR CURB/INLET EXTENSION OPENING WITH EPOXY AND MORTAR AS PER ITEM 429 CONCRETE STRUCTURE REPAIR SPECIFICATIONS. EPOXY AND MORTAR IS SUBSIDIARY TO ITEM 465.

ITEM 467: SAFETY END TREATMENT

ALL TYPE II SET'S SHALL HAVE RIPRAP, CLASS "A" MINIMUM, APRONS AS SHOWN ON THE PLANS. THE CONTRACTOR MAY SUBMIT AN ALTERNATE PRECAST SET DESIGN FOR APPROVAL BY THE ENGINEER.

ITEM 471: FRAMES, GRATES, RINGS, AND COVERS

ALL GRATES WILL BE TACK WELDED TO THE FRAMES IN A MANNER SATISFACTORY TO THE ENGINEER.

ITEM 502: BARRICADES, SIGNS, AND TRAFFIC HANDLING

SHADOW VEHICLES EQUIPPED WITH TRUCK-MOUNTED ATTENUATORS ARE REQUIRED FOR TRAFFIC HANDLING. SEE NOTES FOR ITEM 6185: TRUCK MOUNTED ATTENUATOR/TRAILER ATTENUATOR, FOR ADDITIONAL REFERENCES PERTAINING TO THE TMAS.

REPLACE/RELOCATE ALL REGULATORY SIGNS REMOVED DUE TO CONSTRUCTION OPERATIONS WITH THE SAME SIGN ON FIXED SUPPORT(S) IMMEDIATELY UPON ITS REMOVAL. FIRST OBTAIN PROJECT ENGINEER APPROVAL BEFORE REMOVING ANY REGULATORY ROADWAY SIGN. REQUIRED

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
GENERAL NOTES

SHEET 7 OF 14

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK. DN:		6	TEXAS					21G
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK. DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK. TR:								

4/11/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GD\01 GENERAL\07 General Notes\Liberty_General Notes_Revised.dgn

FLAGGERS ARE TO BE AVAILABLE TO DIRECT TRAFFIC DURING SIGN INTERMEDIATE DOWN TIME.

RELOCATE ANY DIRECTIONAL SIGN ASSEMBLIES REMOVED DURING CONSTRUCTION OPERATIONS IMMEDIATELY UPON THEIR REMOVAL.

THESE SIGNS SHALL BE RELOCATED TO A LOCATION IN ACCORDANCE WITH THE LATEST VERSION OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES". IN NO CASE WILL A SIGN BE REMOVED WITHOUT A REPLACEMENT SIGN AND SUPPORT(S) BEING READILY AVAILABLE AND A LOCATION ESTABLISHED. REMOVAL AND RELOCATION OF THESE SIGNS REQUIRED FOR TRAFFIC CONTROL WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO ITEM 502.

FROM THE BEGINNING TO THE END OF THE PROJECT, ALL TRAFFIC CONTROL DEVICES NEED TO BE IN ACCEPTABLE CONDITION AS PER THE TEXAS QUALITY GUIDELINES FOR WORK ZONE TRAFFIC CONTROL DEVICES.

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 "SAFETY CONTINGENCY" IS NOT INTENDED TO BE USED IN LIEU OF BID ITEMS ESTABLISHED BY THE CONTRACT.

ITEM 504: FIELD OFFICE AND LABORATORY

FOR THIS PROJECT A FIELD OFFICE WILL NOT BE REQUIRED AT THE PROJECT SITE.

ITEM 506: TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS

BEFORE STARTING EACH PHASE OF CONSTRUCTION, REVIEW WITH THE ENGINEER THE SW3P USED FOR TEMPORARY EROSION CONTROL AS OUTLINED ON THE PLANS. BEFORE CONSTRUCTION, PLACE THE TEMPORARY EROSION AND SEDIMENTATION CONTROL FEATURES AS SHOWN ON THE SW3P. LOCATION OF

CONSTRUCTION EXITS ARE TO BE APPROVED BY THE ENGINEER. AFTER COMPLETING EARTHWORK OPERATIONS, RESTORE AND RESEED THE DISTURBED AREAS IN ACCORDANCE WITH THE DEPARTMENT'S SPECIFICATIONS FOR PERMANENT OR TEMPORARY EROSION CONTROL. BEFORE STARTING GRADING OPERATIONS AND DURING THE PROJECT DURATION, PLACE THE TEMPORARY OR PERMANENT EROSION CONTROL MEASURES TO PREVENT SEDIMENT FROM LEAVING THE RIGHT OF WAY.

THE CONTRACTOR FORCE ACCOUNT "EROSION CONTROL MAINTENANCE" THAT HAS BEEN ESTABLISHED FOR THIS PROJECT IS INTENDED TO BE UTILIZED FOR WORK ZONE BEST MANAGEMENT PRACTICE (BMP) MAINTENANCE, TO IMPROVE THE EFFECTIVENESS OF THE ENVIRONMENTAL CONTROLS THAT MAY NEED MAINTENANCE ATTENTION AND/OR REQUIRE REPLACEMENT WHILE THE PROJECT IS STILL UNDER THE CONSTRUCTION STAGE. THESE PROCEDURES WILL BE MUTUALLY AGREED UPON BY THE ENGINEER AND THE CONTRACTOR'S RESPONSIBLE PERSON BASED ON WEEKLY OR MORE FREQUENT BMP MANAGEMENT REVIEWS ON THE PROJECT. THE "EROSION CONTROL MAINTENANCE" IS NOT INTENDED TO BE USED IN LIEU OF BID ITEMS ESTABLISHED BY THE CONTRACT.

ITEM 508: CONSTRUCTING DETOURS

FLEXIBLE BASE, PRIME COAT, AND ASPHALTIC CONCRETE PAVEMENT USED FOR DETOURS SHALL MEET THE REQUIREMENTS OF ITEMS 247, 310 AND 3076 RESPECTIVELY, EXCEPT FOR MEASUREMENT AND PAYMENT.

ITEM 529: CONCRETE CURB, GUTTER, AND COMBINED CURB AND GUTTER

BEFORE FINAL ACCEPTANCE OF THE PROJECT, REMOVE DISCOLORATION CAUSED BY TIRE MARKS, MUD, ASPHALT, PAINT OR OTHER SIMILAR MATERIAL BY ANY METHOD SATISFACTORY TO THE ENGINEER TO ACHIEVE A UNIFORM COLOR AND TEXTURE OF THE FINISHED SURFACE EXPOSED TO VIEW.

CURB ATTACHED TO THE MBGF THRIE-BEAM TRANSITION SECTION WILL BE SUBSIDIARY TO THE MBGF TRANSITION.

ITEM 530: INTERSECTIONS, DRIVEWAYS, AND TURNOUTS

PRIME COAT SHALL MEET THE REQUIREMENTS OF ITEM 310.

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
GENERAL NOTES

SHEET 8 OF 14

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK. DN:		6	TEXAS					21H
DW:		STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK. DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK. TR:								

4/11/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GD\01 GENERAL\07 General Notes\Liberty_General Notes_Revised.dgn

DAILY TESTING REQUIREMENTS FOR HOT MIX ASPHALTIC CONCRETE PAVEMENTS FOR DRIVES, COMMERCIAL ENTRANCES AND/OR TURNOUTS MAY BE WAIVED BY THE ENGINEER.

PUBLIC AND PRIVATE DRIVEWAYS NEED TO HAVE A SMOOTH VERTICAL TRANSITION TIE-IN BETWEEN THE PROPOSED DRIVEWAY AND THE EXISTING DRIVEWAY. THE CONTRACTOR IS TO ADD A VERTICAL TAPER IF NEEDED WHICH WILL BE SUBSIDIARY TO ITEM 530.

ITEM 531: SIDEWALKS

CONSTRUCT ¼-INCH THICK SCORE JOINTS AT A MAXIMUM 6-FOOT SPACING AND EXPANSION JOINTS AT A MAXIMUM 18 FOOT SPACING. CONSTRUCT A JOINT IN THE CENTER OF THE SIDEWALK IF IT IS OVER 15-FEET WIDE. FOR STEEL REINFORCEMENT, USE 6X6-INCH SPACING WITH #3 BARS OR 6X6 – D6 WELDED WIRE FABRIC.

ITEM 531: SIDEWALKS

CONSTRUCT ¼-INCH THICK SCORE JOINTS AT A MAXIMUM 6-FOOT SPACING AND EXPANSION JOINTS AT A MAXIMUM 18 FOOT SPACING. CONSTRUCT A JOINT IN THE CENTER OF THE SIDEWALK IF IT IS OVER 15-FEET WIDE. FOR STEEL REINFORCEMENT, USE 6X6-INCH SPACING WITH #3 BARS OR 6X6 – D6 WELDED WIRE FABRIC.

ITEM 540: METAL BEAM GUARD FENCE

THE OPTIONAL TERMINAL ANCHOR POST WITH THE TERMINAL CONNECTOR WILL BE REQUIRED AS SHOWN ON THE METAL BEAM GUARD FENCE STANDARD.

GALVANIZE THE RAIL ELEMENTS SUPPLIED FOR THIS PROJECT USING A TYPE II ZINC COATING.

ITEM 544: GUARDRAIL END TREATMENTS

LABEL "END TREATMENT TYPE" ON BACKSIDE OF UNIT AT TIME OF INSTALLATION.

ITEM 560: MAILBOX ASSEMBLIES

COORDINATE AND VERIFY FINAL MAILBOX LOCATIONS WITH TXDOT AND THE US POSTMASTER.

ITEM 585: RIDE QUALITY FOR PAVEMENT SURFACES

USE SURFACE TEST TYPE "B" FOR SERVICE ROADS AND RAMPS.

QUALITY CONTROL RESULTS SHALL BE SUBMITTED TO TXDOT THE NEXT WORKING DAY AFTER EACH DAY'S PAVING.

PAVEMENT AREAS WITH PUBLIC TURNOUT INTERSECTIONS THAT CARRY MAJOR TRAFFIC VOLUMES WILL NOT BE SUBJECTED TO INERTIAL PROFILER TESTING. THESE AREAS SHALL BE EVALUATED USING THE 10-FT. STRAIGHTEDGE.

DIAMOND GRINDING SHALL BE USED TO REMOVE LOCALIZED ROUGHNESS.

USE SURFACE TEST TYPE B PAY ADJUSTMENT SCHEDULE 1 TO EVALUATE RIDE QUALITY OF THE TRAVEL LANES IN ACCORDANCE WITH ITEM 585, "RIDE QUALITY FOR PAVEMENT SURFACES." THIS INCLUDES RAMPS AND SERVICE ROAD TRAVEL LANES.

ITEM 610: ROADWAY ILLUMINATION ASSEMBLIES

LUMINAIRES SHOWN ON THE PROPOSED TRAFFIC SIGNAL INSTALLATION LAYOUT SHEETS MAY BE SHOWN AT AN ANGLE FOR CLARITY. ALL LUMINAIRES SHOWN SHALL BE INSTALLED PERPENDICULAR TO THE MAIN ROADWAY UNDER CONSTRUCTION.

IN ADDITION TO ED (3)-14, EACH CABLE FOR LUMINAIRES SHALL BE IDENTIFIED IN EACH GROUND BOX, POLE BASE, OR OTHER ACCESSIBLE LOCATION WITH YELLOW ELECTRICAL TAPE WRAPPED AROUND THE CABLE. THE TAPE MARKING SHALL BE AT LEAST 2 INCHES.

ALL LUMINAIRES ON TRAFFIC SIGNAL POLES SHALL BE RATED FOR 240 VAC. ALL SAFETY LIGHTING POLES SHALL BE SERVICED FOR 480 VAC.

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
GENERAL NOTES

SHEET 9 OF 14

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK. DN:		6	TEXAS					211
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK. DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK. TR:								

4/11/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GD\01 GENERAL\07 General Notes\Liberty_General Notes_Revised.dgn

LUMINAIRES INSTALLED ON TRAFFIC SIGNAL POLES WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS OF THE PROJECT.

ITEM 618: CONDUIT

ALL CONDUIT ENDS IN POLE BASES, CONTROLLERS AND GROUND BOXES SHALL BE PLUGGED WITH 4 TO 6 INCHES OF POLYURETHANE SEALANT OR ITS EQUIVALENT AFTER CABLES ARE IN PLACE.

CONDUIT SHALL BE PLACED IN A STRAIGHT LINE NOT TO EXCEED 2.0 FEET IN ANY DIRECTION. THE DEPTH OF THE CONDUIT SHALL BE 2.0 FEET EXCEPT WHEN CROSSING A ROADWAY WHERE THE DEPTH SHALL NOT BE MORE THAN 3.0 FEET NOR LESS THAN 1.0 FOOT BELOW THE BOTTOM OF THE BASE MATERIAL IN THE ROADWAY WHEN PLACED BY THE JACKING OR BORING METHOD. ANY EVIDENCE OF DAMAGE TO THE ROADWAY DURING THE JACKING OR BORING OPERATION SHALL BE SUFFICIENT GROUNDS TO STOP THE METHOD BEING USED.

CONDUIT RUNS UNDER PAVED ROADWAYS OR DRIVEWAYS SHALL BE JACKED OR BORED AND THEN PUSHED ACROSS. AT THESE LOCATIONS, GALVANIZED RIGID METAL MAY BE USED. ALL OTHER RUNS SHALL BE MADE BY TRENCHING. EXISTING PAVEMENT WHICH WILL BE REMOVED, RECONSTRUCTED OR OVERLAID WITH NEW PAVEMENT MAY BE TRENCHED ACROSS. TRENCHES FOR CONDUIT RUNS SHALL BE A MINIMUM 2 FEET DEEP AND 4 INCHES WIDE. THE CONDUIT SHALL BE PLACED ON A 2-INCH SAND CUSHION AND THEN BACKFILLED WITH A MINIMUM OF 6 INCHES SAND FILL. THE REMAINDER OF THE TRENCH SHALL BE BACKFILLED WITH FLEXIBLE BASE, SOIL OR TWO-SACK CONCRETE AS REQUIRED BY LOCATION OF CONDUIT ON THE PROJECT OR AS DIRECTED. THE TOP 3 INCHES SHALL MATCH THE EXISTING SURFACE MATERIAL.

ALL CONDUIT ELBOWS AND RIGID EXTENSIONS REQUIRED TO BE INSTALLED ON PVC CONDUIT SYSTEMS WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS.

USE MATERIALS FROM PREQUALIFIED MATERIAL PRODUCER LIST AS SHOWN ON THE TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) - CONSTRUCTION DIVISION'S (CST) MATERIAL PRODUCER LIST. CATEGORY IS "ROADWAY ILLUMINATION AND ELECTRICAL SUPPLIES."

ITEM 620: ELECTRICAL CONDUCTORS

FOR FLASHING BEACONS (ITEM 685) AND PED POLES (ITEM 687) WITHIN THE PROJECT, PROVIDE SINGLE-POLE BREAKAWAY DISCONNECTS.

USE BUSSMAN HEBW, LITTELFUSE LEB, FERRAZ-SHAWMUT FEB, OR EQUAL ON UNGROUNDED CONDUCTORS.

FOR ALL GROUNDED CONDUCTORS USE BUSSMAN HET, LITTELFUSE LET, FERRAZ-SHAWMUT FEBN, OR EQUAL ON UNGROUNDED CONDUCTORS. FOR ALL GROUNDED CONDUCTORS USE BUSSMAN HET, LITTELFUSE LET, FERRAZ SHAWMUT FEBN, OR EQUAL. THESE BREAKAWAY CONNECTORS HAVE A WHITE COLORED MARKING AND A PERMANENTLY INSTALLED SOLID NEUTRAL.

ITEM 621: TRAY CABLE

CONNECT LUMINAIRES ON TRAFFIC SIGNAL POLES USING A 4-CONDUCTOR TRAY CABLE WITH CONDUCTOR COLORS OF RED, BLACK AND GREEN #12 AWG (XHHW). THE WHITE (NEUTRAL) CONDUCTOR WILL NOT BE NEEDED AND WILL BE CAPPED.

ITEM 628: ELECTRICAL SERVICES

ARRANGE FOR AND COOPERATE WITH THE UTILITY COMPANY TO PROVIDE ELECTRICAL POWER FOR THE SERVICE(S) SHOWN AND AS REQUIRED BY THE PLANS. A METER WILL BE REQUIRED ON ALL ELECTRICAL SERVICES.

ITEMS 636: SIGNS

COMPLETE SIGN BLANKS AND PANELS SHALL BE HANDLED AND STORED AT THE JOB SITE IN SUCH A MANNER THAT CORNERS, EDGES AND FACES ARE NOT DAMAGED. FINISHED SIGN BLANKS SHALL BE STORED IN EITHER A WEATHERPROOF WARE-HOUSE OR OUTSIDE AND OFF THE GROUND IN A VERTICAL POSITION. ALL PAPER, CARDBOARD AND CHEMICALLY TREATED SEPARATORS AND PACKAGING SHALL BE REMOVED PRIOR TO OUTSIDE STORAGE.

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
GENERAL NOTES

SHEET 10 OF 14

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					21J
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

4/11/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\01 GENERAL\07 General Notes\Liberty_General Notes_Revised.dgn

Project Number: **Sheet U**

County: Hidalgo **Control:** 0921-02-194

Highway: Liberty Blvd

ITEM 644: SMALL ROADSIDE SIGN ASSEMBLIES

ALL SIGNS SHALL BE INSTALLED AS SHOWN IN THE PLANS AND IN ACCORDANCE WITH THE CURRENT EDITION OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND THE "SIGN CREW FIELD BOOK" (SCFB).

ALL SIGNS SHALL BE ERECTED ACCORDING TO THE LOCATIONS SHOWN ON THE SIGNING LAYOUT SHEETS EXCEPT THAT A SIGN MAY BE SHIFTED IN ORDER TO SECURE A MORE DESIRABLE LOCATION. ALL SIGN LOCATIONS WILL BE STAKED AS SHOWN IN THE PLANS AND AS APPROVED. IT IS THE INTENT OF THE PLANS TO ERECT ALL ROADSIDE TRAFFIC SIGNS WITH THE SIGN EDGE A MINIMUM OF 6 FEET FROM THE EDGE OF THE SHOULDER, OR IF NONE, 12 FEET FROM THE EDGE OF THE TRAVEL LANE. IN CURB AND GUTTER SECTIONS, THE SIGN EDGE SHALL BE A MINIMUM OF 2 FEET FROM THE FACE OF THE CURB.

FOR THIS PROJECT, ALUMINUM TYPE SIGN BLANKS AS PROVIDED FOR UNDER ITEM 636 WILL BE REQUIRED FOR ALL PROPOSED SIGNING INSTALLED UNDER ITEM 644. ALUMINUM SIGN BLANKS LESS THAN 7.5 SQUARE FEET SHALL BE 0.08-INCH-THICK, SIGN BLANKS 7.5 TO 15 SQUARE FEET SHALL BE 0.100-INCH-THICK AND SIGN BLANKS GREATER THAN 15 SQUARE FEET SHALL BE 0.125 INCH THICK.

ALL EXCESS EXCAVATION SHALL BE SPREAD UNIFORMLY INSIDE THE RIGHT OF WAY AS DIRECTED AND SHALL BE INCLUDED IN THE PRICE OF THESE ITEMS.

SIGN TYPES WHICH DESIGN DETAILS ARE NOT SHOWN ON THE PLANS SHALL CONFORM WITH THE LATEST EDITION OF THE DEPARTMENT'S "STANDARD HIGHWAY SIGN DESIGN FOR TEXAS" MANUAL.

SIGNS SHOWN TO BE REMOVED SHALL INCLUDE THE COMPLETE SIGN INSTALLATION AND SEPARATE THE SIGN POST AT THE CONCRETE FOUNDATION. THE CONCRETE FOUNDATION SHALL BE DISPOSED IN ACCORDANCE WITH THIS BID ITEM. EXCEPT FOR CONCRETE FOUNDATIONS, ALL REMOVED SIGN PANELS, SIGN POSTS, AND HARDWARE SHALL REMAIN THEN PROPERTY OF THE DEPARTMENT. ALL REMOVED SIGN INSTALLATIONS SHALL BE COMPLETELY DISASSEMBLED. ALL SALVAGEABLE SECTIONS OF SIGN PANELS SHALL BE RECYCLED BY TXDOT. THE REMOVED SIGN MATERIAL WILL BE REQUIRED TO BE HAULED TO THE MAINTENANCE YARD CLOSEST TO THE PROJECT. NO SIGNS SHALL BE REMOVED WITHOUT PRIOR APPROVAL.

Project Number: **Sheet V**

County: Hidalgo **Control:** 0921-02-194

Highway: Liberty Blvd

ITEM 656: FOUNDATIONS FOR TRAFFIC CONTROL DEVICES

THE DIMENSIONS SHOWN ON THE PLANS FOR LOCATION OF SIGNAL POLE FOUNDATIONS, CONDUIT AND OTHER ITEMS MAY BE VARIED TO MEET EXISTING CONDITIONS AS APPROVED.

THE WORK AREA SHALL BE CLEANED UP AND ALL LOOSE MATERIAL RESULTING FROM THE CONTRACT OPERATIONS SHALL BE REMOVED FROM THE WORK AREA EACH DAY BEFORE WORK IS SUSPENDED.

NO TRAFFIC SIGNAL POLE SHALL BE PLACED ON THE FOUNDATIONS PRIOR TO SEVEN (7) DAYS FOLLOWING PLACEMENT OF CONCRETE.

ITEM 658: DELINEATOR AND OBJECT MARKER ASSEMBLIES

DELINEATOR ASSEMBLIES SHALL BE INSTALLED 8 FEET FROM THE EDGE OF THE SHOULDER UNLESS RESTRICTED BY SOME OBSTRUCTION, IN WHICH CASE, THE DELINEATOR ASSEMBLY SHALL BE PLACED BETWEEN 2 AND 8 FEET FROM THE EDGE OF THE SHOULDER.

BI-DIRECTIONAL OBJECT MARKERS SHALL BE IN ACCORDANCE WITH THE D&OM STANDARD SHEETS. THE CONTRACTOR IS DIRECTED TO THE STANDARDS WHEN INSTRUCTED WHERE AND HOW TO INSTALL THE OBJECT MARKERS.

ITEMS 662 AND 666: WORK ZONE PAVEMENT MARKINGS AND RETROREFLECTORIZED PAVEMENT MARKINGS

ALL PERMANENT PAVEMENT MARKINGS AND WORK ZONE PAVEMENT MARKINGS FOR THIS PROJECT UNDER THESE ITEMS SHALL BE 0.100 INCHES (100 MIL) THICK THERMOPLASTIC.

ANY PERMANENT PAVEMENT MARKINGS OR NON-REMOVAL WORK ZONE PAVEMENT MARKINGS LACKING REFLECTIVITY IN ACCORDANCE WITH THE REQUIREMENTS OF TEX 828-B, OR THAT FAIL TO MEET MINIMUM RETRO REFLECTIVITY REQUIREMENTS FOR LONGITUDINAL PAVEMENT MARKINGS WHEN REQUIRED, WILL BE ADDRESSED PER THE REQUIREMENTS OF THE SPECIFICATION. THE ROADWAY WILL BE RE-STRIPED AT NO ADDITIONAL COMPENSATION.

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
GENERAL NOTES

SHEET 11 OF 14

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				21K
DW:		STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

4/11/2022 K:\Counties\HD\Liberty Rd (US83 to Mile 3)\GD\01 GENERAL\07 General Notes\Liberty_General Notes_Revised.dgn

PAVEMENT SURFACE PREPARATION FOR MARKINGS AND MARKERS WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO ITEM 666.

PRIOR TO ANY STRIPING OPERATIONS, AN ON-SITE COORDINATION MEETING BETWEEN ALL THE PARTIES INVOLVED WILL BE REQUIRED TO REVIEW STRIPING DETAILS AND REQUIREMENTS TO ENSURE QUALITY WORK.

THE BEADS USED ON THIS PROJECT SHALL MEET THE REQUIREMENTS OF DEPARTMENTAL MATERIALS SPECIFICATION DMS-8290, GLASS TRAFFIC BEADS TEXAS TYPE II & III. USE A 50% TYPE II/ 50% TYPE III MIX UTILIZING A DOUBLE DROP SYSTEM WITH TYPE III BEADS DROPPED FIRST.

ITEM 677: ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS

ASPHALT AND AGGREGATE TYPES AND GRADES SHALL BE AS APPROVED IN WRITING WHEN A SURFACE TREATMENT IS USED TO ELIMINATE EXISTING PAVEMENT MARKINGS.

ITEM 680: HIGHWAY TRAFFIC SIGNALS

THE INSTALLATION OF HIGHWAY TRAFFIC SIGNALS SHALL CONSIST OF THE FOLLOWING PRINCIPAL ITEMS:

1. FURNISHING AND INSTALLING 16-PHASE FULL TRAFFIC ACTUATED CONTROLLERS, BASE MOUNTED CABINETS, CONFLICT MONITORS, LOAD SWITCHES AND LOOP AMPLIFIERS.
2. FURNISHING AND INSTALLING EITHER STEEL MAST ARM POLES, OR STEEL STRAIN POLES AND SPAN WIRE AND PEDESTAL POLES (AS SHOWN ON PLANS), ELECTRICAL SERVICE, LUMINAIRES, SIGNAL HEADS, SIGNAL CABLES, PEDESTRIAN HEADS AND PEDESTRIAN PUSH BUTTONS WITH SIGNS THAT MEET THE "AMERICANS WITH DISABILITIES ACT" STANDARDS, LOOP DETECTORS, GROUND BOXES, CONDUIT RUNS AND CONTROLLER CONCRETE FOUNDATIONS.
3. REMOVAL AND DISPOSAL OF EXISTING SIGNAL MATERIAL SPECIFIED IN THE PLANS.
4. ALL OTHER ITEMS NOT LISTED ABOVE WHICH ARE NEEDED TO PROVIDE FOR COMPLETE TRAFFIC SIGNAL INSTALLATIONS AND FOR PROPER SIGNAL OPERATION AS CALLED FOR IN THE PLANS AND SPECIFICATIONS SHALL BE FURNISHED AND INSTALLED.

ANY DEVIATION OF LOCATION FOR PROPOSED SIGNAL WORK SHALL BE AS APPROVED.

SIGNAL CONTROLLER

THE SIGNAL INSTALLATIONS SHALL BE WIRED IN ACCORDANCE WITH THE PHASE DIAGRAMS IN THE PLANS. THE PROPOSED BASE MOUNTED CABINET SHALL CONTAIN 16-PHASE CONFLICT MONITOR WHICH DISPLAY THE "R-Y-G" AND "WALK" PHASES. IN ADDITION TO DETECTING PHASING CONFLICTS, THE CONFLICT MONITOR SHALL ALSO BE ABLE TO DETECT MULTIPLE SIGNAL HEAD INDICATIONS WITHIN EVERY PHASE. THE CONFLICT MONITOR SHALL CONTINUE TO OPERATE IN THE EVENT OF A POWER SUPPLY FAILURE IN THE TIMER AND SHALL BE ABLE TO RETAIN IN MEMORY THE TIME AND DATE OF THE FAILURE DETECTION. TIME CHANGES SHALL BE PROGRAMMABLE IN THE FIELD WITHOUT REPLACING COMPONENTS OR USE OF EXTERNAL DEVICES. THE FULL-ACTUATED CONTROLLER SHALL MEET N.E.M.A. SPECIFICATIONS.

A CONTROLLER MANUFACTURER'S TECHNICIAN SHALL BE REQUIRED TO LOAD INITIAL TIMING PROGRAMS INTO THE CONTROLLERS AS CALLED FOR IN THE PLANS. ONCE THE TRAFFIC SIGNALS ARE TURNED ON, THE SAME TECHNICIAN SHALL MONITOR THE SIGNAL OPERATION AND TRAFFIC MOVEMENT AND SHALL ADJUST SETTINGS FOR BEST SIGNAL OPERATION. THE TECHNICIAN SHALL PROVIDE THE STATE WITH A CERTIFICATION THAT THE TIMING PLAN AND COORDINATION HAS BEEN ESTABLISHED ACCORDING TO THE PLANS. THIS CERTIFICATION SHALL INCLUDE A RECORD SHOWING ALL SETTINGS AND FUNCTIONS PROGRAMMED INTO THE TIMER AND ANY RELATED UNITS.

THE CONTROLLER MUST BE DELIVERED WITH TWO SETS OF WIRING DIAGRAMS AND OPERATING MANUALS ENCLOSED IN A WEATHERPROOF BAG.

ALL WIRING NOT COVERED BY THE PLANS AND SPECIFICATIONS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE.

EXISTING UTILITIES

THE EXACT LOCATION OF EXISTING UNDERGROUND UTILITIES SHALL BE VERIFIED WITH THE UTILITY COMPANIES PRIOR TO CONSTRUCTION TO AVOID CONFLICT WITH OR DAMAGE TO THESE UTILITIES.

COORDINATION WITH THE UTILITY COMPANIES WILL BE REQUIRED TO MAKE ANY ADJUSTMENTS, DUE TO UTILITY CONFLICTS, AS DEFINED IN THE SPECIFICATIONS OR DEEMED NECESSARY.

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
GENERAL NOTES

SHEET 12 OF 14

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				21L
DW:		STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

4/11/2022 K:\Counties\HD\Liberty Rd (US83 to Mile 3)\GDJ\01 GENERAL\07 GeneralNotes\Liberty_GeneralNotes_Revised.dgn

UNIFORMITY IN EQUIPMENT

1. ALL TRAFFIC SIGNAL HEADS FURNISHED SHALL BE BY THE SAME MANUFACTURER.
2. ALL SIGNAL FITTINGS AND PIPE BRACKETS SHALL BE OF AN APPROVED METALLIC MATERIAL AND OF THE SAME DESIGN AND MANUFACTURER.
3. ALL TRAFFIC SIGNAL POLES FURNISHED SHALL BE BY THE SAME MANUFACTURER.
4. ALL LOOP DETECTOR AMPLIFIERS FURNISHED SHALL BE BY THE SAME MANUFACTURER.

HANDLING OF TRAFFIC

ROADS AND STREETS SHALL BE KEPT OPEN TO TRAFFIC AT ALL TIMES. THE SETTING OF LOOP DETECTORS SHALL BE ARRANGED SO AS TO CLOSE ONLY ONE LANE OF A ROADWAY AT A TIME. THE INSTALLATION OF SIGNAL HEADS, POLES AND CONDUIT SHALL ALSO BE ARRANGED SO AS TO PERMIT THE CONTINUOUS MOVEMENT OF TRAFFIC IN BOTH DIRECTIONS AT ALL TIMES.

ALL CONSTRUCTION OPERATIONS SHALL BE CONDUCTED TO PROVIDE THE LEAST POSSIBLE INTERFERENCE TO TRAFFIC AS SHOWN ON THE PLANS, AS PROVIDED FOR IN THE SPECIFICATIONS AND/OR AS DIRECTED. ALL SIGNING, BARRICADING AND HANDLING OF TRAFFIC SHALL CONFORM TO THE CURRENT EDITION OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

SEQUENCE OF WORK

1. THE EXISTING TRAFFIC SIGNAL INSTALLATIONS SHALL REMAIN IN OPERATION AT ALL TIMES DURING CONSTRUCTION OF THE PROPOSED TRAFFIC SIGNAL INSTALLATIONS OR MODIFICATIONS.
2. THE COMPLETE REMOVAL OF THE SPECIFIED EXISTING TRAFFIC SIGNALS OR SPECIFIED ITEMS WILL BE REQUIRED WHEN THE PROPOSED TRAFFIC SIGNAL INSTALLATIONS ARE IN PLACE AND OPERATIONAL.
3. ALL LABOR, TOOLS, AND MATERIALS USED TO REMOVE THE SPECIFIED EXISTING TRAFFIC SIGNAL MATERIAL SHALL NOT BE PAID FOR DIRECTLY, BUT BE CONSIDERED SUBSIDIARY TO THE VARIOUS ITEMS OF WORK.
4. FINAL INSPECTION SHALL BE CONDUCTED IN CONJUNCTION WITH THE DISTRICT SIGNAL SHOP.

ITEM 682: VEHICLE AND PEDESTRIAN SIGNAL HEADS

ALL SIGNAL HEADS SHALL BE COVERED WITH BURLAP FROM THE TIME OF INSTALLATION UNTIL THE SIGNAL IS PLACED IN OPERATION. ALL SIGNAL HEADS SHALL BE OF POLYCARBONATE MATERIAL AND YELLOW IN COLOR. SIGNAL HEADS SHALL HAVE STANDARD DETACHABLE VISORS. LED'S SHALL BE FURNISHED FOR ALL TRAFFIC SIGNAL HEADS.

SIGNAL HEADS SHALL BE POSITIONED CAREFULLY TO PROVIDE THE BEST VIEW OF SIGNAL INDICATIONS TO MOTORISTS. ALL SIGNAL HEADS SHALL BE INSTALLED TO A NEAT OVERALL APPEARANCE.
NOMINAL HEIGHT FOR SIGNAL HEADS ABOVE PAVEMENT SURFACE SHALL BE 18 FEET 6 INCHES, PLUS/MINUS 3 INCHES.

PEDESTRIAN SIGNAL HEADS SHALL BE POSITIONED CAREFULLY TO PROVIDE THE BEST VIEW TO PEDESTRIANS.

ITEM 684: TRAFFIC SIGNAL CABLES

ALL SIGNAL CABLE SHALL BE #12 AWG; 2/C LOOP. LEAD-IN SHALL BE #14 AWG SHIELDED AND LOOP WIRES IN PAVEMENT.

ITEM 686: TRAFFIC SIGNAL POLE ASSEMBLIES (STEEL)

THE LOCATIONS FOR THE PROPOSED TRAFFIC SIGNAL POLES ARE APPROXIMATE. THE EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD IN COORDINATION WITH THE DISTRICT SIGNAL SHOP.

ERECTION AND/OR REMOVAL OF POLES AND LUMINARIES LOCATED NEAR ANY OVERHEAD ELECTRICAL POWER LINES SHALL BE ACCOMPLISHED USING ESTABLISHED INDUSTRY AND UTILITY SAFETY PRACTICES. THE APPROPRIATE UTILITY COMPANY SHALL BE CONSULTED WITH PRIOR TO BEGINNING SUCH WORK.

ITEM 688: PEDESTRIAN DETECTORS AND VEHICLE LOOP DETECTORS

THE CONTRACTOR SHALL INSTALL LOOP VEHICLE DETECTORS IN ACCORDANCE WITH THE INTERSECTION LAYOUTS IN THE PLANS OR AS DIRECTED. EACH LOOP DETECTOR LEAD-IN CABLE SHALL BE TAGGED INSIDE THE CONTROLLER

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
GENERAL NOTES

SHEET 13 OF 14

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK. DN:		6	TEXAS				21M
DW:		STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK. DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK. TR:							

4/11/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GD\01 GENERAL\07 General Notes\Liberty_General Notes_Revised.dgn

Project Number: **Sheet AA**

County: Hidalgo **Control:** 0921-02-194

Highway: Liberty Blvd

CABINET WITH ITS LOOP NUMBER. THE LOOP AMPLIFIERS SHALL INDICATE THE LOOP AND PHASE OF CONTROL OR DIRECTION OF CONTROL. LOOP WIRES IN STREET SHALL BE #14 AWG. PEDESTRIAN DETECTORS SHALL MEET THE MINIMUM REQUIREMENTS CALLED FOR BY THE "AMERICANS WITH DISABILITIES ACT".

LOOP DETECTOR LEAD-IN CABLE SHALL BE CONTINUOUS FROM GROUND BOX TO THE CONTROLLER.

SPLICES FOR LOOP WIRE WILL BE PERMITTED ONLY AT GROUND BOXES OR POLE BASE WITH APPROVED WEATHERPROOF SPLICE KITS.

A MINIMUM LENGTH OF 2.0 FEET FOR EACH CABLE SHALL BE LEFT IN EACH GROUND BOX.

ITEM 6185: TRUCK MOUNTED ATTENUATOR/TRAILER ATTENUATOR

IN ADDITION TO THE SHADOW VEHICLES WITH TRUCK MOUNTED ATTENUATOR (TMA) THAT ARE SPECIFIED AS BEING REQUIRED ON THE TRAFFIC CONTROL PLAN FOR THE PROJECT, PROVIDE 1 ADDITIONAL SHADOW VEHICLE(S) WITH TMA AS PER TCP (2-2) -18 AS DETAILED ON GENERAL NOTE 7 OF THIS STANDARD SHEET; AND AS PER TCP (2-3) -18 AS DETAILED ON GENERAL NOTE 8 OF THIS STANDARD SHEET.

THEREFORE, 3 TOTAL SHADOW VEHICLES WITH TMA WILL BE REQUIRED ON THIS PROJECT FOR THE TYPE OF WORK AS SHOWN ON THE PLANS. THE CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING IF ONE OR MORE OF HIS CONSTRUCTION OPERATIONS WILL BE ONGOING AT THE SAME TIME AND THUS DETERMINE THE TOTAL NUMBER OF TMAS NEEDED FOR THE PROJECT.

4/11/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\01 GENERAL\07 General Notes\Liberty_General Notes_Revised.dgn

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
GENERAL NOTES

SHEET 14 OF 14

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					21N
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:								
TR:		PHR	HIDALGO	0921	02	194		LIBERTY
CK TR:								

GENERAL NOTES AND SPECIFICATIONS DATA:

USE A POWER-BROOM WHEN CLEANING THE ROADWAY AS NEEDED.

REMOVE & DISPOSE ALL MATERIAL NOT DEEMED SALVAGEABLE BY THE ENGINEER, UNLESS OTHERWISE SHOWN ON THE PLANS.

ON EXISTING PAVEMENT THAT WILL REMAIN IN PLACE, SAND BLAST OR SURFACE TREAT IN ORDER TO REMOVE EXISTING STRIPING.

DO NOT BLOCK DRAINAGE WHEN HANDLING & STOCKPILING EXCAVATED MATERIAL.

MAINTAIN ACCESS TO DRIVEWAYS AND INTERSECTIONS THROUGH ALL PHASES OF CONSTRUCTION.

MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.

TRAFFIC CONTROL DEVICES:

AT THE COMMENCEMENT OF THE PROJECT, ALL TRAFFIC CONTROL DEVICES SHALL BE IN ACCEPTABLE CONDITION, AND MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT, AS PER GUIDELINES FOR TEMPORARY TRAFFIC CONTROL DEVICES AND FEATURES.

NOTIFY THE PROJECT ENGINEER IN WRITING(E-MAIL IS ACCEPTABLE) ONCE THE TRAFFIC CONTROL PLAN(TCP) AND ALL TRAFFIC CONTROL DEVICES HAVE BEEN INSTALLED AS PER PLANS ON THE PROJECT SO THAT THE COUNTY'S RESPONSIBLE PERSON ACCOMPANIED BY THE CONTRACTOR'S RESPONSIBLE PERSON CAN CONDUCT A NIGHT INSPECTION ON THE SAID TCP AND TRAFFIC CONTROL DEVICES. COMMENCEMENT OF WORK WILL NOT BE AUTHORIZED NOR ALLOWED UNTIL THE PROJECT ENGINEER NOTIFIES THE CONTRACTOR IN WRITING(E-MAIL IS ACCEPTABLE) TO PROCEED WITH THE WORK.

CONTRACTOR SHALL HAVE A SUFFICIENT AMOUNT OF TRAFFIC CONTROL DEVICES IN ACCEPTABLE CONDITION TO REPLACE ANY DAMAGED TRAFFIC CONTROL DEVICE WITHIN 24 HOURS OF NOTIFICATION.

PROVIDE ADDITIONAL SIGNS AND BARRICADES AS NECESSARY TO ADDRESS FIELD CONSTRUCTIBILITY & VISIBILITY. THESE ADDITIONAL SIGNS WILL BE CONSIDERED SUBSIDIARY TO ITEM 502.

REMOVE OR COMPLETELY COVER ALL EXISTING SIGNS WHICH ARE IN CONFLICT WITH THE TRAFFIC CONTROL PLAN.

ADJUST STOP SIGNS AS NEEDED ON INTERSECTING STREETS DURING THE VARIOUS CONSTRUCTION PHASES. DO NOT REMOVE ANY EXISTING STOP SIGNS UNTIL TEMPORARY SIGNS ARE IN PLACE.

COORDINATE THE TRAFFIC CONTROL PLAN AND THE VARIOUS SEQUENCES OF CONSTRUCTION WITH ADJACENT CONSTRUCTION PROJECTS IF APPLICABLE, TO ENSURE THE UNINTERRUPTED AND SAFE FLOW OF TRAFFIC.

NOTIFY THE PROJECT ENGINEER IN WRITING WHEN MAJOR TRAFFIC CHANGES ARE TO BE MADE. NOTIFICATIONS MUST BE GIVEN A MINIMUM OF THREE WORKING DAYS PRIOR TO THE CHANGE.

ALL WORK ZONE PAVEMENT MARKINGS FOR THIS PROJECT SHALL BE 0.100 INCHES (100 MIL) THICK THERMOPLASTIC.

SAFETY:

PROTECT EXPOSED PITS THAT MUST REMAIN OPEN DURING NON-WORKING HOURS AS PER OSHA REQUIREMENTS.

PROJECT SPECIFIC NOTES:

1. TRAFFIC CONTROL PLAN STANDARDS TO GOVERN FLAGGING OPERATIONS.

2. THE CONTRACTOR SHALL COORINATE A MINIMUM OF 72 HOURS PRIOR TO ANY WORK ON HCID NO.16, HCID NO.6, AND HCDD NO.1 FACILITIES.

3. THE CONTRACTOR SHALL COORINATE ALL LANE AND TEMPORARY ROAD CLOSURES WITH LOCAL RESIDENTS, BUSINESSES AND SCHOOLS.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED
PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO
TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

TRAFFIC CONTROL PLAN NOTES

SHEET 1 OF 1 SHEETS

LIBERTY BLVD TRAFFIC CONTROL GENERAL NOTES

SCALE: 1" = 100' SHEET 1 OF 1

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					22
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

D:\Liberty Rd (US83 to Mile 3\02 TCP\02 NOTE-SEQ\district-tcp-gen-notes.dgn
11/12/2020

SEQUENCE OF CONSTRUCTION

PHASE I

1. INSTALL PROJECT LIMIT AND ADVANCE WARNING SIGNS AND INSTALL CROSSROAD BARRICADES/SIGNS, AS SHOWN ON THE TRAFFIC CONTROL PLAN, STANDARDS, AND DETOUR LAYOUT, IN ACCORDANCE WITH THE LATEST TxMUTCD AND/OR AS DIRECTED BY THE ENGINEER/COUNTY.

2. COORDINATE WITH LOCAL RESIDENTS AND LOCAL TRAFFIC, BEFORE ANY ROADWAY CONSTRUCTION, WITHIN THE ROAD CLOSURES FOR CONTINUING ACCESS DURING CONSTRUCTION. CONTACT THE COUNTY TO COORDINATE A REPRESENTATIVE BE PRESENT DURING ALL CORRESPONDENCE.

3. THE CONTRACTOR SHALL BE LIMITED TO CONSTRUCTING THE PROPOSED ROADWAY IN NEW LOCATION SECTION ONLY (STA. 37+00 NORTH TO STA. 124+56).

4. AFTER EXISTING UTILITIES HAVE BEEN RELOCATED, CONSTRUCT THE PROPOSED IRRIGATION CROSSINGS, STORM SEWER LATERAL CROSSINGS, STORM SEWER TRUNKLINE, BRIDGE STRUCTURE, AND CULVERT DRAINAGE OUTFALLS. PRIOR TO AND/OR DURING EACH APPROPRIATE PHASE OF CONSTRUCTION PROVIDE APPROPRIATE TRAFFIC CONTROL DEVICES AND SIGNING AS REQUIRED.

5. CONSTRUCT PHASE I OF LIBERTY ROAD AS SHOWN ON THE TCP TYPICAL SECTIONS UP TO THE FIRST 1 1/2" ACP LIFT. INSTALL ALL TEMPORARY EROSION CONTROL PROTECTION AS SHOWN ON THE SW3P LAYOUTS AND STANDARDS.

6. AFTER PHASE I IS COMPLETED, THIS SECTION WILL REMAIN CLOSED UNTIL PHASE VI IS COMPLETED AS PER THE TCP LAYOUTS AND TYPICAL SECTIONS.

PHASE II

1. INSTALL ADVANCE WARNINGS SIGNS AND BARRICADES AS SHOWN ON THE TRAFFIC CONTROL PLAN AND STANDARDS IN ACCORDANCE WITH THE LATEST TXMUTCD AND/OR AS DIRECTED BY THE ENGINEER OR COUNTY.

2. AFTER EXISTING UTILITIES HAVE BEEN RELOCATED, CONSTRUCT THE PROPOSED TEMPORARY DETOUR (STA.137+23 TO STA.151+22) AS SHOWN ON THE PHASE II DETOUR LAYOUTS AND TCP TYPICAL SECTIONS. INSTALL ANY AND ALL APPLICABLE TEMPORARY EROSION CONTROL PROTECTION.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING POSITIVE DRAINAGE THROUGHOUT THE DURATION OF CONSTRUCTION.

PHASE III

1. INSTALL ADVANCE WARNINGS SIGNS AND BARRICADES AS SHOWN ON THE TRAFFIC CONTROL PLAN AND STANDARDS IN ACCORDANCE WITH THE LATEST TXMUTCD AND/OR AS DIRECTED BY THE ENGINEER OR COUNTY.

2. STRIPE THE NEWLY CONSTRUCTED DETOUR AND EXISTING ROADWAY AS SHOWN ON THE TCP LAYOUTS AND TYPICAL SECTIONS. SHIFT THE EXISTING TRAFFIC TO THE SECTION OF EXISTING ROADWAY AND TEMPRORARY DETOUR.

3. AFTER EXISTING UTILITIES HAVE BEEN RELOCATED, CONSTRUCT THE PROPOSED STORM DRAINAGE TRUNK LINE, LATERAL CROSSINGS AND STORM DRAINAGE OUTFALLS. PRIOR TO AND/OR DURING EACH APPROPRIATE PHASE OF CONSTRUCTION. PROVIDE APPROPRIATE TRAFFIC CONTROL DEVICES AND SIGNING AS REQUIRED.

4. CONSTRUCT THE EAST-HALF OF THE ROADWAY BETWEEN STA.124+56 TO STA.145+52. UP TO THE FIRST 1 1/2" ACP W/ONE COURSE TREATEMENT AS SHOWN ON THE PHASE III TCP LAYOUTS AND TYPICAL SECTIONS. INSTALL ALL TEMPORARY EROSION CONTROL PROTECTION AS SHOWN ON THE SW3P LAYOUTS AND STANDARDS AND AS THEY PERTAIN TO PHASE III CONSTRUCTION.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING POSITIVE DRAINAGE THROUGHOUT THE DURATION OF CONSTRUCTION. ROADWAY ACCESS TO ALL INTERSECTION ROADWAYS AND DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.

PHASE IV

1. STRIPE NEWLY CONSTRUCTED EAST-HALF OF LIBERTY BLVD, FOR TWO 11' LANES OF BI-DIRECTIONAL TRAFFIC FROM STA. STA.124+56 TO STA.151+22. AS SHOWN ON PHASE IV TCP LAYOUTS AND TYPICAL SECTIONS.

2. SWITCH, INSTALL, AND REMOVE ANY NECESSARY SIGNS, BARRICADES, CHANNELIZING DEVICES AND WORK ZONE PAVEMENT MARKINGS AS SHOWN FOR THIS PHASE IV OF THE TCP.

3. SHIFT EXISTING NORTH AND SOUTH BOUND TRAFFIC UNTO THE NEWLY CONSTRUCTED EAST-HALF OF LIBERTY BLVD.

4. CONSTRUCT THE REMAINING STORM DRAIN SYSTEM AND CONSTRUCT THE PROPOSED ROADWAY SECTION UP TO THE FIRST 1 1/2" ACP LIFT W/ONE COURSE SURFACE TREATMENT AS SHOWN ON THE TCP LAYOUTS AND TYPICAL SECTIONS. INSTALL ALL TEMPORARY EROSION CONTROL PROTECTION AS SHOWN ON THE SW3P LAYOUTS AND STANDARDS AND AS THEY PERTAIN TO THE PHASE IV CONSTRUCTION.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING POSITIVE DRAINAGE THROUGHOUT THE DURATION OF CONSTRUCTION. ROADWAY ACCESS TO ALL INTERSECTION ROADWAYS AND DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.

PHASE V

1. INSTALL ADVANCE WARNINGS SIGNS AND BARRICADES AS SHOWN ON THE TRAFFIC CONTROL PLAN AND STANDARDS IN ACCORDANCE WITH THE LATEST TXMUTCD AND/OR AS DIRECTED BY THE ENGINEER OR COUNTY.

2. AFTER EXISTING UTILITIES HAVE BEEN RELOCATED, CONSTRUCT THE PROPOSED TEMPORARY DETOUR (STA.11+67 TO STA.13+89) AS SHOWN ON THE PHASE V DETOUR LAYOUTS AND TCP TYPICAL SECTIONS. INSTALL ANY AND ALL APPLICABLE TEMPORARY EROSION CONTROL PROTECTION.

3. STRIPE EAST-HALF OF EXISTING LIBERTY RD., FOR ONE WAY (NORTH BOUND) DIRECTIONAL TRAFFIC FROM STA.11+60 TO STA.25+70, AS SHOWN ON THE TCP PHASE V LAYOUTS AND TYPICAL SECTIONS. DETOUR SOUTH BOUND TRAFFIC THROUGH DIAMOND AVE AND THROUGH TOM GIL RD TO CONTINUE TRAFFIC TO US83 AS SHOWN ON TCP PHASE V TCP LAYOUTS, TYPICAL SECTIONS, AND DETOUR LAYOUT.

4. CONSTRUCT THE WEST-HALF OF THE ROADWAY BETWEEN STA.11+60 TO STA.37+00. INCLUDING ALL APPROPRIATE DRAINAGE APPURTENANCES UP TO THE FIRST 1 1/2" ACP LIFT W/ONE COURSE SURFACE TREATMENT, AS SHOWN ON THE PHASE V TCP LAYOUTS AND TYPICAL SECTIONS. INSTALL ALL TEMPORARY EROSION CONTROL PROTECTION AS SHOWN ON THE SW3P LAYOUTS AND STANDARDS AND AS THEY PERTAIN TO THE PHASE V CONSTRUCTION.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING POSITIVE DRAINAGE THROUGHOUT THE DURATION OF CONSTRUCTION. ROADWAY ACCESS TO ALL INTERSECTION ROADWAYS AND DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.

PHASE VI

1. STRIPE NEWLY CONSTRUCTED WEST-HALF OF LIBERTY BLVD, FOR TWO 12' LANES OF BI-DIRECTIONAL TRAFFIC FROM STA.11+60 to STA.37+00, AS SHOWN ON PHASE VI TCP LAYOUTS AND TYPICAL SECTIONS.

2. SWITCH, INSTALL, AND REMOVE ANY NECESSARY SIGNS, BARRICADES, CHANNELIZING DEVICES AND WORK ZONE PAVEMENT MARKINGS AS SHOWN FOR THIS PHASE VI OF THE TCP.

3. SHIFT EXISTING NORTH AND SOUTH BOUND TRAFFIC UNTO THE NEWLY CONSTRUCTED WEST-HALF OF LIBERTY BLVD.

4. CONSTRUCT THE REMAINING STORM DRAIN SYSTEM AND CONSTRUCT THE PROPOSED ROADWAY SECTION UP TO THE FIRST 1 1/2" ACP LIFT W/ONE COURSE SURFACE TREATMENT AS SHOWN ON THE TCP LAYOUTS AND TYPICAL SECTIONS. INSTALL ALL TEMPORARY EROSION CONTROL PROTECTION AS SHOWN ON THE SW3P LAYOUTS AND STANDARDS AND AS THEY PERTAIN TO THE PHASE VI CONSTRUCTION.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING POSITIVE DRAINAGE THROUGHOUT THE DURATION OF CONSTRUCTION. ROADWAY ACCESS TO ALL INTERSECTION ROADWAYS AND DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.

PHASE VII

1. SWITCH, INSTALL, AND REMOVE ANY NECESSARY SIGNS, BARRICADES, CHANNELIZING DEVICES AND WORK ZONE PAVEMENT MARKINGS AS SHOWN FOR THIS PHASE OF THE TCP.

2. PLACE FINAL ACP COURSE ON THE ENTIRE PROPOSED ROADWAY IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. TCP STANDARDS SHALL GOVERN FINAL OVERLAY OPERATIONS.

3. INSTALL GUIDE MARKS AND SHORT TERM MARKINGS.

4. INSTALL FINAL STRIPING AND SIGNING.

5. OPEN ROADWAYS TO FULL TRAFFIC AND REMOVE ALL TCP BARRICADES, SIGNS, CHANNELIZING DEVICES, PAVEMENT MARKINGS AND EROSION/ SEDIMENTATION CONTROL DEVICES AFTER APPROVAL AND ACCEPTANCE OF THE PROJECT BY THE COUNTY.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
08/04/2020

THE COUNTY OF HIDALGO
TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

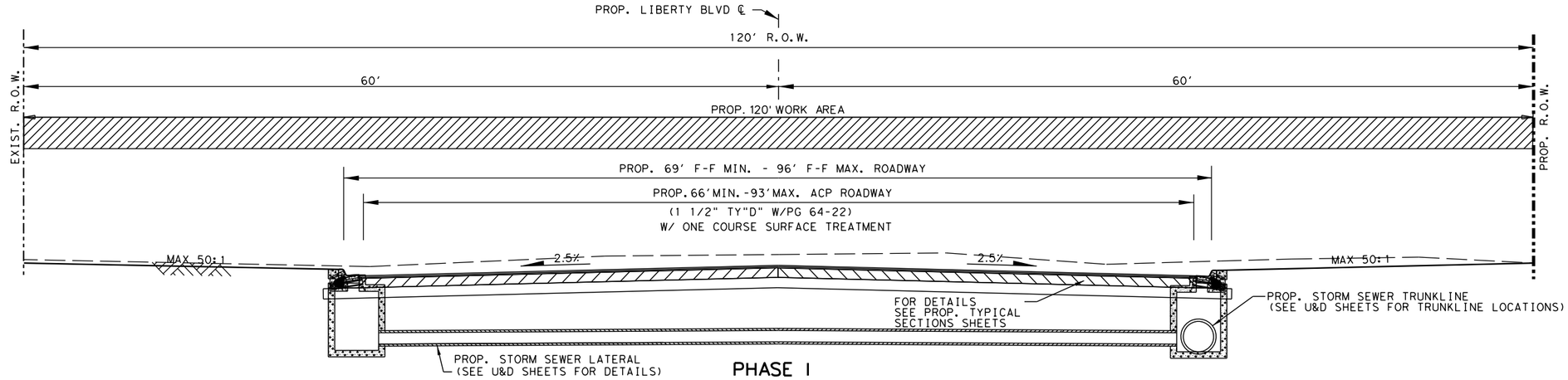
2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
TRAFFIC CONTROL PLAN
SEQUENCE OF CONSTRUCTION

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					23
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

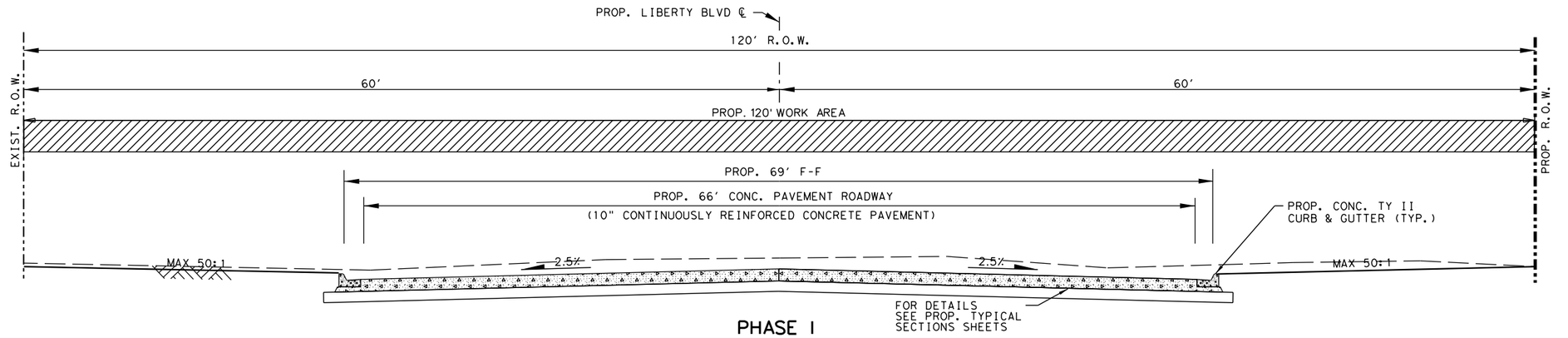
$FILE$
$DATE$



PHASE I

PROP TRAFFIC CONTROL PLAN. LIBERTY BLVD TYPICAL SECTION

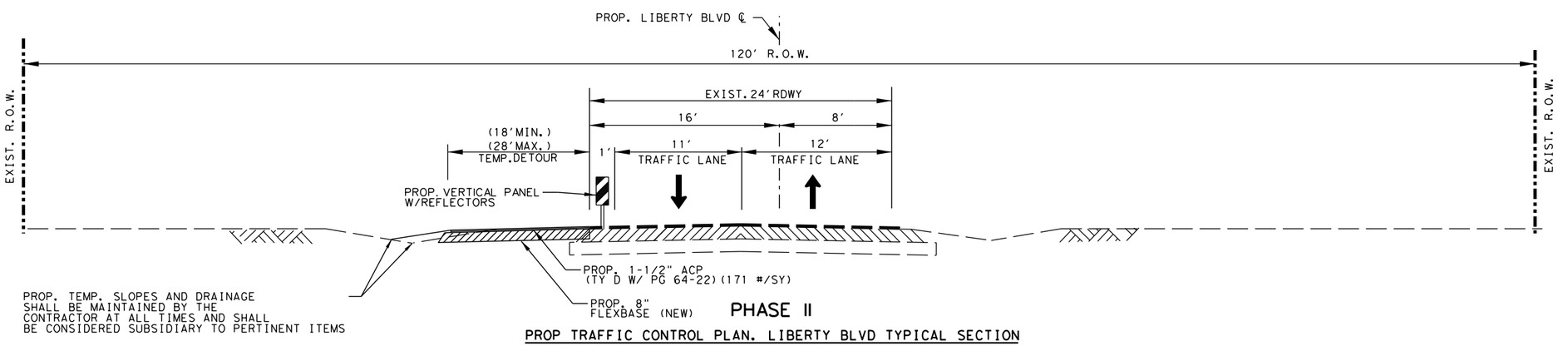
STA. 37+00.00 TO STA. 40+96.66
STA. 40+94.76 TO STA. 41+34.76 - (PROPOSED BRIDGE CROSSING)
STA. 54+13.85 TO STA. 59+19.68 - (PROPOSED LA JOYA BYPASS EXCEPTION TO BE CONSTRUCTED BY OTHERS)
STA. 59+19.68 TO STA.79+15.00
STA. 80+85.00 TO STA.98+43.00
STA. 98+59.00 TO STA.124+56.00



PHASE I

PROP TRAFFIC CONTROL PLAN. LIBERTY BLVD TYPICAL SECTION

STA. 98+43.00 TO STA.98+59.00



PHASE II

PROP TRAFFIC CONTROL PLAN. LIBERTY BLVD TYPICAL SECTION

STA. 137+23 TO STA.142+37 (18' DETOUR)
STA. 142+37 TO STA.144+60 (TRANSITION TEMP. DETOUR FROM 18' TO 28')
STA. 144+60 TO STA.145+52 (28' DETOUR)
STA. 145+52 TO STA.151+22 (TRANSITION TEMP. DETOUR FROM 28' TO 0')

LEGEND:

- [A] 4" SOLID WHITE STRIPE (NON-REMOV)
- [B][B] 4" DOUBLE SOLID YELLOW STRIPE (NON-REMOV) W/ TY II-A-A MARKERS @ 40' C-C
- TEMPORARY DETOUR
- SUBSIDIARY TO PERTINENT ITEMS

STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED
PROFESSIONAL ENGINEER
04/07/2022

THE COUNTY OF HIDALGO
TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

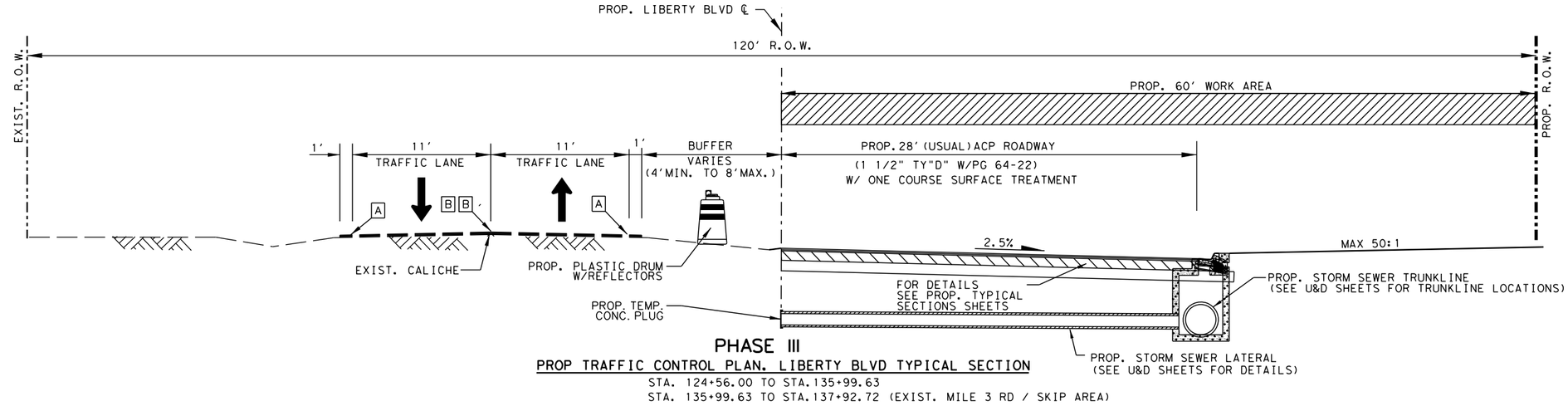
900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
TRAFFIC CONTROL PLAN
PHASE I & PHASE II
TYPICAL SECTION

NTS

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				24
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

12/4/2020 D:\Liberty Rd (US83 to Mile 3\)02 TCP\02 TCP TYPICAL SECTION\LIB_PH01_n_PH02 TCP SECT.dgn

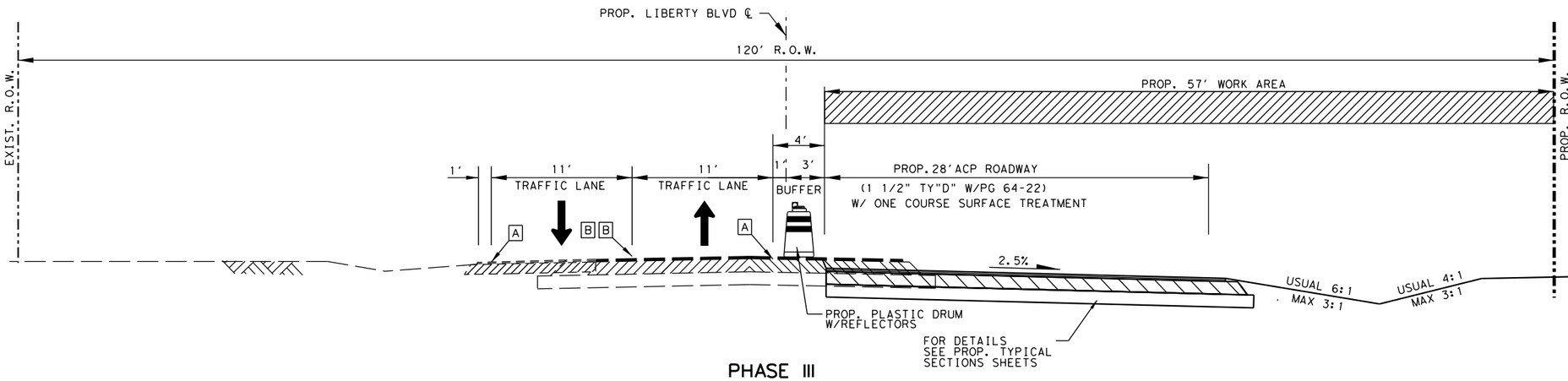


PHASE III

PROP TRAFFIC CONTROL PLAN. LIBERTY BLVD TYPICAL SECTION

STA. 124+56.00 TO STA.135+99.63

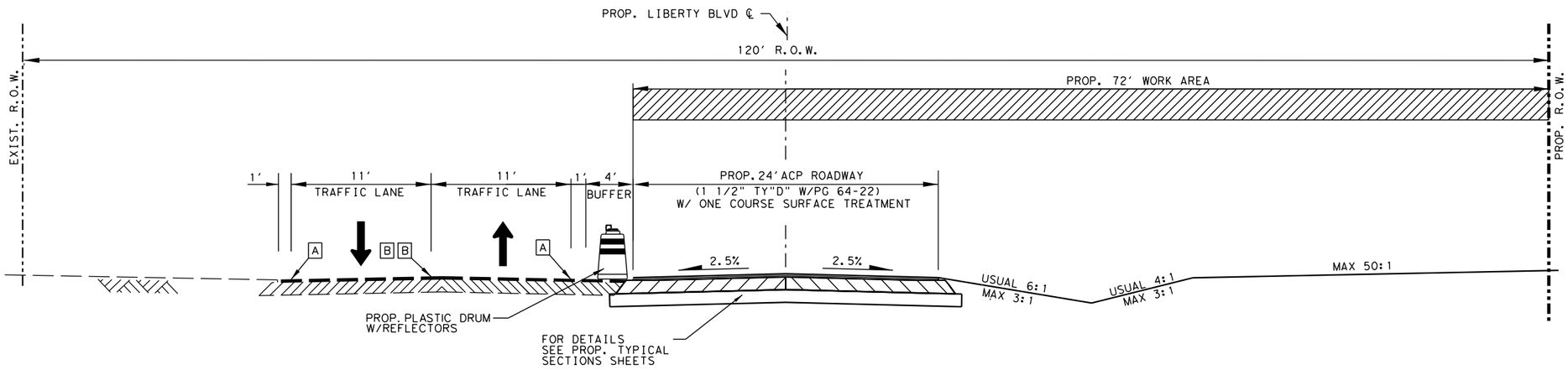
STA. 135+99.63 TO STA.137+92.72 (EXIST. MILE 3 RD / SKIP AREA)



PHASE III

PROP TRAFFIC CONTROL PLAN. LIBERTY BLVD TYPICAL SECTION

STA. 137+92.72 TO STA.144+65.17



PHASE III

PROP TRAFFIC CONTROL PLAN. LIBERTY BLVD TYPICAL SECTION

STA. 144+65.17 TO STA.145+52.00

LEGEND:

- A — 4" SOLID WHITE STRIPE (NON-REMOV)
- B B — 4" DOUBLE SOLID YELLOW STRIPE (NON-REMOV) W/ TY II-A-A MARKERS @ 40' C-C
- CONSTRUCTION AREA
- ✧ SUBSIDIARY TO PERTINENT ITEMS

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
09/22/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
TRAFFIC CONTROL PLAN
PHASE III
TYPICAL SECTION

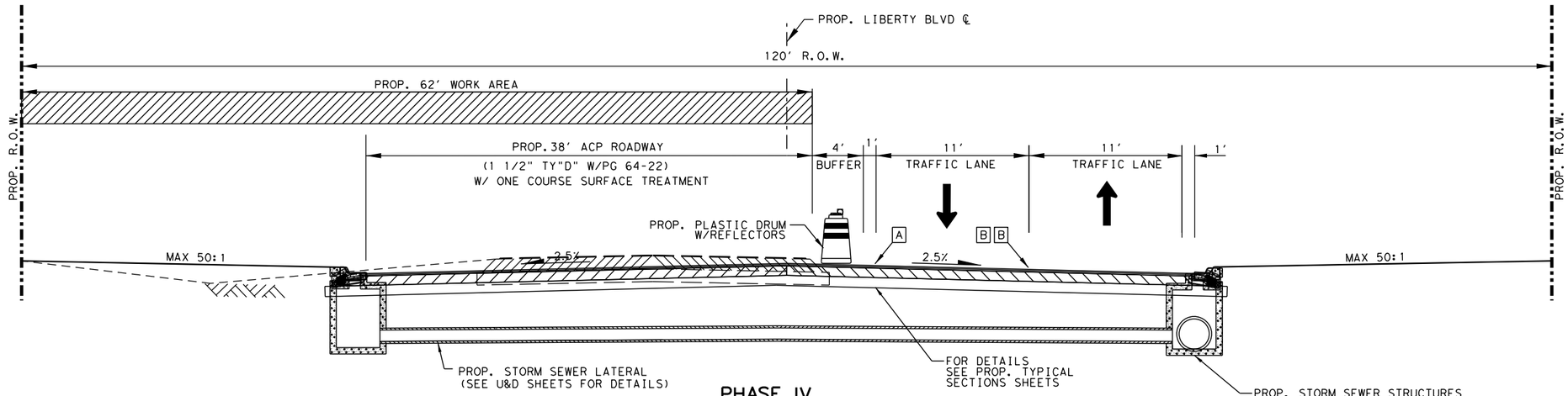
NTS

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				25
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

9/22/2020 D:\Liberty Rd (US83 to Mile 3\02 TCP\02 TCP TYPICAL SECTION\LIB_PH03 TCP SECT.dgn

LEGEND:

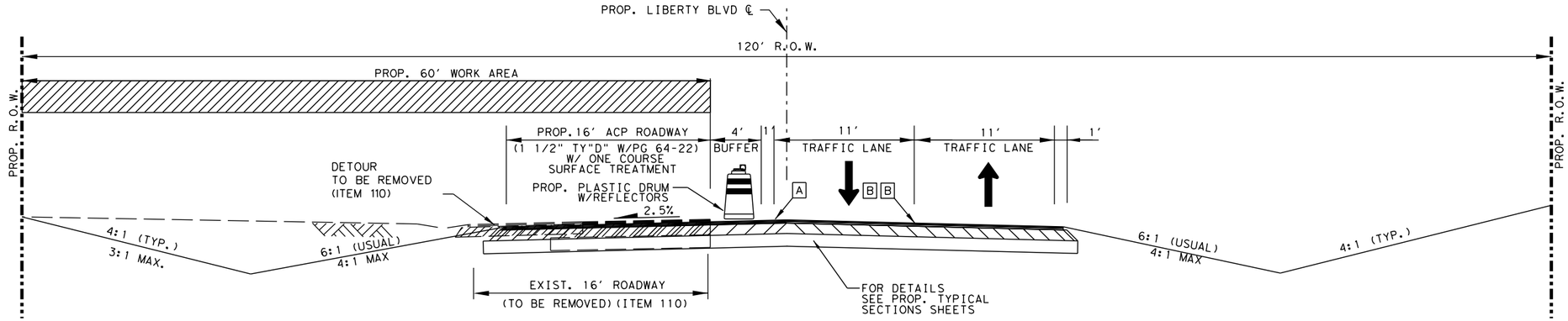
- [A] 4" SOLID WHITE STRIPE (NON-REMOV)
- [B B] 4" DOUBLE SOLID YELLOW STRIPE (NON-REMOV) W/ TY II-A-A MARKERS @ 40'C-C
- ⊗ SEE BRIDGE LAYOUTS AND BRIDGE TYPICAL SECTIONS FOR LIMITS AND DETAILS.
- CONSTRUCTION AREA
- ✧ SUBSIDIARY TO PERTINENT ITEMS



PHASE IV

PROP TRAFFIC CONTROL PLAN. LIBERTY BLVD TYPICAL SECTION

STA.124+56 TO STA.135+99.53



PHASE IV

PROP TRAFFIC CONTROL PLAN. LIBERTY BLVD TYPICAL SECTION

STA. 135+99.53 TO STA. 137+92.72 (EXIST. MILE 3 RD / SKIP AREA)
STA. 137+92.72 TO STA. 142+37.00
STA. 142+37.00 TO STA. 145+52.00 (TRANS FROM PROP.28' RDWY TO EXIST.24' RDWY)

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL LICENSED ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

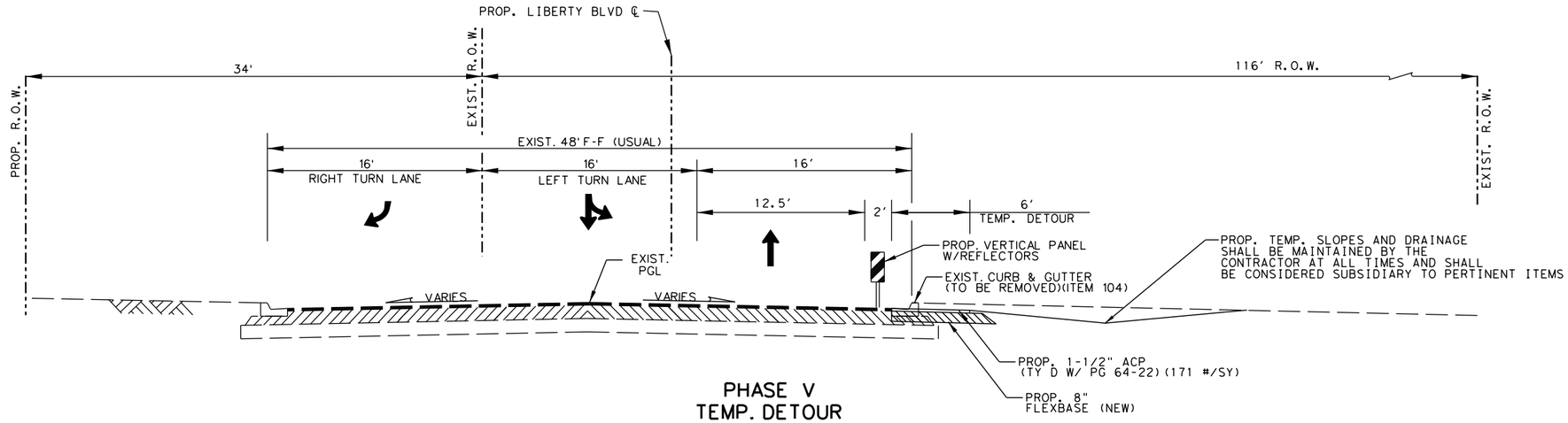
2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
TRAFFIC CONTROL PLAN
PHASE IV
TYPICAL SECTION

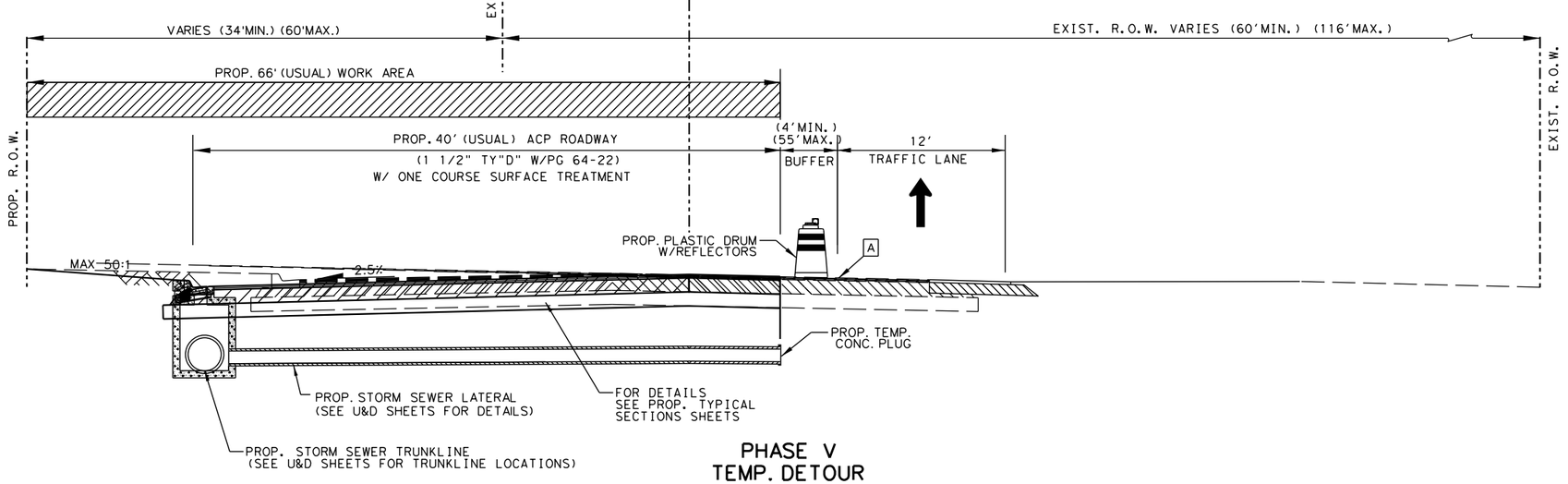
DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					26
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

11/10/2020 D:\Liberty Rd (US83 to Mile 3\)02 TCP\02 TCP TYPICAL SECTION\LIB_PH04 TCP SECT.dgn



PHASE V
TEMP. DETOUR
PROP TRAFFIC CONTROL PLAN. LIBERTY BLVD TYPICAL SECTION

STA.11+60 TO STA.13+89



PHASE V
TEMP. DETOUR
PROP TRAFFIC CONTROL PLAN. LIBERTY BLVD TYPICAL SECTION

STA.11+66 TO STA.23+66

LEGEND:

- [A] 4" SOLID WHITE STRIPE (NON-REMOV)
- [B][B] 4" DOUBLE SOLID YELLOW STRIPE (NON-REMOV) W/ TY II-A-A MARKERS @ 40'C-C
- CONSTRUCTION AREA
- SUBSIDIARY TO PERTINENT ITEMS

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

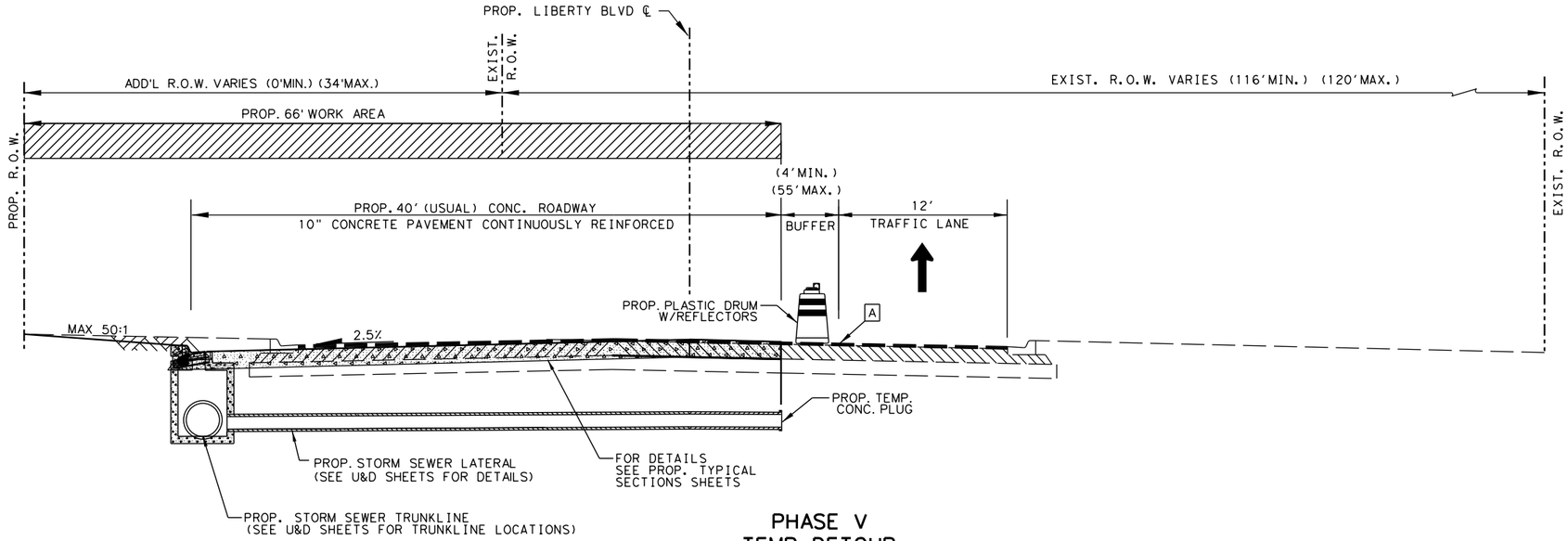
LIBERTY BLVD
TRAFFIC CONTROL PLAN
PHASE V
TYPICAL SECTION

NTS

SHEET 1 OF 2 SHEETS

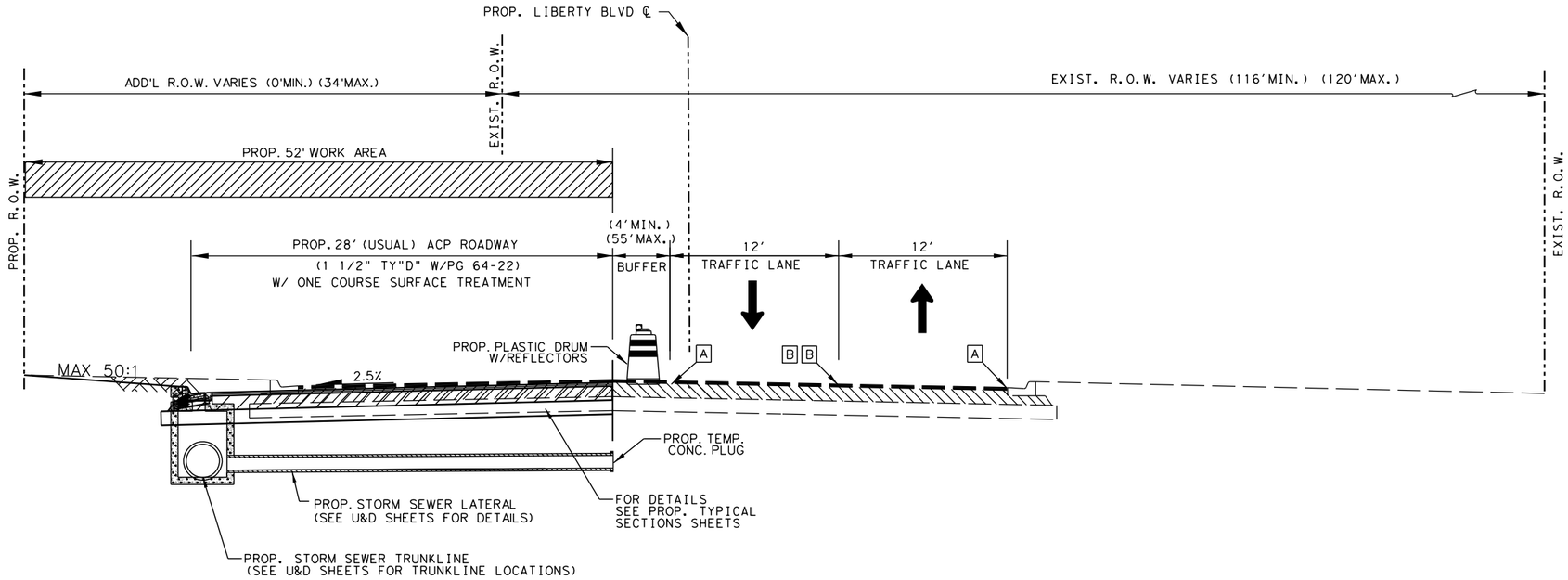
DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				27
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0926	02	199	LIBERTY
TR:							
CK TR:							

11/10/2020 D:\Liberty Rd (US83 to Mile 3)\02 TCP\02 TCP TYPICAL SECTION\LIB_PH05 TCP SECT.dgn



PHASE V
TEMP. DETOUR
PROP TRAFFIC CONTROL PLAN. LIBERTY BLVD TYPICAL SECTION

STA. 23+66 TO STA. 28+76



PHASE V
TEMP. DETOUR
PROP TRAFFIC CONTROL PLAN. LIBERTY BLVD TYPICAL SECTION

STA. 28+76 TO STA. 37+00

LEGEND:

- [A] 4" SOLID WHITE STRIPE (NON-REMOV)
- [B][B] 4" DOUBLE SOLID YELLOW STRIPE (NON-REMOV) W/ TY II-A-A MARKERS @ 40' C-C
- CONSTRUCTION AREA
- SUBSIDIARY TO PERTINENT ITEMS

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED
PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

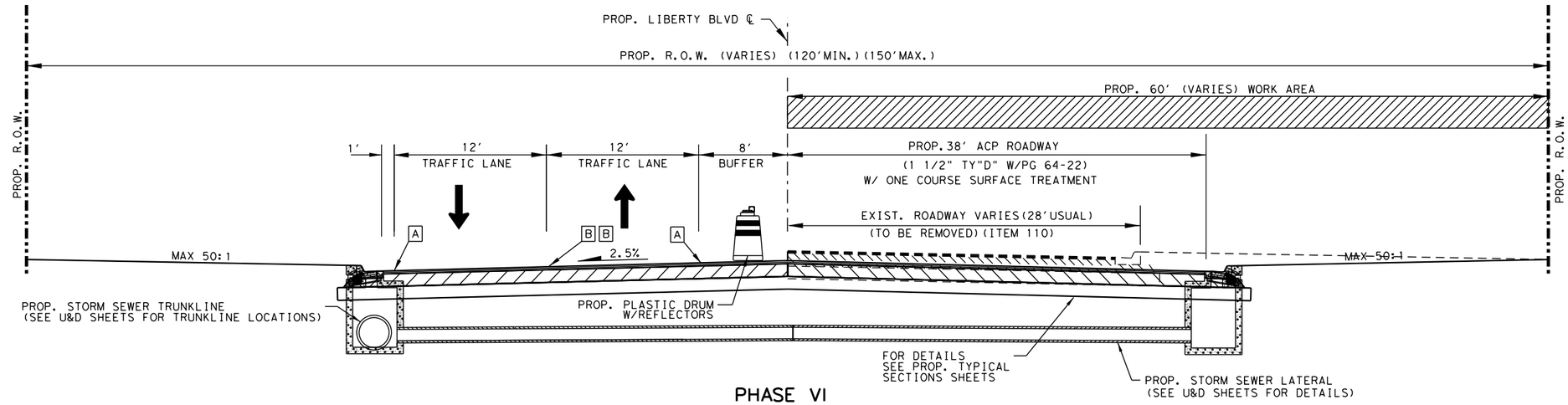
LIBERTY BLVD
TRAFFIC CONTROL PLAN
PHASE V
TYPICAL SECTION

NTS

SHEET 2 OF 2 SHEETS

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				28
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0926	02	199	LIBERTY
TR:							
CK TR:							

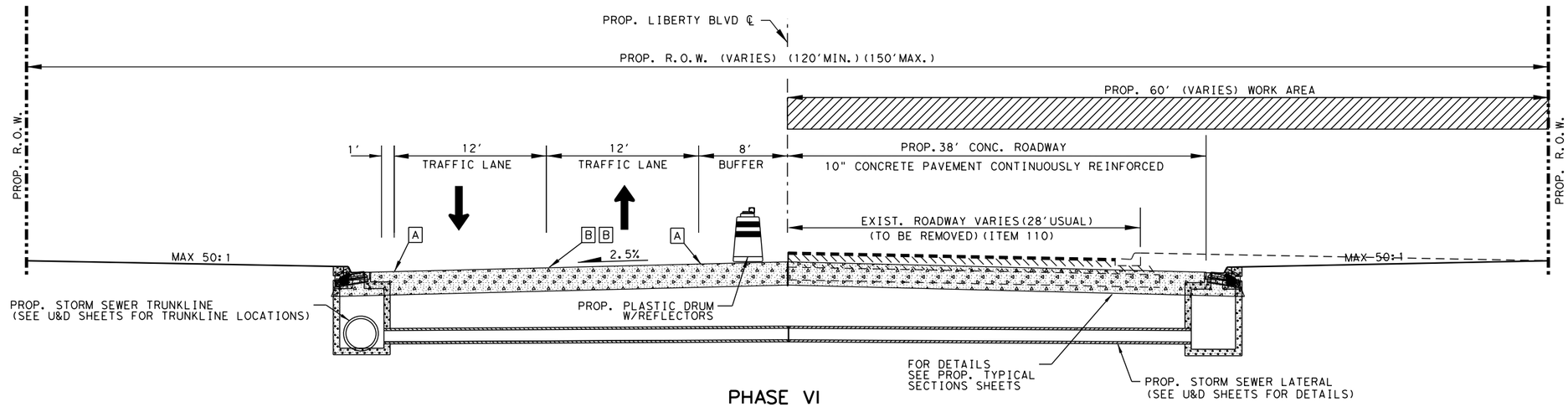
11/10/2020 D:\Liberty Rd (US83 to Mile 3)\02 TCP\02 TCP TYPICAL SECTION\LIB_PH05 TCP SECT.dgn



PHASE VI

PROP TRAFFIC CONTROL PLAN. LIBERTY BLVD TYPICAL SECTION

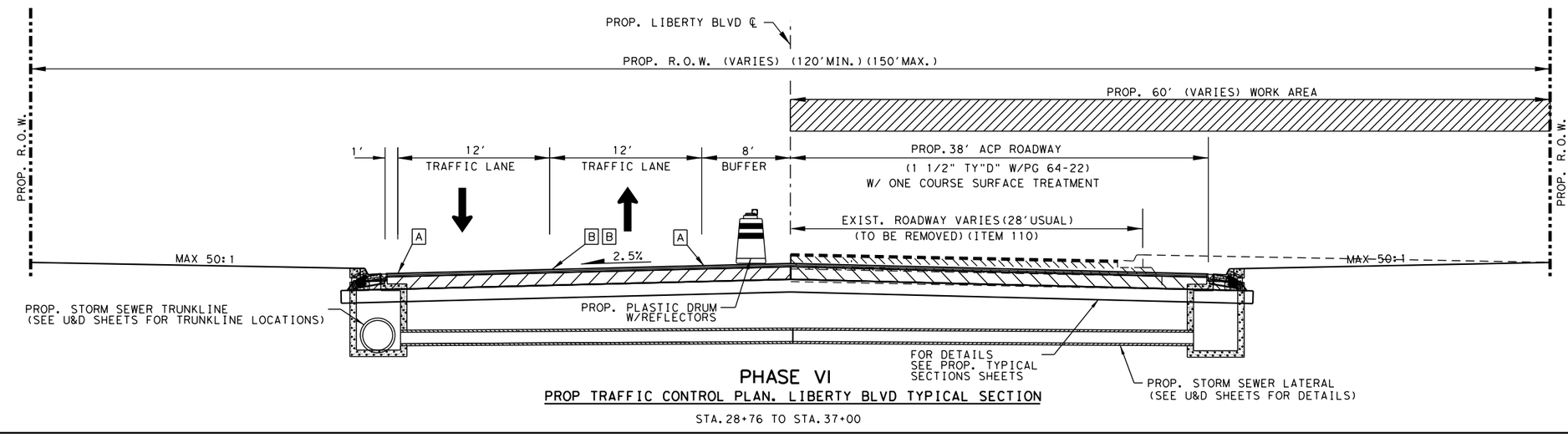
STA.11+60 TO STA.23+65



PHASE VI

PROP TRAFFIC CONTROL PLAN. LIBERTY BLVD TYPICAL SECTION

STA.23+65 TO STA.28+76



PHASE VI

PROP TRAFFIC CONTROL PLAN. LIBERTY BLVD TYPICAL SECTION

STA.28+76 TO STA.37+00

LEGEND:

- [A] 4" SOLID WHITE STRIPE (NON-REMOV)
- [B B] 4" DOUBLE SOLID YELLOW STRIPE (NON-REMOV) W/ TY II-A-A MARKERS @ 40' C-C
- CONSTRUCTION AREA
- SUBSIDIARY TO PERTINENT ITEMS

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED
PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD TRAFFIC CONTROL PLAN PHASE VI TYPICAL SECTION

NTS

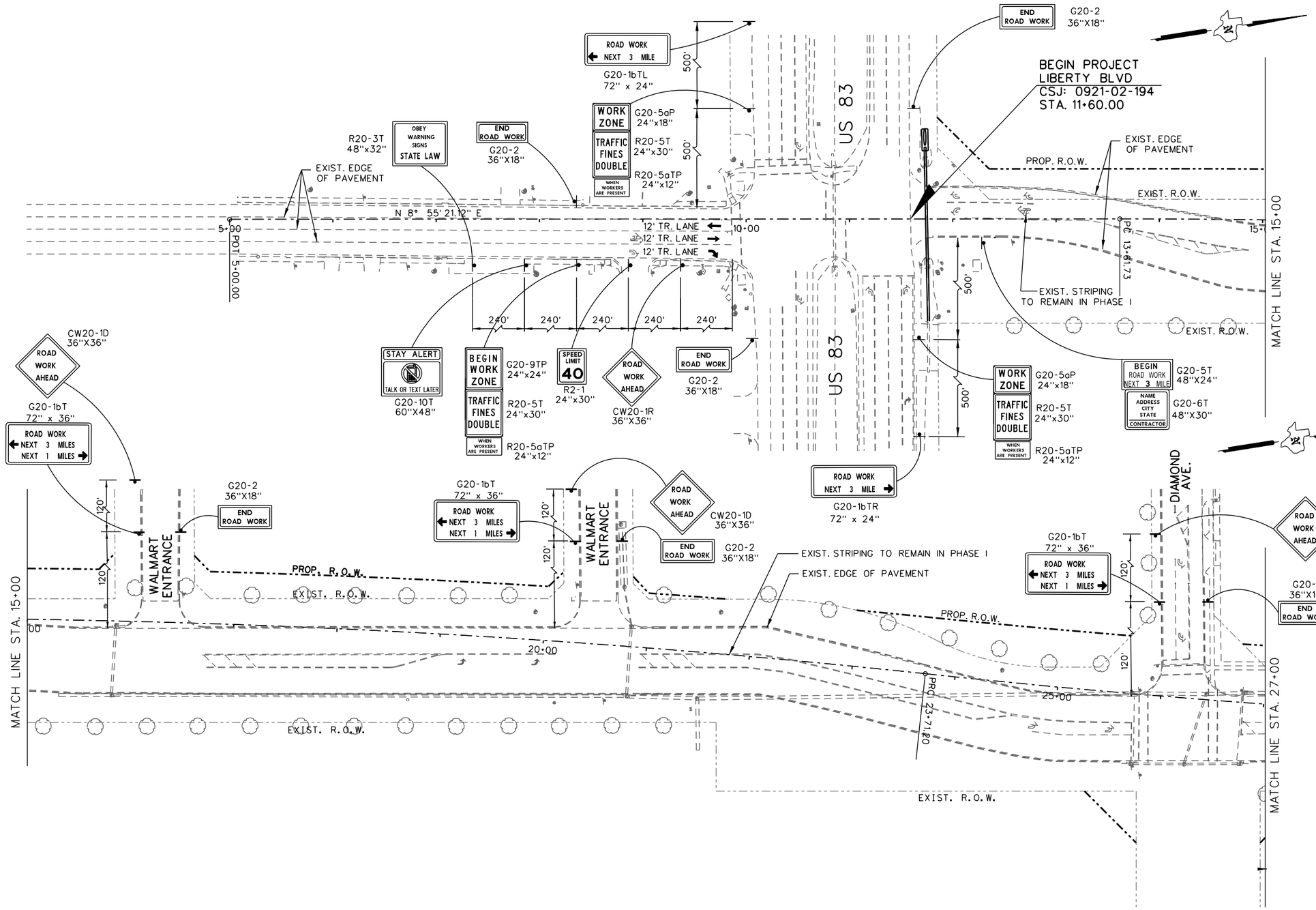
DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				29
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0926	02	199	LIBERTY
TR:							
CK TR:							

11/10/2020 D:\Liberty Rd (US83 to Mile 31\02 TCP\02 TCP TYPICAL SECTION\LIB_PH06 TCP SECT.dgn

SHEET SUMMARY

STATION LIMITS	ITEM 508					PAVEMENT MARKINGS (ITEM 662)											ITEM 677						ITEM 104
	CONSTRUCTING DETOURS (SY)	REFLECTORS		SHORT TERM (TAB)		NON-REMOVABLE							REMOVABLE				ELIMINATING EXISTING PAVEMENT MARKINGS						REMOVING EXIST. CURB & GUTTER (LF)
		TY I-C (EA)	TY II-A-A (EA)	TY W (EA)	TY Y-2 (EA)	4"WHITE SOLID (LF)	8"WHITE SOLID (LF)	24"WHITE SOLID (LF)	WORD (EA)	ARROW (EA)	4"YELLOW SOLID (LF)	4"YELLOW BROKEN (LF)	4"WHITE (DOT) (LF)	4"WHITE SOLID (LF)	4"YELLOW (DOT) (LF)	4"YELLOW SOLID (LF)	4"PAV'MT MARKINGS (LF)	8"PAV'MT MARKINGS (LF)	12"PAV'MT MARKINGS (LF)	24"PAV'MT MARKINGS (LF)	WORD (EA)	ARROW (EA)	
5+00-15+00																							
15+00-27+00																							
TOTAL																							

LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●, ■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)



STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL ENGINEER
LICENSED
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
TRAFFIC CONTROL PLAN
PHASE I

SCALE 1" = 100' SHEET 1 OF 7

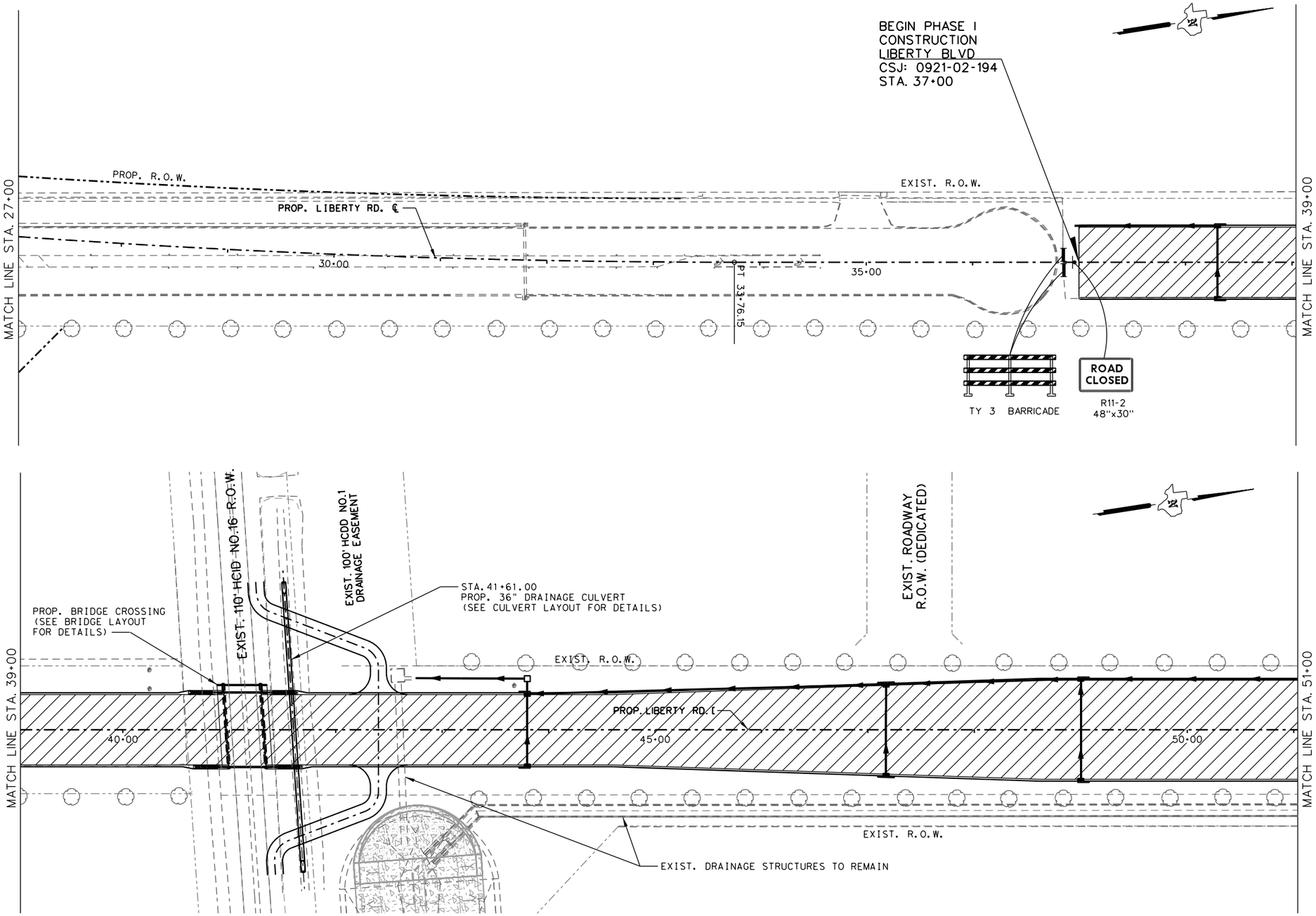
DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.	SHEET NO.
						6	TEXAS		30

STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
PHR	HIDALGO	0921	02	194	LIBERTY

11/10/2020 D:\Liberty Rd (US83 to Mile 3)\02 TCP\02 TCP PHASE 01\Liberty_TCP01_PHASE 01.dgn

SHEET SUMMARY

STATION LIMITS	ITEM 508					PAVEMENT MARKINGS (ITEM 662)											ITEM 677					
	CONSTRUCTING DETOURS (SY)	REFLECTORS		SHORT TERM (TAB)		NON-REMOVABLE							REMOVABLE				ELIMINATING EXISTING PAVEMENT MARKINGS					
		TY I-C (EA)	TY II-A-A (EA)	TY W (EA)	TY Y-2 (EA)	4"WHITE SOLID (LF)	8"WHITE SOLID (LF)	24"WHITE SOLID (LF)	WORD (EA)	ARROW (EA)	4"YELLOW SOLID (LF)	4"YELLOW BROKEN (LF)	4"WHITE (DOT) (LF)	4"WHITE SOLID (LF)	4"YELLOW (DOT) (LF)	4"YELLOW SOLID (LF)	4"PAV'MT MARKINGS (LF)	8"PAV'MT MARKINGS (LF)	12"PAV'MT MARKINGS (LF)	24"PAV'MT MARKINGS (LF)	WORD (EA)	ARROW (EA)
27+00-39+00																						
39+00-51+00																						
TOTAL																						



LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●,■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
08/04/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
TRAFFIC CONTROL PLAN
PHASE I

SCALE 1" = 100' SHEET 2 OF 7

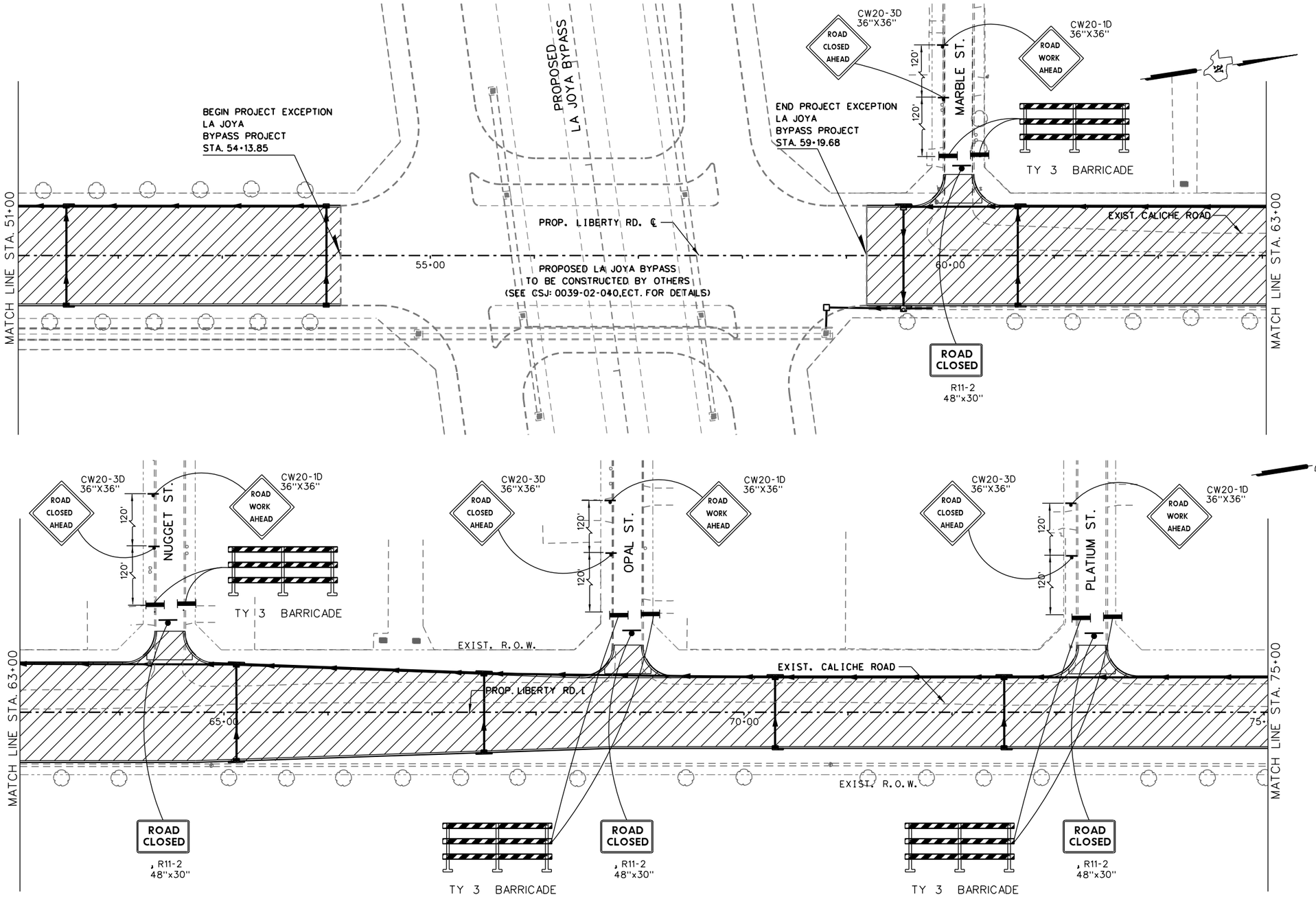
DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					31
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

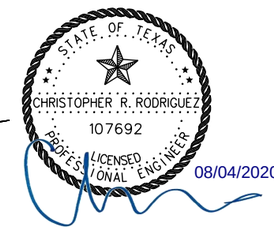
8/4/2020 D:\Liberty Rd (US83 to Mile 3)\02 TCP\02 TCP PHASE 01\Liberty_TCP02_PHASE 01.dgn

SHEET SUMMARY

STATION LIMITS	ITEM 508					PAVEMENT MARKINGS (ITEM 662)											ITEM 677					
	CONSTRUCTING DETOURS (SY)	REFLECTORS		SHORT TERM (TAB)		NON-REMOVABLE							REMOVABLE				ELIMINATING EXISTING PAVEMENT MARKINGS					
		TY I-C (EA)	TY II-A-A (EA)	TY W (EA)	TY Y-2 (EA)	4"WHITE SOLID (LF)	8"WHITE SOLID (LF)	24"WHITE SOLID (LF)	WORD (EA)	ARROW (EA)	4"YELLOW SOLID (LF)	4"YELLOW BROKEN (LF)	4"WHITE (DOT) (LF)	4"WHITE SOLID (LF)	4"YELLOW (DOT) (LF)	4"YELLOW SOLID (LF)	4"PAV'MT MARKINGS (LF)	8"PAV'MT MARKINGS (LF)	12"PAV'MT MARKINGS (LF)	24"PAV'MT MARKINGS (LF)	WORD (EA)	ARROW (EA)
51+00-63+00																						
63+00-75+00																						
TOTAL																						

LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●, ■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)





THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
TRAFFIC CONTROL PLAN
PHASE I

SCALE 1" = 100'

SHEET 3 OF 7

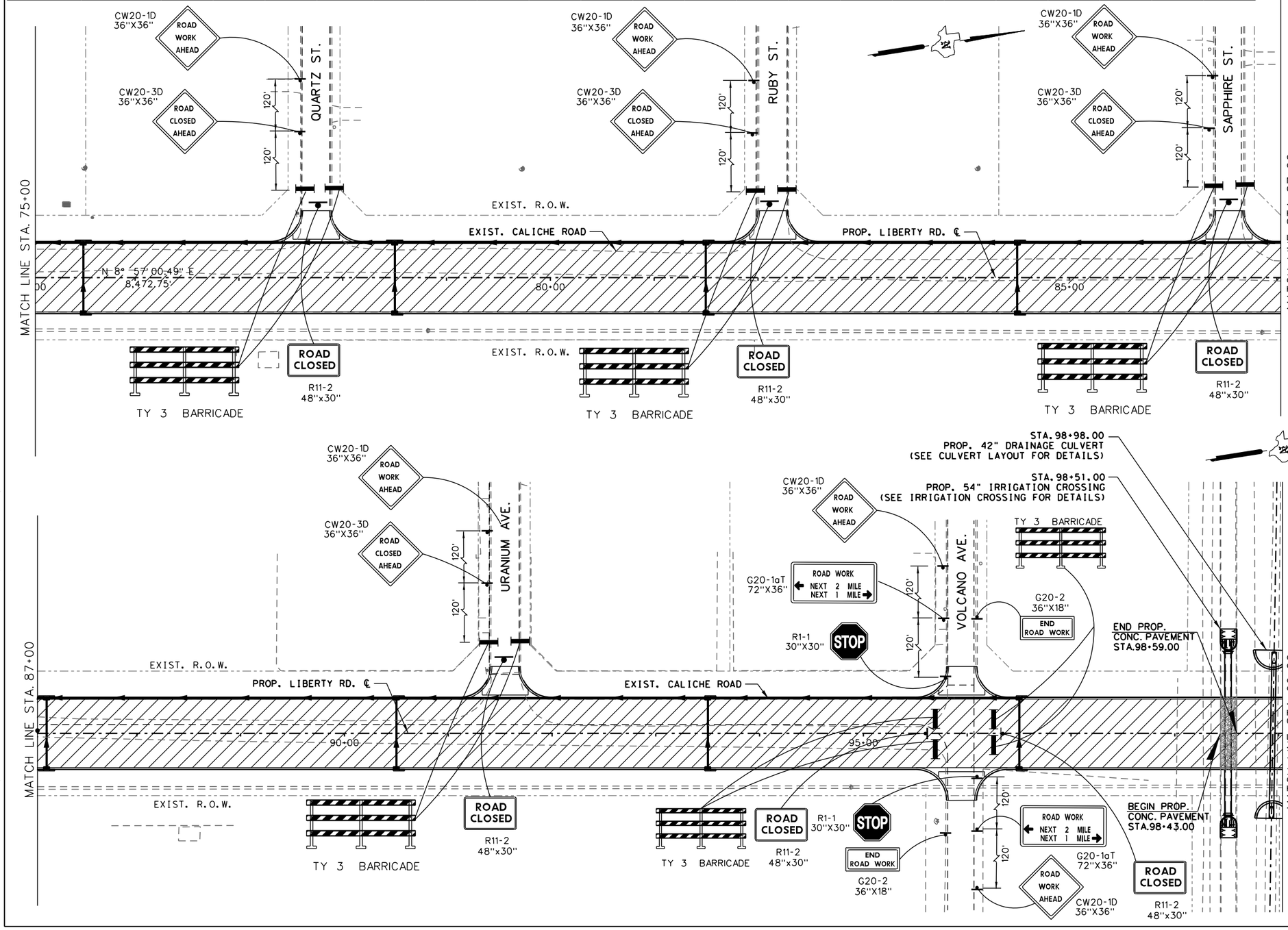
DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
						6	TEXAS					32
						STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
						PHR	HIDALGO	0921	02	194		LIBERTY

8/4/2020 D:\Liberty Rd (US83 to Mile 3)\02 TCP\02 TCP PHASE 01\Liberty_TCP03_PHASE 01.dgn

SHEET SUMMARY

STATION LIMITS	ITEM 508					PAVEMENT MARKINGS (ITEM 662)											ITEM 677					
	CONSTRUCTING DETOURS (SY)	REFLECTORS		SHORT TERM (TAB)		NON-REMOVABLE							REMOVABLE				ELIMINATING EXISTING PAVEMENT MARKINGS					
		TY I-C (EA)	TY II-A-A (EA)	TY W (EA)	TY Y-2 (EA)	4"WHITE SOLID (LF)	8"WHITE SOLID (LF)	24"WHITE SOLID (LF)	WORD (EA)	ARROW (EA)	4"YELLOW SOLID (LF)	4"YELLOW BROKEN (LF)	4"WHITE (DOT) (LF)	4"WHITE SOLID (LF)	4"YELLOW (DOT) (LF)	4"YELLOW SOLID (LF)	4"PAV'MT MARKINGS (LF)	8"PAV'MT MARKINGS (LF)	12"PAV'MT MARKINGS (LF)	24"PAV'MT MARKINGS (LF)	WORD (EA)	ARROW (EA)
75+00-87+00																						
87+00-99+00																						
TOTAL																						

LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●, ■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)



STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL LICENSED ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
TRAFFIC CONTROL PLAN
PHASE I

SCALE 1" = 100'

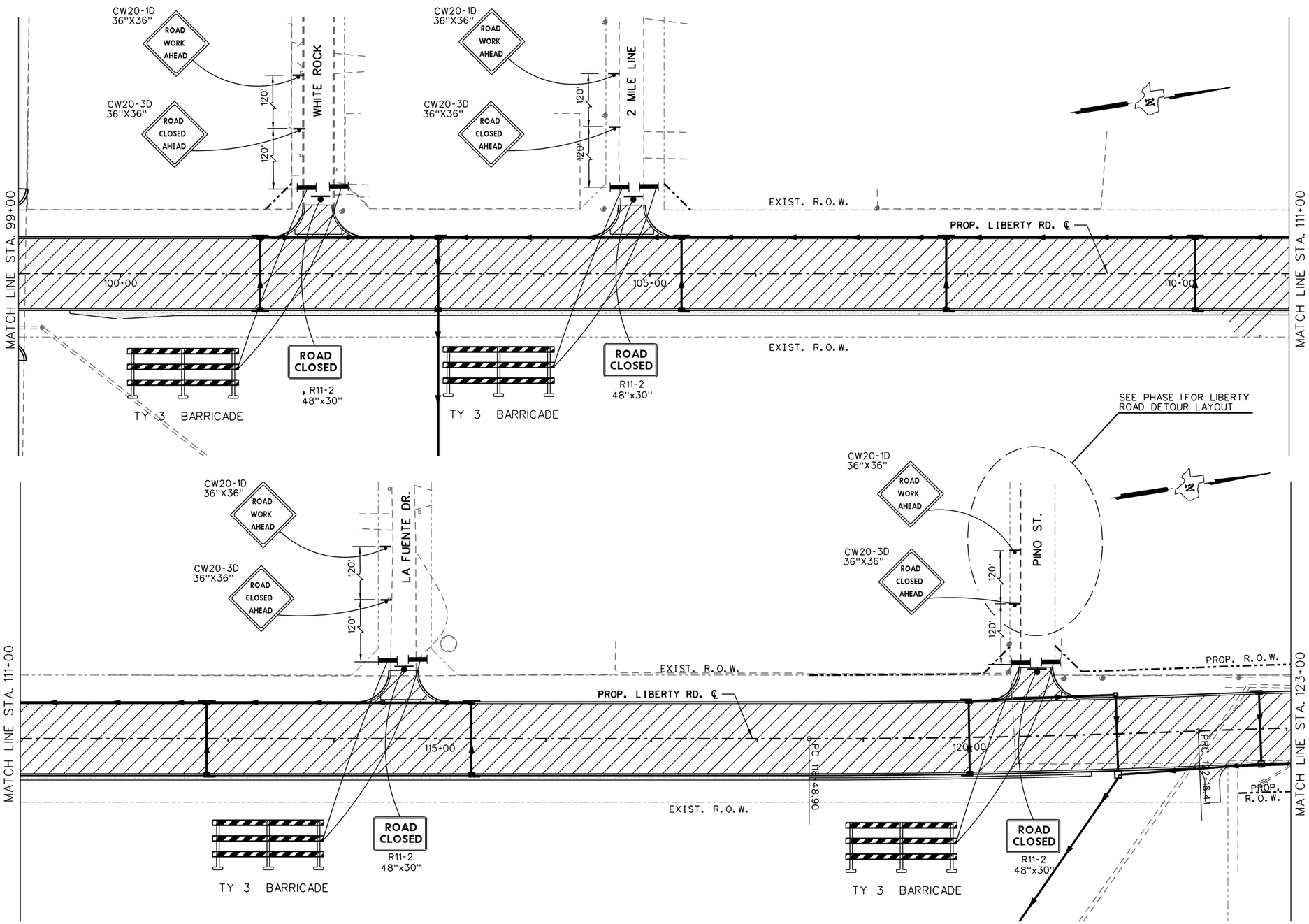
SHEET 4 OF 7

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					33
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

12/3/2020 D:\Liberty Rd (US83 to Mile 3)\02 TCP\02 TCP PHASE 01\Liberty_TCP04_PHASE 01.dgn

SHEET SUMMARY

STATION LIMITS	ITEM 508					PAVEMENT MARKINGS (ITEM 662)											ITEM 677					
	CONSTRUCTING DETOURS (SY)	REFLECTORS		SHORT TERM (TAB)		NON-REMOVABLE							REMOVABLE				ELIMINATING EXISTING PAVEMENT MARKINGS					
		TY I-C (EA)	TY II-A-A (EA)	TY W (EA)	TY Y-2 (EA)	4"WHITE SOLID (LF)	8"WHITE SOLID (LF)	24"WHITE SOLID (LF)	WORD (EA)	ARROW (EA)	4"YELLOW SOLID (LF)	4"YELLOW BROKEN (LF)	4"WHITE (DOT) (LF)	4"WHITE SOLID (LF)	4"YELLOW (DOT) (LF)	4"YELLOW SOLID (LF)	4"PAV'MT MARKINGS (LF)	8"PAV'MT MARKINGS (LF)	12"PAV'MT MARKINGS (LF)	24"PAV'MT MARKINGS (LF)	WORD (EA)	ARROW (EA)
99+00-111+00																						
111+00-123+00																						
TOTAL																						



LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●, ■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD TRAFFIC CONTROL PLAN PHASE I

SCALE 1" = 100'

SHEET 5 OF 7

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				34
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

D:\Liberty Rd (US83 to Mile 3)\02 TCP\02 TCP PHASE 01\Liberty_TCP05_PHASE 01.dgn

11/10/2020

SHEET SUMMARY

STATION LIMITS	ITEM 508					PAVEMENT MARKINGS (ITEM 662)											ITEM 677					
	CONSTRUCTING DETOURS (SY)	REFLECTORS		SHORT TERM (TAB)		NON-REMOVABLE							REMOVABLE				ELIMINATING EXISTING PAVEMENT MARKINGS					
		TY I-C (EA)	TY II-A-A (EA)	TY W (EA)	TY Y-2 (EA)	4"WHITE SOLID (LF)	8"WHITE SOLID (LF)	24"WHITE SOLID (LF)	WORD (EA)	ARROW (EA)	4"YELLOW SOLID (LF)	4"YELLOW BROKEN (LF)	4"WHITE (DOT) (LF)	4"WHITE SOLID (LF)	4"YELLOW (DOT) (LF)	4"YELLOW SOLID (LF)	4"PAV'MT MARKINGS (LF)	8"PAV'MT MARKINGS (LF)	12"PAV'MT MARKINGS (LF)	24"PAV'MT MARKINGS (LF)	WORD (EA)	ARROW (EA)
123+00-135+00																						
135+00-147+00																						
TOTAL																						

LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●, ■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)

END PHASE I
CONSTRUCTION
LIBERTY BLVD
CSJ: 0921-02-194
STA. 124+56

R11-2 48"x30" ROAD CLOSED

TY 3 BARRICADE

CW20-3D 36"X36" ROAD CLOSED AHEAD

CW20-3B 36"X36" ROAD CLOSED 1000 FT

MATCH LINE STA. 123+00

PROP. R.O.W.
EXIST. R.O.W.
PROP. LIBERTY RD. ℄
N 8° 57' 00.49" E
1,208.80'

125+00
PI 125+83.92
130+00
135+00

MATCH LINE STA. 135+00

PROP. R.O.W.

G20-2 36"X18" ROAD WORK END

ASH ST.

R1-1 30"X30" STOP

ROAD WORK NEXT 3 MILE G20-1bTL 72"X24"

CW20-1D 36"X36" ROAD WORK AHEAD

BIRCH ST.

CEDAR ST.

CW20-1D 36"X36" ROAD WORK AHEAD

MATCH LINE STA. 135+00

CW20-1D 36"X36" ROAD WORK AHEAD

G20-1aT 72"X36" ROAD WORK NEXT 1 MILE NEXT 3 MILE

R1-1 30"X30" STOP

MILE 3 RD.

G20-2 36"X18" END ROAD WORK

EXIST. R.O.W.
PROP. LIBERTY RD. ℄
N 8° 38' 53.39" E
920.01'

140+00
PI 137+92.72
145+00

MATCH LINE STA. 147+00

R1-1 30"X30" STOP

END ROAD WORK G20-2 36"X18"

G20-1aT 72"X36" ROAD WORK NEXT 3 MILE NEXT 1 MILE

MILE 3 RD.

CW20-1D 36"X36" ROAD WORK AHEAD

DOGWOOD AVE.

ROAD WORK NEXT 3 MILE G20-1bTL 72"X24"

CW20-1D 36"X36" ROAD WORK AHEAD

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
TRAFFIC CONTROL PLAN
PHASE I

SCALE 1" = 100'

SHEET 6 OF 7

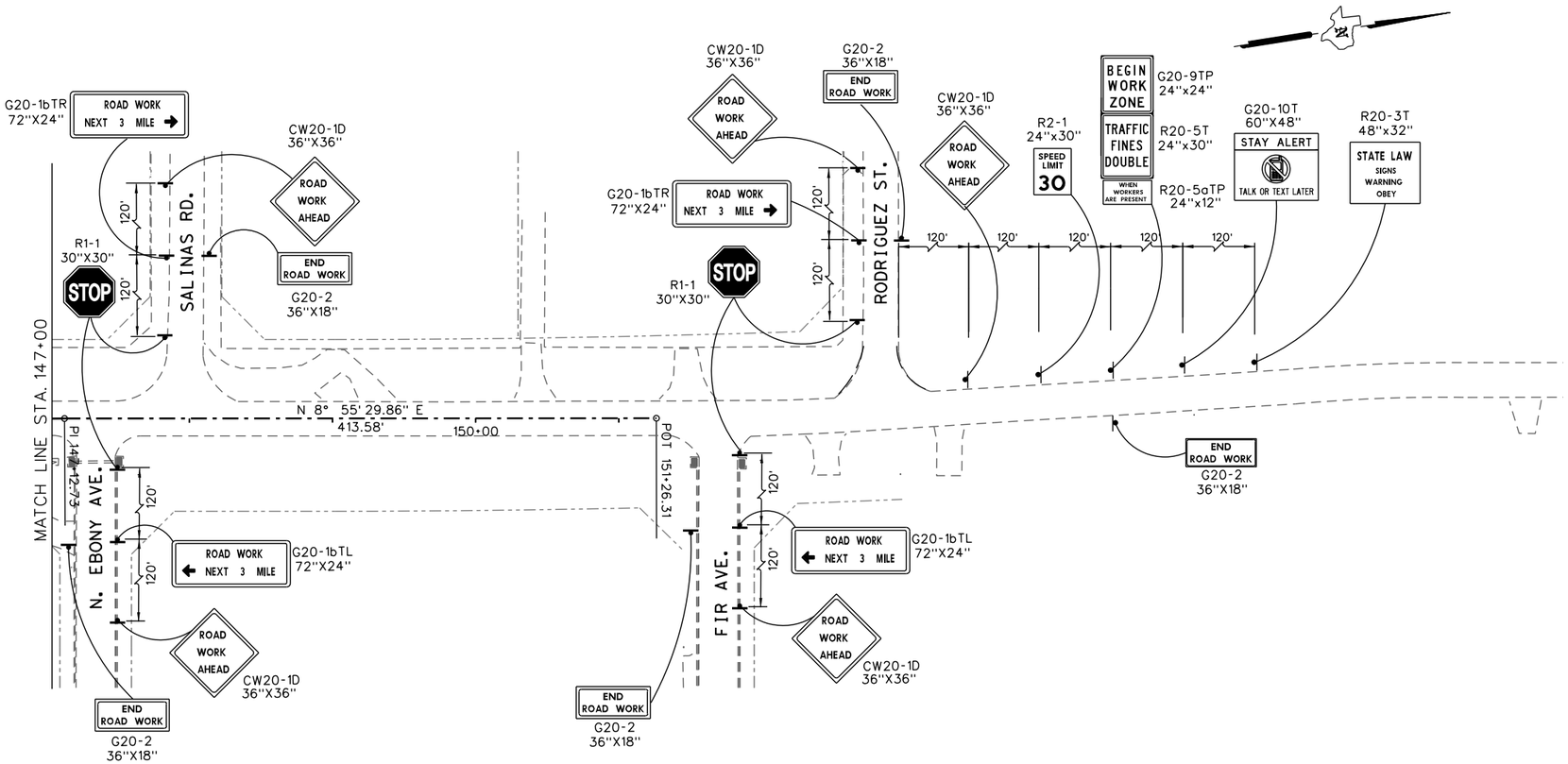
DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.	SHEET NO.
						6	TEXAS		35
						STATE DIST. NO	COUNTY	CONTROL NO. / SECTION NO. / JOB NO.	HIGHWAY NO.
						PHR	HIDALGO	0921 / 02 / 194	LIBERTY

11/10/2020 D:\Liberty Rd (US83 to Mile 3\02 TCP\02 TCP PHASE 01\Liberty_TCP06_PHASE 01.dgn

SHEET SUMMARY

STATION LIMITS	ITEM 508					PAVEMENT MARKINGS (ITEM 662)											ITEM 677					
	CONSTRUCTING DETOURS (SY)	REFLECTORS		SHORT TERM (TAB)		NON-REMOVABLE							REMOVABLE				ELIMINATING EXISTING PAVEMENT MARKINGS					
		TY I-C (EA)	TY II-A-A (EA)	TY W (EA)	TY Y-2 (EA)	4"WHITE SOLID (LF)	8"WHITE SOLID (LF)	24"WHITE SOLID (LF)	WORD (EA)	ARROW (EA)	4"YELLOW SOLID (LF)	4"YELLOW BROKEN (LF)	4"WHITE (DOT) (LF)	4"WHITE SOLID (LF)	4"YELLOW (DOT) (LF)	4"YELLOW SOLID (LF)	4"PAV'MT MARKINGS (LF)	8"PAV'MT MARKINGS (LF)	12"PAV'MT MARKINGS (LF)	24"PAV'MT MARKINGS (LF)	WORD (EA)	ARROW (EA)
147+00-154+00																						
TOTAL																						

LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●, ■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)



STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

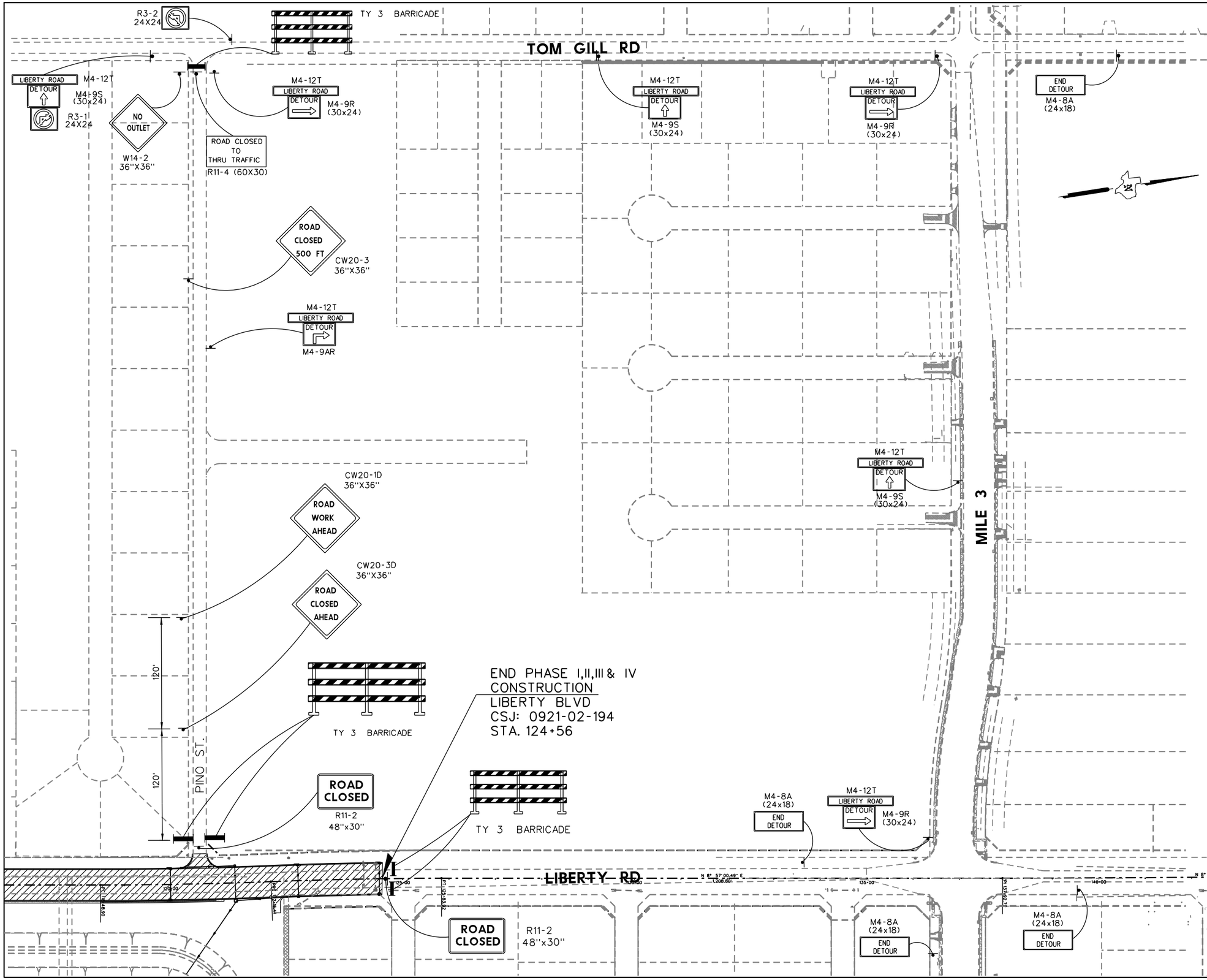
LIBERTY BLVD
TRAFFIC CONTROL PLAN
PHASE I

SCALE 1" = 100'

SHEET 7 OF 7

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				36
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

11/10/2020 D:\Liberty Rd (US83 to Mile 3)\02 TCP\02 TCP PHASE 01\Liberty_TCP07_PHASE 01.dgn



LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●, ■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL LICENSED ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD DETOUR PHASE I, PHASE II, PHASE III AND PHASE IV

SCALE 1" = 100'

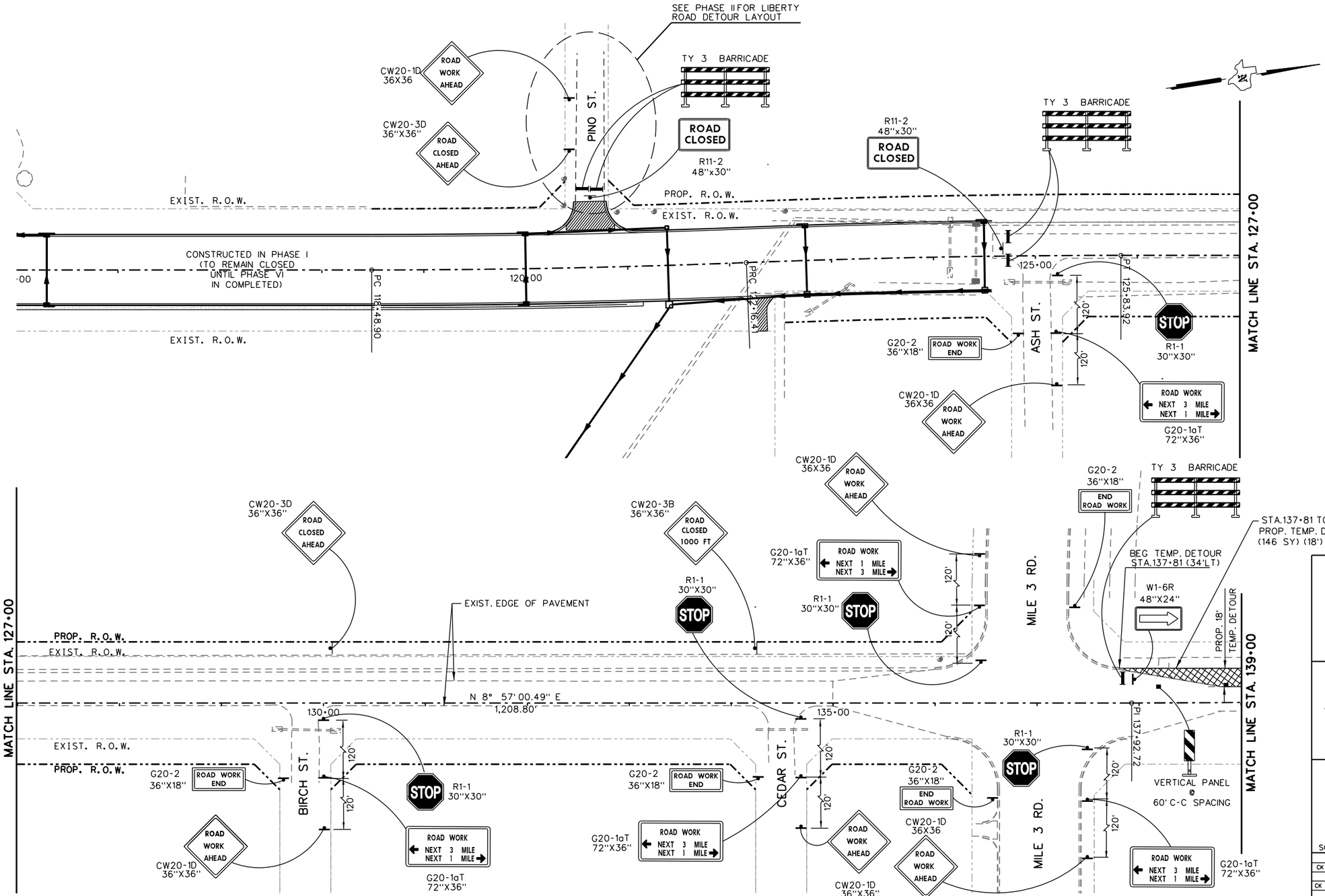
SHEET 1 OF 1

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				37
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

SHEET SUMMARY

STATION LIMITS	ITEM 508	PAVEMENT MARKINGS (ITEM 662)															ITEM 677					
	CONSTRUCTING DETOURS (SY)	REFLECTORS		SHORT TERM (TAB)		NON-REMOVABLE							REMOVABLE				ELIMINATING EXISTING PAVEMENT MARKINGS					
		TY I-C (EA)	TY II-A-A (EA)	TY W (EA)	TY Y-2 (EA)	4"WHITE SOLID (LF)	8"WHITE SOLID (LF)	24"WHITE SOLID (LF)	WORD (EA)	ARROW (EA)	4"YELLOW SOLID (LF)	4"YELLOW BROKEN (LF)	4"WHITE (DOT) (LF)	4"WHITE SOLID (LF)	4"YELLOW (DOT) (LF)	4"YELLOW SOLID (LF)	4"PAV'MT MARKINGS (LF)	8"PAV'MT MARKINGS (LF)	12"PAV'MT MARKINGS (LF)	24"PAV'MT MARKINGS (LF)	WORD (EA)	ARROW (EA)
115+00-127+00																						
127+00-139+00	341																					
TOTAL	341																					

LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●, ■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)



STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL ENGINEER
LICENSED
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD TRAFFIC CONTROL PLAN PHASE II

SCALE 1" = 100' SHEET 1 OF 2

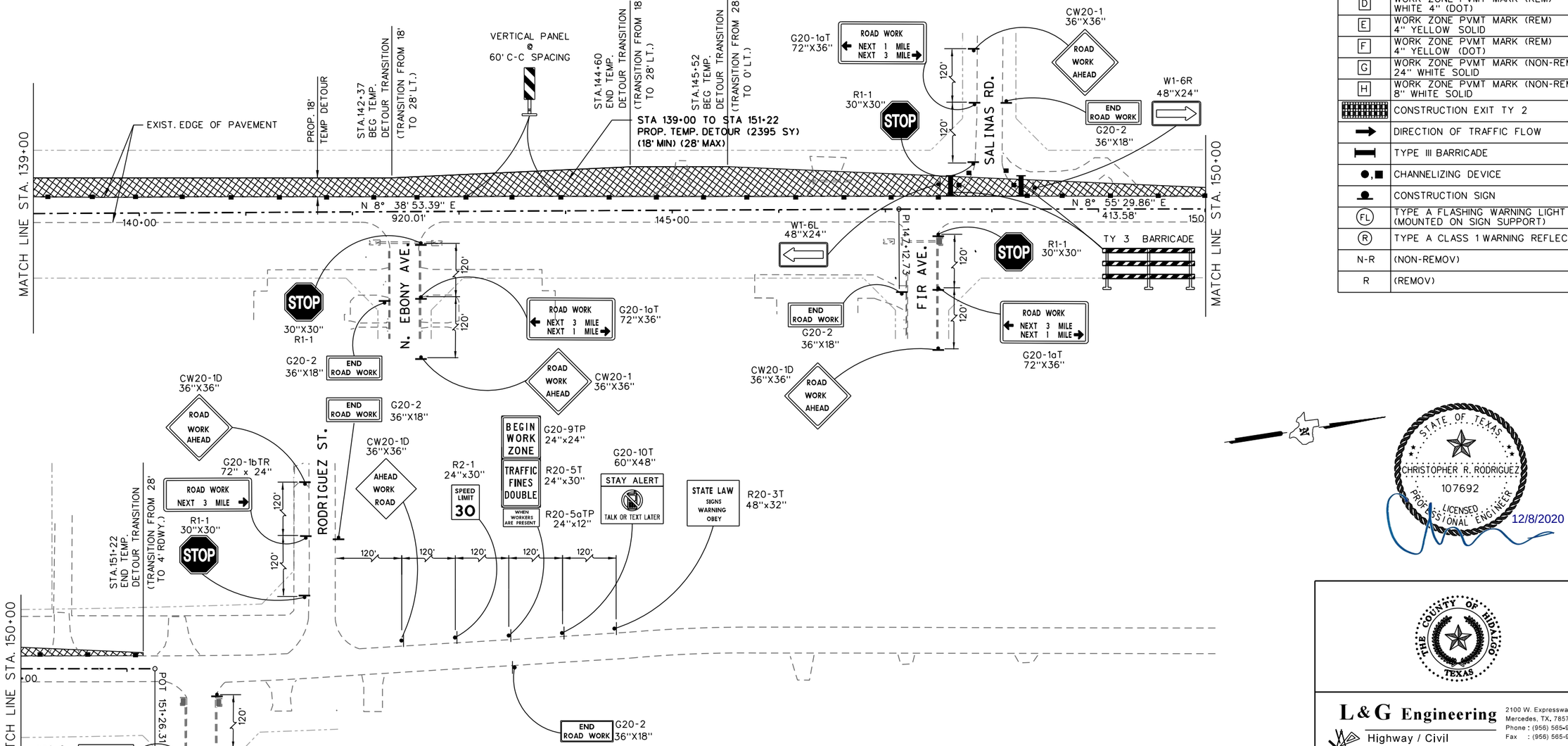
DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					38
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

11/10/2020 D:\Liberty Rd (US83 to Mile 3)\02 TCP\02 TCP PHASE 02\Liberty_TCP01_PHASE 02.dgn

SHEET SUMMARY

STATION LIMITS	ITEM 508					PAVEMENT MARKINGS (ITEM 662)											ITEM 677					
	CONSTRUCTING DETOURS	REFLECTORS		SHORT TERM (TAB)		NON-REMOVABLE							REMOVABLE				ELIMINATING EXISTING PAVEMENT MARKINGS					
	(SY)	TY I-C (EA)	TY II-A-A (EA)	TY W (EA)	TY Y-2 (EA)	4"WHITE SOLID (LF)	8"WHITE SOLID (LF)	24"WHITE SOLID (LF)	WORD (EA)	ARROW (EA)	4"YELLOW SOLID (LF)	4"YELLOW BROKEN (LF)	4"WHITE (DOT) (LF)	4"WHITE SOLID (LF)	4"YELLOW (DOT) (LF)	4"YELLOW SOLID (LF)	4"PAV'MT MARKINGS (LF)	8"PAV'MT MARKINGS (LF)	12"PAV'MT MARKINGS (LF)	24"PAV'MT MARKINGS (LF)	WORD (EA)	ARROW (EA)
139+00-150+00	2395																					
TOTAL	2395																					

LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●, ■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)



CHRISTOPHER R. RODRIGUEZ
107692
STATE OF TEXAS
PROFESSIONAL LICENSED ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
TRAFFIC CONTROL PLAN
PHASE II

SCALE 1" = 100' SHEET 2 OF 2

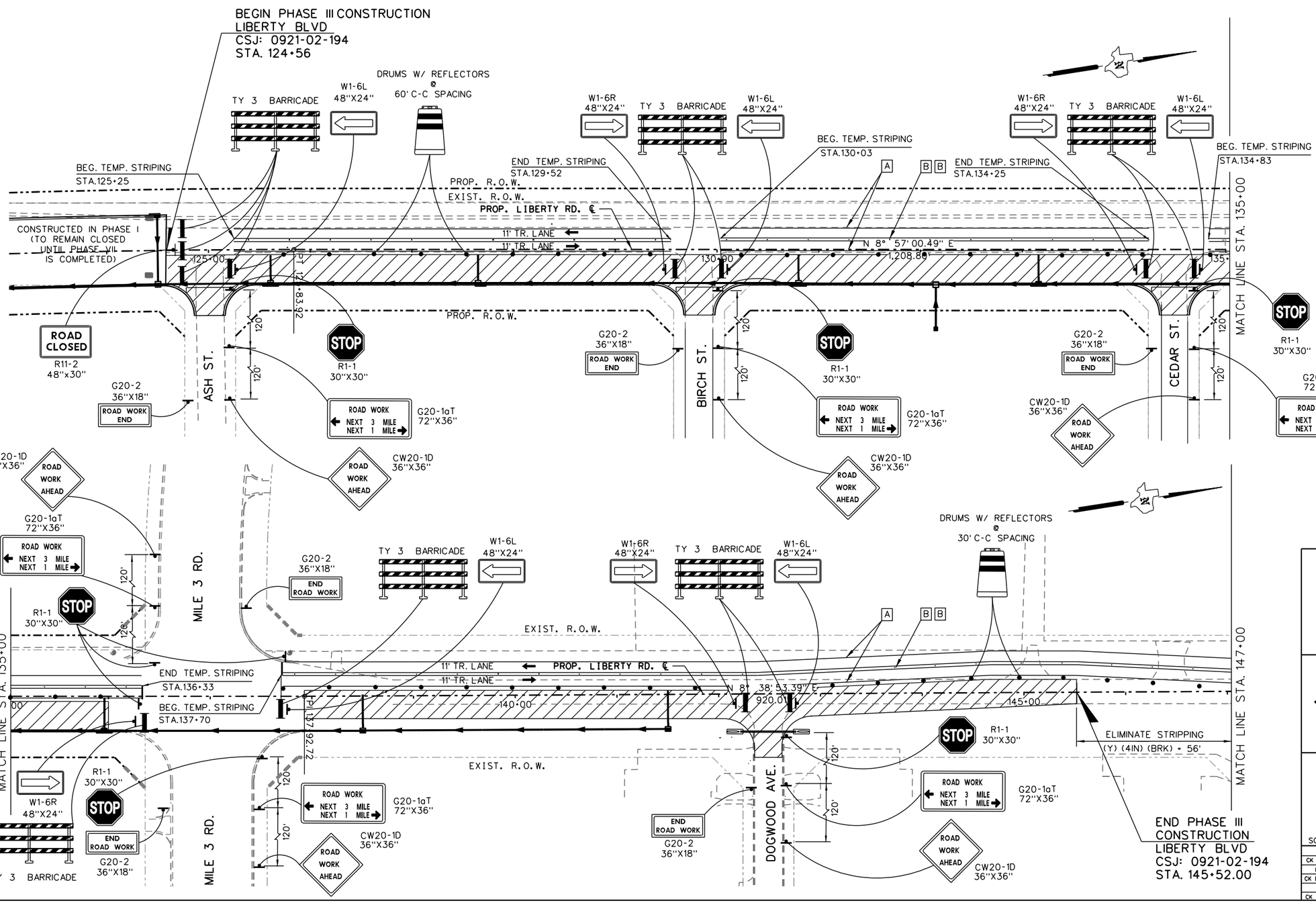
DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				39
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

11/10/2020 D:\Liberty Rd (US83 to Mile 3)\02 TCP\02 TCP PHASE 02\Liberty_TCP02_PHASE 02.dgn

SHEET SUMMARY

STATION LIMITS	ITEM 508					PAVEMENT MARKINGS (ITEM 662)											ITEM 677					
	CONSTRUCTING DETOURS (SY)	REFLECTORS		SHORT TERM (TAB)		NON-REMOVABLE							REMOVABLE				ELIMINATING EXISTING PAVEMENT MARKINGS					
		TY I-C (EA)	TY II-A-A (EA)	TY W (EA)	TY Y-2 (EA)	4"WHITE SOLID (LF)	8"WHITE SOLID (LF)	24"WHITE SOLID (LF)	WORD (EA)	ARROW (EA)	4"YELLOW SOLID (LF)	4"YELLOW BROKEN (LF)	4"WHITE (DOT) (LF)	4"WHITE SOLID (LF)	4"YELLOW (DOT) (LF)	4"YELLOW SOLID (LF)	4"PAV'MT MARKINGS (LF)	8"PAV'MT MARKINGS (LF)	12"PAV'MT MARKINGS (LF)	24"PAV'MT MARKINGS (LF)	WORD (EA)	ARROW (EA)
123+00-135+00			22			1700					1700						56					
135+00-147+00			30			2400	24				2400											
TOTAL			52			4800	24				4800						56					

LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●, ■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)



STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD TRAFFIC CONTROL PLAN PHASE III

SCALE 1" = 100' SHEET 1 OF 2

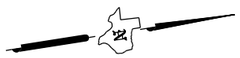
DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				40
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

11/10/2020 D:\Liberty Rd (US83 to Mile 3\02 TCP\02 TCP PHASE 03\Liberty_TCP02_PHASE 03.dgn

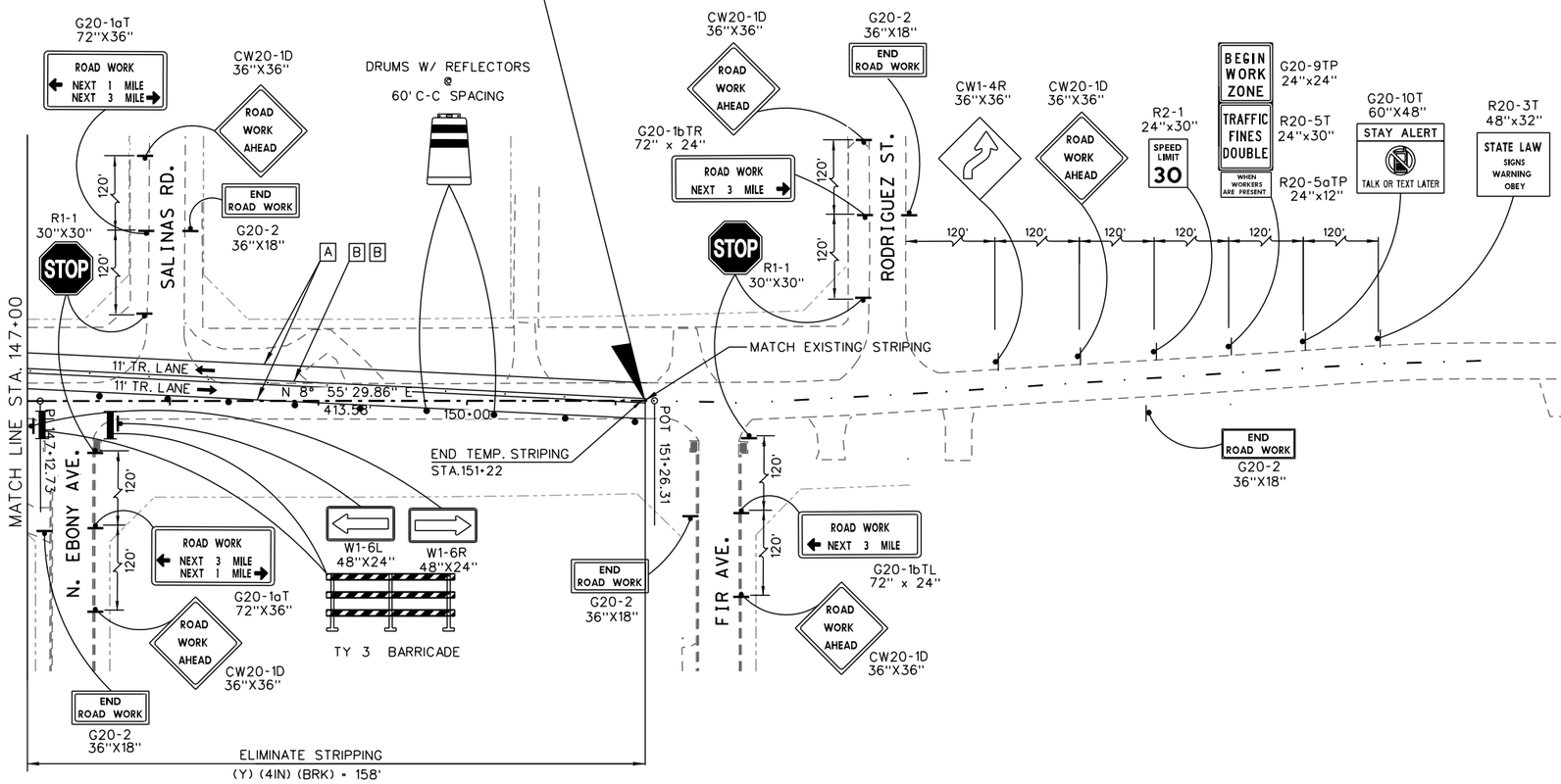
SHEET SUMMARY

STATION LIMITS	ITEM 508					PAVEMENT MARKINGS (ITEM 662)											ITEM 677					
	CONSTRUCTING DETOURS (SY)	REFLECTORS		SHORT TERM (TAB)		NON-REMOVABLE							REMOVABLE				ELIMINATING EXISTING PAVEMENT MARKINGS					
		TY I-C (EA)	TY II-A-A (EA)	TY W (EA)	TY Y-2 (EA)	4"WHITE SOLID (LF)	8"WHITE SOLID (LF)	24"WHITE SOLID (LF)	WORD (EA)	ARROW (EA)	4"YELLOW SOLID (LF)	4"YELLOW BROKEN (LF)	4"WHITE (DOT) (LF)	4"WHITE SOLID (LF)	4"YELLOW (DOT) (LF)	4"YELLOW SOLID (LF)	4"PAV'MT MARKINGS (LF)	8"PAV'MT MARKINGS (LF)	12"PAV'MT MARKINGS (LF)	24"PAV'MT MARKINGS (LF)	WORD (EA)	ARROW (EA)
147+00-159+00			25			1924					1924						158					
TOTAL			25			1924					1924						158					

LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●, ■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)



END PHASE III CONSTRUCTION
LIBERTY BLVD
CSJ: 0921-02-194
STA. 151+22.00



STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD TRAFFIC CONTROL PLAN PHASE III

SCALE 1" = 100'

SHEET 2 OF 2

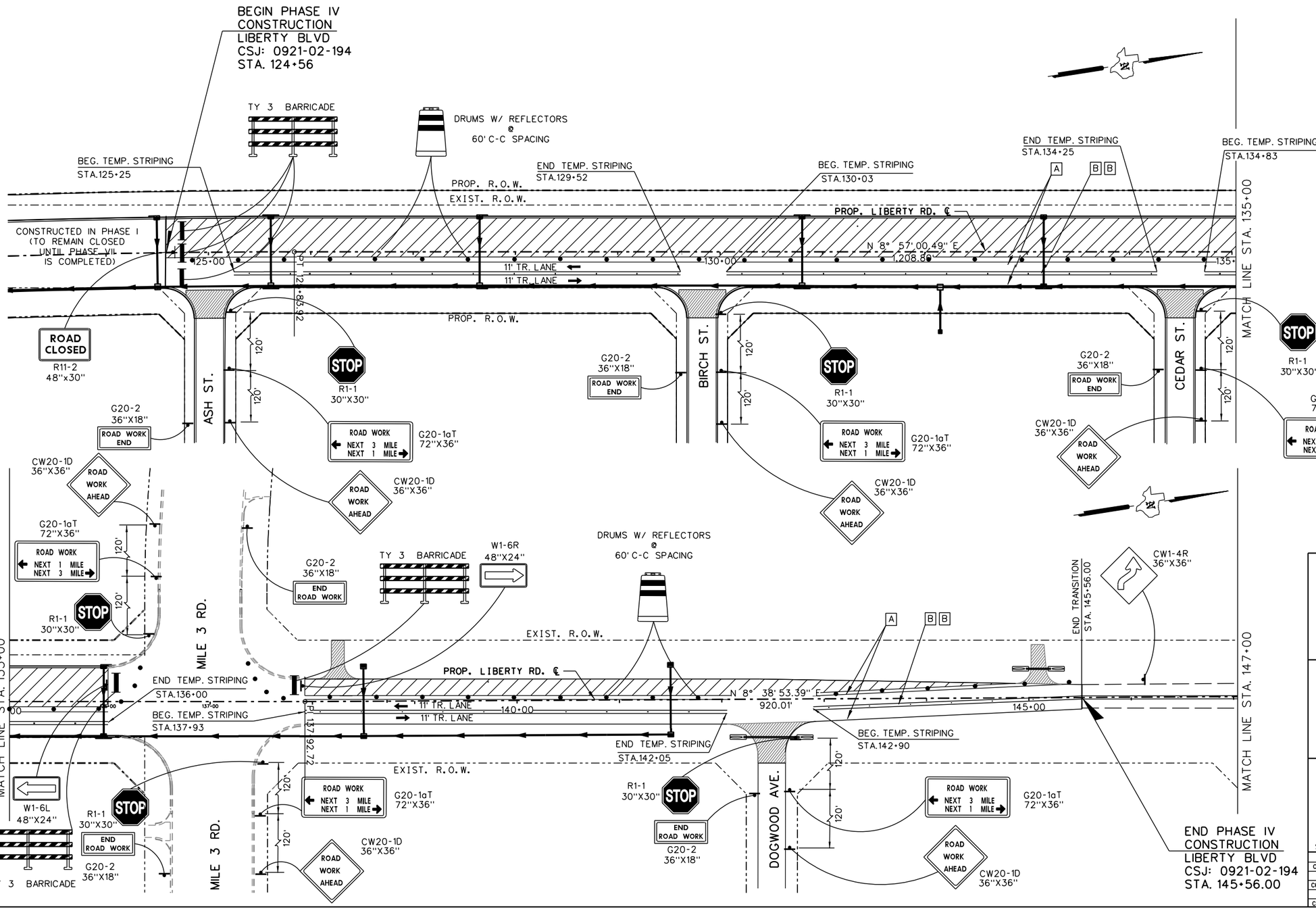
DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				41
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

11/10/2020 D:\Liberty Rd (US83 to Mile 3)\02 TCP\02 TCP PHASE 03\Liberty_TCP03_PHASE 03.dgn

SHEET SUMMARY

STATION LIMITS	ITEM 508					PAVEMENT MARKINGS (ITEM 662)											ITEM 677					
	CONSTRUCTING DETOURS (SY)	REFLECTORS		SHORT TERM (TAB)		NON-REMOVABLE							REMOVABLE				ELIMINATING EXISTING PAVEMENT MARKINGS					
		TY I-C (EA)	TY II-A-A (EA)	TY W (EA)	TY Y-2 (EA)	4"WHITE SOLID (LF)	8"WHITE SOLID (LF)	24"WHITE SOLID (LF)	WORD (EA)	ARROW (EA)	4"YELLOW SOLID (LF)	4"YELLOW BROKEN (LF)	4"WHITE (DOT) (LF)	4"WHITE SOLID (LF)	4"YELLOW (DOT) (LF)	4"YELLOW SOLID (LF)	4"PAV'MT MARKINGS (LF)	8"PAV'MT MARKINGS (LF)	12"PAV'MT MARKINGS (LF)	24"PAV'MT MARKINGS (LF)	WORD (EA)	ARROW (EA)
123+00-135+00			22			850					1700											
135+00-147+00			26			1043					2086											
TOTAL			48			1853					3786											

LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●, ■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)



STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD TRAFFIC CONTROL PLAN PHASE IV

SCALE 1" = 100' SHEET 1 OF 2

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				42
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

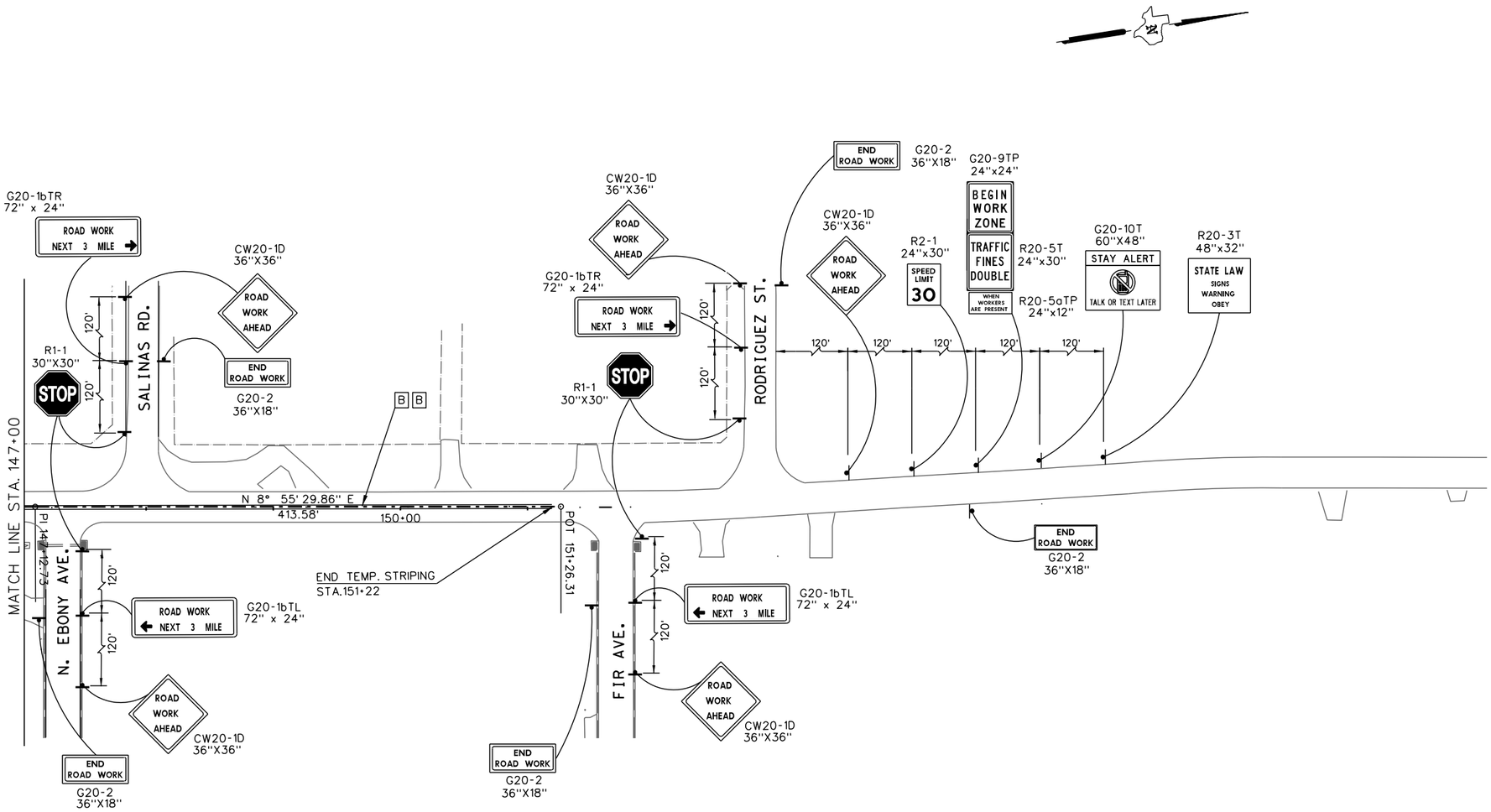
D:\Liberty Rd (US83 to Mile 3\02 TCP\02 TCP PHASE 04\Liberty_TCP02_PHASE 04.dgn

11/10/2020

SHEET SUMMARY

STATION LIMITS	ITEM 508					PAVEMENT MARKINGS (ITEM 662)											ITEM 677					
	CONSTRUCTING DETOURS (SY)	REFLECTORS		SHORT TERM (TAB)		NON-REMOVABLE							REMOVABLE				ELIMINATING EXISTING PAVEMENT MARKINGS					
		TY I-C (EA)	TY II-A-A (EA)	TY W (EA)	TY Y-2 (EA)	4"WHITE SOLID (LF)	8"WHITE SOLID (LF)	24"WHITE SOLID (LF)	WORD (EA)	ARROW (EA)	4"YELLOW SOLID (LF)	4"YELLOW BROKEN (LF)	4"WHITE (DOT) (LF)	4"WHITE SOLID (LF)	4"YELLOW (DOT) (LF)	4"YELLOW SOLID (LF)	4"PAV'MT MARKINGS (LF)	8"PAV'MT MARKINGS (LF)	12"PAV'MT MARKINGS (LF)	24"PAV'MT MARKINGS (LF)	WORD (EA)	ARROW (EA)
147+00-159+00			10													844						
TOTAL			10													844						

LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●, ■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)



STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL LICENSED ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
TRAFFIC CONTROL PLAN
PHASE IV

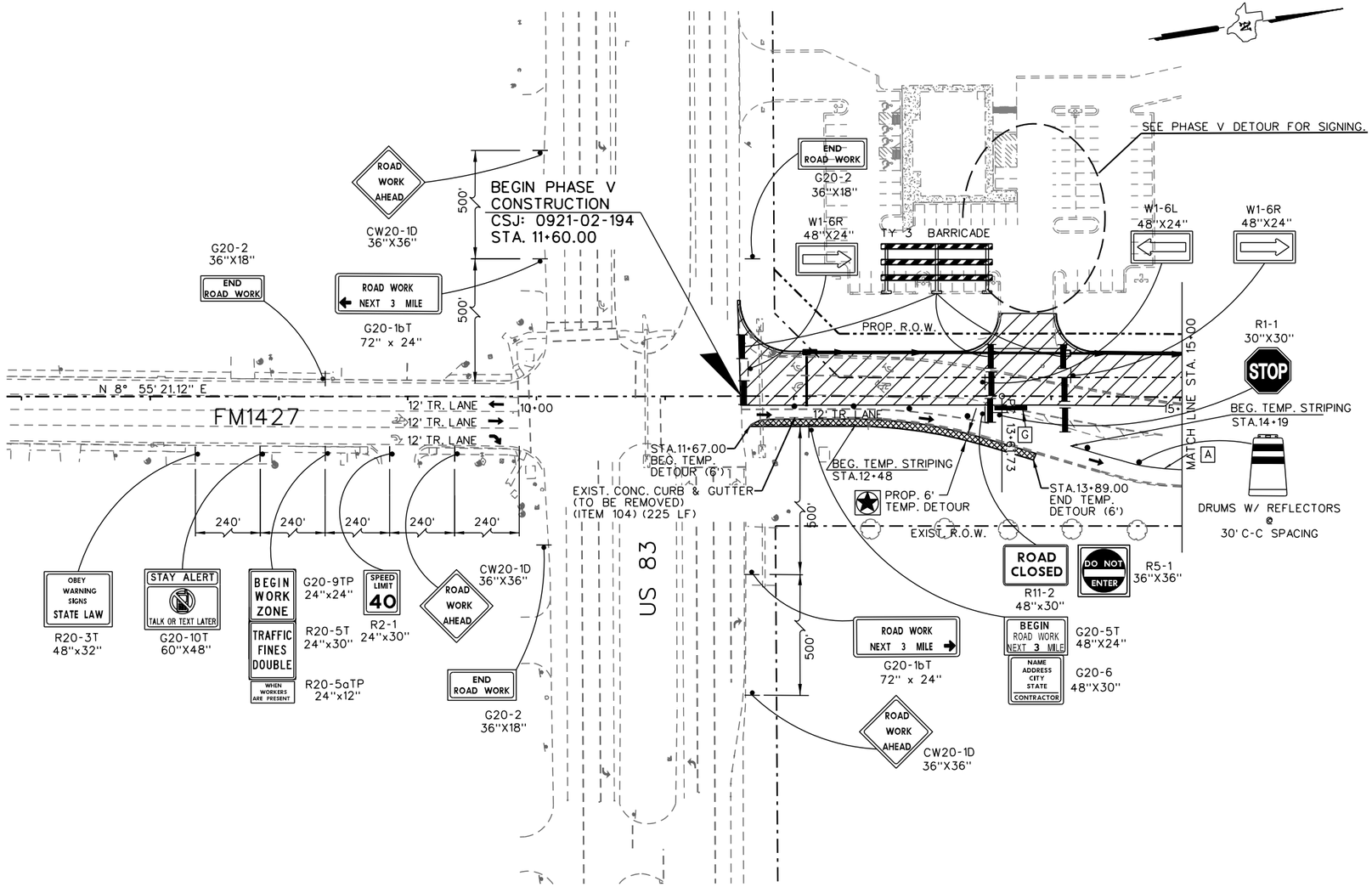
SCALE 1" = 100' SHEET 2 OF 2

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				43
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

11/10/2020 D:\Liberty Rd (US83 to Mile 3)\02 TCP\02 TCP PHASE 04\Liberty_TCP03_PHASE 04.dgn

SHEET SUMMARY

STATION LIMITS	ITEM 508					PAVEMENT MARKINGS (ITEM 662)											ITEM 677					
	CONSTRUCTING DETOURS (SY)	REFLECTORS		SHORT TERM (TAB)		NON-REMOVABLE							REMOVABLE				ELIMINATING EXISTING PAVEMENT MARKINGS					
		TY I-C (EA)	TY II-A-A (EA)	TY W (EA)	TY Y-2 (EA)	4"WHITE SOLID (LF)	8"WHITE SOLID (LF)	24"WHITE SOLID (LF)	WORD (EA)	ARROW (EA)	4"YELLOW SOLID (LF)	4"YELLOW BROKEN (LF)	4"WHITE (DOT) (LF)	4"WHITE SOLID (LF)	4"YELLOW (DOT) (LF)	4"YELLOW SOLID (LF)	4"PAV'MT MARKINGS (LF)	8"PAV'MT MARKINGS (LF)	12"PAV'MT MARKINGS (LF)	24"PAV'MT MARKINGS (LF)	WORD (EA)	ARROW (EA)
5+00-15+00						81																
TOTAL						81																



LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●, ■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)

STA.11+67 (RT) TO STA.13+89 (RT) PROP. TEMP. DETOUR SHALL BE CONSTRUCTED PRIOR TO FULL ROADWAY CONSTRUCTION.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL LICENSED ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
TRAFFIC CONTROL PLAN
PHASE V

SCALE 1" = 100'

SHEET 1 OF 3

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
		6	TEXAS				44
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
TR:		PHR	HIDALGO	0921	02	194	LIBERTY
CK TR:							

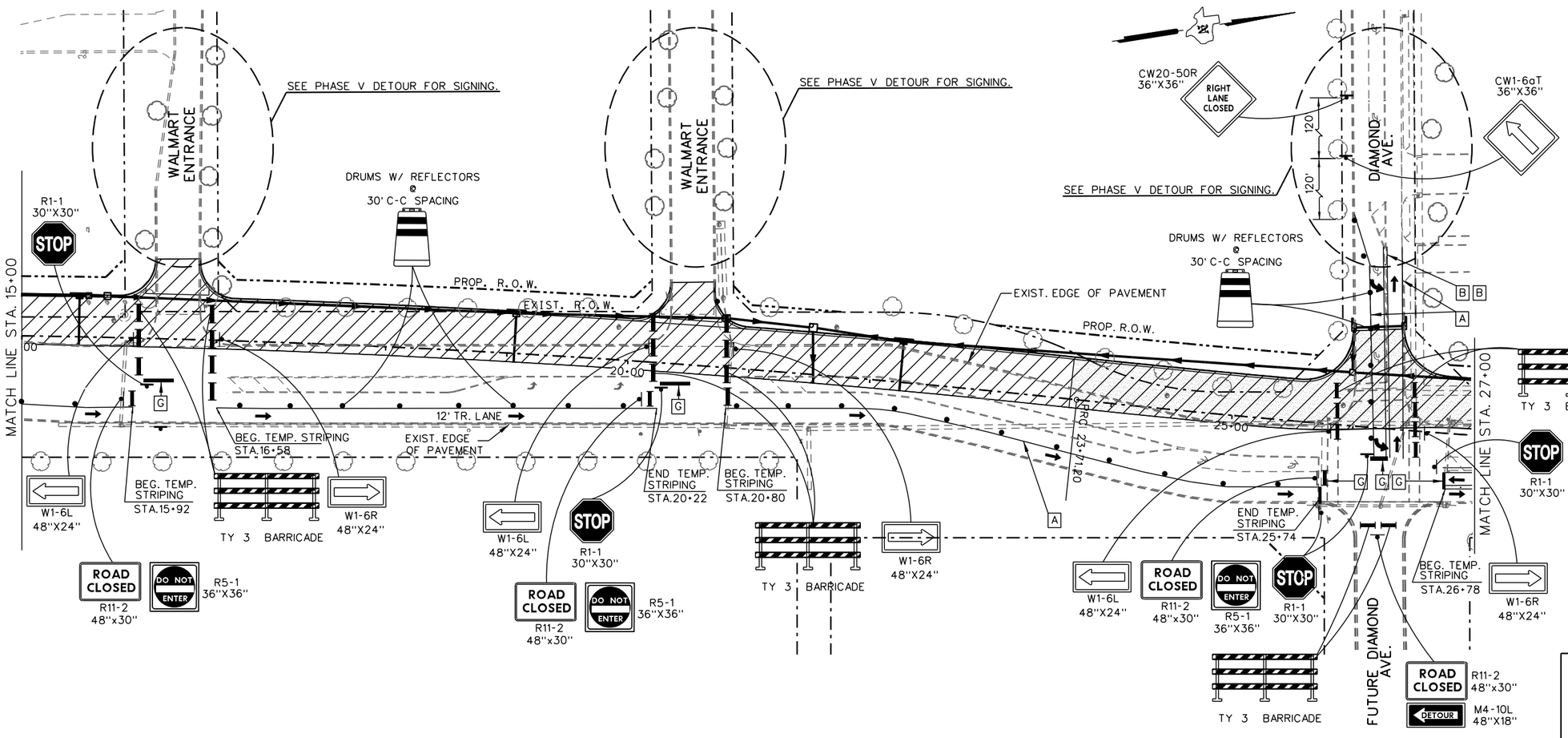
$FILE$

$DATE$

SHEET SUMMARY

STATION LIMITS	ITEM 508					PAVEMENT MARKINGS (ITEM 662)											ITEM 677					
	CONSTRUCTING DETOURS (SY)	REFLECTORS		SHORT TERM (TAB)		NON-REMOVABLE							REMOVABLE				ELIMINATING EXISTING PAVEMENT MARKINGS					
		TY I-C (EA)	TY II-A-A (EA)	TY W (EA)	TY Y-2 (EA)	4"WHITE SOLID (LF)	8"WHITE SOLID (LF)	24"WHITE SOLID (LF)	WORD (EA)	ARROW (EA)	4"YELLOW SOLID (LF)	4"YELLOW BROKEN (LF)	4"WHITE (DOT) (LF)	4"WHITE SOLID (LF)	4"YELLOW (DOT) (LF)	4"YELLOW SOLID (LF)	4"PAV'MT MARKINGS (LF)	8"PAV'MT MARKINGS (LF)	12"PAV'MT MARKINGS (LF)	24"PAV'MT MARKINGS (LF)	WORD (EA)	ARROW (EA)
15+00-27+00			5			972		72			300											
TOTAL			5			972		72			300											

LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●, ■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)



STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
TRAFFIC CONTROL PLAN
PHASE V

SCALE 1" = 100' SHEET 2 OF 3

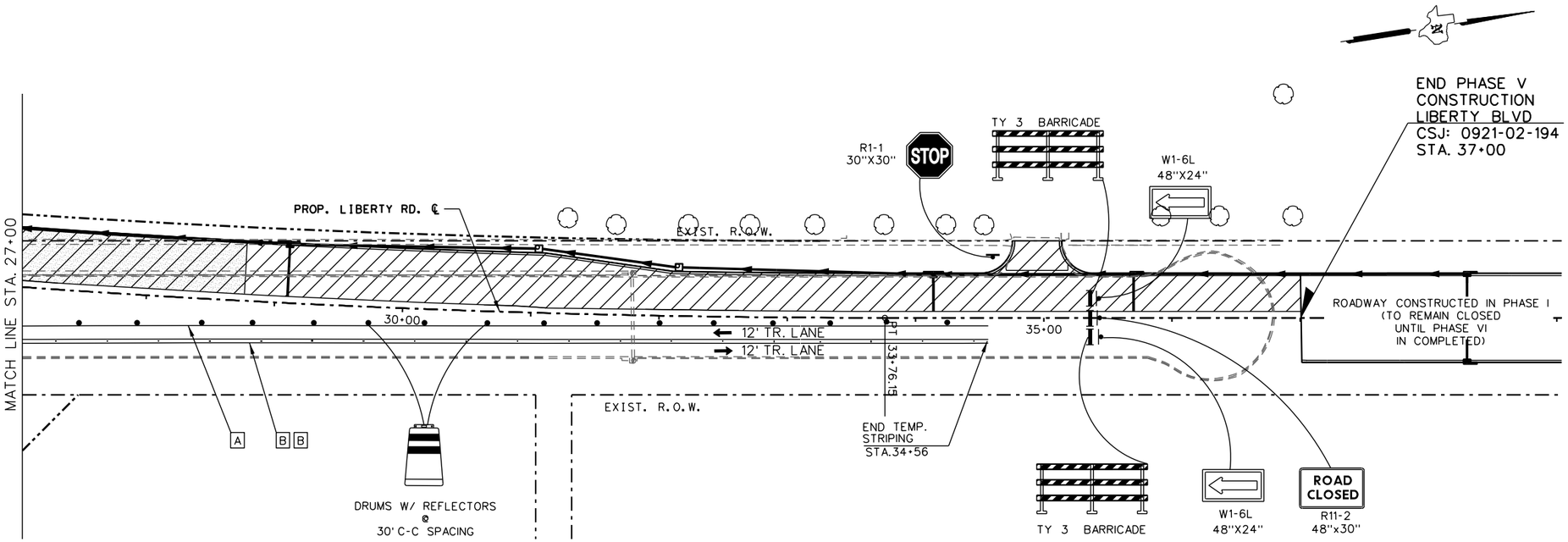
DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				45
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

$FILE$

$DATE$

SHEET SUMMARY

STATION LIMITS	ITEM 508	ITEM 662															ITEM 677					
	CONSTRUCTING DETOURS (SY)	REFLECTORS		SHORT TERM (TAB)		NON-REMOVABLE							REMOVABLE				ELIMINATING EXISTING PAVEMENT MARKINGS					
		TY I-C (EA)	TY II-A-A (EA)	TY W (EA)	TY Y-2 (EA)	4"WHITE SOLID (LF)	8"WHITE SOLID (LF)	24"WHITE SOLID (LF)	WORD (EA)	ARROW (EA)	4"YELLOW SOLID (LF)	4"YELLOW BROKEN (LF)	4"WHITE (DOT) (LF)	4"WHITE SOLID (LF)	4"YELLOW (DOT) (LF)	4"YELLOW SOLID (LF)	4"PAV'MT MARKINGS (LF)	8"PAV'MT MARKINGS (LF)	12"PAV'MT MARKINGS (LF)	24"PAV'MT MARKINGS (LF)	WORD (EA)	ARROW (EA)
27+00-39+00			20			750					1500											
TOTAL			20			750					1500											



LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
→	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●,■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
TRAFFIC CONTROL PLAN
PHASE V

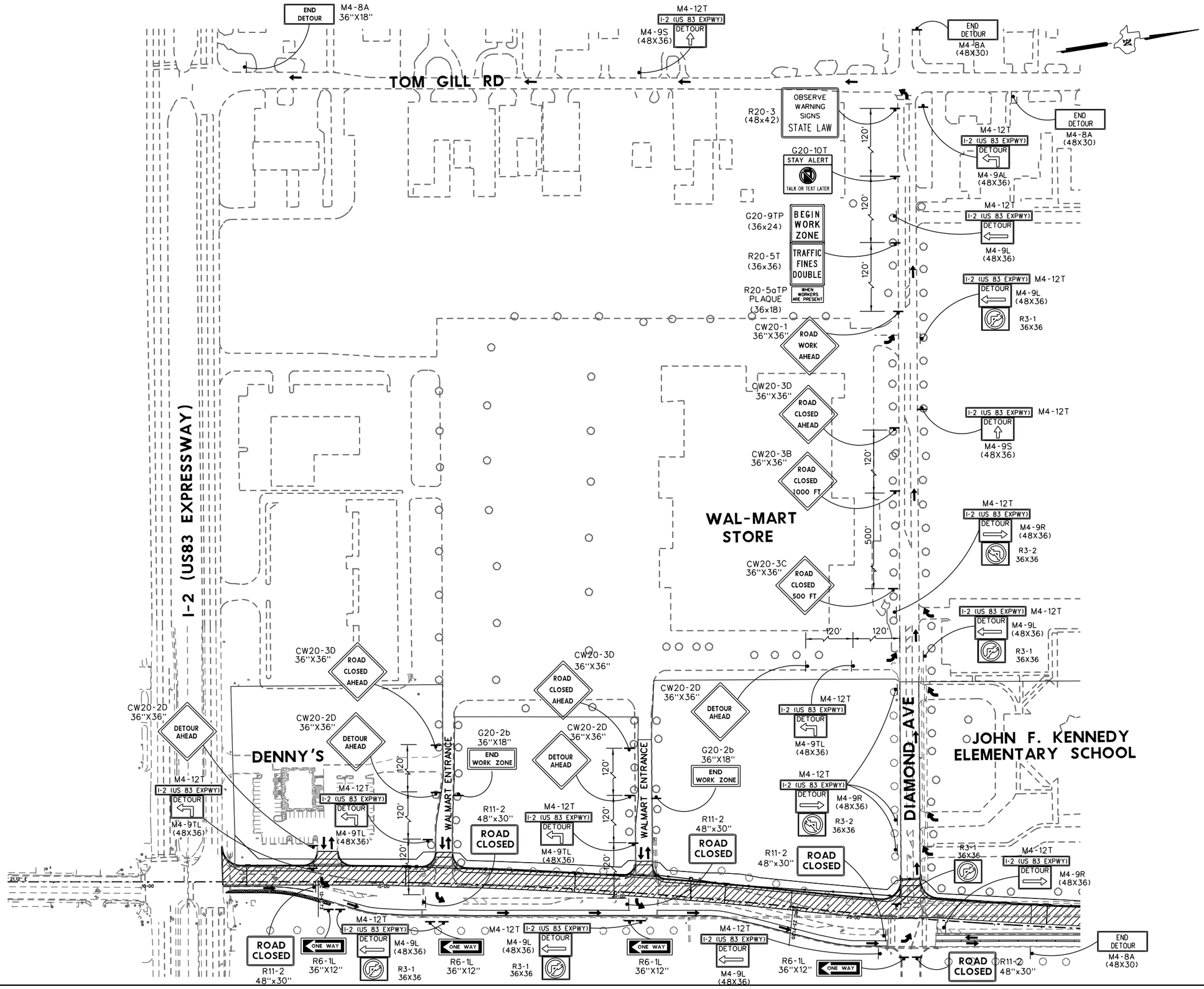
SCALE 1" = 100'

SHEET 3 OF 3

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					46
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

$FILE$

$DATE$



LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●, ■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
08/04/2020

THE COUNTY OF HIDALGO TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD DETOUR PHASE V

SCALE 1" = 100'

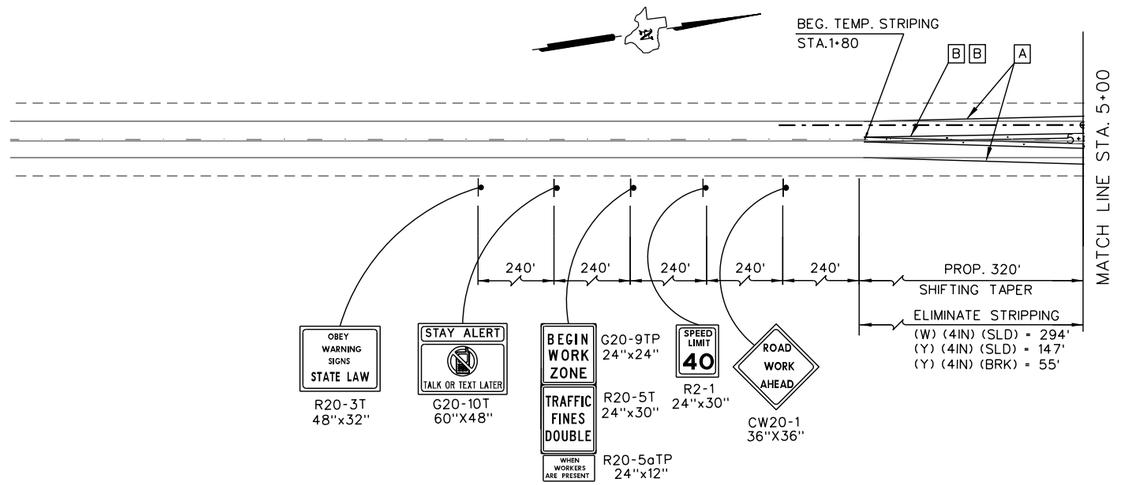
SHEET 1 OF 1

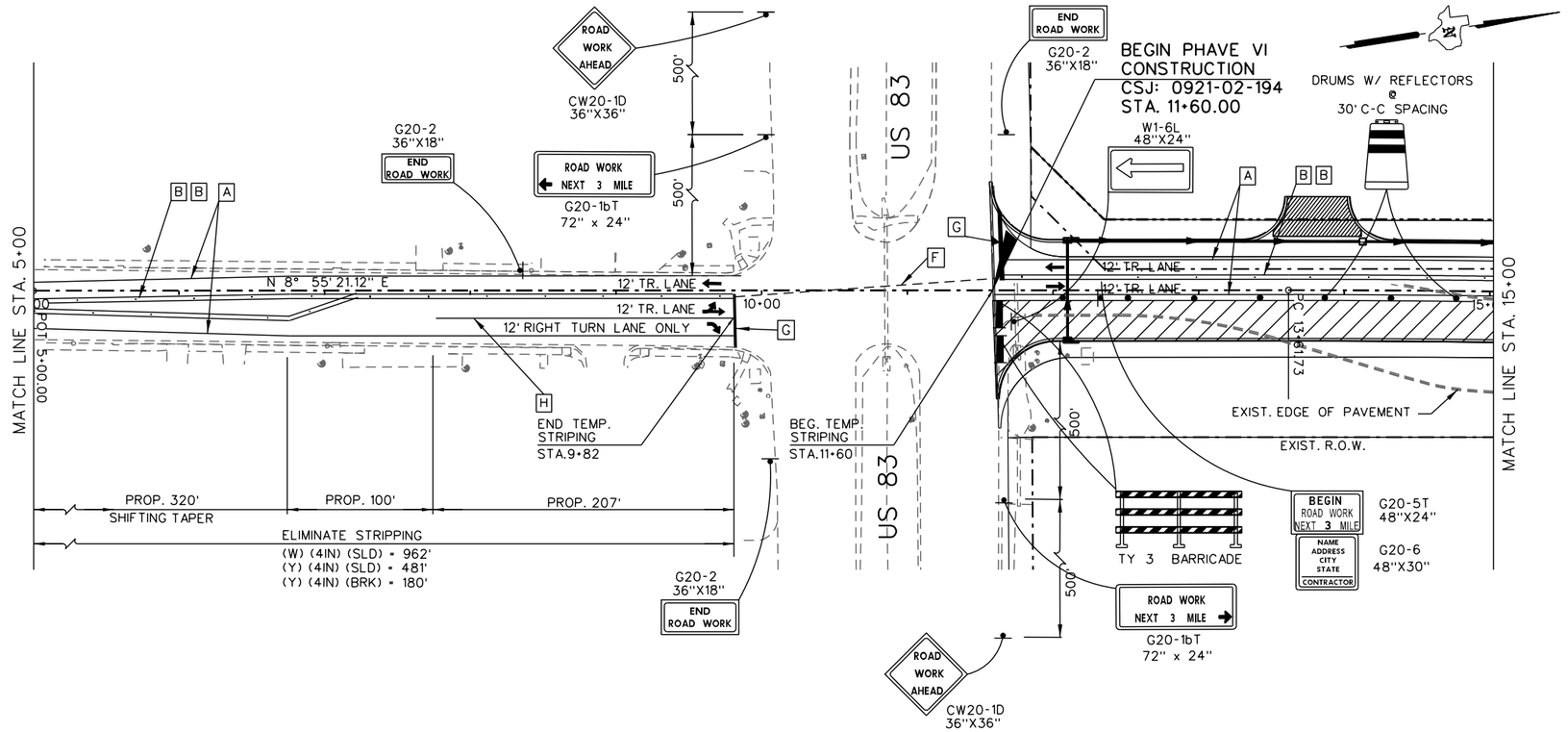
DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				47
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

SHEET SUMMARY

STATION LIMITS	ITEM 508					PAVEMENT MARKINGS (ITEM 662)											ITEM 677					
	CONSTRUCTING DETOURS (SY)	REFLECTORS		SHORT TERM (TAB)		NON-REMOVABLE							REMOVABLE				ELIMINATING EXISTING PAVEMENT MARKINGS					
		TY I-C (EA)	TY II-A-A (EA)	TY W (EA)	TY Y-2 (EA)	4"WHITE SOLID (LF)	8"WHITE SOLID (LF)	24"WHITE SOLID (LF)	WORD (EA)	ARROW (EA)	4"YELLOW SOLID (LF)	4"YELLOW BROKEN (LF)	4"WHITE (DOT) (LF)	4"WHITE SOLID (LF)	4"YELLOW (DOT) (LF)	4"YELLOW SOLID (LF)	4"PAV'MT MARKINGS (LF)	8"PAV'MT MARKINGS (LF)	12"PAV'MT MARKINGS (LF)	24"PAV'MT MARKINGS (LF)	WORD (EA)	ARROW (EA)
0+00-5+00			8			300					600											
5+00-15+00			50			1642	207	96			1996				177							
TOTAL			58			1942	207	96			2596				177							

LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●, ■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)





STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
TRAFFIC CONTROL PLAN
PHASE VI

SCALE 1" = 100'

SHEET 1 OF 3

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					48
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

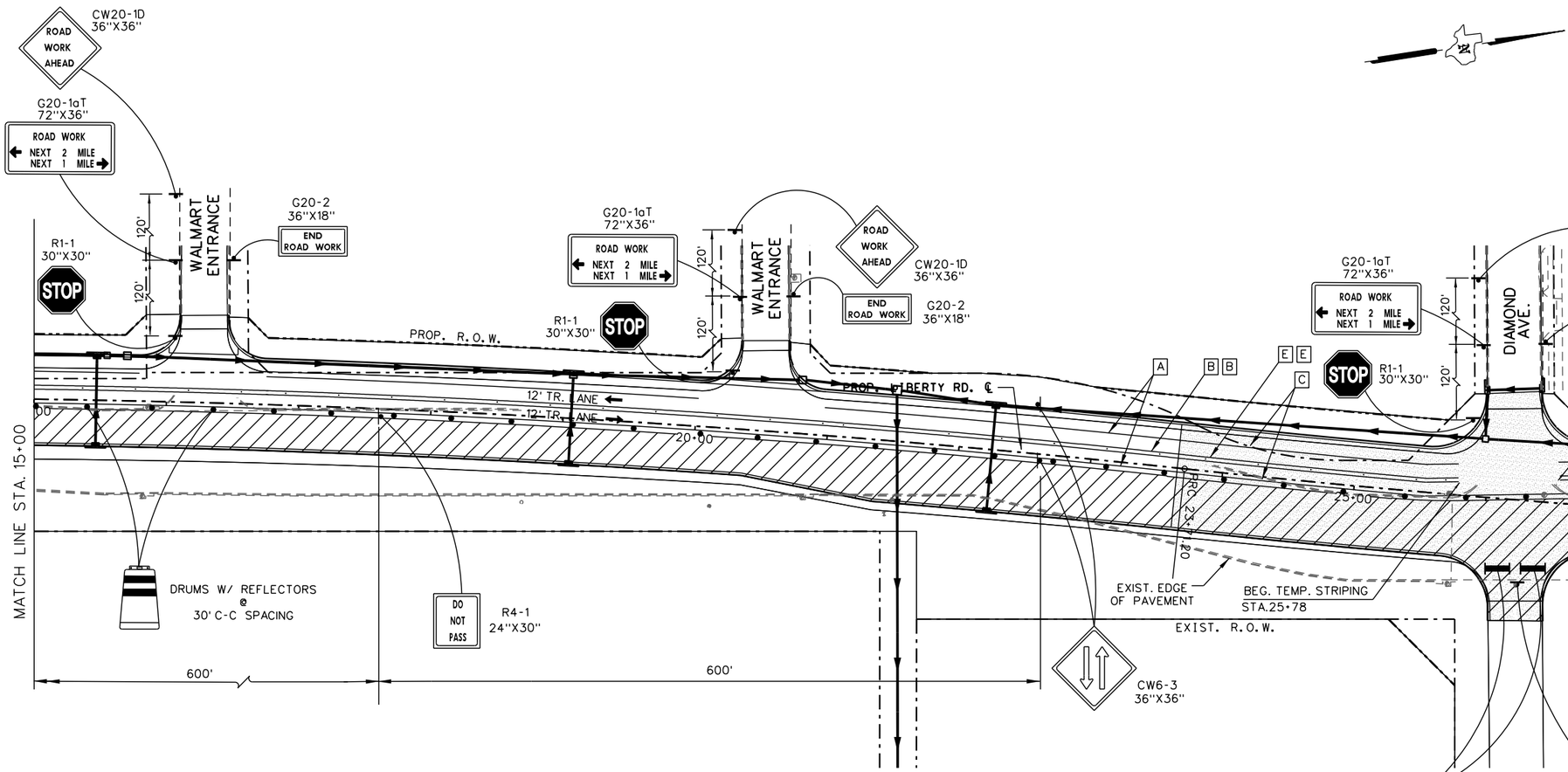
$FILE$

$DATE$

SHEET SUMMARY

STATION LIMITS	ITEM 508					PAVEMENT MARKINGS (ITEM 662)											ITEM 677					
	CONSTRUCTING DETOURS (SY)	REFLECTORS		SHORT TERM (TAB)		NON-REMOVABLE							REMOVABLE				ELIMINATING EXISTING PAVEMENT MARKINGS					
		TY I-C (EA)	TY II-A-A (EA)	TY W (EA)	TY Y-2 (EA)	4"WHITE SOLID (LF)	8"WHITE SOLID (LF)	24"WHITE SOLID (LF)	WORD (EA)	ARROW (EA)	4"YELLOW SOLID (LF)	4"YELLOW BROKEN (LF)	4"WHITE (DOT) (LF)	4"WHITE SOLID (LF)	4"YELLOW (DOT) (LF)	4"YELLOW SOLID (LF)	4"PAV'MT MARKINGS (LF)	8"PAV'MT MARKINGS (LF)	12"PAV'MT MARKINGS (LF)	24"PAV'MT MARKINGS (LF)	WORD (EA)	ARROW (EA)
15+00-27+00			30			2400	14				1892					508						
TOTAL			30			2400	14				1892					508						

LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E E	WORK ZONE PVMT MARK (REM) 4" DOUBLE YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●, ■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)



STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD TRAFFIC CONTROL PLAN PHASE VI

SCALE 1" = 100'

SHEET 2 OF 3

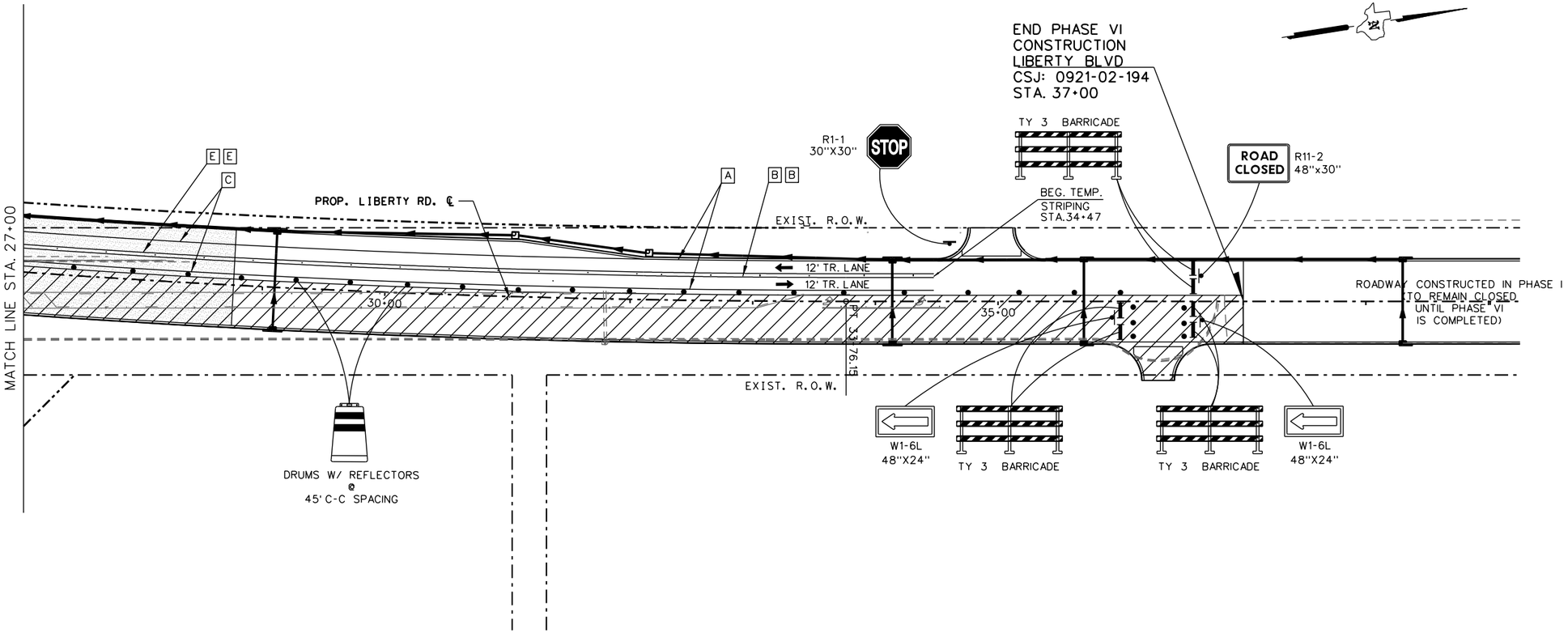
DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				49
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

$FILE$

$DATE$

SHEET SUMMARY

STATION LIMITS	ITEM 508					PAVEMENT MARKINGS (ITEM 662)											ITEM 677					
	CONSTRUCTING DETOURS (SY)	REFLECTORS		SHORT TERM (TAB)		NON-REMOVABLE							REMOVABLE				ELIMINATING EXISTING PAVEMENT MARKINGS					
		TY I-C (EA)	TY II-A-A (EA)	TY W (EA)	TY Y-2 (EA)	4"WHITE SOLID (LF)	8"WHITE SOLID (LF)	24"WHITE SOLID (LF)	WORD (EA)	ARROW (EA)	4"YELLOW SOLID (LF)	4"YELLOW BROKEN (LF)	4"WHITE (DOT) (LF)	4"WHITE SOLID (LF)	4"YELLOW (DOT) (LF)	4"YELLOW SOLID (LF)	4"PAV'MT MARKINGS (LF)	8"PAV'MT MARKINGS (LF)	12"PAV'MT MARKINGS (LF)	24"PAV'MT MARKINGS (LF)	WORD (EA)	ARROW (EA)
27+00-37+00			10			1156					1156			344		344						
TOTAL			10			1156					1156			344		344						



LEGEND	
	CONSTRUCTION PHASE
	TEMPORARY CONST. DETOUR
A	WORK ZONE PVMT MARK (NON-REM) 4" WHITE SOLID
B	WORK ZONE PVMT MARK (NON-REM) 4" YELLOW SOLID
B B	WORK ZONE PVMT MARK (NON-REM) 4" DOUBLE YELLOW SOLID
C	WORK ZONE PVMT MARK (REM) 4" WHITE SOLID
D	WORK ZONE PVMT MARK (REM) WHITE 4" (DOT)
E	WORK ZONE PVMT MARK (REM) 4" YELLOW SOLID
F	WORK ZONE PVMT MARK (REM) 4" YELLOW (DOT)
G	WORK ZONE PVMT MARK (NON-REM) 24" WHITE SOLID
H	WORK ZONE PVMT MARK (NON-REM) 8" WHITE SOLID
	CONSTRUCTION EXIT TY 2
	DIRECTION OF TRAFFIC FLOW
	TYPE III BARRICADE
●,■	CHANNELIZING DEVICE
	CONSTRUCTION SIGN
FL	TYPE A FLASHING WARNING LIGHT (MOUNTED ON SIGN SUPPORT)
R	TYPE A CLASS 1 WARNING REFLECTOR
N-R	(NON-REMOV)
R	(REMOV)

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL LICENSED ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
TRAFFIC CONTROL PLAN
PHASE VI

SCALE 1" = 100' SHEET 3 OF 3

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					50
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

$FILE$

$DATE$

DISCLAIMER:
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: 12/17/2021 8:35:08 AM
FILE: K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\10 STANDARDS\NEW Updated Standards (VA)\bc-21.dgn

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. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.

11. 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 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.

2. Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.

2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

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 Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

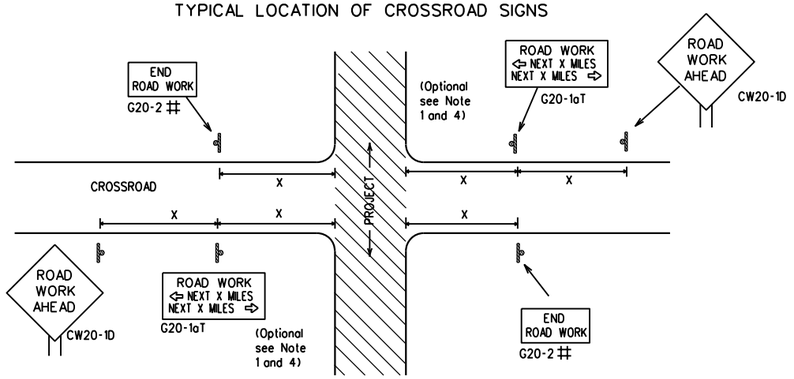
BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13 9-07 8-14 5-10 5-21	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		51

DISCLAIMER:
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: 12/17/2021 8:35:09 AM
FILE: K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\10 STANDARDS\NEW Updated Standards (VA) \bc-21.dgn

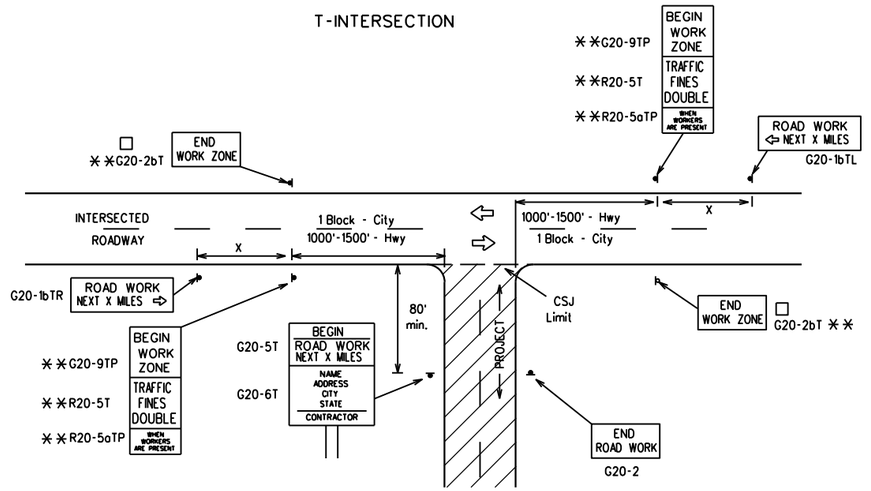
TYPICAL LOCATION OF CROSSROAD SIGNS



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 as per TMUTCD Part 5. 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]

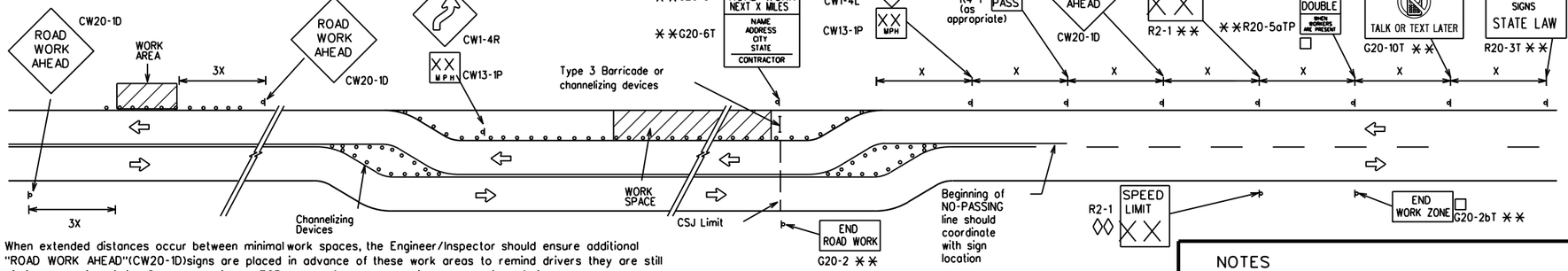
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ 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 as per TMUTCD Part 5. 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.

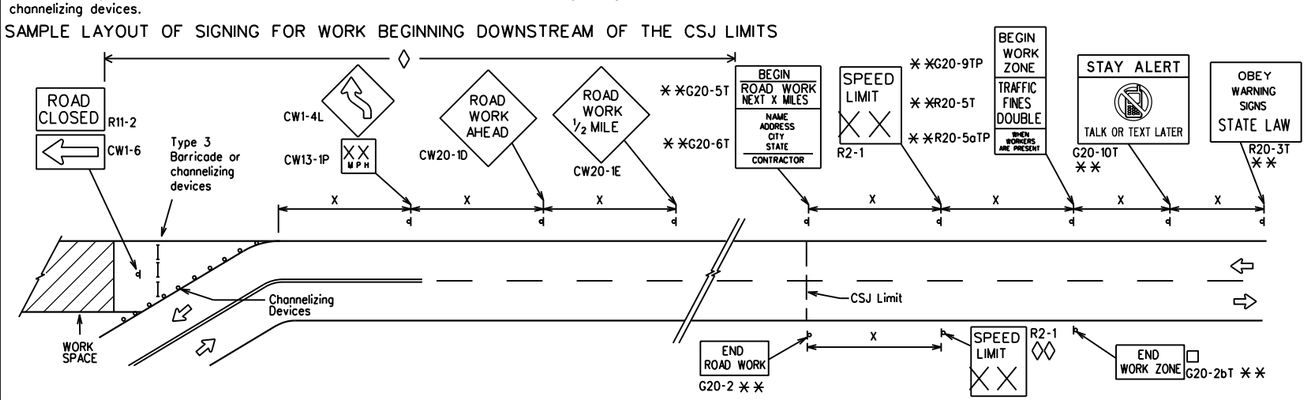
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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.

** CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.

◊ 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.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		52

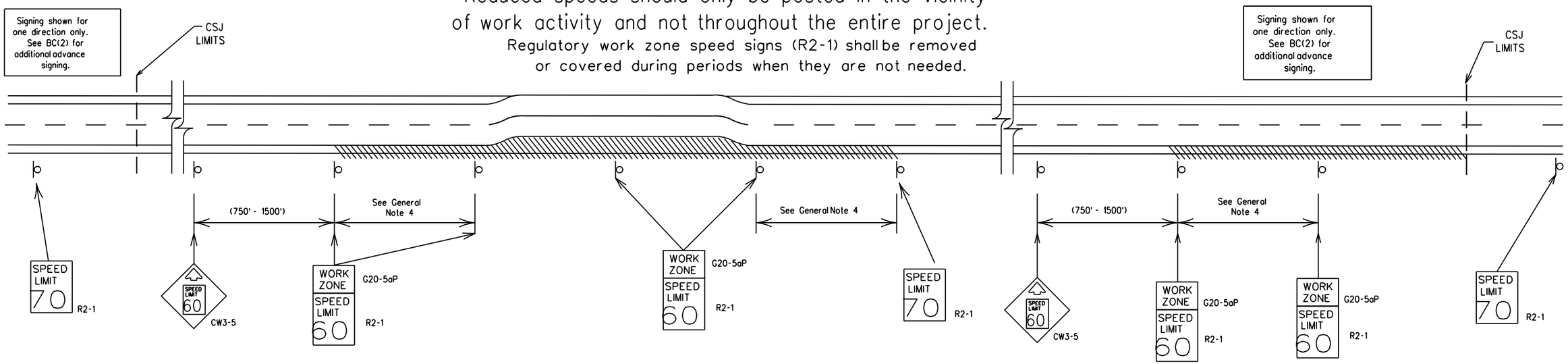
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 12/17/2021 8:35:09 AM
FILE: K:\Counties\HIDL\Liberty Rd (US83 to Mile 3)\GDJ\10 STANDARDS\NEW Updated Standards (VA) 8bc-21.dgn

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 traveled 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 Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

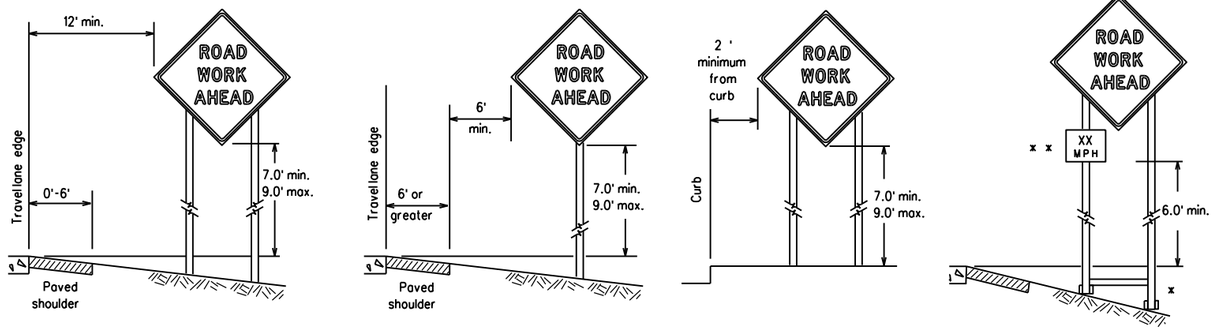
BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		53

DISCLAIMER:
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: 12/17/2021 8:35:09 AM
FILE: K:\Counties\HIDL\Liberty Rd (US83 to Mile 3)\GDJ\10 STANDARDS\NEW Updated Standards (VA)\bc-21.dgn

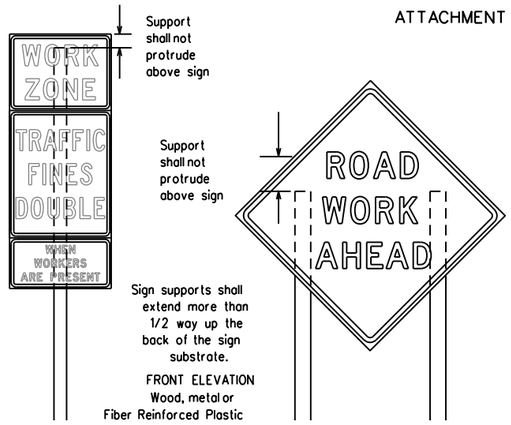
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

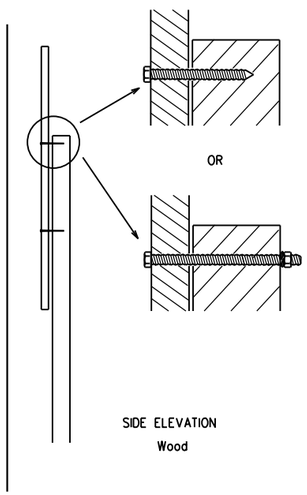


x When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

x x 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





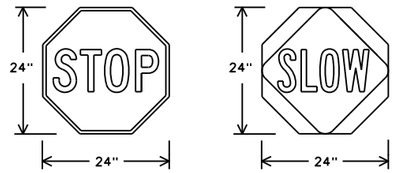
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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.

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.

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".
2. STOP/SLOW paddles shall be retroreflectorized when used at night.
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.



SHEETING REQUIREMENTS (WHEN USED AT NIGHT)		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	ORANGE	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDER	WHITE	TYPE B OR C SHEETING
LEGEND & BORDER	BLACK	ACRYLIC NON-REFLECTIVE FILM

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, specific service (LOGO), 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. For details for covering large guide signs see the TS-CD standard.
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 standard sheets, TLRS standard sheets or the CWZTCD list. The signs shall meet the required mounting heights shown on the BC, or the SMD standard sheets 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) for small roadside signs. Supports for temporary large roadside signs shall meet the requirements detailed on the Temporary Large Roadside Signs (TLRS) standard sheets. 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 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 Safety Division Standard

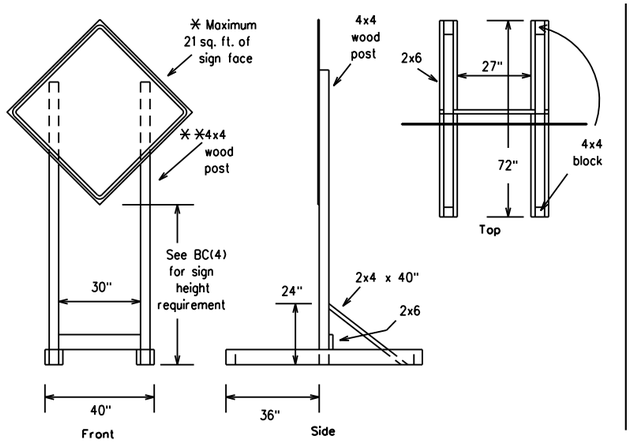
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

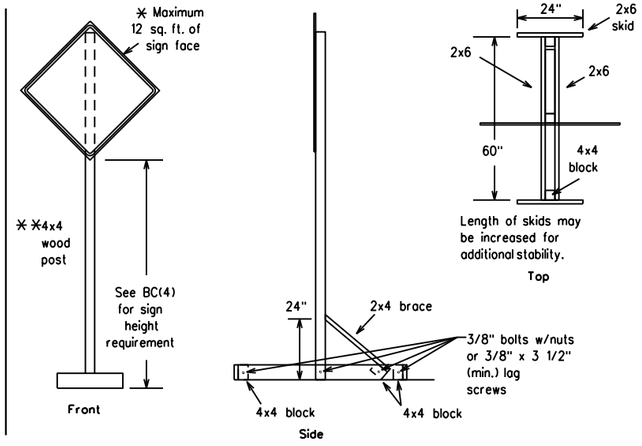
BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		54

DISCLAIMER:
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.

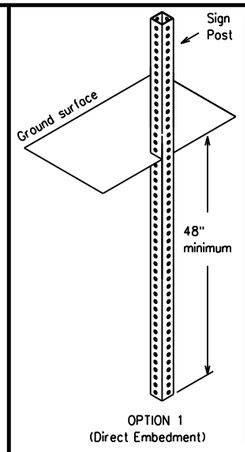
DATE: 12/17/2021 8:35:10 AM
FILE: K:\Counties\HIDAL\Liberty Rd (US83 to Mile 3)\GDJ\10 STANDARDS\NEW Updated Standards (VA)\bc-21.dgn

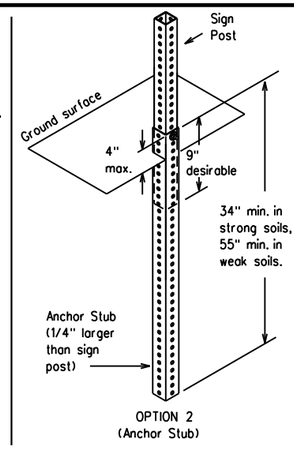


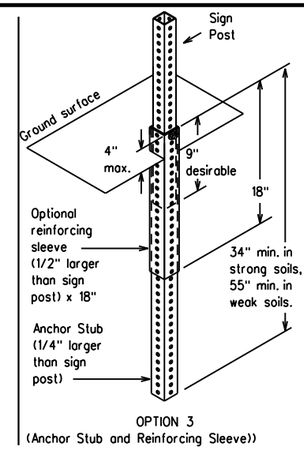


SKID MOUNTED WOOD SIGN SUPPORTS

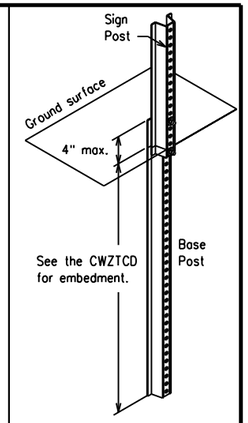
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS







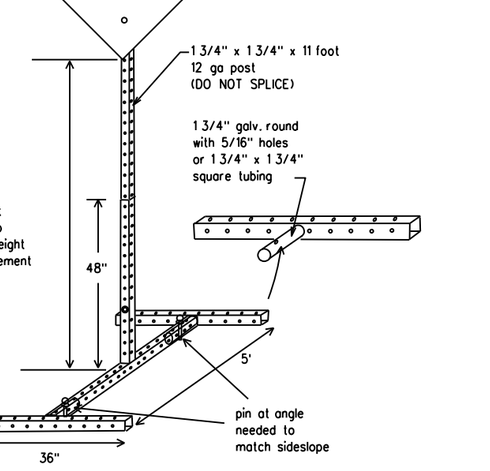
PERFORATED SQUARE METAL TUBING

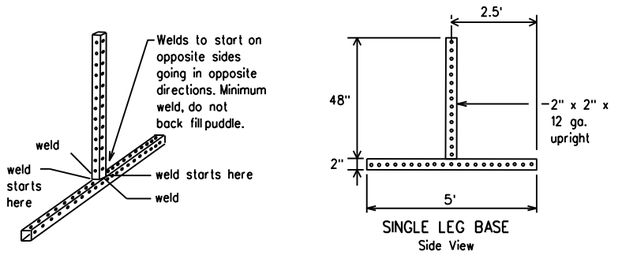


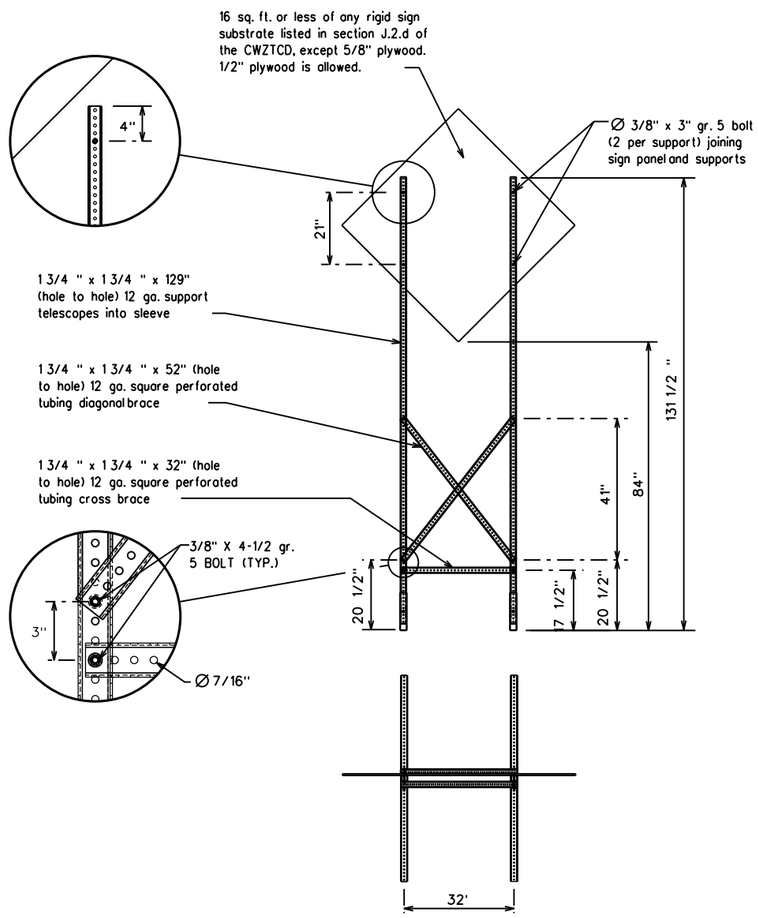
WING CHANNEL
Lap-splice/base bolted anchor

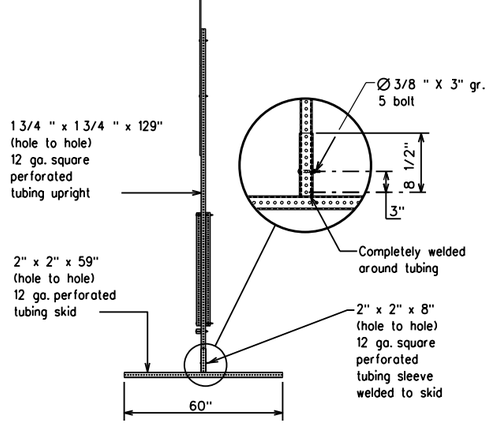
GROUND MOUNTED SIGN SUPPORTS

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.









SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID 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.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		55

DISCLAIMER:
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: 12/17/2021 8:35:10 AM
FILE: K:\Counties\HIDL\Liberty Rd (US83 to Mile 3)\GDJ\10 STANDARDS\NEW Updated Standards (VA)\bc-21.dgn

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

FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT
RIGHT X LANES CLOSED	RIGHT X LANES OPEN
CENTER LANE CLOSED	DAYTIME LANE CLOSURES
NIGHT LANE CLOSURES	I-XX SOUTH EXIT CLOSED
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE
EXIT CLOSED	RIGHT LN TO BE CLOSED
MALL DRIVEWAY CLOSED	X LANES CLOSED TUE - FRI
XXXXXXXX BLVD CLOSED	

Other Condition List

ROADWORK XXX FT	ROAD REPAIRS XXXX FT
FLAGGER XXXX FT	LANE NARROWS XXXX FT
RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE
MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT
LOOSE GRAVEL XXXX FT	UNEVEN LANES XXXX FT
DETOUR X MILE	ROUGH ROAD XXXX FT
ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN
BUMP XXXX FT	US XXX EXIT X MILES
TRAFFIC SIGNAL XXXX FT	LANES SHIFT *

* 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

MERGE RIGHT	FORM X LINES RIGHT
DETOUR NEXT X EXITS	USE XXXXX RD EXIT
USE EXIT XXX	USE EXIT I-XX NORTH
STAY ON US XXX SOUTH	USE I-XX E TO I-XX N
TRUCKS USE US XXX N	WATCH FOR TRUCKS
WATCH FOR TRUCKS	EXPECT DELAYS
EXPECT DELAYS	PREPARE TO STOP
REDUCE SPEED XXX FT	END SHOULDER USE
USE OTHER ROUTES	WATCH FOR WORKERS
STAY IN LANE *	

Location List

AT FM XXXX
BEFORE RAILROAD CROSSING
NEXT X MILES
PAST US XXX EXIT
XXXXXXX TO XXXXXXX
US XXX TO FM XXXX

Warning List

SPEED LIMIT XX MPH
MAXIMUM SPEED XX MPH
MINIMUM SPEED XX MPH
ADVISORY SPEED XX MPH
RIGHT LANE EXIT
USE CAUTION
DRIVE SAFELY
DRIVE WITH CARE

** Advance Notice List

TUE-FRI XX AM- X PM
APR XX-XX X PM-X AM
BEGINS MONDAY
BEGINS MAY XX
MAY X-X XX PM - XX AM
NEXT FRI-SUN
XX AM TO XX PM
NEXT TUE AUG XX
TONIGHT XX PM- XX AM

* 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 Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

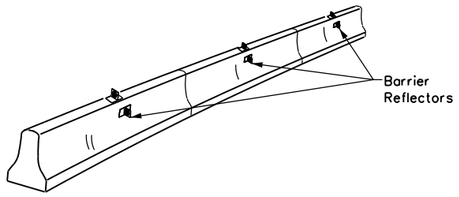
BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		56

DISCLAIMER:
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.

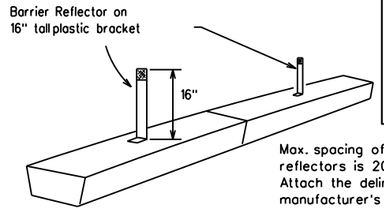
DATE: 12/17/2021 8:35:10 AM
FILE: K:\Countfies\HIDL\Liberty Rd (US83 to Mile 3)\GDJ\10 STANDARDS\NEW Updated Standards (VA)\bc-21.dgn

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.

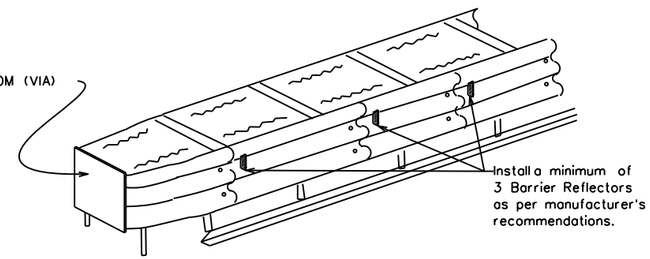


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

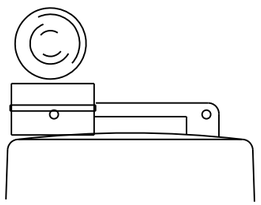


DELINEATION OF END TREATMENTS

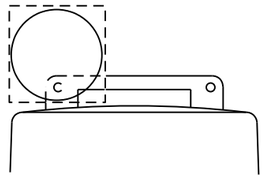
END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet the apppropriate crashworthy standards as defined in the Manual for Assessing Safety Hardware (MASH). 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 or C 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

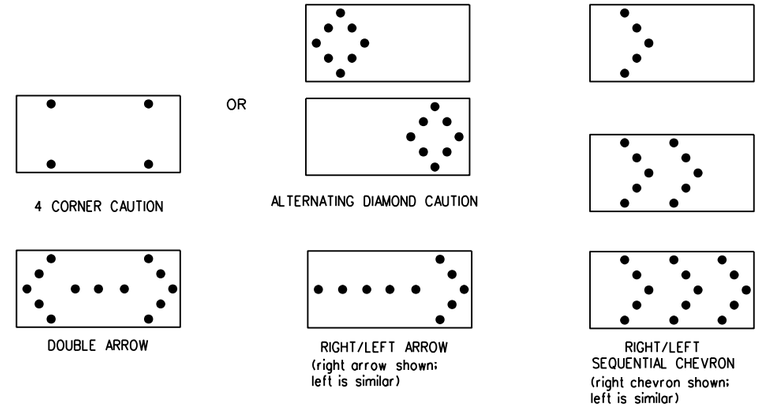
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing 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:



4 CORNER CAUTION

ALTERNATING DIAMOND CAUTION

DOUBLE ARROW

RIGHT/LEFT ARROW
(right arrow shown;
left is similar)

RIGHT/LEFT
SEQUENTIAL CHEVRON
(right chevron shown;
left is similar)

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 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 Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		57

DISCLAIMER:
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: 12/17/2021 8:35:11 AM
FILE: K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\10 STANDARDS\NEW Updated Standards (VA)\bc-21.dgn

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:

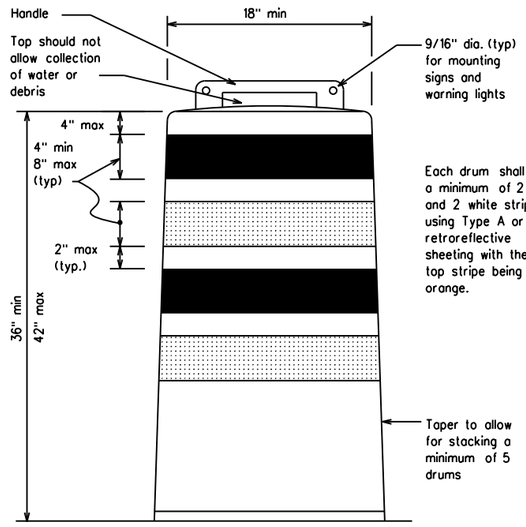
1. Plastic drums shall be a two-piece design: the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents 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.

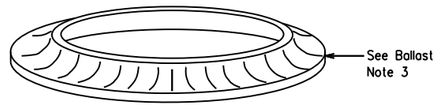
RETROREFLECTIVE SHEETING

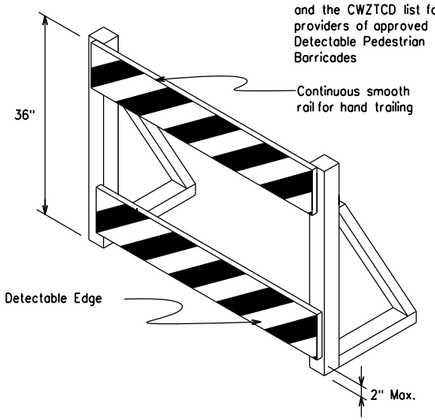
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall 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.

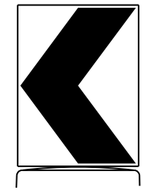




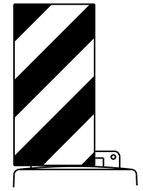


DETECTABLE PEDESTRIAN BARRICADES

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. Refer to WZ(BTS-2) for Pedestrian Control requirements for Sidewalk Diversions, Sidewalk Detours and Crosswalk Closures.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a Detectable Pedestrian Barricade shall be placed across the full width of the closed sidewalk instead of a Type 3 Barricade.
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 (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 should 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 or Type C Orange$_{FL}$ 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 or Type B. 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 Safety Division Standard

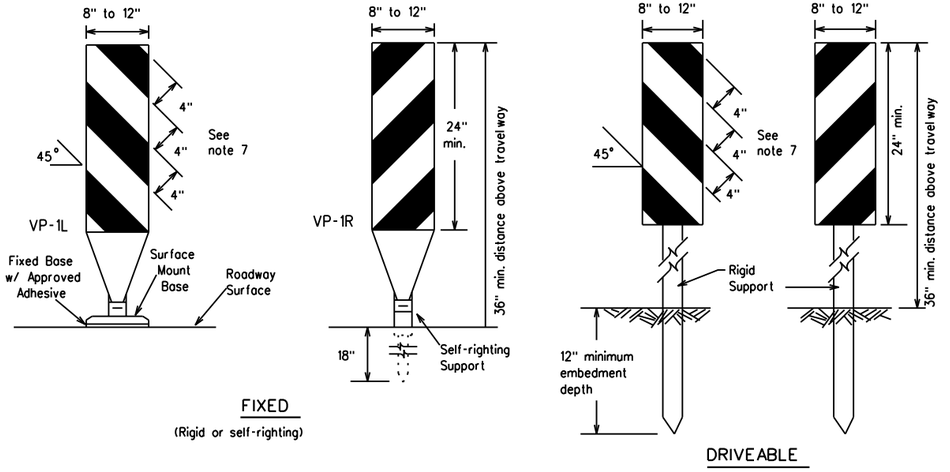
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

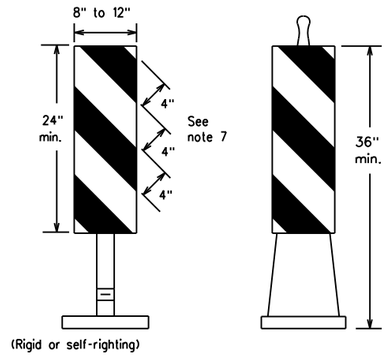
BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	PHR	HIDALGO		58
7-13				

DISCLAIMER:
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.

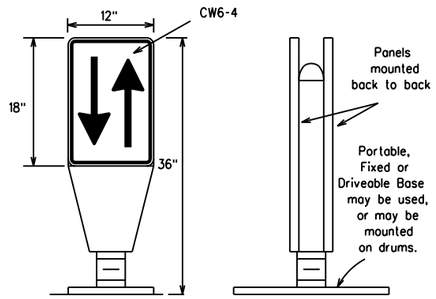
DATE: 12/17/2021 8:35:11 AM
FILE: K:\Counties\HIDN\Liberty Rd (US83 to Mile 3)\GDJ\10 STANDARDS\NEW Updated Standards (VA)\bc-21.dgn





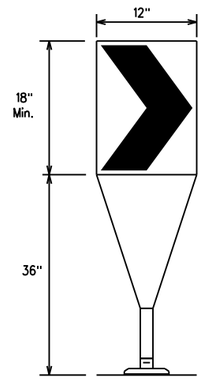
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual for additional requirements on the use 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 or Type B 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 or Type C conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

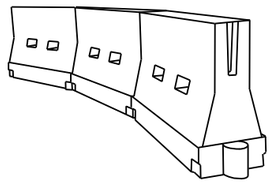


1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of 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 or Type C 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). Place reflective sheeting 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 Manual for Assessing Safety Hardware (MASH) 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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		59

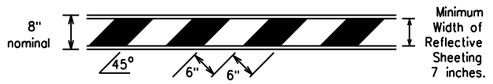
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 12/17/2021 8:35:11 AM
FILE: K:\Counties\HIDL\Liberty Rd (US83 to Mile 3)\GDJ\10 STANDARDS\NEW Updated Standards (VA)\bc-21.dgn

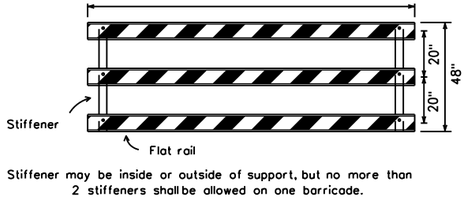
TYPE 3 BARRICADES

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 or Type B conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



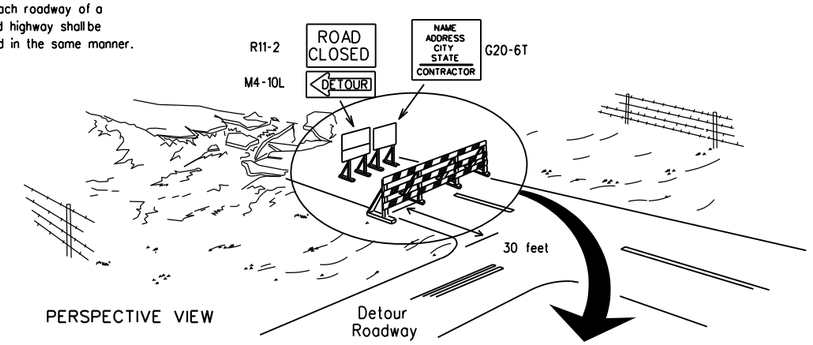
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

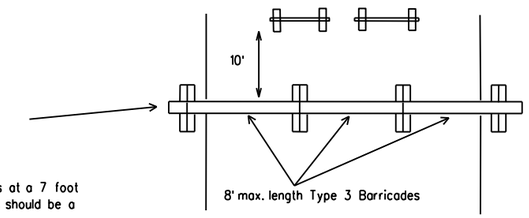
Each roadway of a divided highway shall be barricaded in the same manner.



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.

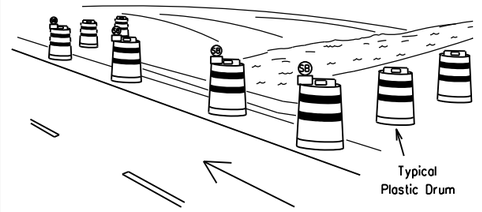
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

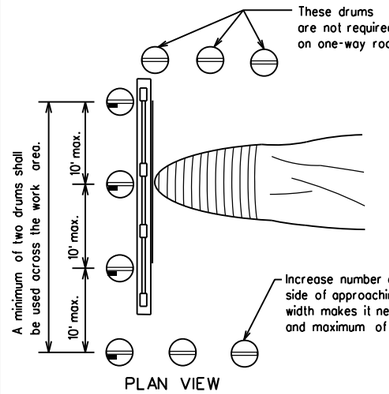
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

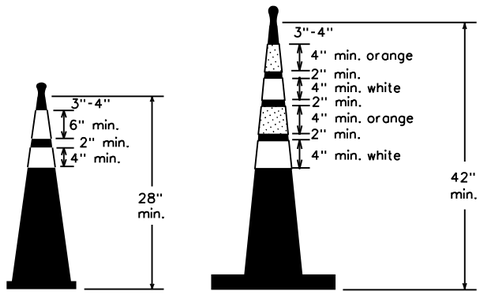
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder 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.



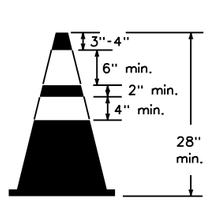
PLAN VIEW

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

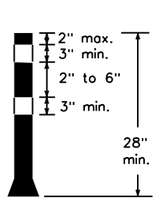
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

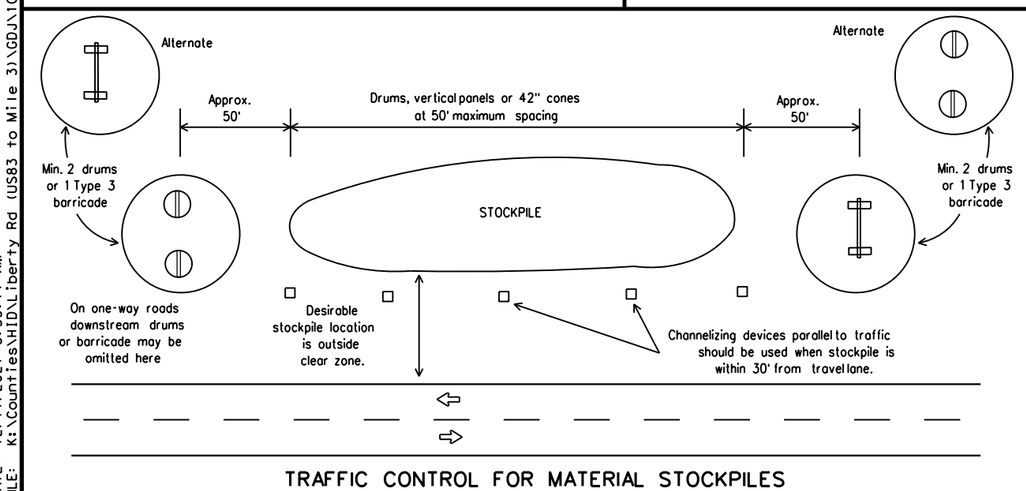


Tubular Marker

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 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 or Type B.
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

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	PHR	HIDALGO		60

DISCLAIMER:
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: 12/17/2021 8:35:12 AM
FILE: K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\10 STANDARDS\NEW Updated Standards (VA)\bc-21.dgn

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.

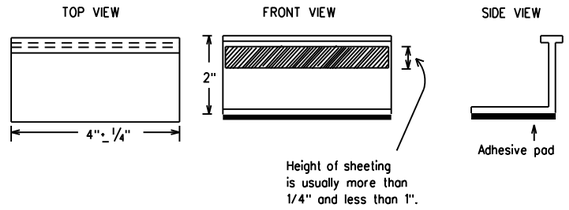
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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 Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-98 9-07 5-21 1-02 7-13 11-02 8-14	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		61

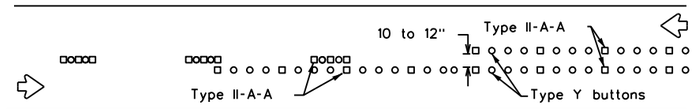
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 12/17/2021 8:35:12 AM
FILE: K:\Counties\HIDN\Liberty Rd (US83 to Mile 3)\GDJ\10 STANDARDS\NEW Updated Standards (VA)\bc-21.dgn

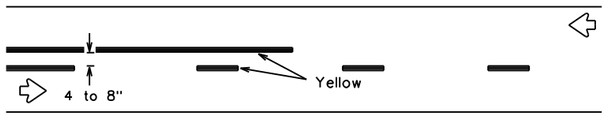
PAVEMENT MARKING PATTERNS



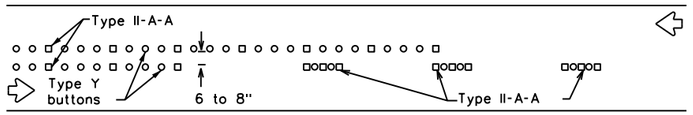
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



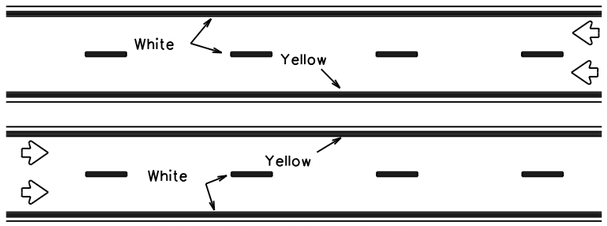
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



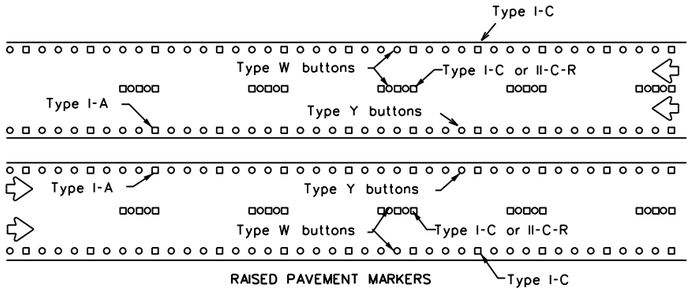
RAISED PAVEMENT MARKERS - PATTERN B

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



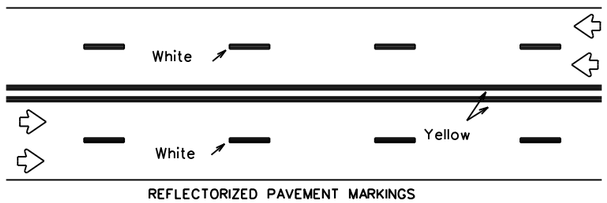
REFLECTORIZED PAVEMENT MARKINGS



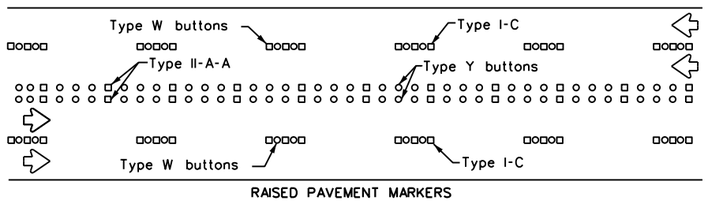
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



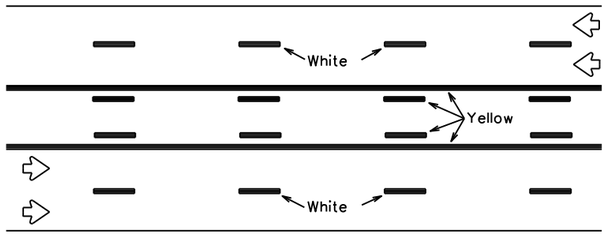
REFLECTORIZED PAVEMENT MARKINGS



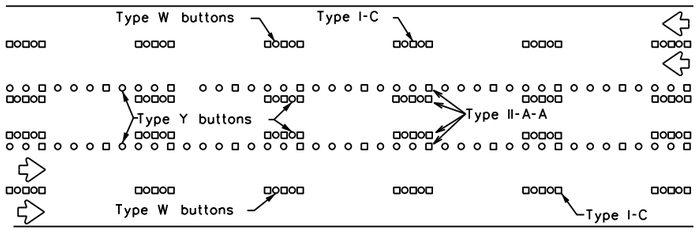
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

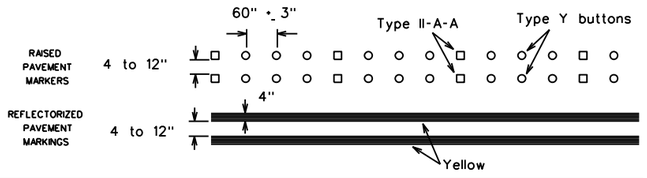
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

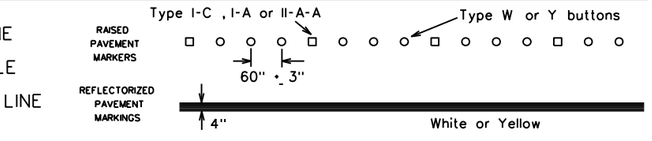
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

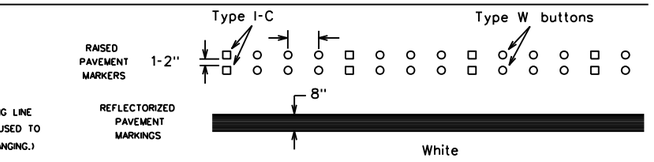


EDGE LINE OR SINGLE NO-PASSING LINE



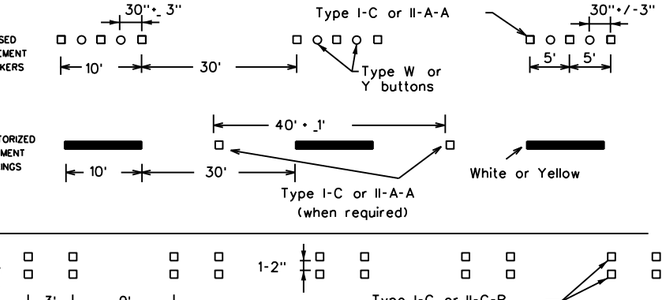
WIDE LINE

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

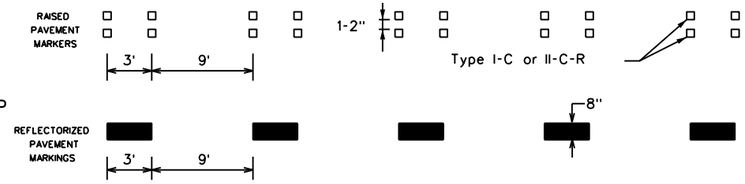


BROKEN LINES

CENTER LINE OR LANE LINE

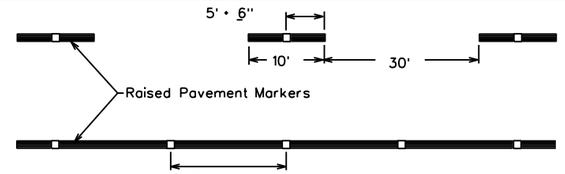


AUXILIARY OR LANEDROP LINE



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 Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

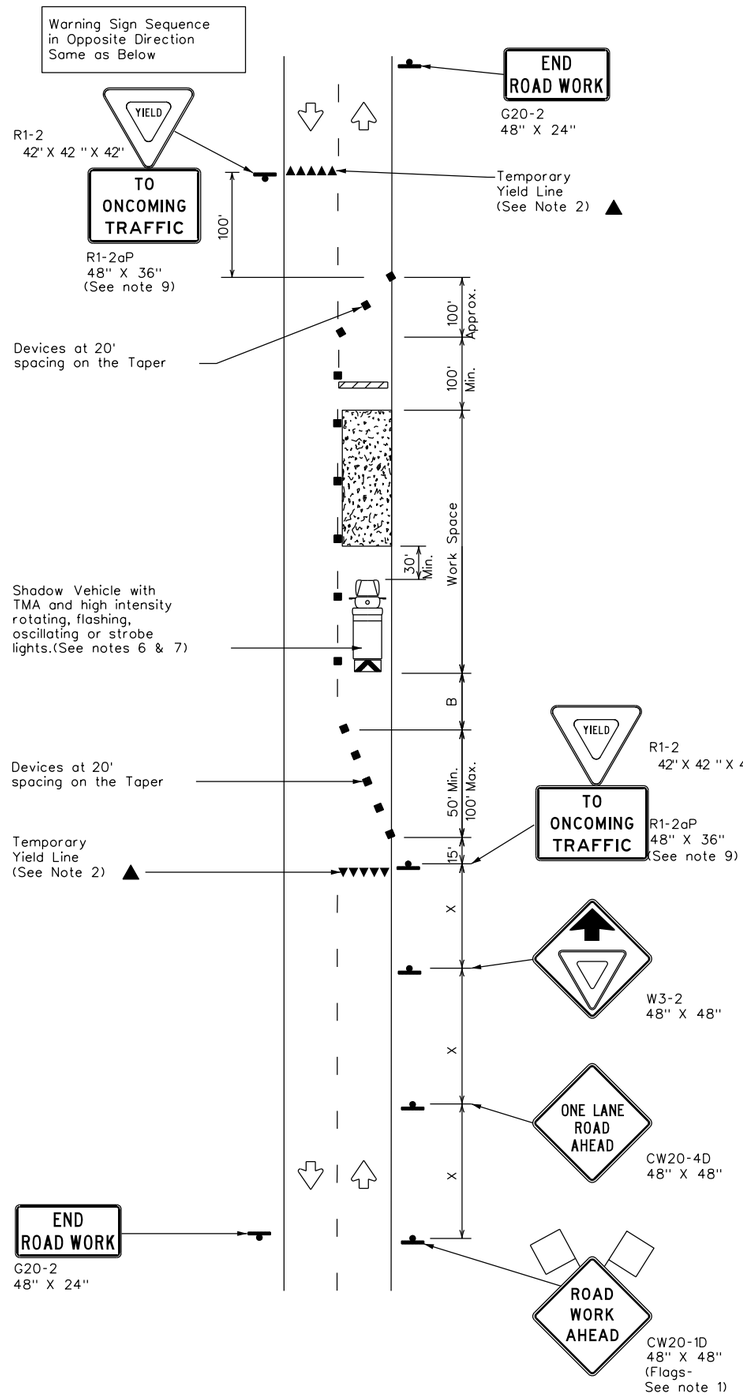
BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0921	02	194	FM 1925
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		62

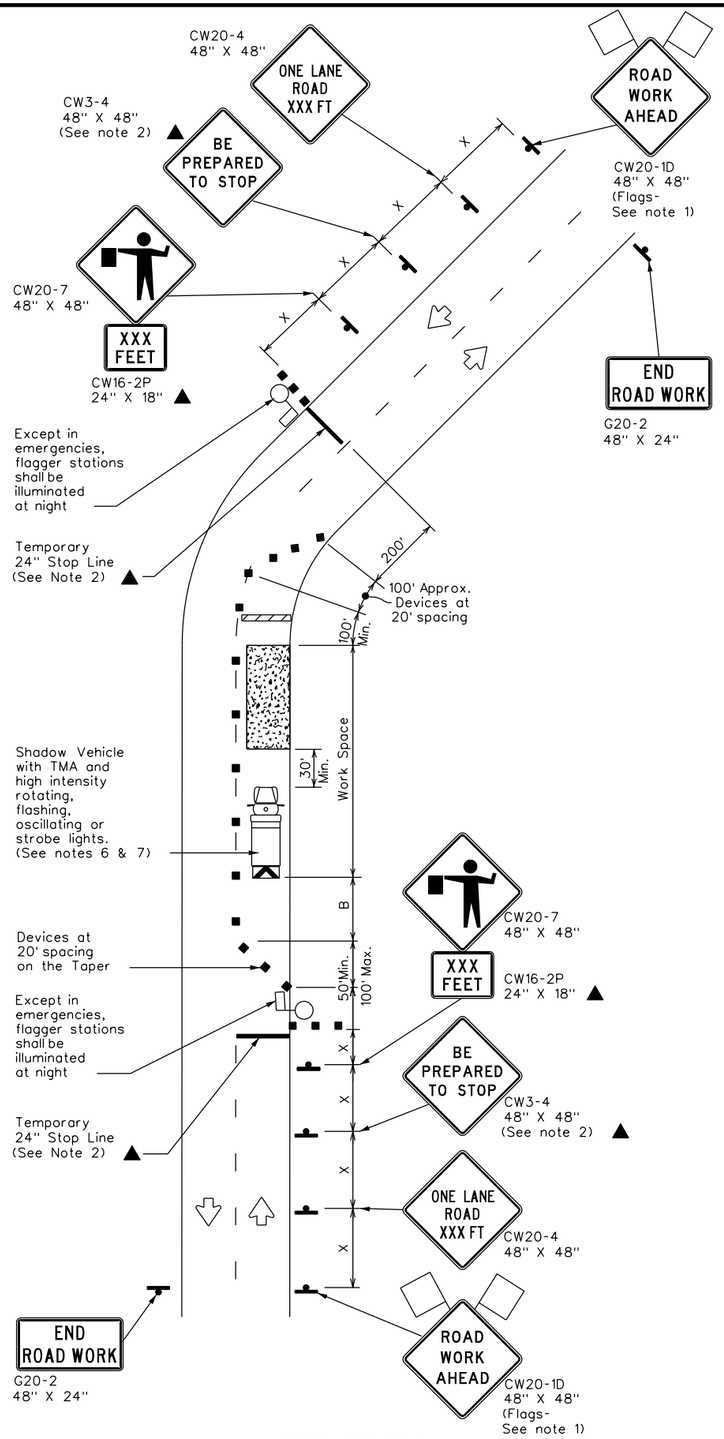
106

DISCLAIMER:
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:
FILE:



TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



TCP (2-2b)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

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"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

* 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 CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. 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.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-2a)

8. The R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work space should be no longer than one half city block. In rural areas, roadways with less than 2000 ADT, work space should be no longer than 400 feet.
9. The R1-2aP "YIELD TO ONCOMING TRAFFIC" sign shall be placed on a support at a 7 foot minimum mounting height.

TCP (2-2b)

10. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
12. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situtations.

Texas Department of Transportation
Traffic Operations Division Standard

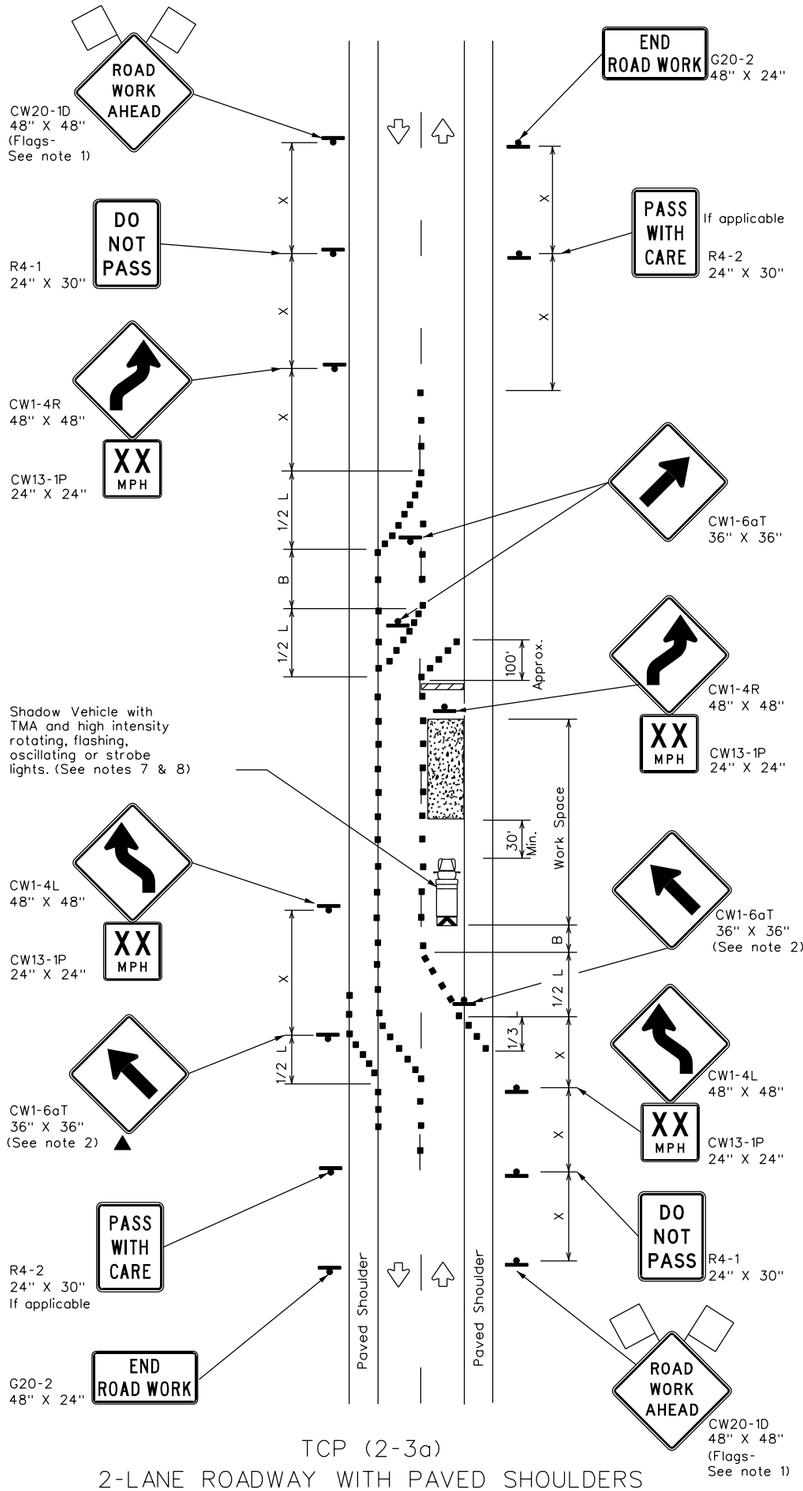
TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0921	02	194	LIBERTY
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	PHR	HIDALGO		63

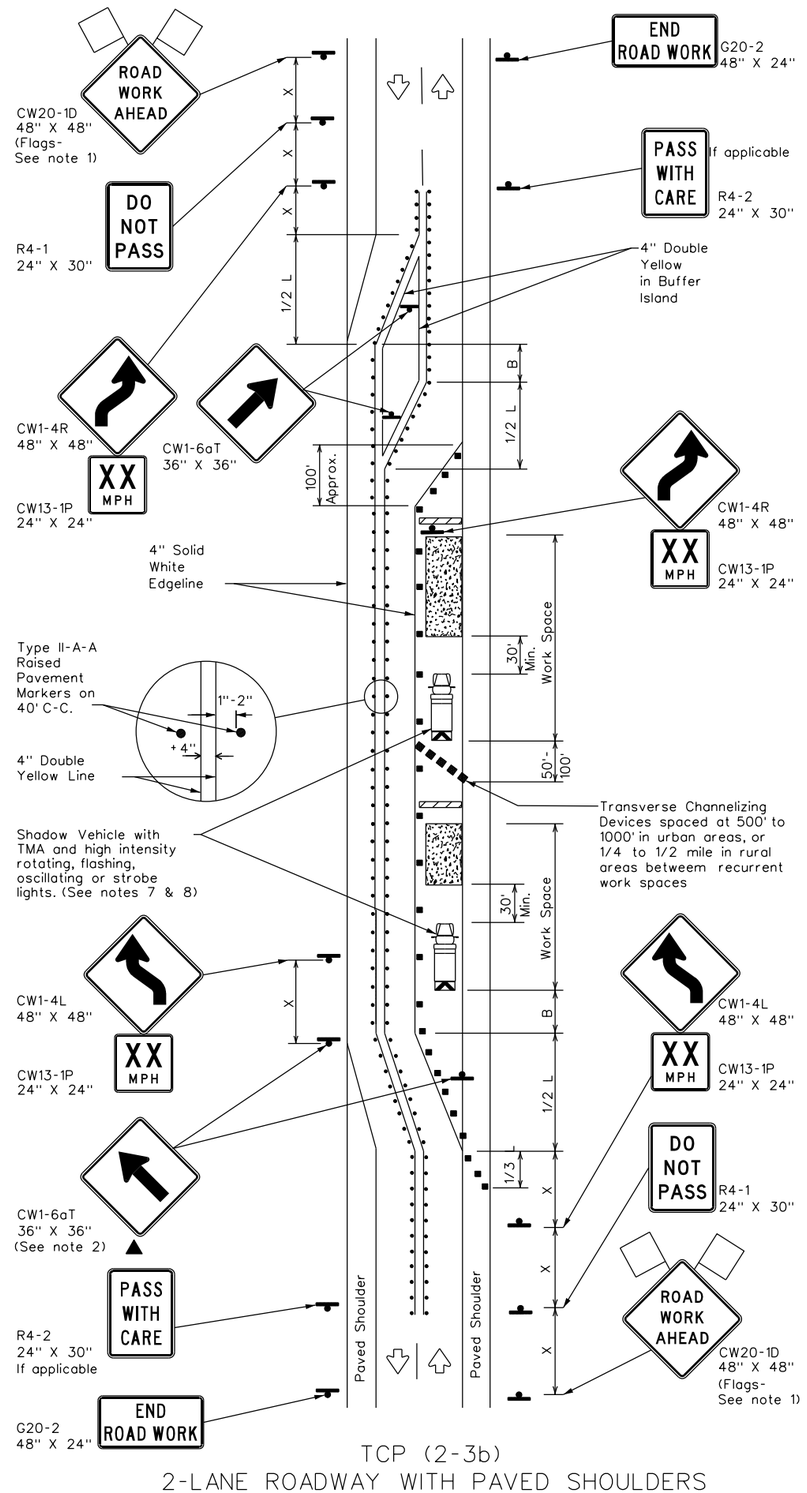
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:



TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



TCP (2-3b)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Raised Pavement Markers Ty II-AA
	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
				TCP(2-3b)ONLY
			✓	✓

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. When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
4. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
5. The R4-1 "DO NOT PASS," R4-2 " PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
6. Conflicting pavement marking shall be removed for long term projects.
7. 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.
8. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-3a)

9. Conflicting pavement markings shall be removed for long-term projects. 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 device spacing is intended for the area of the conflicting markings, not the entire work zone.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-18

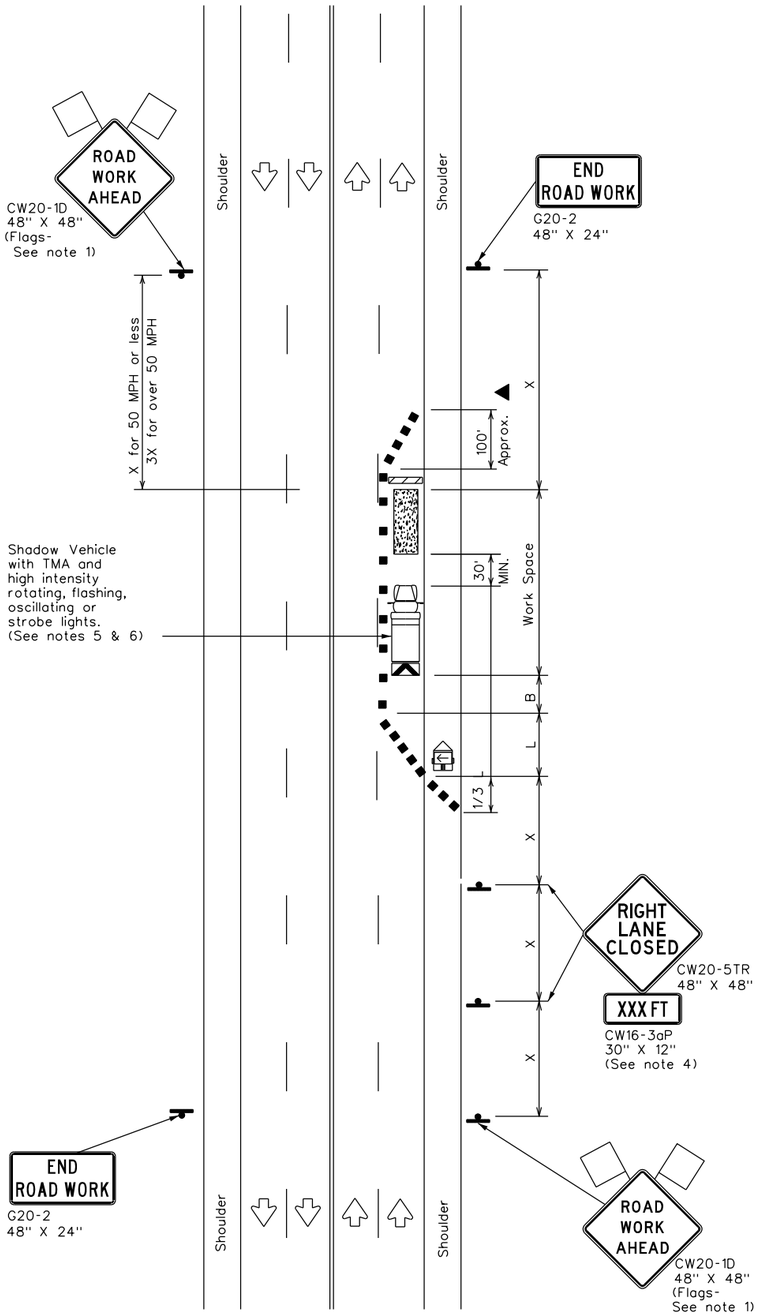
© TxDOT December 1985

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
8-95 2-12	0921	02	194	LIBERTY
1-97	DIST	COUNTY		SHEET NO.
4-98	PHR	HIDALGO		64
3-03				

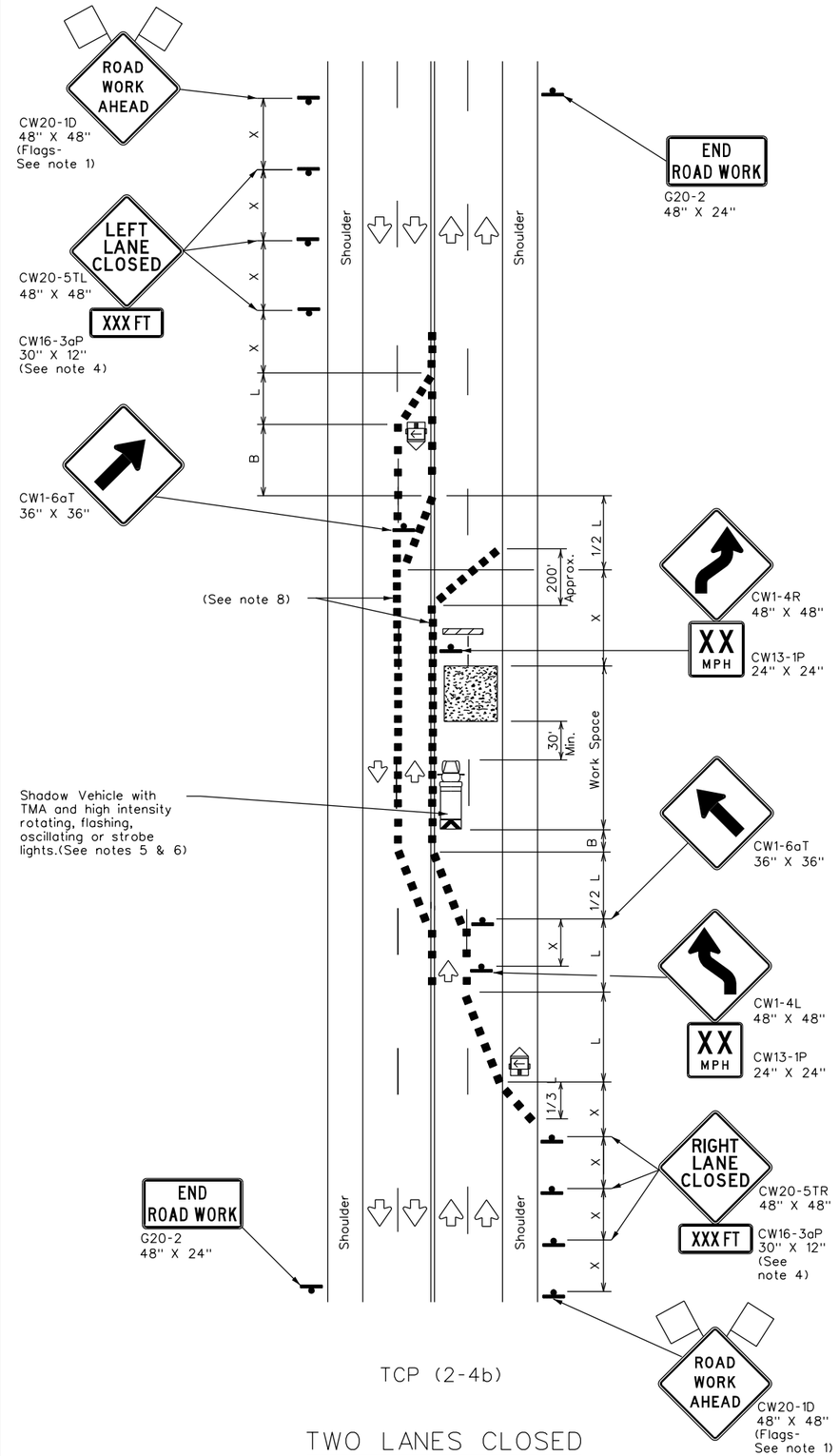
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:



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

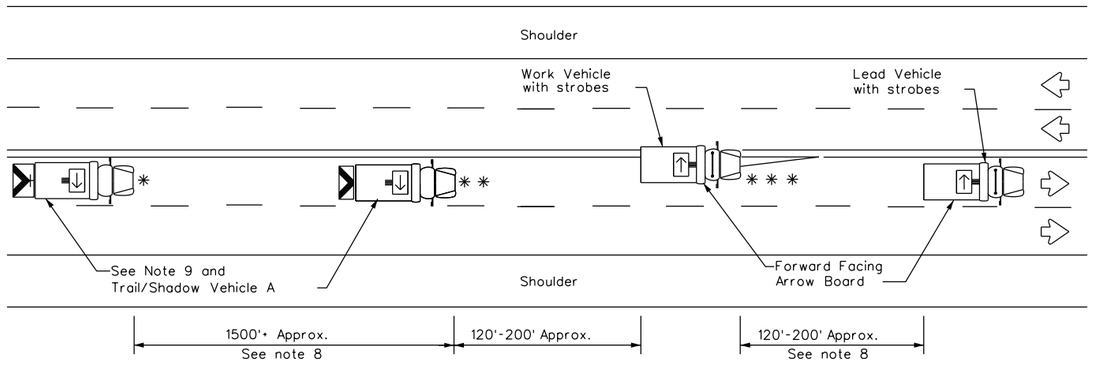
TRAFFIC CONTROL PLAN
LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0921	02	194	LIBERTY
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	PHR	HIDALGO		65

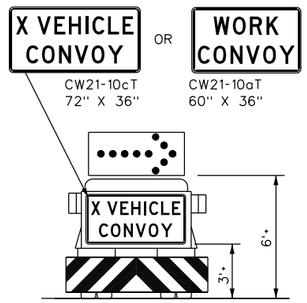
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:



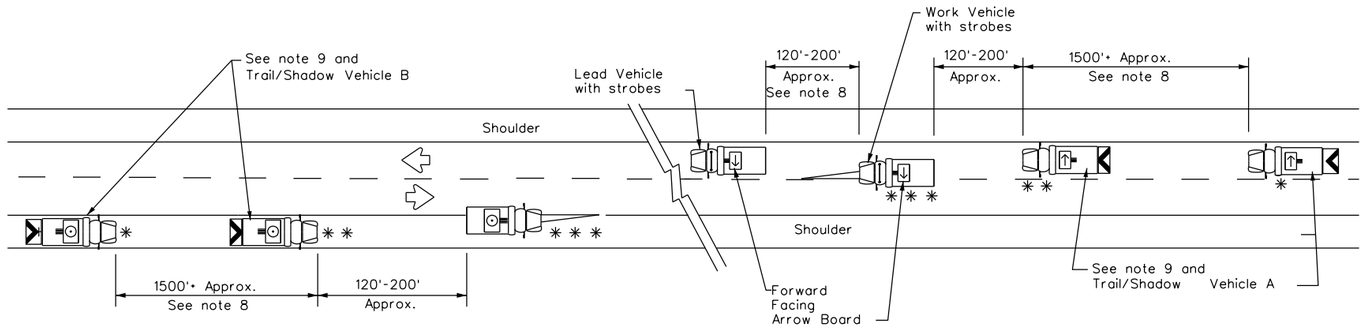
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

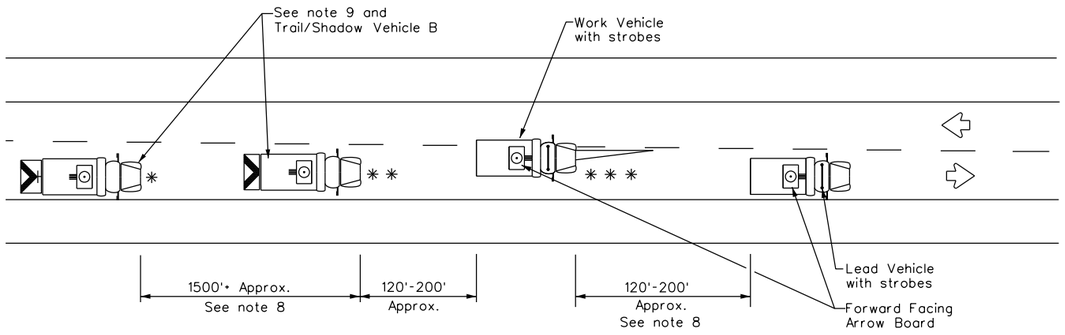


WORK ON SHOULDER

WORK ON TRAVEL LANE

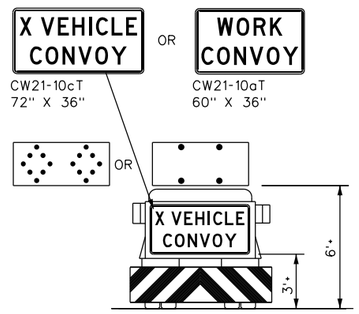
TCP (3-1b)

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.

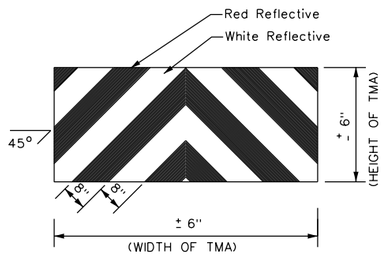
6. Each vehicle shall have two-way radio communication capability.

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

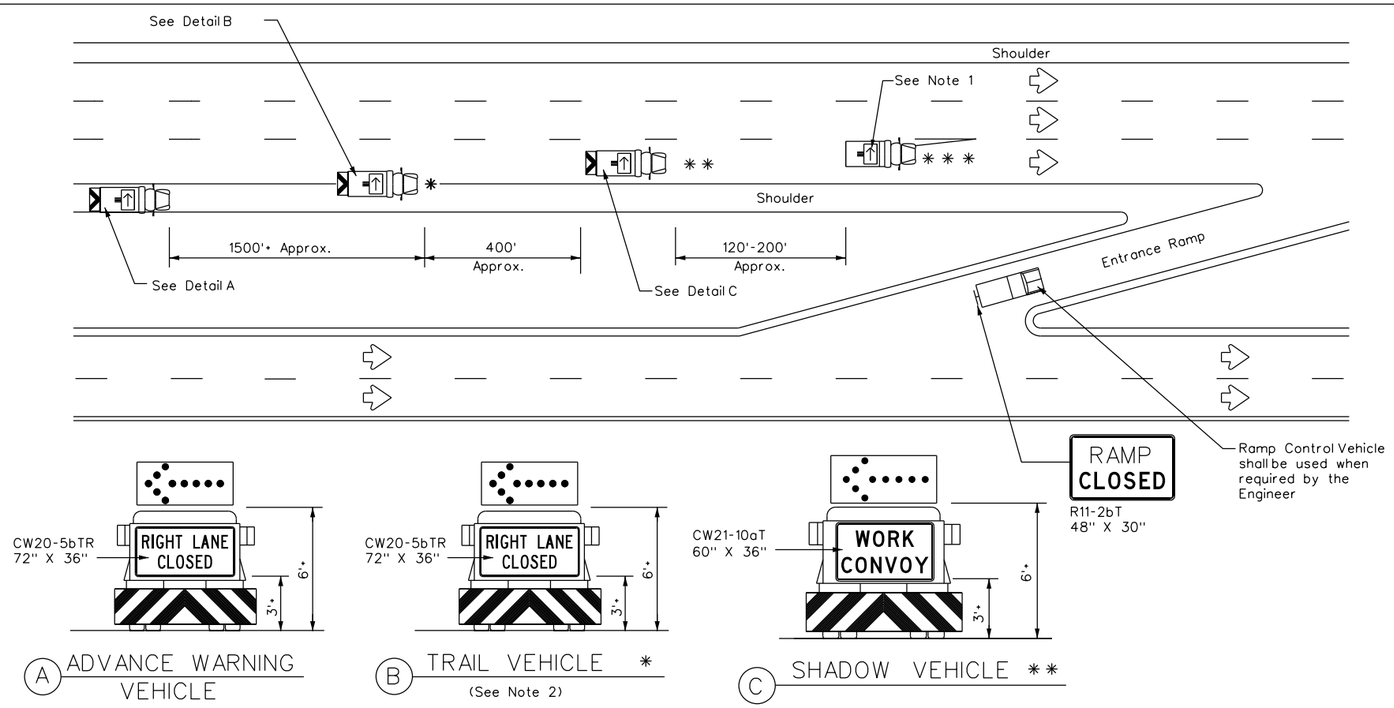
TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

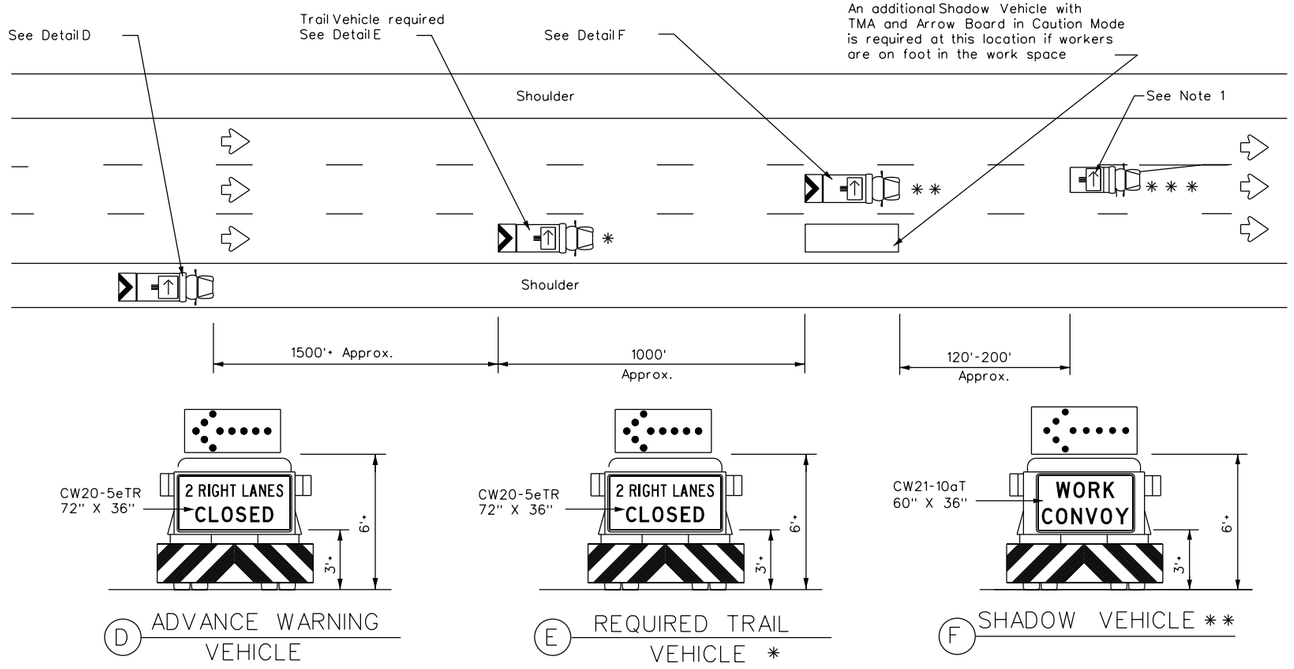
FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
2-94 4-98 8-95 7-13 1-97	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		66

DISCLAIMER:
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:
FILE:



RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



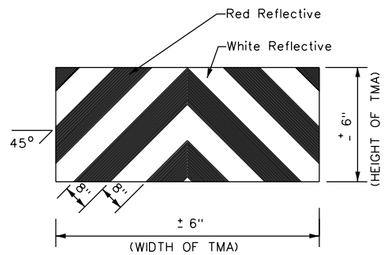
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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. ADVANCE WARNING, TRAIL and SHADOW vehicles shall be equipped with Type B or Type C flashing arrow boards as per the Barricade and Construction (BC) standards. Arrow boards on WORK vehicles will be optional based on the type of work being performed. The arrow boards shall be operated from inside the vehicle.
2. For TCP(3-2a) the Engineer will determine if the TRAIL VEHICLE is required based on prevailing roadway conditions, traffic volume, and sight distance restrictions. All other vehicles shown for both TCP(3-2a) and TCP(3-2b) are required.
3. 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.
4. The use of truck mounted attenuators (TMA) on the ADVANCE WARNING, SHADOW, and TRAIL vehicles are required.
5. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DMS 8300, Type A.
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 may vary according to terrain, work activity and other factors.
9. Standard 48" X 48" diamond shaped warning signs with the same message as those shown may be used where adequate mounting space exists.
10. The signs shown should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or a 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, must 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. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
12. The principles on this sheet may be used to close lanes from the left side of the roadway considering the number of lanes, shoulder width, sight distance, and ramp frequency.
13. Signs and flashing arrow board modes shall be appropriately altered when implementing left lane closures or interior closures which close the left lanes.
14. The Advance Warning Vehicle may straddle the edgeline when shoulder width makes it necessary.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

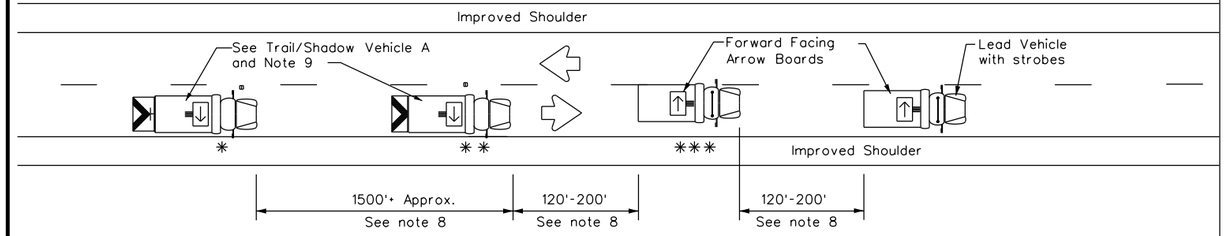
TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		67

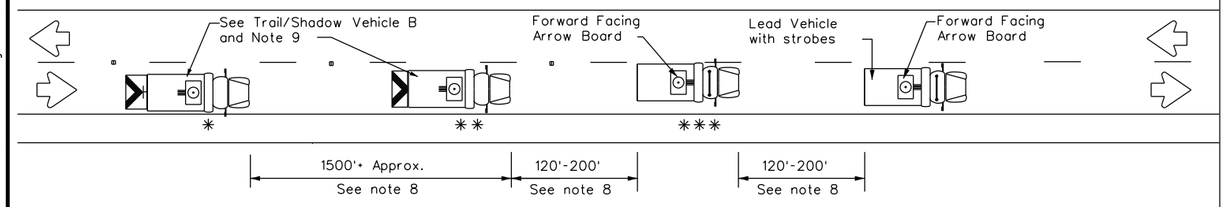
176

DISCLAIMER:
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.



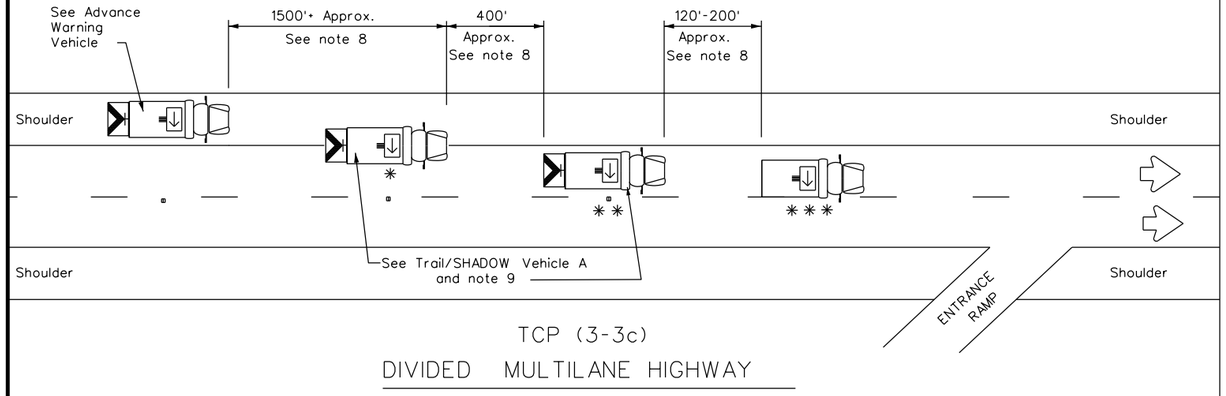
TCP (3-3a)

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



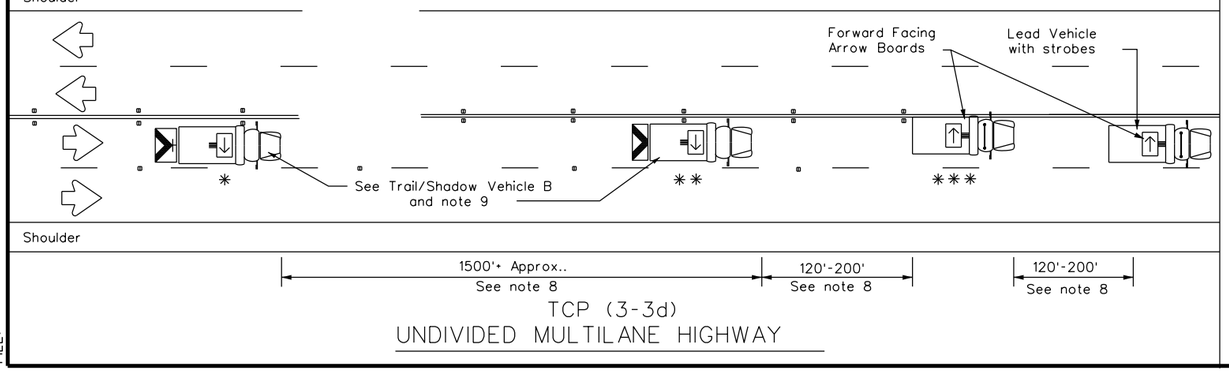
TCP (3-3b)

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



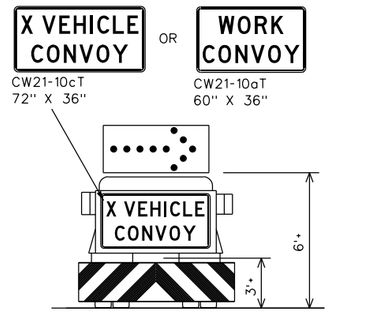
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



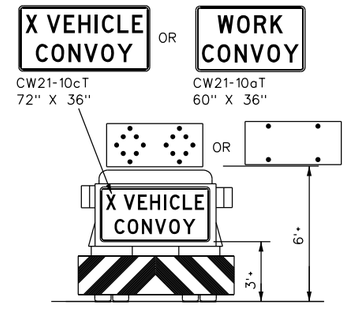
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



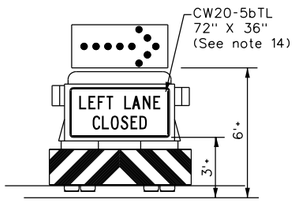
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

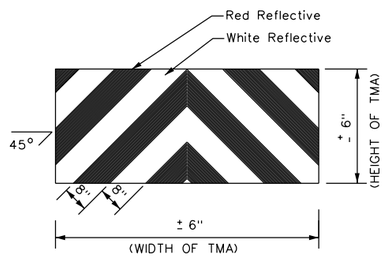


TRAIL/SHADOW VEHICLE B

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

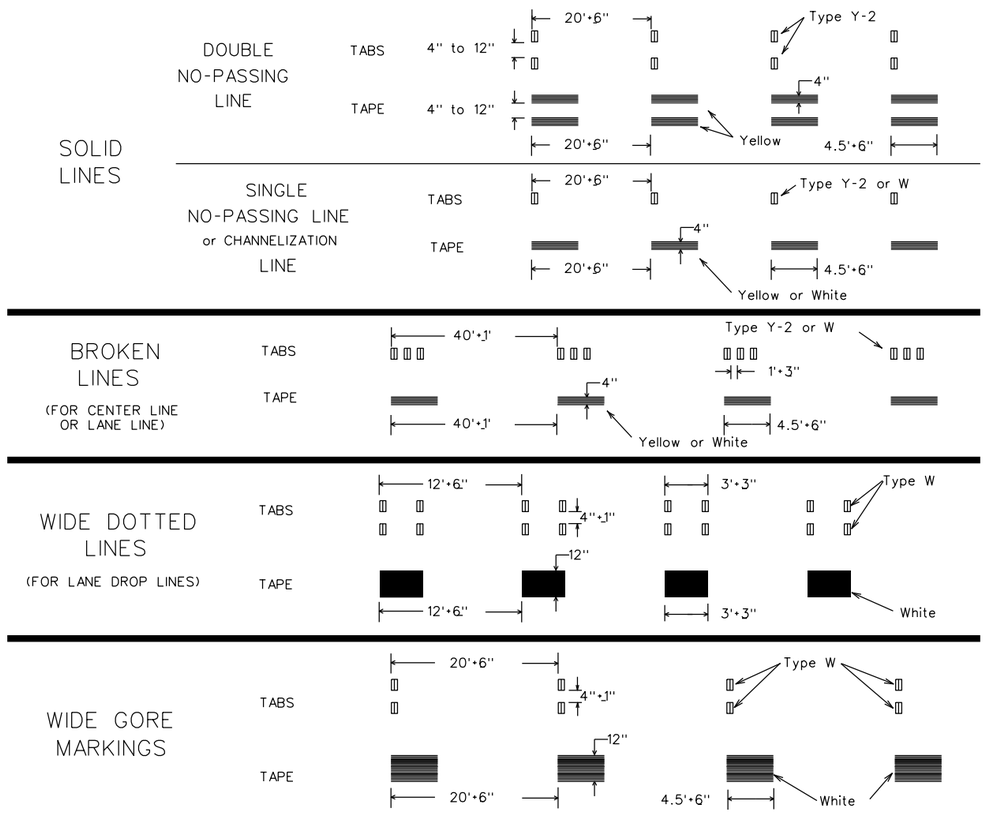
FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	PHR	HIDALGO		68
1-97 7-14				

DATE:
FILE:

DISCLAIMER:
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:
FILE:

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



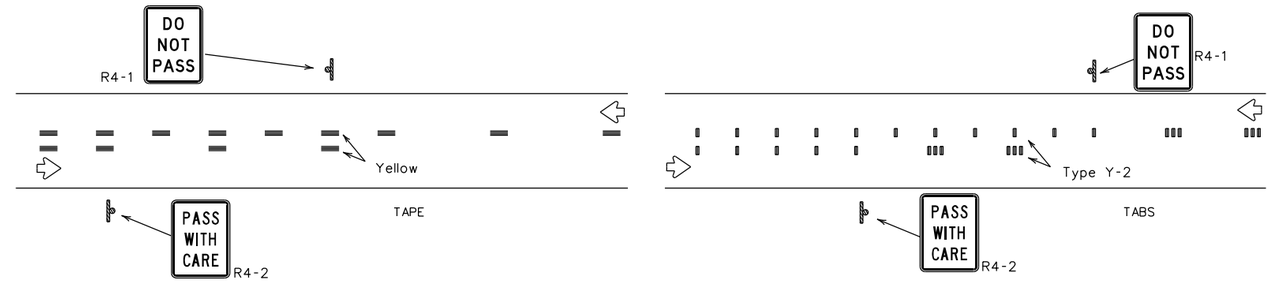
NOTES:

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.

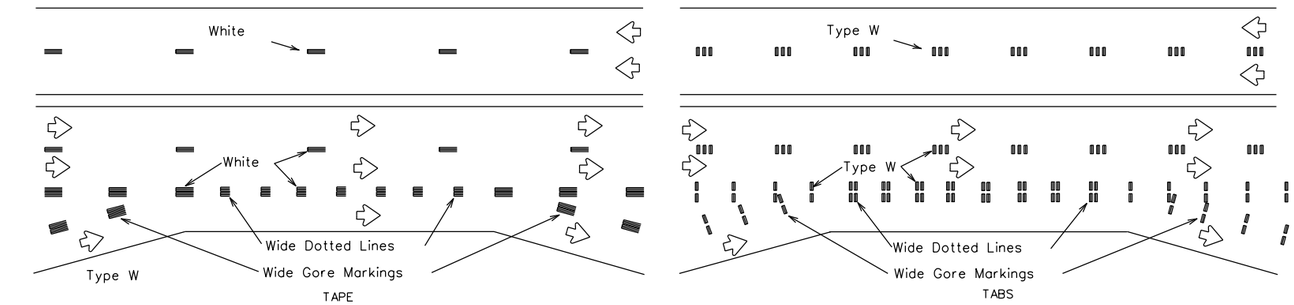
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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.

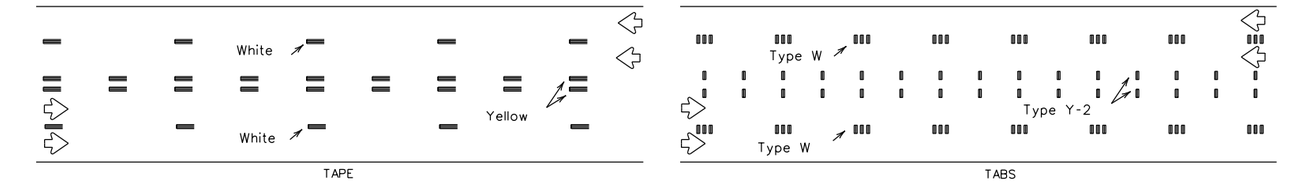
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



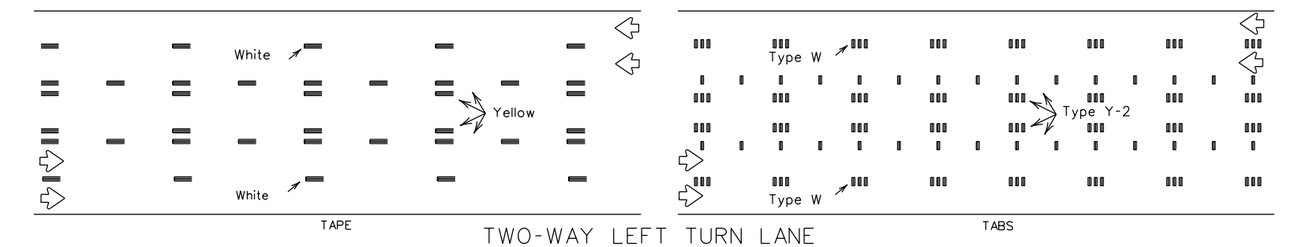
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



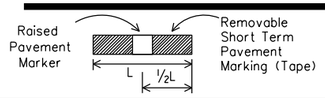
LANE LINES FOR DIVIDED HIGHWAY



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

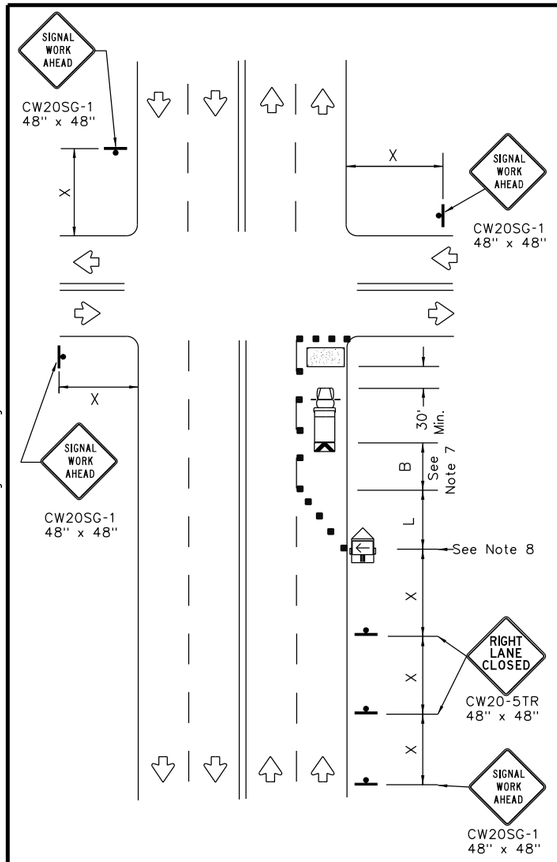
WZ(STPM)-13

FILE:	wzstpm-13.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS		0921	02	194	LIBERTY
1-97		DIST	COUNTY		SHEET NO.
3-03		PHR	HIDALGO		69
7-13					

111

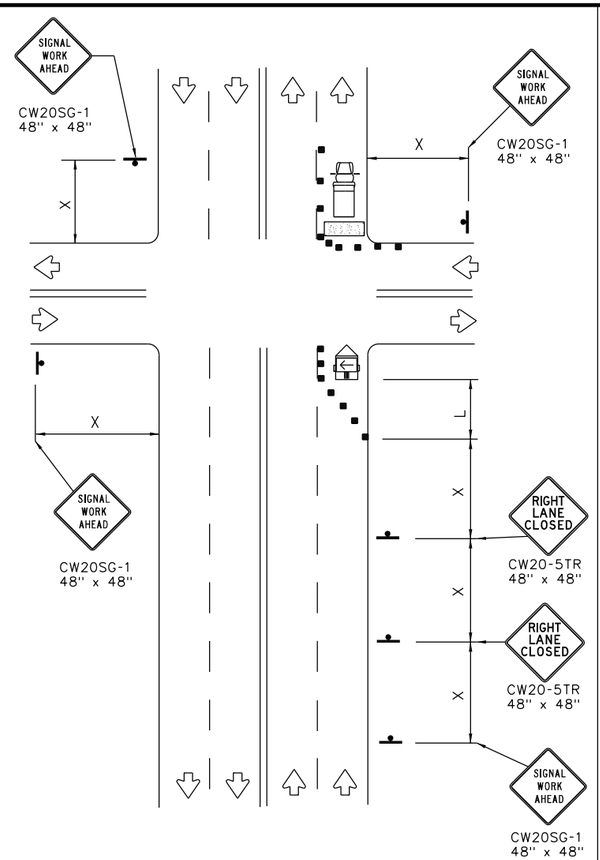
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:



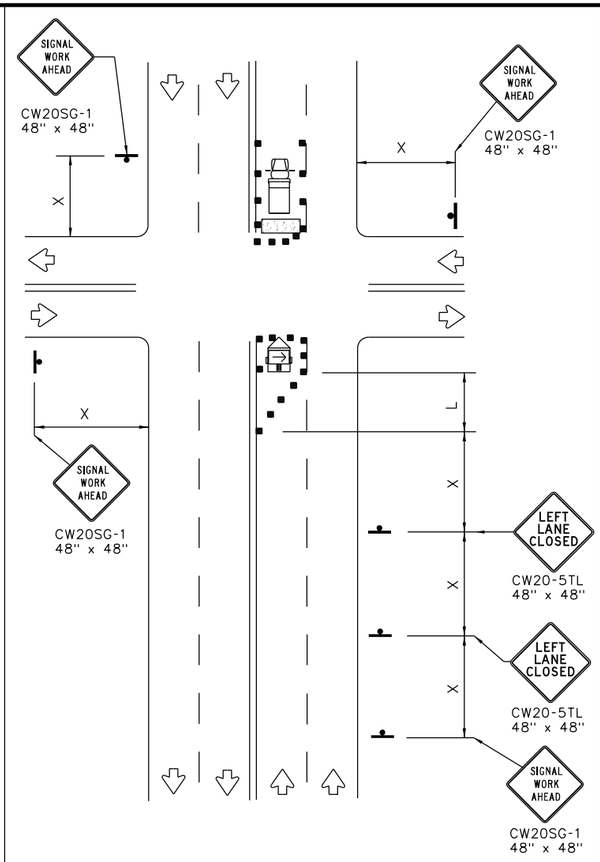
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



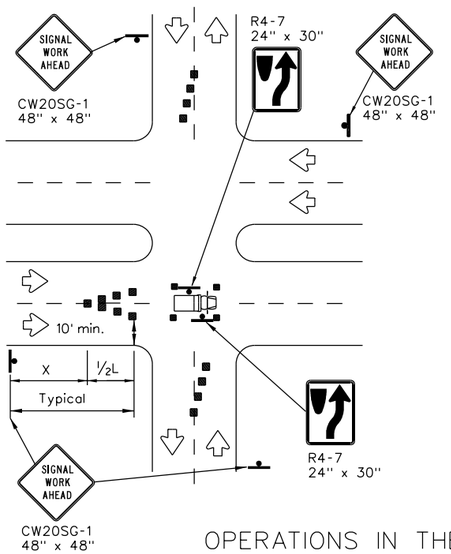
FAR SIDE RIGHT LANE CLOSURE

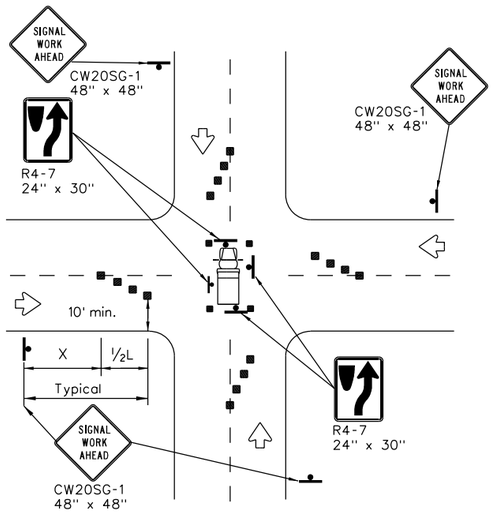
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY





OPERATIONS IN THE INTERSECTION

SHORT DURATION

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.

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.

Texas Department of Transportation

Traffic Operations Division Standard

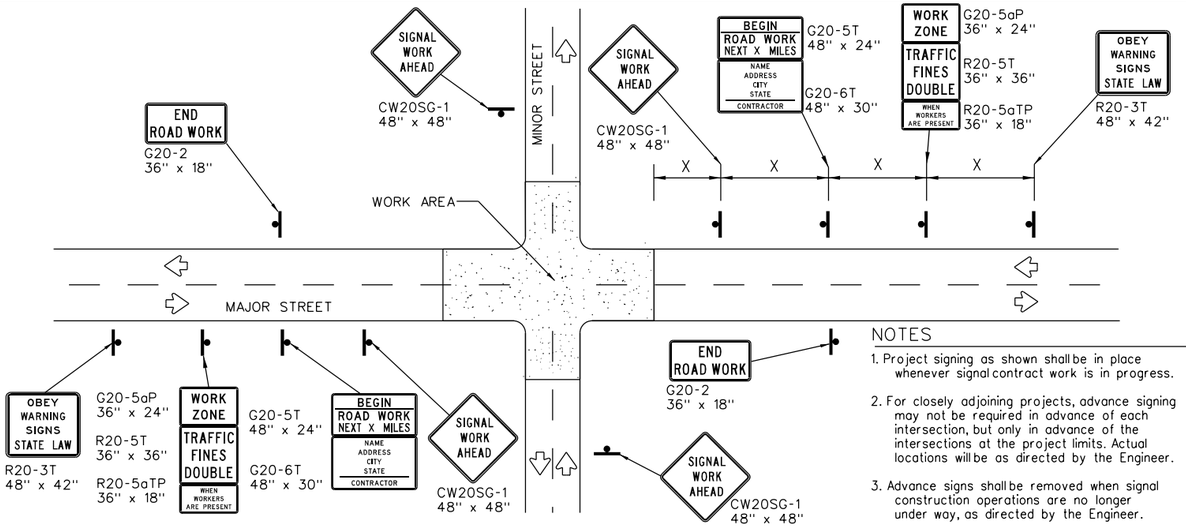
TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	PHR	HIDALGO		70

DISCLAIMER:
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:
FILE:



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

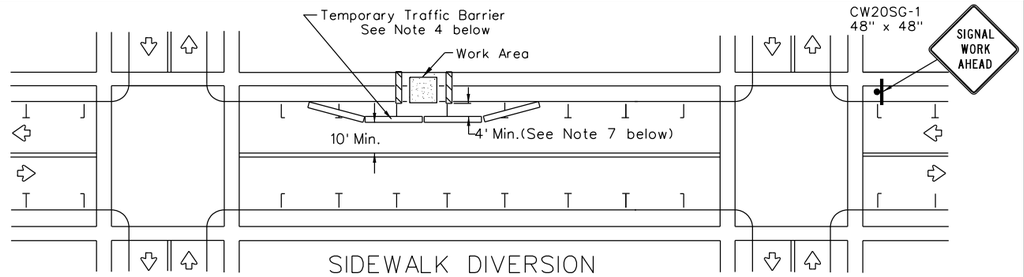
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support 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

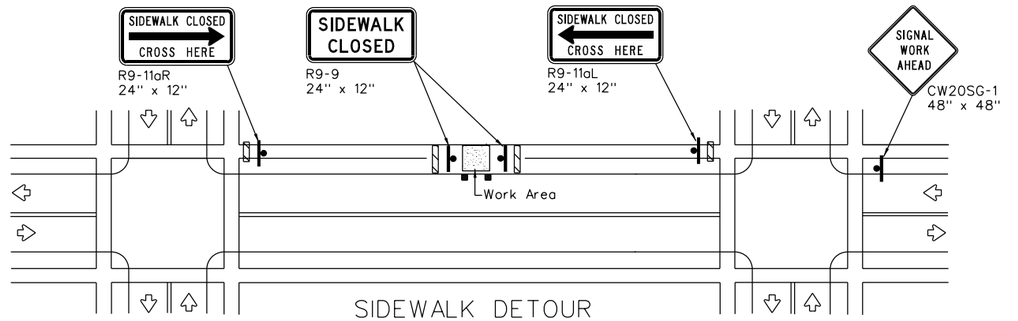
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

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

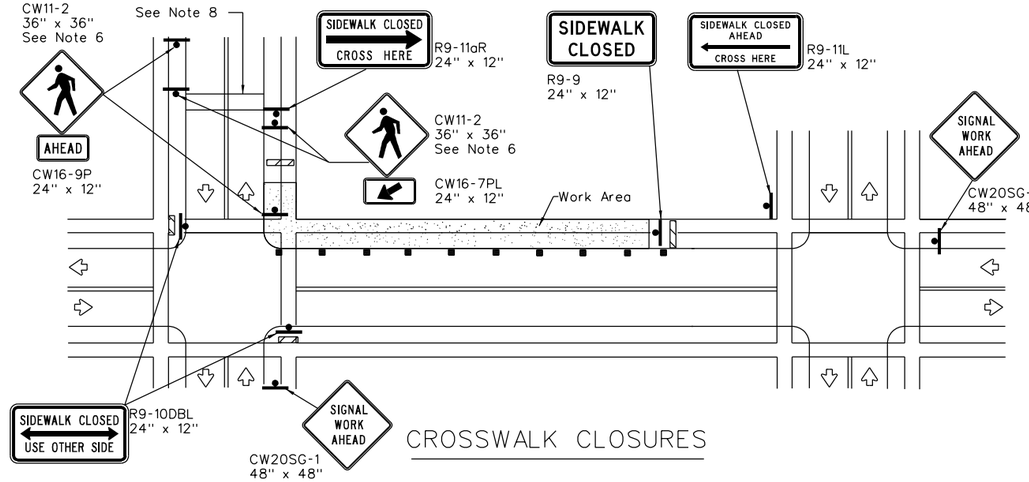
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



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
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	PHR	HIDALGO		71

Chain PCL_HAL contains:
 8000 CUR PCL_HAL1 CUR PCL_HAL2 CUR PCL_HAL3 CUR PCL_HAL4 8001 8002 8003

Beginning chain PCL_HAL description

Point 8000 N 16,613,580.0295 E 1,003,520.8978 Sta 3+00.00

Course from 8000 to PC PCL_HAL1 N 8° 55′ 21.12" E Dist 861.7250

Curve Data

Curve PCL_HAL1
P.I. Station 18+66.95 N 16,615,128.0162 E 1,003,763.9298
Delta = 6° 08′ 47.49" (RT)
Degree = 0° 36′ 31.97"
Tangent = 505.2234
Length = 1,009.4776
Radius = 9,410.0000
External = 13.5530
Long Chord = 1,008.9936
Mid. Ord. = 13.5335
P.C. Station 13+61.73 N 16,614,628.9065 E 1,003,685.5702
P.T. Station 23+71.20 N 16,615,615.8666 E 1,003,895.2794
C.C. N 16,613,169.4256 E 1,012,981.6993
Back = N 8° 55′ 21.12" E
Ahead = N 15° 04′ 08.61" E
Chord Bear = N 11° 59′ 44.87" E

Curve Data

Curve PCL_HAL2
P.I. Station 28+74.15 N 16,616,101.5221 E 1,004,026.0380
Delta = 6° 07′ 08.13" (LT)
Degree = 0° 36′ 31.97"
Tangent = 502.9503
Length = 1,004.9444
Radius = 9,410.0000
External = 13.4314
Long Chord = 1,004.4669
Mid. Ord. = 13.4122
P.C. Station 23+71.20 N 16,615,615.8666 E 1,003,895.2794
P.T. Station 33+76.15 N 16,616,598.3485 E 1,004,104.2844
C.C. N 16,618,062.3076 E 994,808.8595
Back = N 15° 04′ 08.61" E
Ahead = N 8° 57′ 00.49" E
Chord Bear = N 12° 00′ 34.55" E

Course from PT PCL_HAL2 to PC PCL_HAL3 N 8° 57′ 00.49" E Dist 8,472.7483

Curve Data

Curve PCL_HAL3
P.I. Station 120+32.68 N 16,625,149.4764 E 1,005,451.0223
Delta = 2° 14′ 15.82" (LT)
Degree = 0° 36′ 31.97"
Tangent = 183.7805
Length = 367.5142
Radius = 9,410.0000
External = 1.7945
Long Chord = 367.4909
Mid. Ord. = 1.7941
P.C. Station 118+48.90 N 16,624,967.9336 E 1,005,422.4307
P.T. Station 122+16.41 N 16,625,331.9971 E 1,005,472.5036
C.C. N 16,626,431.8927 E 996,127.0058
Back = N 8° 57′ 00.49" E
Ahead = N 6° 42′ 44.67" E
Chord Bear = N 7° 49′ 52.58" E

Curve Data

Curve PCL_HAL4
P.I. Station 124+00.19 N 16,625,514.5178 E 1,005,493.9850
Delta = 2° 14′ 15.82" (RT)
Degree = 0° 36′ 31.97"
Tangent = 183.7805
Length = 367.5142
Radius = 9,410.0001
External = 1.7945
Long Chord = 367.4909
Mid. Ord. = 1.7941
P.C. Station 122+16.41 N 16,625,331.9971 E 1,005,472.5036
P.T. Station 125+83.92 N 16,625,696.0606 E 1,005,522.5766
C.C. N 16,624,232.1015 E 1,014,818.0016
Back = N 6° 42′ 44.67" E
Ahead = N 8° 57′ 00.49" E
Chord Bear = N 7° 49′ 52.58" E

Course from PT PCL_HAL4 to 8001 N 8° 57′ 00.49" E Dist 1,208.7977

Point 8001 N 16,626,890.1401 E 1,005,710.6351 Sta 137+92.72

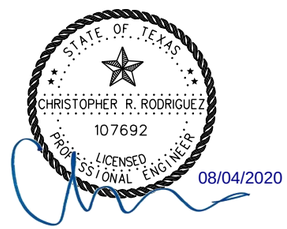
Course from 8001 to 8002 N 8° 38′ 53.39" E Dist 920.0128

Point 8002 N 16,627,799.6926 E 1,005,848.9742 Sta 147+12.73

Course from 8002 to 8003 N 8° 55′ 29.86" E Dist 413.5794

Point 8003 N 16,628,208.2646 E 1,005,913.1372 Sta 151+26.31

Ending chain PCL_HAL description



THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

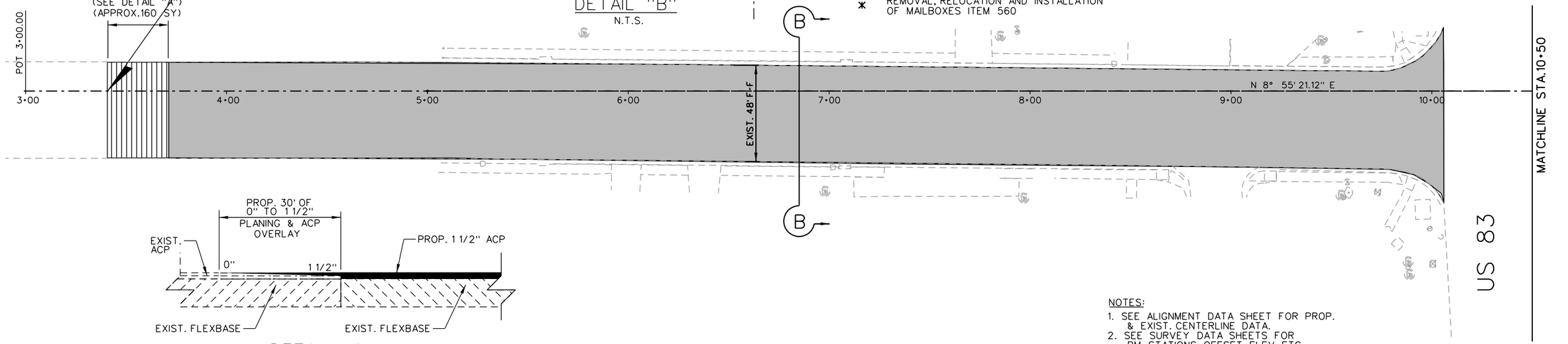
LIBERTY BLVD ALIGNMENT DATA

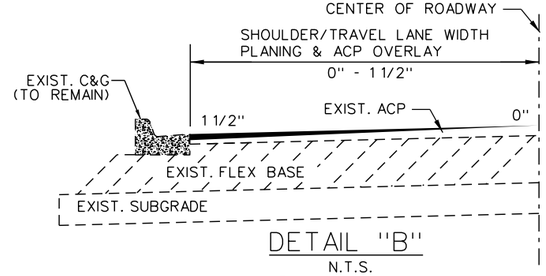
DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					72
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

8/1/2020 D:\Liberty Rd (US83 to Mile 3)\03 ROADWAY\01 AlignData\LIBERTY_align data.dgn

BEGIN INCICENTAL CONSTRUCTION
LIBERTY BLVD
CSJ: 0921-02-194
STA. 3+55.00

PROP. 30' PLANING AND OVERLAY (0"-1 1/2") (SEE DETAIL "A") (APPROX.160 SY)





DETAIL "B"
N.T.S.

DETAIL "A"
N.T.S.

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURNOUT TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED DETAIL "A" PLANING (0-1½") AND OVERLAY
- PROPOSED WIDENING
- PROPOSED DETAIL "B" PLANING (0-1½") AND OVERLAY
- EXIST ROAD TO BE REMOVED (ITEM 110)
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- * REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560

SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
354	PLANE ASPH CONC PAV (0" TO 1 1/2")	SY	4677

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEETS FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS

EXIST. & PROP. CENTERLINE

PROFILE TO MATCH AND BE GOVERNED BY EXISTING FIELD CONDITIONS.

PROP. PGL
EXIST. CL

PROP. LT/RT T.O.C. & EXIST. LT/RT R.O.W.

PROFILE TO MATCH AND BE GOVERNED BY EXISTING FIELD CONDITIONS.

PROP. LT TOC
PROP. RT TOC
EXIST. LT R.O.W
EXIST. RT R.O.W.

$FILE$
$DATE$

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
08/04/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

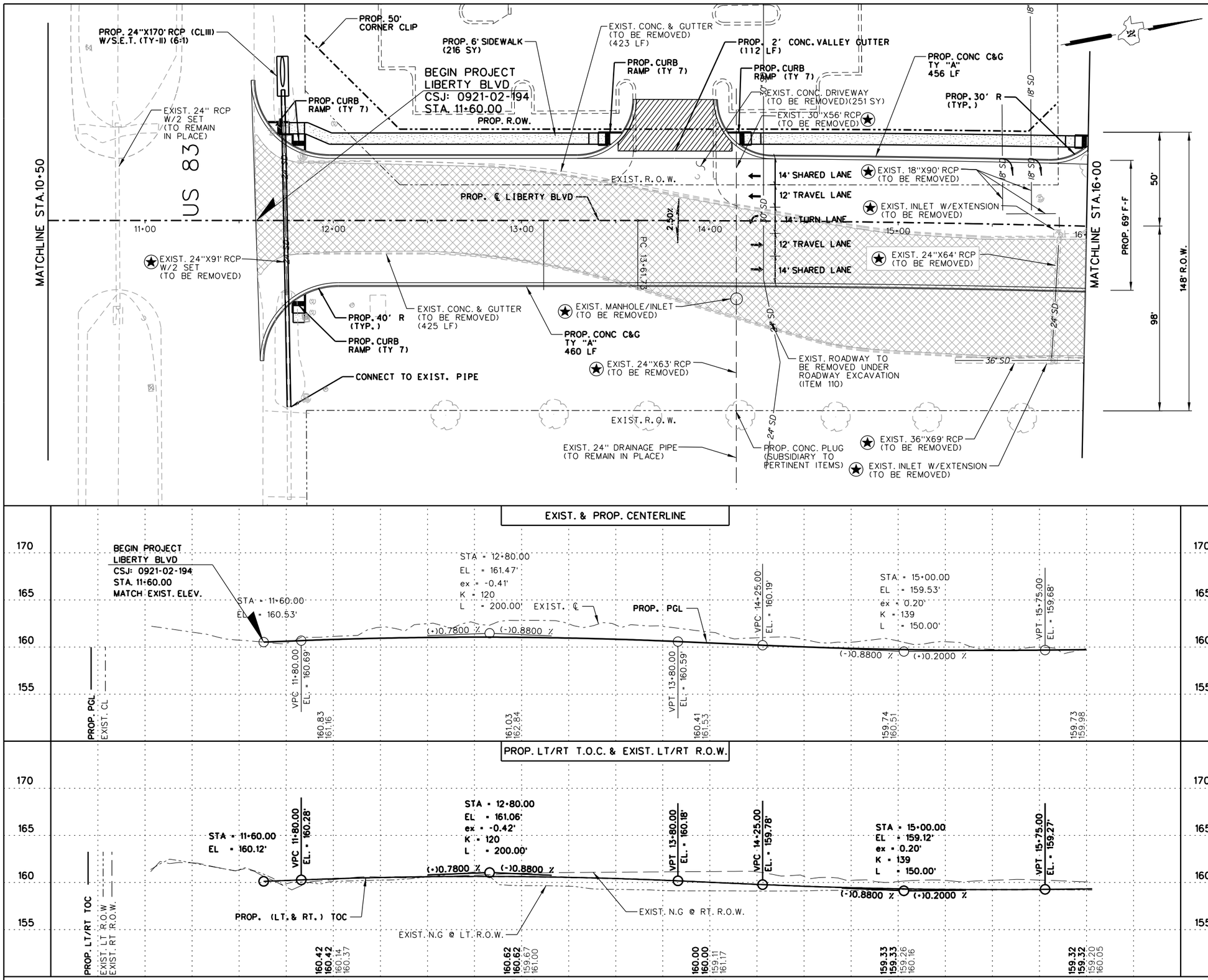
2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 3+00 TO STA. 10+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					73
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								



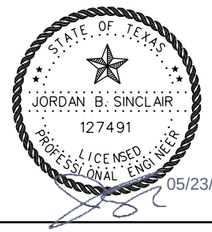
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
104	REMOVE CONC. (DRIVEWAY)	SY	251
104	REMOVE CONC. (CURB & GUTTER)	LF	848
464	RC PIPE (CL-III)(24")	LF	170
467	SET (TY II) (24")(RCP)(6:1)(P)	EA	1
496	REMOVE STR (SET)	EA	2
496	REMOVE STR (PIPE)	LF	433
496	REMOVE STR (INLET)	EA	3
529	CONC CURB & GUTTER (TY-A)	LF	916
529	CONC VALLEY GUTTER	LF	112
531	CURB RAMPS (TY 7)	EA	5
531	CONCRETE SIDEWALKS	SY	216

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURNOUT TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- EXIST ROAD TO BE REMOVED (ITEM 110)
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS





L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD PLAN AND PROFILE STA. 10+50 TO STA. 16+00

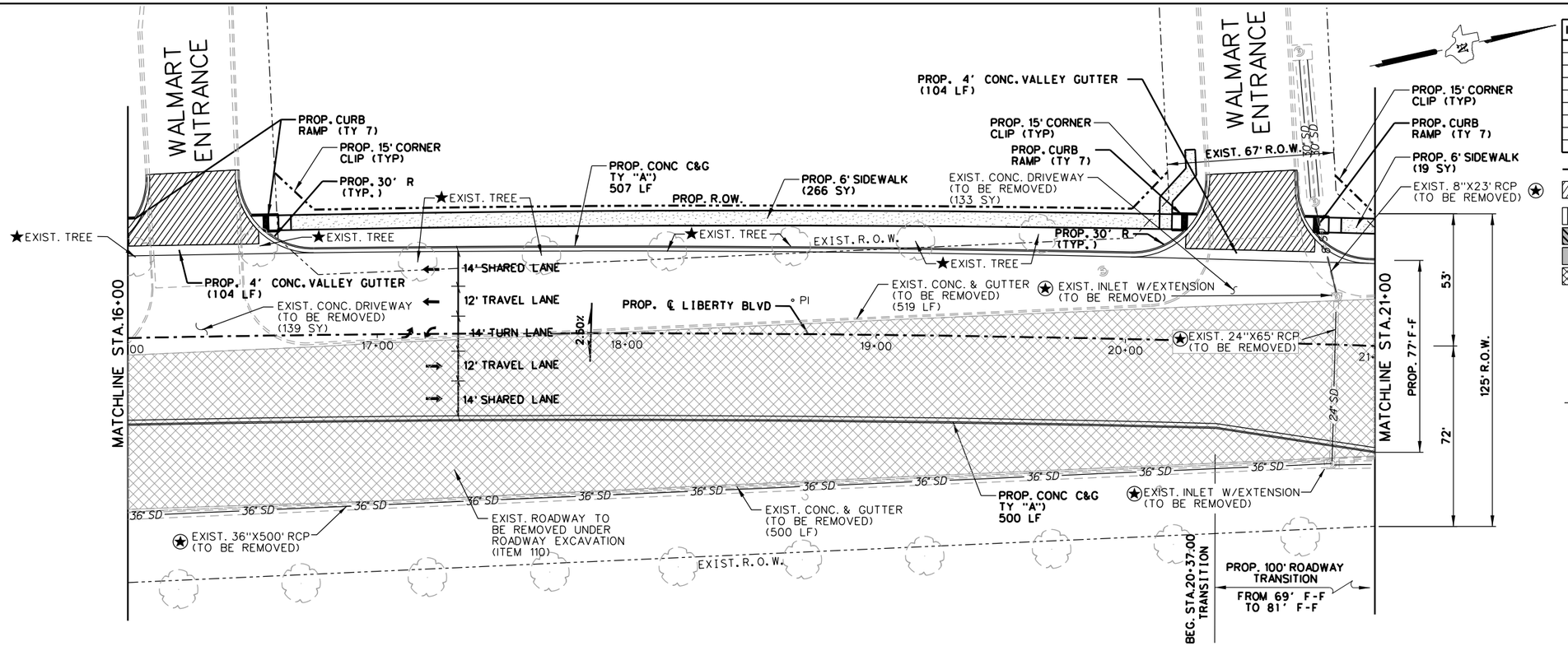
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 2 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
6	TEXAS				74
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
PHR	HIDALGO	0921	02	194	LIBERTY

K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDV\03 ROADWAY\02 P&P\LIBERTY_PP02.dgn
5/6/2022



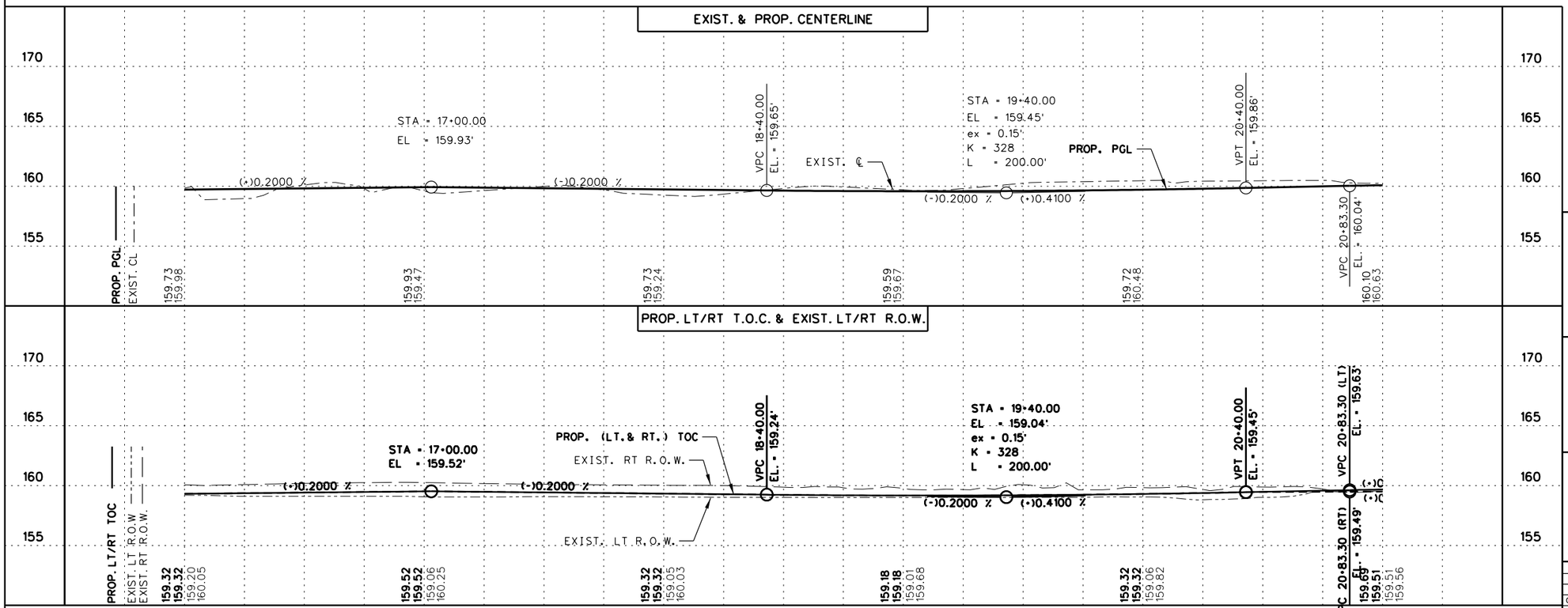
SHEET SUMMARY

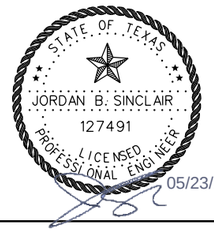
ITEM	DESCRIPTION	UNIT	QUANTITY
104	REMOVE CONC. (CURB & GUTTER)	LF	1019
104	REMOVE CONC. (DRIVEWAYS)	SY	272
496	REMOVE STR (PIPE)	LF	588
496	REMOVE STR (INLET)	EA	2
529	CONC CURB & GUTTER (TY-A)	LF	1007
529	CONC VALLEY GUTTER	LF	208
531	CURB RAMPS (TY 7)	EA	4
531	CONCRETE SIDEWALKS	SY	285

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS







L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 16+00 TO STA. 21+00

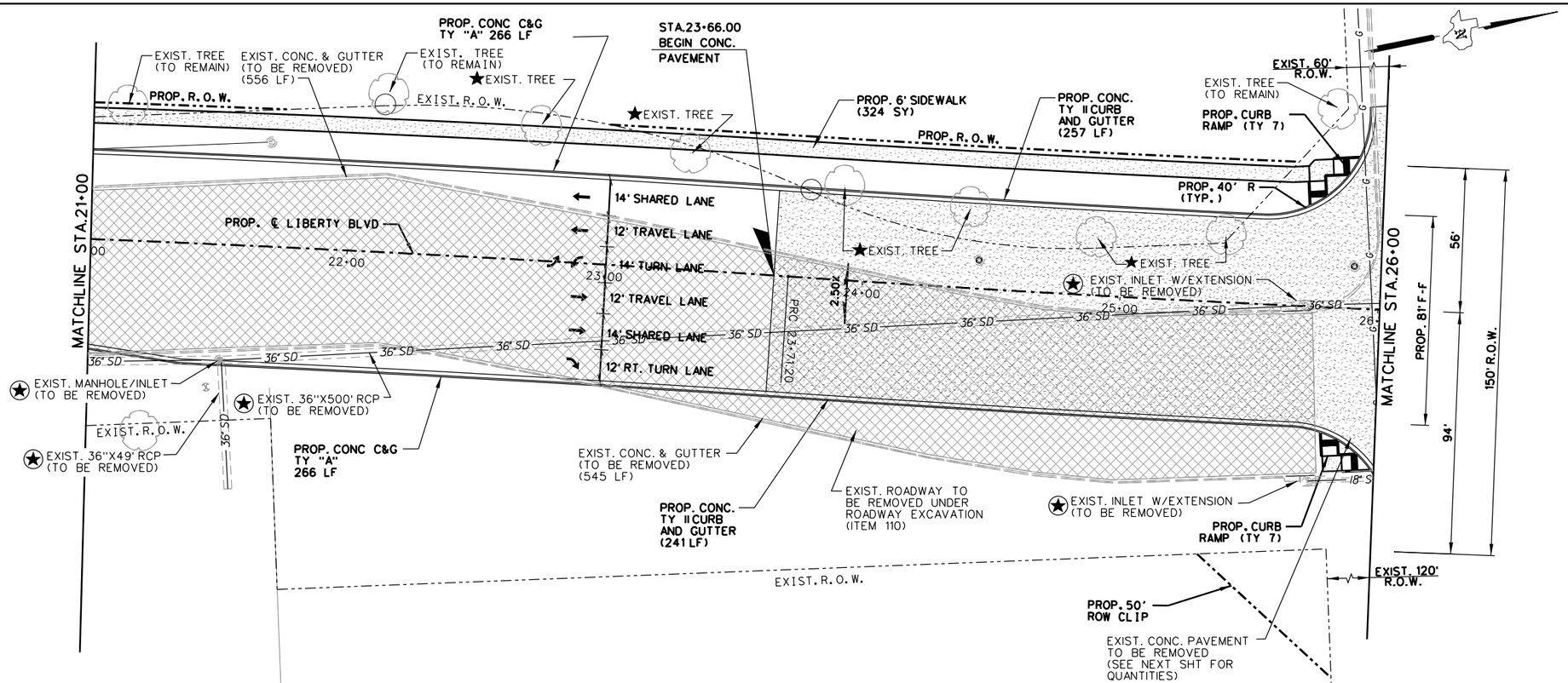
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 3 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					75
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

K:\Counties\HD\Liberty Rd (US83 to Mile 3)\GDJ\03 ROADWAY\02 P&P\LIBERTY_PP03.dgn
5/6/2022



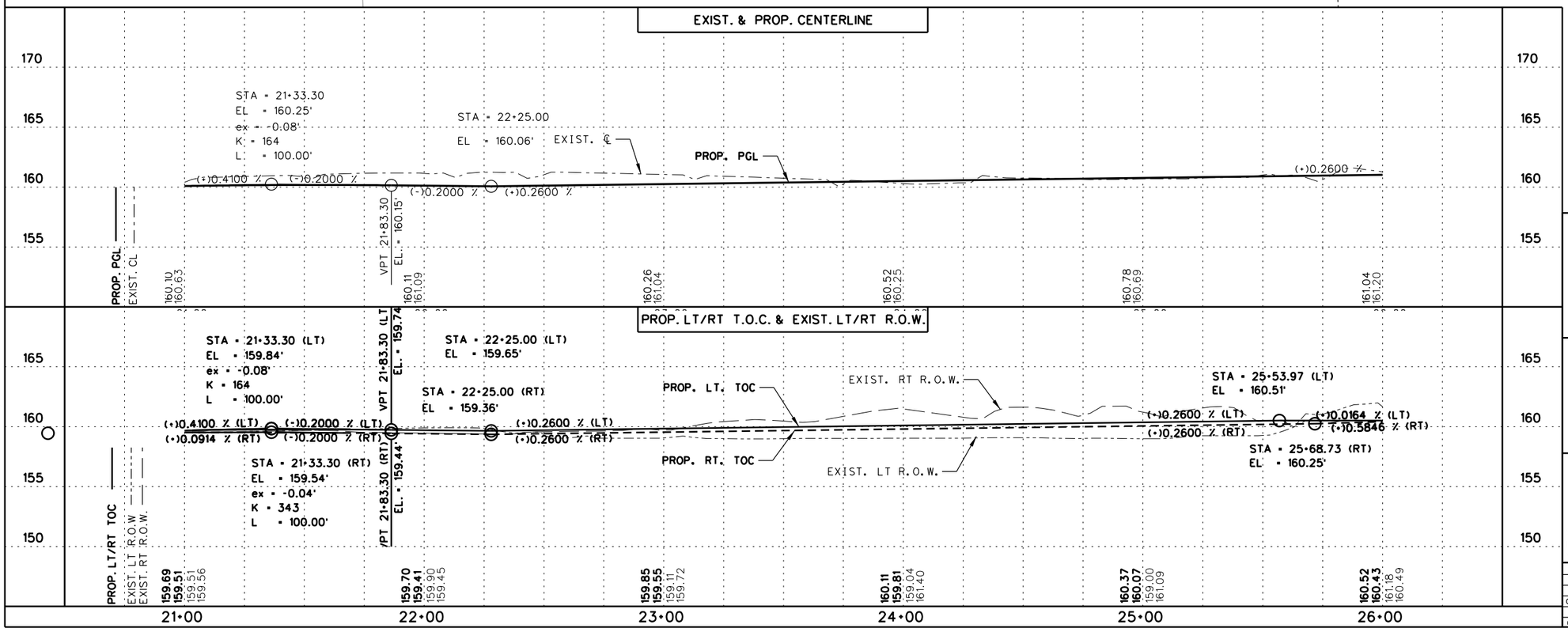
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
104	REMOVE CONC. (CURB & GUTTER)	LF	1101
496	REMOVE STR (INLET)	EA	3
496	REMOVE STR (PIPE)	LF	500
529	CONC. CURB & GUTTER (TY II)	LF	448
529	CONC CURB & GUTTER (TY-A)	LF	532
531	CURB RAMPS (TY 7)	EA	4
531	CONCRETE SIDEWALKS	SY	324

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
06/03/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

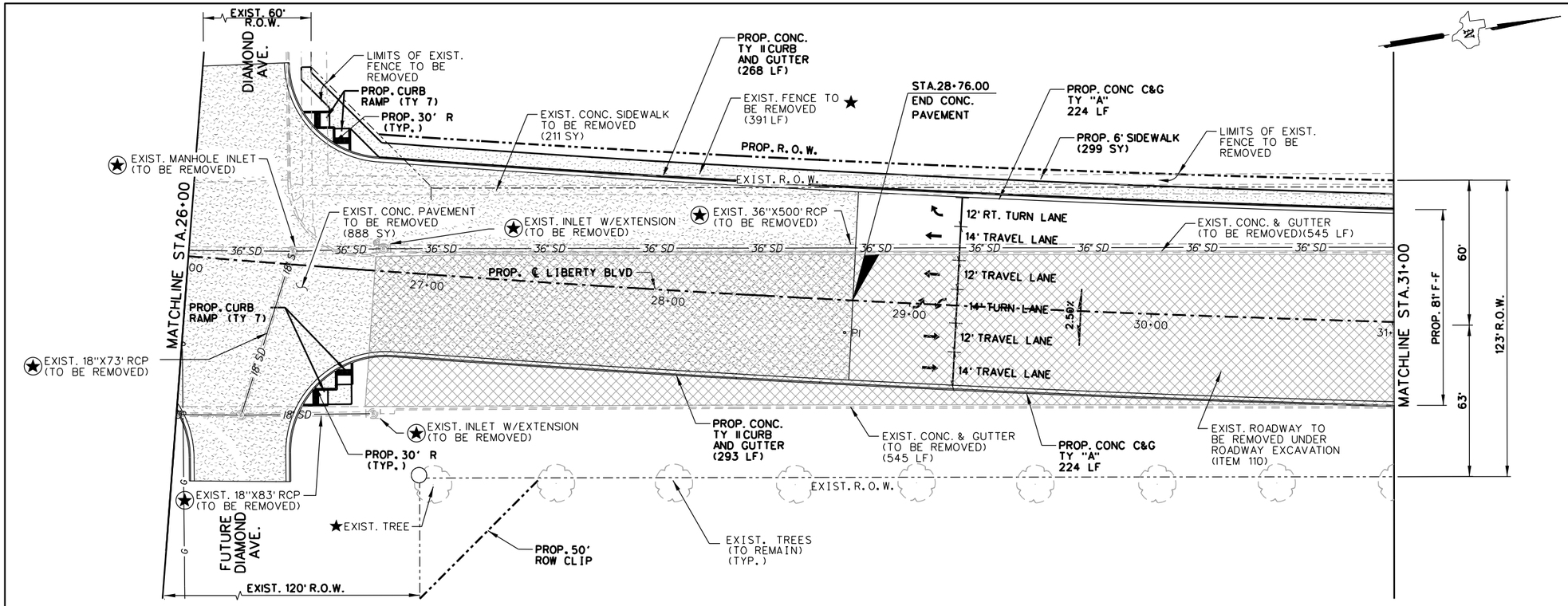
LIBERTY BLVD
PLAN AND PROFILE
STA. 21+00 TO STA. 26+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 4 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.	SHEET NO.
						6	TEXAS		76
						STATE DIST. NO	COUNTY	CONTROL NO. / SECTION NO. / JOB NO.	HIGHWAY NO.
						PHR	HIDALGO	0921 / 02 / 194	LIBERTY

6/3/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GD\03 ROADWAY\02 P&P\LIBERTY_PP04.dgn



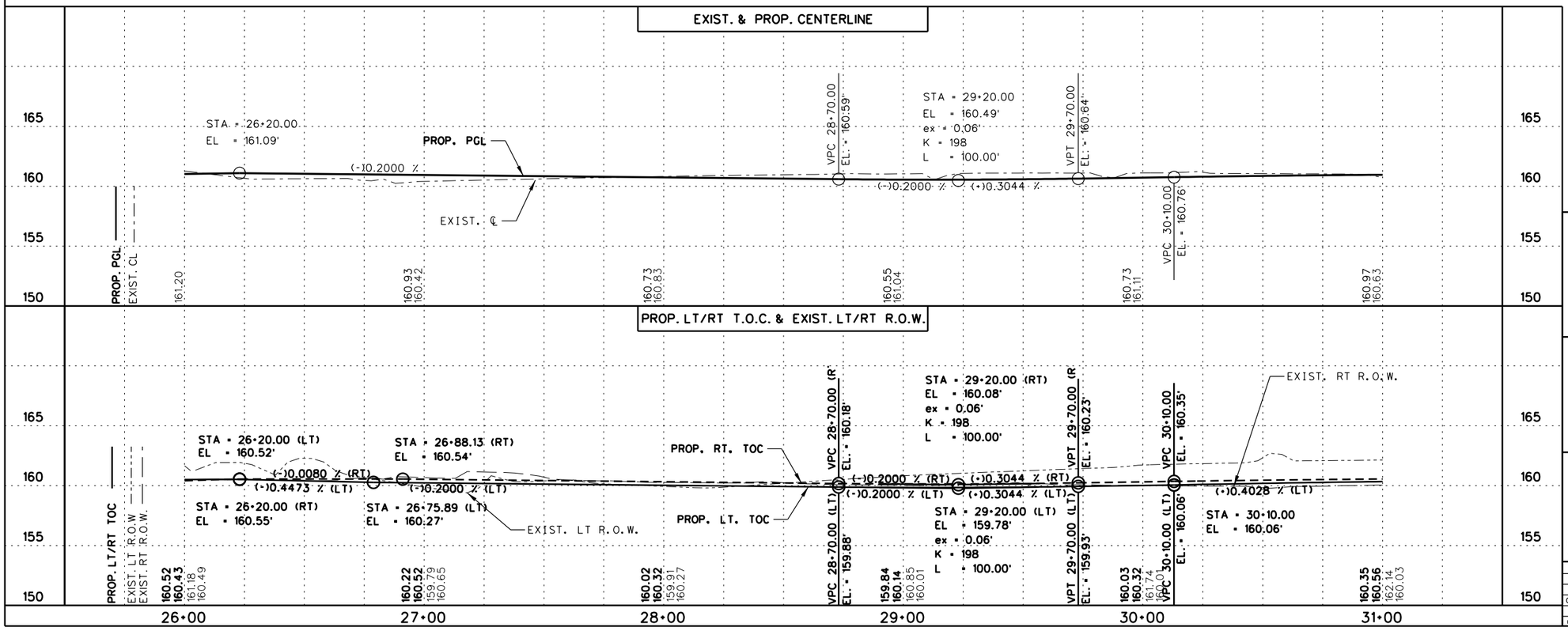
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
104	REMOVE CONC. (PAV)	SY	888
104	REMOVE CONC. (SIDEWALKS)	SY	211
104	REMOVE CONC. (CURB & GUTTER)	LF	1090
496	REMOVE STR (PIPE)	LF	656
496	REMOVE STR (INLET)	EA	3
529	CONC. CURB & GUTTER (TY II)	LF	448
529	CONC CURB & GUTTER (TY-A)	LF	1009
531	CURB RAMPS (TY 7)	EA	4
531	CONCRETE SIDEWALKS	SY	299

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
06/03/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD PLAN AND PROFILE STA. 26+00 TO STA. 31+00

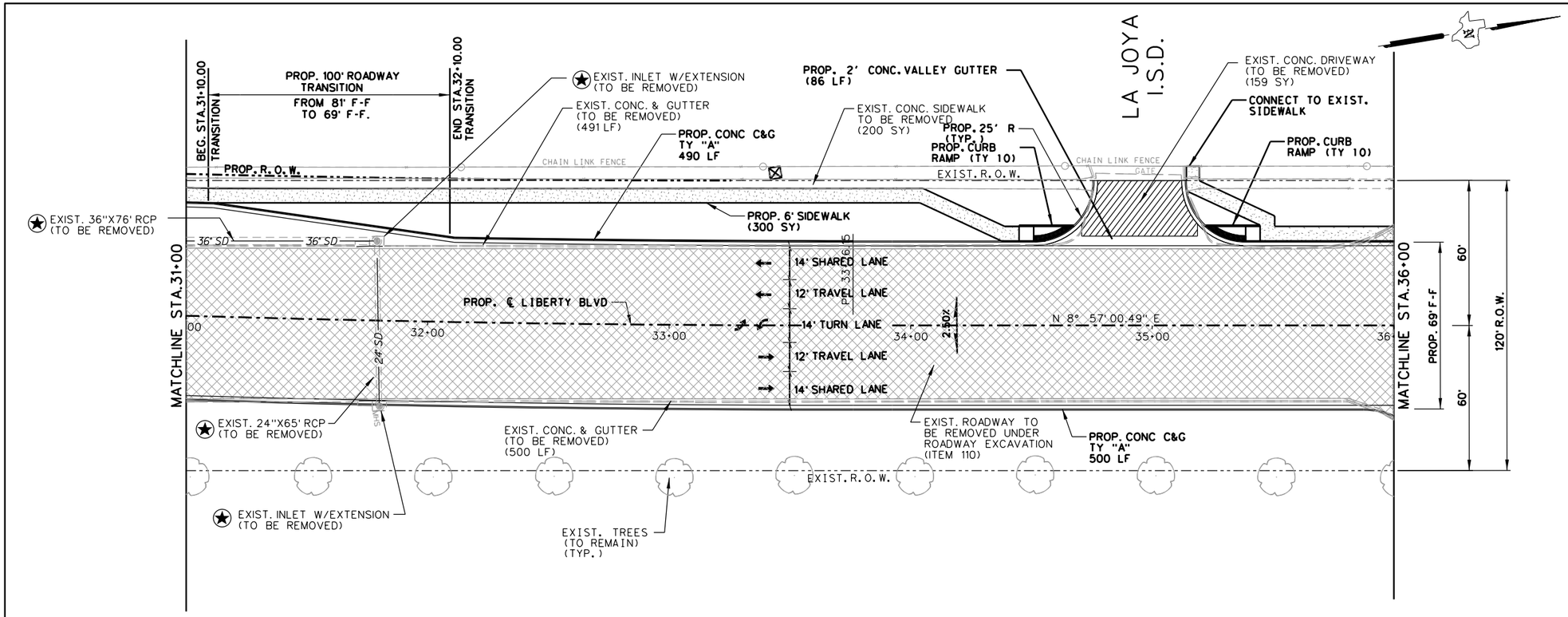
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 5 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					77
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

K:\Counties\HD\Liberty Rd (US83 to Mile 3)\GDJ\03 ROADWAY\02 P&P\LIBERTY_PP05.dgn
6/3/2022



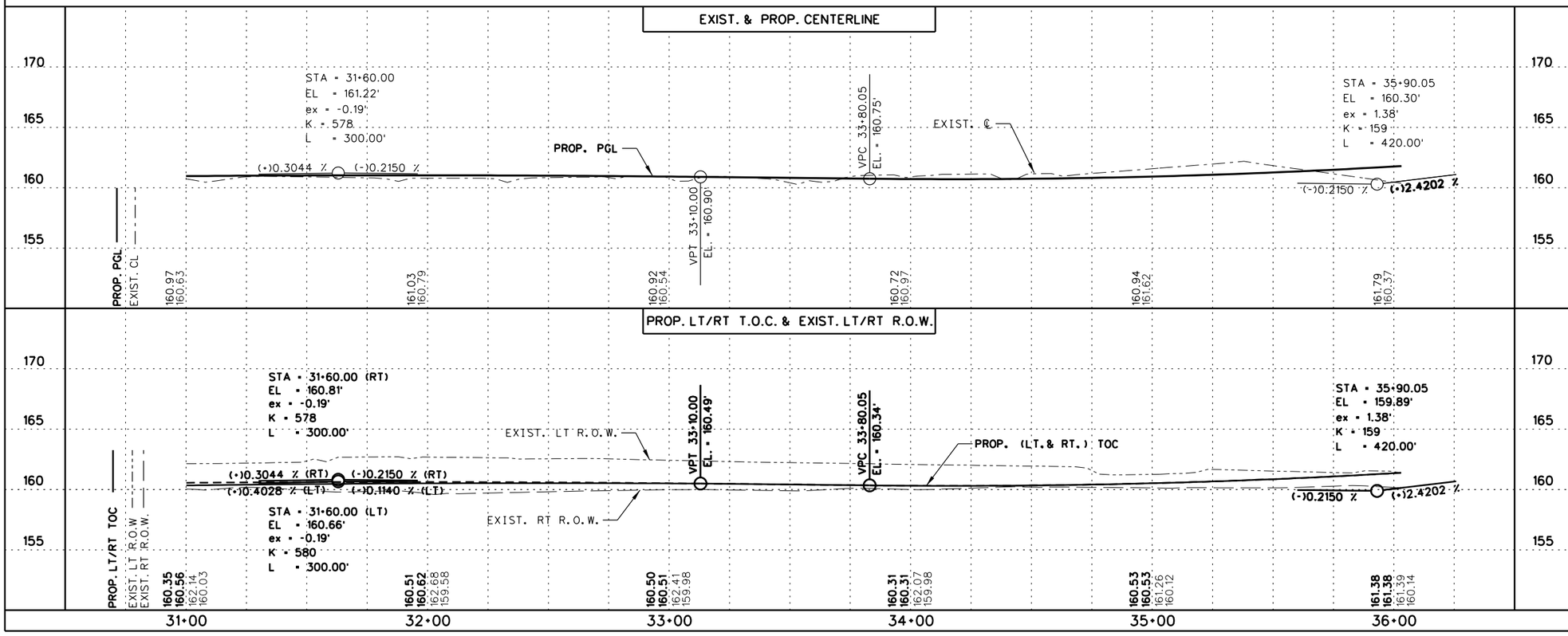
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
104	REMOVE CONC. (SIDEWALKS)	SY	200
104	REMOVE CONC. (DRIVEWAYS)	SY	159
104	REMOVE CONC. (CURB & GUTTER)	LF	991
496	REMOVE STR (PIPE)	LF	141
496	REMOVE STR (INLET)	EA	2
529	CONC VALLEY GUTTER	LF	86
529	CONC CURB & GUTTER (TY-A)	LF	990
531	CONCRETE SIDEWALKS	SY	300
531	CURB RAMPS (TY 10)	EA	2

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
06/03/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 31+00 TO STA. 36+00

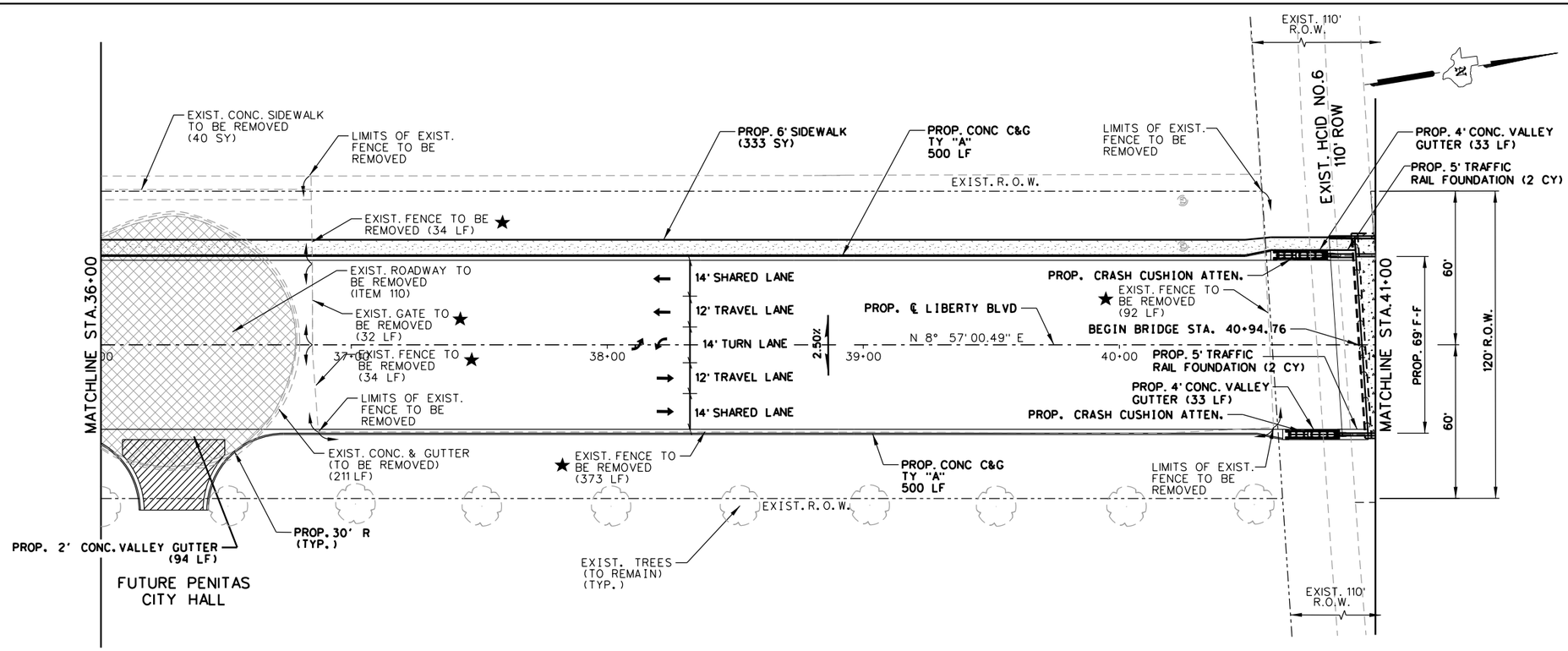
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 6 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					78
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

6/3/2022
K:\Counties\HID\Liberty Rd (US83 to Mile 31\GDU\03 ROADWAY\02 P&P\LIBERTY_PP06_A.dgn



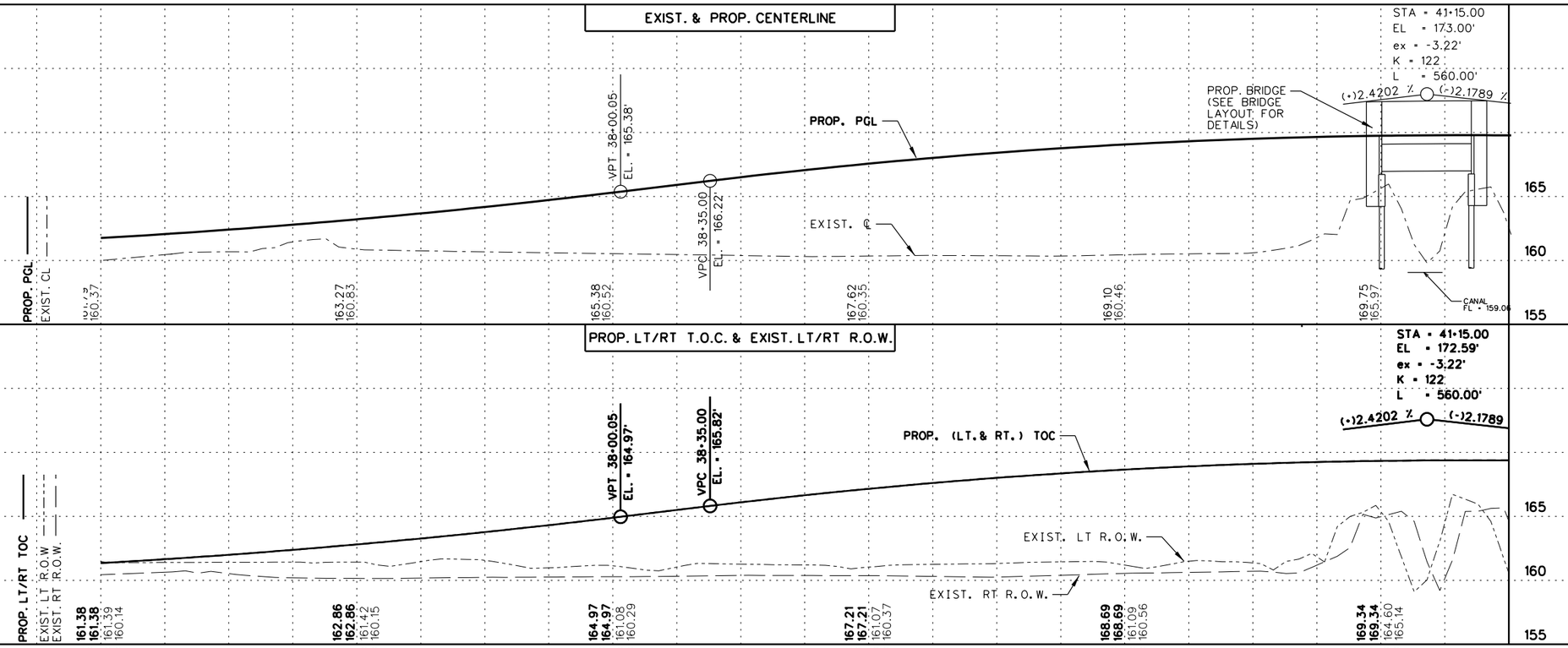
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
104	REMOVE CONC. (SIDEWALKS)	SY	40
104	REMOVE CONC. (CURB & GUTTER)	LF	211
420	CL C CONC. (RAIL FOUNDATION)	CY	4
529	CONC CURB & GUTTER (TY-A)	LF	1000
529	CONC. CURB & GUTTER (VALLEY GUTTER)	LF	160
531	CONCRETE SIDEWALKS	SY	333
545	CRASH CUSHION ATTEN.	EA	2

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 36+00 TO STA. 41+00

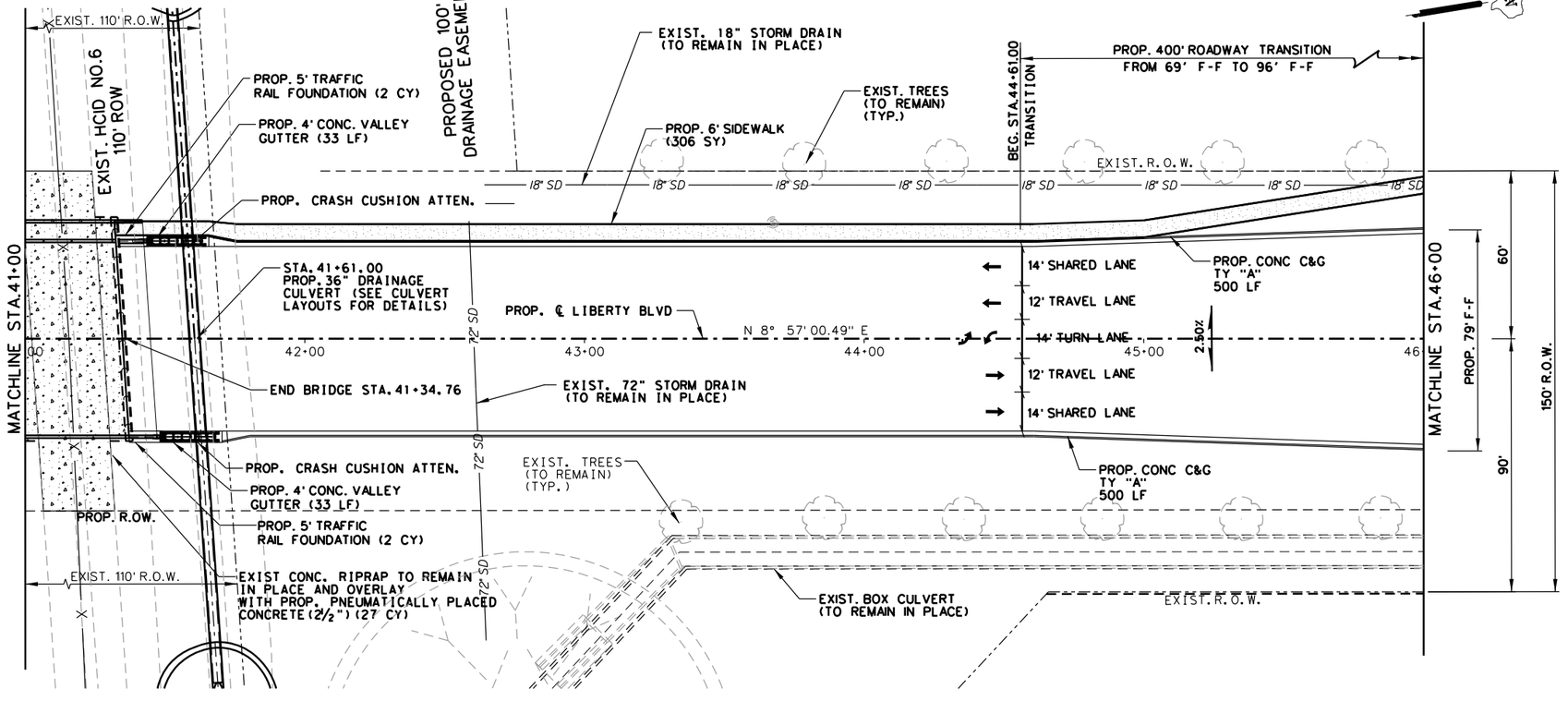
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 7 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					79
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\03 ROADWAY\02 P&P\LIBERTY_PP07_A.dgn
5/6/2022



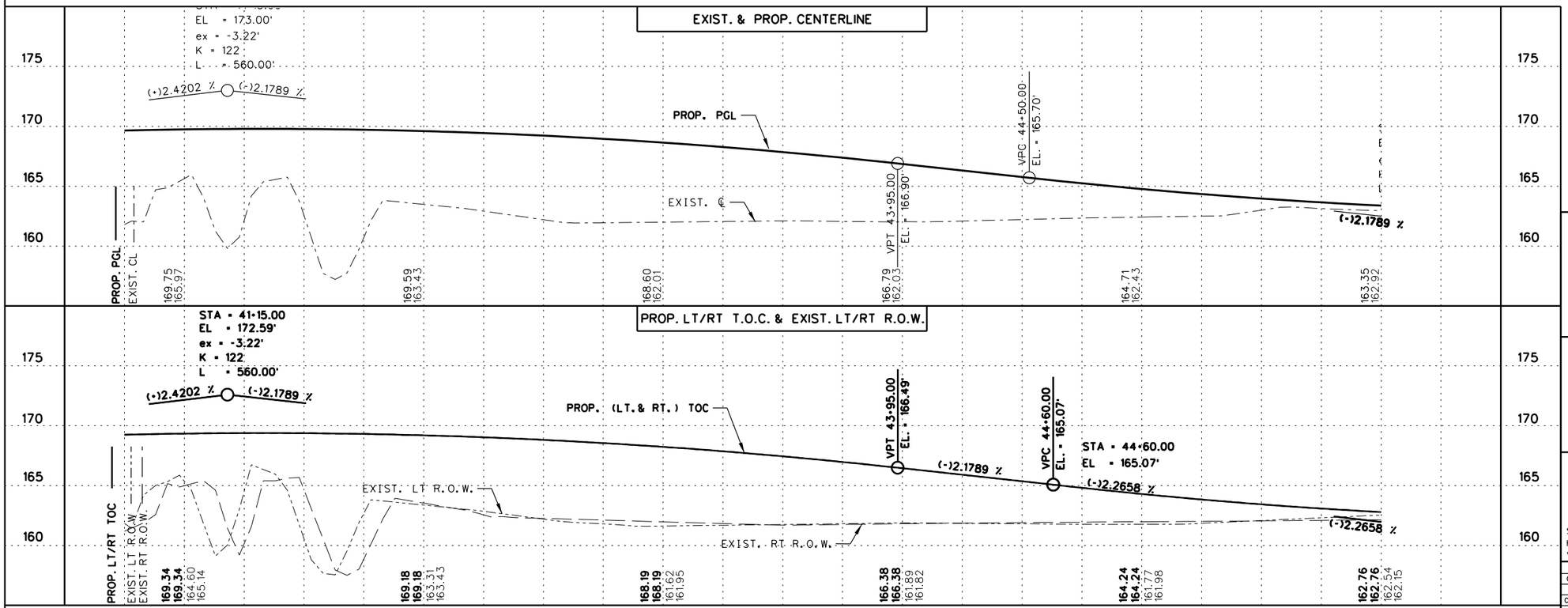
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
420	CL C CONC. (RAIL FOUNDATION)	CY	4
432	RIPRAP (PNEUM PLAC CONC)(2.5IN)	CY	27
529	CONC. CURB & GUTTER (VALLEY GUTTER)	LF	66
529	CONC CURB & GUTTER (TY-A)	LF	1000
531	CONCRETE SIDEWALKS	SY	306
545	CRASH CUSHION ATTEN.	EA	2

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 41+00 TO STA. 46+00

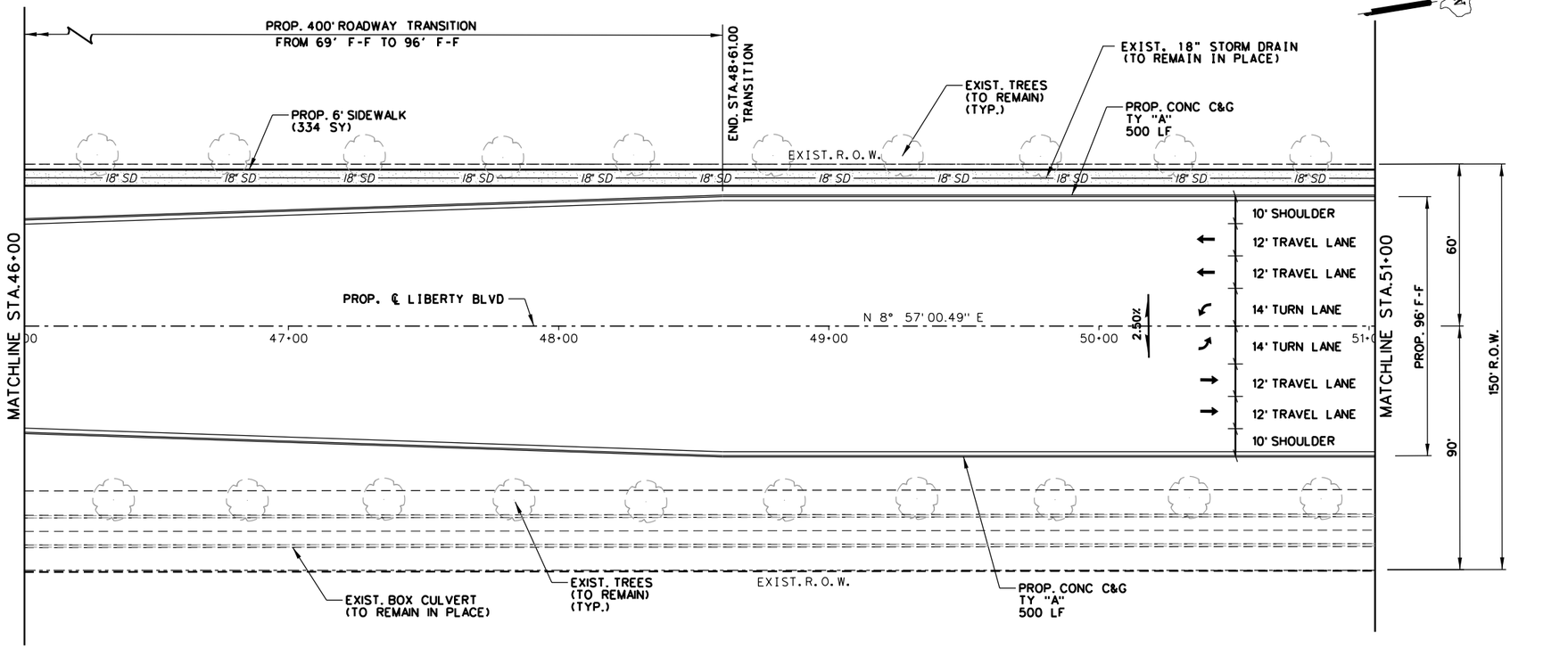
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 8 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					80
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GOV\03 ROADWAY\02 P&P\LIBERTY_PP08_A.dgn
5/6/2022



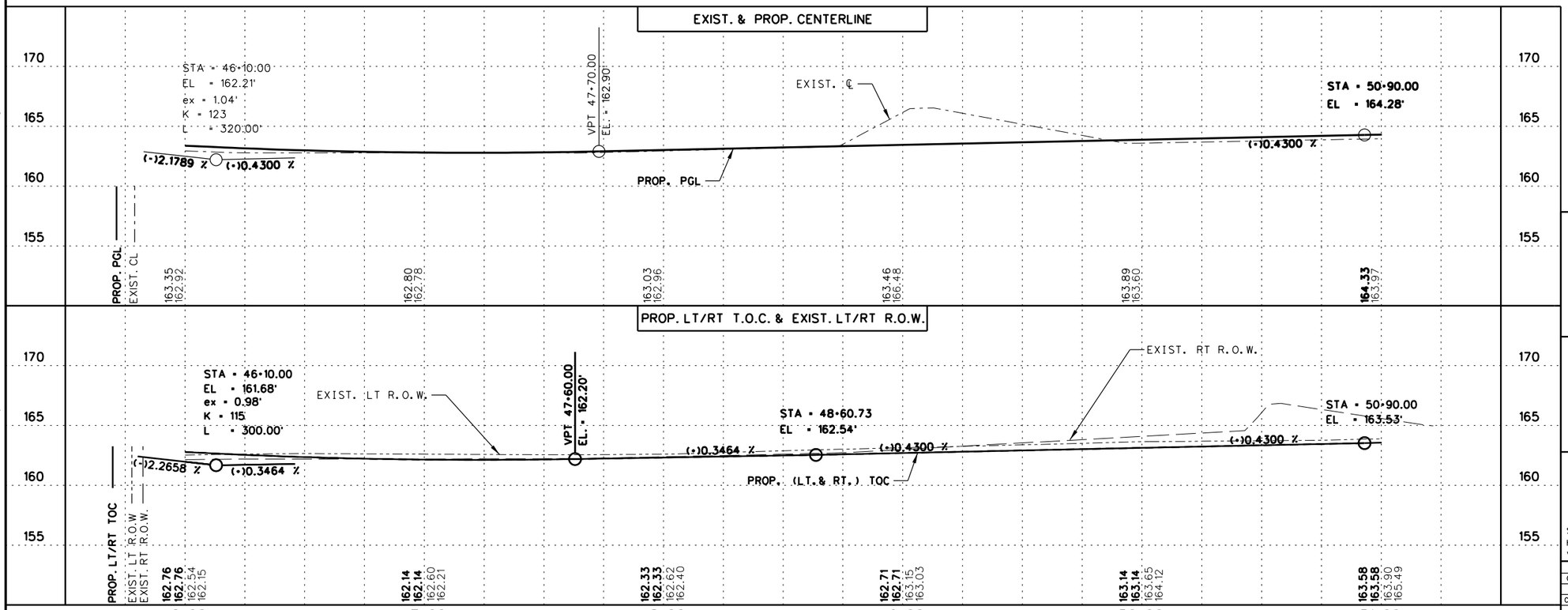
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
529	CONC CURB & GUTTER (TY-A)	LF	1000
531	CONCRETE SIDEWALKS	SY	334

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 46+00 TO STA. 51+00

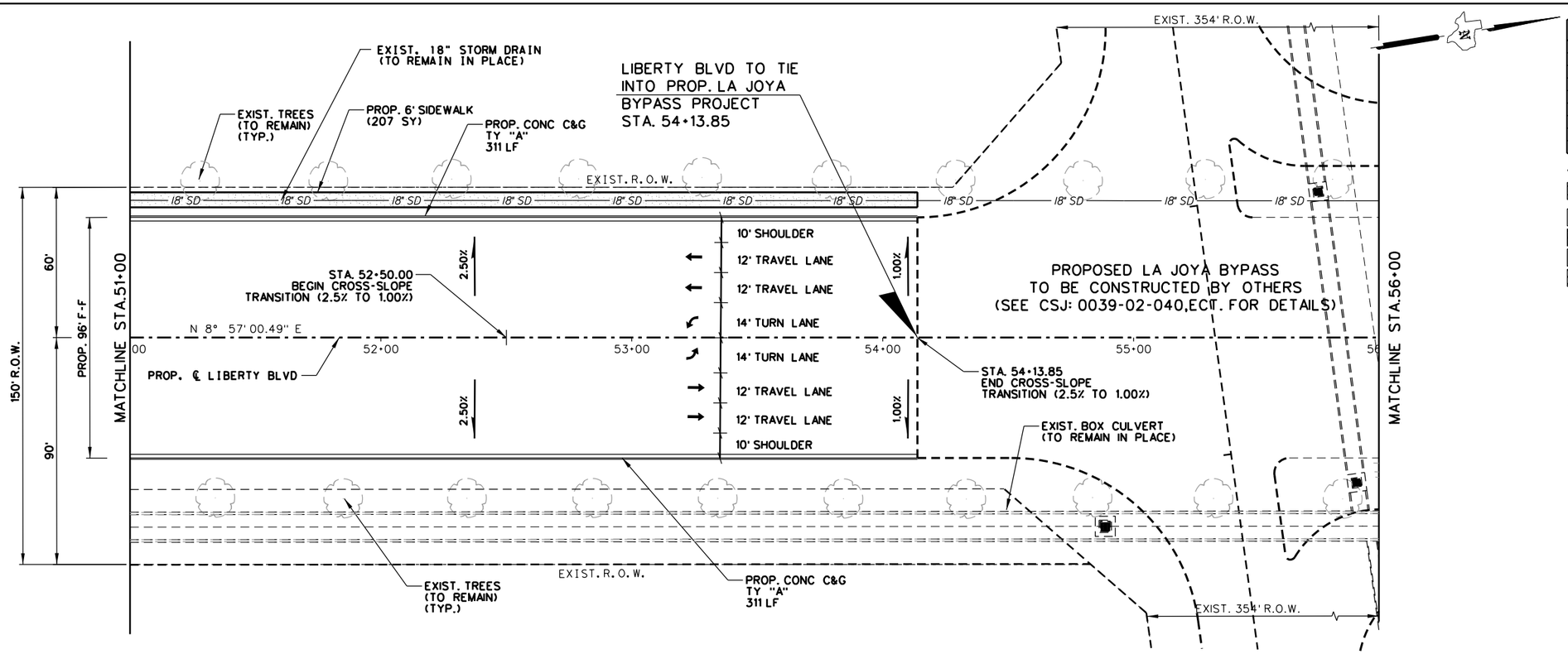
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 9 OF 28

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					81
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

K:\Counties\HID\Liberty Rd (US83 to Mile 3\)\GDJ\03 ROADWAY\02 P&P\LIBERTY_PP09_A.dgn

5/6/2022



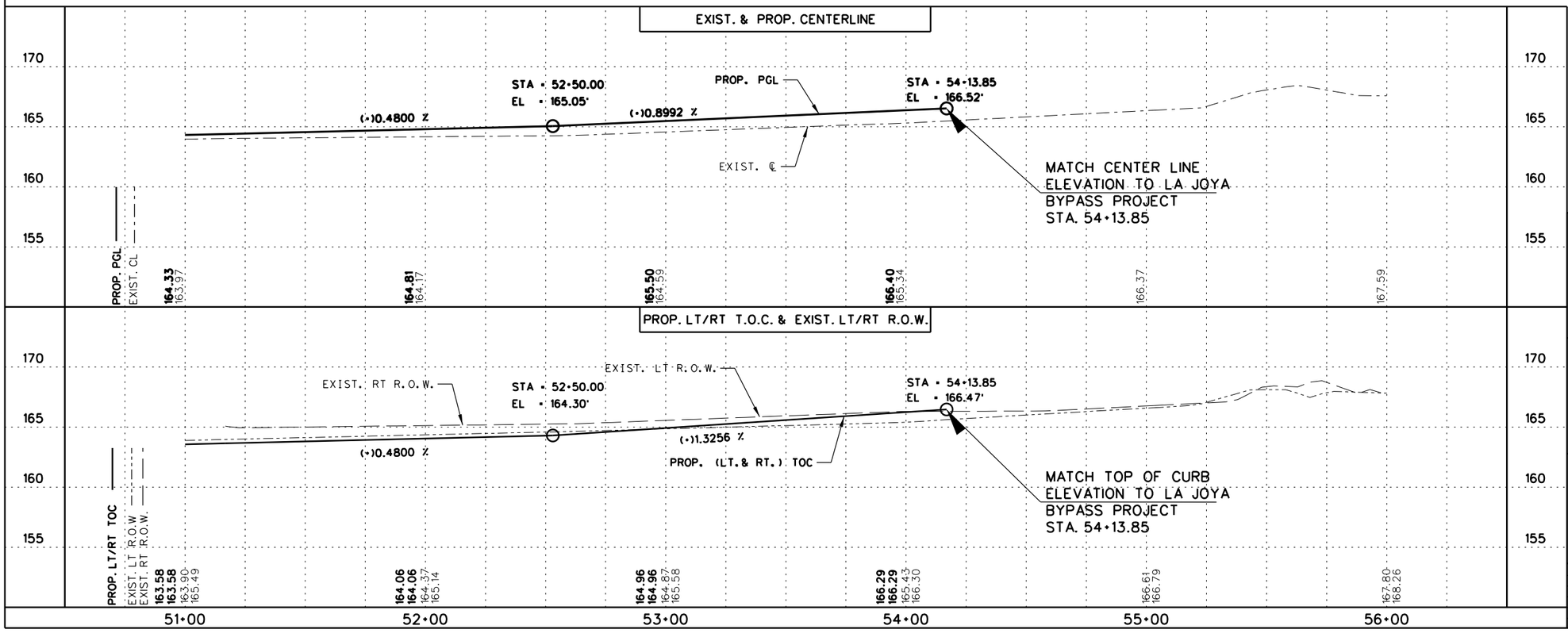
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
529	CONC CURB & GUTTER (TY-A)	LF	622
531	CONCRETE SIDEWALKS	SY	207

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD PLAN AND PROFILE STA. 51+00 TO STA. 56+00

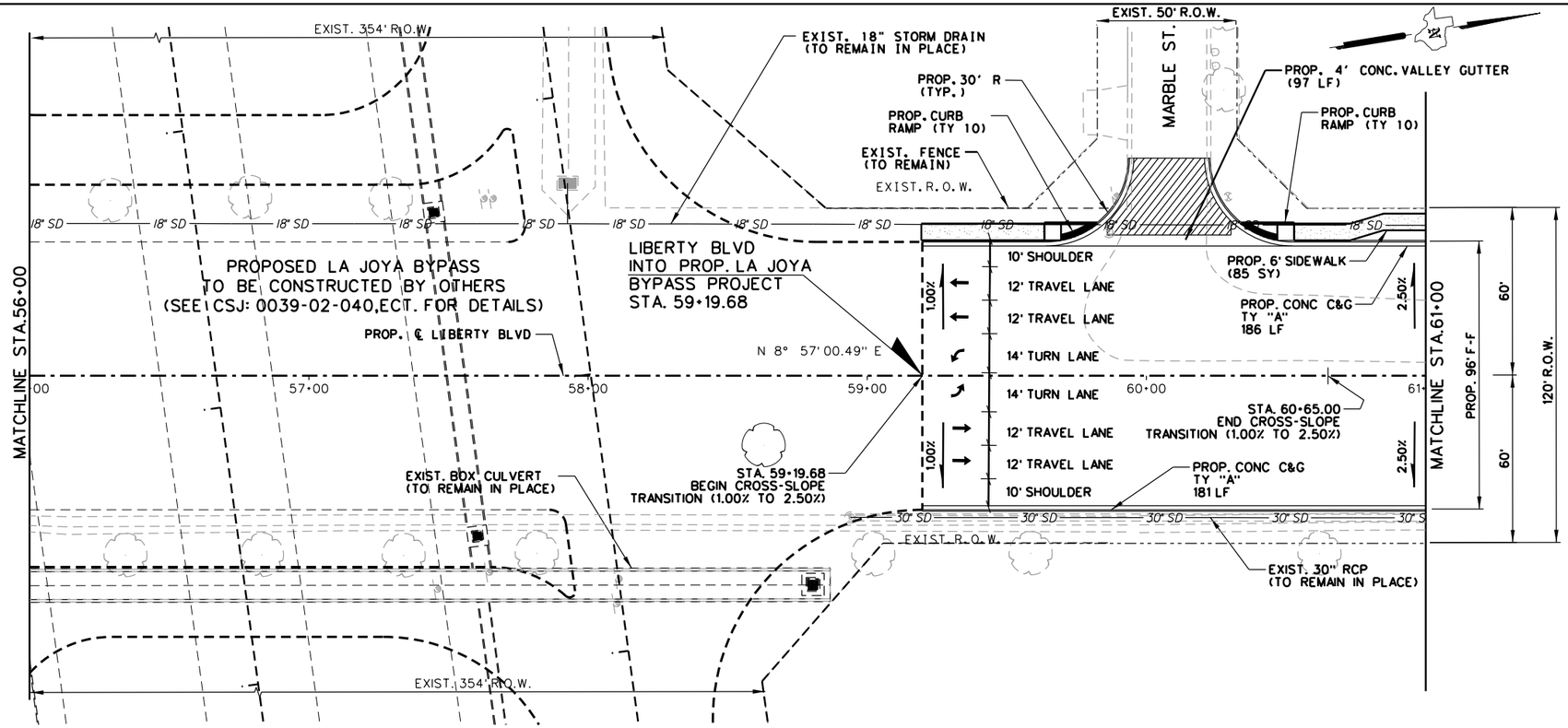
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 10 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					82
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

5/6/2022 K:\Counties\HD\Liberty Rd (US83 to Mile 3)\GDJ\03 ROADWAY\02 P&P\LIBERTY_PP010_A.dgn



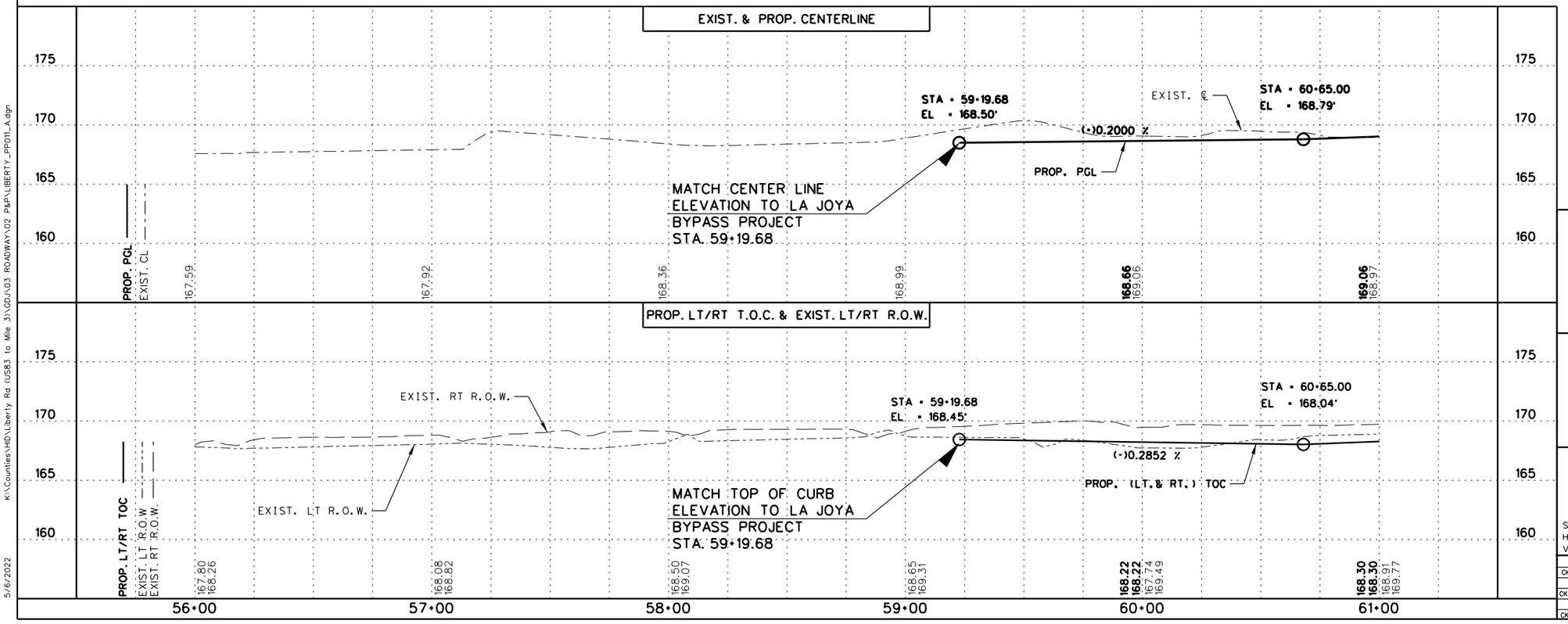
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
529	CONC CURB & GUTTER (TY-A)	LF	367
531	CONCRETE SIDEWALKS	SY	85
531	CURB RAMPS (TY 10)	EA	2
529	CONC VALLEY GUTTER	LF	97

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD PLAN AND PROFILE STA. 56+00 TO STA. 61+00

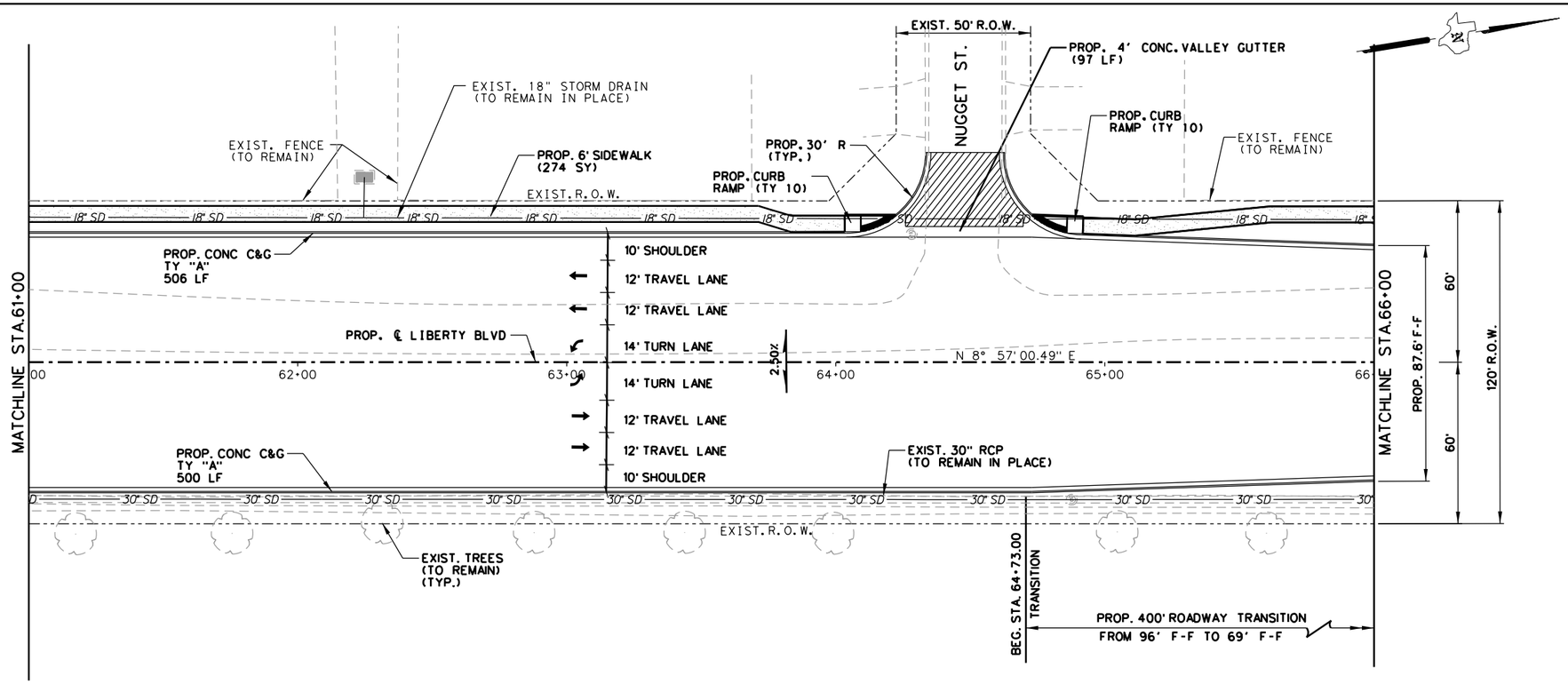
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 11 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					83
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\03 ROADWAY\02 P&P\LIBERTY_PP011_A.dgn
5/6/2022



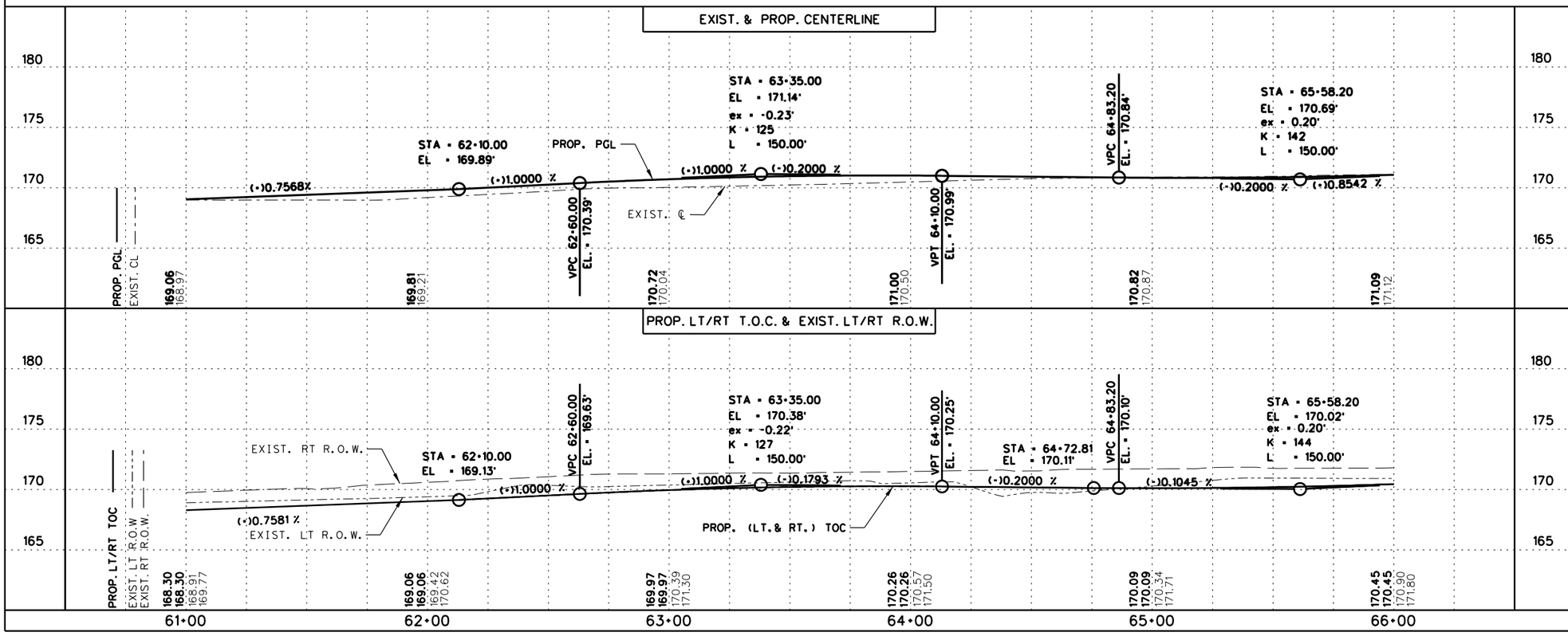
SHEET SUMMARY

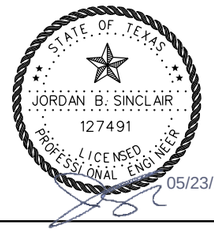
ITEM	DESCRIPTION	UNIT	QUANTITY
529	CONC CURB & GUTTER (TY-A)	LF	1006
531	CONCRETE SIDEWALKS	SY	274
531	CURB RAMPS (TY 10)	EA	2
529	CONC VALLEY GUTTER	LF	97

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS





THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 61+00 TO STA. 66+00

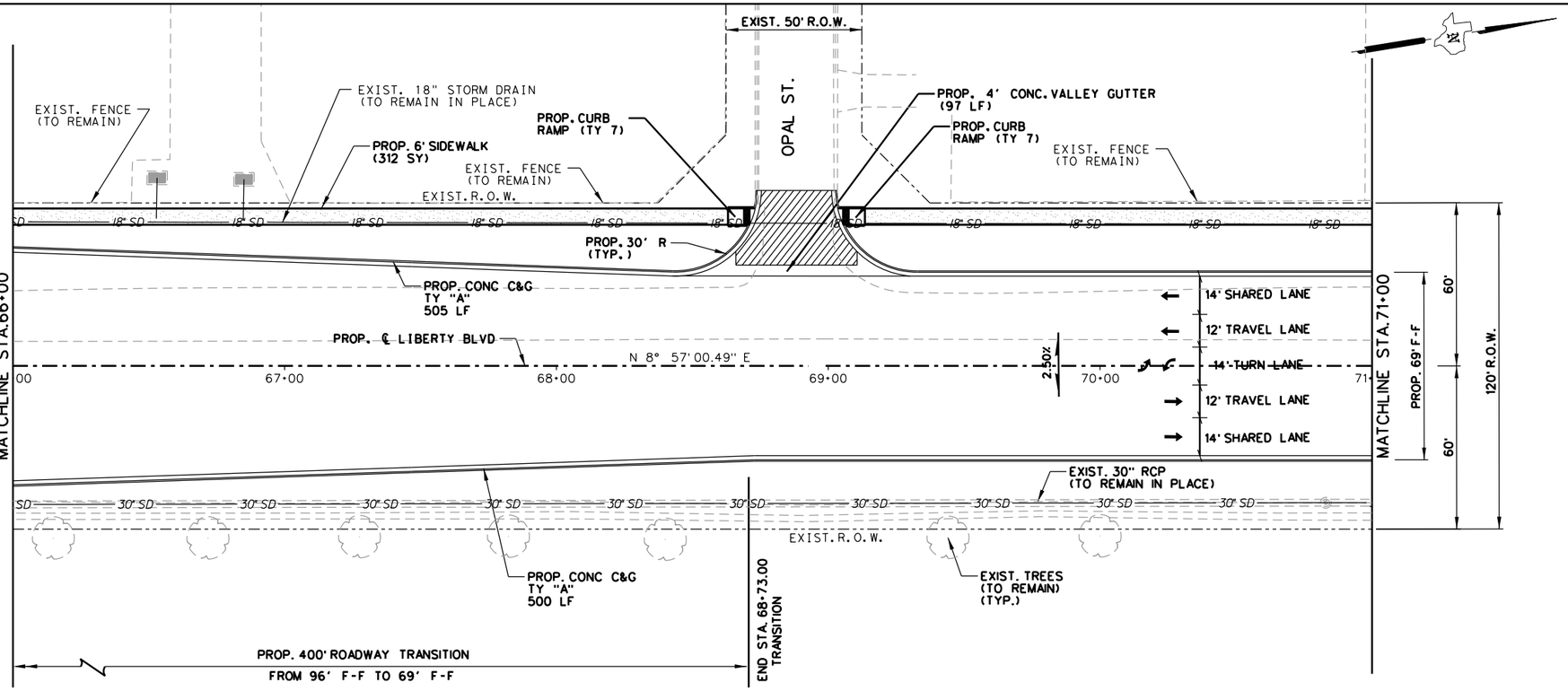
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 12 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					84
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

5/6/2022 K:\Counties\HD\Liberty Rd (US83 to Mile 3)\GDJ\03 ROADWAY\02 P&P\LIBERTY_PP012_A.dgn



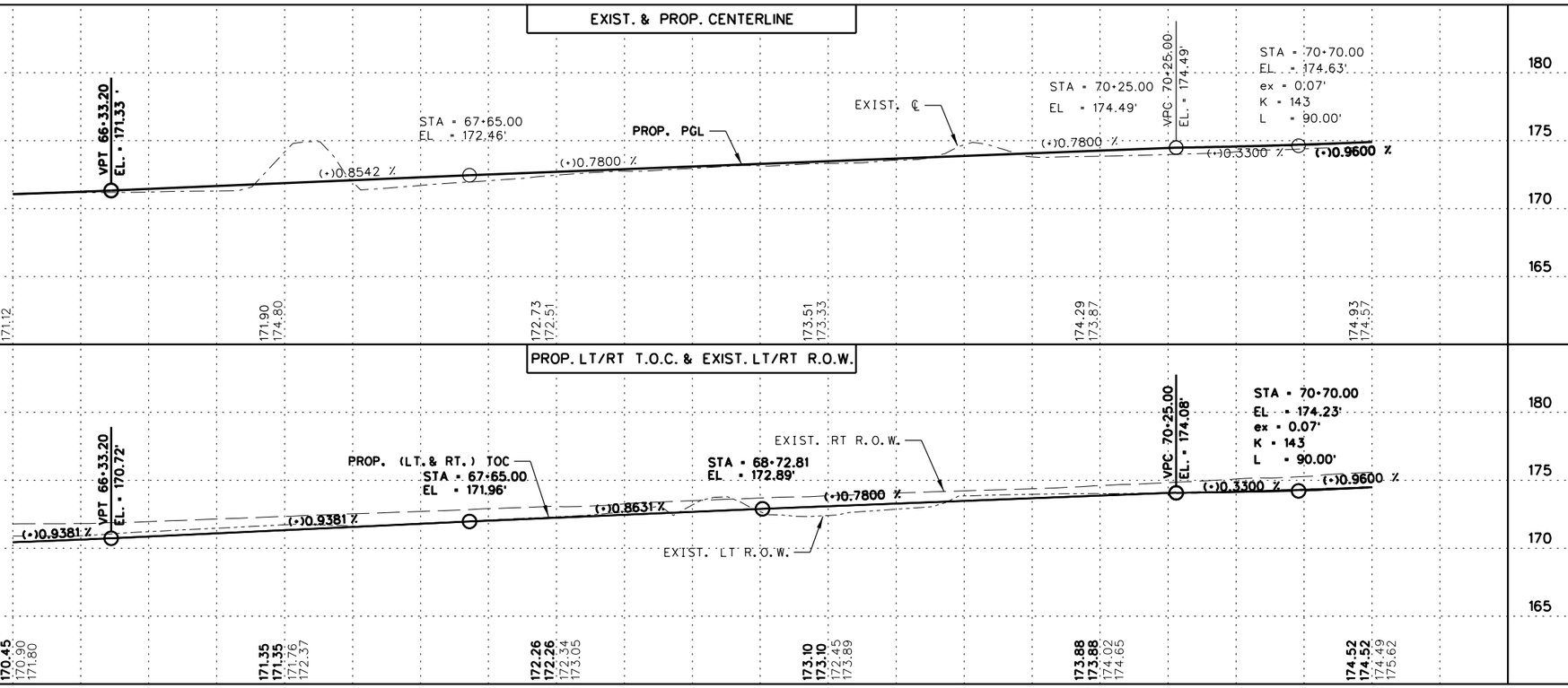
SHEET SUMMARY

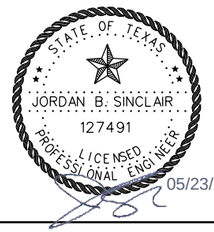
ITEM	DESCRIPTION	UNIT	QUANTITY
529	CONC CURB & GUTTER (TY-A)	LF	1005
531	CONCRETE SIDEWALKS	SY	312
531	CURB RAMPS (TY 7)	EA	2
529	CONC VALLEY GUTTER	LF	97

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS





THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 66+00 TO STA. 71+00

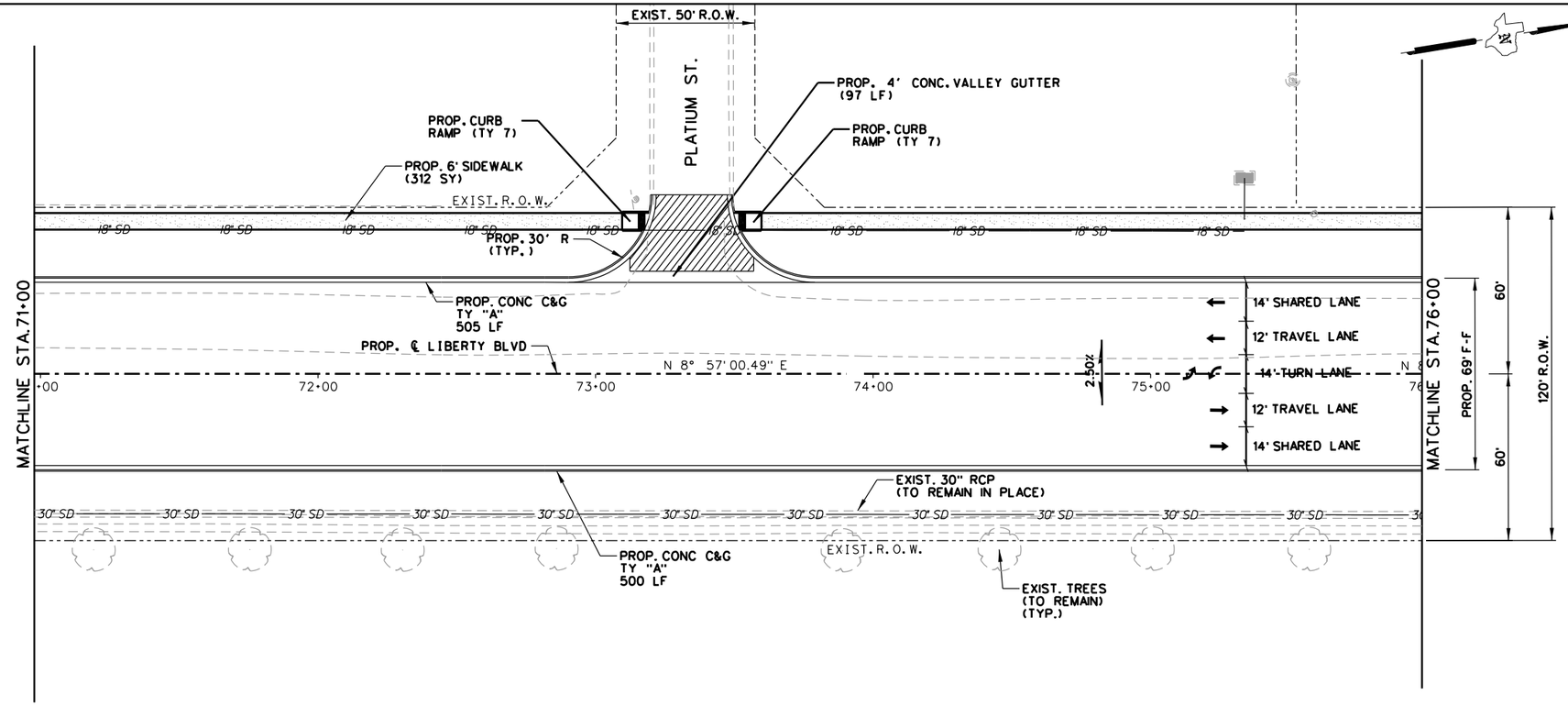
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 13 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					85
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

5/6/2022 K:\Counties\HD\Liberty Rd (US83 to Mile 3)\GDJ\03 ROADWAY\02 P&P\LIBERTY_PP013_A.dgn



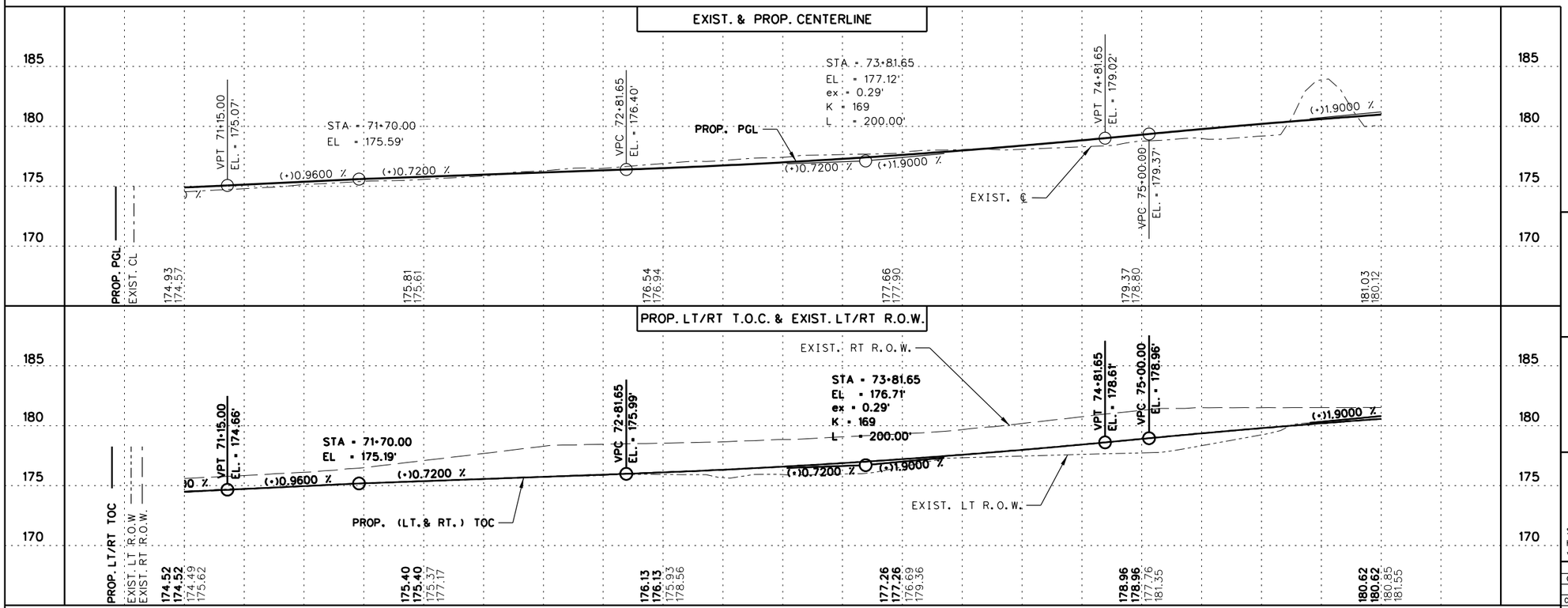
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
529	CONC CURB & GUTTER (TY-A)	LF	1005
531	CONCRETE SIDEWALKS	SY	312
531	CURB RAMPS (TY 7)	EA	2
529	CONC VALLEY GUTTER	LF	97

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 71+00 TO STA. 76+00

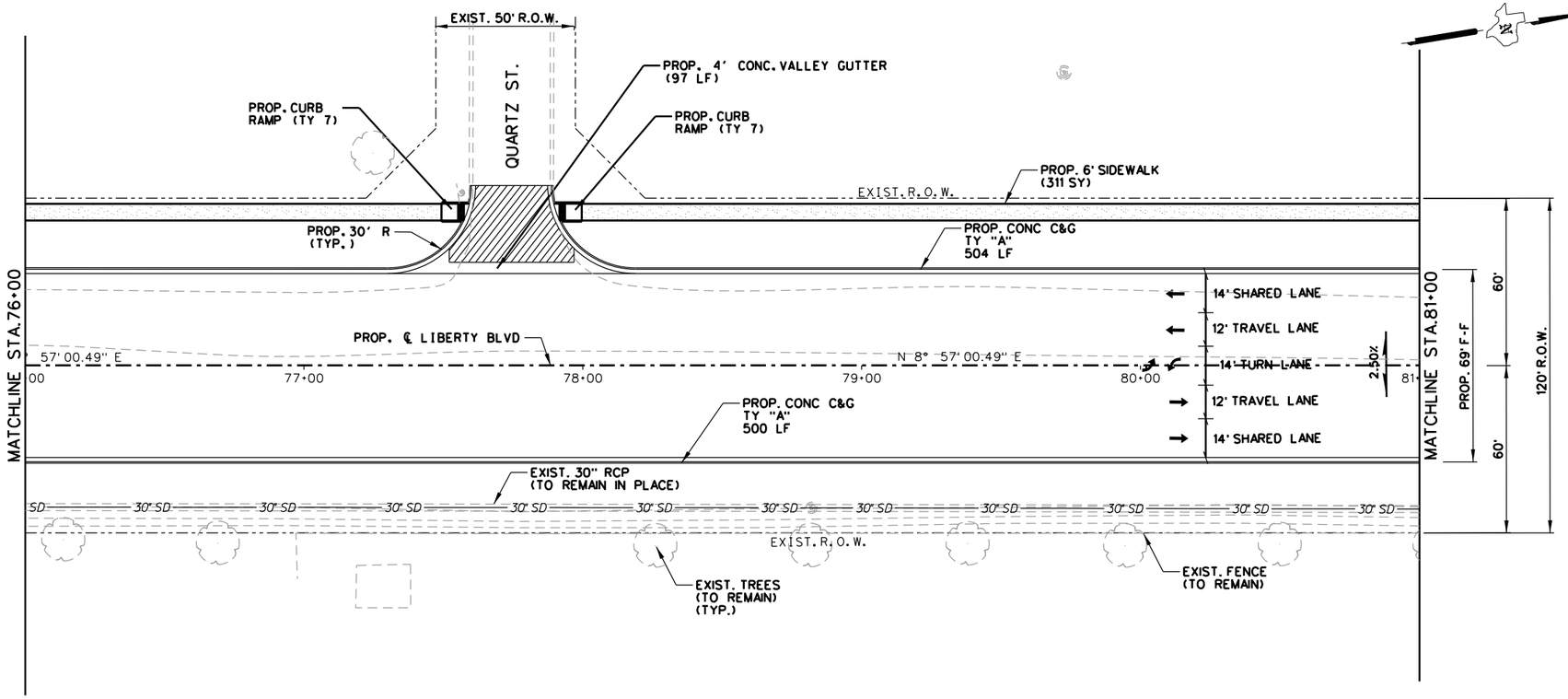
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 14 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					86
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

K:\Counties\HDV\Liberty Rd (US83 to Mile 3)\GDJ\03 ROADWAY\02 P&P\LIBERTY_PP014_A.dgn
5/6/2022



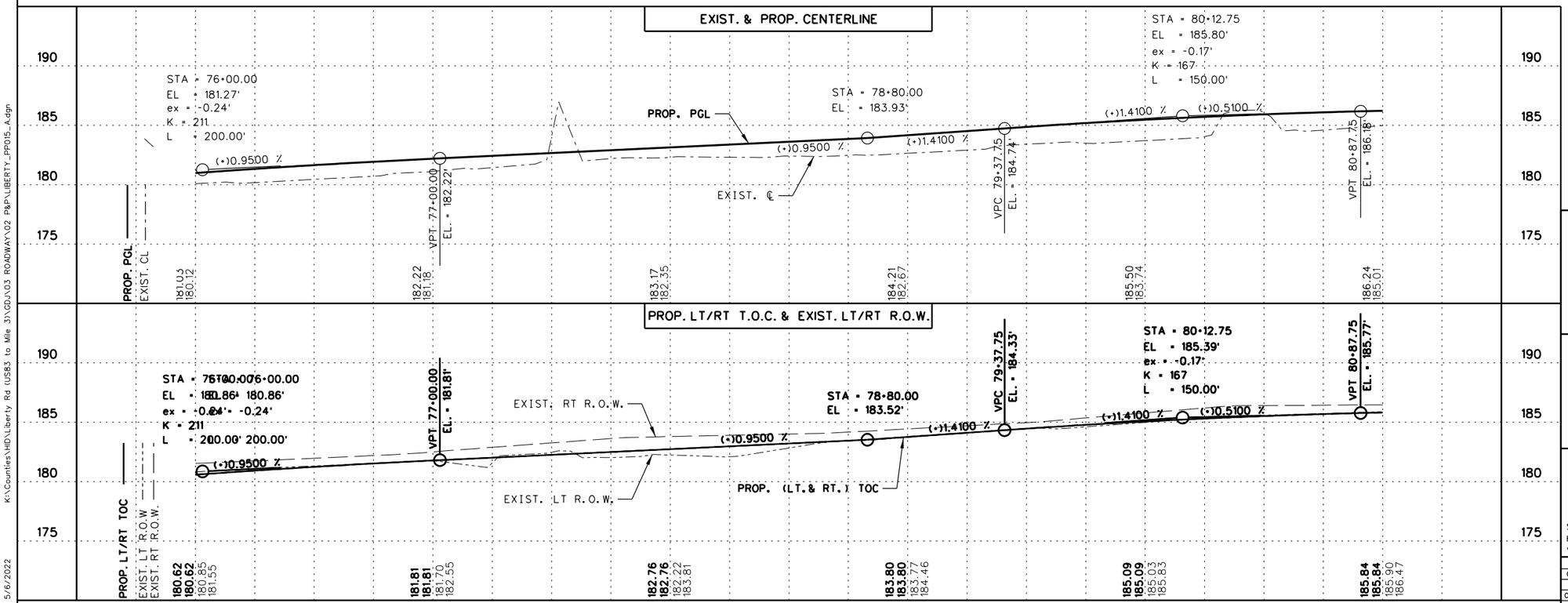
SHEET SUMMARY

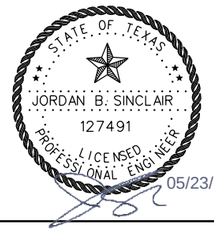
ITEM	DESCRIPTION	UNIT	QUANTITY
529	CONC CURB & GUTTER (TY-A)	LF	1004
531	CONCRETE SIDEWALKS	SY	311
531	CURB RAMPS (TY 7)	EA	2
529	CONC VALLEY GUTTER	LF	97

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS







L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

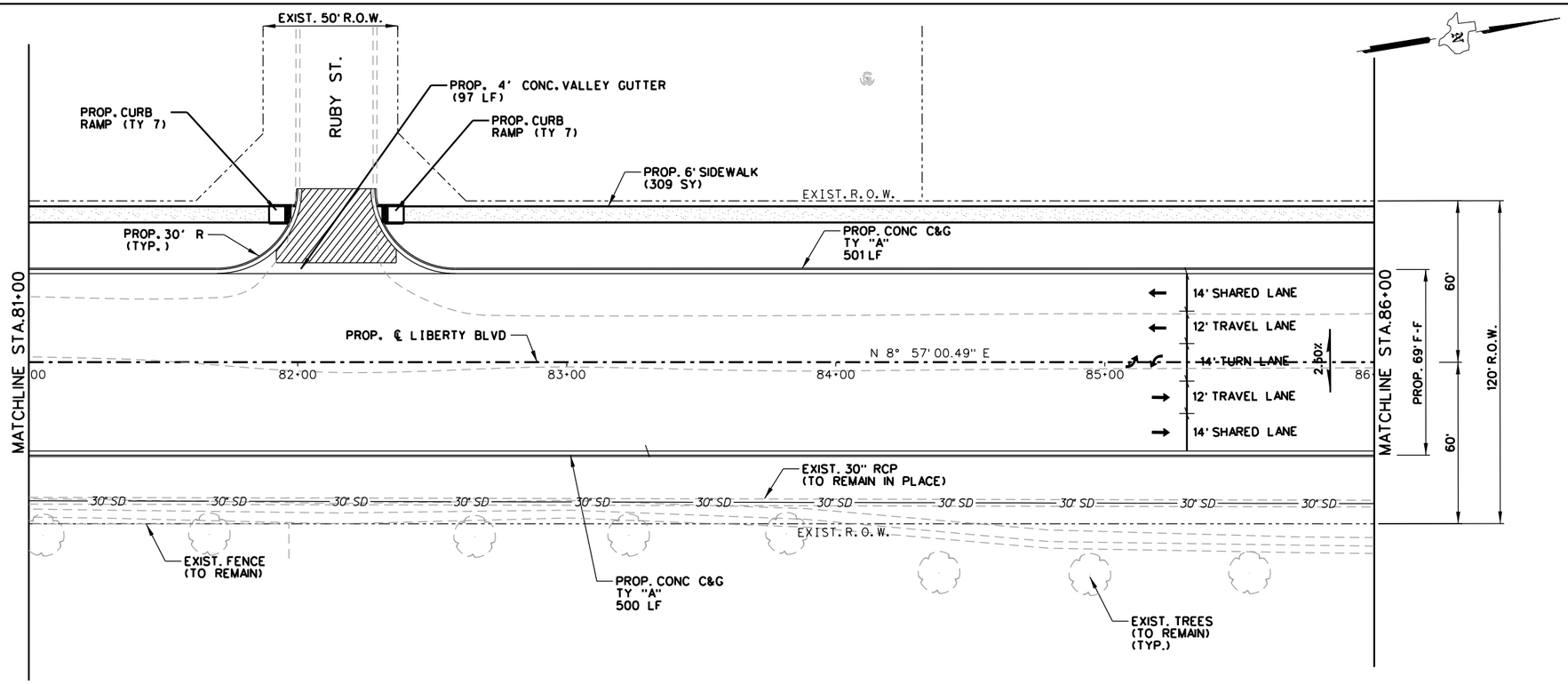
LIBERTY BLVD
PLAN AND PROFILE
STA. 76+00 TO STA. 81+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 15 OF 28

DN:	FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:	6	TEXAS					87
DW:	STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:	PHR	HIDALGO	0921	02	194	LIBERTY	
TR:							
CK TR:							

5/6/2022 K:\Counties\HD\Liberty Rd (US83 to Mile 3)\GDJ\03 ROADWAY\02 P&P\LIBERTY_PP015_A.dgn



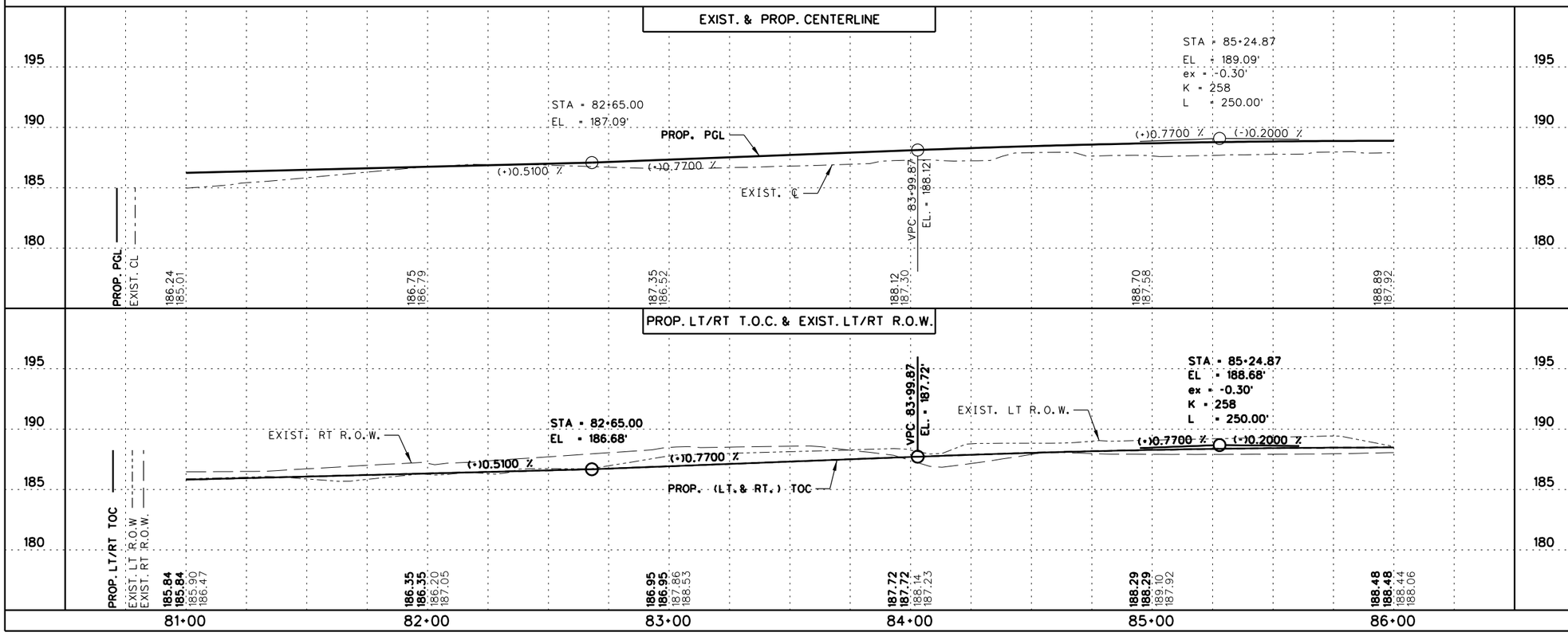
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
529	CONC CURB & GUTTER (TY-A)	LF	1001
531	CONCRETE SIDEWALKS	SY	309
531	CURB RAMPS (TY 7)	EA	2
529	CONC VALLEY GUTTER	LF	97

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 81+00 TO STA. 86+00

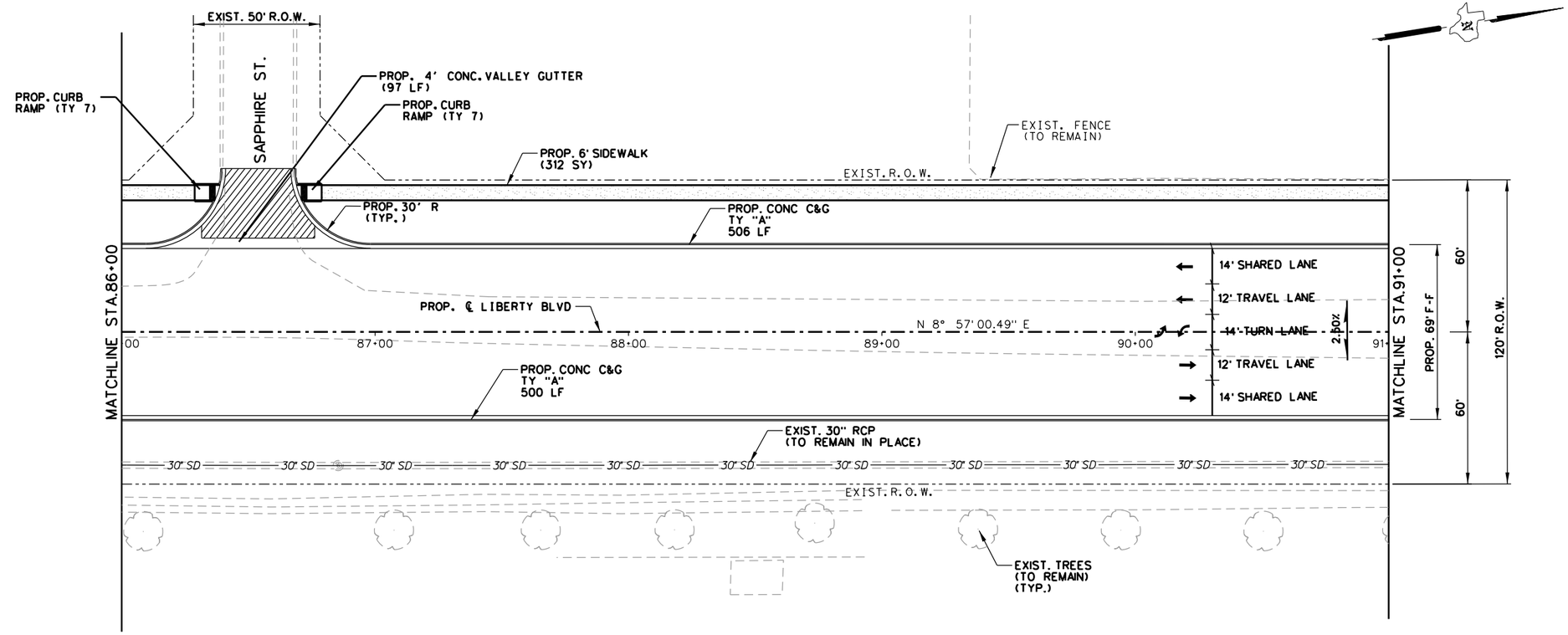
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 16 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					88
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

5/6/2022 K:\Counties\HDV\Liberty Rd (US83 to Mile 3)\GDJ\03 ROADWAY\02 P&P\LIBERTY_PP016_A.dgn



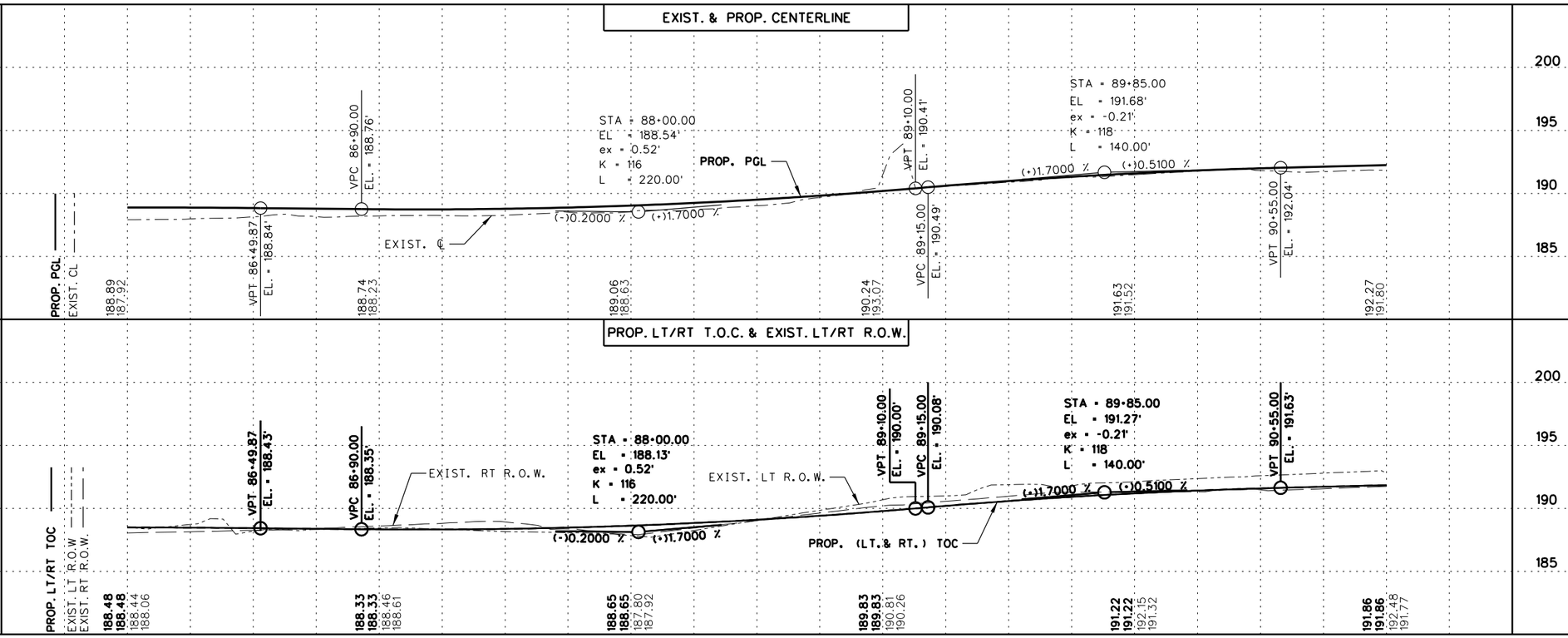
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
529	CONC CURB & GUTTER (TY-A	LF	1006
531	CONCRETE SIDEWALKS	SY	312
531	CURB RAMPS (TY 7)	EA	2
529	CONC VALLEY GUTTER	LF	97

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 86+00 TO STA. 91+00

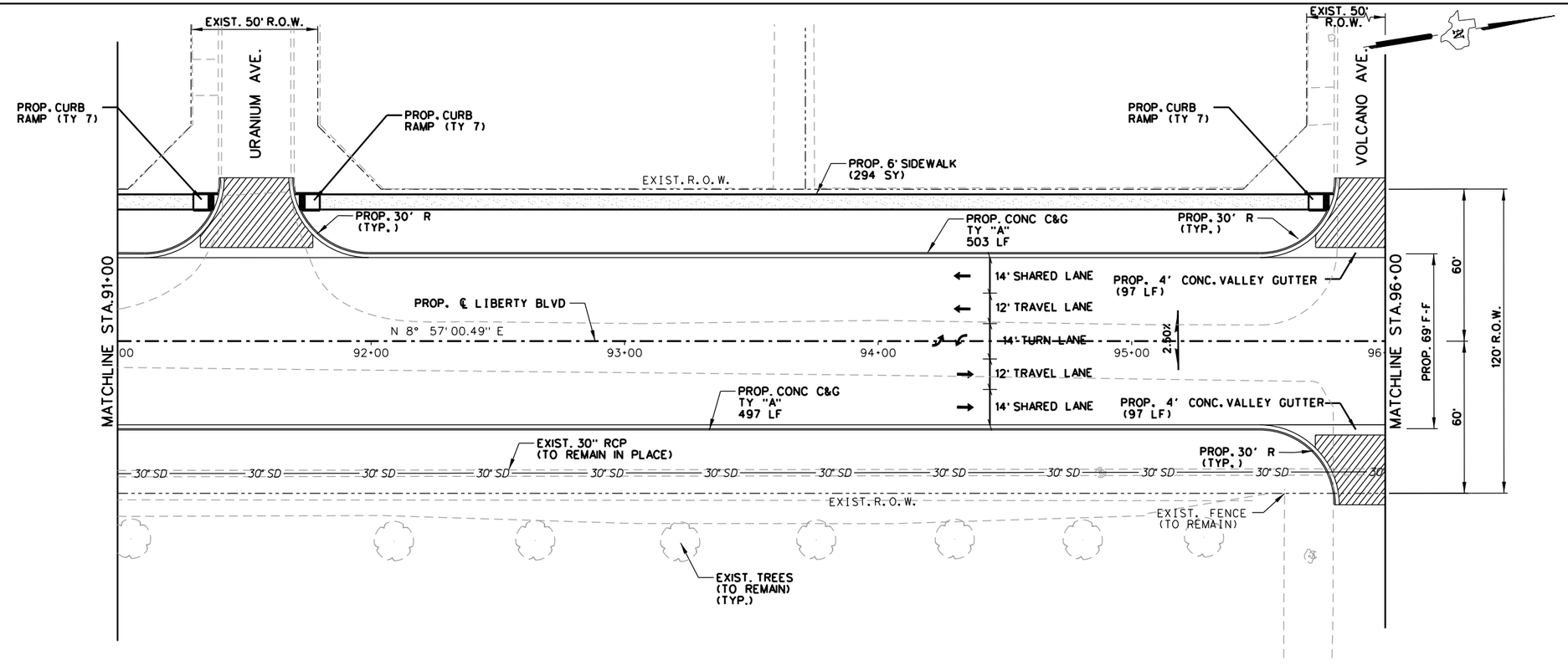
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 17 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					89
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

5/6/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\03 ROADWAY\02 P&P\LIBERTY_PP017_A.dgn



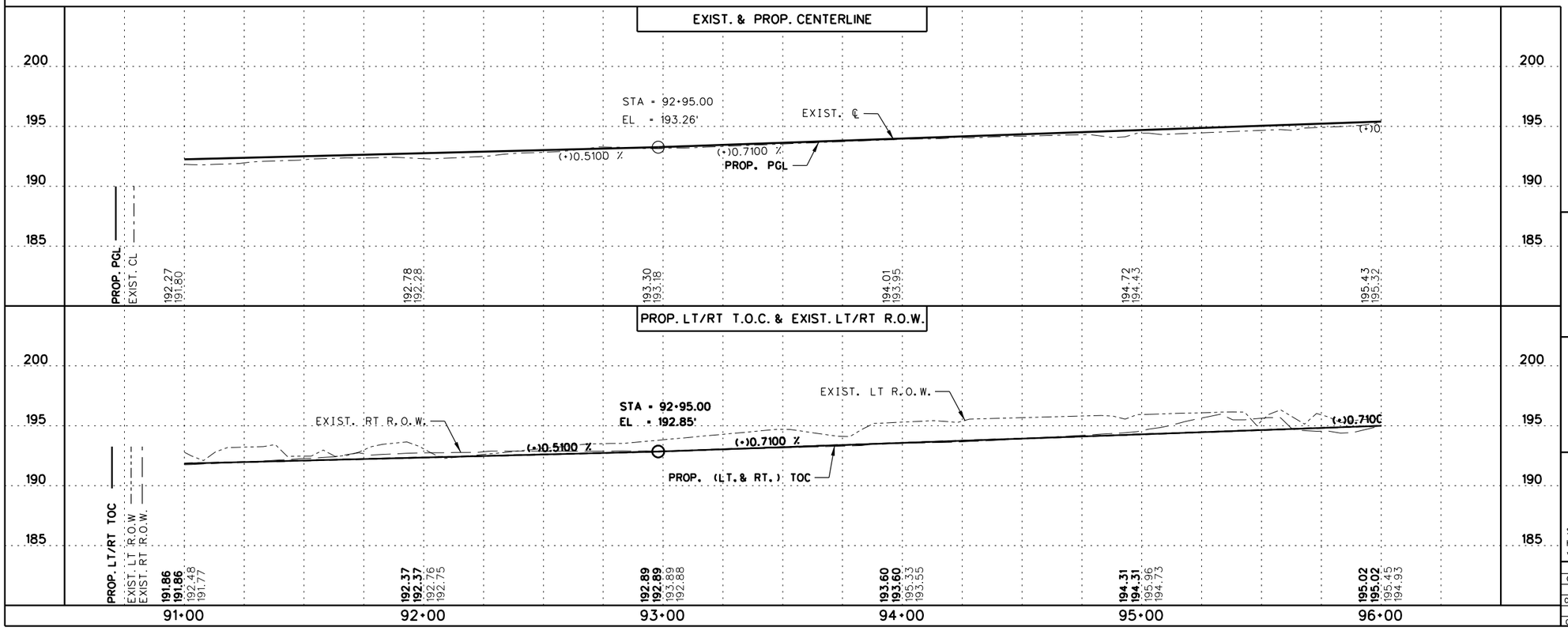
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
529	CONC CURB & GUTTER (TY-A)	LF	1000
531	CONCRETE SIDEWALKS	SY	294
531	CURB RAMPS (TY 7)	EA	3
529	CONC VALLEY GUTTER	LF	241

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 91+00 TO STA. 96+00

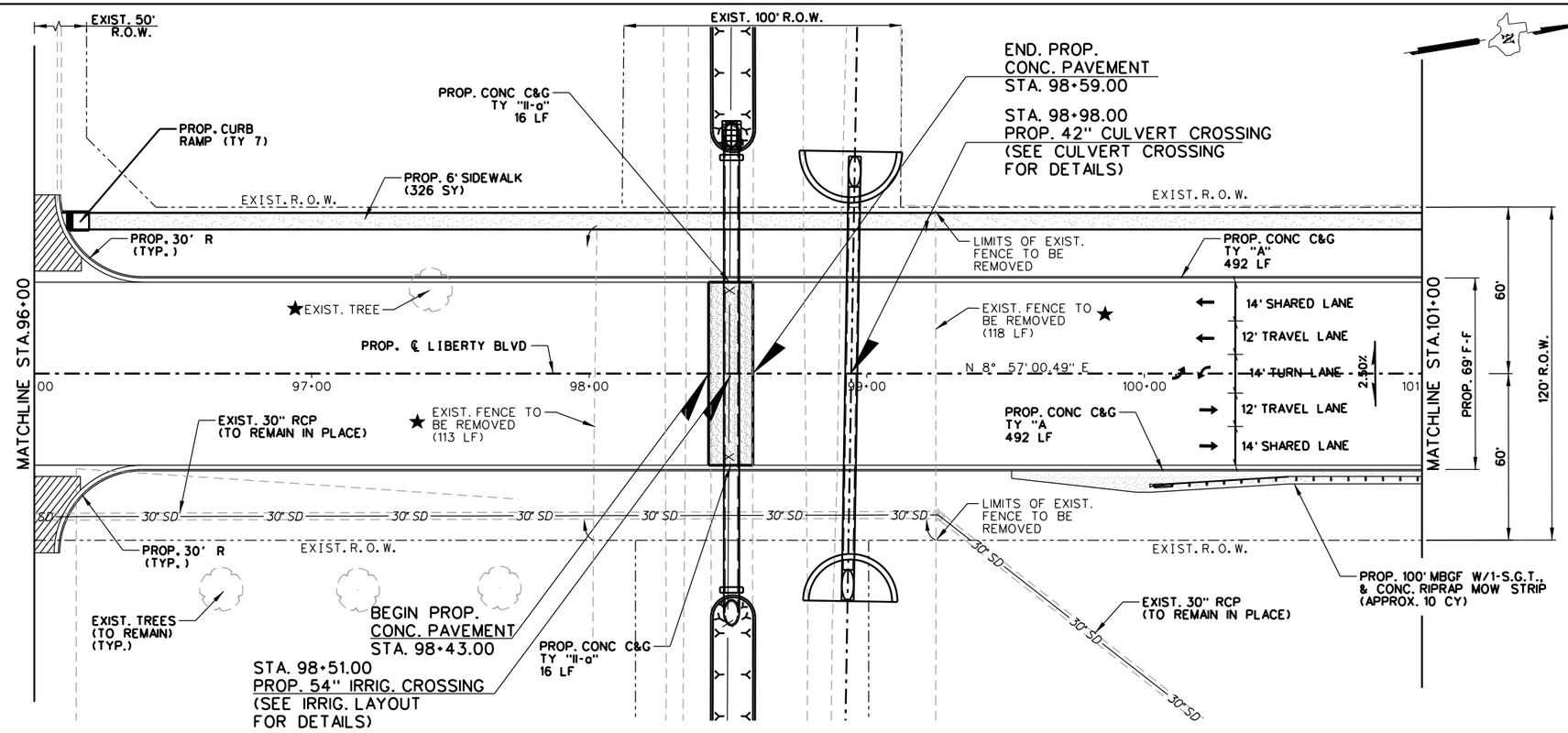
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 18 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					90
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

K:\Counties\HDV\Liberty Rd (US83 to Mile 3)\GDJ\03 ROADWAY\02 P&P\LIBERTY_PP018_A.dgn
5/6/2022



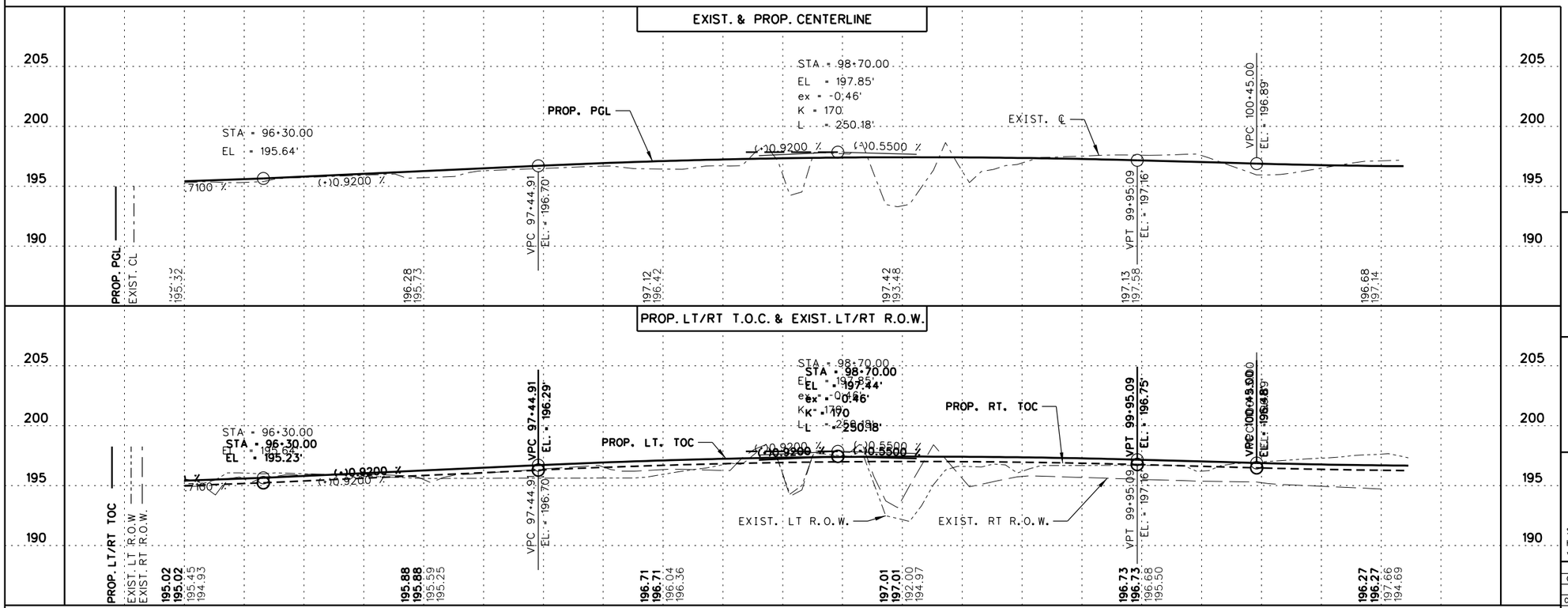
SHEET SUMMARY

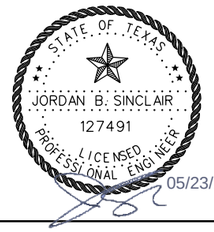
ITEM	DESCRIPTION	UNIT	QUANTITY
432	RIPRAP (MOW STRIP)(4")	CY	10
529	CONC CURB & GUTTER (TY-A)	LF	984
529	CONC CURB & GUTTER (TY-IIa)	LF	32
531	CONCRETE SIDEWALKS	SY	326
531	CURB RAMPS (TY 7)	EA	1
540	METAL BEAM GUARD FENCE	LF	100
544	GUARDRAIL END TRTMNT (INSTALL)	EA	1

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS





THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD PLAN AND PROFILE STA. 96+00 TO STA. 101+00

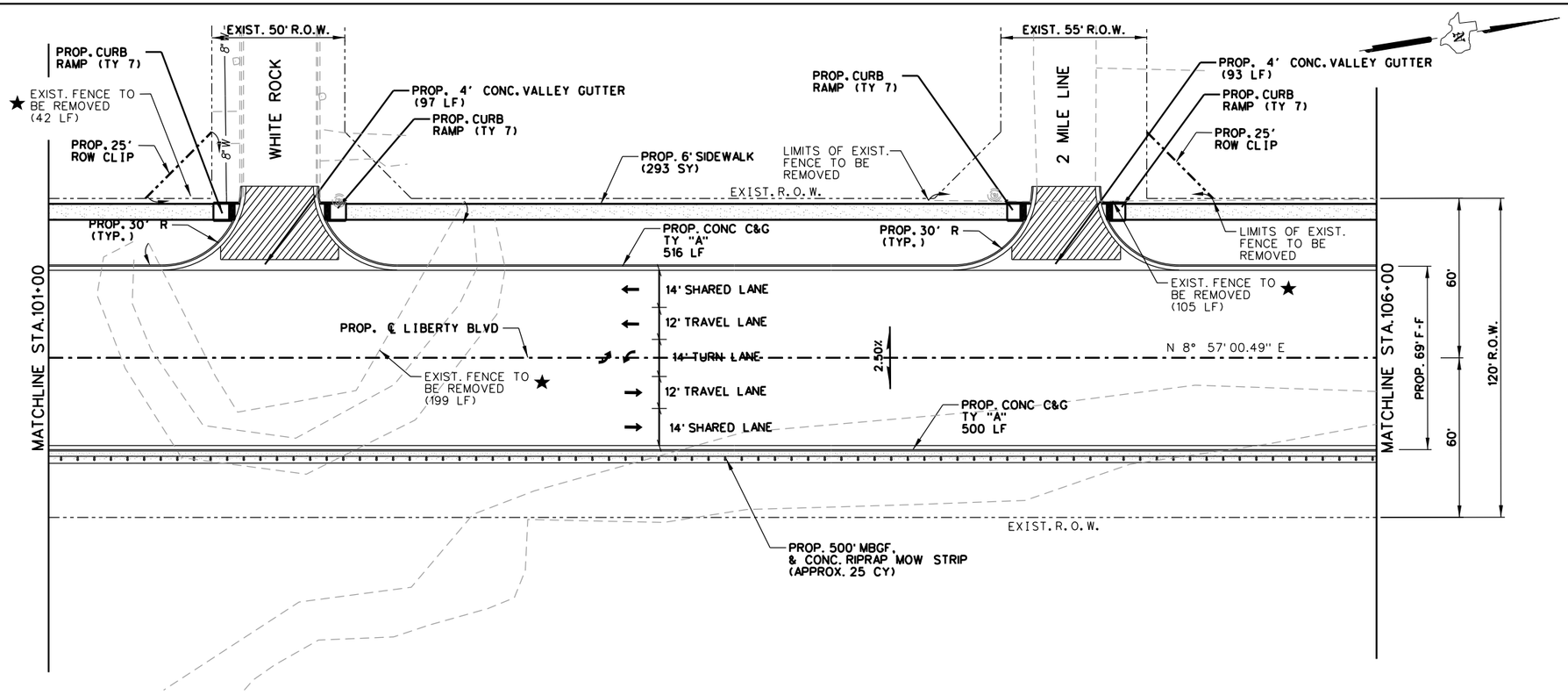
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 19 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					91
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

K:\Counties\HD\Liberty Rd (US83 to Mile 3)\GDJ\03 ROADWAY\02 P&P\LIBERTY_PP019_A.dgn
5/6/2022



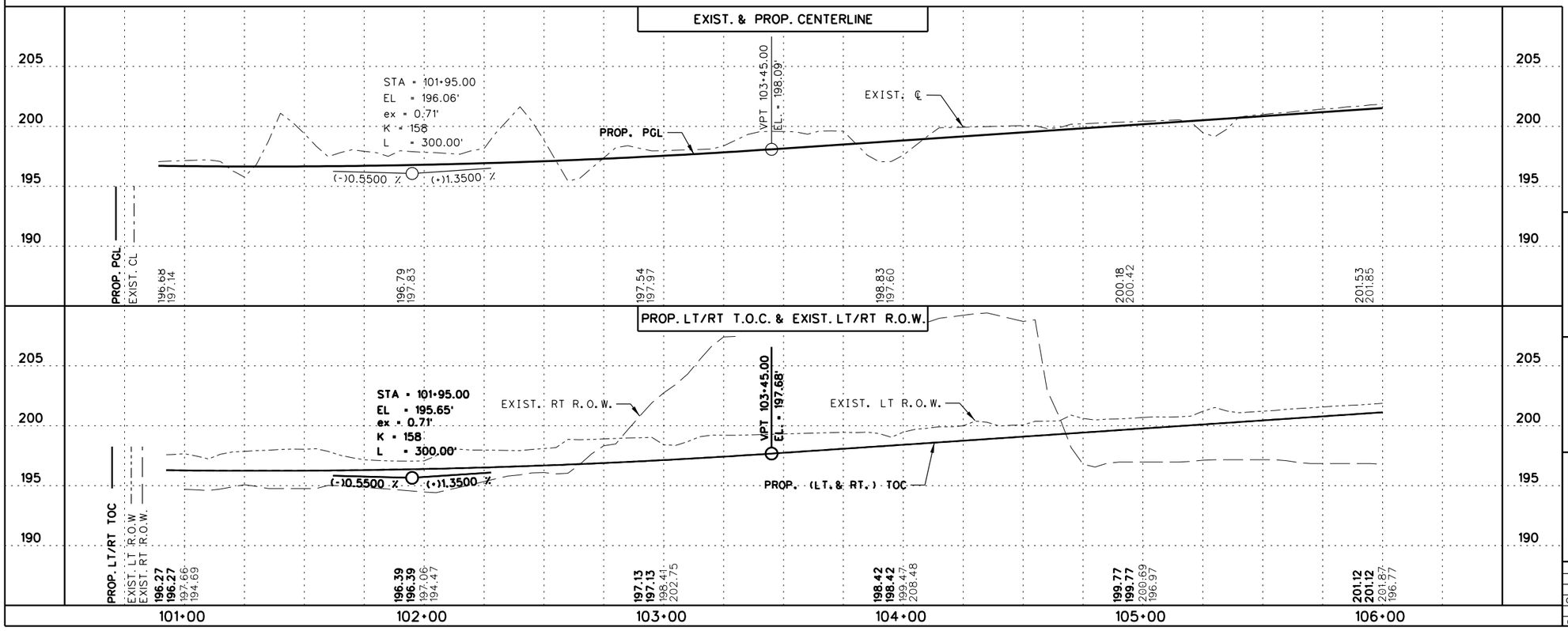
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
432	RIPRAP (MOW STRIP)(4")	CY	25
529	CONC CURB & GUTTER (TY-A	LF	1016
531	CONCRETE SIDEWALKS	SY	293
531	CURB RAMPS (TY 7)	EA	4
540	METAL BEAM GUARD FENCE	LF	500
529	CONC VALLEY GUTTER	LF	190

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 101+00 TO STA. 106+00

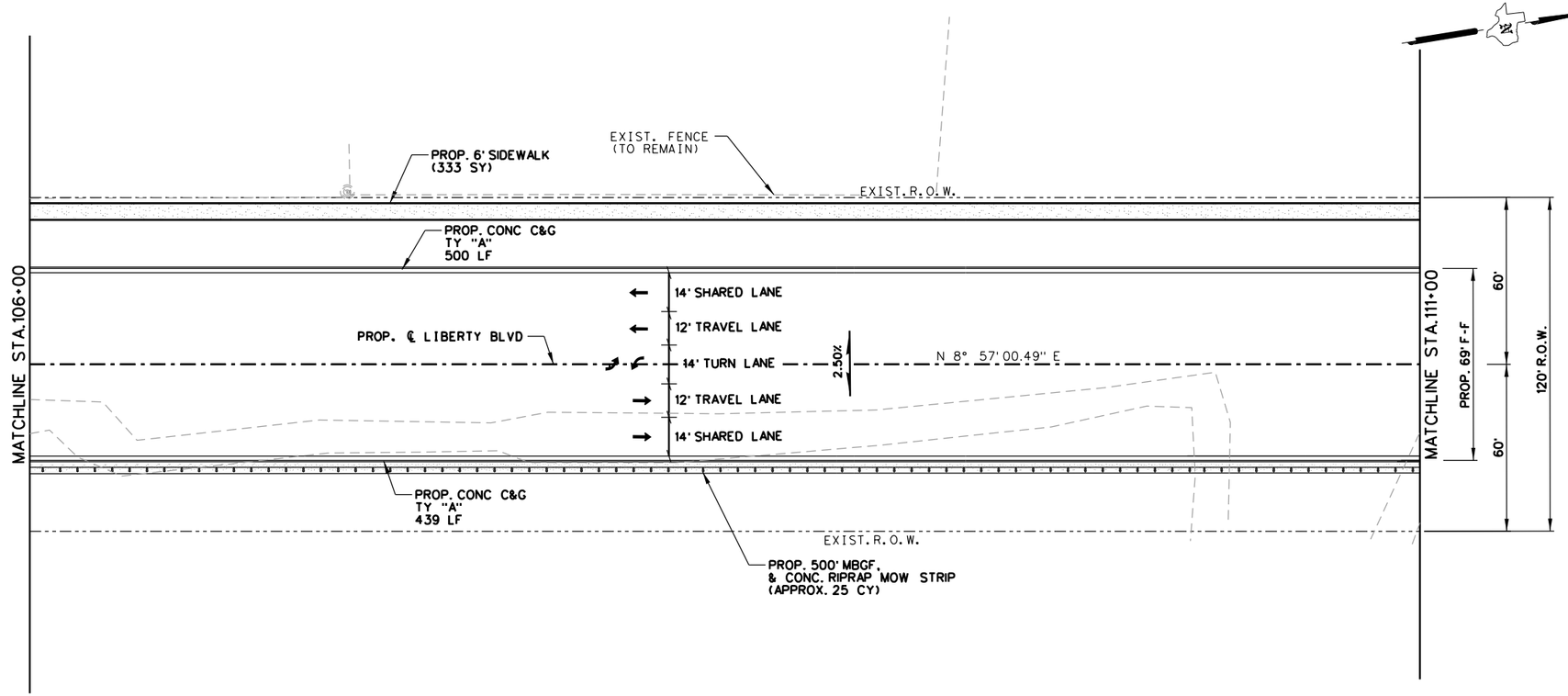
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 20 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					92
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

K:\Counties\HDV\Liberty Rd (US83 to Mile 3)\CDJV\03 ROADWAY\02 P&P\LIBERTY_PP020_A.dgn
5/6/2022



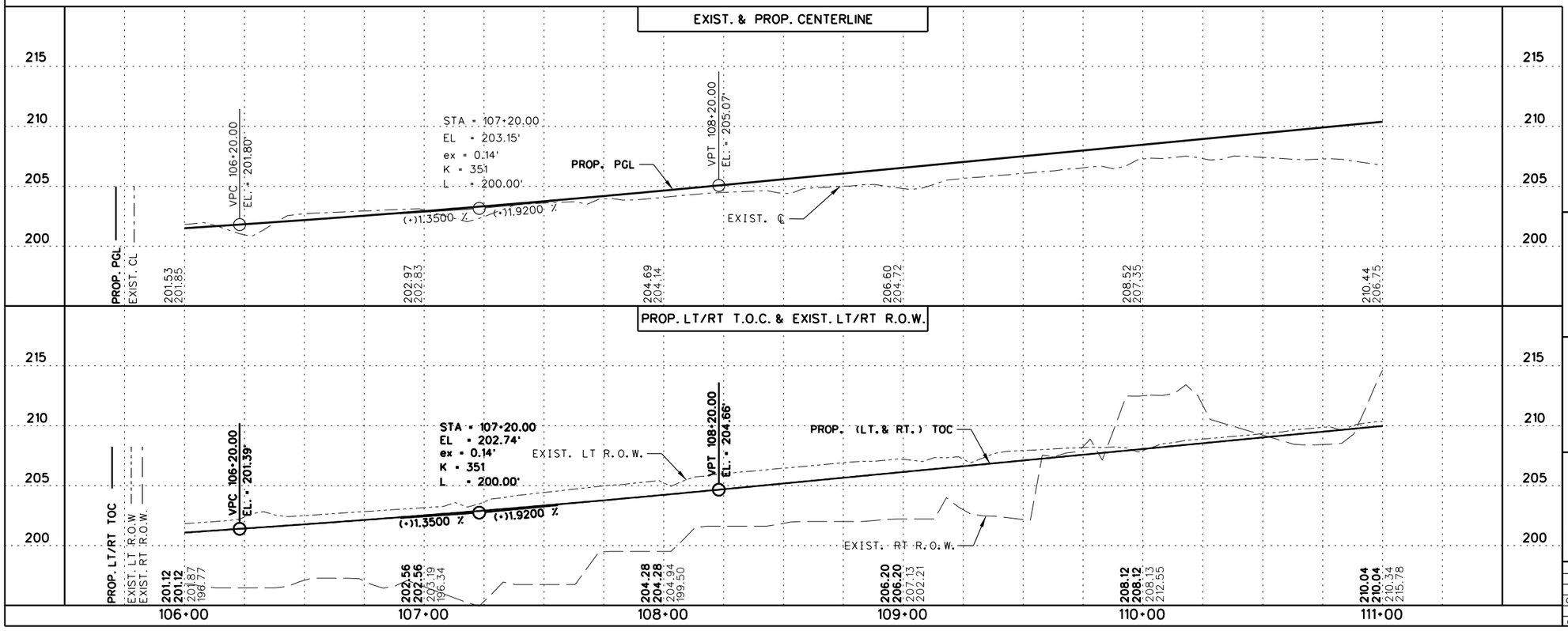
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
432	RIPRAP (MOW STRIP)(4")	CY	25
529	CONC CURB & GUTTER (TY-A	LF	939
531	CONCRETE SIDEWALKS	SY	333
540	METAL BEAM GUARD FENCE	LF	500

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 106+00 TO STA. 111+00

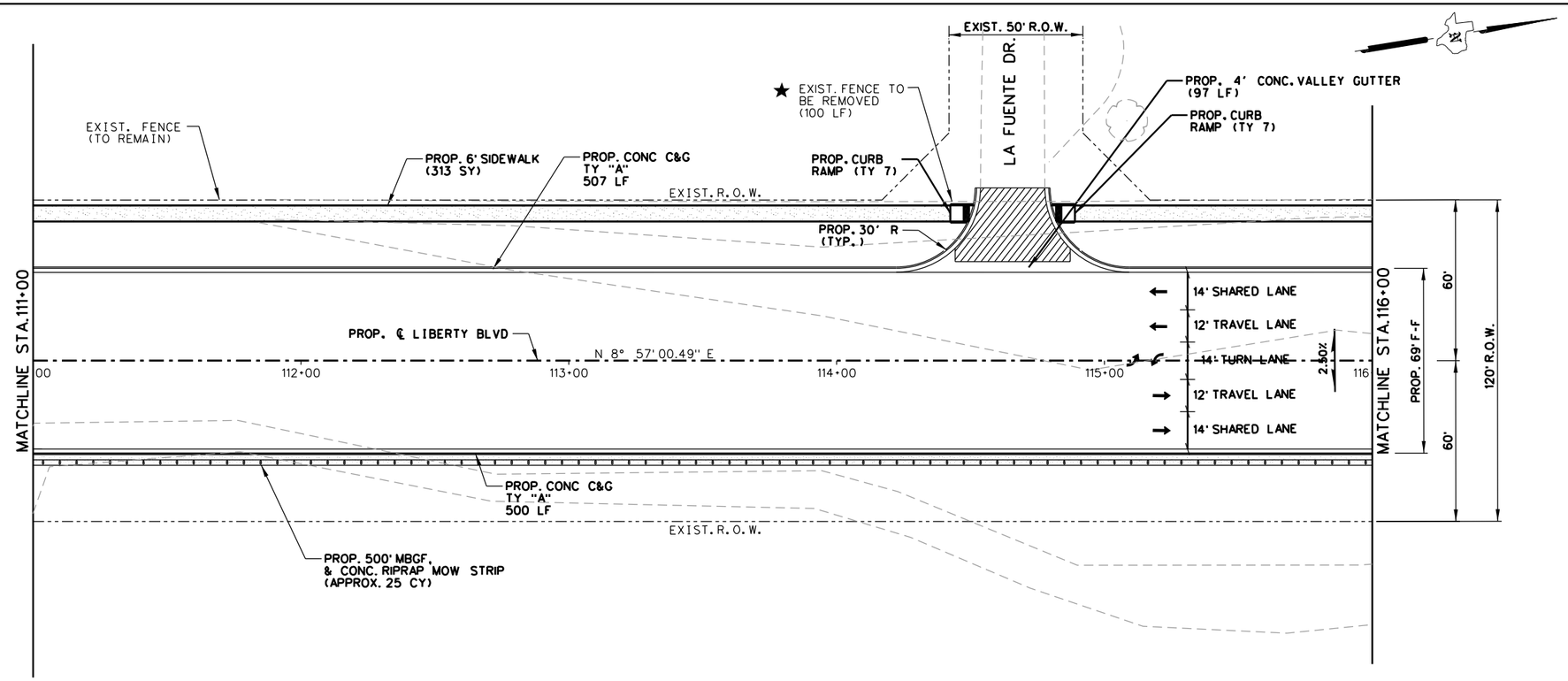
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 21 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					93
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

5/6/2022 K:\Counties\HD\Liberty Rd (US83 to Mile 3)\GDJ\03 ROADWAY\02 P&P\LIBERTY_PP021_A.dgn



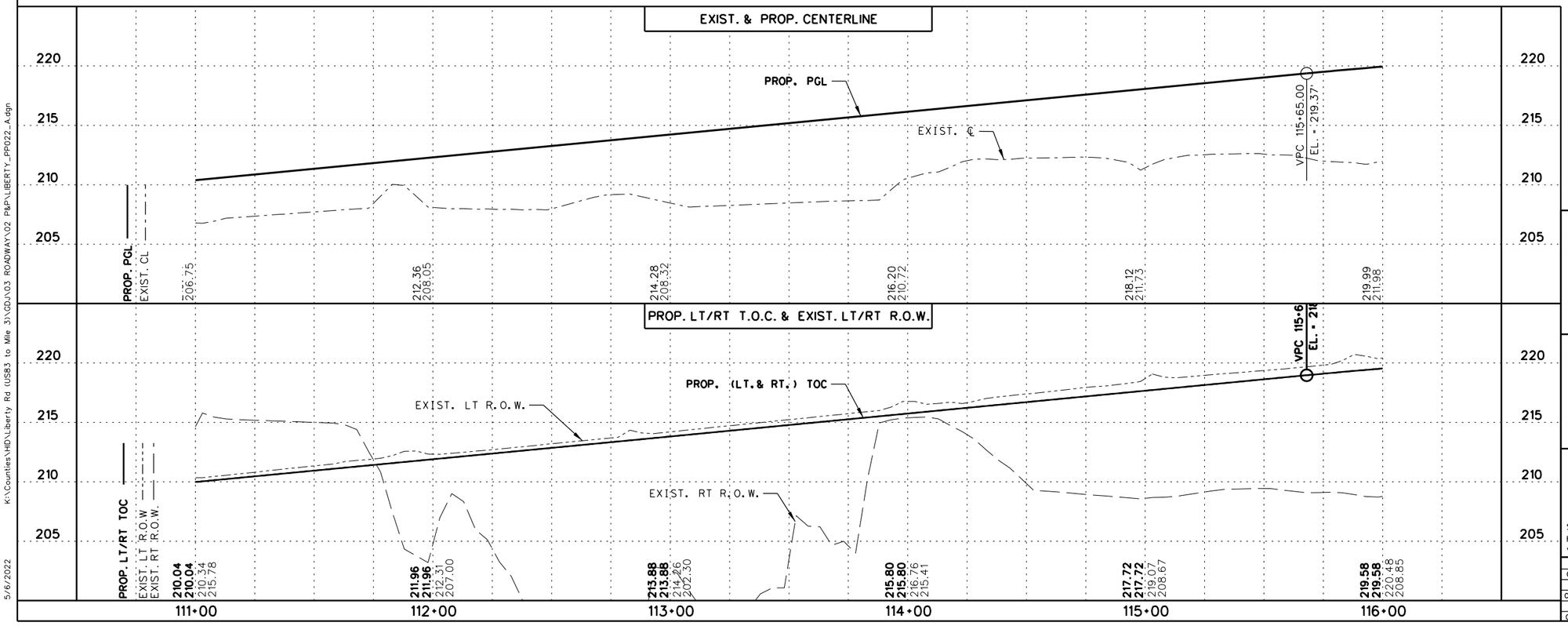
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
432	RIPRAP (MOW STRIP)(4")	CY	25
529	CONC CURB & GUTTER (TY-A)	LF	1007
531	CONCRETE SIDEWALKS	SY	313
531	CURB RAMPS (TY 7)	EA	2
540	METAL BEAM GUARD FENCE	LF	500
529	CONC VALLEY GUTTER	LF	97

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 111+00 TO STA. 116+00

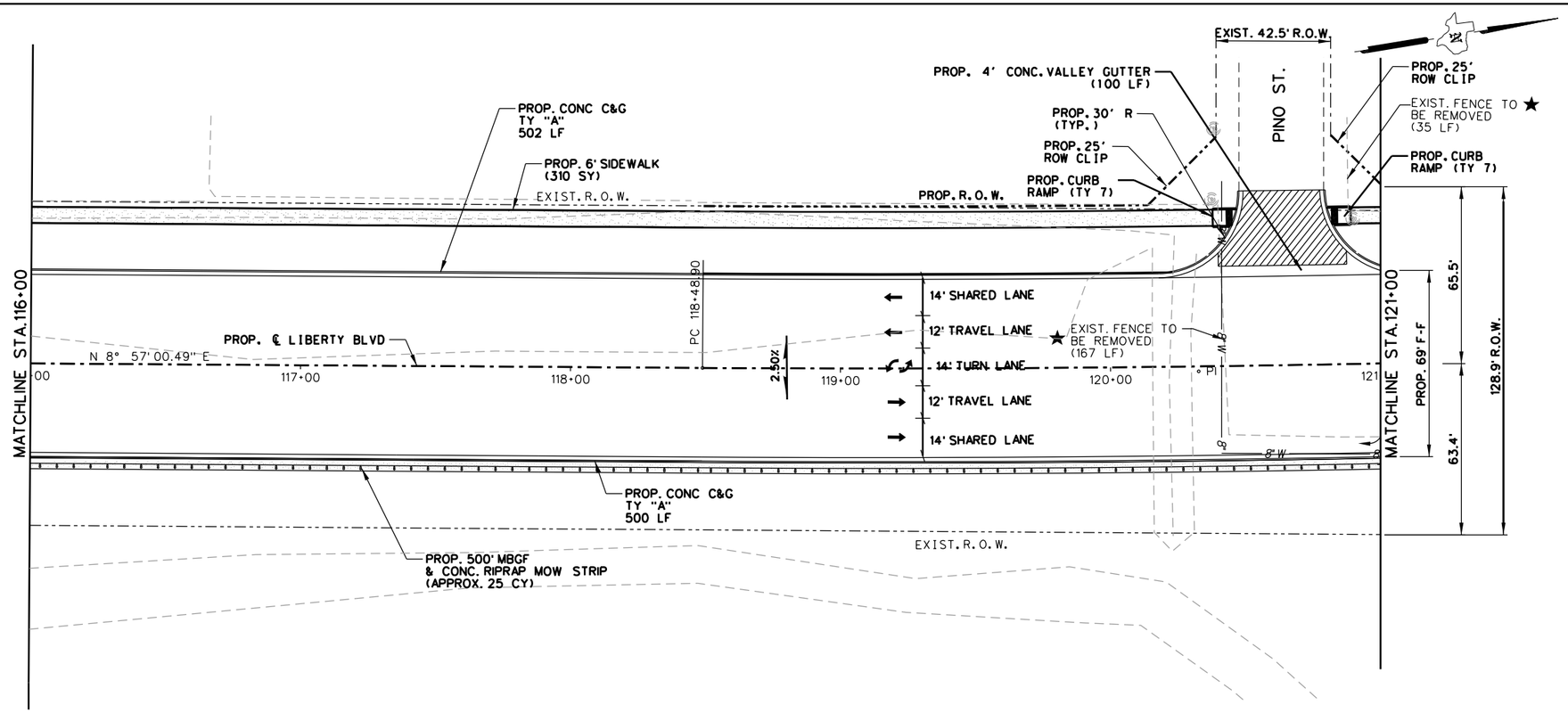
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 22 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					94
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

5/6/2022 K:\Counties\HDV\Liberty Rd (US83 to Mile 3)\CDJV\03 ROADWAY\02 P&P\LIBERTY_PP022_A.dgn



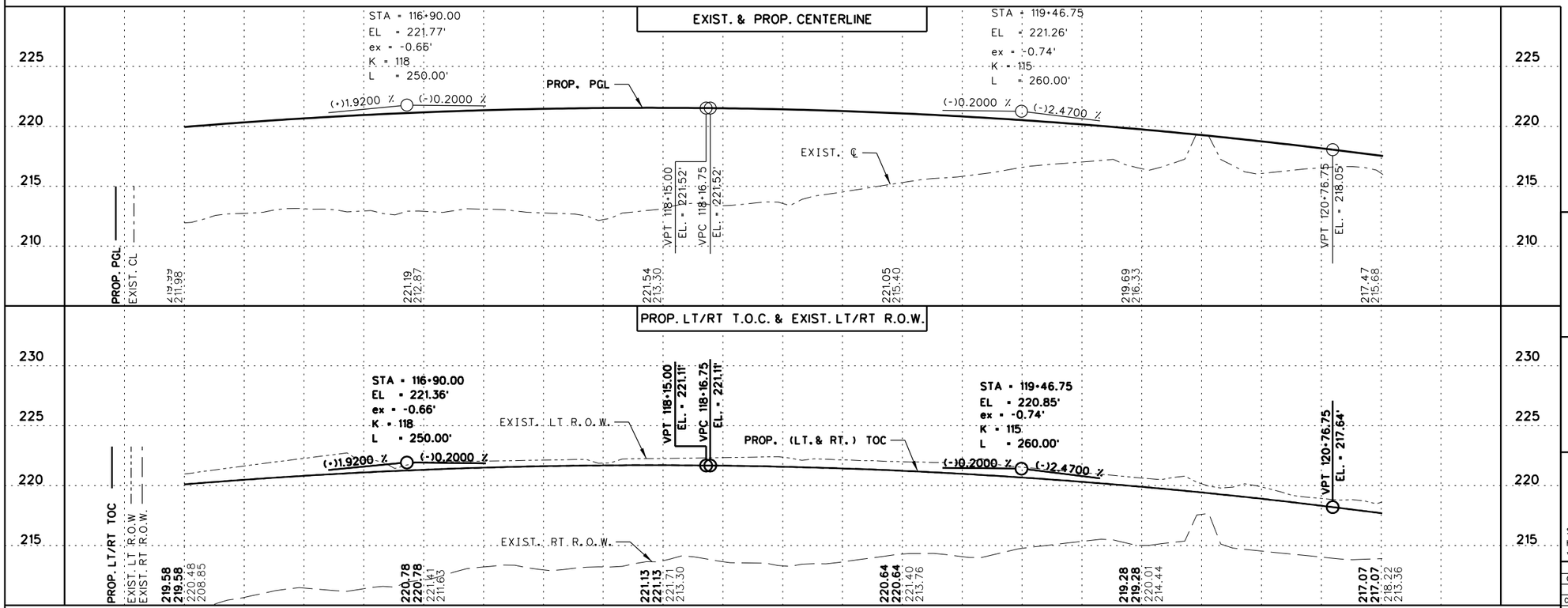
SHEET SUMMARY

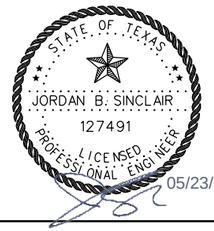
ITEM	DESCRIPTION	UNIT	QUANTITY
432	RIPRAP (MOW STRIP)(4")	CY	25
529	CONC CURB & GUTTER (TY-A)	LF	1002
531	CONCRETE SIDEWALKS	SY	310
531	CURB RAMPS (TY 7)	EA	2
540	METAL BEAM GUARD FENCE	LF	500
529	CONC VALLEY GUTTER	LF	100

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- ★ TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- ✱ REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- ★ TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS





THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 116+00 TO STA. 121+00

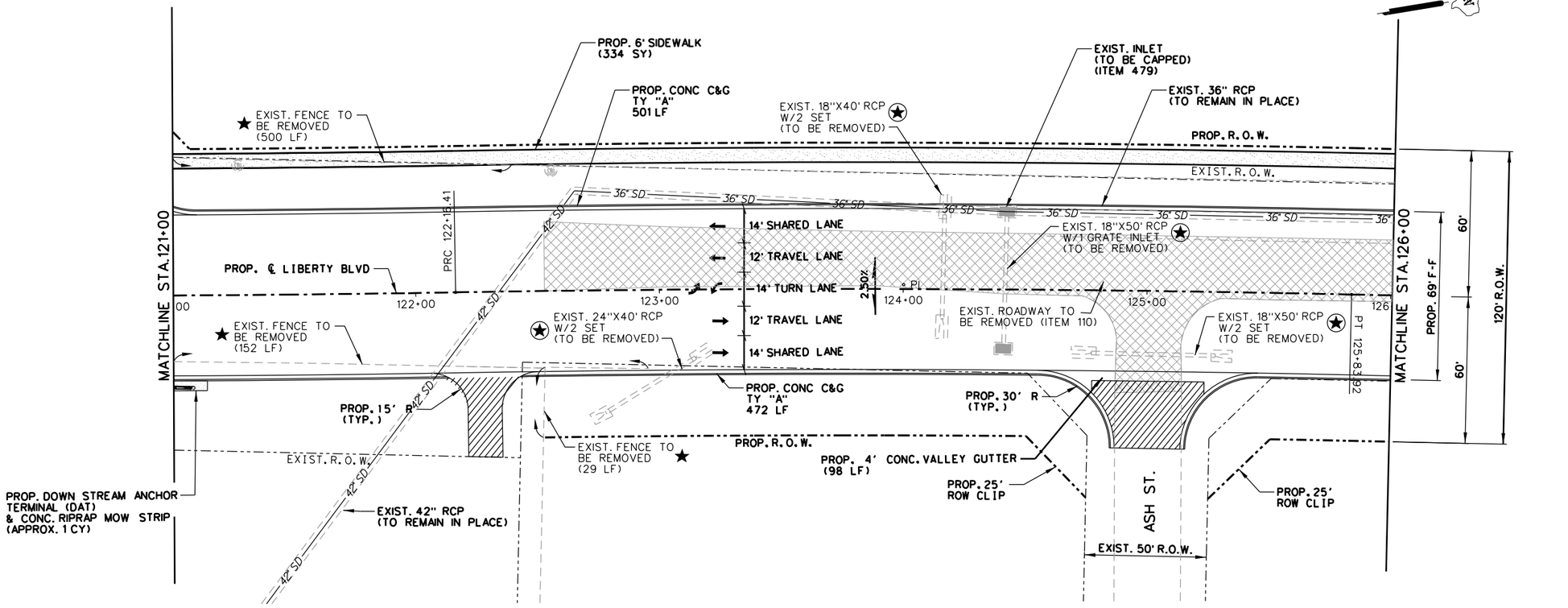
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 23 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					95
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

5/6/2022 K:\Counties\HDO\Liberty Rd (US83 to Mile 3)\GDJ\03 ROADWAY\02 P&P\LIBERTY_PP023_A.dgn



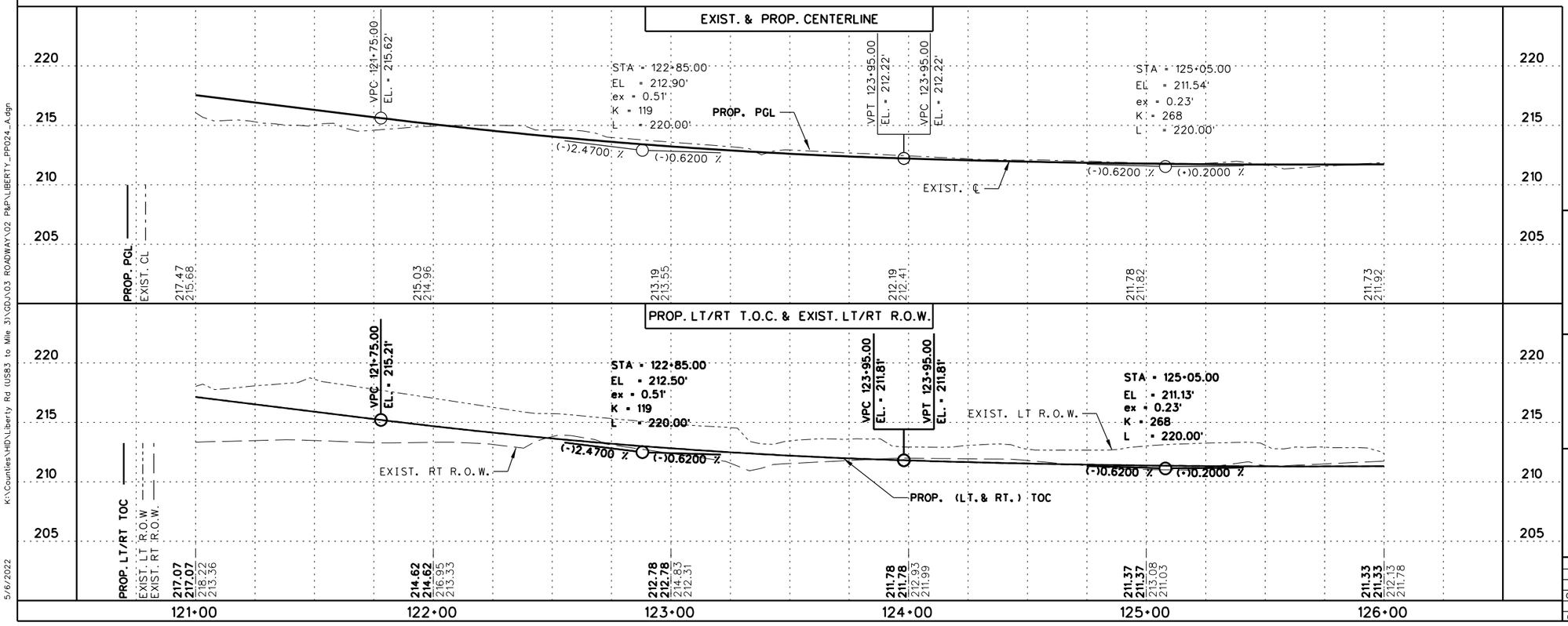
SHEET SUMMARY

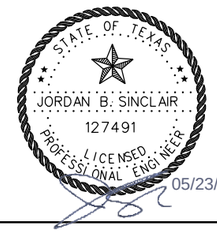
ITEM	DESCRIPTION	UNIT	QUANTITY
432	RIPRAP (MOW STRIP)(4")	CY	1
496	REMOVE STR (SET)	EA	6
496	REMOVE STR (PIPE)	LF	180
496	REMOVE STR (INLET)	EA	1
529	CONC CURB & GUTTER (TY-A)	LF	973
531	CONCRETE SIDEWALKS	SY	334
540	DOWNSTREAM ANCHOR TERMINAL SECT.	EA	1
529	CONC VALLEY GUTTER	LF	98
479	ADJUST INLET (CAP)	EA	1

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS







L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 121+00 TO STA. 126+00

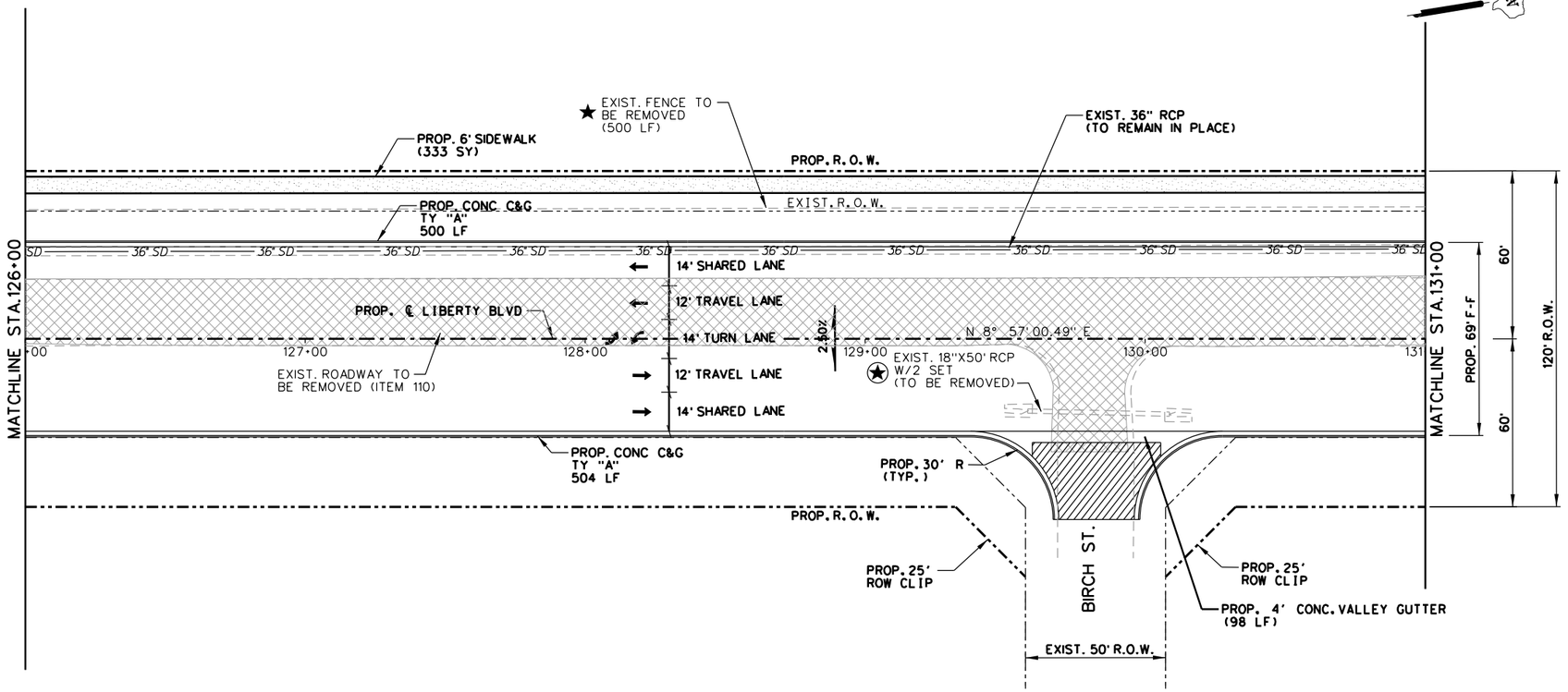
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 24 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					96
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

5/6/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\03 ROADWAY\02 P&P\LIBERTY_PP024_A.dgn



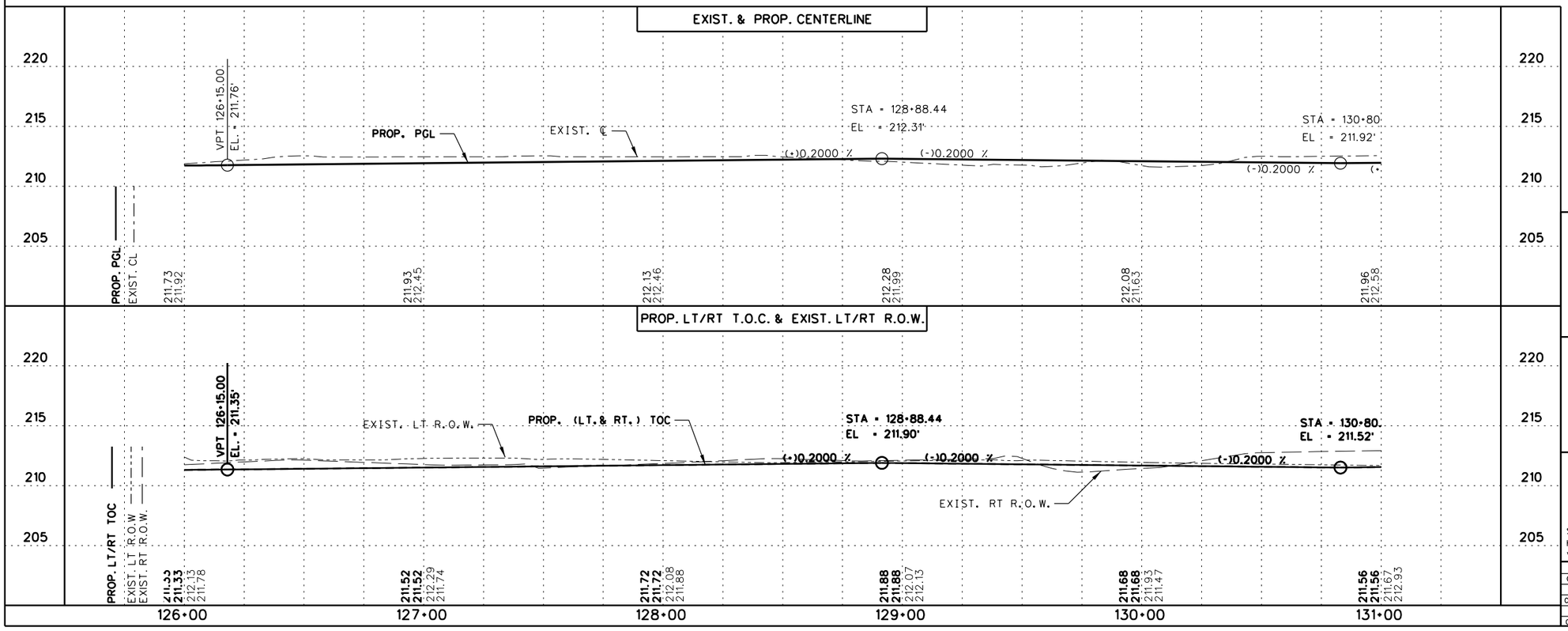
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
529	CONC CURB & GUTTER (TY-A)	LF	1004
531	CONCRETE SIDEWALKS	SY	333
496	REMOVE STR (SET)	EA	2
496	REMOVE STR (PIPE)	LF	50
529	CONC VALLEY GUTTER	LF	98

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 126+00 TO STA. 131+00

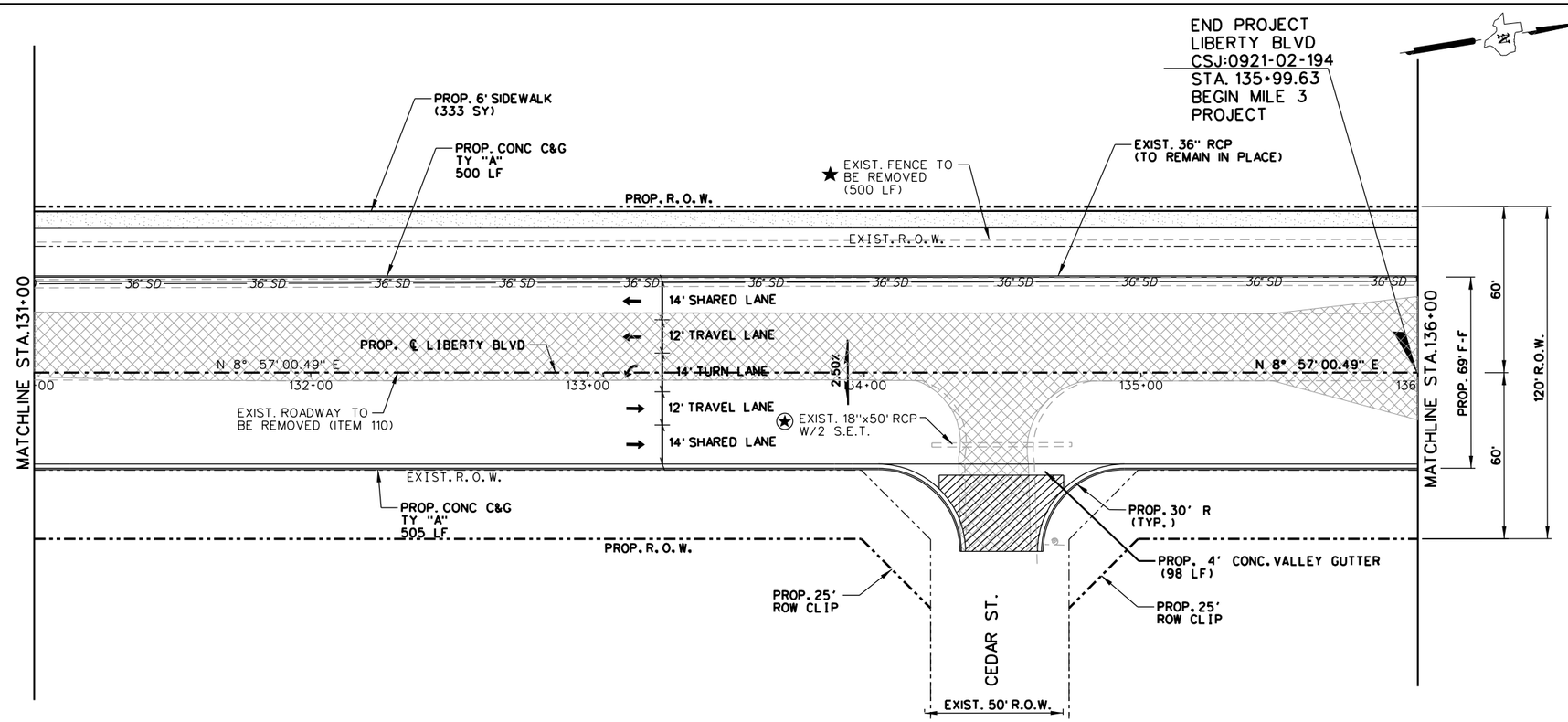
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 25 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					97
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

5/6/2022 K:\Counties\HD\Liberty Rd (US83 to Mile 3)\CDJV\03 ROADWAY\02 P&P\LIBERTY_PP025_A.dgn



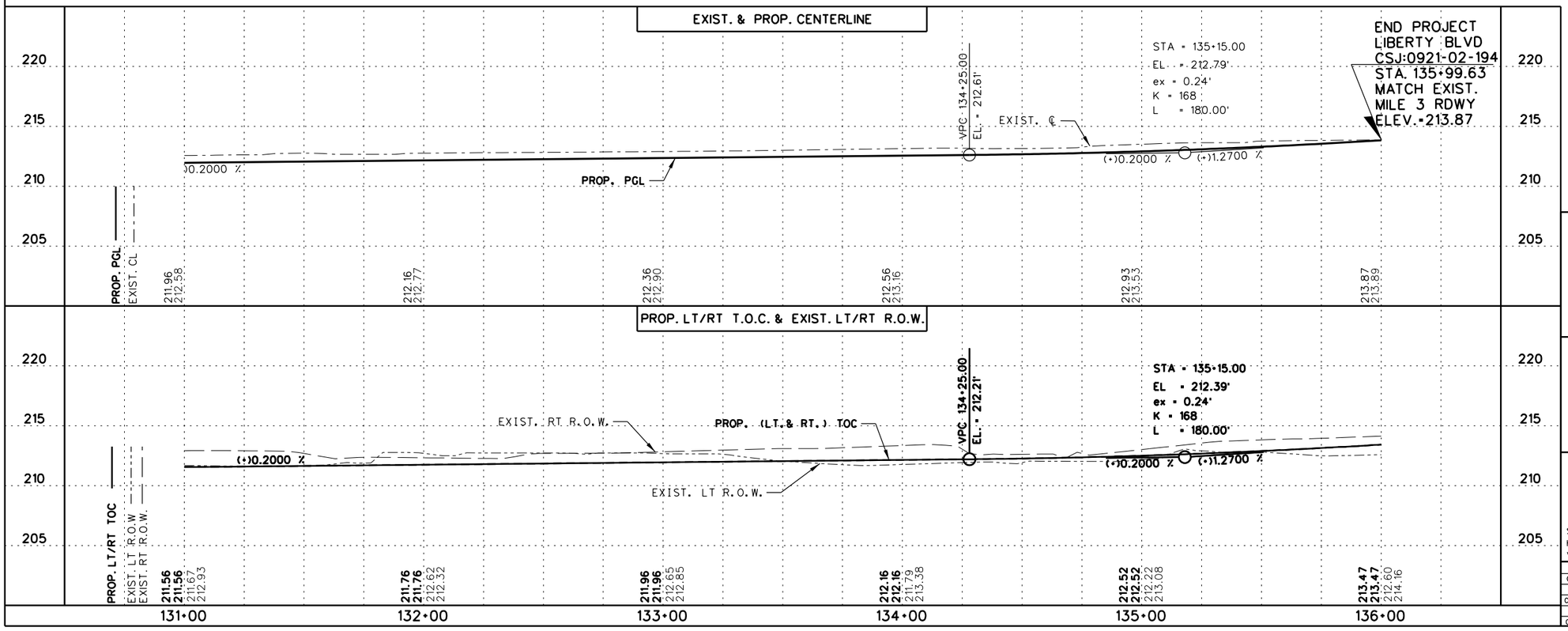
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
496	REMOVE STR (SET)	EA	2
496	REMOVE STR (PIPE)	LF	50
529	CONC CURB & GUTTER (TY-A)	LF	1005
531	CONCRETE SIDEWALKS	SY	333
529	CONC VALLEY GUTTER	LF	98

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 131+00 TO STA. 136+00

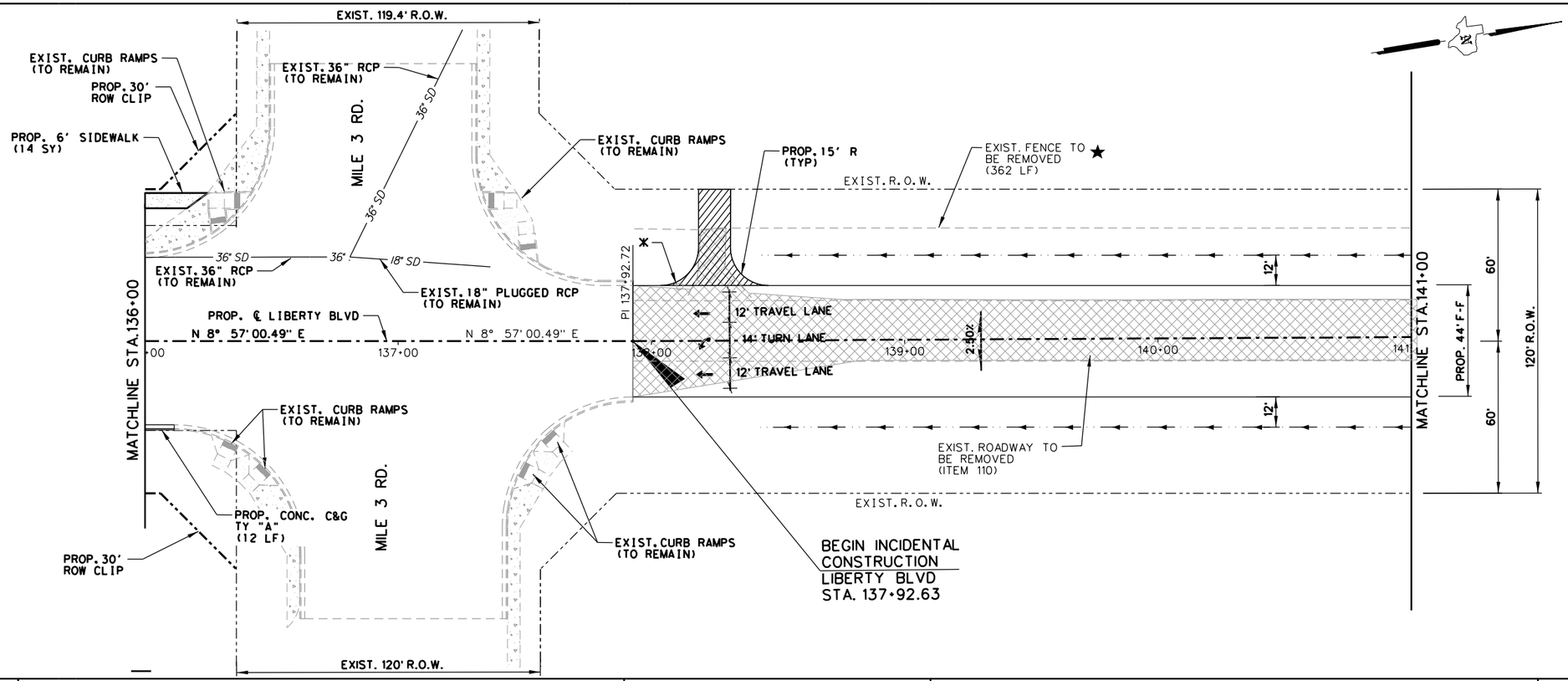
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 26 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					98
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

5/6/2022 K:\Counties\HDO\Liberty Rd (US83 to Mile 3)\ODJ\03 ROADWAY\02 P&P\LIBERTY_PP026_A.dgn



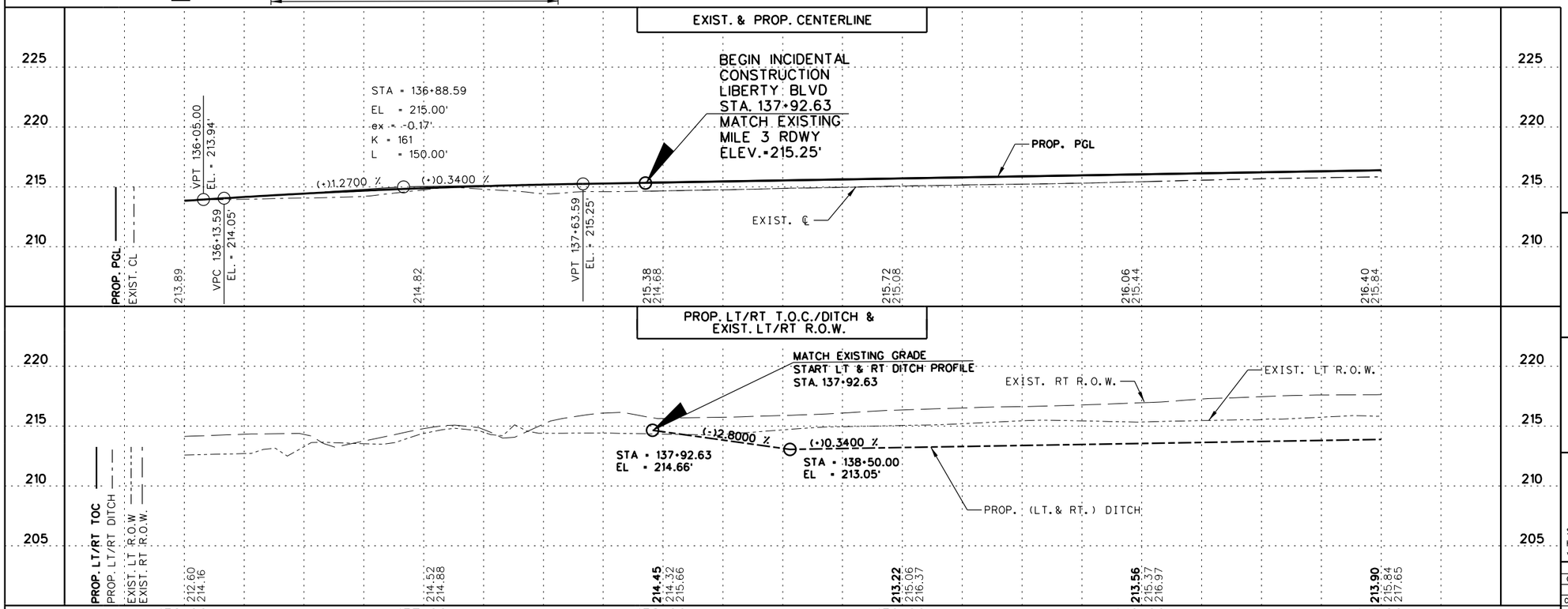
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
531	CONCRETE SIDEWALKS	SY	14
529	CONC CURB & GUTTER (TY-A)	LF	12

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS







L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

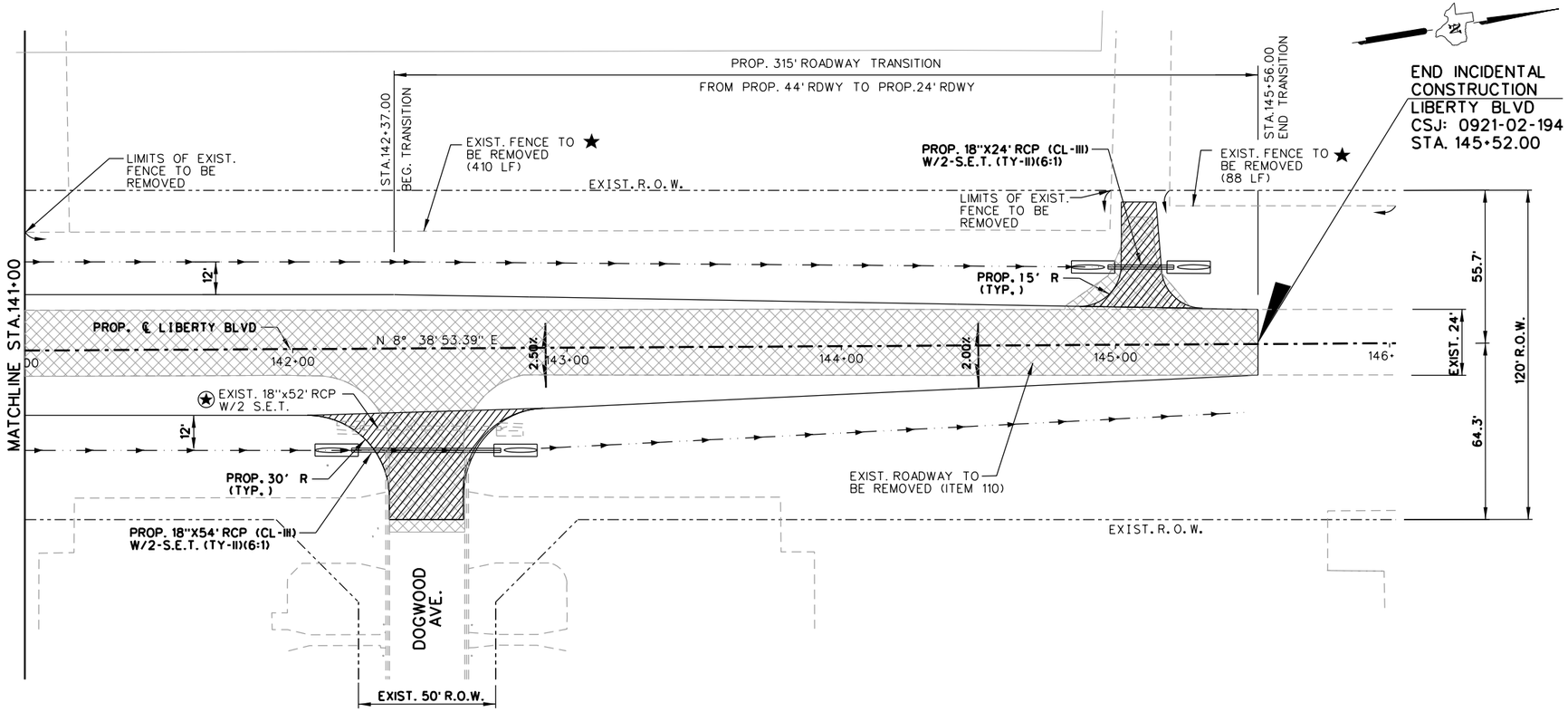
LIBERTY BLVD PLAN AND PROFILE STA. 136+00 TO STA. 141+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 27 OF 28

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				99
DW:		STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:	
CK TR:	

5/23/2022 K:\Counties\HD\Liberty Rd (US83 to Mile 3)\GDJ\03 ROADWAY\02 P&P\LIBERTY_PP027_A.dgn



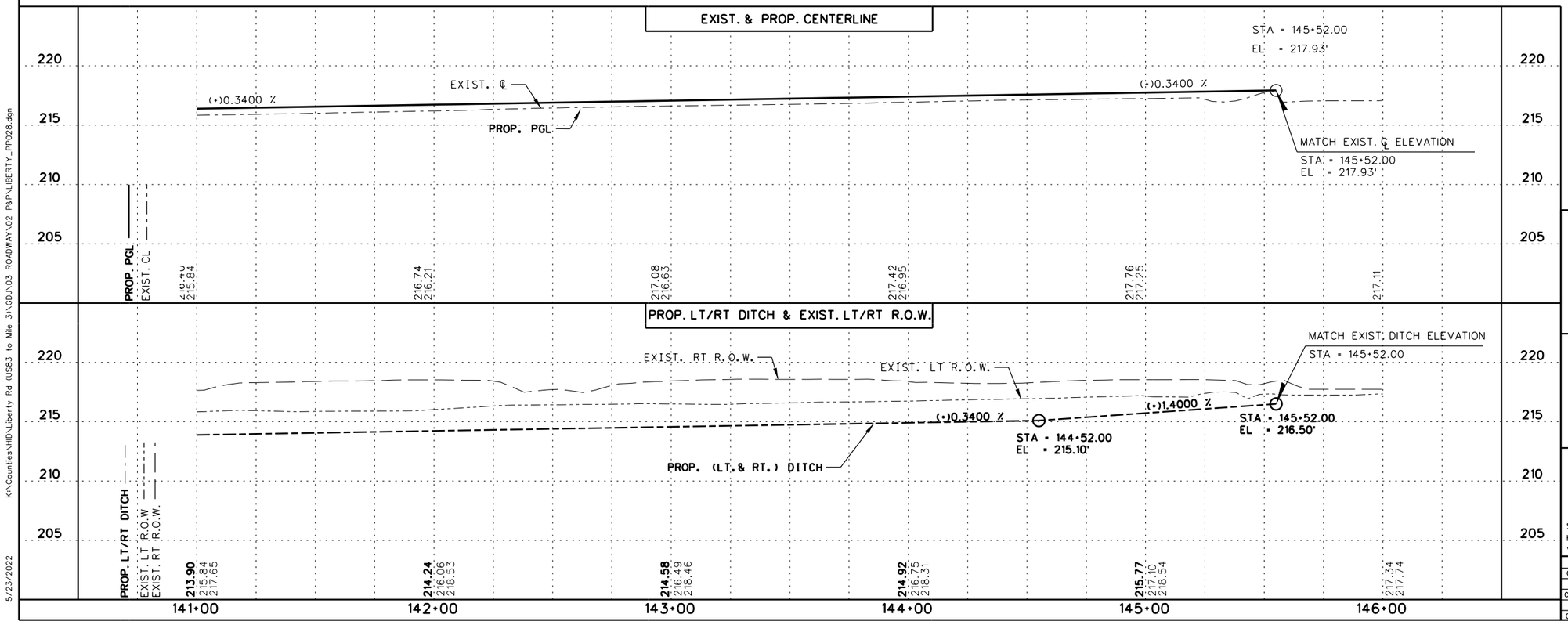
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
464	RC PIPE (CL-III)(18IN)	LF	78
467	SET (TY II)(18)(RCP)(6:1)(P)	EA	4
496	REMOVE STR (SET)	EA	2
496	REMOVE STR (PIPE)	LF	52

LEGEND:

- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/TURN TABLE FOR QUANTITIES & PIPE QUANTITIES)
- PROPOSED PLANING (0-1½")
- PROPOSED WIDENING
- PROPOSED OVERLAY
- OBLITERATE EXIST ROAD
- DIRECTION OF TRAFFIC
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"
- DITCH

NOTES:
1. SEE ALIGNMENT DATA SHEET FOR PROP. & EXIST. CENTERLINE DATA.
2. SEE SURVEY DATA SHEET FOR BM STATIONS, OFFSET, ELEV. ETC.
3. FOR DRAINAGE & UTILITIES INFORMATION SEE U&D's SHEETS



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PLAN AND PROFILE
STA. 141+00 TO STA. 146+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 28 OF 28

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
6	TEXAS					100
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
PHR	HIDALGO	0921	02	194	LIBERTY	

K:\Counties\HID\Liberty Rd (US83 to Mile 3\GDJ\03 ROADWAY\02 P&P\LIBERTY_PP028.dgn
5/23/2022

SUMMARY OF INTERSECTIONS AND DRIVEWAYS

STATION LIMITS (AT CL OF DRWY)	WIDTH	LENGTH	RADIUS	ITEM 530 6004 PRIVATE D/W (CONC)	ITEM 530 6005 PRIVATE D/W (ACP) (TY PB-1)	ITEM 530 6002 INTER-SECTIONS (ACP) (TY PBS-2)
	FT.	FT.	FT.	S.Y. EST.	S.Y. EST.	S.Y. EST.
RIGHT SIDE						
26+36(DIAMOND AVE.)	24	32	30	INCLUDED IN RDWY QUANTITIES		
42+40	15	170	20		302	
55+52	27	30	10		95	
95+92	21	27	25		93	
110+58	34	27	25		132	
122+26	14	35	10		59	
125+00(ASH ST.)	27	31.5	30			137
129+80(BIRCH ST.)	27	31.5	30			137
134+47(CEDAR ST.)	26	31.5	30			134
142+47(DOGWOOD AVE.)	27	31.5	30			137
147+33(N. EBONY AVE.)	27	31.5	30			137
LEFT SIDE						
16+26	34	39	30	190		
20+50	34	68	30	300		
26+20(DIAMOND AVE.)	38	33	30	INCLUDED IN RDWY QUANTITIES		
34+93	35	27	30	148		
42+40	15	170	20		302	
55+45	16	27	10		53	
60+06(MARBLE ST.)	28	31.5	30			141
64+45(NUGENT ST.)	27	31.5	30			137
68+87(OPAL ST.)	26	31.5	30			134
73+31(PLATIUM ST.)	27	31.5	30			137
77+72(QUARTZ ST.)	27	31.5	30			137
82+11(RUBY ST.)	30	31.5	30			148
86+51(SAPPHIRE ST.)	25	31.5	30			130
91+52(URANIUM AVE.)	29	31.5	30			144
95+92(VOLCANO AVE.)	25	31.5	30			130
101+84(WHITE ROCK)	30	31.5	30			148
104+81(2 MILE LINE)	22	31.5	30			120
114+64(LA FUENTE DR.)	24	31.5	30			127
120+62(PINO ST.)	29	32	30			146
138+22	12	27	10		41	
145+06	12	29	10		43	
146+43	12	30	10		45	
148+00(SALINASST.)	25	32	30			132
TOTAL				638	1165	2593

THE COUNTY OF HIDALGO TEXAS

L & G Engineering

Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD DRIVEWAY TABLE

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					101
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

$FILE$

$DATE$

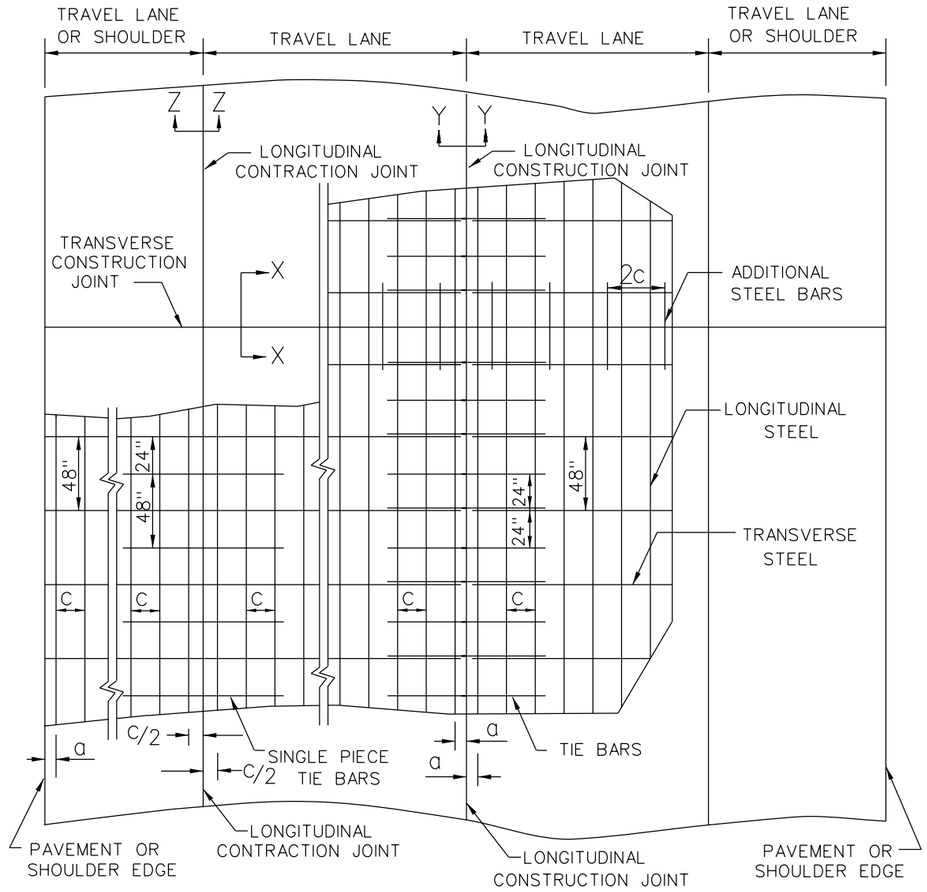
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

GENERAL NOTES

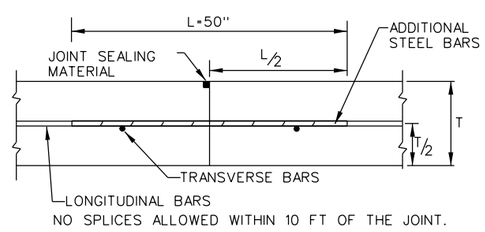
TABLE NO.1 LONGITUDINAL STEEL					
SLAB THICKNESS AND BAR SIZE		REGULAR STEEL BARS	FIRST SPACING AT EDGE OR JOINT	ADDITIONAL STEEL BARS AT TRANSVERSE CONSTRUCTION JOINT (SECTION X-X)	
T (IN.)	BAR SIZE	SPACING c (IN.)	SPACING a (IN.)	SPACING 2 x c (IN.)	LENGTH L (IN.)
7.0	#5	6.5	3 TO 4	13	50
7.5	#5	6.0	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



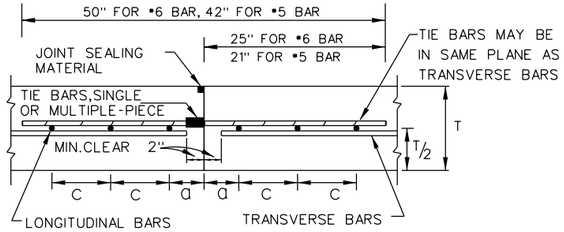
TYPICAL PAVEMENT LAYOUT

PLAN VIEW (NOT TO SCALE)



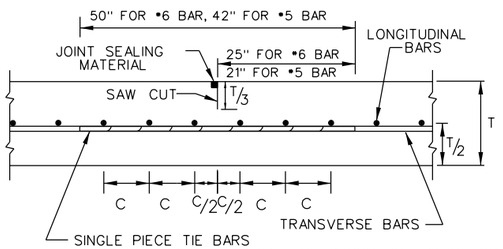
TRANSVERSE CONSTRUCTION JOINT

SECTION X - X



LONGITUDINAL CONSTRUCTION JOINT

SECTION Y - Y



LONGITUDINAL CONTRACTION JOINT

SECTION Z - Z

Texas Department of Transportation

Design Division Standard

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

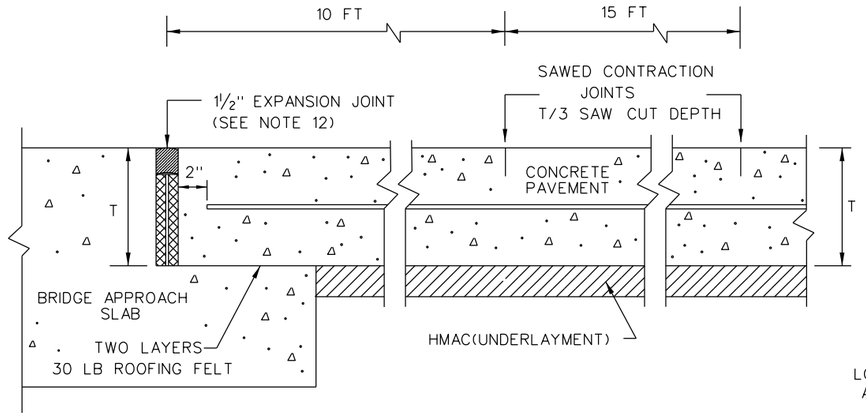
ONE LAYER STEEL BAR PLACEMENT
T - 7 to 13 INCHES

CRCP(1)-20

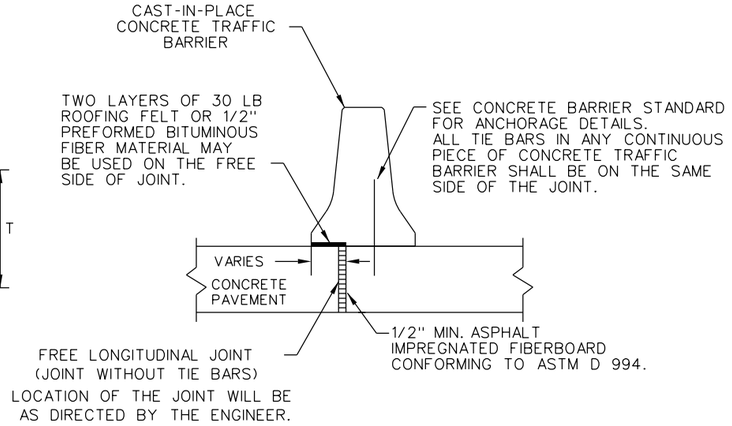
FILE: crcp120.dgn	DN: TxDOT	CK:KM	DW: AN	CK: VP
© TxDOT: APRIL 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
10/10/2011 ADD GN #12 04/09/2013 REMOVE 6" AND 6.5" ADD CTE REQUIREMENTS 05/05/2017 CoTE AS RATED 4.3	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		102

DISCLAIMER:
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.

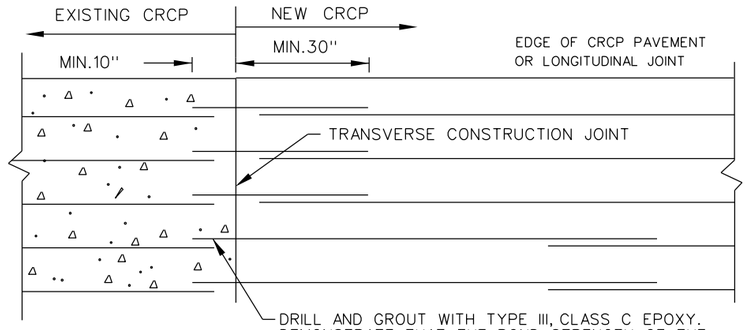
DATE:
FILE:



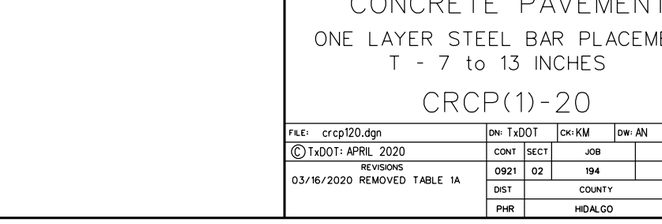
TRANSVERSE EXPANSION JOINT DETAIL
AT BRIDGE APPROACH



FREE LONGITUDINAL JOINT DETAIL

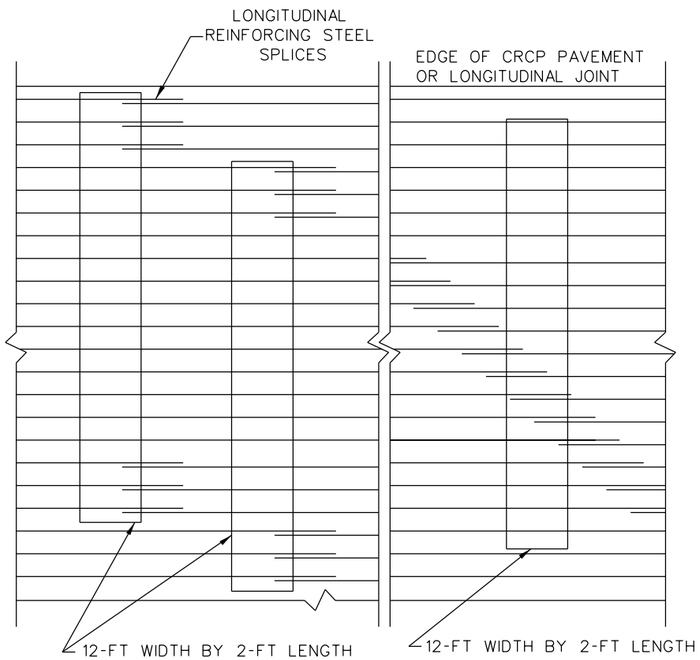


OPTION A: DRILL AND EPOXY
PLAN VIEW (NOT TO SCALE)



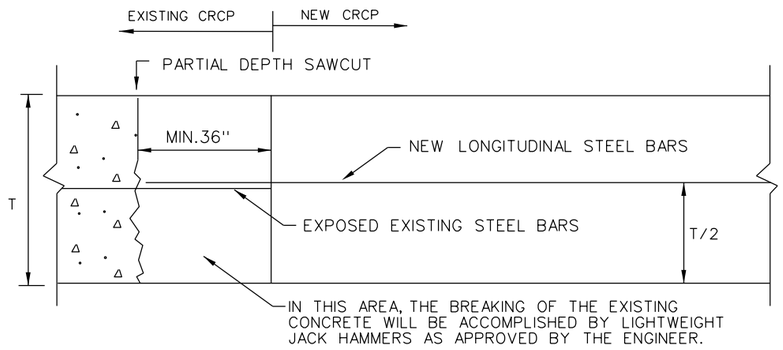
1. BEFORE WIDENING WORK, DEMONSTRATE THAT THE BOND STRENGTH OF THE EPOXY-GROUTED TIE BARS MEETS THE REQURIMENTS OF PULL-OUT TEST SPECIFIED IN ITEM 361.
2. SPACE TIE BARS AT 24" SPACING. USE #6 TIE BARS FOR 8" AND THICKER SLABS, USE #5 TIE BARS FOR LESS THAN 8" THICK SLABS.

LONGITUDINAL WIDENING JOINT DETAIL



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 B: BREAKBACK AND LAP

TRANSVERSE TIE JOINT DETAIL
EXISTING CRCP TO NEW CRCP

SHEET 2 OF 2

Texas Department of Transportation

Design Division Standard

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

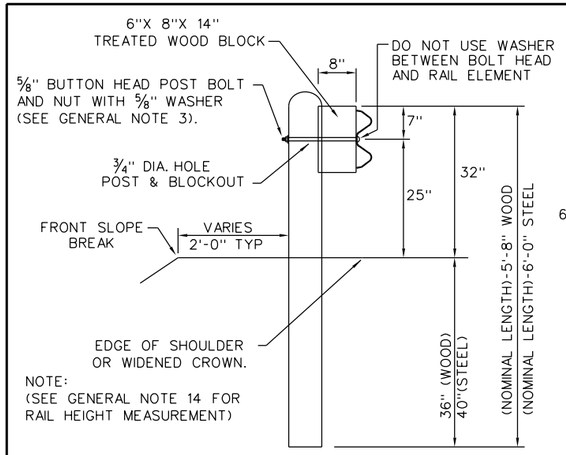
ONE LAYER STEEL BAR PLACEMENT
T - 7 to 13 INCHES

CRCP(1)-20

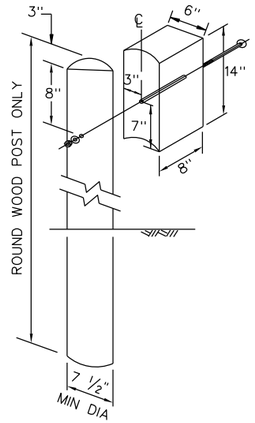
FILE: crcp120.dgn	DN: TxDOT	CK: KM	DW: AN	CK: VP		
© TxDOT: APRIL 2020	CONT	SECT	JOB		HIGHWAY	
REVISIONS 03/16/2020 REMOVED TABLE 1A	0921	02	194		LIBERTY	
	DIST	COUNTY			SHEET NO.	
	PHR	HIDALGO			103	

DISCLAIMER:
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.

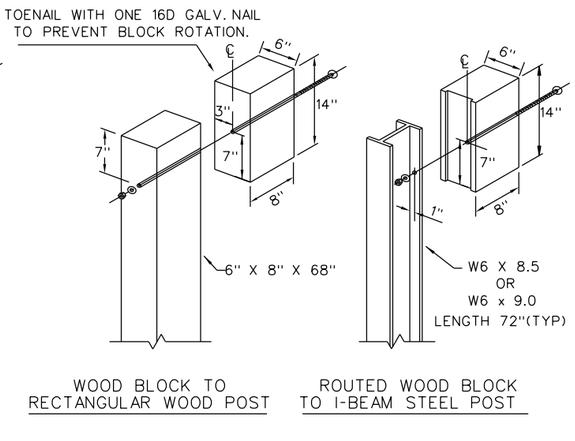
DATE:
FILE:



TYPICAL POST PLACEMENT



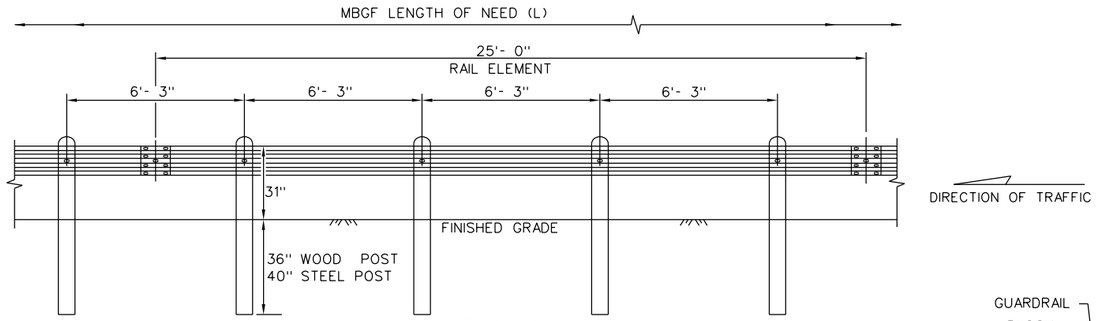
WOOD BLOCK TO
ROUND WOOD POST



WOOD BLOCK TO
RECTANGULAR WOOD POST

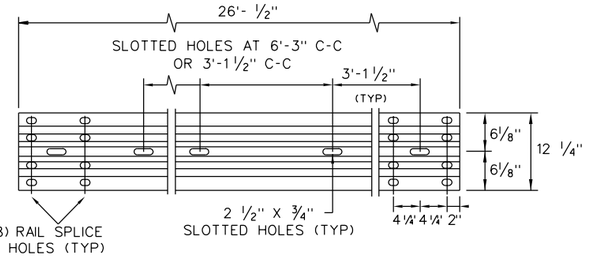
ROUTED WOOD BLOCK
TO I-BEAM STEEL POST

NOTE: * "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



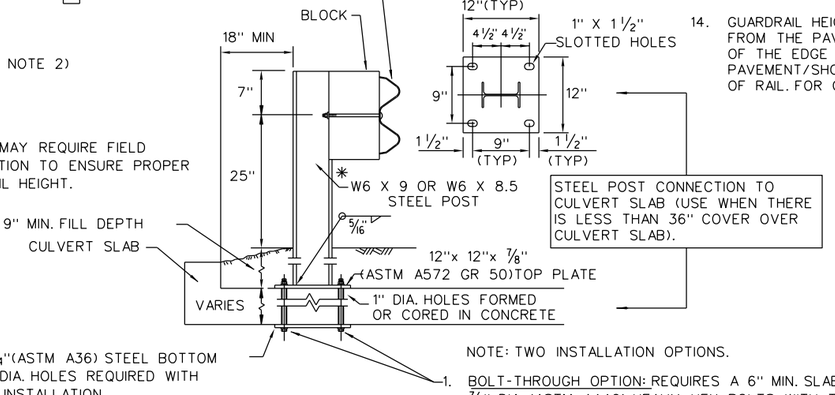
ELEVATION
MID-SPAN RAIL SPLICE

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

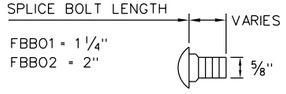
NOTE: TWO INSTALLATION OPTIONS.

1. BOLT-THROUGH OPTION: REQUIRES A 6" MIN. SLAB THICKNESS. 7/8" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS.
NOTE: BOLT LENGTH = SLAB PLUS 2 1/4" MIN.

2. EPOXY ANCHOR OPTION: THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE 7/8" 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 1/4" MIN. BEYOND NUT.

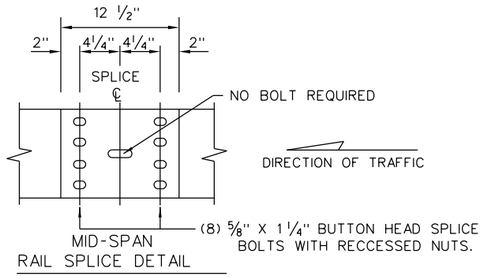
NOTE: CULVERTS OF 25 FT. OR LESS, SEE GF(31)LS STANDARD FOR "LONG SPAN" OPTION.

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 1/2" 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 5/8" 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.

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.

Texas Department of Transportation

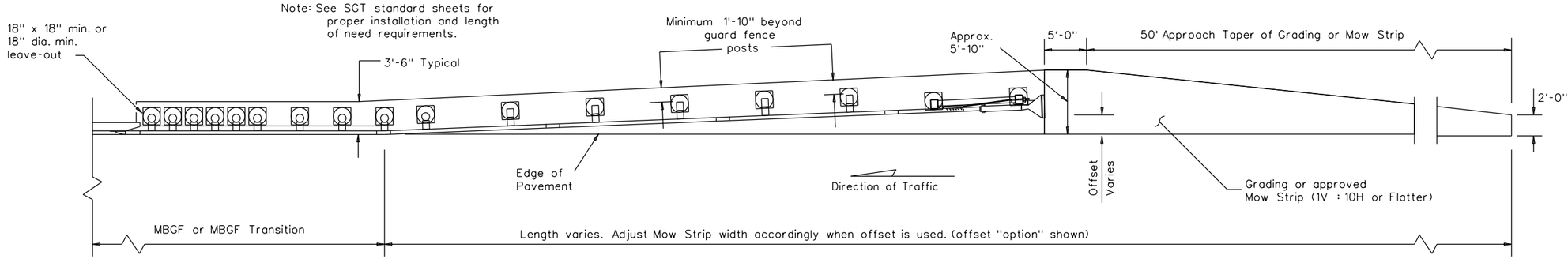
Design Division Standard

METAL BEAM GUARD FENCE
TL-3 MASH COMPLIANT
GF(31)-19

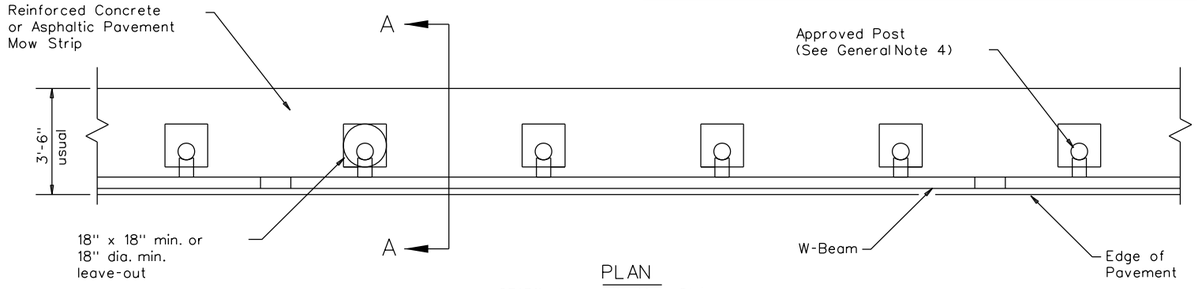
FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0921	02	194	LIBERTY	
	DIST	COUNTY		SHEET NO.	
	PHR	HIDALGO		104	

DISCLAIMER:
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:
FILE:

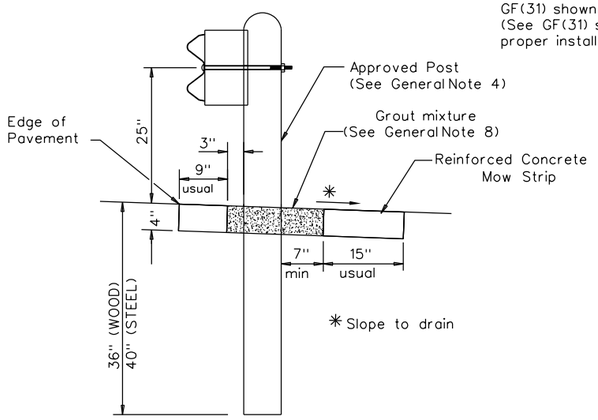


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



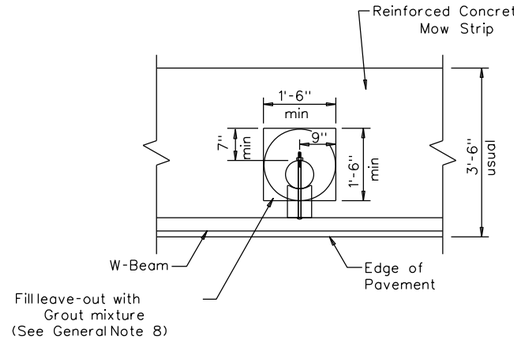
PLAN

GF(31) shown with Mow Strip
(See GF(31) standard sheet for
proper installation)



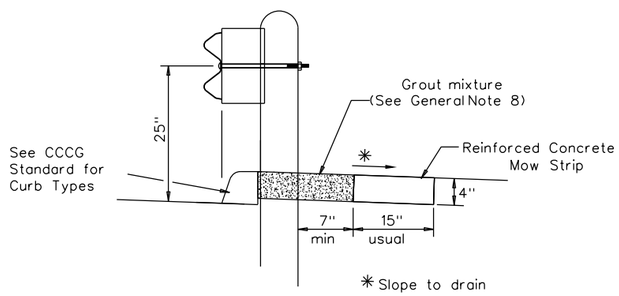
SECTION A-A

Typical



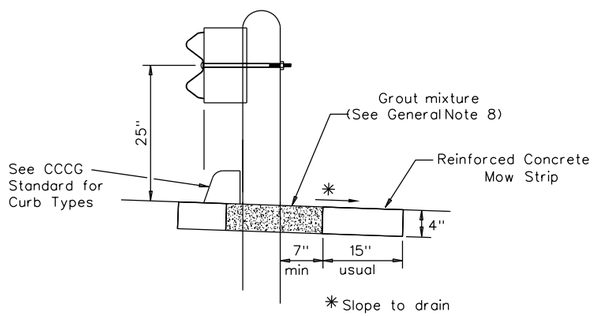
MOW STRIP DETAIL

Reinforced Concrete Mow Strip
with 18" x 18" Square or
18" Dia. minimum leave-out.



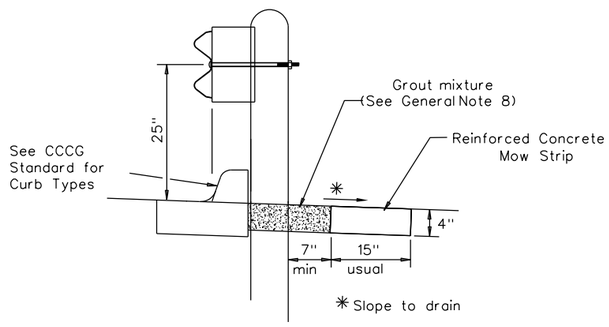
CURB OPTION (1)

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 1 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

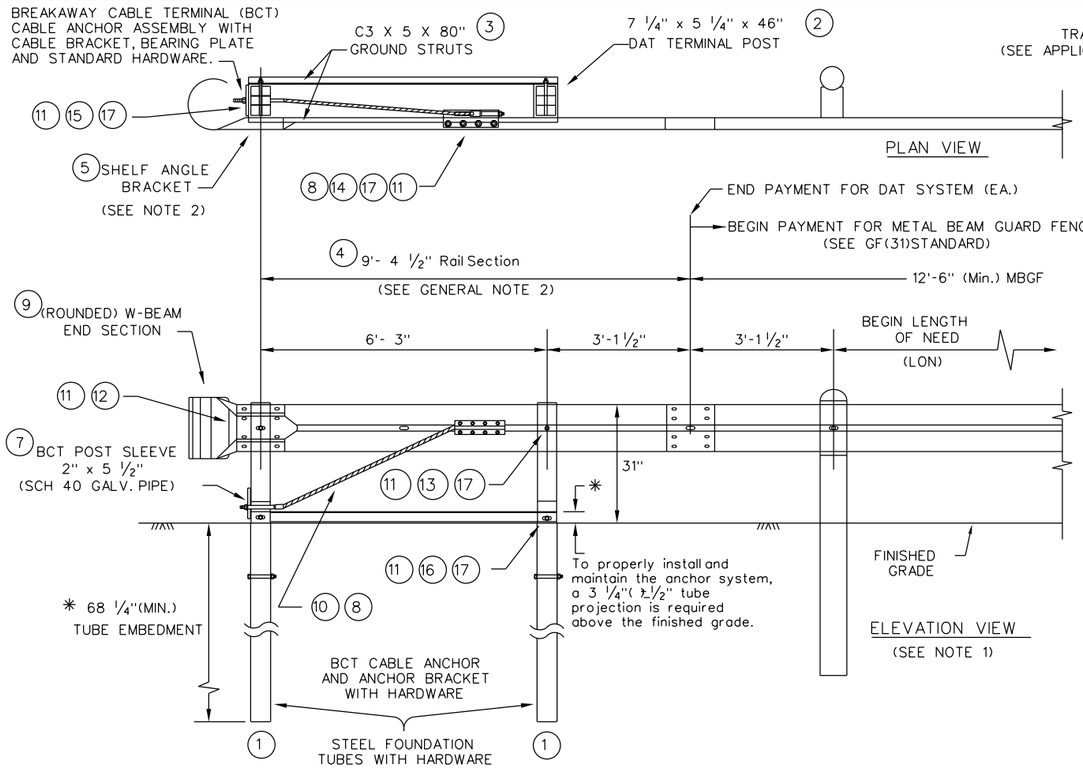
METAL BEAM GUARD FENCE (MOW STRIP) TL-3 MASH COMPLIANT

GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG		
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY		
REVISIONS	0921	02	194	LIBERTY		
	DIST	COUNTY		SHEET NO.		
	PHR	HIDALGO		105		

DISCLAIMER:
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:
FILE:



DOWNSTREAM ANCHOR TERMINAL (DAT)

NOTE: ONLY FOR DOWNSTREAM USE, WHEN LOCATED OUTSIDE THE HORIZONTAL CLEARANCE AREA OF OPPOSING TRAFFIC.

GENERAL NOTES

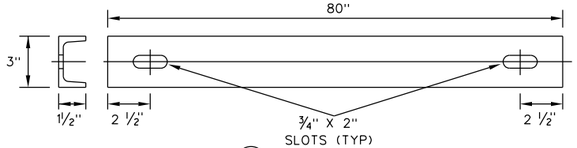
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN 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

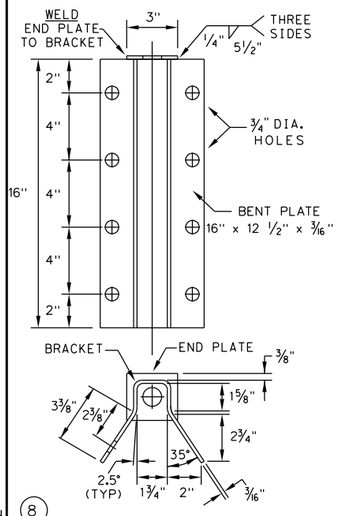
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

#	(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

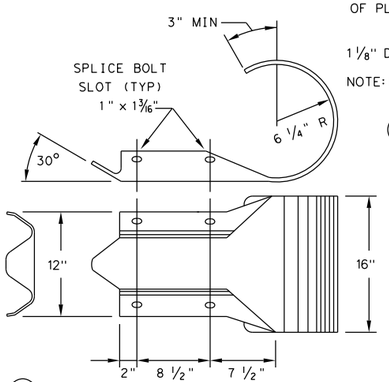
4 TERMINAL RAIL ELEMENT FOR DAT



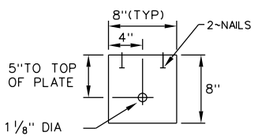
3 CHANNEL STRUT
C3 X 5 X 80",GRADE A36



8 GUARDRAIL ANCHOR BRACKET

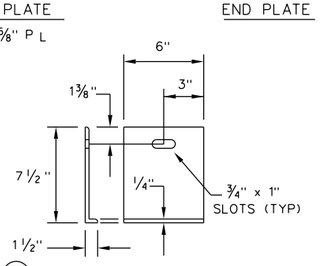


9 W-BEAM END SECTION (ROUNDED) (12 GA.)

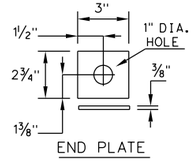


NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

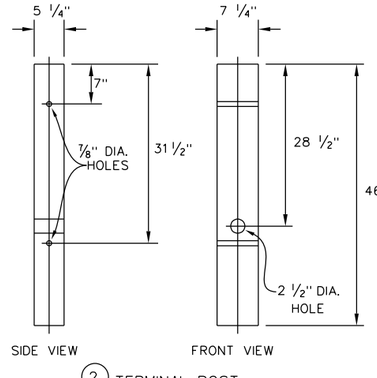
6 BEARING PLATE
8"x 8"x 5/8" P L



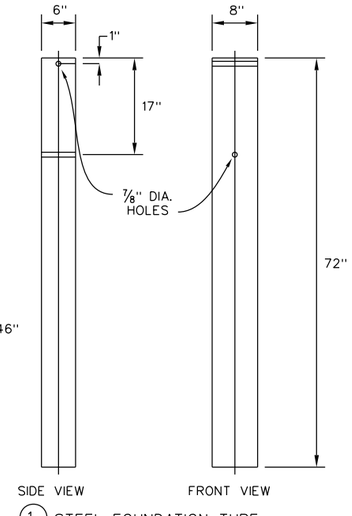
5 SHELF ANGLE BRACKET



END PLATE



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

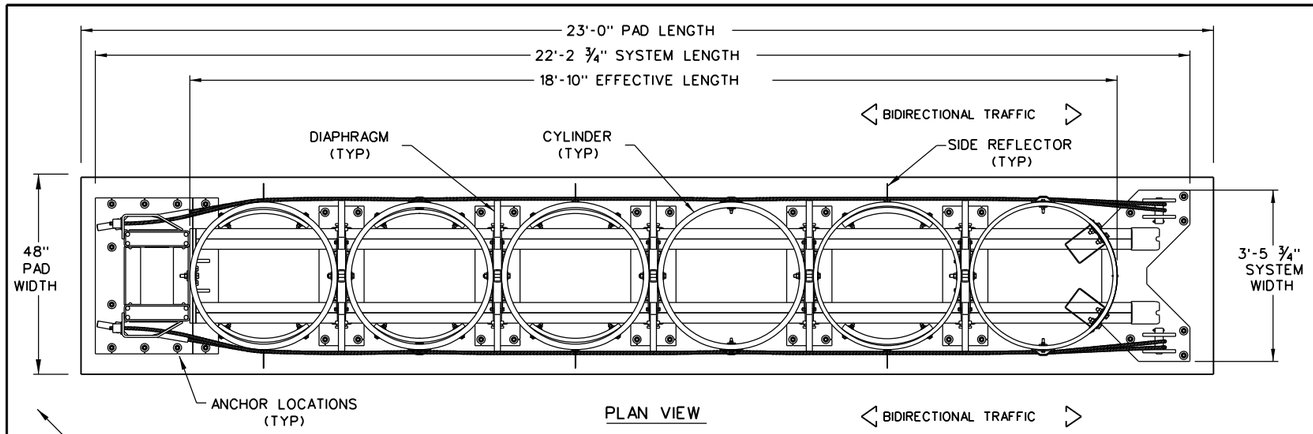
METAL BEAM GUARD FENCE (DOWNSTREAM ANCHOR TERMINAL) TL-3 MASH COMPLIANT

GF(31)DAT-19

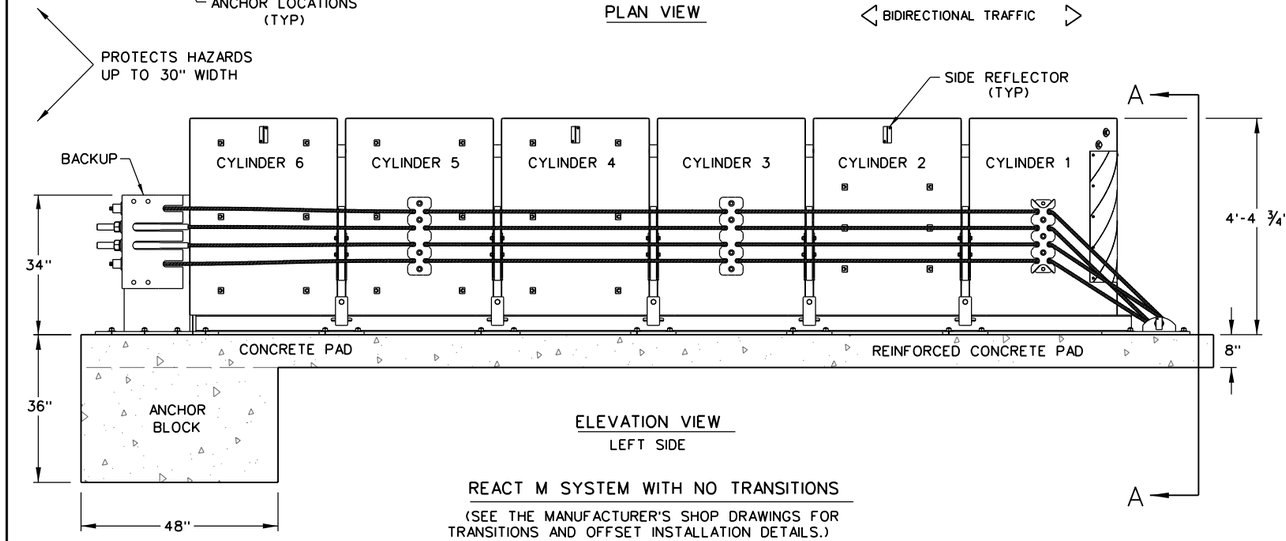
FILE: gf31dat19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		106

DISCLAIMER:
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:
FILE:



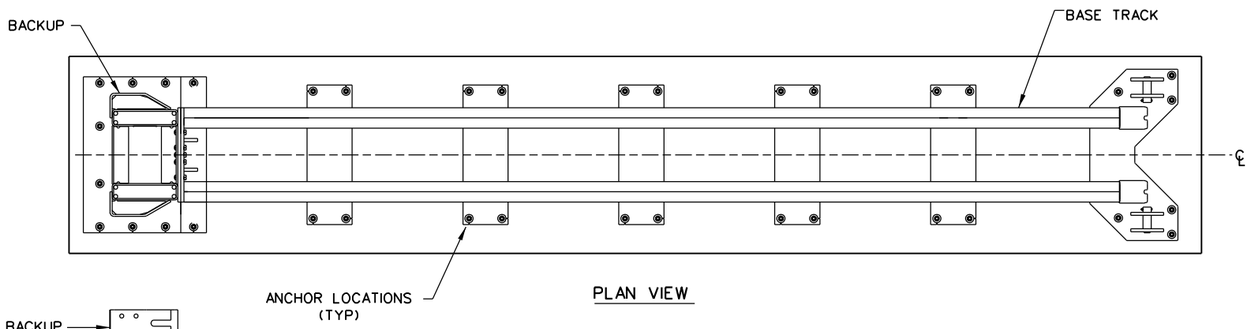
PLAN VIEW



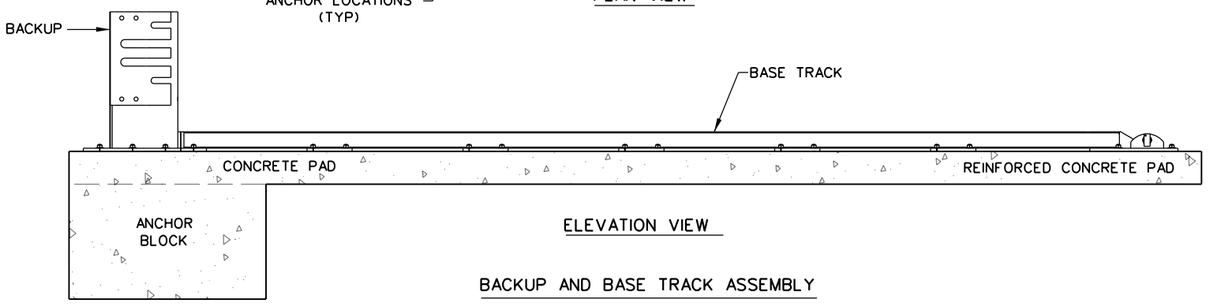
ELEVATION VIEW
LEFT SIDE

REACT M SYSTEM WITH NO TRANSITIONS

(SEE THE MANUFACTURER'S SHOP DRAWINGS FOR TRANSITIONS AND OFFSET INSTALLATION DETAILS.)



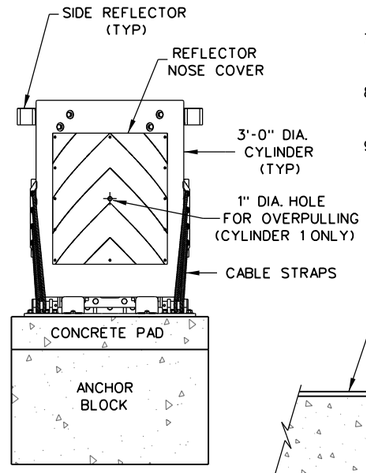
PLAN VIEW



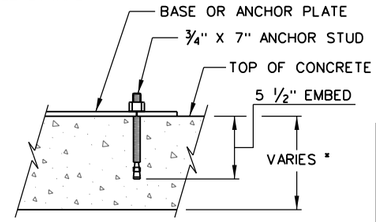
ELEVATION VIEW

BACKUP AND BASE TRACK ASSEMBLY

(SEE THE MANUFACTURER'S SHOP DRAWINGS FOR TRANSITIONS, OFFSETS, BIDIRECTIONAL AND UNIDIRECTIONAL INSTALLATION DETAILS.)

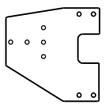


VIEW A-A

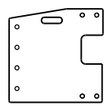


ANCHORING DETAIL
*SEE FOUNDATION TYPES TABLE

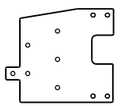
BACKUP ASSEMBLY TYPES FOR SYSTEM TRANSITIONS



SAFETY SHAPE BARRIER TRANSITION (ADAPTER)
TRANSITION PLATE(S)(OPTIONAL) REQUIRED W/BI-DIRECTIONAL TRAFFIC FLOWS ONLY.



VERTICAL WALL BARRIER TRANSITION (ADAPTER)
TRANSITION PLATE(S)(OPTIONAL) REQUIRED W/UNIDIRECTIONAL TRAFFIC FLOWS ONLY.



VERTICAL WALL BARRIER TRANSITION (ADAPTER)
TRANSITION PLATE(S)(OPTIONAL) REQUIRED W/BI-DIRECTIONAL TRAFFIC FLOWS ONLY.

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 AT 1(888)323-6374 OR WEBSITE: www.trinityhighway.com.
2. THE NOSE OF THE REACT M SHALL BE CLAD WITH A PLASTIC WRAP WITH STANDARD DELINEATION ADHERED TO THE WRAP AND SHALL HAVE A SERIES OF SIDE MARKER REFLECTORS ON BOTH SIDES OF THE UNIT. SEE SITE PLAN VIEWS FOR MARKER AND PLASTIC WRAP COLOR ORIENTATION.
3. FOR BI-DIRECTIONAL TRAFFIC, APPROPRIATE TRANSITION DETAILS WILL BE AS SHOWN ON THE MANUFACTURER'S SHOP DRAWINGS.
4. DETAILS OF COMPONENTS FOR THE REACT M, BACKUPS AND REINFORCING DETAILS WILL BE SHOWN ON THE MANUFACTURER'S SHOP DRAWINGS FURNISHED TO THE ENGINEER.
5. 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%.
6. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
7. THE REACT M SYSTEM SHOULD BE APPROXIMATELY PARALLEL WITH THE BARRIER OR CENTERLINE OF MERGING BARRIERS.
8. ALL STEEL COMPONENTS TO BE HOT DIPPED GALVANIZED EXCEPT STAKES, DRIVE SPIKES, THREADED BOLTS IN BACKUP UNIT, AND WEDGE FITTINGS ON CABLES.
9. THIS DRAWING REPRESENTS THE REACT M TL-3 SYSTEM, RE-DIRECTIVE, NON-GATING CRASH CUSHION THAT CAN PROTECT HAZARDS UP TO 30-INCHES IN WIDTH.

DESIGN DATA TABLE FOR REACT M

TEST NUMBER	TEST LEVEL	OVERALL LENGTH	TRANSITION LENGTH	SYSTEM WIDTH
3-30 TO 3-36	TL-3	22'-2 ¾"	-	3'-5 ¾"
3-37A	TL-3	22'-2 ¾"	9'-10 ¾"	3'-5 ¾"
3-38	TL-3	22'-2 ¾"	-	3'-5 ¾"

ANCHOR SYSTEM TYPE
APPROVED ADHESIVE, 7" STUDS, 5.5" EMBEDMENT
FOUNDATION TYPES
MINIMUM 8" REINFORCED PORTLAND CEMENT CONCRETE PAD (REQUIRED REINFORCING STEEL FOR CONCRETE PAD SHALL BE SHOWN ON THE MANUFACTURER'S SHOP DRAWINGS. MINIMUM 8" NON-REINFORCED PORTLAND CEMENT CONCRETE ROADWAY MEASURING AT LEAST 12' WIDE BY 50' LONG) MINIMUM 7" CONCRETE DECK STRUCTURE, OR MINIMUM 6" REINFORCED CONCRETE ROADWAY

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE REACT M SYSTEM AND IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

TRINITY HIGHWAY ENERGY ABSORPTION CRASH CUSHION REACT M (NARROW) (MASH TL-3)

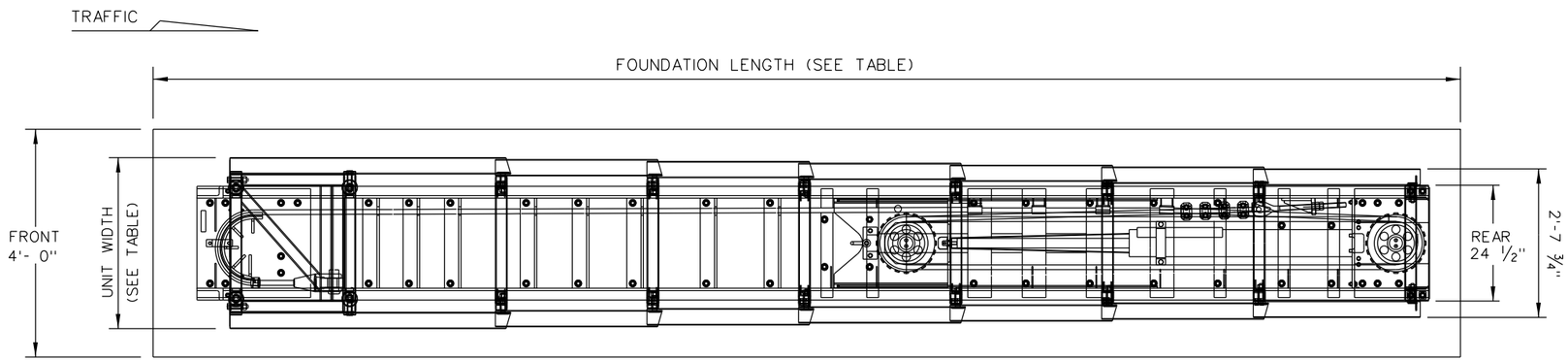
REACT(M)-21

LOW MAINTENANCE

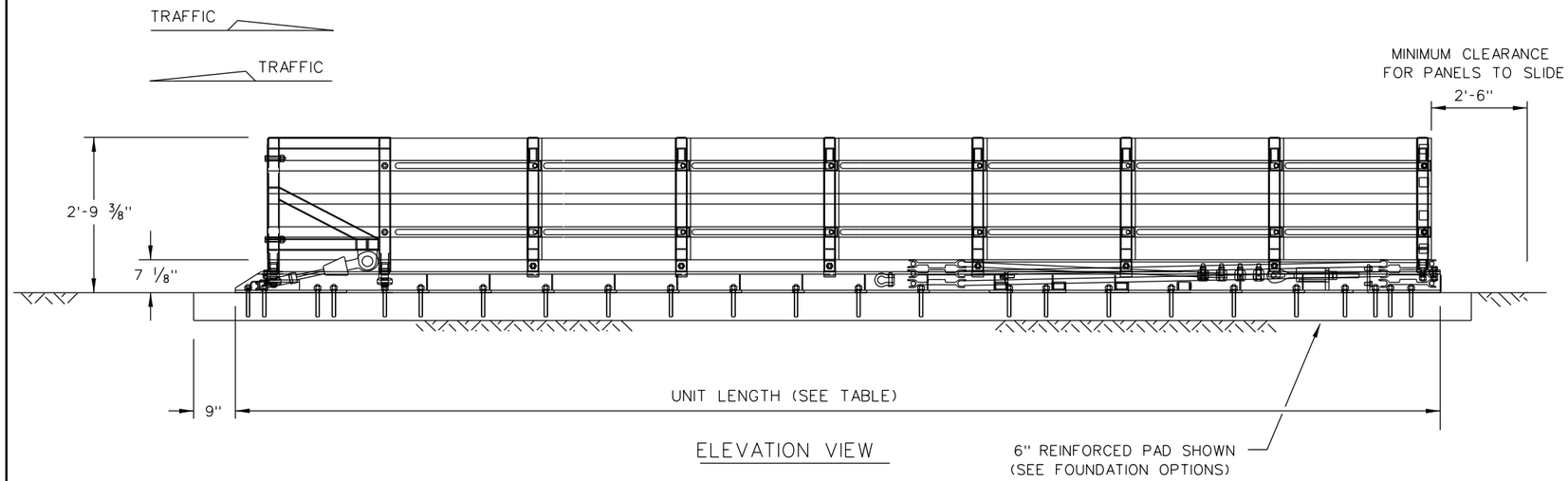
FILE: reactm21.dgn	DN: TXDOT	CK: KM	DW: SS	CK: CL
©TxDOT: JULY 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	6	HIDALGO		107

DISCLAIMER:
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:
FILE:



PLAN VIEW



ELEVATION VIEW

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: WORK AREA PROTECTION, CORP. AT (800) 327-4417, OR (630) 377-9100.
2. FOR BI-DIRECTIONAL TRAFFIC, APPROPRIATE TRANSITION PANELS WILL BE REQUIRED.
3. ADDITIONAL DETAILS FOR THE TRANSITION OPTION 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 SCI100GM & SCI70GM SYSTEMS SHOULD BE APPROXIMATELY PARALLEL WITH THE BARRIER OR CENTERLINE OF MERGING BARRIERS.

NOTE:
FOR ATTACHMENT AND TRANSITIONS TO OTHER SHAPES, BARRIERS, RAILINGS AND BI-DIRECTIONAL TRAFFIC FLOWS ARE AVAILABLE. (SEE MANUFACTURER'S PRODUCT MANUAL)

NOTE:
SIDE PANELS CAN TRAVEL 30" BEYOND THE LAST TERMINAL BRACE AT THE REAR OF THE CUSHION. ALL OBJECTS THAT MAY INTERFERE WITH THIS MOTION CAN AFFECT PERFORMANCE OF AND MAY CAUSE UNDUE DAMAGE TO THE CRASH CUSHION.

MODEL	TEST LEVEL	UNIT LENGTH (approx.)	UNIT WIDTH	FOUNDATION LENGTH	OBSTACLE WIDTH
SCI70GM	TL-2	13'-6"	2'-10 5/8"	15'- 6 1/4"	24"to 36"
SCI100GM	TL-3	21'-6"	3'-1 1/2"	23'- 0"	24"to 36"

SYSTEM AND PAD LENGTHS VARY DEPENDING ON BACKUP TYPE.

FOUNDATION OPTIONS
6" REINFORCED CONCRETE (5 1/2" ANCHOR EMBEDMENT)
8" UNREINFORCED CONCRETE (5 1/2" ANCHOR EMBEDMENT)
3" MIN. ASPHALT OVER 3" MIN. CONCRETE (16 1/2" ANCHOR EMBED.)
6" ASPHALT OVER 6" COMPACT SUBBASE (16 1/2" ANCHOR EMBED.)
8" MINIMUM ASPHALT (16 1/2" ANCHOR EMBEDMENT)

FOR STEEL PLACEMENT IN CONCRETE FOUNDATIONS, SEE MANUFACTURER'S PRODUCT MANUAL.

TRANSITION OPTIONS
CONCRETE VERTICAL WALL
CONCRETE TRAFFIC BARRIERS
GUARDRAIL (W-BEAM)
GUARDRAIL (THRIE-BEAM)

TRANSITION TYPES ARE SHOWN ELSEWHERE ON THE PLANS (I.E. ATTENUATOR LOCATION DETAILS OR IN THE GENERAL NOTES).

FOR BI-DIRECTIONAL TRANSITION PANEL AND END SHOE DETAILS, SEE MANUFACTURER'S PRODUCT MANUAL.

LOW MAINTENANCE

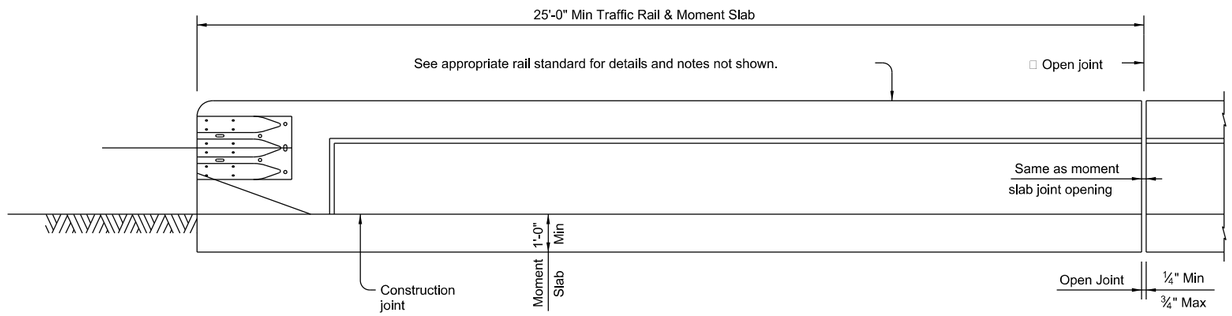
Texas Department of Transportation

Design Division Standard

WORK AREA PROTECTION CORP (SMART-NARROW)

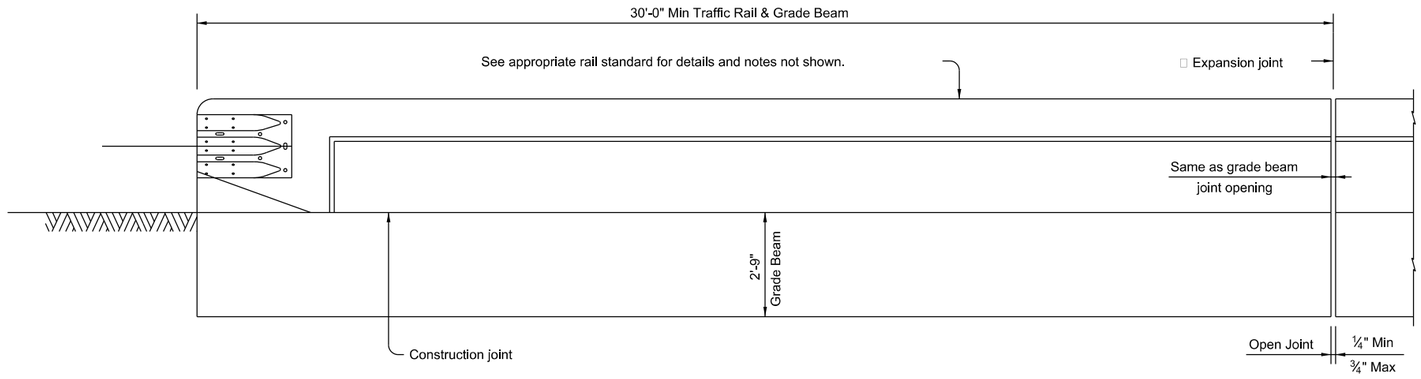
SMTC(N)-16

FILE: smtcn16.dgn	DN: TxDOT	CK: KM	DW: VP	CK: VP	
©TxDOT: February 2006	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0921	02	194	LIBERTY	
REVISED 06, 2013 (VP) REVISED 03, 2016 (VP)	DIST	COUNTY		SHEET NO.	
	PHR	HIDALGO		108	



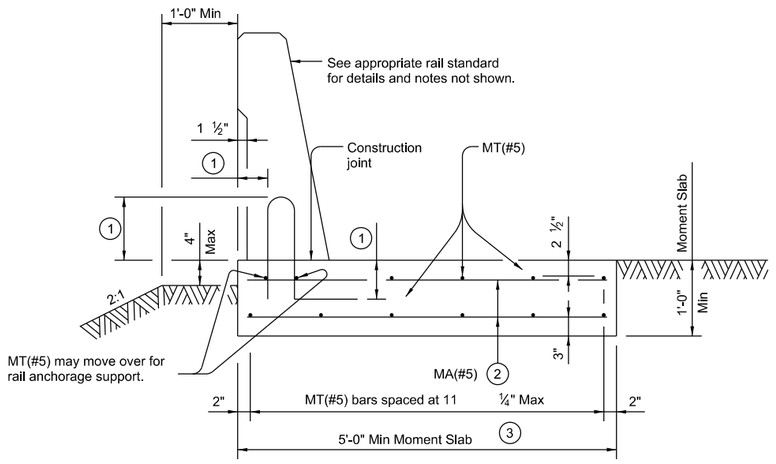
ROADWAY ELEVATION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)

(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)



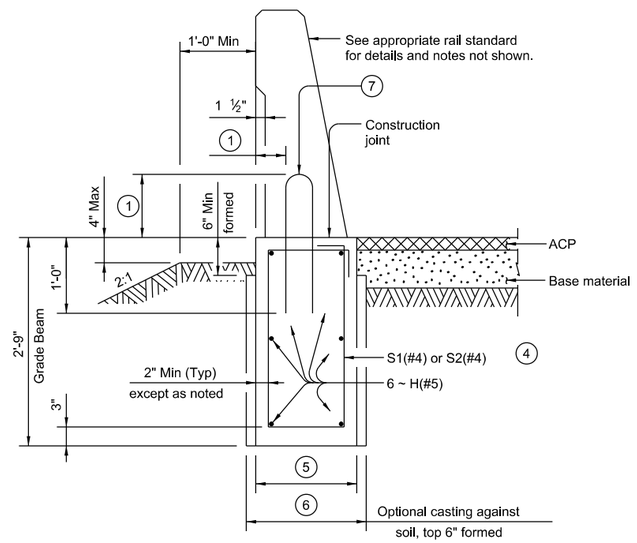
ROADWAY ELEVATION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)

(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)



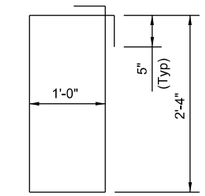
SECTION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)

(Showing SSTR rail other rails are similar.)

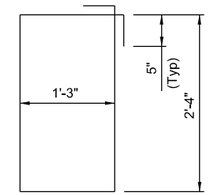


SECTION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)

(Showing SSTR rail other rails are similar.)



BARS S1(#4)



BARS S2(#4)

1. See applicable bridge rail standard.
2. MA(#5) space longitudinally along moment slab at 12" Max. (Spaced 2 ½" longitudinally from outside edge of moment slab).
3. Approximate moment slab concrete = 0.19 CY/LF and reinforcement = 22.4 LB/LF.
4. S1(#4) or S2(#4) spaced longitudinally along grade beam at 8" Max. (Spaced 2 ½" longitudinally from outside edge of grade beam).
5. Use bar S1(#4) with 1'-4" grade beam width and bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS. Approximate grade beam concrete = 0.14 CY/LF and reinforcement = 13.8 LB/LF.

   Use bar S2(#4) with 1'-7" grade beam width and bridge rail types: T66 and C66. Approximate grade beam concrete = 0.16 CY/LF and reinforcement = 14.2 LB/LF.
6. 1'-6" for bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS.

   1'-9" bridge rail types: T66 and C66.
7. Modify reinforcing on standard bridge rail anchorage if necessary by extending rail anchorage 12" Min, vertically into traffic rail

CONSTRUCTION NOTES:

Align moment slab (TRF-MS) or grade beam (TRF-GB) open joints with rail open joints maintaining no less than minimum rail length. Provide moment slab (TRF-MS) or grade beam (TRF-GB) with open joints at no greater than 100' spacing unless otherwise shown on the plans or approved by the Engineer.

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 required elsewhere.

Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for bars S1(#4), S2(#4) and H(#5) unless noted otherwise. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:

Uncoated or galvanized ~ #5 = 2'-4"

Epoxy coated ~ #5 = 3'-6"

GENERAL NOTES:

Use of these details will result in a moment slab (TRF-MS) or grade beam (TRF-GB) foundation that is acceptable for traffic rails which are MASH TL-2, TL-3, or TL-4 compliant.

See elsewhere in the plans for selected options between moment slab (TRF-MS) and/or grade beam (TRF-GB).

The foundation design resistance is based on the current AASHTO bridge railing requirements with the assumption of fair to good soil support conditions. Poor soil conditions will require suitably deeper and/or wider foundations.

See appropriate rail standard for details and notes not shown.

This detail is intended for use as a guide to unusual railing anchorage situations but may be included in the plans, modified as necessary to apply to specific installations required on the project.

Payment for moment slab (TRF-MS) and/or grade beam (TRF-GB) will be by Class "C" concrete or Class "C" (HPC) concrete for rail foundations.

The associated bridge railing will be paid for by the linear foot which includes the concrete and reinforcement.

Excavation will be subsidiary to other Items.

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

TRAFFIC RAIL FOUNDATIONS

FOR MASH TL-2, TL-3 & TL-4 BRIDGE RAILS

TRF

FILE: rlstd027-20.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS 07-20: Added moment slab with rail foundation lengths.	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		109

DISCLAIMER:
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.

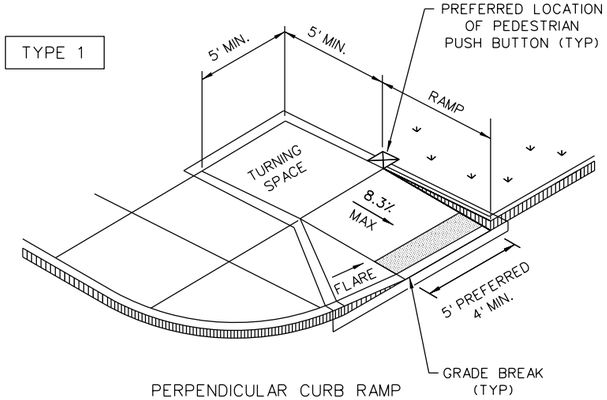
DATE:
FILE:

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	PERMANENT	79	EXISTING BRIDGE (LT)	40•87.50	3	1	CONC	7"	CONCRETE TRAFFIC RAIL	36"	2'-9 3/8"	33'	X				X					
1	PERMANENT	79	EXISTING BRIDGE (RT)	40•87.50	3	1	CONC	7"	CONCRETE TRAFFIC RAIL	36"	2'-9 3/8"	33'	X				X					
1	PERMANENT	80	EXISTING BRIDGE (LT)	41•52.50	3	1	CONC	7"	CONCRETE TRAFFIC RAIL	36"	2'-9 3/8"	33'	X				X					
1	PERMANENT	80	EXISTING BRIDGE (RT)	41•52.50	3	1	CONC	7"	CONCRETE TRAFFIC RAIL	36"	2'-9 3/8"	33'	X				X					

DISCLAIMER:
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.

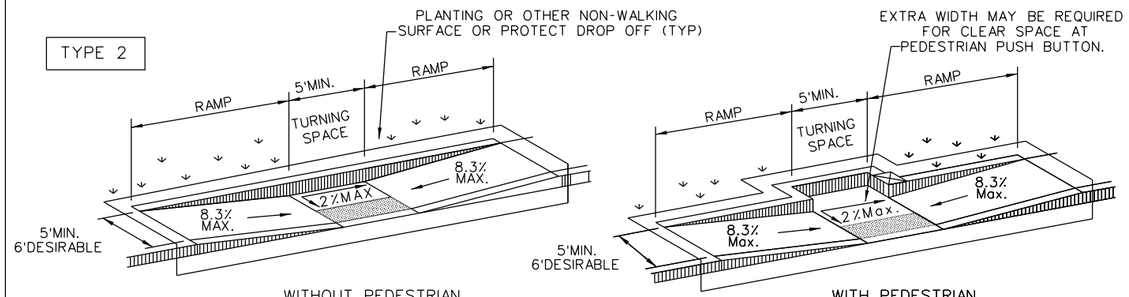
DATE:
FILE:

TYPE 1



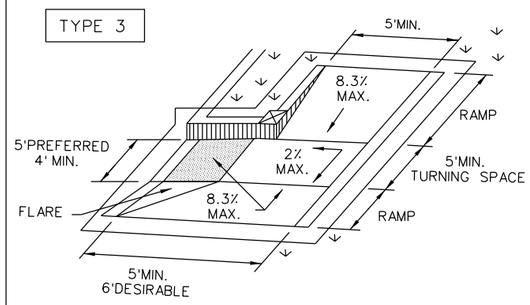
PERPENDICULAR CURB RAMP

TYPE 2

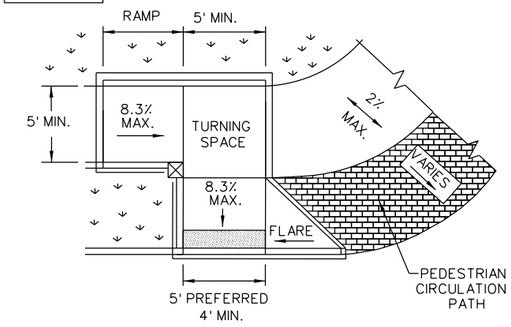


PARALLEL CURB RAMP

TYPE 3

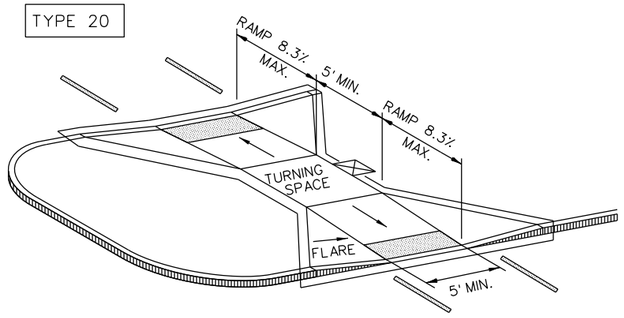


TYPE 6



COMBINATION CURB RAMPS

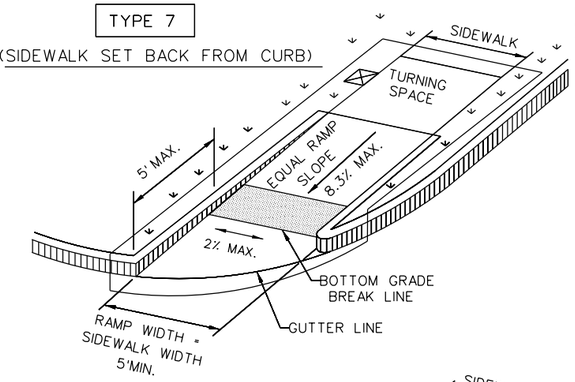
TYPE 20



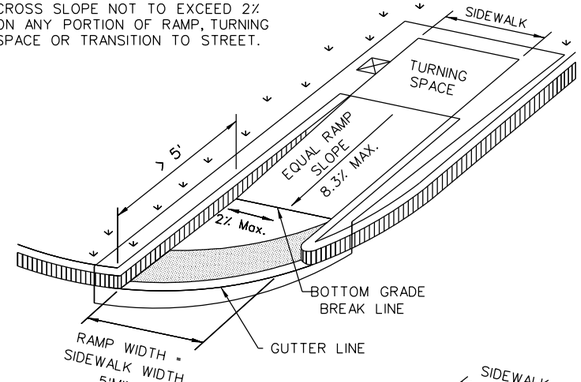
CURB RAMPS AT MEDIAN ISLANDS

TYPE 7

(SIDEWALK SET BACK FROM CURB)

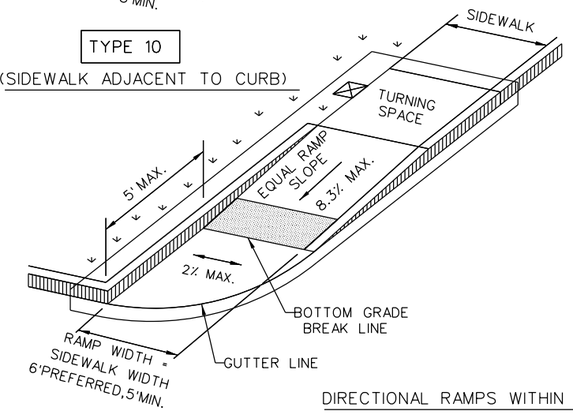


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.

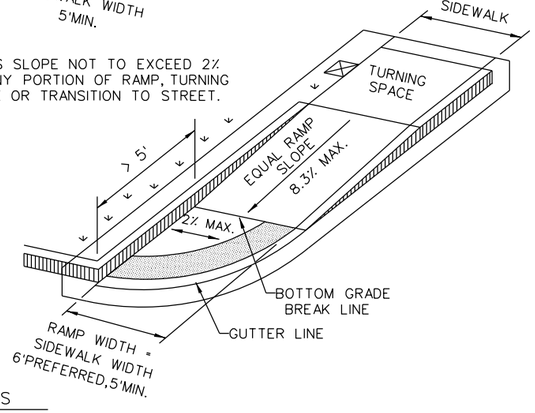


TYPE 10

(SIDEWALK ADJACENT TO CURB)

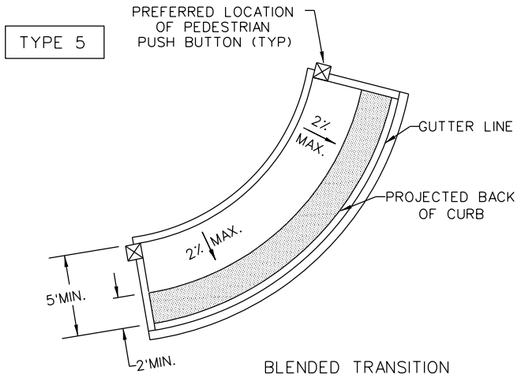


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



DIRECTIONAL RAMPS WITHIN RADIUS

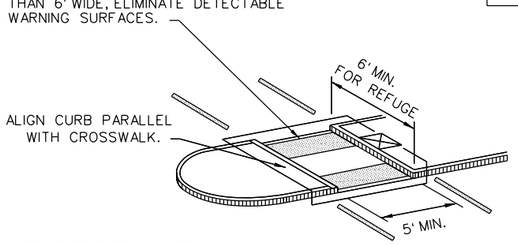
TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

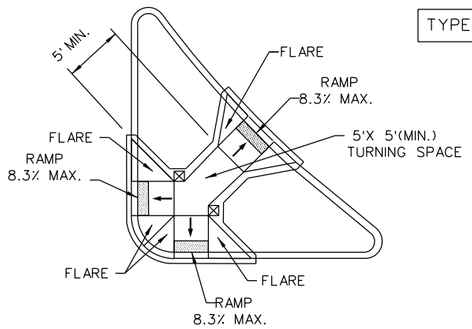
TYPE 21

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.

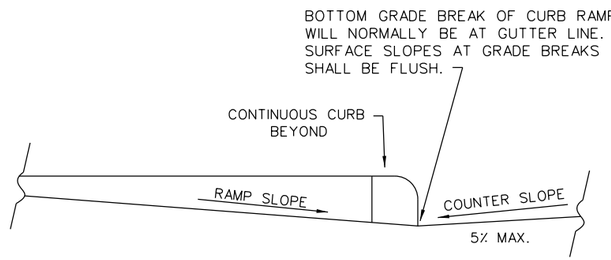


NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

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	CK: PK	DW: TxDOT	CK: HD
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		111

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 applicalble 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.

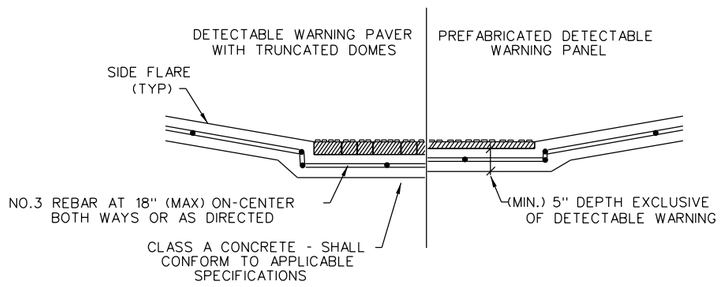
30. Changes in level greater than 1/4 inch are not permitted.

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".

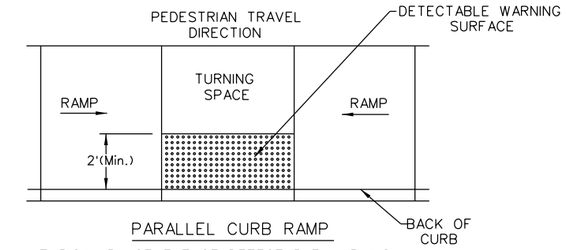
34. Sidewalk details are shown elsewhere in the plans.



SECTION VIEW DETAIL

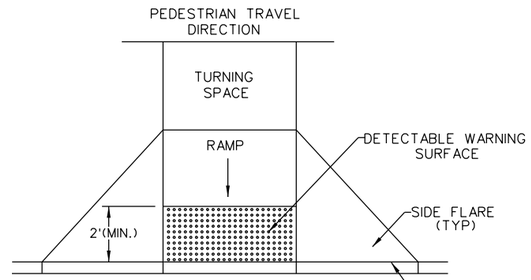
CURB RAMP AT DETECTIBLE WARNINGS

DETECTABLE WARNING SURFACE DETAILS



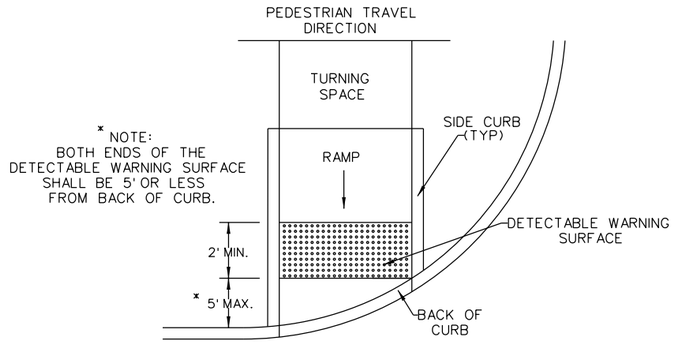
PARALLEL CURB RAMP

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		CK: PK	DW: TxDOT		CK: HD
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0921	02	194		LIBERTY	
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.	
	PHR	HIDALGO			112	

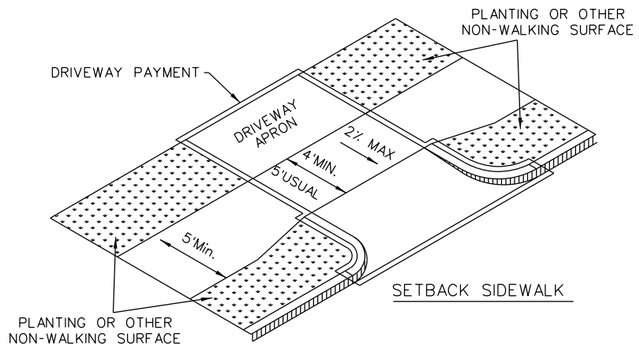
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

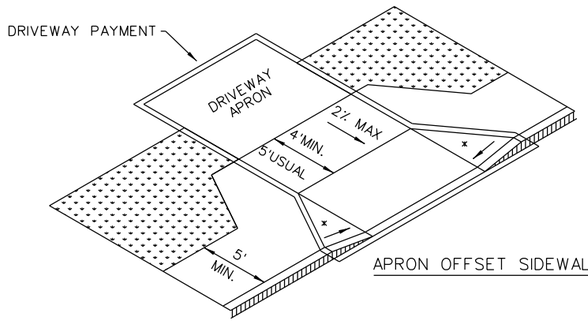
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

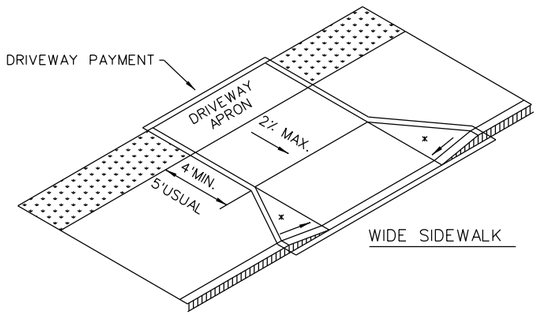
SIDEWALK TREATMENT AT DRIVEWAYS



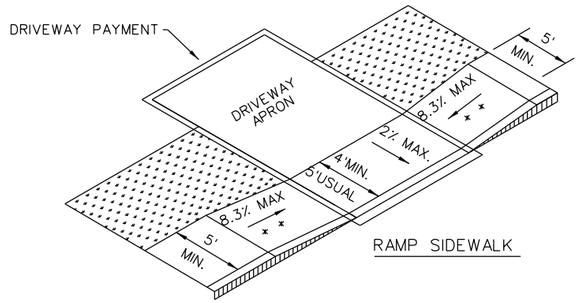
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

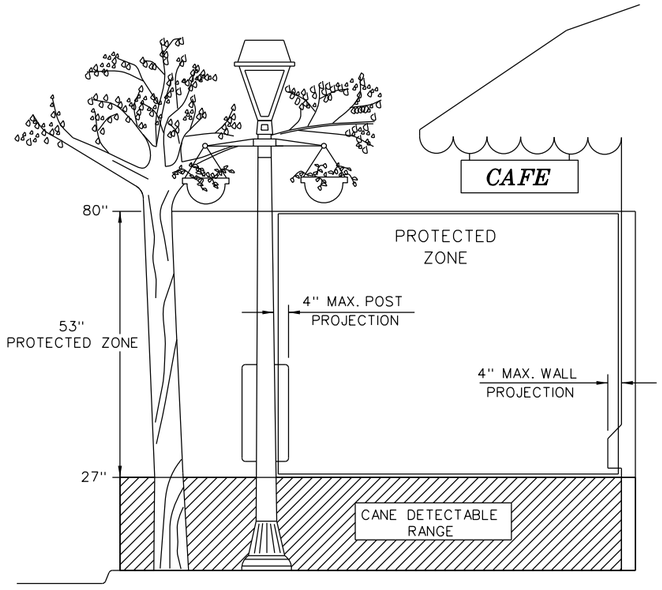


RAMP SIDEWALK

NOTES:

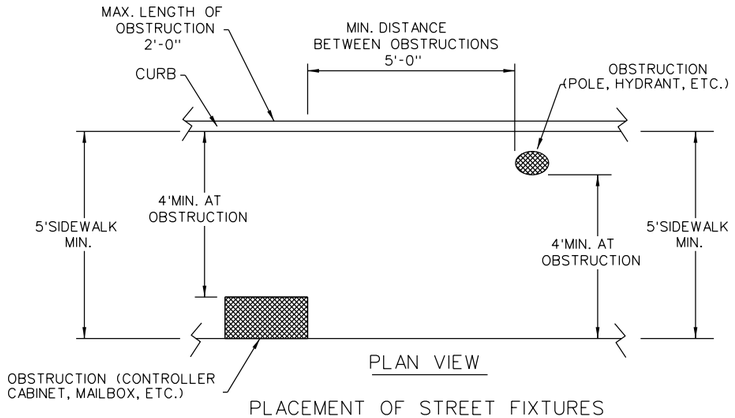
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

* * 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

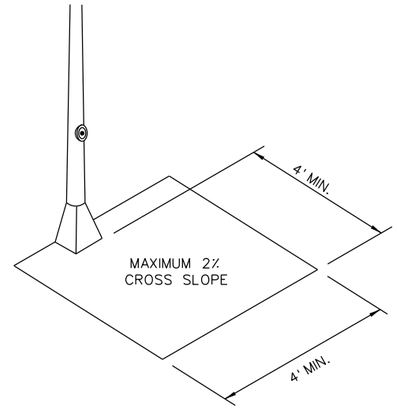
NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



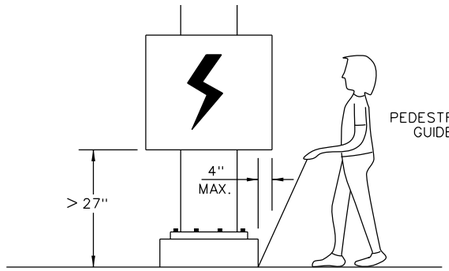
PLAN VIEW

PLACEMENT OF STREET FIXTURES

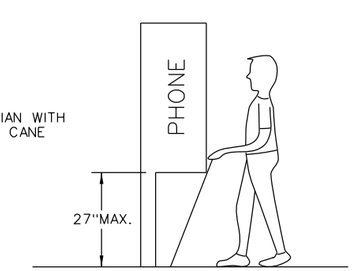
NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



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

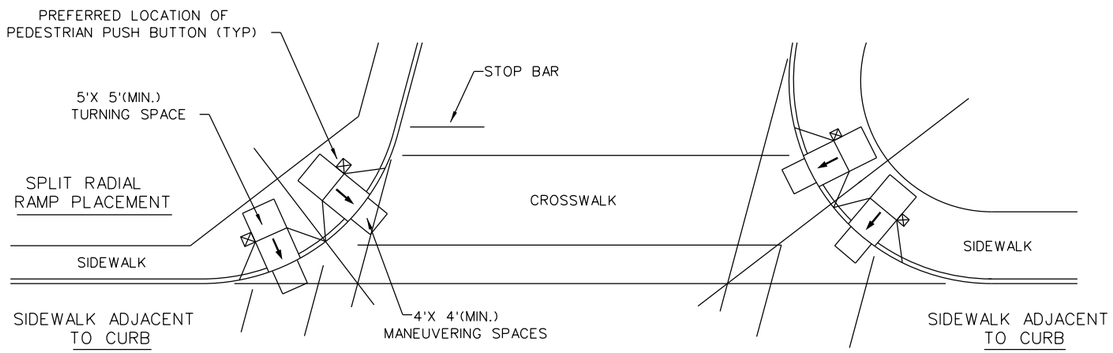
FILE: ped18	DN: TxDOT		CK: PK		DW: TxDOT		CK: HD
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0921	02	194		LIBERTY		
REVISED 08.2005 REVISED 06.2012 REVISED 01.2018	DIST	COUNTY					SHEET NO.
	PHR	HIDALGO					113

DISCLAIMER:
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.

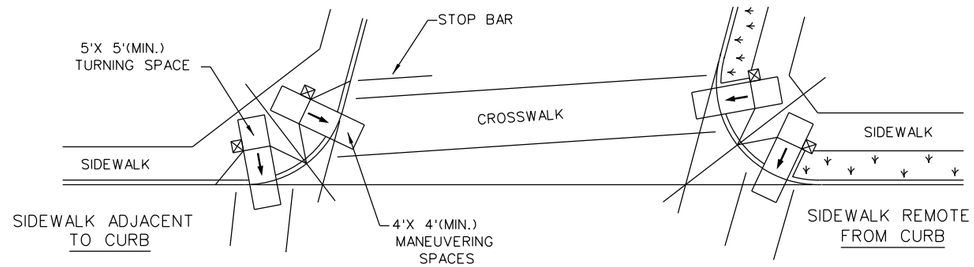
DATE:
FILE:

TYPICAL CROSSING LAYOUTS

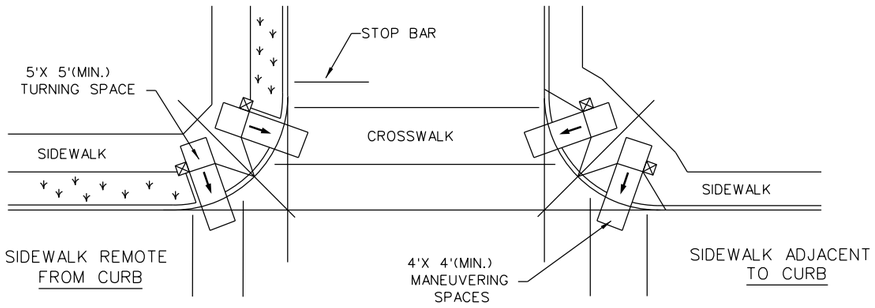
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



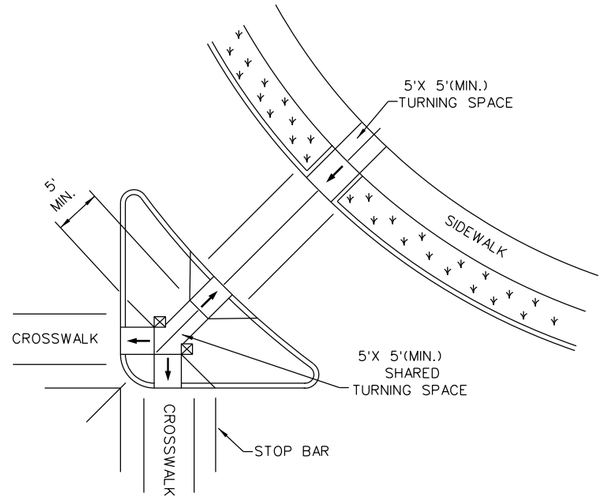
SKEWED INTERSECTION WITH "LARGE" RADIUS



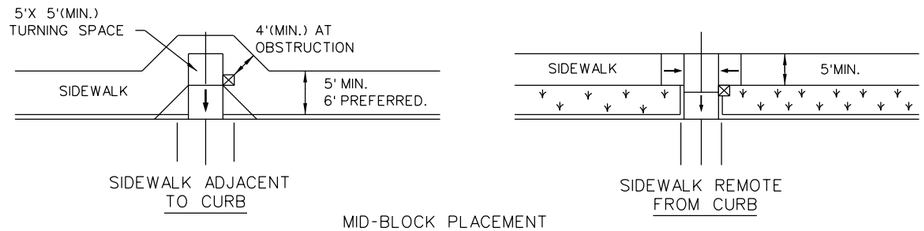
SKEWED INTERSECTION WITH "SMALL" RADIUS



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

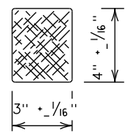
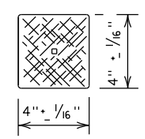
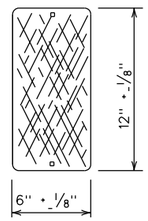
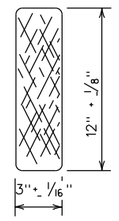
PED-18

FILE: ped18	DN: TxDOT	CK: PK	DW: TxDOT	CK: HD			
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY			
REVISIONS	0921	02	194	LIBERTY			
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.			
	PHR	HIDALGO		114			

DISCLAIMER:
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:
FILE:

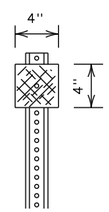
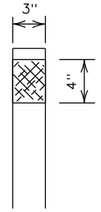
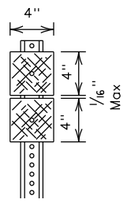
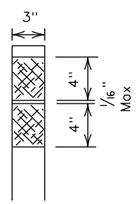
REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			

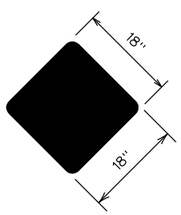
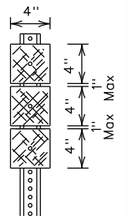
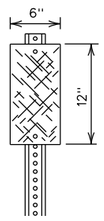
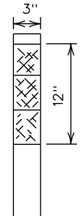
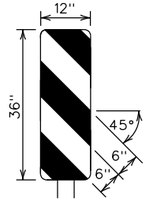
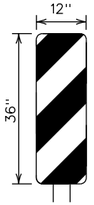
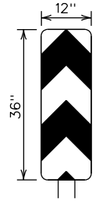
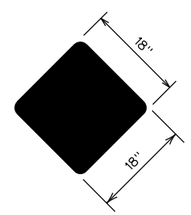
NOTE

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.

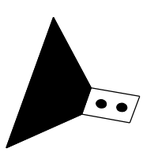
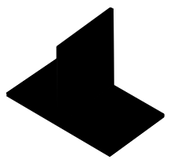
DELINEATORS

	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

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 or C Sheeting (FL)	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B or C Sheeting (FL)			Red -Type B or C Sheeting (FL)
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

BARRIER REFLECTORS (BRF)

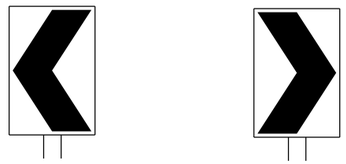
	GF1	GF2	CTB
DEVICE			

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



W1-8

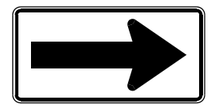
SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

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



W1-6

SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

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

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

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

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	0921	02	194	LIBERTY
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	PHR	HIDALGO		115

20A

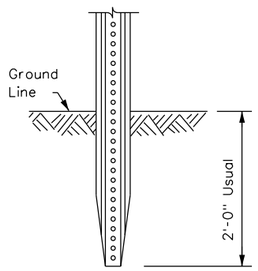
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

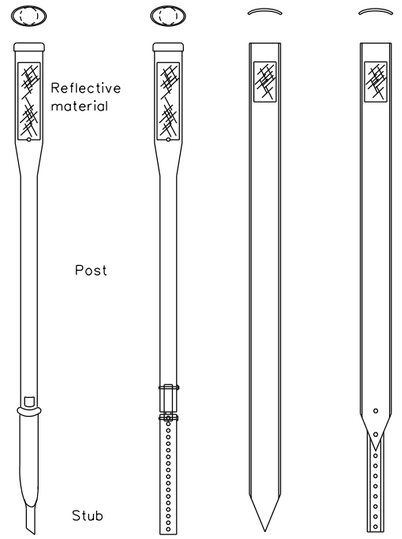


NOTES

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.

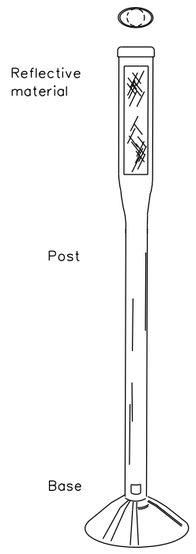
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



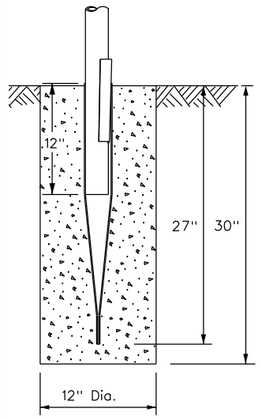
SURFACE MOUNT

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.

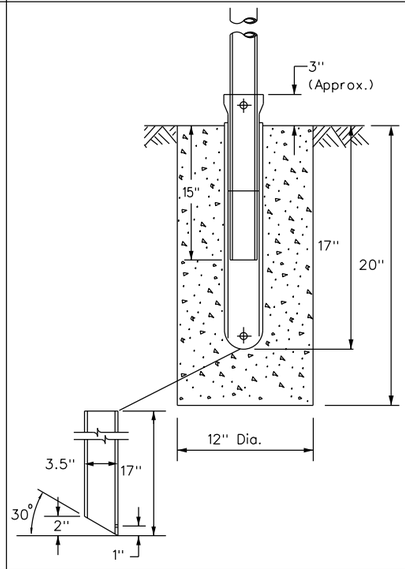
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

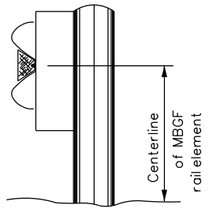
NOTE

1. Install per manufacturer's recommendations.

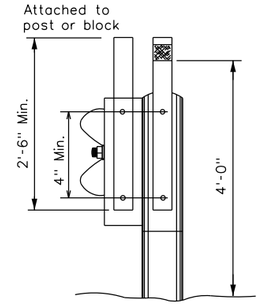
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

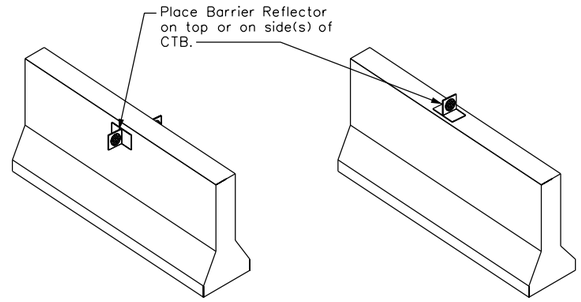
GF1



GF2



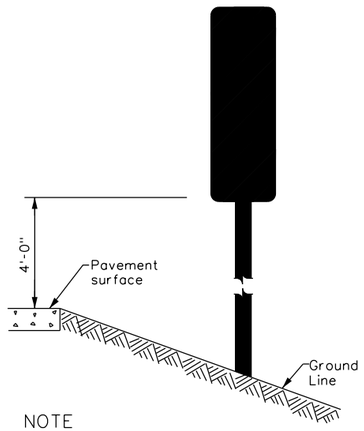
CONCRETE TRAFFIC BARRIER (CTB)



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.

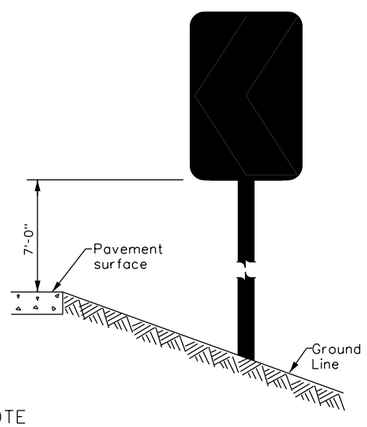
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



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)

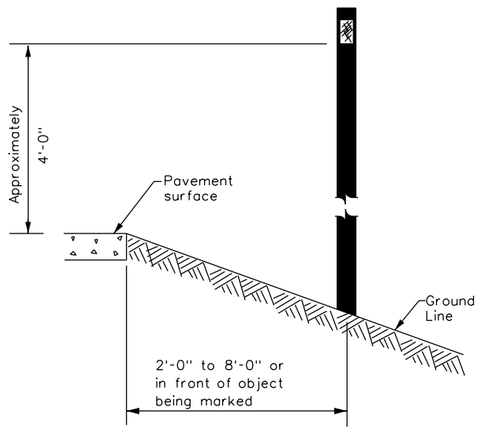
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



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
REVISIONS	0921	02	194	LIBERTY
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	PHR	HIDALGO		116

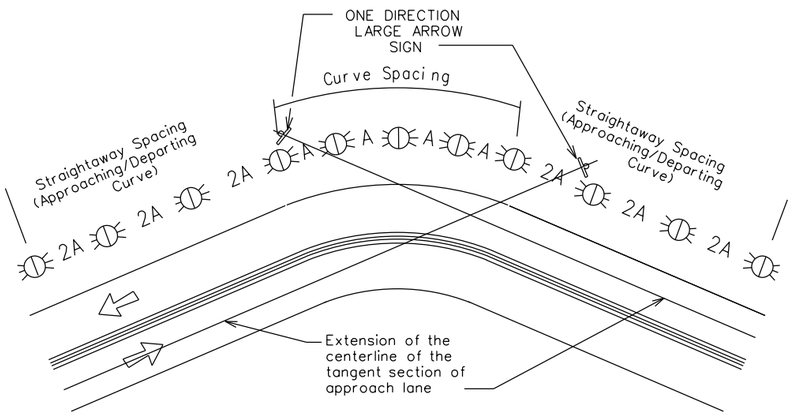
20B

DISCLAIMER:
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.

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

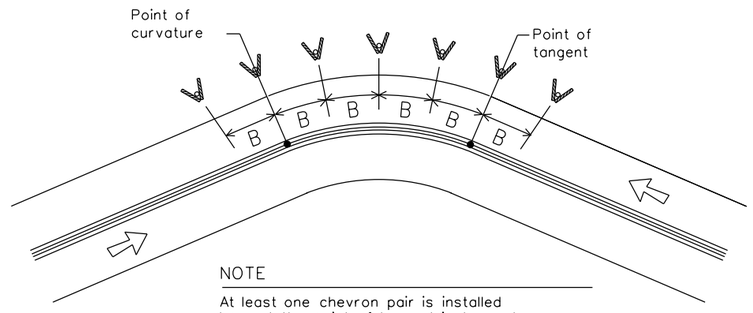
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



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
REVISIONS	0921	02	194	LIBERTY
3-15 8-15	DIST	COUNTY		SHEET NO.
8-15 7-20	PHR	HIDALGO		117

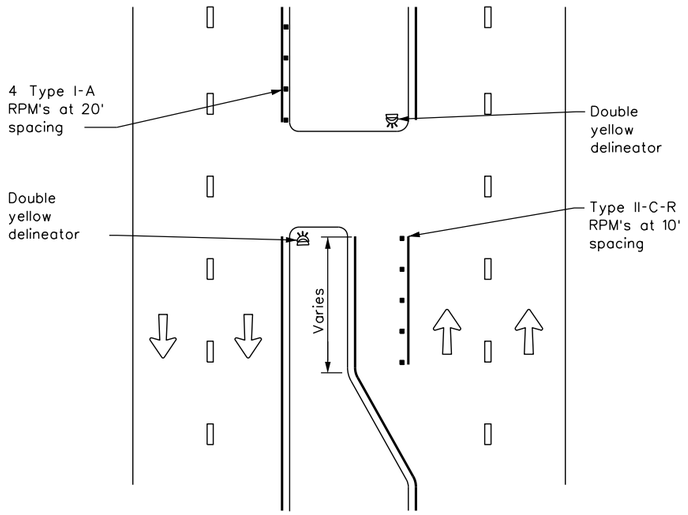
DATE:
FILE:

20C

DISCLAIMER:
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.

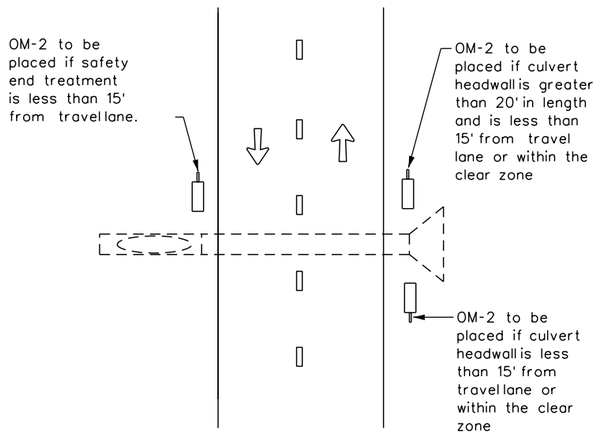
DATE:
FILE:

CROSSOVERS



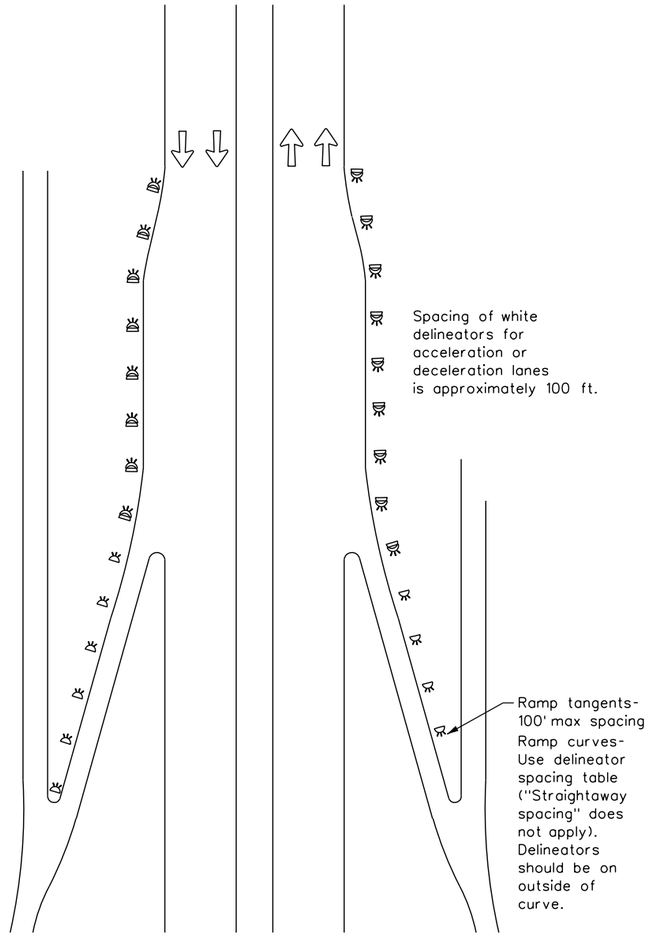
DETAIL 1

FOR CULVERTS WITHOUT MBGF



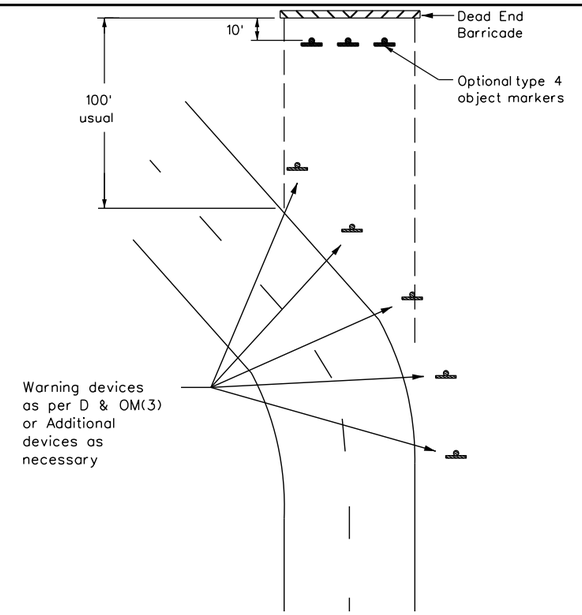
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



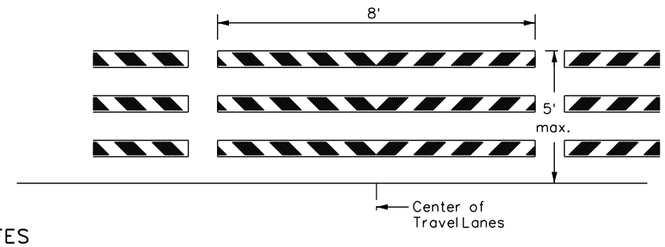
DETAIL 3

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

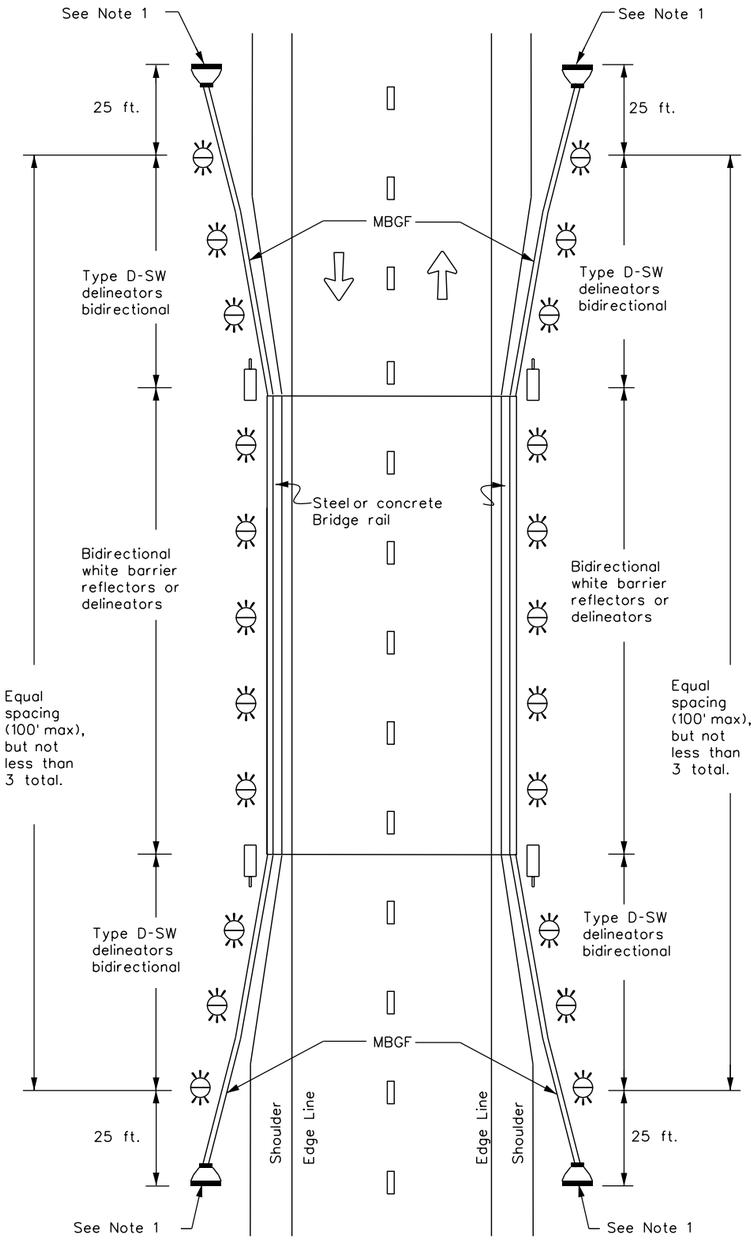
FILE: dom4-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
3-15 7-20	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		118A

20D

DISCLAIMER:
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: 11/18/2020 11:07:13 AM
FILE: P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\10 STANDARDS\02 ROADWAYS\dom5-20.dgn

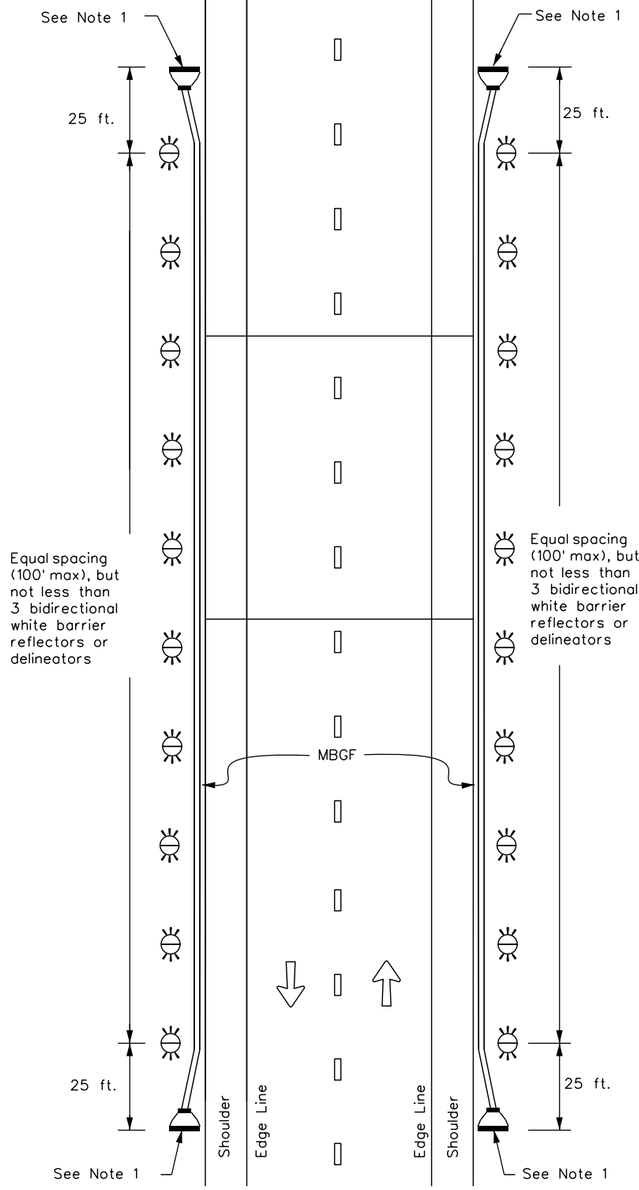
TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH RAIL



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.

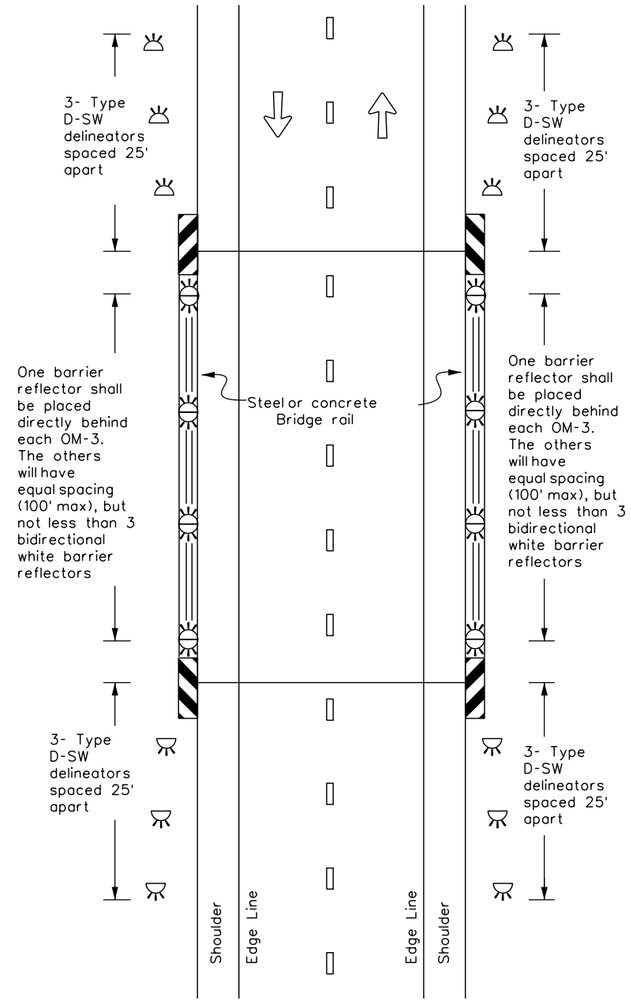
TWO-WAY, TWO LANE ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



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

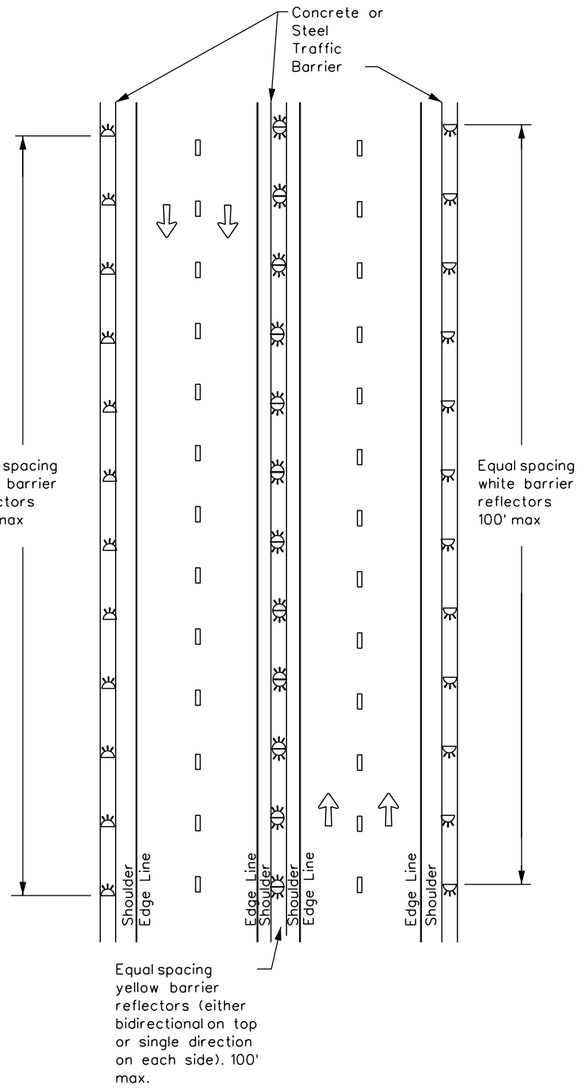
FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
7-20	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		118B

20E

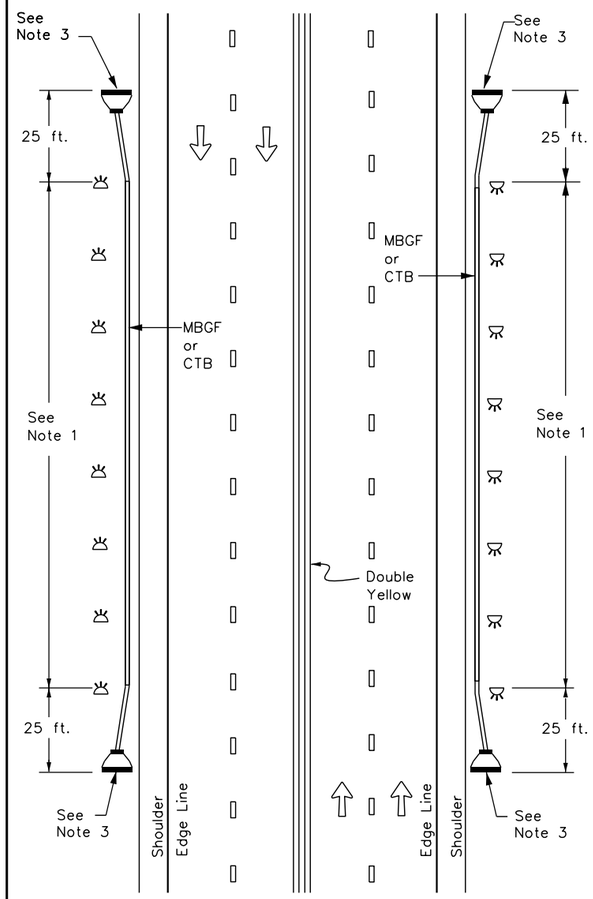
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 11/18/2020 11:08:40 AM
FILE: P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\10 STANDARDS\02 ROADWAY\dom6-20.dgn

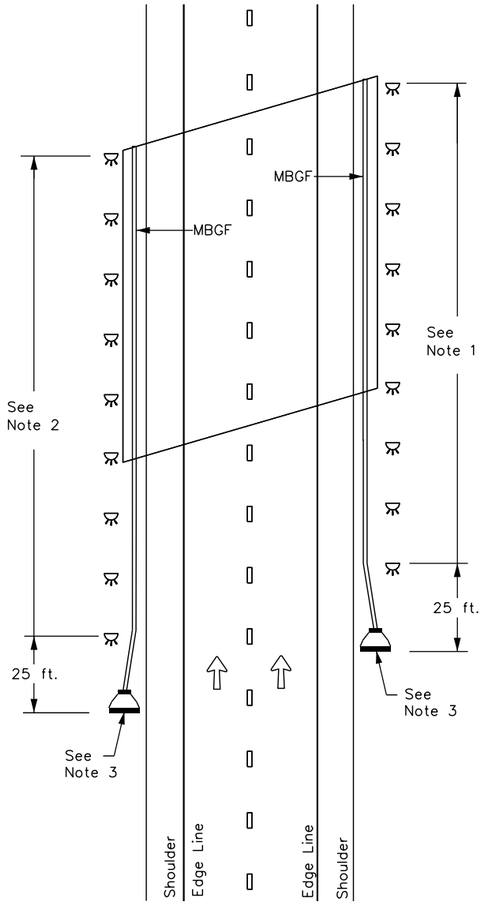
CONTINUOUS CONCRETE OR STEEL BARRIER



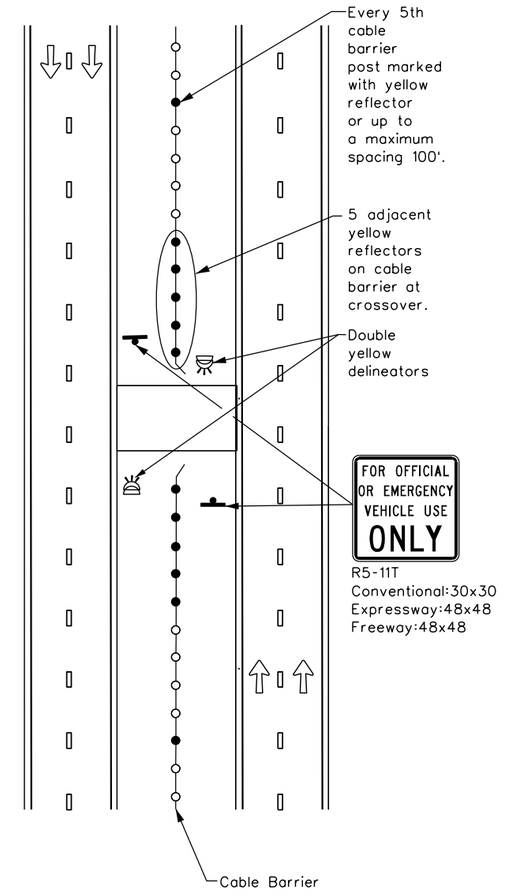
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



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

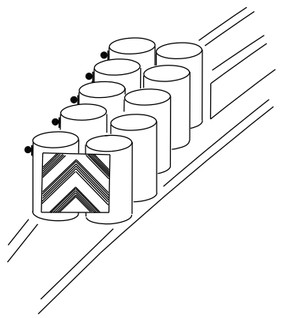
Traffic Safety Division Standard

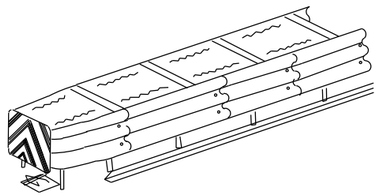
DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

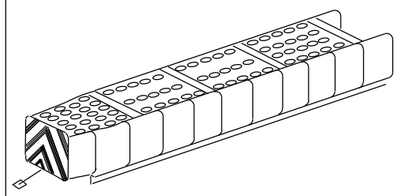
D & OM(6)-20

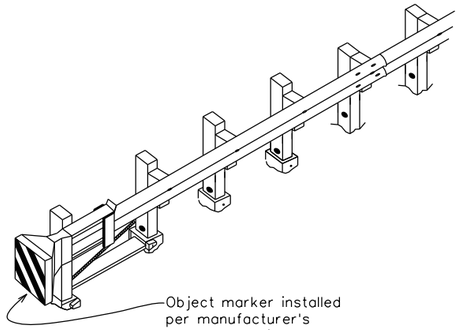
FILE: dom6-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
7-20	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		118C

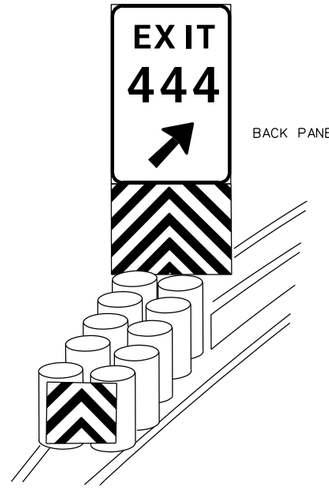
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

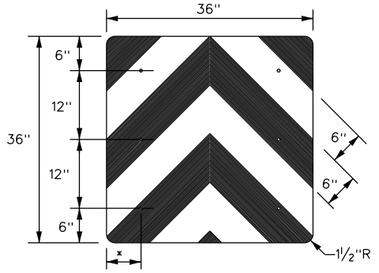


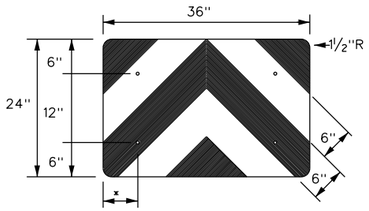




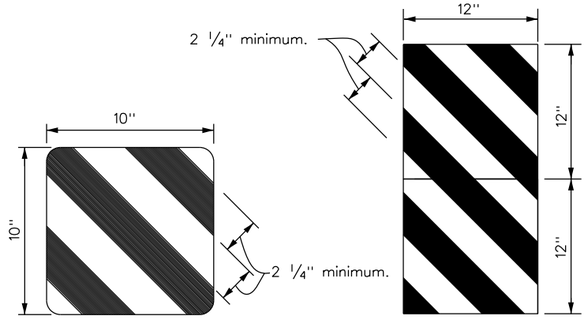




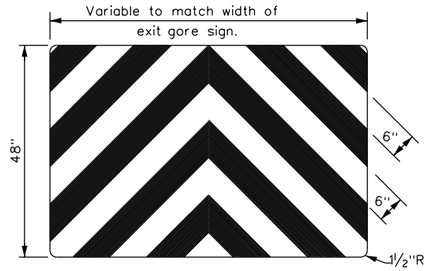


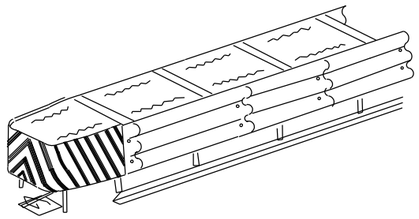


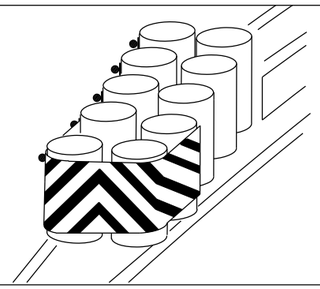
x Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

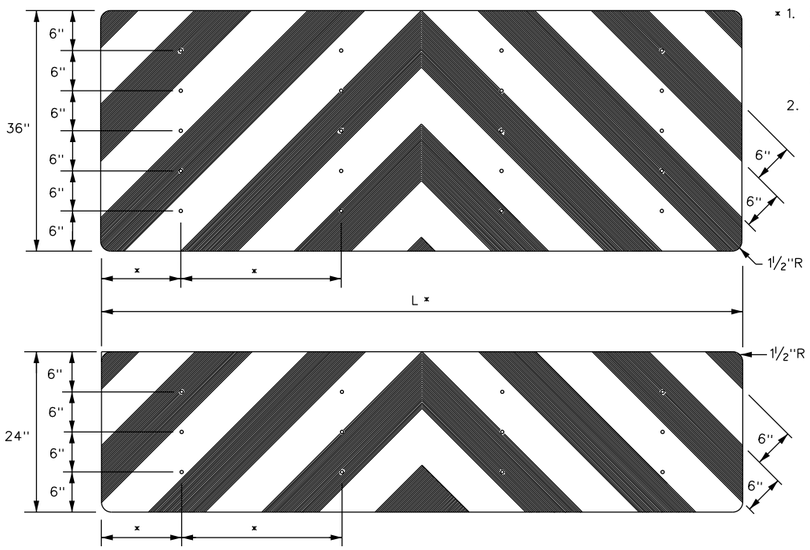


OBJECT MARKERS SMALLER THAN 3 FT ^{2}









NOTES

* 1. Spacing should be adjusted to attach through centerline of drum, per attenuator manufacturers recommendation, or as directed by the Engineer.

2. Mounting should be flush with top of attenuator. Minimum size 96" x 24".

NOTES

1. Object Markers shall conform to the Texas MUTCD and meet the color and reflectivity requirement of Department Material Specification DMS 8300. Background shall be yellow reflective sheeting (Type B or C) and Chevron shall be black.

2. Object Markers may be fabricated from adhesive backed reflective sheeting applied directly to guardrail end treatment, or applied directly to an "end cap" as per the manufacturer's recommendation. Direct applied sheeting shall provide a smooth surface and have no wrinkles, air bubbles, cuts or tears. A radius at the corners is not required for direct applied sheeting.

3. Object Marker size may be reduced to fit smaller devices. Width of alternating black and yellow stripes are typically 6". Object Markers smaller than 3ft may have reduced width stripes of a minimum of 2 ¼".

4. Pop rivets, screws, or nuts and bolts may be used to attach object markers and reflectors. Holes, slots or other openings may be cut or drilled through object markers to allow cable or other attachments.

5. Object Marker at nose of attenuator is subsidiary to the attenuator.

6. See D & OM (1-4) for required barrier reflectors.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS

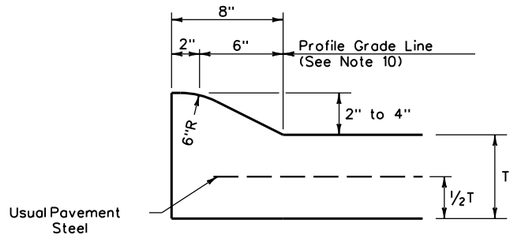
D & OM(VIA)-20

FILE: domvia20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT December 1989	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
4-92 8-04	DIST	COUNTY		SHEET NO.
8-95 3-15	PHR	HIDALGO		119
4-98 7-20				
20G				

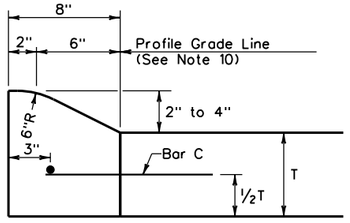
DATE:
FILE:

DISCLAIMER:
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.

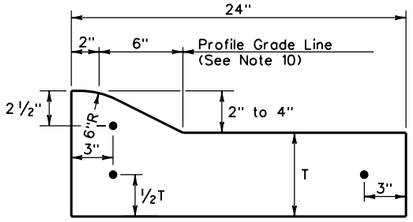
DATE:
FILE:



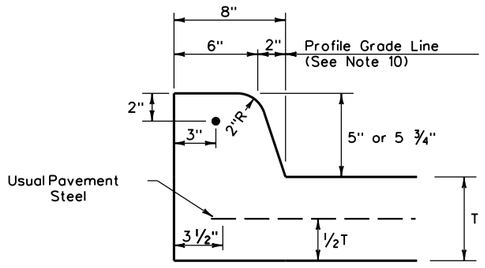
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



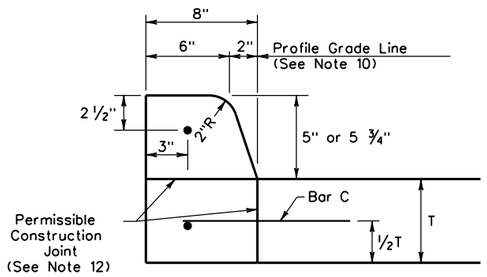
TYPE I CURB
2" - 4" HEIGHT



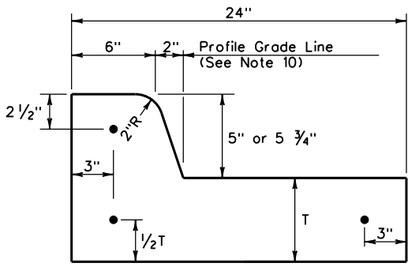
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



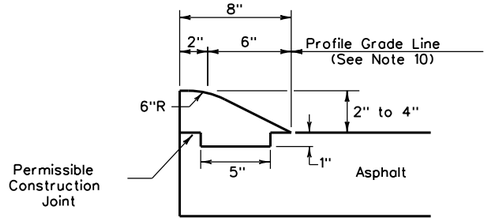
TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



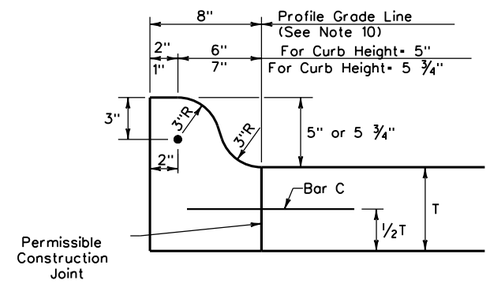
TYPE II CURB
5" - 5 ¾" HEIGHT



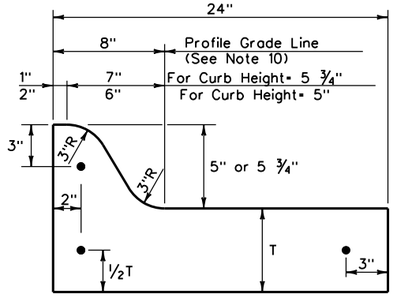
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



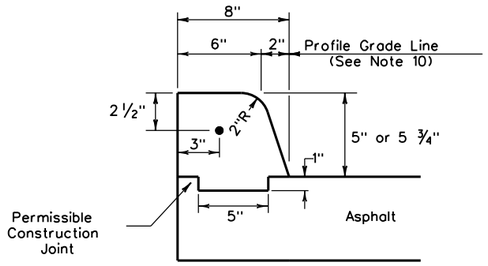
TYPE III CURB (KEYED)
2" - 4" HEIGHT



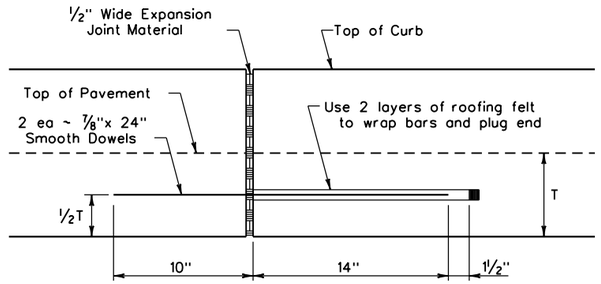
TYPE IIa CURB
5" - 5 ¾" HEIGHT



TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT



TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



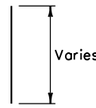
EXPANSION JOINT DETAIL

CURB TRANSITION
Note: To be paid for as Highest Curb

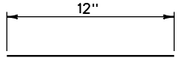
CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans,or as directed by the Engineer.

GENERAL NOTES

1. All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
2. Concrete shall be Class A.
3. When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of fiber reinforced concrete in lieu of reinforcing steel is acceptable. Use fibers meeting the requirements of DMS 4550, "Fibers for Concrete," and dose fibers in accordance with Material Producers List (MPL) "Fibers for Class A and B Concrete Applications."
4. Round exposed sharp edges with a rounding tool, to a minimum radius of ¼ inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is to be placed on existing concrete pavement, Bar B may be drilled and the grouted in place, or may be inserted into fresh concrete.
7. Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C~C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. When horizontal permissible construction joints are used, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans. Reinforcing steel for curb section shall then conform to that required for concrete curb.
13. Bar B used as needed to support curb reinforcing steel during concrete placement.



BAR B



BAR C

Texas Department of Transportation

Design Division Standard

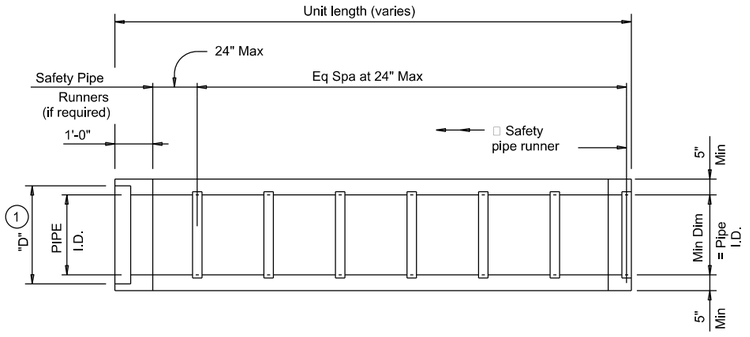
CONCRETE CURB AND CURB AND GUTTER

CCCG-21

FILE: cccg21.dgn	DN: TXDOT	CK: AN	DW: SS	CK: KM
© TxDOT: FEBRUARY 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	6	HIDALGO		120

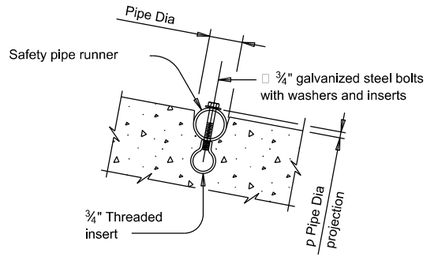
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:



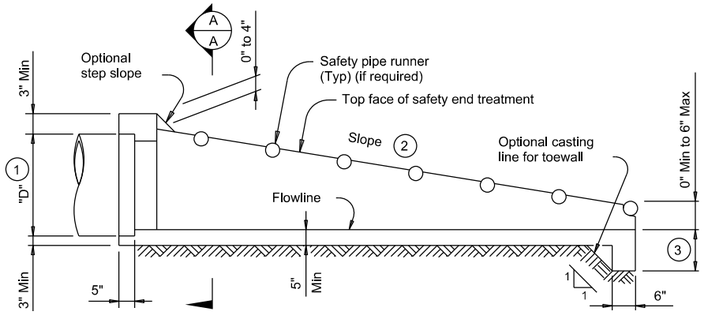
PLAN

(Showing bell end connection.)



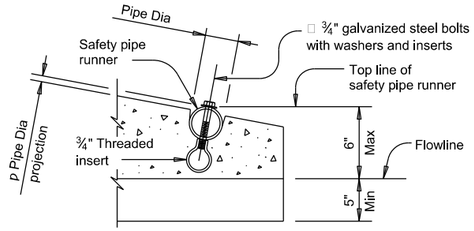
INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)

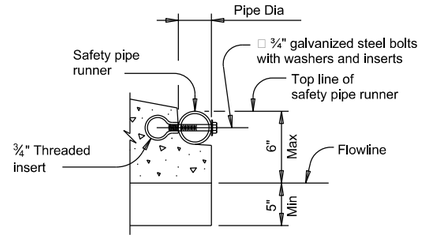


LONGITUDINAL ELEVATION

(Showing bell end connection.)



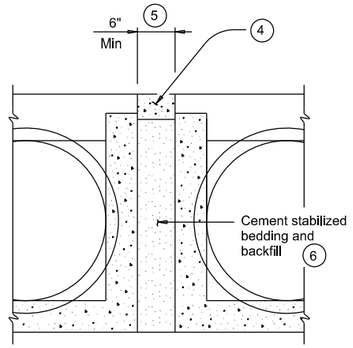
OPTION A



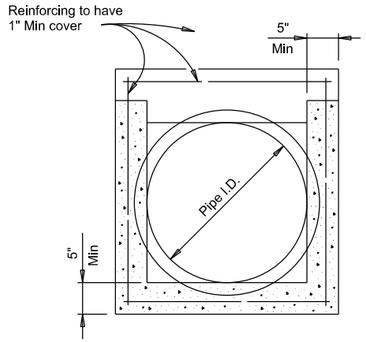
OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

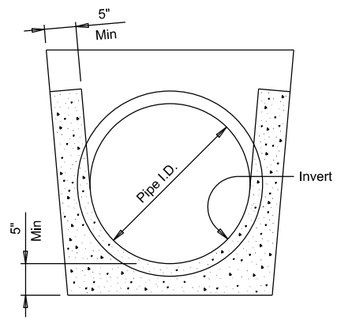
(If required)



MULTIPLE PIPE INSTALLATION

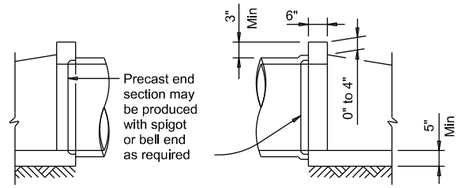


OPTION WITH SQUARE BOTTOM



OPTION WITH INVERT BOTTOM

SECTION A-A



OPTIONAL JOINT FOR RCP

(Showing joint between RCP and precast safety end treatment.)

REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	RCP Wall "B" Thickness	TP Wall Thickness (7)	"D" (1)	Slope	Min Length	Pipe Runners Required		Required Pipe Runner Size		
						Single Pipe	Multiple Pipe	Nominal Dia.	O.D.	I.D.
12"	2"	1.15"	17.00"	6:1	4' - 9"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
15"	2 ¼"	1.30"	20.50"	6:1	6' - 5"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
18"	2 ½"	1.60"	24.00"	6:1	8' - 0"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
24"	3"	1.95"	31.00"	6:1	11' - 3"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
30"	3 ½"	2.65"	38.50"	6:1	14' - 8"	No	Yes	4" STD	4.500"	4.026"
36"	4"	2.75"	45.50"	6:1	17' - 11"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 ½"	N/A	52.50"	6:1	21' - 2"	Yes	Yes	4" STD	4.500"	4.026"

(1) Dimension "D" is based on reinforced concrete pipe (RCP) meeting the requirements of ASTM C-76, Class III, (RCP Wall "B" thickness). Adjust "D" for any other wall thickness used. For thermoplastic pipe (TP) take into account the annular space requirements for grouted connections.

(2) Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.

(3) Toewall to be used only when dimension is shown elsewhere in the plans.

(4) Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".

(5) Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.

(6) Provide cement stabilized bedding and backfill in accordance with the Item 400, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.

(7) Thermoplastic pipe wall thickness may vary. Adjust accordingly. Thermoplastic pipe requires the safety end treatments to have a bell end for grouted connections.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP), and thermoplastic pipe (TP) may be used for TYPE II end treatment as specified in Item "Safety End Treatment".

When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Manufacture this product in accordance with Item 467, "Safety End Treatment" except as noted below :

A. Provide minimum reinforcing of #4 at 6" (Grade 40) or #4 at 9" (Grade 60) each way or 6"x6" - D12 x D12 or 5"x5" - D10 x D10 welded wire reinforcement (WWR).

B. For precast (steel formed) sections, provide Class "C" concrete (f'c = 3,600 psi).

At the option and expense of the Contractor the next larger size of safety end treatment may be furnished; as long as the "D" dimension cast is that of the required size of pipe.

Pipe runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

Galvanize all steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

Connect RCP using the Optional Joint for RCP detail shown or in accordance with Item 464, "Reinforced Concrete Pipe". Connect TP by grouting. See PBGC standard for grouted connections with TP and precast safety end treatment.

Texas Department of Transportation

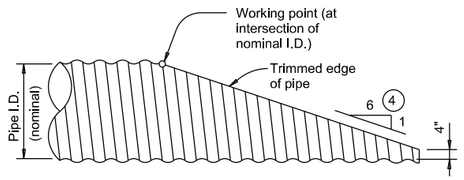
Bridge Division Standard

PRECAST SAFETY END TREATMENT

TYPE II ~ PARALLEL DRAINAGE

PSET-SP

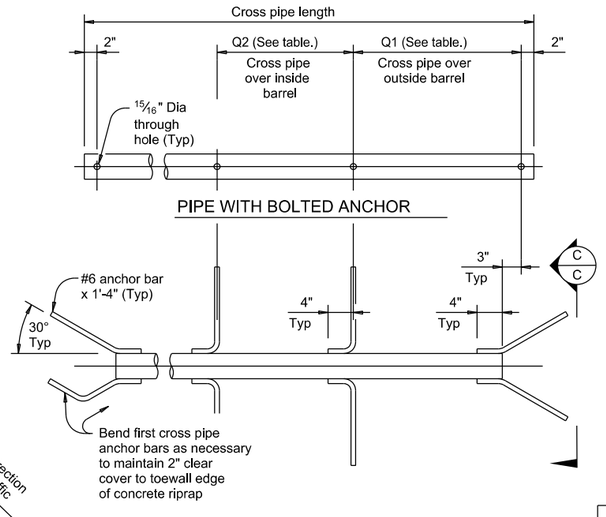
FILE: psetspss-20.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		121



NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

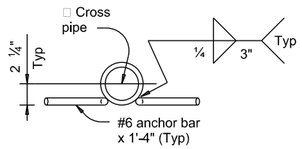
SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert Details at reinforced concrete pipe (RCP) culvert are similar.)



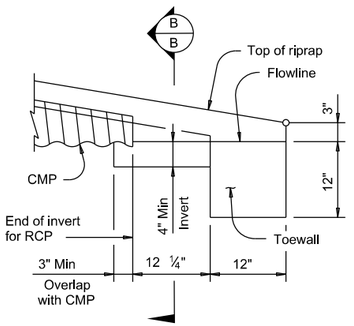
PIPE WITH BOLTED ANCHOR

PIPE WITH ANCHOR BARS



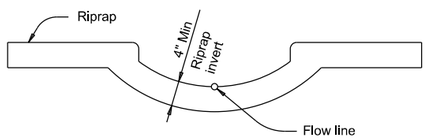
SECTION C-C

CROSS PIPE DETAILS



DETAIL "A"

(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)



SECTION B-B

(Cross pipes not shown for clarity.)

CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, AND RIPRAP QUANTITIES (2)

Nominal Culvert I.D.	Conc Riprap (CY) (6)	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
12"	0.6	0' - 9"	N/A	2' - 1"	1' - 9"	3 or more pipe culverts	3" Std (3.500" O.D.)
15"	0.7	0' - 11"	N/A	2' - 5"	2' - 2"		
18"	0.8	1' - 2"	N/A	2' - 10"	2' - 8"		
21"	0.9	1' - 4"	N/A	3' - 2"	3' - 1"		
24"	0.9	1' - 7"	N/A	3' - 6"	3' - 7"		
27"	1.0	1' - 8"	N/A	3' - 10"	3' - 11"	3 or more pipe culverts	3 1/2" Std (4.000" O.D.)
30"	1.1	1' - 10"	N/A	4' - 2"	4' - 4"	2 or more pipe culverts	
33"	1.2	1' - 11"	4' - 2"	4' - 5"	4' - 8"	All pipe culverts	
36"	1.3	2' - 1"	4' - 5"	4' - 9"	5' - 1"	All pipe culverts	4" Std (4.500" O.D.)
42"	1.5	2' - 4"	4' - 11"	5' - 5"	5' - 10"		
48"	1.7	2' - 7"	5' - 5"	6' - 0"	6' - 7"	All pipe culverts	5" Std (5.563" O.D.)
54"	2.0	3' - 0"	5' - 11"	6' - 9"	7' - 6"		
60"	2.2	3' - 3"	6' - 5"	7' - 4"	8' - 3"		
66"	2.4	3' - 3"	6' - 11"	7' - 10"	8' - 9"		
72"	2.7	3' - 4"	7' - 5"	8' - 5"	9' - 4"		

(1) The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe no more than 6" above the flow line.

(2) Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1#2" standard pipe (4" O.D.) for the first bottom pipe.

(3) Install the third cross pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, install all other cross pipes using the bolted connection details.

(4) Match cross slope as shown elsewhere in the plans. Cross slope of 6:1 or flatter is required for vehicle safety.

(5) Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".

(6) Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for contractor's information only.

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Provide cross pipes that meet the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 (Gr B), or API 5LX52.

Provide ASTM A307 bolts and nuts.

Galvanize all steel components, except concrete reinforcing, after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

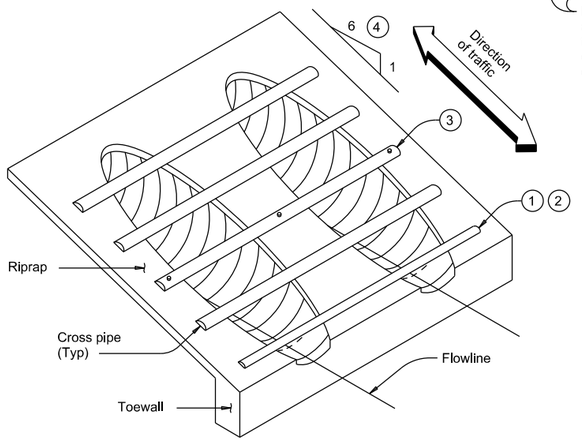
GENERAL NOTES:

Cross pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

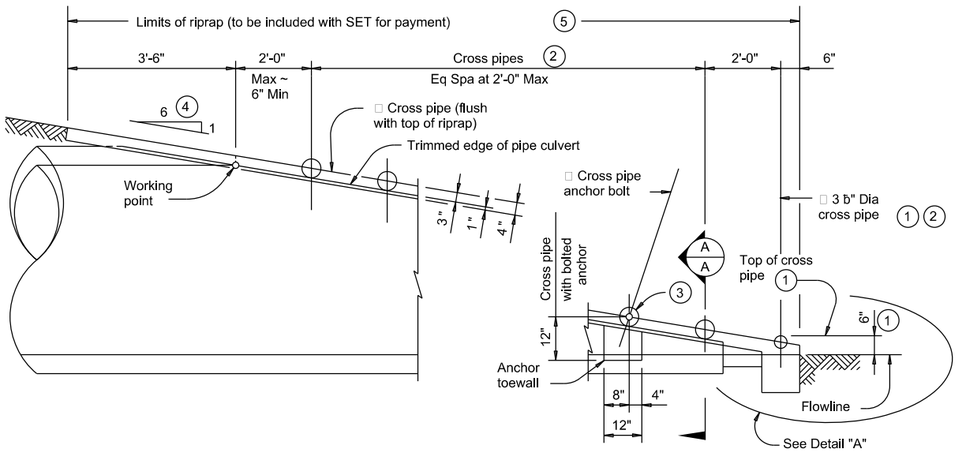
Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the cross pipes.

Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap".

Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.

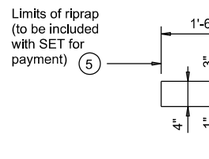


ISOMETRIC VIEW OF TYPICAL INSTALLATION

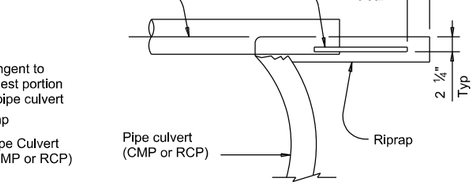


SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

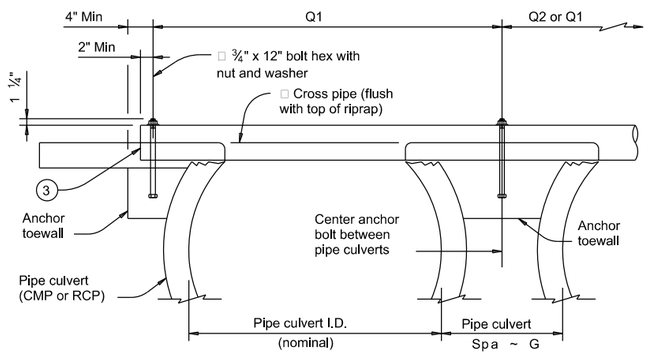
(Showing reinforced concrete pipe (RCP) culvert. Details at corrugated metal pipe (CMP) culvert are similar.)



SHOWING TYPICAL PIPE CULVERT AND RIPRAP



SHOWING CROSS PIPE WITH ANCHOR BAR



SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A

Texas Department of Transportation

Bridge Division Standard

SAFETY END TREATMENT

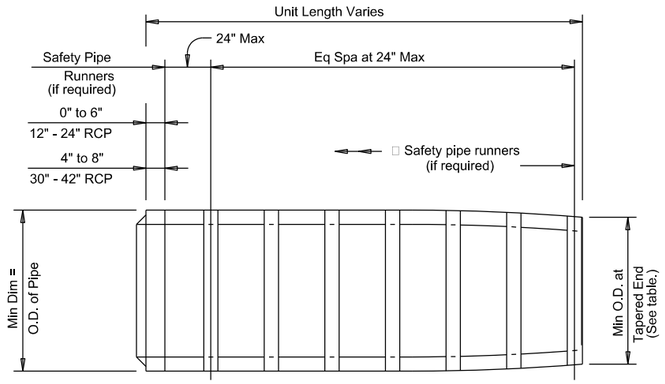
FOR 12" DIA TO 72" DIA
PIPE CULVERTS
TYPE II ~ PARALLEL DRAINAGE

SETP-PD

FILE: setppdse-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		122

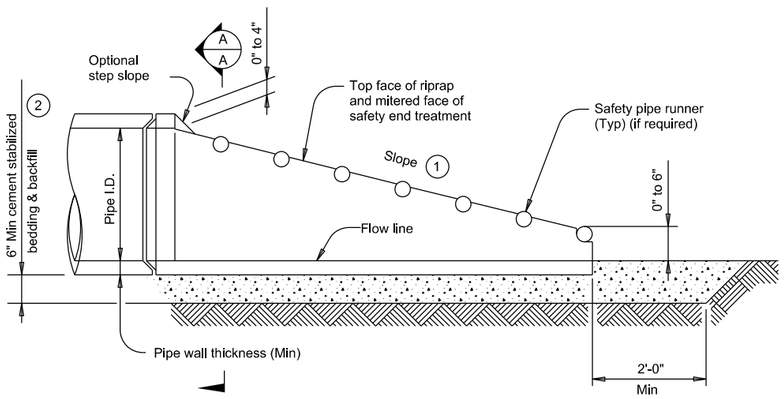
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:



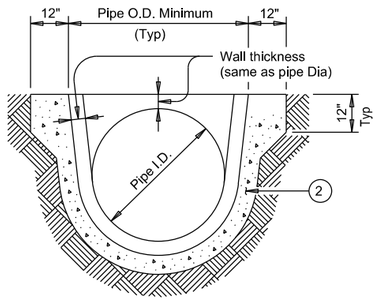
PLAN VIEW - 12" THRU 24"

(Showing spigot end connection.)

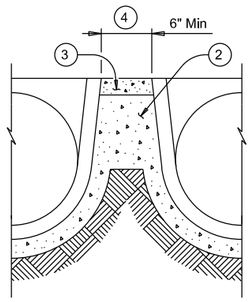


LONGITUDINAL ELEVATION - 12" THRU 24"

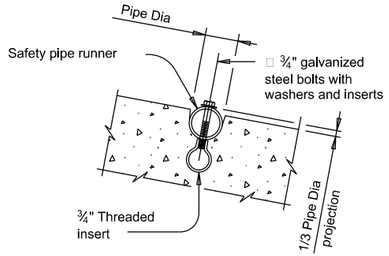
(Showing spigot end connection.)



SECTION A-A

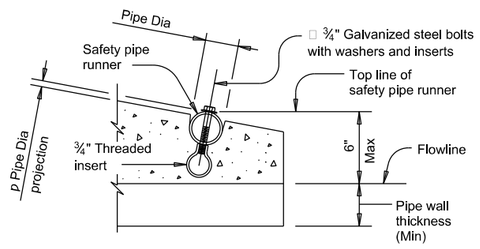


MULTIPLE PIPE INSTALLATION

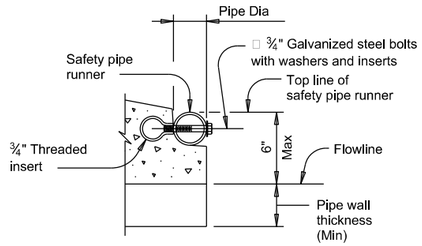


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



OPTION A



OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)

1. Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.

   Provide cement stabilized bedding and backfill in accordance with the Item, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.
3. Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".
4. Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.
5. Safety pipe runners are required for multiple pipe culverts with more than two pipes.

REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	Min Wall Thickness	Min O.D.	Min O.D. at Tapered End	Min Reinf Requirements (sq. in. per ft. of Pipe)	Max Slope	Min Length of Unit	Pipe Runner Requirements		Required Pipe Runner Sizes		
							Single Pipe	Multiple Pipe	Nominal Dia	O.D.	I.D.
12"	2"	16"	16"	0.07 Circ.	6:1	4' - 0"	No	(5)	3" STD	3.500"	3.068"
15"	2 ¼"	19 ½"	19"	0.07 Circ.	6:1	5' - 8"	No	(5)	3" STD	3.500"	3.068"
18"	2 ½"	23"	21 ½"	0.07 Circ.	6:1	7' - 3"	No	(5)	3" STD	3.500"	3.068"
24"	3"	30"	27"	0.07 Circ.	6:1	10' - 6"	No	(5)	3" STD	3.500"	3.068"
30"	3 ½"	37"	31"	0.18 Circ.	6:1	12' - 1"	No	Yes	4" STD	4.500"	4.026"
36"	4"	44"	36"	0.19 Ellip.	6:1	15' - 4"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 ½"	51"	41 ½"	0.23 Ellip.	6:1	18' - 7"	Yes	Yes	4" STD	4.500"	4.026"

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.

Galvanize steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP) may be used for TYPE II end treatment as specified in Item 467, "Safety End Treatment".

When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.

Manufacture precast concrete end sections in accordance with Item 464, "Reinforced Concrete Pipe" and in accordance with ASTM Specification C-76, Class III, Wall B for circular pipe.

Provide precast concrete end sections with a spigot or bell end for compatibility to upstream or downstream end conditions with sufficient annular space to allow for grout, mortar, cold applied asphalt joint compound or pre-formed plastic gasket material.

Methods of lifting shall be provided by the manufacturer for ease of loading, unloading and installation.

Pipe runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

DISCLAIMER:
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:
FILE:

Texas Department of Transportation

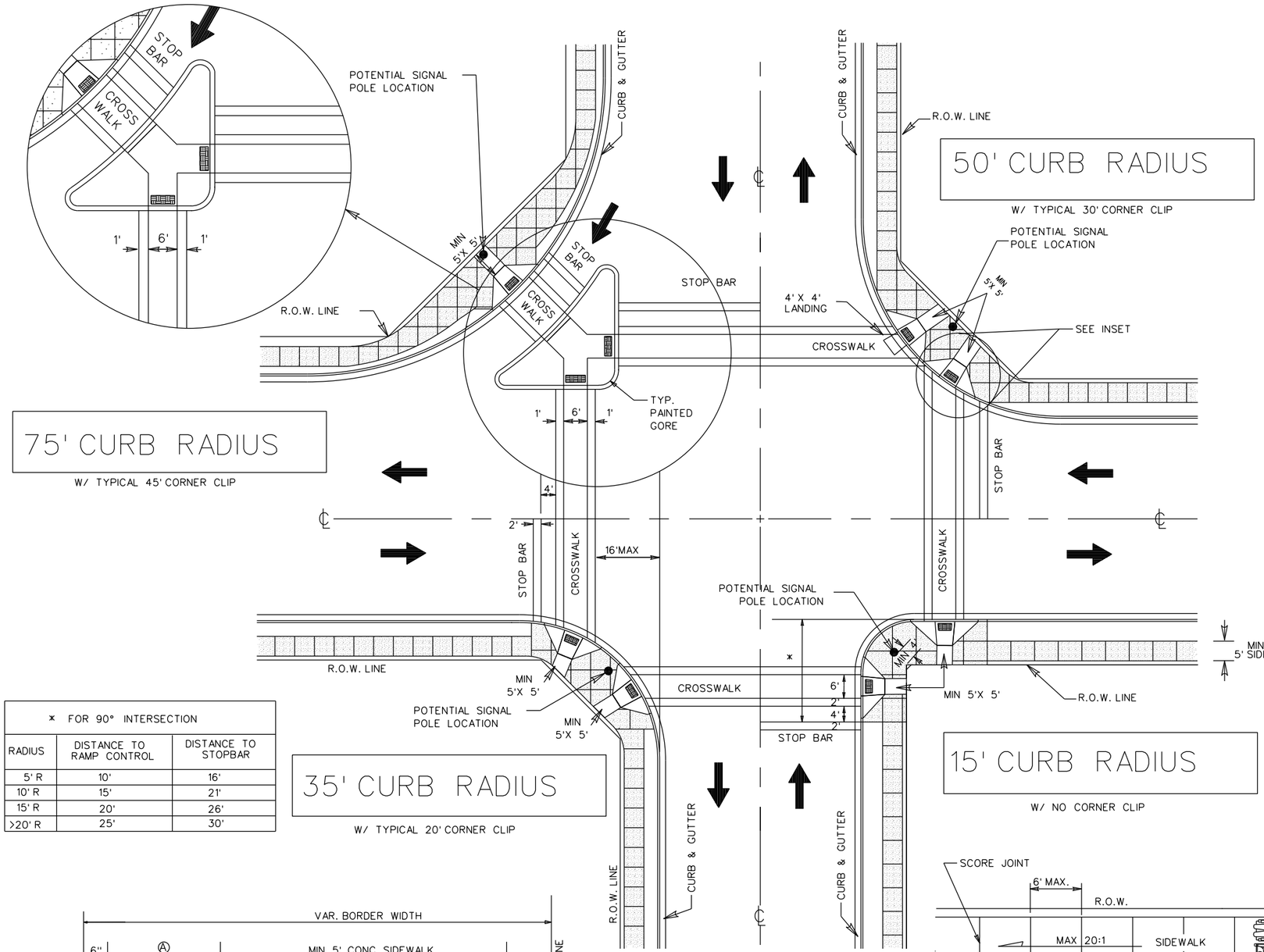
Bridge Division Standard

PRECAST SAFETY END TREATMENT

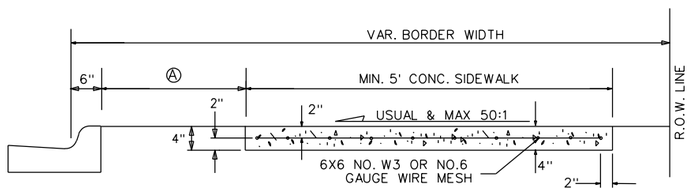
TYPE II ~ PARALLEL DRAINAGE

PSET-RP

FILE: psetrpss-20.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		123

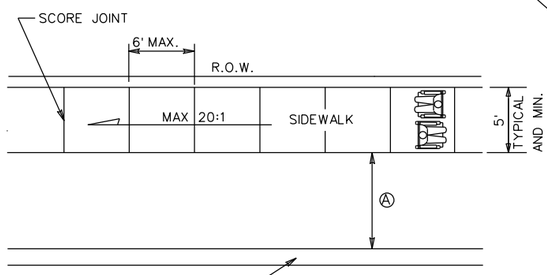


* FOR 90° INTERSECTION		
RADIUS	DISTANCE TO RAMP CONTROL	DISTANCE TO STOPBAR
5' R	10'	16'
10' R	15'	21'
15' R	20'	26'
>20' R	25'	30'



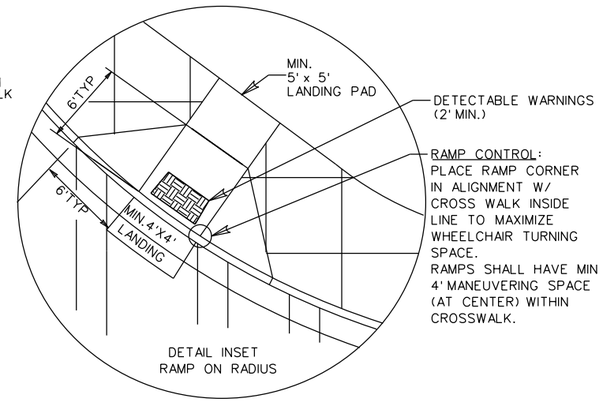
TYPICAL CONC. SIDEWALK

TYPICAL WHEEL CHAIR RAMP LOCATION



SCORE JOINTS 1/4" THICKNESS
EXPANSION JOINT EVERY 30'
JOINT IN CENTER OF SIDEWALK IF OVER 15' WIDE.

PLAN VIEW



DETAIL INSET
RAMP ON RADIUS

GENERAL NOTES

- ALL RAMPS SHALL HAVE A 5' x 5' LANDING PAD.
- RAMP CENTER TO BE PERPENDICULAR TO FACE OF CURB. A PERPENDICULAR RAMP MAY BE LOCATED WITHIN THE RADIUS OF A CURBLINE.
- SIDEWALK GRADE TO BE PARALLEL TO TOP OF CURB AND GUTTER UNLESS OTHERWISE SHOWN ON PLANS OR DIRECTED BY THE ENGINEER.
- SIDEWALK WIDTH AS SHOWN ELSEWHERE IN PLANS. MIN WIDTH 5'. PROVIDE DROPPED CURBS AT INTERSECTIONS. ALL CONCRETE SHALL BE CLASS "A" PROPOSED SIDEWALKS TO MATCH EXIST. SIDEWALK.
- NO VERTICAL CHANGES SHALL EXCEED 1/4" IN ELEVATION AT ADJOINING SURFACES.
- TO PROVIDE ACCESS TO PEDESTRIAN BUTTON, SIDEWALK / LANDING PAD SHALL EXTEND AND/ OR ABUT TO SIGNAL POLE CONC. FOUNDATION.
- COLOR TEXTURIZED CONCRETE SHALL BE USED TO COLOR AREAS AT RAMPS. COLOR SHALL BE " BRICK RED " AS PER L.M. SCOFIELD COMPANY STANDARDS COLOR A-26 OR EQUAL. COLOR TEXTURIZED CONCRETE SHALL BE SUBSIDIARY TO CURB RAMP ITEM
- IF THE DETAIL IS TO BE USED IN A PLAN SET, IT MUST BE SIGNED AND SEALED.

Ⓐ DESIRABLE 3' OR GREATER FOR HIGH SPEED TRAFFIC. FOR BORDER WIDTHS OF 8' OR LESS, PLACE SIDEWALK ADJACENT TO CURB.

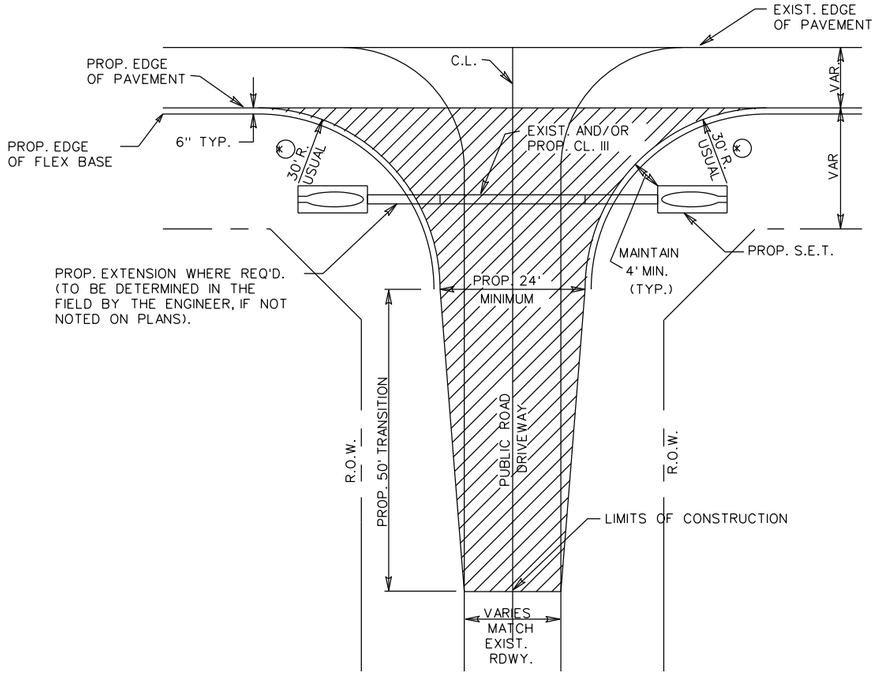
© TxDOT 2018

Texas Department of Transportation

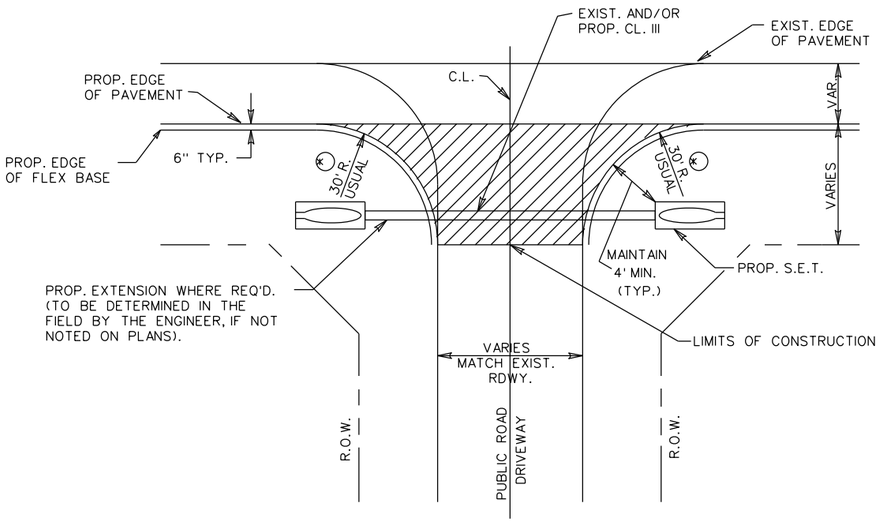
SIDEWALK & WHEELCHAIR RAMP DESIGN GUIDE

REV. 5/18 SIDEWALK.DGN

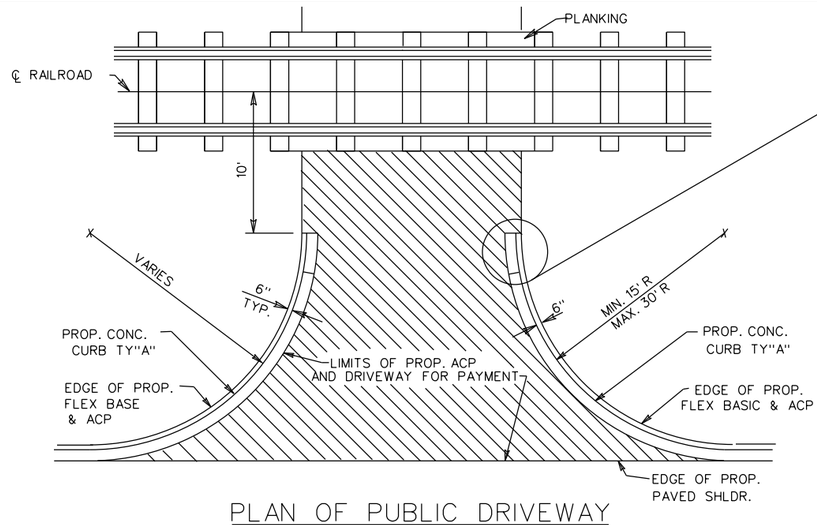
FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		FILE NO.			SHEET NO.
6						124
STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	21	HIDALGO	0921	02	194	LIBERTY



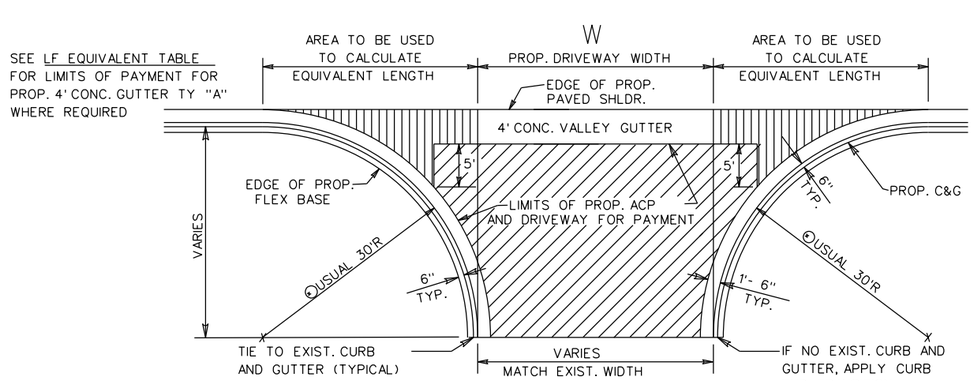
TYPICAL DETAIL
(WHEN EXIST. ROADWAY WIDTH LESS THAN 24'.)



TYPICAL DETAIL
(WHEN EXIST. ROADWAY WIDTH EQUAL TO OR GREATER THAN 24'.)



PLAN OF PUBLIC DRIVEWAY ADJACENT TO R.R. CROSSING



PLAN OF PUBLIC DRIVEWAY

LF EQUIVALENT TABLE FOR PAYMENT LIMITS OF 4'CONC. GUTTER TY."A"

LF OF VALLEY GUTTER= W + X1 + X2	
WHERE X1 AND X2 MAY VARY DEPENDING ON RADIUS	
Prop. Driveway Radius	X1 or X2 (Sq Ft Area / 4') Equivalent LF Length
10	3
15	7
20	12
25	19
30	27
35	37
40	48
45	61
50	75
55	91
60	109
65	127
70	148
75	170

TY PBS1

EXIST. UNPAVED PUBLIC DRIVEWAYS TO BE CONSTRUCTED AS SHOWN WITH 12" LIME TREAT. SUBGRADE, 8" FLEX. BASE 1% LIME, THEN PRIMED AND SURFACED WITH 171#/SY ACP.

TY PBS2

EXIST. DRIVEWAY TO BE CONSTRUCTED SAME AS PROPOSED ROADWAY.

GENERAL NOTES:

AVERAGE DIMENSIONS SHOWN ON TABLE OF DRIVEWAYS ARE FOR ESTIMATING PURPOSES ONLY.

LOCATIONS LISTED ON THE TABLE ARE APPROXIMATE, EXACT LOCATIONS, DIMENSIONS, AND TYPE TO BE ESTABLISHED DURING CONSTRUCTION BY THE ENGINEER AS REQUIRED.

(*) SEE DRIVEWAY TABLE, TURNING RADIUS MAY BE REDUCED AS APPROVED BY THE ENGINEER.

SEE TABLE OF DRIVEWAYS FOR TOTAL LENGTH OF PROP. 4' CONC. VALLEY GUTTER FOR EACH LOCATION.

© TxDOT 2019

PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

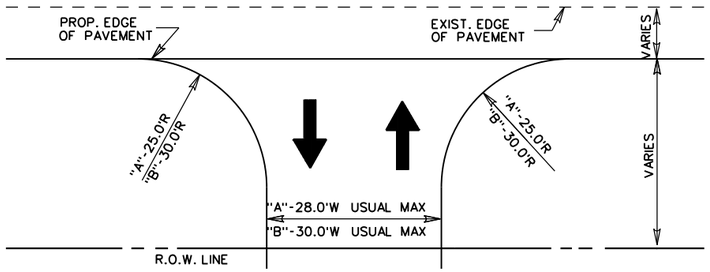
DRIVEWAY DETAILS PUBLIC (COUNTY ROAD-CITY STREET)

REV. 8/19

DRIVEWAY3.DGN

FED.RD. DIV.NO.	STATE AID PROJECT NO.			FILE NO.			SHEET NO.
6							125
STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.	
TEXAS	21	HIDALGO	0921	02	194	LIBERTY	

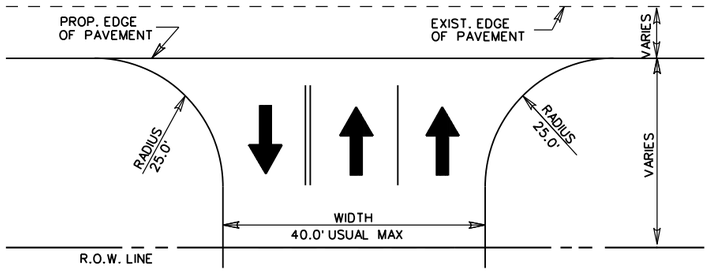
DESIGNS FOR TWO-WAY COMMERCIAL DRIVEWAYS



"A"- ONE ENTRY LANE AND ONE EXIT LANE, FEWER THAN 4 LARGE VEHICLES PER HOUR

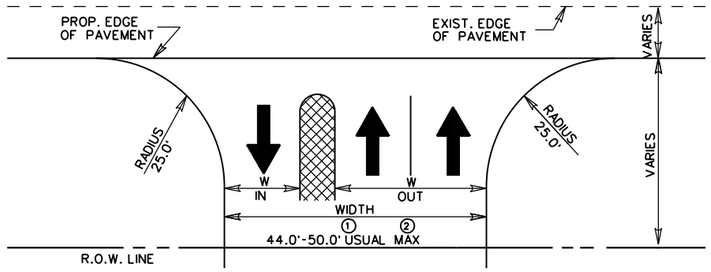
"B"- ONE ENTRY LANE AND ONE EXIT LANE, 4 OR MORE SINGLE UNIT VEHICLES PER HOUR ①

① - *DRIVEWAY DESIGNS FOR LARGER VEHICLES WILL BE CONSIDERED ON A CASE BY CASE BASIS*



ONE ENTRY LANE AND TWO EXIT LANES (WITHOUT DIVIDERS)

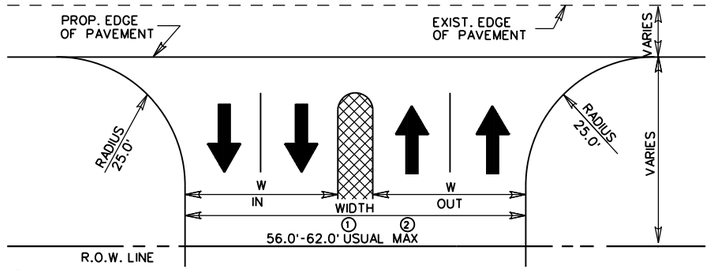
DESIGNS FOR TWO-WAY COMMERCIAL DRIVEWAYS



① - *4.0' WIDE DIVIDER, FACE-TO-FACE CURBS*

② - *10.0' WIDE DIVIDER, FACE-TO-FACE-CURBS*

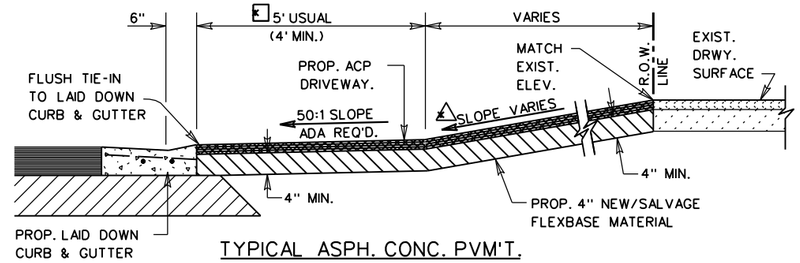
ONE ENTRY LANE AND TWO EXIT LANES (WITH A DIVIDER)



① - *4.0' WIDE DIVIDER, FACE-TO-FACE CURBS*

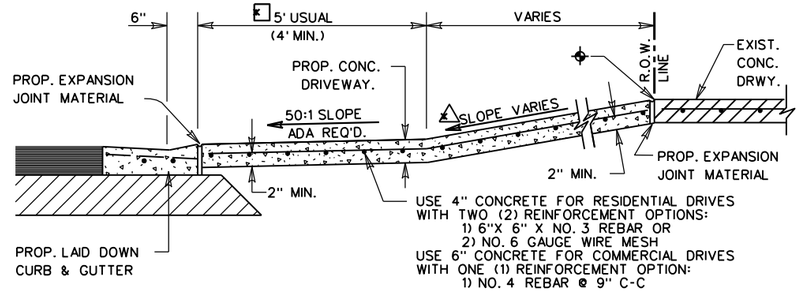
② - *10.0' WIDE DIVIDER, FACE-TO-FACE-CURBS*

TWO ENTRY LANES AND TWO EXIT LANES (WITH A DIVIDER)



TYPICAL ASPH. CONC. PVM'T. DRIVEWAY SECTION

N.T.S.



TYPICAL CONCRETE DRIVEWAY SECTION

N.T.S.

℄ CONCRETE SHALL BE SAW CUT TO THE LIMITS OF REMOVAL WHERE APPLICABLE.

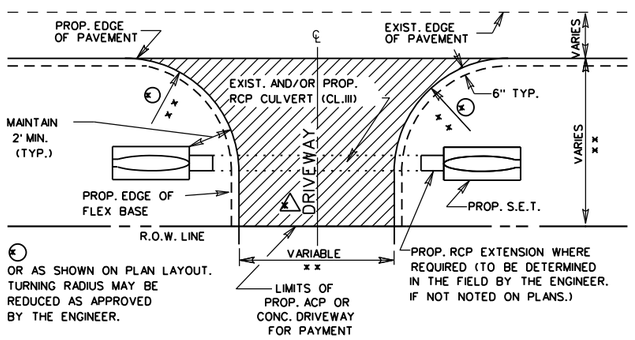
℄ PROP./FUTURE SIDEWALK CROSSING LOCATION UNLESS SHOWN ELSEWHERE ON P&P SHEETS. SEE P&P SHEETS FOR PROP. SIDEWALK LOCATION IF SIDEWALKS ARE INCLUDED AS PART OF PROJECT. REFER TO STATE STANDARDS - PEDESTRIAN FACILITIES - FOR ADDITIONAL REQUIREMENTS.

⚠ ENTRANCE'S BASE AND SURFACING MAY BE EXTENDED BEYOND R.O.W. LINE AS REQUIRED TO MEET EXISTING GRADE IN A SATISFACTORY MANNER OF WHICH NO STEEPER THAN 12:1 FOR COMMERCIAL DRIVEWAY AND 8:1 FOR RESIDENTIAL DRIVEWAY SLOPE WILL BE CONSTRUCTED.

PROP. DWY ALGEBRAIC DIFFERENCE TABLE
COMMERCIAL DRIVEWAYS @ A = 6% MAX.
RESIDENTIAL DRIVEWAYS @ A = 8% MAX.

PROPOSED DRIVEWAY SLOPE TABLE
COMMERCIAL DRIVEWAYS @ 12:1 MAX.
RESIDENTIAL DRIVEWAYS @ 8:1 MAX.

PRIVATE AND COMMERCIAL DRIVES WITHOUT CURB & GUTTER

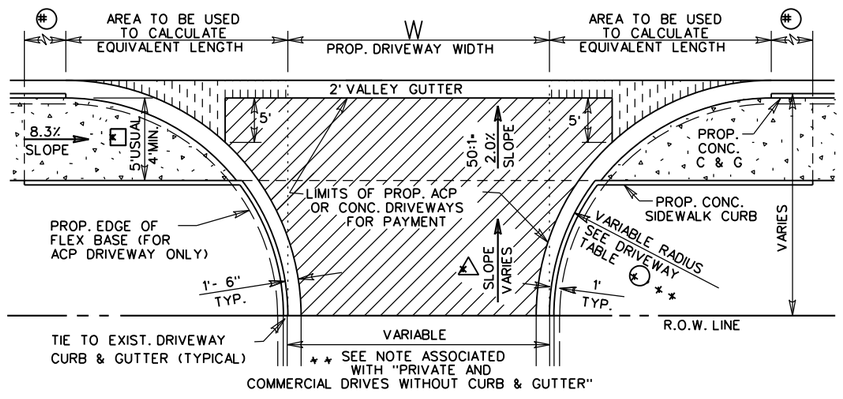


PLAN OF PRIVATE AND COMMERCIAL DRIVES

** FOR PRIVATE RESIDENTIAL DRIVES, TRY TO MATCH EXISTING WITH A MINIMUM WIDTH OF 12 FT. AND A MAXIMUM WIDTH OF 24 FT. WITH 15 FT. USUAL RADIUS. FOR COMMERCIAL DRIVES, USE ABOVE COMMERCIAL DRIVEWAY DETAILS.

⚠ SEE TYPICAL DRIVEWAY SECTIONS NOTES FOR DRIVEWAY SLOPE CRITERIA.

PRIVATE AND COMMERCIAL DRIVES WITH CURB & GUTTER



PLAN OF PRIVATE AND COMMERCIAL DRIVES

SEE P&P SHEETS FOR LOCATIONS OF DRIVES

N.T.S.

℄ PROP./FUTURE CONC. SIDEWALK LOCATION UNLESS SHOWN ELSEWHERE ON P&P SHEETS. REFER TO STATE STANDARDS - PEDESTRIAN FACILITIES - FOR ADDITIONAL REQUIREMENTS.

Ⓗ LIMITS OF SLOPE FOR PROP. CONC. CURB BASED ON 8.3% SLOPE FOR SIDEWALK.

⚠ SEE TYPICAL DRIVEWAY SECTIONS NOTES FOR DRIVEWAY SLOPE CRITERIA.

LF EQUIVALENT TABLE FOR PAYMENT LIMITS OF 2' VALLEY GUTTER

LF OF VALLEY GUTTER= W + X1 + X2	
WHERE X1 AND X2 MAY VARY DEPENDING ON RADIUS	
Prop. Driveway Radius	X1 or X2 (Sq Ft Area / 2') Equivalent LF Length
5'	1
8'	2
10'	4
12'	6
15'	9
18'	12
20'	15
22'	18
25'	24
28'	30
30'	34

SEE DRIVEWAY TABLE FOR LIMITS OF LAID DOWN CURB TO BE PAID FOR AS CURB AND GUTTER

DRIVEWAY TYPES

TY PB-1

EXIST. PRIVATE OR COMMERCIAL DRIVEWAYS TO BE CONSTRUCTED AS SHOWN WITH 4" NEW AND/OR SALVAGE FLEX. BASE, PRIMED AND SURFACED WITH 171#/SY ACP.

CONCRETE (RESIDENTIAL)

EXIST. PRIVATE DRIVEWAYS TO BE CONSTRUCTED AS SHOWN WITH 4" CONCRETE. TO BE PAID FOR BY THE SQ.YD.

CONCRETE (COMMERCIAL)

EXIST. BUSINESS DRIVEWAYS TO BE CONSTRUCTED AS SHOWN WITH 6" CONCRETE. TO BE PAID FOR BY THE SQ.YD.

© TxDOT 2021

PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

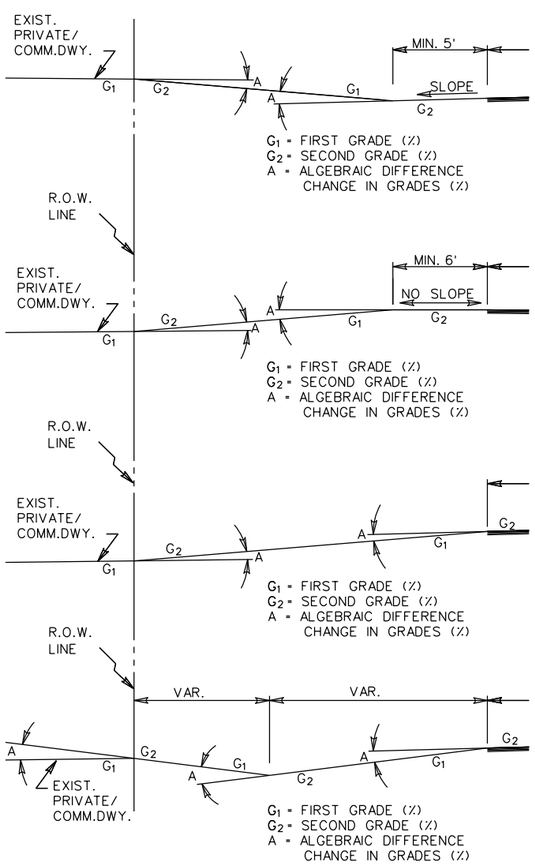
DRIVEWAY DETAILS PRIVATE (RESIDENTIAL-COMMERCIAL)

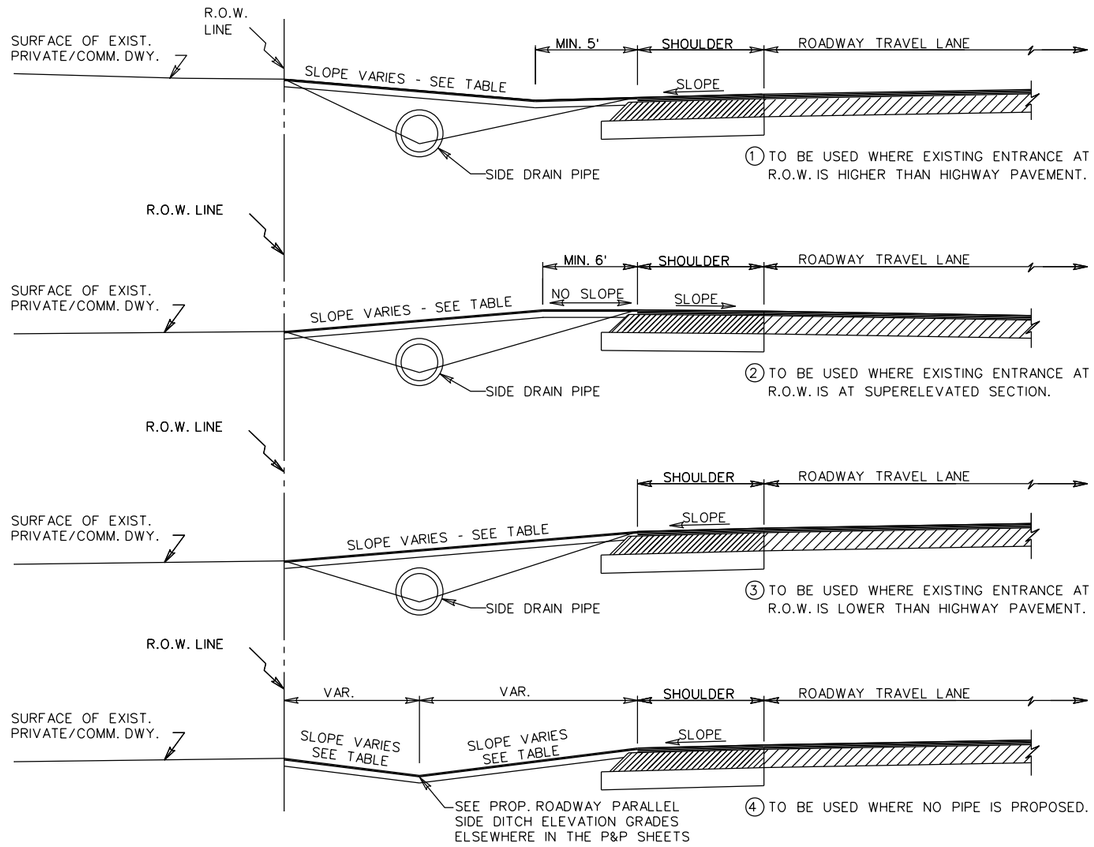
REV. 09/21

DRIVEWAY2.DGN

FED.RD. DIV.NO.	PROJECT NO.	FILE NO.	SHEET NO.
6			126

STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	21	HIDALGO	1803	02	194	LIBERTY

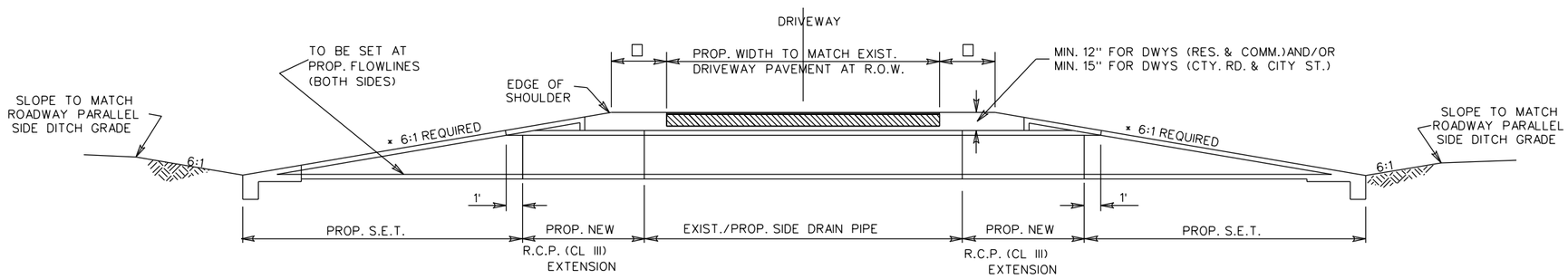




TYPICAL ENTRANCE PROFILE FOR DRIVEWAYS W/OUT C&G

PROPOSED DRIVEWAY SLOPE TABLE
COMMERCIAL DRIVEWAYS @ 12:1 MAX.
RESIDENTIAL DRIVEWAYS @ 8:1 MAX.

PROP. DWY ALGEBRAIC DIFFERENCE TABLE
COMMERCIAL DRIVEWAYS @ A = 6% DESIRABLE
RESIDENTIAL DRIVEWAYS @ A = 8% DESIRABLE
FORMULA, A=G2-G1



□ - 1' MIN. ON DRIVEWAYS (RES. & COMM.)
2' MIN. ON DRIVEWAYS (COUNTY RD. & CITY ST.)

* - 6:1 SLOPE REQUIRED

NOTES:

ALL ENTRANCES CONSTRUCTED ON THIS PROJECT ARE SUBJECT TO CONCURRENCE WITH EXISTING GOVERNING REGULATIONS AS SET OUT BY THE STATE - TEXAS TRANSPORTATION COMMISSION.

ENTRANCE'S BASE AND SURFACING MAY BE EXTENDED BEYOND R.O.W. LINE AS REQUIRED TO MEET EXISTING DRIVEWAY GRADE IN A SATISFACTORY MANNER OF WHICH NO STEEPER THAN 12:1 FOR COMMERCIAL DRIVEWAY AND 8:1 FOR RESIDENTIAL DRIVEWAY SLOPE WILL BE CONSTRUCTED.

ALL FLEXIBLE BASE USED FOR PRIVATE DRIVES & COMMERCIAL DRIVES WILL NOT REQUIRE LIME TREATMENT.

EXACT LOCATIONS, DIMENSIONS, AND TYPE TO BE ESTABLISHED DURING CONSTRUCTION BY THE ENGINEER.

PROP. WIDTH OF DRIVEWAYS TO MATCH EXISTING WIDTH AT R.O.W. LINE.

114 #/SY ACP (COMPACTED) IS EQUAL TO 1 IN. DEPTH,
171 #/SY ACP (COMPACTED) IS EQUAL TO 1½ IN. DEPTH.

SIDE DRAIN PIPES TO BE INSTALLED WHERE ROADWAY DITCH DRAINAGE IS NECESSARY, AS INDICATED ON PLANS AND/OR AS DIRECTED BY THE ENGINEER.

SIDE DRAIN PIPES TO BE INSTALLED WITH A MINIMUM OF 12" COVER WITH PROPOSED RESIDENTIAL & COMMERCIAL DRIVEWAY MATERIAL OR 15" COVER WITH PROPOSED COUNTY ROAD & CITY STREET ROADWAY MATERIAL.

AVERAGE DRIVEWAY DIMENSIONS SHOWN ON TABLE OF DRIVEWAYS (ELSEWHERE IN PLANS) ARE FOR ESTIMATING PURPOSES ONLY. ACTUAL DRIVEWAY DIMENSIONS MAY BE CHANGED BY THE ENGINEER BASED ON EXISTING FIELD CONDITIONS.

THE RATE OF PRIME COAT SHALL BE 0.10 GAL/SY FOR PRIVATE AND/OR COMMERCIAL DRIVEWAYS AND 0.20 GAL/SY FOR PUBLIC DRIVEWAYS (COUNTY ROADS AND/OR CITY STREETS).

TYPICALLY A CHANGE IN GRADE OF THREE PERCENT (3%) OR LESS AND A DISTANCE BETWEEN CHANGES IN GRADE OF AT LEAST ELEVEN FEET (11') ACCOMMODATES MOST VEHICLES. HOWEVER, LITERATURE SUGGESTS THAT A SIX PERCENT (6%) TO EIGHT PERCENT (8%) CHANGE IN GRADE MAY OPERATE EFFECTIVELY. INDIVIDUAL SITE CONDITIONS SHOULD BE EVALUATED TO ACCOMMODATE THE VEHICLE FLEET USING THE DRIVEWAY.

© TxDOT 2020

PHARR DISTRICT STANDARD

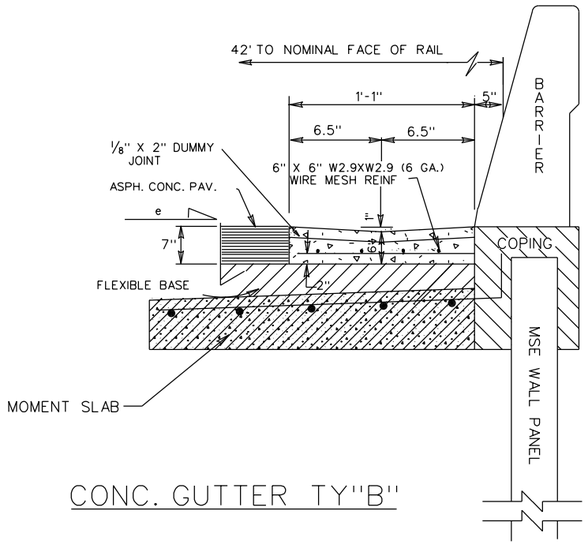
TEXAS DEPARTMENT OF TRANSPORTATION

DRIVEWAY PROFILE DETAILS

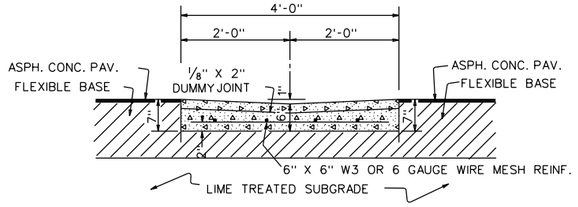
REV. 3/2020

DRIVEWAY1.DGN

FED.RD. DIV.NO.	STATE AID PROJECT NO.		FILE NO.			SHEET NO.
6						127
STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	21	HIDALGO	0921	02	194	LIBERTY

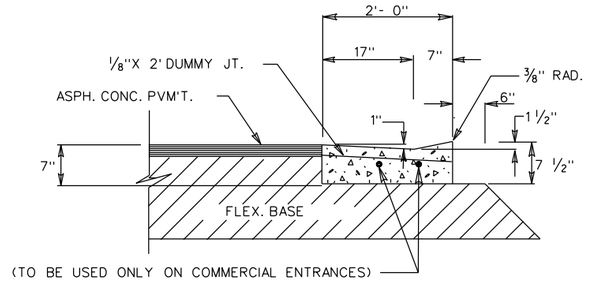


CONC. GUTTER TY"B"



4' CONC. VALLEY GUTTER (TY"A")

TO BE USED WHERE REQUIRED TO CARRY DRAINAGE WATER ACROSS SIDE STREETS



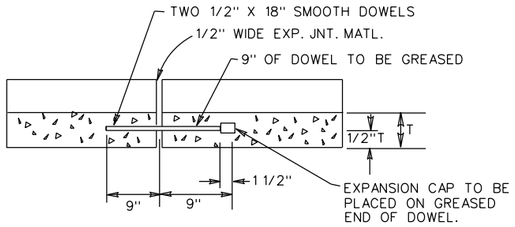
(TO BE USED ONLY ON COMMERCIAL ENTRANCES)
2-NO. 5 LONGITUDINAL REINF. BAR REINF. STEEL TO BE MADE PART OF ITEM "CONC. CURB & GUTTER." THE LENGTH OF REINFORCING STEEL WILL BE THE WIDTH OF THE PROP. COMMERCIAL ENTRANCE PLUS FOUR FEET.

CONC. GUTTER

NOTE:

CONCRETE GUTTER TO BE USED ONLY WHERE PERMITTED BY TEXAS DEPARTMENT OF TRANSPORTATION REGULATIONS FOR ACCESS DRIVEWAYS.

2' VALLEY GUTTER SHALL BE PAID FOR AS CONC. CURB AND GUTTER . CONCRETE CURB & GUTTER & CONCRETE CURB SHALL BE MEASURED FOR PAYMENT ALONG FACE OF CURB AT FLOW LINE.

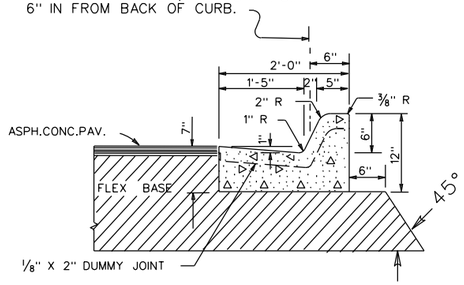


DETAIL EXPANSION JOINT

LONGITUDINAL SECTION THRU CURB AND/OR C&G. REINFORCING STEEL (WHEN USED) SHALL NOT CROSS EXPANSION JOINTS. STEEL SHALL BE TERMINATED 3" ± 1" FROM FACE OF THE JOINT.

1/2" PREMOLDED EXPANSION JOINT MATERIAL SHALL BE INSTALLED WHERE CONC. CURB & GUTTER ABUTS CONC. CURB, OR WHERE CONC. CURB & GUTTER OR CONC. CURB ABUT INLETS, BRIDGE WINGWALLS, BRIDGE ABUT-MENTS AND/OR ANY OTHER LOCATIONS SPECIFIED BY THE ENGINEER. MAX. SPACING = 105'

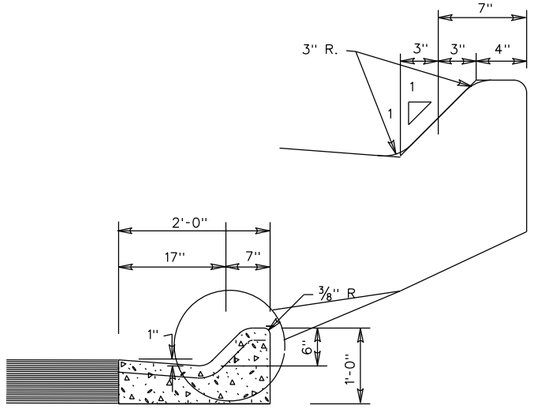
ALL HORIZONTAL DIMENSIONS AND RADII SHOWN ON PLANS, RELATING TO CURB & GUTTER, ARE TO A POINT 6" IN FROM BACK OF CURB.



CONC. CURB & GUTTER TY "A" (BARRIER)

NOTE:
EXPANSION JOINTS

1/2" PREMOLDED EXPANSION JOINT MATERIAL SHALL BE INSTALLED WHERE CONC. CURB & GUTTER ABUTS CONC. CURB, OR WHERE CONC. CURB & GUTTER OR CONC. CURB ABUT INLETS, BRIDGE WINGWALLS, BRIDGE ABUT-MENTS AND/OR ANY OTHER LOCATIONS SPECIFIED BY THE ENGINEER. MAX. SPACING = 105'

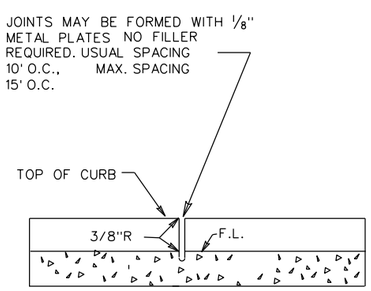


CONC. CURB & GUTTER TY. "B" (MOUNTABLE)

NOTE:
WHERE PROPOSED CURB & GUTTER IS TO BE CONNECTED TO EXIST. CURB & GUTTER IT SHOULD BE DONE AT THE EXIST. GUTTER FLOW LINE ELEVATION.

1/2" PREMOLDED EXPANSION JOINT MATERIAL SHALL BE INSTALLED WHERE CONC. CURB & GUTTER ABUTS CONC. CURB, OR WHERE CONC. CURB & GUTTER OR CONC. CURB ABUT INLETS, BRIDGE WINGWALLS, BRIDGE ABUT-MENTS AND/OR ANY OTHER LOCATIONS SPECIFIED BY THE ENGINEER. MAX. SPACING = 105'

JOINTS MAY BE FORMED WITH 1/8" METAL PLATES NO FILLER REQUIRED. USUAL SPACING 10' O.C., MAX. SPACING 15' O.C.



DETAIL DUMMY JOINT

NOTE:
DUMMY JOINTS TO BE USED ON CURB & CUTTER, CONC. MEDIAN AND ALL TYPE OF VALLEY GUTTERS JOINTS TO BE LOCATED BY THE ENGINEER.

© TxDOT 2002

PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

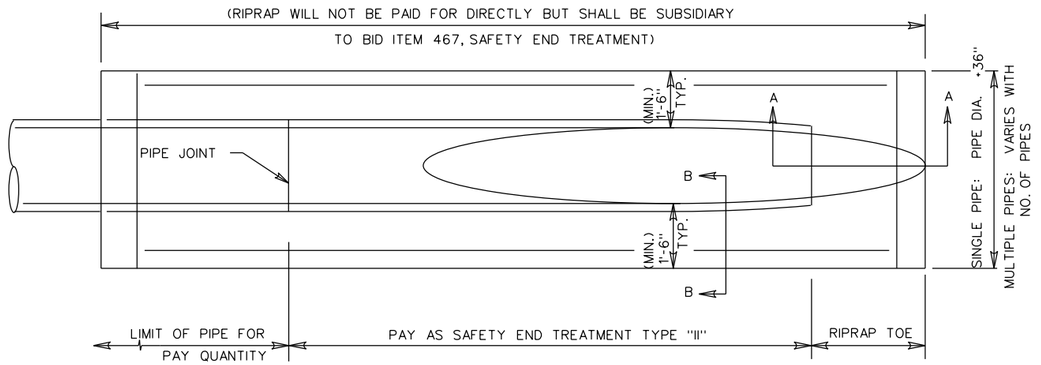
CURB & GUTTER DETAILS

REV. 4/02

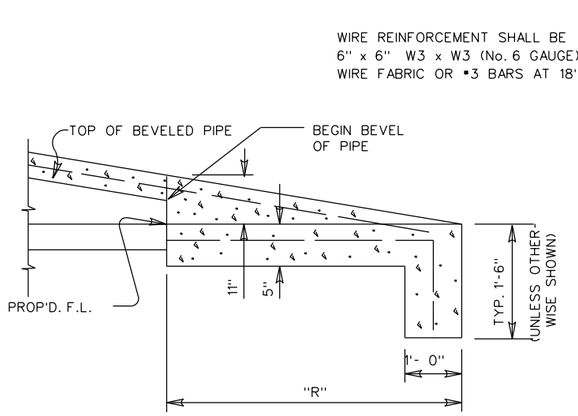
C&G.DGN

FED.RD. DIV.NO.	STATE AID PROJECT NO.		FILE NO.			SHEET NO.
6						128
STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TX	21	HIDALGO	0921	02	194	LIBERTY

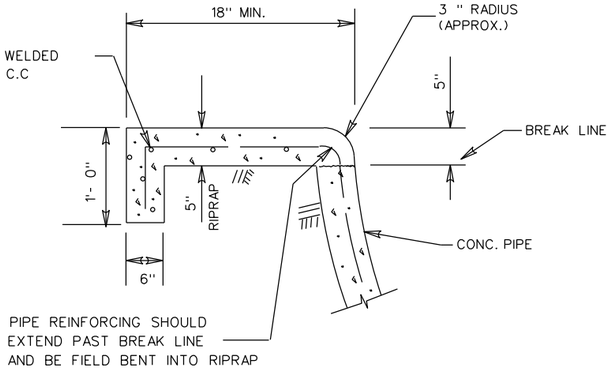
8/4/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\10 STANDARDS\02 ROADWAY\C&G.dgn



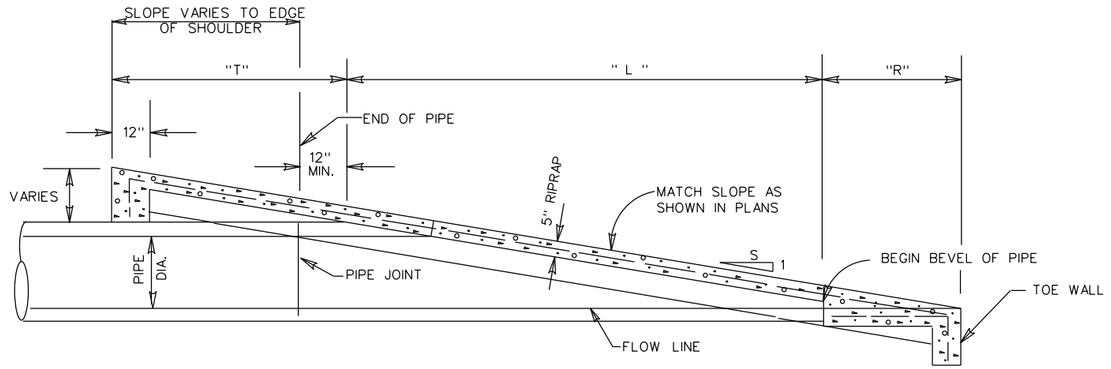
PLAN VIEW



SEC. A-A



SEC. B-B



ELEVATION
SAFETY END TREATMENT

SAFETY END TREATMENT PIPE LENGTHS

PIPE DIA. (IN.)	"L"			
	3:1	4:1	5:1	6:1
12	2'-0"	2'-8"	3'-4"	4'-0"
15	2'-9"	3'-8"	4'-7"	5'-6"
18	3'-6"	4'-8"	5'-10"	7'-0"
24	5'-1½"	6'-10"	8'-6½"	10'-3"
30	6'-9"	9-0"	11'-3"	13'-6"
36	8'-6"	11'-4"	14'-2"	17'-0"
42	10'-1½"	13'-6"	16'-10½"	20'-3"
48	11'-9"	15'-8"	19'-7"	23'-6"

* DRIVEWAYS & TURNOUTS ARE 6:1 ONLY

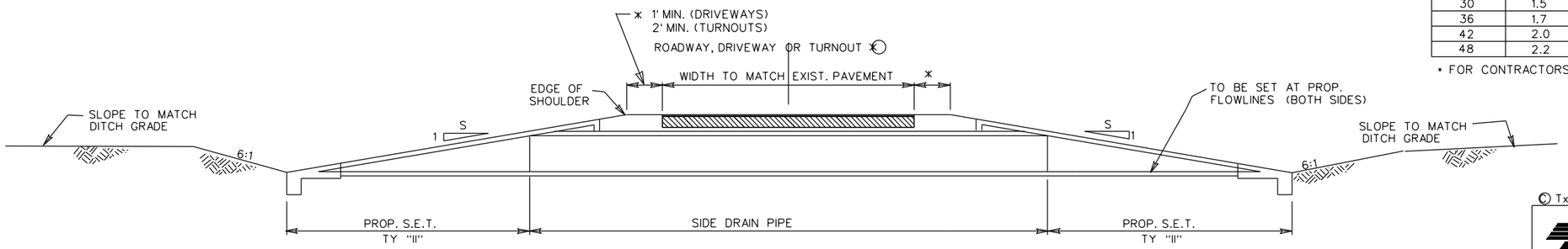
RIPRAP TOE LENGTHS

SLOPE	" R "	"T"
3:1	2'-9"	1'-9"
4:1	3'-8"	2'-4"
5:1	4'-7"	2'-11"
6:1	5'-6"	3'-6"

ESTIMATED RIPRAP VOLUME (CY)

PIPE DIA. (IN.)				
	3:1	4:1	5:1	6:1
12	.9	1.1	1.3	1.6
15	1.0	1.2	1.5	1.8
18	1.1	1.4	1.6	1.9
24	1.3	1.6	2.0	2.3
30	1.5	1.9	2.3	2.7
36	1.7	2.2	2.7	3.2
42	2.0	2.5	3.1	3.6
48	2.2	2.8	3.4	4.1

* FOR CONTRACTORS INFORMATION ONLY (SINGLE PIPE)



TYPICAL SIDEDRAIN SECTION

NOTE:

ALL EXCAVATION AND BACKFILL REQUIRED AT ALL PIPE SIDE DRAIN CONNECTIONS, ADJUSTMENTS AND/OR EXTENSIONS WILL NOT BE PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO THE BID ITEMS INVOLVED AND IN ACCORDANCE WITH ITEM 400 "STRUCTURAL EXCAVATION".

© TxDOT 2016

PHARR DISTRICT STANDARDS

TEXAS DEPARTMENT OF TRANSPORTATION

SAFETY END TREATMENT DETAILS

REV. 9/16

SET.DGN

FED.RD. DIV.NO.	STATE AID PROJECT NO.		FILE NO.			SHEET NO.
6						129
STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	21	HIDALGO	0921	02	194	LIBERTY

BEGIN PROJECT
LIBERTY BLVD
CSJ: 0921-02-194
STA. 11+60.00

IGNITE ST
JADE ST
MARBLE ST.
NUGGET ST.
TOM GILL RD

A-1 0.51
A-3 2.42
A-5 1.83
A-7 2.75
A-9 0.27
A-11 3.83
A-13 1.39
A-15 0.74
A-17 0.73
B-1 1.25
B-3 2.51
B-5 1.21
B-7 2.16
B-9 0.36
C-1 1.15
C-3 1.37
C-5 1.46

WALMART ENTRANCE
WALMART ENTRANCE
DIAMOND AVE.
PROP. R.O.W.
EXIST. R.O.W.
PROP. LIBERTY BLVD ℄
PROPOSED LA JOYA BYPASS
MARBLE ST.
NUGGET ST.

A-2 0.51
A-4 2.41
A-6 2.39
A-8 2.85
A-10 0.32
A-12 2.87
A-14 1.86
A-16 1.26
A-18 1.35
B-2 0.41
B-4 1.84
B-6 1.06
B-8 2.16
B-10 0.50
C-2 0.84
C-4 1.42
C-6 1.58

I-2/ US 83
DIAMOND AVE.
HCDD•1 DRAINAGE DITCH
HCID•16 IRRIGATION CANAL
PROPOSED LA JOYA BYPASS
23RD ST

MATCHLINE STA. 67+00

LEGEND

- A-13 / 1.39 — DESIGNATION OF DRAINAGE AREA AREA IN ACRES
- DRAINAGE AREA BOUNDRARY
- XX — DRAINAGE STRUCTURE ID
- EXISTING FLOW DIRECTION

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
08/04/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

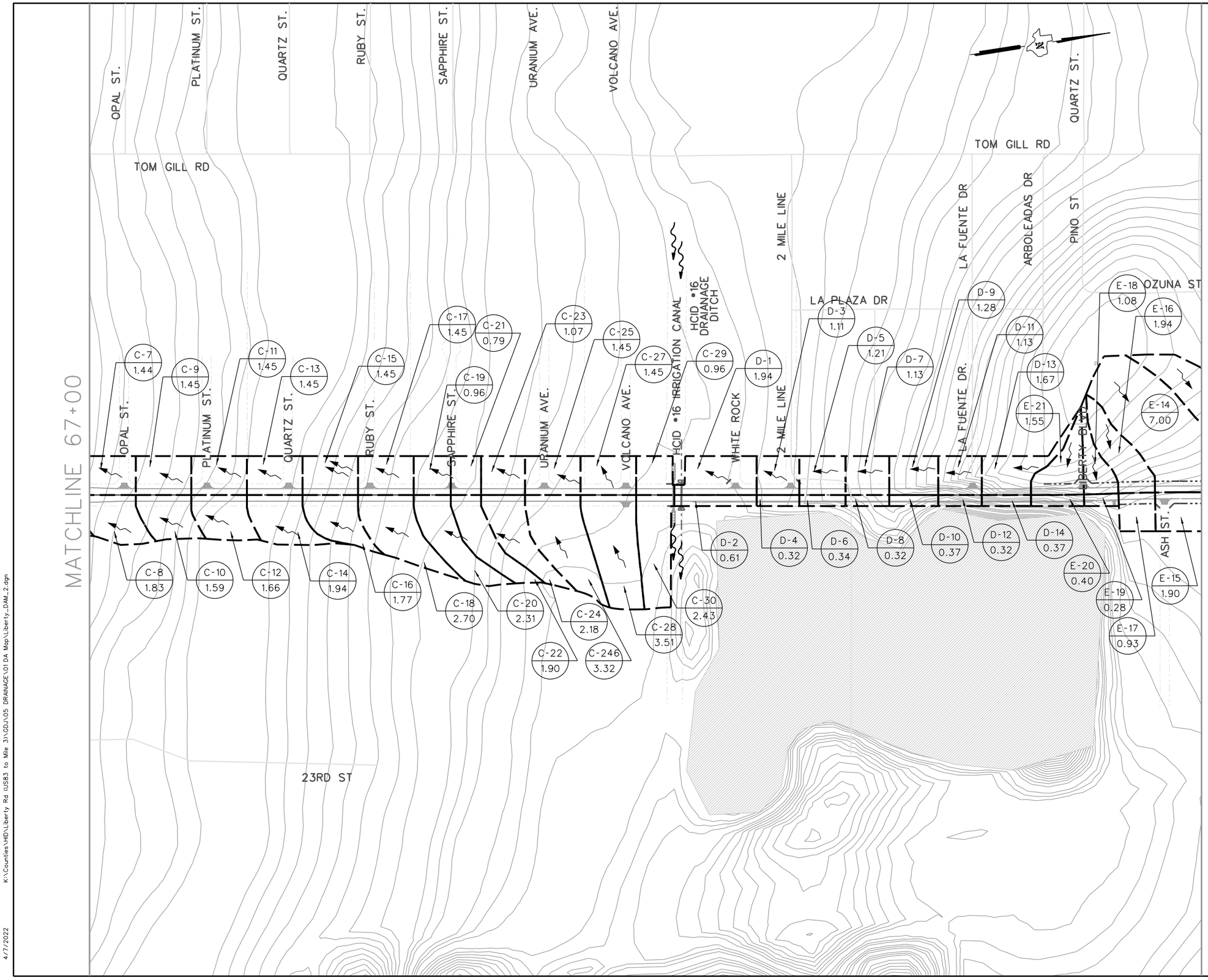
LIBERTY BLVD
DRAINAGE AREA MAP
STA. 11+60 TO STA. 67+00

SCALE: 1" = 500'

SHEET 1 OF 3

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				130
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

8/4/2020
P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\01 DA Map\Liberty_DAM_1.dgn



LEGEND

- A-13 / 1.39 — DESIGNATION OF DRAINAGE AREA, AREA IN ACRES
- DRAINAGE AREA BOUNDRARY
- XX — DRAINAGE STRUCTURE ID
- EXISTING FLOW DIRECTION
- PROPOSED TRUNK LINE

STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
04/07/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
DRAINAGE AREA MAP
STA. 67+00 TO STA. 127+00

SCALE: 1" = 500'

SHEET 2 OF 3

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					131
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

4/7/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\05 DRAINAGE\01 DA Map\Liberty_DAM_2.dgn

N G GONZALEZ CIR
N G GONZALEZ CIR
3 MILE LINE RD
PUERTA BLANCA DR
VELA DR
MARIA DR
SALINAS ST.
DESPERADO CIR DR
TOM GILL RD
ZARATE ST
SOLIS ST
GARZA ST
SALINAS ST.
END PROJECT
BEGIN INCIDENTAL
LIBERTY BLVD
CSJ: 0921-02-194
STA. 137+92.72
SALINAS ST.
RODRIGUEZ ST.
MATCHLINE 127+00
E-5 0.96
E-3 1.56
E-1 2.05
E-10 2.67
E-7 1.60
E-12 4.63
PROP. LIBERTY BLVD ℄
PROP. R.O.W.
EXIST. R.O.W.
PROP. R.O.W.
EXIST. R.O.W.
BIRCH ST
CEDAR ST
MILE 3 RD
DOGWOOD AVE
EBONY AVE
FIR AVE
E-4 6.61
E-2 6.88
E-11 1.74
E-13 0.89
E-8 9.41
E-9 5.52
E-6 4.57
END INCIDENTAL
LIBERTY BLVD
CSJ: 0921-02-194
STA. 145+52.00

LEGEND

A-13 / 1.39	DESIGNATION OF DRAINAGE AREA AREA IN ACRES
— — —	DRAINAGE AREA BOUNDRARY
XX	DRAINAGE STRUCTURE ID
~~►	EXISTING FLOW DIRECTION
➡	PROPOSED TRUNK LINE

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL LICENSED ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
DRAINAGE AREA MAP
STA. 127+00 TO STA. 154+37

SCALE: 1" = 500'

SHEET 3 OF 3

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					132
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

11/6/2020 \\dc1\projects\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\01 DA Map\Liberty_DAM_3.dgn

NETWORK "A, B, & C"

RUNOFF COMPUTATIONS

AREA ID	TOTAL AREA (acres)	TOTAL SUBAREA 1 (acres)	Subarea 1 Description	Subarea 1 "C" Value	TOTAL SUBAREA 2 (acres)	Subarea 2 Description	Subarea 2 "C" Value	TOTAL SUBAREA 3 (acres)	Subarea 3 Description	Subarea 3 "C" Value	TOTAL SUBAREA 4 (acres)	Subarea 4 Description	Subarea 4 "C" Value	Total "C" Value	Tc (min)	Intensity (in/hr)	Discharge (ft/s)
A-1	0.514	0.386	Business Downtown	0.83	0.08	Unimproved Black/Loess 3-5	0.28	0.05	Street Asph/Conc	0.900	0.00		0.75	0.00	15.24	5.43	2.09
A-2	0.508	0.303	Business Downtown	0.83	0.11	Unimproved Black/Loess 3-5	0.28	0.10	Street Asph/Conc	0.900	0.00		0.72	0.00	16.10	5.29	1.95
A-3	2.415	1.778	Business Downtown	0.83	0.24	Unimproved Black/Loess 3-5	0.28	0.40	Street Asph/Conc	0.900	0.00		0.79	0.00	41.60	3.11	5.91
A-4	2.413	1.446	Business Downtown	0.83	0.53	Unimproved Black/Loess 3-5	0.28	0.44	Street Asph/Conc	0.900	0.00		0.72	0.00	28.05	3.96	6.91
A-5	1.834	1.165	Business Downtown	0.83	0.25	Unimproved Black/Loess 3-5	0.28	0.42	Street Asph/Conc	0.900	0.00		0.77	0.00	25.86	4.15	5.87
A-6	2.386	1.526	Business Downtown	0.83	0.40	Unimproved Black/Loess 3-5	0.28	0.46	Street Asph/Conc	0.900	0.00		0.75	0.00	37.87	3.30	5.91
A-7	2.75	2.133	Business Downtown	0.83	0.28	Unimproved Black/Loess 3-5	0.28	0.34	Street Asph/Conc	0.900	0.00		0.78	0.00	39.30	3.23	6.95
A-8	2.851	1.474	Business Downtown	0.83	0.72	Unimproved Black/Loess 3-5	0.28	0.66	Street Asph/Conc	0.900	0.00		0.71	0.00	34.50	3.50	7.06
A-9	0.267	0.094	Business Downtown	0.83	0.17	Street Asph/Conc	0.90	0.00		0.000	0.00		0.88	0.00	10.00	6.44	1.51
A-10	0.318	0.14	Business Downtown	0.83	0.18	Street Asph/Conc	0.90	0.00		0.000	0.00		0.87	0.00	10.00	6.44	1.78
A-11	3.83	2.5	Business Downtown	0.83	0.74	Unimproved Black/Loess 3-5	0.28	0.59	Street Asph/Conc	0.900	0.00		0.73	0.00	63.20	2.34	6.58
A-12	2.872	1.645	Business Downtown	0.83	0.65	Unimproved Black/Loess 3-5	0.28	0.58	Street Asph/Conc	0.900	0.00		0.72	0.00	38.90	3.25	6.71
A-13	1.393	0.696	Business Downtown	0.83	0.17	Industrial Light	0.55	0.20	Unimproved Black/Loess 3-5	0.280	0.33	Street Asph/Conc	0.74	0.90	38.60	3.26	3.34
A-14	1.864	1.332	Business Downtown	0.83	0.23	Unimproved Black/Loess 3-5	0.28	0.31	Street Asph/Conc	0.900	0.00		0.78	0.00	37.10	3.35	4.83
A-15	0.744	0.385	Industrial Light	0.55	0.15	Unimproved Black/Loess 3-5	0.28	0.21	Street Asph/Conc	0.900	0.00		0.59	0.00	23.50	4.37	1.93
A-16	1.256	0.895	Business Downtown	0.83	0.13	Unimproved Black/Loess 3-5	0.28	0.23	Street Asph/Conc	0.900	0.00		0.79	0.00	38.40	3.27	3.24
A-17	0.734	0.361	Industrial Light	0.55	0.16	Unimproved Black/Loess 3-5	0.28	0.22	Street Asph/Conc	0.900	0.00		0.59	0.00	21.30	4.61	2.01
A-18	1.347	0.823	Business Downtown	0.83	0.31	Unimproved Black/Loess 3-5	0.28	0.22	Street Asph/Conc	0.900	0.00		0.72	0.00	59.10	2.45	2.37
B-1	1.249	0.899	Unimproved Sand/Sandy 0-3%	0.18	0.15	Lawns Sandy/Flat 2%	0.08	0.20	Street Asph/Conc	0.900	0.00		0.28	0.00	23.90	4.33	1.54
B-2	0.411	0.212	Lawns Sandy/Flat 2	0.08	0.20	Street Asph/Conc	0.90	0.00		0.000	0.00		0.48	0.00	23.63	4.36	0.85
B-3	2.507	1.791	Unimproved Sand/Sandy 0-3%	0.18	0.23	Lawns Sandy/Flat 2%	0.08	0.49	Street Asph/Conc	0.900	0.00		0.31	0.00	13.15	5.79	4.50
B-4	1.838	0.676	Unimproved Sand/Sandy 0-3%	0.18	0.68	Lawns Sandy/Flat 2%	0.08	0.49	Street Asph/Conc	0.900	0.00		0.33	0.00	14.45	5.56	3.41
B-5	1.205	0.861	Unimproved Sand/Sandy 0-3%	0.18	0.07	Lawns Sandy/Flat 2%	0.08	0.28	Street Asph/Conc	0.900	0.00		0.34	0.00	18.18	4.99	2.04
B-6	1.055	0.536	Unimproved Sand/Sandy 0-3%	0.18	0.24	Lawns Sandy/Flat 2%	0.08	0.28	Street Asph/Conc	0.900	0.00		0.35	0.00	17.73	5.06	1.84
B-7	2.157	1.638	Unimproved Sand/Sandy 0-3%	0.18	0.24	Lawns Sandy/Flat 2%	0.08	0.28	Street Asph/Conc	0.900	0.00		0.26	0.00	23.18	4.41	2.48
B-8	2.157	1.638	Unimproved Sand/Sandy 0-3%	0.18	0.24	Lawns Sandy/Flat 2%	0.08	0.28	Street Asph/Conc	0.900	0.00		0.26	0.00	16.32	5.26	2.96
B-9	0.362	0.212	Unimproved Sand/Sandy 0-3%	0.18	0.06	Lawns Sandy/Flat 2%	0.08	0.10	Street Asph/Conc	0.900	0.00		0.35	0.00	11.73	6.06	0.78
B-10	0.504	0.3	Unimproved Sand/Sandy 0-3%	0.18	0.10	Lawns Sandy/Flat 2%	0.08	0.10	Street Asph/Conc	0.900	0.00		0.31	0.00	16.20	5.28	0.82
C-1	1.003	0.33	Street Ashp/Conc	0.90	0.52	Residential Single	0.40	0.00		0.000	0.00		0.52	0.00	15.00	5.47	2.83
C-2	0.703	0.206	Street Ashp/Conc	0.90	0.42	Unimproved Areas / Sandy 0-3	0.18	0.00		0.000	0.00		0.38	0.00	10.00	6.44	1.72
C-3	1.519	0.348	Street Ashp/Conc	0.90	1.08	Residential Single	0.40	0.00		0.000	0.00		0.50	0.00	17.00	5.16	3.88
C-4	1.562	0.347	Street Ashp/Conc	0.90	1.13	Unimproved Areas / Sandy 0-3	0.18	0.00		0.000	0.00		0.33	0.00	10.00	6.44	3.37
C-5	1.457	0.857	Residental Single	0.40	0.17	Lawns Sandy/Flat 2%	0.08	0.43	Street Asph/Conc	0.900	0.00		0.51	0.00	17.00	5.16	3.84
C-6	1.584	1.171	Unimproved Sand/Sandy 0-3%	0.18	0.10	Lawns Sandy/Flat 2%	0.08	0.32	Street Asph/Conc	0.900	0.00		0.32	0.00	10.00	6.44	3.25
C-7	1.436	0.836	Residental Single	0.40	0.22	Lawns Sandy/Flat 2%	0.08	0.38	Street Asph/Conc	0.900	0.00		0.48	0.00	17.00	5.16	3.58
C-8	1.833	1.419	Unimproved Sand/Sandy 0-3%	0.18	0.16	Lawns Sandy/Flat 2%	0.08	0.26	Street Asph/Conc	0.900	0.00		0.27	0.00	11.12	6.19	3.09
C-9	1.446	1.033	Residental Single	0.40	0.18	Lawns Sandy/Flat 2%	0.08	0.24	Street Asph/Conc	0.900	0.00		0.44	0.00	18.00	5.02	3.22
C-10	1.588	0.176	Lawns Sandy/Flat 2%	0.08	1.17	Unimproved Sand/Sandy 0-3%	0.18	0.24	Street Asph/Conc	0.900	0.00		0.28	0.00	11.12	6.19	2.72
C-11	1.446	0.238	Lawns Sandy/Flat 2%	0.08	0.85	Residental Single	0.40	0.36	Street Asph/Conc	0.900	0.00		0.47	0.00	18.00	5.02	3.43
C-12	1.659	1.246	Unimproved Sand/Sandy 0-3%	0.18	0.18	Lawns Sandy/Flat 2%	0.08	0.24	Street Asph/Conc	0.900	0.00		0.27	0.00	11.06	6.21	2.81
C-13	1.446	0.845	Residental Single	0.40	0.24	Lawns Sandy/Flat 2%	0.08	0.36	Street Asph/Conc	0.900	0.00		0.47	0.00	18.00	5.02	3.43
C-14	1.936	1.523	Unimproved Sand/Sandy 0-3%	0.18	0.18	Lawns Sandy/Flat 2%	0.08	0.24	Street Asph/Conc	0.900	0.00		0.26	0.00	11.21	6.17	3.10
C-15	1.446	1.033	Residental Single	0.40	0.18	Lawns Sandy/Flat 2%	0.08	0.24	Street Asph/Conc	0.900	0.00		0.44	0.00	18.00	5.02	3.22
C-16	1.767	1.354	Unimproved Sand/Sandy 0-3	0.18	0.18	Lawns Sandy/Flat 2	0.08	0.24	Street Asph/Conc	0.900	0.00		0.27	0.00	11.13	6.19	2.92
C-17	1.446	0.846	Residental Single	0.40	0.24	Lawns Sandy/Flat 2%	0.08	0.36	Street Asph/Conc	0.900	0.00		0.47	0.00	18.00	5.02	3.43
C-18	2.698	2.284	Unimproved Sand/Sandy 0-3%	0.18	0.18	Lawns Sandy/Flat 2%	0.08	0.24	Street Asph/Conc	0.900	0.00		0.24	0.00	12.67	5.88	3.76
C-19	1.446	0.846	Residental Single	0.40	0.24	Lawns Sandy/Flat 2%	0.08	0.36	Street Asph/Conc	0.900	0.00		0.47	0.00	17.00	5.16	3.52
C-20	2.93	2.517	Unimproved Sand/Sandy 0-3%	0.18	0.18	Lawns Sandy/Flat 2%	0.08	0.24	Street Asph/Conc	0.900	0.00		0.23	0.00	14.08	5.62	3.83
C-21	0.786	0.206	Street Ashp/Conc	0.90	0.46	Residential Single	0.40	0.00		0.000	0.00		0.48	0.00	17.00	5.16	1.95
C-22	1.898	0.129	Street Ashp/Conc	0.90	1.67	Unimproved Areas / Sandy 0-3	0.18	0.00		0.000	0.00		0.22	0.00	18.40	4.97	2.11
C-23	1.143	0.188	Street Ashp/Conc	0.90	0.82	Residential Single	0.40	0.00		0.000	0.00		0.44	0.00	17.00	5.16	2.61
C-24	2.179	0.188	Street Ashp/Conc	0.90	1.85	Unimproved Areas / Sandy 0-3	0.18	0.00		0.000	0.00		0.24	0.00	18.80	4.91	2.52
C-25	1.446	0.846	Residental Single	0.40	0.24	Lawns Sandy/Flat 2%	0.08	0.36	Street Asph/Conc	0.900	0.00		0.47	0.00	18.00	5.02	3.42
C-26	3.319	2.906	Unimproved Sand/Sandy 0-3%	0.18	0.18	Lawns Sandy/Flat 2%	0.08	0.24	Street Asph/Conc	0.900	0.00		0.23	0.00	17.16	5.14	3.86
C-27	1.446	0.846	Residental Single	0.40	0.24	Lawns Sandy/Flat 2%	0.08	0.36	Street Asph/Conc	0.900	0.00		0.47	0.00	18.00	5.02	3.42
C-28	3.507	3.068	Unimproved Sand/Sandy 0-3%	0.18	0.15	Lawns Sandy/Flat 2%	0.08	0.27	Street Asph/Conc	0.900	0.00		0.23	0.00	22.96	4.43	3.59
C-29	0.962	0.682	Residental Single	0.40	0.12	Lawns Sandy/Flat 2%	0.08	0.16	Street Asph/Conc	0.900	0.00		0.45	0.00	17.00	5.16	2.21
C-30	2.431	2.148	Unimproved Sand/Sandy 0-3	0.18	0.12	Lawns Sandy/Flat 2	0.08	0.16	Street Asph/Conc	0.900	0.00		0.22	0.00	10.00	6.44	3.50

NOTES:

1. CALCULATIONS MADE BY "GEOPAK DRAINAGE" HYDRAULIC COMPUTER PROGRAM.
2. ALLOWABLE PONDING WIDTH = 16' AS PER TXDOT BRIDGE DIVISION HYDRAULIC MANUAL
3. SEWER CALCULATIONS BASED ON MANNING'S FORMULA.
4. TW USED FOR THE STORM SEWER DESIGN WAS BASED ON OUTFALL SOFFIT ELEVATIONS WHICH ARE HIGHER THAN ACTUAL 5YR H.C.D.D. #1 TW ELEVATIONS.
5. RAINFALL FREQUENCY = 5 YR.
6. ✳ DRAINAGE LINK CONSIDERED FOR SRCMP MATERIAL ALTERNATIVE
7. RAINFALL INTENSITY REFERENCED FROM TxDOT'S "RAINFALL INTENSITY-DURATION-FREQUENCY COEFFICIENTS FOR TEXAS" WHICH ARE BASED ON UNITED STATES GEOLOGICAL SURVEY (USGS) SCIENTIFIC INVESTIGATIONS REPORT 2004-5041 "ATLAS OF DEPTH-DURATION FREQUENCY OF PRECIPITATION ANNUAL MAXIMA FOR TEXAS".

STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
04/08/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
HYDRAULIC DATA
RUNOFF COMPUTATIONS

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					133
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

4/8/2022 K:\Counties\HD\Liberty Rd (US83 to Mile 3)\GDJ\05 DRAINAGE\02 HydraulicData\Liberty_HydData_NetworkC_Mod.dgn

NETWORK "D & E"

RUNOFF COMPUTATIONS

AREA ID	TOTAL AREA (acres)	TOTAL SUBAREA 1 (acres)	Subarea 1 Description	Subarea 1 "C" Value	TOTAL SUBAREA 2 (acres)	Subarea 2 Description	Subarea 2 "C" Value	TOTAL SUBAREA 3 (acres)	Subarea 3 Description	Subarea 3 "C" Value	TOTAL SUBAREA 4 (acres)	Subarea 4 Description	Subarea 4 "C" Value	Total "C" Value	Tc (min)	Intensity (in/hr)	Dis-charge (ft/s)
D-1	1.94	1.14	Residential Single	0.40	0.32	Unimproved Black/Loess 3-5	0.28	0.48	Street Asph/Conc	0.90	0.00		0.00	0.50	17.92	5.03	4.90
D-2	0.61	0.26	Unimproved Black/Loess 3-5	0.28	0.35	Street Asph/Conc	0.90	0.00		0.00	0.00		0.00	0.64	15.00	5.47	2.13
D-3	1.11	0.59	Residential Single	0.40	0.23	Unimproved Black/Loess 3-5	0.28	0.29	Street Asph/Conc	0.90	0.00		0.00	0.51	12.30	5.95	3.34
D-4	0.32	0.14	Unimproved Black/Loess 3-5	0.28	0.18	Street Asph/Conc	0.90	0.00		0.00	0.00		0.00	0.64	10.98	6.22	1.26
D-5	1.21	0.86	Residental Single	0.40	0.15	Lawns Sandy/Flat 2%	0.08	0.20	Street Asph/Conc	0.90	0.00		0.00	0.44	10.00	6.44	3.44
D-6	0.34	0.15	Lawns Sandy/Flat 2%	0.08	0.20	Street Asph/Conc	0.90	0.00		0.00	0.00		0.00	0.55	10.48	6.33	1.20
D-7	1.13	0.81	Residental Single	0.40	0.14	Lawns Sandy/Flat 2%	0.08	0.19	Street Asph/Conc	0.90	0.00		0.00	0.44	10.00	6.44	3.24
D-8	0.32	0.14	Lawns Sandy/Flat 2%	0.08	0.19	Street Asph/Conc	0.90	0.00		0.00	0.00		0.00	0.55	11.20	6.18	1.10
D-9	1.28	0.91	Residental Single	0.40	0.16	Lawns Sandy/Flat 2%	0.08	0.21	Street Asph/Conc	0.90	0.00		0.00	0.44	10.00	6.44	3.65
D-10	0.37	0.13	Lawns Sandy/Flat 2%	0.08	0.24	Street Asph/Conc	0.90	0.00		0.00	0.00		0.00	0.61	10.70	6.28	1.41
D-11	1.13	0.62	Residental Single	0.40	0.21	Lawns Sandy/Flat 2%	0.08	0.30	Street Asph/Conc	0.90	0.00		0.00	0.48	19.62	4.81	2.59
D-12	0.32	0.14	Lawns Sandy/Flat 2%	0.08	0.19	Street Asph/Conc	0.90	0.00		0.00	0.00		0.00	0.55	11.00	6.22	1.11
D-13	1.67	1.30	Residental Single	0.40	0.16	Lawns Sandy/Flat 2%	0.08	0.21	Street Asph/Conc	0.90	0.00		0.00	0.43	15.08	5.45	3.94
D-14	0.37	0.16	Lawns Sandy/Flat 2%	0.08	0.21	Street Asph/Conc	0.90	0.00		0.00	0.00		0.00	0.55	11.34	6.15	1.24
E-1	2.05	0.16	Residential Single	0.40	1.33	Industrial Light	0.55	0.37	Unimproved Black/Loess 3-5	0.28	0.19	Street Asph/Conc	0.90	0.52	40.49	3.16	3.40
E-2	6.88	5.96	Residential Single	0.40	0.50	Unimproved Black/Loess 3-5	0.28	0.43	Street Asph/Conc	0.90	0.00		0.00	0.42	49.60	2.77	8.04
E-3	1.56	0.33	Residental Single	0.40	0.79	Unimproved Sand/Sandy 0-3%	0.18	0.28	Lawns Sandy/Flat 2%	0.08	0.16	Street Asph/Conc	0.90	0.28	40.16	3.18	1.41
E-4	6.61	5.57	Residental Single	0.40	0.54	Lawns Sandy/Flat 2%	0.08	0.49	Street Asph/Conc	0.90	0.00		0.00	0.41	31.39	3.71	10.05
E-5	0.96	0.12	Residental Single	0.40	0.13	Unimproved Sand/Sandy 0-3%	0.18	0.28	Lawns Sandy/Flat 2%	0.08	0.42	Street Asph/Conc	0.90	0.50	10.00	6.44	3.06
E-6	4.57	3.54	Residental Single	0.40	0.46	Lawns Sandy/Flat 2%	0.08	0.59	Street Asph/Conc	0.90	0.00		0.00	0.43	34.06	3.53	6.97
E-7	1.60	1.21	Unimproved Sand/Sandy 0-3%	0.18	0.16	Lawns Sandy/Flat 2%	0.08	0.22	Street Asph/Conc	0.90	0.00		0.00	0.27	36.06	3.41	1.47
E-8	9.41	7.32	Residental Single	0.40	1.29	Lawns Sandy/Flat 2	0.08	0.80	Street Asph/Conc	0.90	0.00		0.00	0.40	65.70	2.28	8.54
E-9	5.52	5.52	Residental Single	0.40	0.00		0.00	0.00		0.00	0.00		0.00	0.40	21.80	4.55	10.05
E-10	2.67	2.27	Unimproved Sand/Sandy 0-3%	0.18	0.17	Lawns Sandy/Flat 2%	0.08	0.23	Street Asph/Conc	0.90	0.00		0.00	0.24	36.16	3.40	2.13
E-11	1.74	1.29	Residental Single	0.40	0.19	Lawns Sandy/Flat 2%	0.08	0.26	Street Asph/Conc	0.90	0.00		0.00	0.44	33.50	3.56	2.72
E-12	4.63	4.37	Unimproved Sand/Sandy 0-3%	0.18	0.11	Lawns Sandy/Flat 2%	0.08	0.15	Street Asph/Conc	0.90	0.00		0.00	0.20	25.78	4.16	3.86
E-13	0.89	0.45	Residental Single	0.40	0.17	Lawns Sandy/Flat 2%	0.08	0.28	Street Asph/Conc	0.90	0.00		0.00	0.50	10.00	6.44	2.85
E-14	7.00	6.45	Unimproved Sand/Sandy 0-3%	0.18	0.23	Lawns Sandy/Flat 2%	0.08	0.31	Street Asph/Conc	0.90	0.00		0.00	0.21	19.45	4.83	7.06
E-15	1.90	1.17	Residental Single	0.40	0.29	Lawns Sandy/Flat 2%	0.08	0.44	Street Asph/Conc	0.90	0.00		0.00	0.47	34.20	3.52	3.12
E-16	1.94	1.66	Unimproved Sand/Sandy 0-3%	0.18	0.12	Lawns Sandy/Flat 2%	0.08	0.16	Street Asph/Conc	0.90	0.00		0.00	0.23	17.18	5.13	2.31
E-17	0.93	0.66	Residental Single	0.40	0.12	Lawns Sandy/Flat 2%	0.08	0.16	Street Asph/Conc	0.90	0.00		0.00	0.44	33.58	3.56	1.47
E-18	1.08	0.56	Unimproved Sand/Sandy 0-3%	0.18	0.16	Lawns Sandy/Flat 2%	0.08	0.36	Street Asph/Conc	0.90	0.00		0.00	0.40	17.18	5.13	2.22
E-19	0.28	0.00	Residental Single	0.40	0.13	Lawns Sandy/Flat 2%	0.08	0.15	Street Asph/Conc	0.90	0.00		0.00	0.52	10.80	6.26	0.91
E-20	0.40	0.17	Lawns Sandy/Flat 2%	0.08	0.23	Street Asph/Conc	0.90	0.00		0.00	0.00		0.00	0.55	11.64	6.08	1.32
E-21	1.55	0.96	Residental Single	0.40	0.25	Lawns Sandy/Flat 2%	0.08	0.34	Street Asph/Conc	0.90	0.00		0.00	0.46	24.95	4.23	3.01

NOTES:

1. CALCULATIONS MADE BY "GEOPAK DRAINAGE" HYDRAULIC COMPUTER PROGRAM.
2. ALLOWABLE PONDING WIDTH = 16' AS PER TXDOT BRIDGE DIVISION HYDRAULIC MANUAL
3. SEWER CALCULATIONS BASED ON MANNING'S FORMULA.
4. TW USED FOR THE STORM SEWER DESIGN WAS BASED ON OUTFALL SOFFIT ELEVATIONS WHICH ARE HIGHER THAN ACTUAL 5YR H.C.D.D. #1 TW ELEVATIONS.
5. RAINFALL FREQUENCY = 5 YR.
6. DRAINAGE LINK CONSIDERED FOR SRCMP MATERIAL ALTERNATIVE
7. RAINFALL INTENSITY REFERENCED FROM TxDOT'S "RAINFALL INTENSITY-DURATION-FREQUENCY COEFFICIENTS FOR TEXAS" WHICH ARE BASED ON UNITED STATES GEOLOGICAL SURVEY (USGS) SCIENTIFIC INVESTIGATIONS REPORT 2004-5041 "ATLAS OF DEPTH-DURATION FREQUENCY OF PRECIPITATION ANNUAL MAXIMA FOR TEXAS".

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
HYDRAULIC DATA
RUNOFF COMPUTATIONS

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					134
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:								
TR:		PHR	HIDALGO	0921	02	194		LIBERTY
CK TR:								

11/19/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\02 HydraulicData\Liberty-HydData.dgn

NETWORK "A"

NODE CONFIGURATION

Node ID	Library Item Name	Node Station	Node Offset (ft)	Node Elev. (ft)	Node Type	Profile Type	Spread X-Sect. Slope 1 (%)	Spread X-Sect. Width 1 (ft.)	Spread X-Sect. Slope 2 (%)	Spread X-Sect. Width 2 (ft.)	Spread X-Sect. Slope 3 (%)	Spread X-Sect. Width 3 (ft.)	Composite X-Sect. Spread Slope (%)	Longitudinal Slope (%)	Curb Length (ft)	Curb Depression (ft)	Curb Depression Width (ft)	Curb Height (ft)	Grate Length (ft)	Grate Width (ft)	Grate Area (ft)	Grate Perimeter (ft)
A-1	PCU10R-3x5	12+10.00	-34.50	160.48	Curb and Grate	On Grade	5.66	1.50	2.50	33.00	0.00	0.00	0.031	0.531	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
A-2	PCU10L-3x5	12+10.00	34.50	160.48	Curb and Grate	On Grade	5.66	1.50	2.50	33.00	0.00	0.00	0.031	0.531	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
A-3	PCU15-4x5	15+47.00	-34.50	159.25	Curb and Grate	Sag	5.56	1.50	2.50	33.00	0.00	0.00	0.028	n/a	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
A-4	PCU15-3x5	15+47.00	34.50	159.25	Curb and Grate	Sag	5.56	1.50	2.50	33.00	0.00	0.00	0.028	n/a	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
A-5	PCU15-5x5	19+06.00	-34.50	159.18	Curb and Grate	Sag	5.56	1.50	2.50	33.00	0.00	0.00	0.028	n/a	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
A-6	PCU15-3x5	19+06.00	34.50	159.18	Curb and Grate	Sag	5.56	1.50	2.50	33.00	0.00	0.00	0.028	n/a	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
A-7	PCU15-4x5	22+25.00	-34.50	159.65	Curb and Grate	Sag	5.56	1.50	2.50	33.00	0.00	0.00	0.028	n/a	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
A-8	PCU15-3x5	22+25.00	46.50	159.35	Curb and Grate	Sag	5.56	1.50	2.50	45.00	0.00	0.00	0.028	n/a	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
A-9	PCU10R-3x5	25+93.90	-80.75	161.40	Curb and Grate	On Grade	5.66	1.50	2.50	19.00	0.00	0.00	0.030	0.200	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
A-10	PCU10L-3x5	26+36.00	-85.50	161.30	Curb and Grate	On Grade	5.66	1.50	2.50	19.00	0.00	0.00	0.030	0.200	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
A-11	PCU15-4x5	29+10.00	-46.50	159.84	Curb and Grate	Sag	5.66	1.50	2.50	45.00	0.00	0.00	0.028	n/a	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
A-12	PCU15-3x5	29+10.00	34.50	160.14	Curb and Grate	Sag	5.66	1.50	2.50	33.00	0.00	0.00	0.028	n/a	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
A-13	PCU15-4x5	34+14.00	-34.50	160.30	Curb and Grate	Sag	5.66	1.50	2.50	33.00	0.00	0.00	0.030	n/a	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
A-14	PCU15-3x5	34+14.00	34.50	160.30	Curb and Grate	Sag	5.66	1.50	2.50	33.00	0.00	0.00	0.029	n/a	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
A-15	PCU10R-3x5	35+70.00	-34.50	161.06	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.031	0.977	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
A-16	PCU10L-3x5	35+70.00	34.50	161.06	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.030	0.977	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
A-17	PCU10R-3x5	38+30.00	-34.50	165.69	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.033	2.420	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
A-18	PCU10L-3x5	38+30.00	34.50	165.69	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.032	2.420	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
A-JCT1	PJB 5x5	15+69.82	-34.00	157.13	Junction	On Grade	5.66	1.50	2.50	33.00	0.00	0.00	0.035	0.000	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
A-JCT2	PJB 4x4	15+54.52	-34.00	157.13	Junction	On Grade	5.66	1.50	2.50	33.00	0.00	0.00	0.035	0.053	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
A-JCT3	PJB 5x5	20+78.45	-40.51	157.03	Junction	On Grade	5.66	1.50	2.50	33.00	0.00	0.00	0.035	0.410	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
A-JCT4	PJB 4x4	14+12.50	-33.50	158.00	Junction	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.031	0.880	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
A-MH1	PSL RC 6x6	21+50.00	-38.50	159.77	Junction	On Grade	5.66	1.50	2.50	33.00	0.00	0.00	0.035	0.003	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
A-MH2	PJB 4x4	25+96.00	-44.00	157.50	Junction	On Grade	5.66	1.50	2.50	40.00	0.00	0.00	0.035	0.260	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
A-MH3	PSL RC 5x5	31+05.00	-50.00	160.26	Junction	On Grade	5.66	1.50	2.50	45.00	0.00	0.00	0.035	0.140	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
A-MH4	PSL RC 5x5	32+15.00	-38.00	160.62	Junction	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.031	0.051	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
A-MH5	PSL RC 6x6	21+50.00	134.00	160.00	Junction	On Grade	5.66	1.50	2.50	33.00	0.00	0.00	0.035	0.000	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
A-OUT	OUTLET	21+57.17	890.00	158.00	Outlet	On Grade	5.66	1.50	2.50	33.00	0.00	0.00	0.035	0.000	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

NODE HYDRAULICS

Node ID	Node Type	Node Profile Type	Node Station	Discharge (ft^3/s)	Capacity (ft^3/s)	Max By Pass Flow (ft^3/s)	By Pass Flow (ft^3/s)	By Pass Flow Into Node (ft^3/s)	By Pass Node ID	Node Length (ft)	Max Ponded Depth (ft)	Computed Ponded Depth (ft)	Max Ponded Width (ft)	Computed Ponded Width (ft)
A-1	Curb and Grate	On Grade	12+10.00	2.09	2.09	0.50	0.01	0.00		9.50	0.50	0.26	16.00	8.58
A-2	Curb and Grate	On Grade	12+10.00	1.95	1.94	0.50	0.00	0.00		9.50	0.50	0.26	16.00	8.33
A-3	Curb and Grate	Sag	15+47.00	5.91	22.02	0.50	0.00	0.00		14.00	0.50	0.39	16.00	13.94
A-4	Curb and Grate	Sag	15+47.00	6.91	22.02	0.50	0.00	0.00		14.00	0.50	0.44	16.00	15.67
A-5	Curb and Grate	Sag	19+06.00	5.87	22.02	0.50	0.00	0.00		14.00	0.50	0.39	16.00	13.87
A-6	Curb and Grate	Sag	19+06.00	5.91	22.02	0.50	0.00	0.00		14.00	0.50	0.39	16.00	13.94
A-7	Curb and Grate	Sag	22+25.00	6.95	22.02	0.50	0.00	0.00		14.00	0.50	0.44	16.00	15.75
A-8	Curb and Grate	Sag	22+25.00	7.06	22.02	0.50	0.00	0.00		14.00	0.50	0.44	16.00	15.92
A-9	Curb and Grate	On Grade	25+93.90	1.51	1.51	0.50	0.00	0.00	A-7	9.50	0.50	0.28	10.00	9.17
A-10	Curb and Grate	On Grade	26+36.00	1.78	1.78	0.50	0.00	0.00	A-11	9.50	0.50	0.29	10.00	9.82
A-11	Curb and Grate	Sag	29+10.00	6.58	22.02	0.50	0.00	0.00		14.00	0.50	0.42	16.00	15.05
A-12	Curb and Grate	Sag	29+10.00	6.71	22.02	0.50	0.00	0.00		14.00	0.50	0.43	16.00	15.27
A-13	Curb and Grate	Sag	34+14.00	3.36	22.02	0.50	0.00	0.02		14.00	0.50	0.27	16.00	10.23
A-14	Curb and Grate	Sag	34+14.00	4.99	22.02	0.50	0.00	0.16		14.00	0.50	0.35	16.00	12.19
A-15	Curb and Grate	On Grade	35+70.00	1.98	1.96	0.50	0.02	0.06	A-13	9.50	0.50	0.23	16.00	7.38
A-16	Curb and Grate	On Grade	35+70.00	3.34	3.19	0.50	0.16	0.11	A-14	9.50	0.50	0.28	16.00	9.19
A-17	Curb and Grate	On Grade	38+30.00	2.01	1.95	0.50	0.06	0.00	A-15	9.50	0.50	0.20	16.00	6.10
A-18	Curb and Grate	On Grade	38+30.00	2.37	2.26	0.50	0.11	0.00	A-16	9.50	0.50	0.21	16.00	6.55
A-JCT1	Junction	On Grade	15+69.82	0.56	0.53	0.50	0.00	0.00		n/a	0.50	0.17	16.00	4.89
A-JCT2	Junction	On Grade	15+54.52	0.56	0.53	0.50	0.00	0.00		n/a	0.50	0.17	16.00	4.89
A-JCT3	Junction	On Grade	20+78.45	0.56	0.53	0.50	0.00	0.00		n/a	0.50	0.17	16.00	4.89
A-JCT4	Junction	On Grade	14+12.50	3.58	2.37	0.50	0.00	0.00		n/a	0.50	0.24	16.00	7.83
A-MH1	Junction	On Grade	21+50.00	0.56	0.53	0.50	0.00	0.00		n/a	0.50	0.17	16.00	4.89
A-MH2	Junction	On Grade	25+96.00	0.56	0.53	0.50	0.00	0.00		n/a	0.50	0.17	16.00	4.89
A-MH3	Junction	On Grade	31+05.00	0.56	0.53	0.50	0.00	0.00		n/a	0.50	0.17	16.00	4.89
A-MH4	Junction	On Grade	32+15.00	3.58	2.37	0.50	0.00	0.00		n/a	0.50	0.24	16.00	7.83
A-MH5	Junction	On Grade	21+50.00	0.56	0.53	0.50	0.00	0.00		n/a	0.50	0.17	16.00	4.89
A-OUT	Outlet	On Grade	21+57.17	0.56	0.53	0.50	0.00	0.00		n/a	0.50	0.17	16.00	4.89

NOTES:

1. CALCULATIONS MADE BY "GEOPAK DRAINAGE" HYDRAULIC COMPUTER PROGRAM.
2. ALLOWABLE PONDING WIDTH = 16' AS PER TXDOT BRIDGE DIVISION HYDRAULIC MANUAL
3. SEWER CALCULATIONS BASED ON MANNING'S FORMULA.
4. TW USED FOR THE STORM SEWER DESIGN WAS BASED ON OUTFALL SOFFIT ELEVATIONS WHICH ARE HIGHER THAN ACTUAL 5YR H.C.D.D. #1 TW ELEVATIONS.
5. RAINFALL FREQUENCY = 5 YR.
6. DRAINAGE LINK CONSIDERED FOR SRCMP MATERIAL ALTERNATIVE

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED
PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO
TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
HYDRAULIC DATA
NETWORK "A"

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					135
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

11/19/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3\05 DRAINAGE\02 HydraulicData\Liberty_HydData.dgn

NETWORK "A"

LINK CONFIGURATION

	Link ID	Type	Upstream Node	Downstream Node	Material	Library Item Name	Number of Barrels	Actual Length (ft)	Hydraulic Length (ft)	Manning's N Value	Slope (%)	Rise (ft)	Span (ft)	Soffit Upstream (ft)	Soffit Downstream (ft)	Invert Upstream (ft)	Invert Downstream (ft)
X	LA-1	Pipe	A-JCT2	A-JCT1	Concrete	36 Inch Dia. Circular	1.00	10.86	15.36	0.012	0.200	3.00	n/a	155.40	155.37	152.40	152.37
X	LA-2	Pipe	A-3	A-JCT2	Concrete	36 Inch Dia. Circular	1.00	3.06	7.56	0.012	0.250	3.00	n/a	155.42	155.40	152.42	152.40
	LA-3	Pipe	A-2	A-1	Concrete	18 Inch Dia. Circular	1.00	65.50	68.50	0.012	0.250	1.50	n/a	156.27	156.10	154.77	154.60
X	LA-4	Pipe	A-1	A-JCT4	Concrete	18 Inch Dia. Circular	1.00	198.18	202.68	0.012	0.200	1.50	n/a	156.10	155.69	154.60	154.19
	LA-5	Pipe	A-4	A-3	Concrete	24 Inch Dia. Circular	1.00	64.50	68.00	0.012	0.250	2.00	n/a	155.70	155.53	153.70	153.53
X	LA-6	Pipe	A-JCT1	A-5	Concrete	42 Inch Dia. Circular	1.00	332.37	337.37	0.012	0.200	3.50	n/a	155.37	154.70	151.87	151.20
	LA-7	Pipe	A-6	A-5	Concrete	18 Inch Dia. Circular	1.00	63.50	67.50	0.012	0.250	1.50	n/a	155.60	155.43	154.10	153.93
X	LA-8	Pipe	A-5	A-JCT3	Concrete	42 Inch Dia. Circular	1.00	168.28	173.28	0.012	0.200	3.50	n/a	154.70	154.35	151.20	150.85
X	LA-10	Pipe	A-JCT3	A-MH1	Concrete	42 Inch Dia. Circular	1.00	66.39	71.89	0.012	0.200	3.50	n/a	154.35	154.21	150.85	150.71
X	LA-11	Pipe	A-17	A-15	Concrete	18 Inch Dia. Circular	1.00	255.00	260.00	0.012	0.200	1.50	n/a	157.56	157.04	156.06	155.54
	LA-12	Pipe	A-16	A-15	Concrete	18 Inch Dia. Circular	1.00	65.50	68.50	0.012	0.250	1.50	n/a	157.50	157.33	156.00	155.83
X	LA-13	Pipe	A-15	A-13	Concrete	24 Inch Dia. Circular	1.00	151.00	156.00	0.012	0.200	2.00	n/a	157.04	156.73	155.04	154.73
	LA-14	Pipe	A-14	A-13	Concrete	18 Inch Dia. Circular	1.00	64.50	68.00	0.012	0.250	1.50	n/a	156.70	156.53	155.20	155.03
X	LA-15	Pipe	A-13	A-MH4	Concrete	30 Inch Dia. Circular	1.00	193.42	198.42	0.012	0.200	2.50	n/a	156.73	156.33	154.23	153.83
X	LA-16	Pipe	A-MH4	A-MH3	Concrete	30 Inch Dia. Circular	1.00	105.17	110.17	0.012	0.200	2.50	n/a	156.33	156.11	153.83	153.61
	LA-17	Pipe	A-12	A-11	Concrete	24 Inch Dia. Circular	1.00	76.50	80.00	0.012	0.250	2.00	n/a	156.50	156.30	154.50	154.30
	LA-18	Pipe	A-11	A-MH2	Concrete	36 Inch Dia. Circular	1.00	307.99	312.49	0.012	0.200	3.00	n/a	155.73	155.10	152.73	152.10
	LA-19	Pipe	A-10	A-9	Concrete	18 Inch Dia. Circular	1.00	38.50	41.50	0.012	0.250	1.50	n/a	157.50	157.40	156.00	155.90
	LA-20	Pipe	A-9	A-MH2	Concrete	18 Inch Dia. Circular	1.00	32.33	36.83	0.012	0.250	1.50	n/a	155.19	155.10	153.69	153.60
	LA-21	Pipe	A-MH2	A-7	Concrete	36 Inch Dia. Circular	1.00	366.21	370.71	0.012	0.200	3.00	n/a	155.10	154.36	152.10	151.36
	LA-22	Pipe	A-8	A-7	Concrete	24 Inch Dia. Circular	1.00	76.50	80.00	0.012	0.250	2.00	n/a	155.70	155.50	153.70	153.50
X	LA-23	Pipe	A-7	A-MH1	Concrete	36 Inch Dia. Circular	1.00	69.95	75.45	0.012	0.200	3.00	n/a	154.36	154.21	151.36	151.21
	LA-24	Pipe	A-MH1	A-MH5	Concrete	48 Inch Dia. Circular	1.00	170.00	176.00	0.012	0.300	4.00	n/a	154.21	153.70	150.21	149.70
	LA-25	Pipe	A-18	A-17	Concrete	18 Inch Dia. Circular	1.00	65.50	68.50	0.012	0.250	1.50	n/a	157.73	157.56	156.23	156.06
X	LA-26	Pipe	A-MH3	A-11	Concrete	30 Inch Dia. Circular	1.00	189.05	194.05	0.012	0.200	2.50	n/a	156.11	155.73	153.61	153.23
X	LA-27	Pipe	A-JCT4	A-3	Concrete	30 Inch Dia. Circular	1.00	130.48	134.98	0.012	0.200	2.50	n/a	155.69	155.42	153.19	152.92
	LA-28	Pipe	A-MH5	A-OUT	Concrete	48 Inch Dia. Circular	1.00	725.00	728.00	0.012	0.300	4.00	n/a	153.70	151.50	149.70	147.50

LINK HYDRAULICS

Link ID	Upstream Node	Downstream Node	Discharge (ft^3/s)	Capacity (ft^3/s)	Uniform Depth (ft)	Uniform Velocity (ft/s)	Critical Depth (ft)	Critical Velocity (ft/s)	Critical Slope (%)	Frict. Slope (%)	Actual Vel. U.S. (ft/s)	Actual Vel. D.S. (ft/s)	Actual Depth U.S. (ft)	Actual Depth D.S. (ft)	HGL U.S. (ft)	HGL D.S. (ft)	EGL U.S. (ft)	EGL D.S. (ft)
LA-1	A-JCT2	A-JCT1	32.67	34.76	2.46	5.26	1.86	7.12	0.004	0.002	6.42	6.76	2.03	1.94	154.43	154.31	155.08	154.74
LA-2	A-3	A-JCT2	27.68	38.86	1.98	5.59	1.70	6.69	0.004	0.002	5.45	5.44	2.03	2.03	154.45	154.43	154.91	155.08
LA-3	A-2	A-1	1.95	6.12	0.61	2.92	0.53	3.52	0.004	0.002	1.94	1.60	0.83	0.98	155.60	155.58	155.66	155.74
LA-4	A-1	A-JCT4	3.94	5.47	0.99	3.19	0.76	4.39	0.005	0.002	3.24	4.39	0.98	0.76	155.58	154.95	155.74	155.31
LA-5	A-4	A-3	6.91	13.18	1.09	3.97	0.93	4.81	0.004	0.002	3.04	4.81	1.36	0.93	155.06	154.46	155.06	154.91
LA-6	A-JCT1	A-5	37.66	52.43	2.31	5.59	1.91	7.03	0.004	0.002	5.26	4.81	2.44	2.65	154.31	153.85	154.74	154.42
LA-7	A-6	A-5	5.91	6.12	1.32	3.59	0.94	5.08	0.005	0.002	3.38	5.08	1.45	0.94	155.55	154.87	155.55	154.42
LA-8	A-5	A-JCT3	47.26	52.43	2.77	5.78	2.15	7.64	0.004	0.002	6.04	6.26	2.65	2.56	153.85	153.42	154.42	154.07
LA-10	A-JCT3	A-MH1	49.08	52.43	2.88	5.80	2.19	7.75	0.004	0.002	6.50	6.87	2.56	2.43	153.42	153.14	154.07	154.08
LA-11	A-17	A-15	3.42	5.47	0.90	3.08	0.71	4.19	0.004	0.002	3.11	4.19	0.90	0.71	156.96	156.25	157.11	156.38
LA-12	A-16	A-15	3.24	6.12	0.81	3.30	0.69	4.11	0.004	0.002	2.60	4.11	1.00	0.69	157.00	156.51	157.00	156.38
LA-13	A-15	A-13	6.80	11.79	1.14	3.66	0.93	4.79	0.004	0.002	3.75	4.65	1.12	0.95	156.17	155.68	156.38	155.96
LA-14	A-14	A-13	4.83	6.12	1.06	3.63	0.85	4.71	0.005	0.003	3.02	4.71	1.27	0.85	156.47	155.88	156.47	155.96
LA-15	A-13	A-MH4	12.62	21.38	1.47	4.22	1.19	5.46	0.004	0.002	4.29	4.29	1.45	1.45	155.68	155.28	155.96	155.57
LA-16	A-MH4	A-MH3	12.62	21.38	1.47	4.22	1.19	5.46	0.004	0.002	4.29	4.30	1.45	1.44	155.28	155.06	155.57	155.35
LA-17	A-12	A-11	6.71	13.18	1.06	3.99	0.92	4.77	0.004	0.002	3.01	4.77	1.34	0.92	155.84	155.22	155.84	155.04
LA-18	A-11	A-MH2	23.71	34.76	1.94	4.92	1.57	6.34	0.004	0.002	4.92	4.68	1.94	2.02	154.66	154.12	155.04	154.49
LA-19	A-10	A-9	1.78	6.12	0.57	2.88	0.50	3.43	0.004	0.003	2.28	3.43	0.68	0.50	156.68	156.40	156.70	154.67
LA-20	A-9	A-MH2	3.26	6.12	0.81	3.33	0.69	4.12	0.004	0.002	3.47	4.12	0.79	0.69	154.48	154.29	154.67	154.49
LA-21	A-MH2	A-7	24.61	34.76	1.94	5.10	1.60	6.42	0.004	0.002	4.86	4.41	2.02	2.21	154.12	153.57	154.49	154.14
LA-22	A-8	A-7	7.06	13.18	1.09	4.05	0.94	4.85	0.004	0.003	3.06	4.85	1.38	0.94	155.08	154.44	155.08	154.14
LA-23	A-7	A-MH1	33.76	34.76	2.64	5.13	1.89	7.21	0.004	0.002	6.05	7.01	2.21	1.93	153.57	153.14	154.14	154.08
LA-24	A-MH1	A-MH5	76.91	91.69	2.93	7.79	2.66	8.68	0.004	0.003	7.79	7.79	2.93	2.93	153.14	151.78	154.08	152.72
LA-25	A-18	A-17	2.37	6.12	0.67	3.09	0.58	3.73	0.004	0.003	2.40	2.15	0.82	0.90	157.05	156.96	157.11	157.11
LA-26	A-MH3	A-11	12.62	21.38	1.47	4.22	1.19	5.46	0.004	0.002	4.30	4.33	1.44	1.44	155.06	154.66	155.35	155.04
LA-27	A-JCT4	A-3	17.83	21.38	1.83	4.62	1.43	6.14	0.004	0.002	4.89	5.67	1.74	1.53	154.93	154.45	155.31	154.91
LA-28	A-MH5	A-OUT	76.91	91.69	2.93	7.79	2.66	8.68	0.004	0.003	7.79	8.68	2.93	2.66	151.78	150.16	152.72	151.33

NOTES:

1. CALCULATIONS MADE BY "GEOPAK DRAINAGE" HYDRAULIC COMPUTER PROGRAM.
2. ALLOWABLE PONDING WIDTH = 16' AS PER TXDOT BRIDGE DIVISION HYDRAULIC MANUAL
3. SEWER CALCULATIONS BASED ON MANNING'S FORMULA.
4. TW USED FOR THE STORM SEWER DESIGN WAS BASED ON OUTFALL SOFFIT ELEVATIONS WHICH ARE HIGHER THAN ACTUAL 5YR H.C.D.D. #1 TW ELEVATIONS.
5. RAINFALL FREQUENCY = 5 YR.
6. X DRAINAGE LINK CONSIDERED FOR SRCMP MATERIAL ALTERNATIVE

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
HYDRAULIC DATA
NETWORK "A"

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					136
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

11/19/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\02 HydraulicData\Liberty_HydData.dgn

NETWORK "B"

NODE CONFIGURATION

Node ID	Library Item Name	Node Station	Node Offset (ft)	Node Elev. (ft)	Node Type	Profile Type	Spread X-Sect. Slope 1 (%)	Spread X-Sect. Width 1 (ft.)	Spread X-Sect. Slope 2 (%)	Spread X-Sect. Width 2 (ft.)	Spread X-Sect. Slope 3 (%)	Spread X-Sect. Width 3 (ft.)	Composite X-Sect. Spread Slope (%)	Longitudinal Slope (%)	Curb Length (ft)	Curb Depression (ft)	Curb Depression Width (ft)	Curb Height (ft)	Grate Length (ft)	Grate Width (ft)	Grate Area (ft)	Grate Perimeter (ft)
B-1	PCU10L-4x5	43+80.00	-34.50	166.81	Curb and Grate	On Grade	5.66	1.50	2.50	33.00	0.00	0.00	0.033	2.056	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
B-2	PCU10R-3x5	43+80.00	34.50	166.81	Curb and Grate	On Grade	5.66	1.50	2.50	33.00	0.00	0.00	0.036	2.056	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
B-3	PCU15-4x5	47+17.00	-43.20	162.16	Curb and Grate	Sag	5.66	1.50	2.50	41.65	0.00	0.00	0.029	n/a	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
B-4	PCU15-3x5	47+17.00	43.20	162.16	Curb and Grate	Sag	5.66	1.50	2.50	41.65	0.00	0.00	0.030	n/a	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
B-5	PCU10R-3x5	49+00.00	-48.00	162.71	Curb and Grate	On Grade	5.66	1.50	2.50	46.50	0.00	0.00	0.030	0.430	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
B-6	PCU10L-3x5	49+00.00	48.00	162.71	Curb and Grate	On Grade	5.66	1.50	2.50	46.50	0.00	0.00	0.031	0.430	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
B-7	PCU10R-3x5	51+50.00	-48.00	163.82	Curb and Grate	On Grade	5.66	1.50	2.50	46.50	0.00	0.00	0.030	0.480	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
B-8	PCU10L-3x5	51+50.00	48.00	163.82	Curb and Grate	On Grade	5.66	1.50	2.50	46.50	0.00	0.00	0.030	0.480	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
B-9	PCU5-3x5	54+00.00	-48.00	165.02	Curb and Grate	On Grade	5.66	1.50	2.50	46.50	0.00	0.00	0.033	0.480	5.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
B-10	PCU5-3x5	54+00.00	48.00	165.02	Curb and Grate	On Grade	5.66	1.50	2.50	46.50	0.00	0.00	0.033	0.480	5.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
B-MH1	PJB 5x5	43+80.00	-48.00	160.50	Junction	On Grade	5.66	1.50	2.50	33.00	0.00	0.00	0.028	2.056	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
B-OUT	OUTLET	42+75.00	-48.50	161.80	Outlet	On Grade	5.66	1.50	2.50	33.00	0.00	0.00	0.028	0.000	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

NODE HYDRAULICS

Node ID	Node Type	Node Profile Type	Node Station	Discharge (ft^3/s)	Capacity (ft^3/s)	Max By Pass Flow (ft^3/s)	By Pass Flow (ft^3/s)	By Pass Flow Into Node (ft^3/s)	By Pass Node ID	Node Length (ft)	Max Ponded Depth (ft)	Computed Ponded Depth (ft)	Max Ponded Width (ft)	Computed Ponded Width (ft)
B-1	Curb and Grate	On Grade	43+80.00	1.54	1.53	0.50	0.01	0.00	B-3	9.50	0.50	0.19	16.00	5.59
B-2	Curb and Grate	On Grade	43+80.00	0.85	0.85	0.50	0.00	0.00	B-4	9.50	0.50	0.15	14.00	4.23
B-3	Curb and Grate	Sag	47+17.00	4.52	22.02	0.00	0.00	0.01		14.00	0.50	0.33	16.00	11.29
B-4	Curb and Grate	Sag	47+17.00	3.41	22.02	0.00	0.00	0.00		14.00	0.50	0.27	16.00	10.44
B-5	Curb and Grate	On Grade	49+00.00	2.06	2.06	0.50	0.00	0.02	B-3	9.50	0.50	0.27	16.00	8.91
B-6	Curb and Grate	On Grade	49+00.00	1.89	1.89	0.50	0.00	0.05	B-4	9.50	0.50	0.26	16.00	8.59
B-7	Curb and Grate	On Grade	51+50.00	2.54	2.52	0.50	0.02	0.06	B-5	9.50	0.50	0.29	16.00	9.50
B-8	Curb and Grate	On Grade	51+50.00	3.03	2.98	0.50	0.05	0.07	B-6	9.50	0.50	0.30	16.00	10.20
B-9	Curb and Grate	On Grade	54+00.00	0.78	0.71	0.50	0.06	0.00	B-7	5.00	0.50	0.19	16.00	5.71
B-10	Curb and Grate	On Grade	54+00.00	0.82	0.75	0.50	0.07	0.00	B-8	5.00	0.50	0.19	16.00	5.83
B-MH1	Junction	On Grade	43+80.00	9.24	8.07	0.00	0.00	0.00		n/a	0.50	0.44	16.00	15.86
B-OUT	Outlet	On Grade	42+75.00	9.24	8.07	0.00	0.00	0.00		n/a	0.50	0.44	16.00	15.86

LINK CONFIGURATION

Link ID	Type	Upstream Node	Downstream Node	Material	Library Item Name	Number of Barrels	Actual Length (ft)	Hydraulic Length (ft)	Manning's N Value	Slope (%)	Rise (ft)	Span (ft)	Soffit Upstream (ft)	Soffit Downstream (ft)	Invert Upstream (ft)	Invert Downstream (ft)
LB-1	Pipe	B-10	B-9	Concrete	18 Inch Dia. Circular	1.00	92.50	95.50	0.012	0.250	1.50	n/a	160.29	160.05	158.79	158.55
✳ LB-2	Pipe	B-9	B-7	Concrete	18 Inch Dia. Circular	1.00	245.00	250.00	0.012	0.250	1.50	n/a	160.05	159.42	158.55	157.92
LB-3	Pipe	B-8	B-7	Concrete	18 Inch Dia. Circular	1.00	92.50	95.50	0.012	0.250	1.50	n/a	160.10	159.86	158.60	158.36
✳ LB-4	Pipe	B-7	B-5	Concrete	24 Inch Dia. Circular	1.00	245.00	250.00	0.012	0.250	2.00	n/a	159.42	158.80	157.42	156.80
LB-5	Pipe	B-6	B-5	Concrete	18 Inch Dia. Circular	1.00	92.50	95.50	0.012	0.250	1.50	n/a	159.00	158.76	157.50	157.26
✳ LB-6	Pipe	B-5	B-3	Concrete	24 Inch Dia. Circular	1.00	178.05	183.05	0.012	0.250	2.00	n/a	158.80	158.34	156.80	156.34
LB-7	Pipe	B-4	B-3	Concrete	18 Inch Dia. Circular	1.00	81.90	85.40	0.012	0.250	1.50	n/a	158.50	158.29	157.00	156.79
✳ LB-8	Pipe	B-3	B-1	Concrete	30 Inch Dia. Circular	1.00	332.14	337.14	0.012	0.250	2.50	n/a	158.34	157.50	155.84	155.00
LB-9	Pipe	B-2	B-1	Concrete	18 Inch Dia. Circular	1.00	64.50	68.00	0.012	0.250	1.50	n/a	163.10	162.93	161.60	161.43
✳ LB-10	Pipe	B-1	B-MH1	Concrete	30 Inch Dia. Circular	1.00	9.75	14.25	0.012	0.250	2.50	n/a	157.50	157.46	155.00	154.96
✳ LB-11	Pipe	B-MH1	B-OUT	Concrete	36 Inch Dia. Circular	1.00	102.50	105.00	0.012	0.250	3.00	n/a	152.46	152.20	149.46	149.20

LINK HYDRAULICS

Link ID	Upstream Node	Downstream Node	Discharge (ft^3/s)	Capacity (ft^3/s)	Uniform Depth (ft)	Uniform Velocity (ft/s)	Critical Depth (ft)	Critical Velocity (ft/s)	Critical Slope (%)	Frict. Slope (%)	Actual Vel. U.S. (ft/s)	Actual Vel. D.S. (ft/s)	Actual Depth U.S. (ft)	Actual Depth D.S. (ft)	HGL U.S. (ft)	HGL D.S. (ft)	EGL U.S. (ft)	EGL D.S. (ft)
LB-1	B-10	B-9	0.82	6.12	0.39	2.27	0.34	2.74	0.004	0.002	2.05	1.51	0.41	0.52	159.20	159.06	159.25	159.18
LB-2	B-9	B-7	1.46	6.12	0.52	2.71	0.45	3.24	0.004	0.003	2.71	2.67	0.52	0.52	159.06	158.44	159.18	158.67
LB-3	B-8	B-7	2.96	6.12	0.77	3.24	0.65	4.00	0.004	0.002	2.53	4.00	0.94	0.65	159.54	159.02	159.54	158.67
LB-4	B-7	B-5	6.20	13.18	1.00	3.96	0.88	4.65	0.004	0.003	3.84	2.87	1.02	1.30	158.44	158.10	158.67	158.39
LB-5	B-6	B-5	1.84	6.12	0.58	2.90	0.51	3.47	0.004	0.003	2.29	1.82	0.70	0.83	158.20	158.10	158.25	158.39
LB-6	B-5	B-3	9.37	13.18	1.32	4.26	1.09	5.33	0.004	0.002	4.34	5.33	1.30	1.09	158.10	157.43	158.39	157.72
LB-7	B-4	B-3	3.41	6.12	0.84	3.37	0.70	4.18	0.004	0.003	2.64	4.18	1.03	0.70	158.03	157.49	158.03	157.72
LB-8	B-3	B-1	15.11	23.90	1.50	4.90	1.31	5.80	0.004	0.003	4.90	4.91	1.50	1.50	157.34	156.50	157.72	156.97
LB-9	B-2	B-1	0.85	6.12	0.40	2.29	0.34	2.80	0.004	0.002	2.07	2.80	0.43	0.34	162.03	161.77	162.08	156.97
LB-10	B-1	B-MH1	17.01	23.90	1.65	4.95	1.40	6.04	0.004	0.002	5.53	6.04	1.50	1.40	156.50	156.36	156.97	152.34
LB-11	B-MH1	B-OUT	17.01	38.86	1.45	5.02	1.32	5.69	0.003	0.002	2.49	2.41	2.78	3.00	152.25	152.20	152.34	152.29

NOTES:

1. CALCULATIONS MADE BY "GEOPAK DRAINAGE" HYDRAULIC COMPUTER PROGRAM.
2. ALLOWABLE PONDING WIDTH = 16' AS PER TXDOT BRIDGE DIVISION HYDRAULIC MANUAL
3. SEWER CALCULATIONS BASED ON MANNING'S FORMULA.
4. TW USED FOR THE STORM SEWER DESIGN WAS BASED ON OUTFALL SOFFIT ELEVATIONS WHICH ARE HIGHER THAN ACTUAL 5YR H.C.D.D. #1 TW ELEVATIONS.
5. RAINFALL FREQUENCY = 5 YR.
6. ✳ DRAINAGE LINK CONSIDERED FOR SRCMP MATERIAL ALTERNATIVE

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
09/22/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
HYDRAULIC DATA
NETWORK "B"

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				137
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

9/22/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3\05 DRAINAGE\02 HydraulicData\Liberty_HydData.dgn

NETWORK "C"

NODE CONFIGURATION

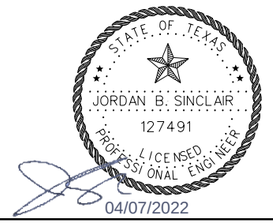
Node ID	Library Item Name	Node Station	Node Offset (ft)	Node Elev. (ft)	Node Type	Profile Type	Spread X-Sect. Slope 1 (%)	Spread X-Sect. Width 1 (ft)	Spread X-Sect. Slope 2 (%)	Spread X-Sect. Width 2 (ft)	Composite X-Sect. Spread (%)	Longitudinal Slope (%)	Curb Length (ft)	Curb Depression (ft)	Curb Depression Width (ft)	Curb Height (ft)	Grate Length (ft)	Grate Width (ft)	Grate Area (sf)	Grate Perimeter (ft)
C-01	PCU15-5x5	59+55.00	-48.00	168.35	Curb and Grate	On Grade	5.560	1.50	1.360	46.50	0.017	0.290	14.00	0.25	1.50	0.50	4.96	1.39	2.29	7.73
C-02	PCO15-5x5	59+55.00	48.00	168.35	Curb	On Grade	5.560	1.50	1.360	46.50	0.018	0.290	14.00	0.25	1.50	0.50	n/a	n/a	n/a	n/a
C-03	PCU10R-4x5	60+65.00	-48.00	168.05	Curb and Grate	Sag	5.560	1.50	2.500	46.50	0.028	n/a	9.50	0.25	1.50	0.50	4.96	1.39	2.29	7.73
C-04	PCU10L-3x5	60+65.00	48.00	168.05	Curb and Grate	Sag	5.560	1.50	2.500	46.50	0.028	n/a	9.50	0.25	1.50	0.50	4.96	1.39	2.29	7.73
C-05	PCU15-4x5	65+12.00	-46.60	170.10	Curb and Grate	Sag	5.560	1.50	2.500	45.10	0.028	n/a	14.00	0.25	1.50	0.50	4.96	1.39	2.29	7.73
C-06	PCU15-3x5	65+12.00	46.70	170.10	Curb and Grate	Sag	5.560	1.50	2.500	45.20	0.028	n/a	14.00	0.25	1.50	0.50	4.96	1.39	2.29	7.73
C-07	PCU15-4x5 (mod)	67+50.00	-38.00	171.83	Curb and Grate	On Grade	5.560	1.50	2.500	36.50	0.030	0.850	14.00	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-08	PCU15-3x5 (mod)	67+50.00	38.60	171.82	Curb and Grate	On Grade	5.560	1.50	2.500	37.10	0.030	0.850	14.00	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-09	PCU15-4x5 (mod)	70+30.00	-34.50	174.10	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.029	0.370	14.00	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-10	PCU10L-3x5 (mod)	70+30.00	34.50	174.10	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.029	0.370	9.50	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-11	PCU15-4x5 (mod)	72+50.00	-34.50	175.76	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.030	0.720	14.00	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-12	PCU10L-3x5 (mod)	72+50.00	34.50	175.76	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.030	0.720	9.50	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-13	PCU15-4x5 (mod)	75+50.00	-34.50	179.85	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.030	1.660	14.00	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-14	PCU10L-3x5 (mod)	75+50.00	34.50	179.85	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.030	1.660	9.50	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-15	PCU15-4x5 (mod)	78+50.00	-34.50	183.23	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.030	0.950	14.00	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-16	PCU10L-3x5 (mod)	78+50.00	34.50	183.23	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.030	0.950	9.50	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-17	PCU10R-4x5 (mod)	81+50.00	-34.50	186.09	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.029	0.510	9.50	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-18	PCU10L-3x5 (mod)	81+50.00	34.50	186.09	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.029	0.510	9.50	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-19	PCU10R-4x5 (mod)	84+50.00	-34.50	188.05	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.029	0.580	9.50	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-20	PCU10L-3x5 (mod)	84+50.00	34.50	188.05	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.029	0.580	9.50	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-21	PCU15-3x5 (mod)	87+13.00	-34.50	188.33	Curb and Grate	Sag	5.560	1.50	2.500	33.00	0.029	n/a	14.00	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-22	PCU15-3x5 (mod)	87+13.00	34.50	188.33	Curb and Grate	Sag	5.560	1.50	2.500	33.00	0.029	n/a	14.00	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-23	PCU10R-3x5 (mod)	88+13.00	-34.50	188.76	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.030	0.860	9.50	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-24	PCU10R-3x5 (mod)	88+13.00	34.50	188.76	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.030	0.860	9.50	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-25	PCU10R-3x5 (mod)	90+50.00	-34.50	191.60	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.029	0.550	9.50	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-26	PCU10L-3x5 (mod)	90+50.00	34.50	191.60	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.029	0.550	9.50	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-27	PCU10R-3x5 (mod)	93+50.00	-34.50	193.24	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.030	0.710	9.50	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-28	PCU10L-3x5 (mod)	93+50.00	34.50	193.24	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.029	0.710	9.50	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-29	PCU10R-3x5 (mod)	96+50.00	-34.50	195.42	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.031	0.920	9.50	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-30	PCU10L-3x5 (mod)	96+50.00	34.50	195.42	Curb and Grate	On Grade	5.560	1.50	2.500	33.00	0.030	0.920	9.50	0.08	1.50	0.50	4.96	1.39	2.29	7.73
C-JCT1	JCT	59+82.00	50.70	169.80	Junction	On Grade	5.560	1.50	2.500	46.50	0.037	0.200	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
C-MH1	5x5JB	58+81.00	50.00	165.94	Junction	On Grade	0.000	0.00	0.000	0.00	0.034	0.390	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
C-OUT	OUTLET	58+80.50	70.86	168.50	Outlet	On Grade	5.660	1.50	2.500	33.00	0.034	0.000	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

NODE HYDRAULICS

Node ID	Node Type	Node Profile Type	Node Station	Discharge (ft^3/s)	Capacity (ft^3/s)	Max By Pass Flow (ft^3/s)	By Pass Flow (ft^3/s)	By Pass Flow Into Node (ft^3/s)	By Pass Node ID	Node Length Actual (ft)	Max Ponded Depth (ft)	Computed Ponded Depth (ft)	Max Ponded Width (ft)	Computed Ponded Width (ft)	Ponded Width Right (ft)	Ponded Width Left (ft)
C-1	Curb and Grate	On Grade	59+55.00	2.83	2.83	0.00	0.00	0.00	C-3	14.00	0.50	0.29	22.00	16.43	n/a	n/a
C-2	Curb	On Grade	59+55.00	1.72	1.72	0.50	0.00	0.00	C-4	14.00	0.50	0.25	22.00	13.43	n/a	n/a
C-3	Curb and Grate	Sag	60+65.00	3.88	14.14	0.00	0.00	0.00		9.50	0.50	0.47	22.00	17.08	7.80	9.04
C-4	Curb and Grate	Sag	60+65.00	3.37	14.14	0.50	0.00	0.00		9.50	0.50	0.43	22.00	15.37	7.35	8.53
C-5	Curb and Grate	Sag	65+12.00	3.88	17.80	0.50	0.00	0.04		14.00	0.50	0.47	22.00	17.08	11.69	14.92
C-6	Curb and Grate	Sag	65+12.00	3.27	17.80	0.50	0.00	0.02		14.00	0.50	0.42	22.00	15.05	10.92	13.96
C-7	Curb and Grate	On Grade	67+50.00	3.58	3.54	0.50	0.04	0.00	C-5	14.00	0.50	0.29	14.00	9.87	n/a	n/a
C-8	Curb and Grate	On Grade	67+50.00	3.19	3.16	0.50	0.02	0.09	C-6	14.00	0.50	0.28	14.00	9.42	n/a	n/a
C-9	Curb and Grate	On Grade	70+30.00	3.25	3.25	0.00	0.00	0.03	C-7	14.00	0.50	0.33	14.00	11.25	n/a	n/a
C-10	Curb and Grate	On Grade	70+30.00	2.94	2.85	0.50	0.09	0.22	C-8	9.50	0.50	0.32	14.00	10.82	n/a	n/a
C-11	Curb and Grate	On Grade	72+50.00	3.54	3.51	0.50	0.03	0.11	C-9	14.00	0.50	0.30	14.00	10.17	n/a	n/a
C-12	Curb and Grate	On Grade	72+50.00	3.22	3.00	0.50	0.22	0.42	C-10	9.50	0.50	0.29	14.00	9.79	n/a	n/a
C-13	Curb and Grate	On Grade	75+50.00	3.47	3.36	0.00	0.11	0.04	C-11	14.00	0.50	0.26	14.00	8.51	n/a	n/a
C-14	Curb and Grate	On Grade	75+50.00	3.37	2.95	0.50	0.42	0.27	C-12	9.50	0.50	0.26	14.00	8.40	n/a	n/a
C-15	Curb and Grate	On Grade	78+50.00	3.44	3.40	0.00	0.04	0.23	C-13	14.00	0.50	0.28	14.00	9.51	n/a	n/a
C-16	Curb and Grate	On Grade	78+50.00	3.20	2.94	0.50	0.27	0.29	C-14	9.50	0.50	0.28	14.00	9.24	n/a	n/a
C-17	Curb and Grate	On Grade	81+50.00	3.65	3.43	0.50	0.23	0.23	C-15	9.50	0.50	0.32	14.00	11.04	n/a	n/a
C-18	Curb and Grate	On Grade	81+50.00	4.03	3.75	0.50	0.29	0.28	C-16	9.50	0.50	0.33	14.00	11.48	n/a	n/a
C-19	Curb and Grate	On Grade	84+50.00	3.52	3.30	0.00	0.23	0.00	C-17	9.50	0.50	0.31	14.00	10.62	n/a	n/a
C-20	Curb and Grate	On Grade	84+50.00	3.83	3.55	0.50	0.28	0.00	C-18	9.50	0.50	0.32	14.00	10.98	n/a	n/a
C-21	Curb and Grate	Sag	87+13.00	2.14	17.80	0.50	0.00	0.19		14.00	0.50	0.32	14.00	10.89	8.10	9.30
C-22	Curb and Grate	Sag	87+13.00	2.30	17.80	0.50	0.00	0.19		14.00	0.50	0.33	14.00	11.51	8.30	9.60
C-23	Curb and Grate	On Grade	88+13.00	2.86	2.67	0.50	0.19	0.25	C-21	9.50	0.50	0.27	14.00	8.99	n/a	n/a
C-24	Curb and Grate	On Grade	88+13.00	2.86	2.67	0.50	0.19	0.33	C-22	9.50	0.50	0.27	14.00	8.99	n/a	n/a
C-25	Curb and Grate	On Grade	90+50.00	3.69	3.45	0.50	0.25	0.27	C-23	9.50	0.50	0.32	14.00	10.91	n/a	n/a
C-26	Curb and Grate	On Grade	90+50.00	4.20	3.86	0.50	0.33	0.34	C-24	9.50	0.50	0.33	14.00	11.48	n/a	n/a
C-27	Curb and Grate	On Grade	93+50.00	3.53	3.26	0.00	0.27	0.10	C-25	9.50	0.50	0.30	14.00	10.18	n/a	n/a
C-28	Curb and Grate	On Grade	93+50.00	3.90	3.56	0.50	0.34	0.32	C-26	9.50	0.50	0.31	14.00	10.61	n/a	n/a
C-29	Curb and Grate	On Grade	96+50.00	2.21	2.11	0.00	0.10	0.00	C-27	9.50	0.50	0.25	14.00	7.98	n/a	n/a
C-30	Curb and Grate	On Grade	96+50.00	3.50	3.18	0.50	0.32	0.00	C-28	9.50	0.50	0.29	14.00	9.63	n/a	n/a
C-JCT1	Junction	On Grade	59+82.00	2.05	13.58	0.00	0.00	0.00		n/a	0.00	0.14	0.00	3.84	n/a	n/a
C-MH1	Junction	On Grade	58+81.00	0.68	0.63	0.00	0.00	0.00		n/a	0.00	0.17	0.00	5.01	n/a	n/a
C-OUT	Outlet	On Grade	58+80.50	0.68	0.63	0.00	0.00	0.00		n/a	0.00	0.17	0.00	5.01	n/a	n/a

NOTES:

1. CALCULATIONS MADE BY "GEOPAK DRAINAGE" HYDRAULIC COMPUTER PROGRAM.
2. ALLOWABLE PONDING WIDTH = 16' AS PER TXDOT BRIDGE DIVISION HYDRAULIC MANUAL
3. SEWER CALCULATIONS BASED ON MANNING'S FORMULA.
4. TW USED FOR THE STORM SEWER DESIGN WAS BASED ON OUTFALL SOFFIT ELEVATIONS WHICH ARE HIGHER THAN ACTUAL 5YR H.C.D.D. #1 TW ELEVATIONS.
5. RAINFALL FREQUENCY = 5 YR.
6. DRAINAGE LINK CONSIDERED FOR SRCMP MATERIAL ALTERNATIVE





L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
HYDRAULIC DATA
NETWORK "C"

SHEET 6 OF 11

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					138
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

3/28/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\05 DRAINAGE\02 HydraulicData\Liberty_HydData_NetworkC_Mod.dgn

NETWORK "C"

NOTES:

1. CALCULATIONS MADE BY "GEOPAK DRAINAGE" HYDRAULIC COMPUTER PROGRAM.
2. ALLOWABLE PONDING WIDTH = 16' AS PER TXDOT BRIDGE DIVISION HYDRAULIC MANUAL
3. SEWER CALCULATIONS BASED ON MANNING'S FORMULA.
4. TW USED FOR THE STORM SEWER DESIGN WAS BASED ON OUTFALL SOFFIT ELEVATIONS WHICH ARE HIGHER THAN ACTUAL 5YR H.C.D.D. #1 TW ELEVATIONS.
5. RAINFALL FREQUENCY = 5 YR.
6. ✳ DRAINAGE LINK CONSIDERED FOR SRCMP MATERIAL ALTERNATIVE

LINK CONFIGURATION

	Link ID	Type	Upstream Node	Downstream Node	Material	Library Item Name	Number of Barrels	Actual Length (ft)	Hydraulic Length (ft)	Manning's N Value	Slope (%)	Rise (ft)	Span (ft)	Soffit Upstream (ft)	Soffit Downstream (ft)	Invert Upstream (ft)	Invert Downstream (ft)
	LC-1	Pipe	C-28	C-27	Concrete	18 Inch Dia. Circular	1.00	63.00	68.50	0.012	0.250	1.50	n/a	191.70	191.53	190.20	190.03
✳	LC-2	Pipe	C-27	C-25	Concrete	18 Inch Dia. Circular	1.00	295.00	300.59	0.012	0.970	1.50	n/a	190.84	187.92	189.34	186.42
	LC-3	Pipe	C-26	C-25	Concrete	18 Inch Dia. Circular	1.00	63.00	68.50	0.012	0.250	1.50	n/a	189.50	189.33	188.00	187.83
✳	LC-4	Pipe	C-25	C-23	Concrete	18 Inch Dia. Circular	1.00	295.00	300.59	0.012	0.970	1.50	n/a	187.92	185.00	186.42	183.50
	LC-5	Pipe	C-24	C-23	Concrete	18 Inch Dia. Circular	1.00	63.00	67.25	0.012	0.250	1.50	n/a	187.70	187.53	186.20	186.03
✳	LC-6	Pipe	C-23	C-21	Concrete	24 Inch Dia. Circular	1.00	332.00	337.59	0.012	0.970	2.00	n/a	185.00	181.73	183.00	179.73
	LC-7	Pipe	C-22	C-21	Concrete	18 Inch Dia. Circular	1.00	63.00	67.25	0.012	0.290	1.50	n/a	184.70	184.51	183.20	183.01
✳	LC-8	Pipe	C-21	C-19	Concrete	24 Inch Dia. Circular	1.00	258.00	263.59	0.012	0.970	2.00	n/a	181.73	179.17	179.73	177.17
	LC-9	Pipe	C-20	C-19	Concrete	18 Inch Dia. Circular	1.00	62.00	68.00	0.012	0.250	1.50	n/a	184.10	183.93	182.60	182.43
✳	LC-10	Pipe	C-19	C-17	Concrete	30 Inch Dia. Circular	1.00	295.00	300.59	0.012	0.970	2.50	n/a	179.17	176.26	176.67	173.76
	LC-11	Pipe	C-18	C-17	Concrete	18 Inch Dia. Circular	1.00	62.00	68.00	0.012	0.250	1.50	n/a	182.20	182.03	180.70	180.53
✳	LC-12	Pipe	C-17	C-15	Concrete	30 Inch Dia. Circular	1.00	295.00	300.59	0.012	0.970	2.50	n/a	176.26	173.34	173.76	170.84
	LC-13	Pipe	C-16	C-15	Concrete	18 Inch Dia. Circular	1.00	62.00	68.00	0.012	0.250	1.50	n/a	179.50	179.33	178.00	177.83
✳	LC-14	Pipe	C-15	C-13	Concrete	30 Inch Dia. Circular	1.00	295.00	300.59	0.012	0.970	2.50	n/a	173.34	170.43	170.84	167.93
	LC-15	Pipe	C-14	C-13	Concrete	18 Inch Dia. Circular	1.00	62.00	68.00	0.012	0.250	1.50	n/a	176.00	175.83	174.50	174.33
✳	LC-16	Pipe	C-13	C-11	Concrete	30 Inch Dia. Circular	1.00	295.00	300.59	0.012	0.970	2.50	n/a	170.43	167.51	167.93	165.01
	LC-17	Pipe	C-12	C-11	Concrete	18 Inch Dia. Circular	1.00	62.00	68.00	0.012	0.250	1.50	n/a	172.00	171.83	170.50	170.33
✳	LC-18	Pipe	C-11	C-9	Concrete	36 Inch Dia. Circular	1.00	215.00	220.59	0.012	0.635	3.00	n/a	167.51	166.11	164.51	163.11
	LC-19	Pipe	C-10	C-9	Concrete	18 Inch Dia. Circular	1.00	62.00	68.00	0.012	0.250	1.50	n/a	169.70	169.53	168.20	168.03
✳	LC-20	Pipe	C-9	C-7	Concrete	36 Inch Dia. Circular	1.00	275.09	280.68	0.012	0.627	3.00	n/a	164.21	162.45	161.21	159.45
	LC-21	Pipe	C-8	C-7	Concrete	18 Inch Dia. Circular	1.00	69.60	75.60	0.012	0.250	1.50	n/a	168.00	167.81	166.50	166.31
✳	LC-22	Pipe	C-7	C-5	Concrete	42 Inch Dia. Circular	1.00	233.16	238.45	0.012	0.342	3.50	n/a	162.45	161.63	158.95	158.13
	LC-23	Pipe	C-6	C-5	Concrete	18 Inch Dia. Circular	1.00	86.30	91.05	0.012	0.250	1.50	n/a	166.40	166.17	164.90	164.67
✳	LC-24	Pipe	C-5	C-3	Concrete	42 Inch Dia. Circular	1.00	441.93	446.93	0.012	0.346	3.50	n/a	161.63	160.09	158.13	156.59
	LC-25	Pipe	C-4	C-3	Concrete	18 Inch Dia. Circular	1.00	89.00	93.75	0.012	0.581	1.50	n/a	164.70	164.16	163.20	162.66
✳	LC-26	Pipe	C-3	C-1	Concrete	42 Inch Dia. Circular	1.00	105.00	110.00	0.012	0.334	3.50	n/a	160.09	159.72	156.59	156.22
	LC-27	Pipe	C-1	C-2	Concrete	42 Inch Dia. Circular	1.00	91.00	96.00	0.012	0.646	3.50	n/a	159.23	158.61	155.73	155.11
✳	LC-28	Pipe	C-2	C-MH1	Concrete	42 Inch Dia. Circular	1.00	69.00	74.00	0.012	0.649	3.50	n/a	158.61	158.13	155.11	154.63
✳	LC-29	Pipe	C-MH1	C-OUT	Concrete	42 Inch Dia. Circular	1.00	18.37	20.87	0.012	0.623	3.50	n/a	158.13	158.00	154.63	154.50
✳	LC-30	Pipe	C-JCT1	C-2	Concrete	30 Inch Dia. Circular	1.00	24.50	27.00	0.012	0.481	2.50	n/a	158.74	158.61	156.24	156.11

LINK HYDRAULICS

Link ID	Upstream Node	Downstream Node	Discharge (ft^3/s)	Capacity (ft^3/s)	Uniform Depth (ft)	Uniform Velocity (ft/s)	Critical Depth (ft)	Critical Velocity (ft/s)	Critical Slope (%)	Frict. Slope (%)	Actual Vel. U.S. (ft/s)	Actual Vel. D.S. (ft/s)	Actual Depth U.S. (ft)	Actual Depth D.S (ft)	HGL U.S. (ft)	HGL D.S (ft)	EGL U.S. (ft)	EGL D.S (ft)
LC-1	C-30	C-29	3.50	6.12	0.86	3.35	0.71	4.22	0.004	0.002	2.66	4.22	1.04	0.71	191.24	190.75	191.24	190.55
LC-2	C-29	C-27	5.01	12.07	0.70	6.15	0.86	4.77	0.005	0.010	4.77	6.15	0.86	0.70	190.20	187.12	190.55	187.71
LC-3	C-28	C-27	3.59	6.12	0.86	3.43	0.72	4.25	0.004	0.003	2.69	4.25	1.06	0.72	189.06	188.56	189.06	188.41
LC-4	C-27	C-25	10.83	12.07	1.19	7.21	1.26	6.82	0.009	0.010	6.82	7.21	1.26	1.19	187.68	184.69	188.41	185.50
LC-5	C-26	C-25	3.86	6.12	0.90	3.47	0.75	4.36	0.005	0.003	2.76	4.36	1.11	0.75	187.31	186.79	187.31	185.20
LC-6	C-25	C-23	16.86	25.75	1.24	8.24	1.48	6.76	0.006	0.010	6.76	8.24	1.48	1.24	184.49	181.95	185.20	183.00
LC-7	C-24	C-23	2.52	6.12	0.70	3.10	0.60	3.81	0.004	0.002	2.43	3.81	0.85	0.60	184.35	183.93	184.35	183.25
LC-8	C-23	C-21	21.04	25.96	1.45	8.66	1.64	7.62	0.007	0.010	7.62	8.60	1.64	1.45	182.34	181.18	183.25	182.33
LC-9	C-22	C-21	2.11	6.59	0.61	3.16	0.55	3.61	0.004	0.003	2.34	3.61	0.76	0.55	183.96	183.56	183.96	182.57
LC-10	C-21	C-19	24.37	25.99	1.66	8.76	1.75	8.38	0.009	0.010	8.38	8.76	1.75	1.66	181.48	178.83	182.57	180.02
LC-11	C-20	C-19	3.83	6.12	0.90	3.45	0.75	4.35	0.005	0.002	2.75	4.35	1.10	0.75	183.70	183.18	183.70	179.44
LC-12	C-19	C-17	29.85	47.12	1.51	9.61	1.86	7.61	0.006	0.010	7.61	9.59	1.86	1.52	178.54	175.27	179.44	176.70
LC-13	C-18	C-17	3.76	6.12	0.88	3.49	0.74	4.32	0.005	0.003	2.73	4.32	1.09	0.74	181.79	181.28	181.79	176.83
LC-14	C-17	C-15	35.01	47.12	1.69	9.94	2.01	8.28	0.006	0.010	8.28	9.90	2.01	1.69	175.77	172.53	176.83	174.06
LC-15	C-16	C-15	2.92	6.12	0.77	3.20	0.65	3.99	0.004	0.002	2.52	3.99	0.94	0.65	178.94	178.49	178.94	174.18
LC-16	C-15	C-13	39.22	47.12	1.85	10.06	2.11	8.87	0.007	0.010	8.87	10.06	2.11	1.85	172.95	169.78	174.18	171.35
LC-17	C-14	C-13	3.10	6.12	0.79	3.27	0.67	4.06	0.004	0.002	2.57	4.06	0.97	0.67	175.47	175.01	175.47	171.54
LC-18	C-13	C-11	43.63	47.12	2.04	10.20	2.20	9.53	0.009	0.010	9.53	10.17	2.20	2.04	170.13	167.05	171.54	168.66
LC-19	C-12	C-11	2.81	6.12	0.75	3.19	0.64	3.94	0.004	0.002	2.50	3.94	0.91	0.64	171.41	170.97	171.41	167.86
LC-20	C-11	C-9	47.76	76.55	1.80	10.76	2.25	8.40	0.005	0.010	8.40	10.70	2.25	1.81	166.76	164.19	167.86	165.97
LC-21	C-10	C-9	2.72	6.12	0.73	3.21	0.63	3.90	0.004	0.003	2.48	3.90	0.89	0.63	169.09	168.66	169.09	165.67
LC-22	C-9	C-7	51.75	76.55	1.89	11.02	2.34	8.75	0.006	0.010	8.75	10.93	2.34	1.91	164.49	161.33	165.67	163.19
LC-23	C-8	C-7	3.09	6.12	0.79	3.27	0.67	4.06	0.004	0.002	2.56	4.06	0.97	0.67	167.47	166.99	167.47	162.33
LC-24	C-7	C-5	56.03	70.83	2.46	7.74	2.34	8.18	0.004	0.004	7.67	7.26	2.49	2.62	161.41	160.68	162.33	161.63
LC-25	C-6	C-5	3.25	6.12	0.81	3.32	0.69	4.12	0.004	0.002	2.60	4.12	1.00	0.69	165.90	165.36	165.90	161.63
LC-26	C-5	C-3	60.35	70.83	2.62	7.82	2.44	8.45	0.004	0.004	7.82	8.17	2.62	2.51	160.68	158.94	161.63	160.11
LC-27	C-4	C-3	3.37	6.12	0.84	3.32	0.70	4.17	0.004	0.002	2.63	4.17	1.02	0.70	164.02	163.47	164.02	160.11
LC-28	C-3	C-1	64.11	93.80	2.23	9.89	2.51	8.68	0.005	0.006	8.68	9.79	2.51	2.25	158.94	157.98	160.11	159.47
LC-29	C-1	C-2	65.86	93.80	2.28	9.90	2.54	8.79	0.005	0.006	7.22	6.85	3.15	3.50	158.88	158.64	159.69	160.29
LC-30	C-2	C-MH1	91.67	93.80	3.08	10.22	2.97	10.54	0.007	0.006	10.28	10.33	3.06	3.04	158.64	158.15	160.29	159.56
LC-31	C-MH1	C-OUT	91.67	93.02	3.08	10.22	2.97	10.54	0.007	0.006	9.53	9.53	3.50	3.50	158.15	158.00	159.56	159.41
LC-32	C-JCT1	C-2	25.00	33.17	1.71	7.01	1.70	7.02	0.005	0.005	5.09	5.09	2.50	2.50	158.96	158.64	159.13	160.29

STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
04/07/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
HYDRAULIC DATA
NETWORK "C"

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					139
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

3/28/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDLV05 DRAINAGE\02 HydraulicData\Liberty_HydData_NetworkC_Mod.dgn

NETWORK "D"

NODE CONFIGURATION

Node ID	Library Item Name	Node Station	Node Offset (ft)	Node Elev. (ft)	Node Type	Profile Type	Spread X-Sect. Slope 1 (%)	Spread X-Sect. Width 1 (ft.)	Spread X-Sect. Slope 2 (%)	Spread X-Sect. Width 2 (ft.)	Spread X-Sect. Slope 3 (%)	Spread X-Sect. Width 3 (ft.)	Composite X-Sect. Spread Slope (%)	Longitudinal Slope (%)	Curb Length (ft)	Curb Depression (ft)	Curb Depression Width (ft)	Curb Height (ft)	Grate Length (ft)	Grate Width (ft)	Grate Area (ft)	Grate Perimeter (ft)
D-1	PCU15-3x5	101+32.00	-34.50	196.24	Curb and Grate	Sag	5.56	1.50	2.50	33.00	0.00	0.00	0.029	n/a	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
D-2	PCU15-3x5	101+32.00	34.50	196.24	Curb and Grate	Sag	5.56	1.50	2.50	33.00	0.00	0.00	0.032	n/a	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
D-3	PCU10R-3x5	103+00.00	-34.50	197.13	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.030	1.065	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
D-4	PCU5-3x5	103+00.00	34.50	197.13	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.033	1.065	5.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
D-5	PCU15-3x5	105+30.00	-34.50	200.18	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.030	1.350	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
D-6	PCU10L-3x5	105+30.00	34.50	200.17	Curb and Grate	On Grade	5.66	1.50	2.50	33.00	0.00	0.00	0.034	1.350	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
D-7	PCU15-3x5	107+80.00	-34.50	203.92	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.031	1.806	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
D-8	PCU10L-3x5	107+80.00	34.50	203.92	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.034	1.806	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
D-9	PCU15-3x5	110+15.00	-34.50	208.40	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.031	1.920	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
D-10	PCU10L-3x5	110+15.00	34.50	208.40	Curb and Grate	On Grade	5.66	1.50	2.50	33.00	0.00	0.00	0.034	1.920	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
D-11	PCU15-3x5	112+80.00	-34.50	213.49	Curb and Grate	On Grade	5.66	1.50	2.50	33.00	0.00	0.00	0.032	1.920	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
D-12	PCU10L-3x5	112+80.00	34.50	213.49	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.034	1.920	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
D-13	PCU15-3x5	115+30.00	-34.50	218.29	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.030	1.920	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
D-14	PCU10L-3x5	115+30.00	34.50	218.29	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.034	1.920	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
D-OUT	OUTLET	103+00.00	177.00	198.00	Outlet	On Grade	5.66	1.50	2.50	33.00	0.00	0.00	0.029	0.000	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

NODE HYDRAULICS

Node ID	Node Type	Node Profile Type	Node Station	Discharge (ft^3/s)	Capacity (ft^3/s)	Max By Pass Flow (ft^3/s)	By Pass Flow (ft^3/s)	By Pass Flow Into Node (ft^3/s)	By Pass Node ID	Node Length (ft)	Max Ponded Depth (ft)	Computed Ponded Depth (ft)	Max Ponded Width (ft)	Computed Ponded Width (ft)
D-1	Curb and Grate	Sag	101+32.00	5.07	22.02	0.50	0.00	0.17		14.00	0.50	0.36	16.00	12.40
D-2	Curb and Grate	Sag	101+32.00	2.32	22.02	0.50	0.00	0.19		14.00	0.50	0.21	16.00	7.08
D-3	Curb and Grate	On Grade	103+00.00	3.34	3.17	0.50	0.17	0.00	D-1	9.50	0.50	0.27	16.00	9.03
D-4	Curb and Grate	On Grade	103+00.00	1.26	1.06	0.50	0.19	0.00	D-2	5.00	0.50	0.19	16.00	5.94
D-5	Curb and Grate	On Grade	105+30.00	3.44	3.44	0.50	0.00	0.00	D-3	14.00	0.50	0.26	16.00	8.70
D-6	Curb and Grate	On Grade	105+30.00	1.20	1.20	0.50	0.00	0.00	D-4	9.50	0.50	0.19	16.00	5.51
D-7	Curb and Grate	On Grade	107+80.00	3.25	3.25	0.50	0.00	0.01	D-5	14.00	0.50	0.25	16.00	7.99
D-8	Curb and Grate	On Grade	107+80.00	1.11	1.11	0.50	0.00	0.00	D-6	9.50	0.50	0.17	16.00	4.97
D-9	Curb and Grate	On Grade	110+15.00	3.65	3.64	0.50	0.01	0.00	D-7	14.00	0.50	0.25	16.00	8.29
D-10	Curb and Grate	On Grade	110+15.00	1.41	1.41	0.50	0.00	0.00	D-8	9.50	0.50	0.18	16.00	5.46
D-11	Curb and Grate	On Grade	112+80.00	2.62	2.62	0.50	0.00	0.03	D-9	14.00	0.50	0.23	16.00	7.18
D-12	Curb and Grate	On Grade	112+80.00	1.11	1.11	0.50	0.00	0.00	D-10	9.50	0.50	0.17	16.00	4.91
D-13	Curb and Grate	On Grade	115+30.00	3.94	3.91	0.50	0.03	0.00	D-11	14.00	0.50	0.26	16.00	8.55
D-14	Curb and Grate	On Grade	115+30.00	1.24	1.24	0.50	0.00	0.00	D-12	9.50	0.50	0.18	16.00	5.16
D-OUT	Outlet	On Grade	103+00.00	3.90	2.91	0.50	0.00	0.00		n/a	0.50	0.31	14.00	10.63

NOTES:

1. CALCULATIONS MADE BY "GEOPAK DRAINAGE" HYDRAULIC COMPUTER PROGRAM.
2. ALLOWABLE PONDING WIDTH = 16' AS PER TXDOT BRIDGE DIVISION HYDRAULIC MANUAL
3. SEWER CALCULATIONS BASED ON MANNING'S FORMULA.
4. TW USED FOR THE STORM SEWER DESIGN WAS BASED ON OUTFALL SOFFIT ELEVATIONS WHICH ARE HIGHER THAN ACTUAL 5YR H.C.D.D. #1 TW ELEVATIONS.
5. RAINFALL FREQUENCY = 5 YR.
6. ✳ DRAINAGE LINK CONSIDERED FOR SRCMP MATERIAL ALTERNATIVE

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
09/22/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
HYDRAULIC DATA
NETWORK "D"

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				140
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

9/22/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\02 HydrolicData\Liberty_HydData.dgn

NETWORK "D"

LINK CONFIGURATION

	Link ID	Type	Upstream Node	Downstream Node	Material	Library Item Name	Number of Barrels	Actual Length (ft)	Hydraulic Length (ft)	Manning's N Value	Slope (%)	Rise (ft)	Span (ft)	Soffit Upstream (ft)	Soffit Downstream (ft)	Invert Upstream (ft)	Invert Downstream (ft)
	LD-1	Pipe	D-2	D-1	Concrete	18 Inch Dia. Circular	1.00	65.50	68.50	0.012	0.250	1.50	n/a	191.65	191.48	190.15	189.98
✳	LD-2	Pipe	D-1	D-3	Concrete	24 Inch Dia. Circular	1.00	163.00	168.00	0.012	0.250	2.00	n/a	191.48	191.06	189.48	189.06
	LD-3	Pipe	D-3	D-4	Concrete	30 Inch Dia. Circular	1.00	65.50	68.50	0.012	0.500	2.50	n/a	191.06	190.71	188.56	188.21
✳	LD-4	Pipe	D-5	D-3	Concrete	24 Inch Dia. Circular	1.00	225.00	230.00	0.012	1.800	2.00	n/a	195.20	191.06	193.20	189.06
	LD-5	Pipe	D-6	D-5	Concrete	18 Inch Dia. Circular	1.00	65.50	68.50	0.012	0.250	1.50	n/a	196.50	196.33	195.00	194.83
✳	LD-6	Pipe	D-7	D-5	Concrete	18 Inch Dia. Circular	1.00	245.00	250.00	0.012	1.800	1.50	n/a	199.70	195.20	198.20	193.70
	LD-7	Pipe	D-8	D-7	Concrete	18 Inch Dia. Circular	1.00	65.50	68.50	0.012	0.250	1.50	n/a	200.20	200.03	198.70	198.53
✳	LD-8	Pipe	D-9	D-7	Concrete	18 Inch Dia. Circular	1.00	230.00	235.00	0.012	1.800	1.50	n/a	203.93	199.70	202.43	198.20
	LD-9	Pipe	D-10	D-9	Concrete	18 Inch Dia. Circular	1.00	65.50	68.50	0.012	0.250	1.50	n/a	204.70	204.53	203.20	203.03
✳	LD-10	Pipe	D-11	D-9	Concrete	18 Inch Dia. Circular	1.00	260.00	265.00	0.012	1.800	1.50	n/a	208.70	203.93	207.20	202.43
	LD-11	Pipe	D-12	D-11	Concrete	18 Inch Dia. Circular	1.00	65.50	68.50	0.012	0.250	1.50	n/a	209.70	209.53	208.20	208.03
✳	LD-12	Pipe	D-13	D-11	Concrete	18 Inch Dia. Circular	1.00	245.00	250.00	0.012	1.800	1.50	n/a	213.20	208.70	211.70	207.20
	LD-13	Pipe	D-14	D-13	Concrete	18 Inch Dia. Circular	1.00	65.50	68.50	0.012	0.250	1.50	n/a	214.60	214.43	213.10	212.93
✳	LD-17	Pipe	D-4	D-OUT	Concrete	30 Inch Dia. Circular	1.00	141.25	142.75	0.012	0.500	2.50	n/a	190.71	190.00	188.21	187.50

LINK HYDRAULICS

Link ID	Upstream Node	Downstream Node	Discharge (ft^3/s)	Capacity (ft^3/s)	Uniform Depth (ft)	Uniform Velocity (ft/s)	Critical Depth (ft)	Critical Velocity (ft/s)	Critical Slope (%)	Frict. Slope (%)	Actual Vel. U.S. (ft/s)	Actual Vel. D.S. (ft/s)	Actual Depth U.S. (ft)	Actual Depth D.S. (ft)	HGL U.S. (ft)	HGL D.S. (ft)	EGL U.S. (ft)	EGL D.S. (ft)
LD-1	D-2	D-1	2.13	6.12	0.64	2.97	0.55	3.63	0.004	0.002	2.35	3.24	0.77	0.60	190.91	190.57	190.92	190.81
LD-2	D-1	D-3	6.86	13.18	1.07	4.01	0.93	4.80	0.004	0.002	3.88	3.29	1.10	1.26	190.57	190.32	190.81	191.12
LD-3	D-3	D-4	26.54	33.80	1.76	7.19	1.76	7.20	0.005	0.005	7.19	7.03	1.76	1.80	190.32	190.01	191.12	190.83
LD-4	D-5	D-3	17.83	35.37	1.05	10.69	1.52	6.95	0.006	0.018	6.95	10.64	1.52	1.05	194.72	190.11	195.47	191.87
LD-5	D-6	D-5	1.20	6.12	0.47	2.52	0.41	3.07	0.004	0.002	2.16	3.07	0.53	0.41	195.53	195.24	195.57	195.47
LD-6	D-7	D-5	14.62	16.42	1.18	9.82	1.40	8.53	0.014	0.018	8.53	9.82	1.40	1.18	199.59	194.87	200.72	196.37
LD-7	D-8	D-7	1.10	6.12	0.45	2.46	0.39	3.02	0.004	0.002	1.00	0.82	0.90	1.06	199.60	199.59	199.62	200.72
LD-8	D-9	D-7	11.54	16.42	0.97	9.50	1.30	7.11	0.009	0.018	7.11	9.48	1.30	0.98	203.72	199.17	204.51	200.57
LD-9	D-10	D-9	1.41	6.12	0.51	2.69	0.45	3.21	0.004	0.003	2.20	1.77	0.59	0.69	203.79	203.72	203.85	204.51
LD-10	D-11	D-9	7.89	16.42	0.77	8.71	1.09	5.75	0.006	0.018	5.75	8.70	1.09	0.77	208.28	203.19	208.80	204.37
LD-11	D-12	D-11	1.11	6.12	0.45	2.48	0.40	2.98	0.004	0.002	2.14	2.98	0.50	0.40	208.70	208.43	208.75	208.80
LD-12	D-13	D-11	5.03	16.42	0.59	7.75	0.86	4.78	0.005	0.018	4.78	7.74	0.86	0.59	212.56	207.79	212.92	208.72
LD-13	D-14	D-13	1.24	6.12	0.47	2.59	0.42	3.09	0.004	0.003	2.17	3.09	0.54	0.42	213.64	213.35	213.68	212.92
LD-17	D-4	D-OUT	27.36	33.80	1.80	7.25	1.78	7.30	0.005	0.005	7.25	7.30	1.80	1.78	190.01	189.28	190.83	190.11

NOTES:

1. CALCULATIONS MADE BY "GEOPAK DRAINAGE" HYDRAULIC COMPUTER PROGRAM.
2. ALLOWABLE PONDING WIDTH = 16' AS PER TXDOT BRIDGE DIVISION HYDRAULIC MANUAL
3. SEWER CALCULATIONS BASED ON MANNING'S FORMULA.
4. TW USED FOR THE STORM SEWER DESIGN WAS BASED ON OUTFALL SOFFIT ELEVATIONS WHICH ARE HIGHER THAN ACTUAL 5YR H.C.D.D. #1 TW ELEVATIONS.
5. RAINFALL FREQUENCY = 5 YR.
6. ✳ DRAINAGE LINK CONSIDERED FOR SRCMP MATERIAL ALTERNATIVE

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED
PROFESSIONAL ENGINEER
09/22/2020

THE COUNTY OF HIDALGO
TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
HYDRAULIC DATA
NETWORK "D"

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				141
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

9/22/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\02 HydrolicData\Liberty_HydData.dgn

NETWORK "E"

NODE CONFIGURATION

Node ID	Library Item Name	Node Station	Node Offset (ft)	Node Elev. (ft)	Node Type	Profile Type	Spread X-Sect. Slope 1 (%)	Spread X-Sect. Width 1 (ft.)	Spread X-Sect. Slope 2 (%)	Spread X-Sect. Width 2 (ft.)	Spread X-Sect. Slope 3 (%)	Spread X-Sect. Width 3 (ft.)	Composite X-Sect. Spread Slope (%)	Longitudinal Slope (%)	Curb Length (ft)	Curb Depression (ft)	Curb Depression Width (ft)	Curb Height (ft)	Grate Length (ft)	Grate Width (ft)	Grate Area (ft)	Grate Perimeter (ft)
E-1	PSL FG 4x5 w 3x5 gr	141+50.00	-34.00	214.07	Grate	On Grade	-25.00	8.00	25.00	12.00	2.00	22.00	0.125	0.340	n/a	n/a	n/a	n/a	5.17	3.17	7.70	16.67
E-2	PSL FG 4x5 w 3x5 gr	141+50.00	34.00	214.07	Grate	On Grade	-25.00	8.00	25.00	12.00	2.00	22.00	0.125	0.340	n/a	n/a	n/a	n/a	5.17	3.17	7.70	16.67
E-3	PSL FG 4x5 w 3x5 gr	138+50.00	-34.00	213.05	Grate	Sag	-25.00	8.00	25.00	12.00	2.00	22.00	0.125	n/a	n/a	n/a	n/a	n/a	5.17	3.17	7.70	16.67
E-4	PSL FG 4x5 w 3x5 gr	138+50.00	34.00	213.05	Grate	Sag	-25.00	8.00	26.00	12.00	2.00	22.00	0.127	n/a	n/a	n/a	n/a	n/a	5.17	3.17	7.70	16.67
E-5	PCU10R-3x5	135+96.00	-34.50	213.42	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.030	1.216	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
E-6	PCU15-4x5	135+96.00	34.50	213.42	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.029	1.216	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
E-7	PCU5-3x5	133+16.00	-34.50	211.99	Curb and Grate	On Grade	5.66	1.50	2.50	33.00	0.00	0.00	0.030	0.200	5.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
E-8	PCU15-4x5	133+16.00	34.50	211.99	Curb and Grate	On Grade	5.66	1.50	2.50	33.00	0.00	0.00	0.028	0.200	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
E-9	PSL FG 3x3 w 3x3 gr	132+15.00	78.00	210.46	Grate	Sag	-25.00	9.00	25.00	9.00	0.00	0.00	0.125	n/a	n/a	n/a	n/a	n/a	3.17	3.17	4.54	12.67
E-10	PCU15-3x5	130+80.00	-34.50	211.52	Curb and Grate	Sag	5.56	1.50	2.50	33.00	0.00	0.00	0.032	n/a	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
E-11	PCU15-5x5	130+80.00	34.50	211.52	Curb and Grate	Sag	5.56	1.50	2.50	33.00	0.00	0.00	0.031	n/a	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
E-12	PCU10R-3x5	127+65.00	-34.50	211.65	Curb and Grate	On Grade	5.66	1.50	2.50	33.00	0.00	0.00	0.029	0.200	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
E-13	PCU10L-5x5	127+65.00	34.50	211.65	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.029	0.200	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
E-14	PCU15-3x5	125+61.00	-34.50	211.30	Curb and Grate	Sag	5.56	1.50	2.50	33.00	0.00	0.00	0.028	n/a	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
E-15	PCU15-5x5	125+61.00	34.50	211.30	Curb and Grate	Sag	5.56	1.50	2.50	33.00	0.00	0.00	0.030	n/a	14.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
E-16	PCU10L-3x5	124+50.00	-34.50	211.53	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.030	0.415	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
E-17	PCU5-5x5	124+50.00	34.50	211.53	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.031	0.415	5.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
E-18	PCU10L-3x5	122+75.00	-34.50	213.16	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.031	1.629	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
E-19	PCU5-5x5	122+75.00	34.50	213.16	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.035	1.629	5.00	0.33	1.50	0.50	4.96	1.39	3.13	7.73
E-20	PCU10R-3x5	120+00.00	34.50	219.28	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.033	1.800	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
E-21	PCU10L-3x5	120+00.00	-34.50	219.28	Curb and Grate	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.031	1.800	9.50	0.33	1.50	0.50	4.96	1.39	3.13	7.73
E-MH1	PJB 5x5	132+15.00	34.50	210.00	Junction	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.125	0.200	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E-MH2	PSL RC 6x6	121+39.56	38.50	216.09	Junction	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.035	2.470	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E-MH3	PSL RC 3x3	121+39.56	-37.00	216.09	Junction	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.035	2.470	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E-OUT	OUTLET	120+30.00	194.30	212.00	Outlet	On Grade	5.56	1.50	2.50	33.00	0.00	0.00	0.035	1.818	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

NODE HYDRAULICS

Node ID	Node Type	Node Profile Type	Node Station	Discharge (ft^3/s)	Capacity (ft^3/s)	Max By Pass Flow (ft^3/s)	By Pass Flow (ft^3/s)	By Pass Flow Into Node (ft^3/s)	By Pass Node ID	Node Length (ft)	Max Ponded Depth (ft)	Computed Ponded Depth (ft)	Max Ponded Width (ft)	Computed Ponded Width (ft)
E-1	Grate	On Grade	141+50.00	3.40	3.37	0.50	0.03	0.00	E-3	n/a	2.00	0.70	12.00	5.62
E-2	Grate	On Grade	141+50.00	8.04	7.85	0.50	0.19	0.00	E-4	n/a	2.00	0.97	12.00	7.77
E-3	Grate	Sag	138+50.00	1.43	29.27	0.50	0.00	0.03		n/a	2.00	0.15	12.00	3.78
E-4	Grate	Sag	138+50.00	10.25	29.27	0.50	0.00	0.19		n/a	2.00	0.54	12.00	7.80
E-5	Curb and Grate	On Grade	135+96.00	3.06	2.92	0.50	0.14	0.00	E-7	9.50	0.50	0.26	16.00	8.47
E-6	Curb and Grate	On Grade	135+96.00	6.97	6.72	0.50	0.26	0.00	E-8	14.00	0.50	0.34	16.00	11.86
E-7	Curb and Grate	On Grade	133+16.00	1.61	1.46	0.50	0.15	0.14	E-10	5.00	0.50	0.28	16.00	9.42
E-8	Curb and Grate	On Grade	133+16.00	8.80	8.78	0.50	0.02	0.26	E-11	14.00	0.50	0.51	16.00	18.56
E-9	Grate	Sag	132+15.00	10.00	17.24	0.50	0.00	0.00		n/a	2.00	0.67	9.00	10.39
E-10	Curb and Grate	Sag	130+80.00	2.28	22.02	0.50	0.00	0.15		14.00	0.50	0.21	16.00	8.51
E-11	Curb and Grate	Sag	130+80.00	2.74	22.02	0.50	0.00	0.02		14.00	0.50	0.24	16.00	9.18
E-12	Curb and Grate	On Grade	127+65.00	3.86	3.82	0.50	0.03	0.00	E-14	9.50	0.50	0.38	16.00	13.42
E-13	Curb and Grate	On Grade	127+65.00	2.85	2.84	0.50	0.01	0.00	E-15	9.50	0.50	0.34	16.00	11.89
E-14	Curb and Grate	Sag	125+61.00	7.10	22.02	0.50	0.00	0.05		14.00	0.50	0.45	16.00	16.00
E-15	Curb and Grate	Sag	125+61.00	3.33	22.02	0.50	0.00	0.21		14.00	0.50	0.27	16.00	11.10
E-16	Curb and Grate	On Grade	124+50.00	2.39	2.38	0.50	0.01	0.08	E-14	9.50	0.50	0.29	16.00	9.55
E-17	Curb and Grate	On Grade	124+50.00	1.59	1.38	0.50	0.21	0.12	E-15	5.00	0.50	0.25	16.00	8.05
E-18	Curb and Grate	On Grade	122+75.00	2.41	2.33	0.50	0.08	0.19	E-16	9.50	0.50	0.23	16.00	7.20
E-19	Curb and Grate	On Grade	122+75.00	0.91	0.79	0.50	0.12	0.00	E-17	5.00	0.50	0.16	16.00	4.63
E-20	Curb and Grate	On Grade	120+00.00	1.32	1.32	0.50	0.00	0.00	E-19	9.50	0.50	0.18	16.00	5.40
E-21	Curb and Grate	On Grade	120+00.00	3.01	2.82	0.50	0.19	0.00	E-18	9.50	0.50	0.24	16.00	7.74
E-MH1	Junction	On Grade	132+15.00	10.00	17.24	0.50	0.00	0.00		n/a	0.50	0.67	16.00	5.38
E-MH2	Junction	On Grade	121+39.56	0.91	0.79	0.50	0.00	0.00		n/a	0.50	0.16	16.00	4.63
E-MH3	Junction	On Grade	121+39.56	0.91	0.79	0.50	0.00	0.00		n/a	0.50	0.16	16.00	4.63
E-OUT	Outlet	On Grade	120+30.00	0.91	0.79	0.50	0.00	0.00		n/a	0.50	0.16	16.00	4.51

NOTES:

1. CALCULATIONS MADE BY "GEOPAK DRAINAGE" HYDRAULIC COMPUTER PROGRAM.
2. ALLOWABLE PONDING WIDTH = 16' AS PER TXDOT BRIDGE DIVISION HYDRAULIC MANUAL
3. SEWER CALCULATIONS BASED ON MANNING'S FORMULA.
4. TW USED FOR THE STORM SEWER DESIGN WAS BASED ON OUTFALL SOFFIT ELEVATIONS WHICH ARE HIGHER THAN ACTUAL 5YR H.C.D.D. #1 TW ELEVATIONS.
5. RAINFALL FREQUENCY = 5 YR.
6. DRAINAGE LINK CONSIDERED FOR SRCMP MATERIAL ALTERNATIVE

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED
PROFESSIONAL ENGINEER
09/22/2020

THE COUNTY OF HIDALGO
TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
HYDRAULIC DATA
NETWORK "E"

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				142
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

9/22/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\02 HydraulicData\Liberty_HydData.dgn

NETWORK "E"

LINK CONFIGURATION

Link ID	Type	Upstream Node	Downstream Node	Material	Library Item Name	Number of Barrels	Actual Length (ft)	Hydraulic Length (ft)	Manning's N Value	Slope (%)	Rise (ft)	Span (ft)	Soffit Upstream (ft)	Soffit Downstream (ft)	Invert Upstream (ft)	Invert Downstream (ft)
LE-1	Pipe	E-1	E-2	Concrete	18 Inch Dia. Circular	1.00	64.00	68.00	0.012	0.250	1.50	n/a	212.30	212.13	210.80	210.63
✳ LE-2	Pipe	E-2	E-4	Concrete	24 Inch Dia. Circular	1.00	295.00	300.00	0.012	0.250	2.00	n/a	210.00	209.25	208.00	207.25
LE-3	Pipe	E-3	E-4	Concrete	18 Inch Dia. Circular	1.00	64.00	68.00	0.012	0.250	1.50	n/a	211.40	211.23	209.90	209.73
LE-4	Pipe	E-4	E-6	Concrete	30 Inch Dia. Circular	1.00	249.18	254.18	0.012	0.250	2.50	n/a	209.25	208.62	206.75	206.12
LE-5	Pipe	E-5	E-6	Concrete	18 Inch Dia. Circular	1.00	64.50	68.00	0.012	0.250	1.50	n/a	209.70	209.53	208.20	208.03
✳ LE-6	Pipe	E-6	E-8	Concrete	36 Inch Dia. Circular	1.00	275.00	280.00	0.012	0.250	3.00	n/a	208.62	207.92	205.62	204.92
LE-7	Pipe	E-7	E-8	Concrete	18 Inch Dia. Circular	1.00	64.50	68.00	0.012	0.250	1.50	n/a	208.20	208.03	206.70	206.53
✳ LE-8	Pipe	E-8	E-MH1	Concrete	36 Inch Dia. Circular	1.00	96.00	101.00	0.012	0.250	3.00	n/a	207.92	207.67	204.92	204.67
✳ LE-9	Pipe	E-9	E-MH1	Concrete	24 Inch Dia. Circular	1.00	39.50	43.50	0.012	0.250	2.00	n/a	208.70	208.59	206.70	206.59
✳ LE-10	Pipe	E-MH1	E-11	Concrete	42 Inch Dia. Circular	1.00	130.01	135.01	0.012	0.250	3.50	n/a	207.67	207.33	204.17	203.83
LE-11	Pipe	E-10	E-11	Concrete	18 Inch Dia. Circular	1.00	63.50	67.50	0.012	0.250	1.50	n/a	207.80	207.63	206.30	206.13
✳ LE-12	Pipe	E-11	E-13	Concrete	42 Inch Dia. Circular	1.00	310.00	315.00	0.012	0.250	3.50	n/a	207.33	206.54	203.83	203.04
LE-13	Pipe	E-12	E-13	Concrete	18 Inch Dia. Circular	1.00	63.50	67.50	0.012	0.250	1.50	n/a	208.00	207.83	206.50	206.33
✳ LE-14	Pipe	E-13	E-15	Concrete	42 Inch Dia. Circular	1.00	198.92	203.92	0.012	0.250	3.50	n/a	206.54	206.03	203.04	202.53
LE-15	Pipe	E-14	E-15	Concrete	24 Inch Dia. Circular	1.00	63.50	67.50	0.012	0.250	2.00	n/a	207.60	207.43	205.60	205.43
✳ LE-16	Pipe	E-15	E-17	Concrete	42 Inch Dia. Circular	1.00	105.61	110.61	0.012	0.250	3.50	n/a	206.03	205.76	202.53	202.26
LE-17	Pipe	E-16	E-17	Concrete	18 Inch Dia. Circular	1.00	63.50	67.50	0.012	0.250	1.50	n/a	207.90	207.73	206.40	206.23
✳ LE-18	Pipe	E-17	E-19	Concrete	42 Inch Dia. Circular	1.00	169.38	174.38	0.012	0.250	3.50	n/a	205.76	205.32	202.26	201.82
LE-19	Pipe	E-18	E-19	Concrete	18 Inch Dia. Circular	1.00	63.50	67.50	0.012	0.250	1.50	n/a	209.50	209.33	208.00	207.83
✳ LE-20	Pipe	E-19	E-MH2	Concrete	42 Inch Dia. Circular	1.00	130.14	135.64	0.012	0.250	3.50	n/a	205.32	204.98	201.82	201.48
LE-21	Pipe	E-20	E-21	Concrete	18 Inch Dia. Circular	1.00	65.50	68.50	0.012	0.250	1.50	n/a	212.92	212.75	211.42	211.25
✳ LE-22	Pipe	E-21	E-MH3	Concrete	18 Inch Dia. Circular	1.00	135.06	139.06	0.012	0.250	1.50	n/a	212.75	212.40	211.25	210.90
LE-23	Pipe	E-MH3	E-MH2	Concrete	18 Inch Dia. Circular	1.00	71.00	75.50	0.012	0.250	1.50	n/a	212.40	212.21	210.90	210.71
✳ LE-24	Pipe	E-MH2	E-OUT	Concrete	42 Inch Dia. Circular	1.00	188.82	191.82	0.012	0.250	3.50	n/a	204.98	204.50	201.48	201.00

LINK HYDRAULICS

Link ID	Upstream Node	Downstream Node	Discharge (ft^3/s)	Capacity (ft^3/s)	Uniform Depth (ft)	Uniform Velocity (ft/s)	Critical Depth (ft)	Critical Velocity (ft/s)	Critical Slope (%)	Frict. Slope (%)	Actual Vel. U.S. (ft/s)	Actual Vel. D.S. (ft/s)	Actual Depth U.S. (ft)	Actual Depth D.S. (ft)	HGL U.S. (ft)	HGL D.S. (ft)	EGL U.S. (ft)	EGL D.S. (ft)
LE-1	E-1	E-2	3.40	6.12	0.84	3.35	0.70	4.18	0.004	0.002	2.64	4.18	1.03	0.70	211.83	211.33	211.83	209.78
LE-2	E-2	E-4	11.01	13.18	1.47	4.46	1.19	5.65	0.005	0.003	4.46	5.15	1.47	1.29	209.47	208.54	209.78	208.96
LE-3	E-3	E-4	1.41	6.12	0.51	2.69	0.45	3.20	0.004	0.003	2.20	3.20	0.59	0.45	210.49	210.18	210.52	208.96
LE-4	E-4	E-6	19.44	23.90	1.83	5.04	1.50	6.34	0.004	0.002	5.18	6.34	1.79	1.50	208.54	207.61	208.96	208.01
LE-5	E-5	E-6	3.06	6.12	0.79	3.23	0.67	4.04	0.004	0.002	2.56	4.04	0.96	0.67	209.16	208.70	209.16	208.01
LE-6	E-6	E-8	25.84	38.86	1.89	5.50	1.64	6.53	0.004	0.002	5.31	4.61	1.95	2.22	207.57	207.14	208.01	207.62
LE-7	E-7	E-8	1.47	6.12	0.52	2.72	0.45	3.25	0.004	0.003	2.21	2.18	0.60	0.61	207.30	207.14	207.34	207.62
LE-8	E-8	E-MH1	31.34	38.86	2.16	5.76	1.82	7.01	0.004	0.003	5.59	5.49	2.22	2.26	207.14	206.92	207.62	207.32
LE-9	E-9	E-MH1	10.00	13.18	1.38	4.33	1.13	5.46	0.004	0.002	3.50	5.46	1.71	1.13	208.41	207.72	208.41	207.32
LE-10	E-MH1	E-11	41.24	58.62	2.26	6.28	2.00	7.26	0.004	0.003	5.07	4.77	2.76	2.94	206.92	206.77	207.32	207.18
LE-11	E-10	E-11	2.13	6.12	0.64	2.97	0.55	3.63	0.004	0.002	2.35	2.95	0.77	0.64	207.07	206.77	207.08	207.18
LE-12	E-11	E-13	44.26	58.62	2.36	6.41	2.07	7.45	0.004	0.003	5.12	4.68	2.94	3.34	206.77	206.38	207.18	206.76
LE-13	E-12	E-13	3.86	6.12	0.90	3.47	0.75	4.36	0.005	0.003	2.75	4.36	1.11	0.75	207.61	207.08	207.61	206.76
LE-14	E-13	E-15	47.03	58.62	2.52	6.35	2.14	7.63	0.004	0.002	4.97	4.89	3.34	3.50	206.38	206.04	206.76	206.50
LE-15	E-14	E-15	7.06	13.18	1.09	4.05	0.94	4.84	0.004	0.003	3.06	4.84	1.38	0.94	206.98	206.37	206.98	206.50
LE-16	E-15	E-17	52.05	58.62	2.77	6.37	2.26	7.94	0.004	0.002	5.41	5.41	3.50	3.50	206.04	205.79	206.50	206.28
LE-17	E-16	E-17	2.31	6.12	0.66	3.08	0.57	3.71	0.004	0.003	2.38	3.71	0.81	0.57	207.21	206.81	207.21	206.28
LE-18	E-17	E-19	53.83	58.62	2.88	6.37	2.30	8.05	0.004	0.002	5.60	5.60	3.50	3.50	205.79	205.37	206.28	205.87
LE-19	E-18	E-19	2.22	6.12	0.65	3.04	0.56	3.67	0.004	0.003	2.37	3.67	0.79	0.56	208.79	208.39	208.79	205.87
LE-20	E-19	E-MH2	54.90	58.62	2.88	6.49	2.32	8.11	0.004	0.003	5.71	5.71	3.50	3.50	205.37	205.02	205.87	205.56
LE-21	E-20	E-21	1.32	6.12	0.50	2.60	0.43	3.15	0.004	0.002	1.48	1.17	0.76	0.91	212.18	212.16	212.21	212.35
LE-22	E-21	E-MH3	3.92	6.12	0.92	3.44	0.76	4.38	0.005	0.002	3.48	3.56	0.91	0.90	212.16	211.80	212.35	211.99
LE-23	E-MH3	E-MH2	3.92	6.12	0.92	3.44	0.76	4.38	0.005	0.002	3.56	4.38	0.90	0.76	211.80	211.47	211.99	205.56
LE-24	E-MH2	E-OUT	56.78	58.62	3.08	6.33	2.36	8.23	0.004	0.002	5.90	5.90	3.50	3.50	205.02	204.50	205.56	205.04

NOTES:

1. CALCULATIONS MADE BY "GEOPAK DRAINAGE" HYDRAULIC COMPUTER PROGRAM.
2. ALLOWABLE PONDING WIDTH = 16' AS PER TXDOT BRIDGE DIVISION HYDRAULIC MANUAL
3. SEWER CALCULATIONS BASED ON MANNING'S FORMULA.
4. TW USED FOR THE STORM SEWER DESIGN WAS BASED ON OUTFALL SOFFIT ELEVATIONS WHICH ARE HIGHER THAN ACTUAL 5YR H.C.D.D. #1 TW ELEVATIONS.
5. RAINFALL FREQUENCY = 5 YR.
6. ✳ DRAINAGE LINK CONSIDERED FOR SRCMP MATERIAL ALTERNATIVE

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
09/22/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

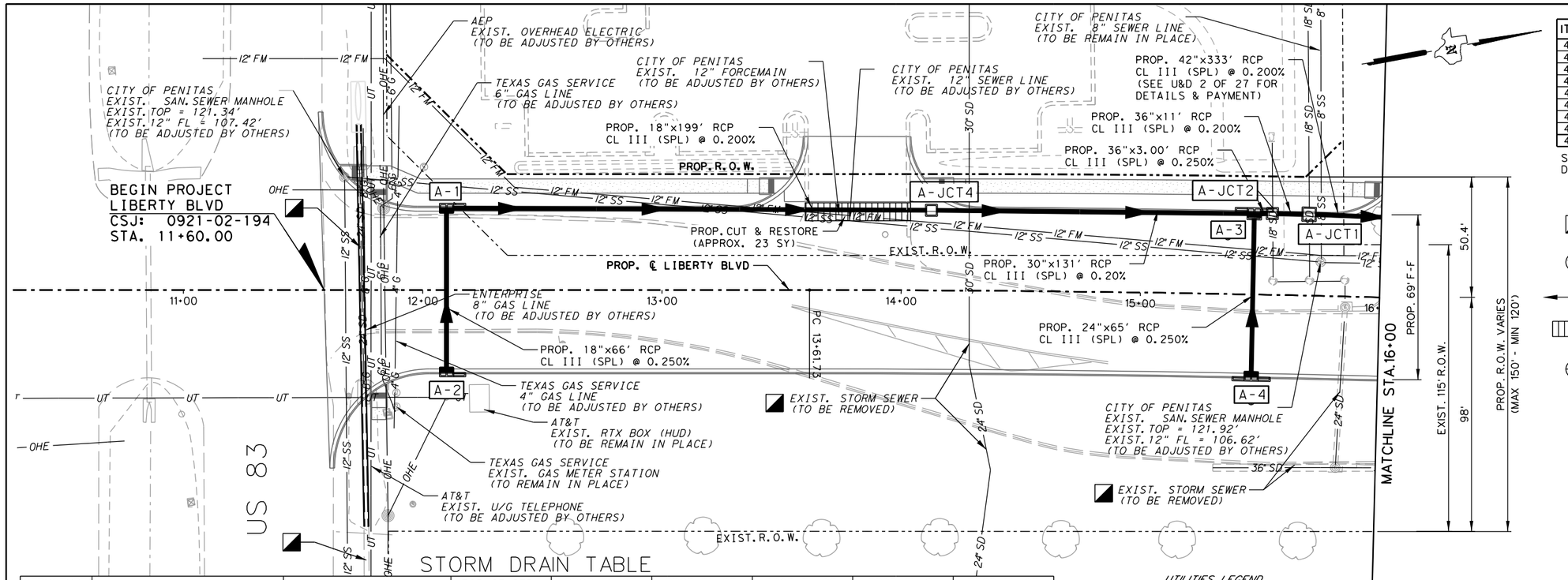
900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
HYDRAULIC DATA
NETWORK "E"

SHEET 11 OF 11

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				143
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

9/22/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\02 HydrolicData\Liberty_HydData.dgn



STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
A-1	PCU10R-3x5	12+10.00 -34.50	160.48	154.60	154.60		154.60	
A-2	PCU10R-3x5	12+10.00 34.50	160.48	154.77				154.77
A-3	PCU15-4x5	15+47.00 -34.50	159.25	152.42	152.42	152.92	153.53	
A-4	PCU15-3x5	15+47.00 34.50	159.25	153.70		152.37		153.70
A-JCT1	PJB 5x5	15+69.82 -34.00	157.13	151.87	151.87			
A-JCT2	PJB 4x4	15+54.52 -34.00	157.13	152.40	152.40	152.40		
A-JCT4	PJB 4x4	14+12.50 -33.50	158.00	153.19	153.19	154.19		

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6

SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	441
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	271
400	CUT & RESTORE	SY	23
402	TRENCH EXCAVATION PROT.	LF	475
464	18" RCP SEWER (CL III)(SPL)	LF	265
464	24" RCP SEWER (CL III)(SPL)	LF	65
464	30" RCP SEWER (CL III)(SPL)	LF	131
464	36" RCP SEWER (CL III)(SPL)	LF	14

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

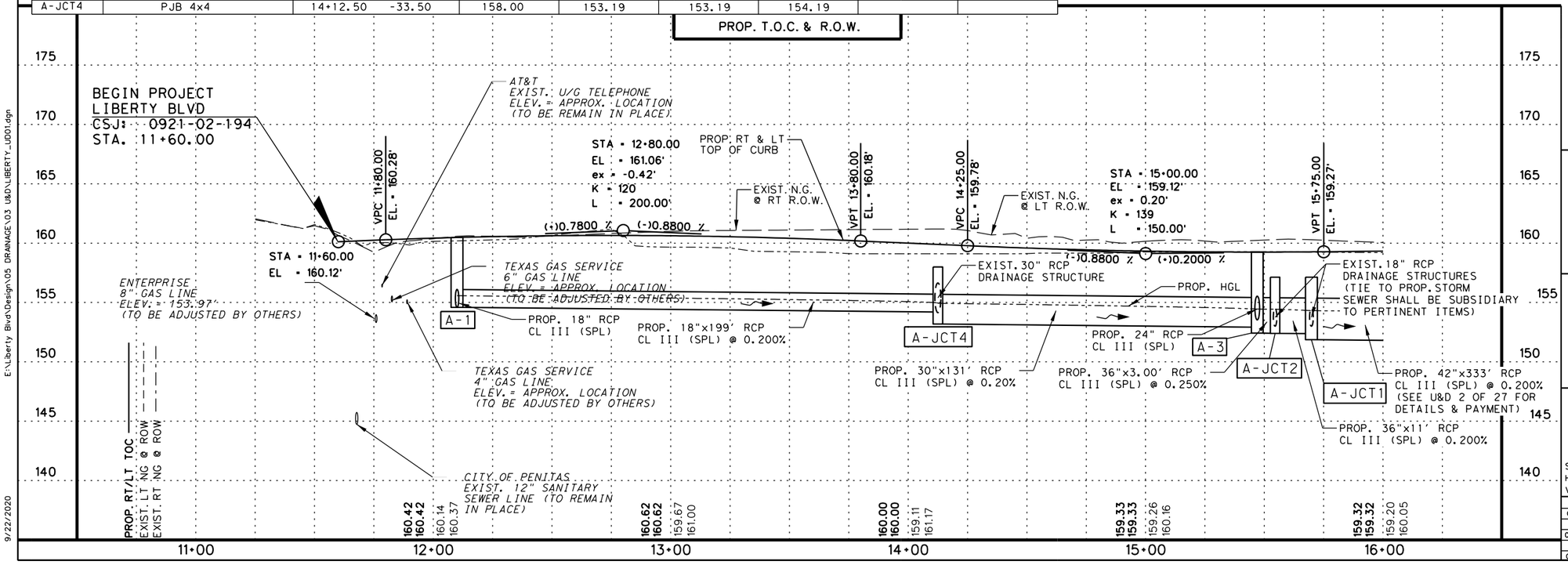
- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.



STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
09/22/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

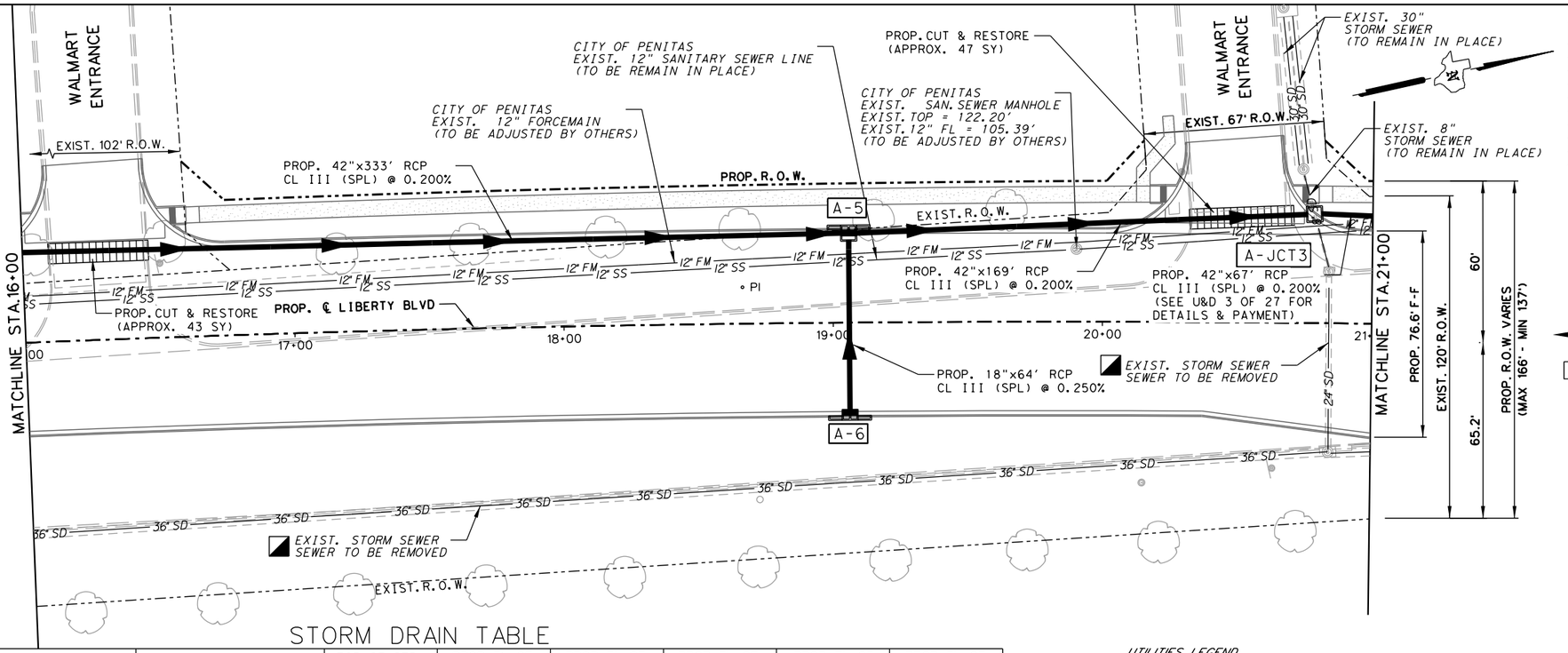
LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 11+60 TO STA. 16+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 1 OF 27

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
						6	TEXAS					144
						STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
						PHR	HIDALGO	0921	02	194		LIBERTY

E:\Liberty Blvd\Design\05 DRAINAGE\03 U&D\LIBERTY_U001.dgn
9/22/2020



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	853
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	508
400	CUT & RESTORE	SY	90
402	TRENCH EXCAVATION PROT.	LF	566
464	18" RCP SEWER (CL III)(SPL)	LF	64
464	42" RCP SEWER (CL III)(SPL)	LF	502

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

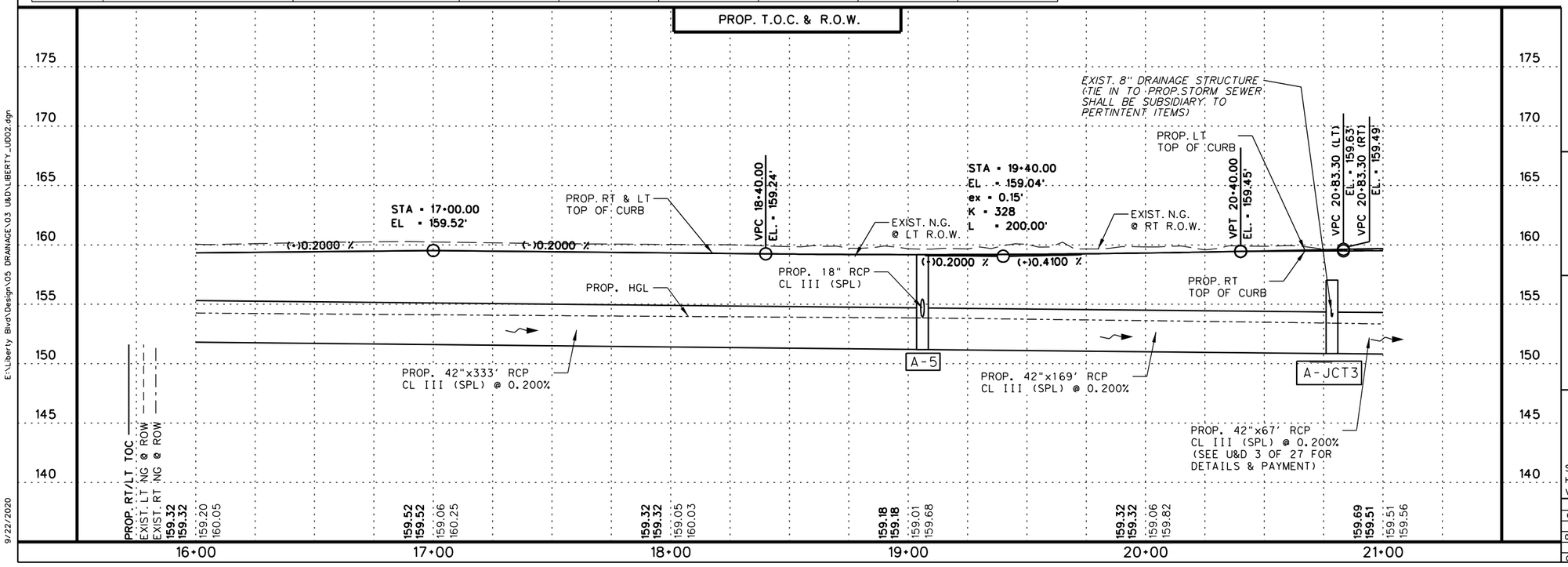
THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

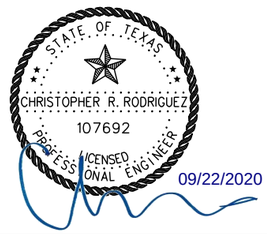
STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
A-5	PCU15-5x5	19+06.00 -34.50	159.18	151.20	151.20	151.20	153.93	
A-6	PCU15-5x5	19+06.00 34.50	159.18	154.10				154.10
A-JCT3	PJB 5x5	20+78.45 -40.51	157.03	150.85	150.85	150.85		

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6





THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 16+00 TO STA. 21+00

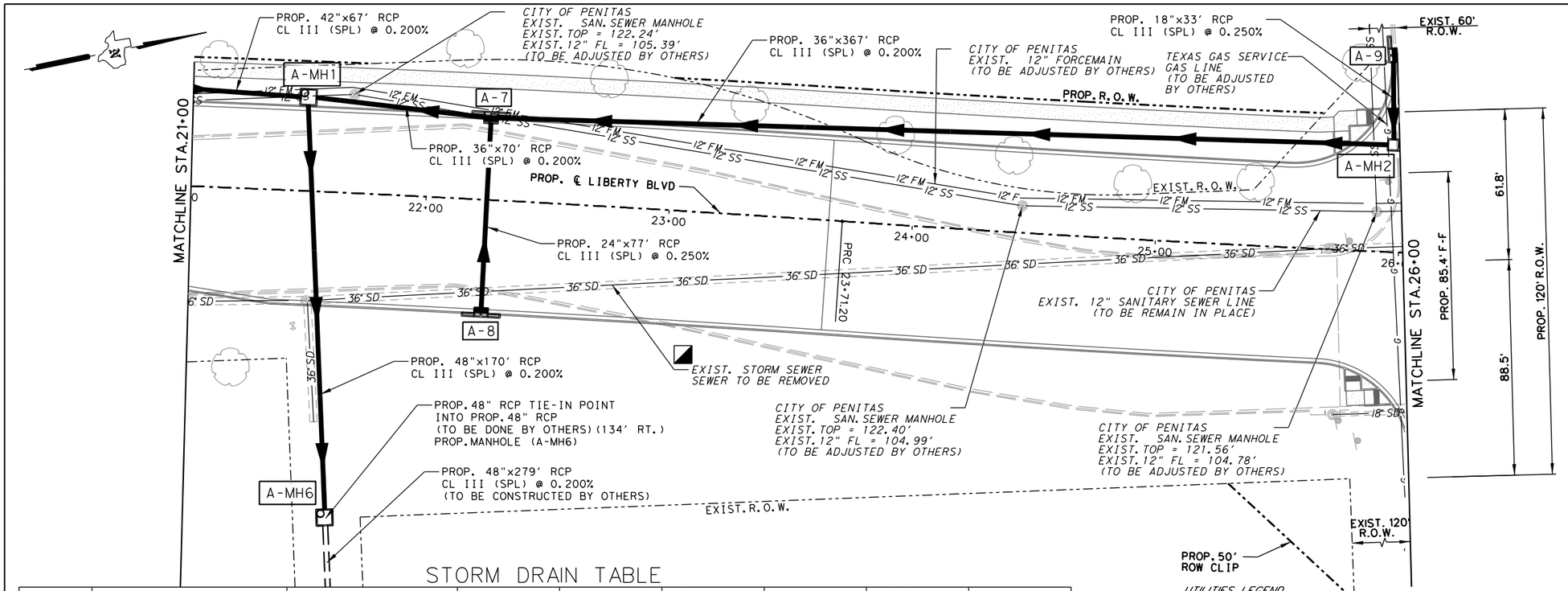
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 2 OF 27

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.	SHEET NO.
						6	TEXAS		145
						STATE DIST. NO	COUNTY	CONTROL NO. / SECTION NO. / JOB NO.	HIGHWAY NO.
						PHR	HIDALGO	0921 / 02 / 194	LIBERTY

E:\Liberty Blvd\Design\05 DRAINAGE\03 U&D\LIBERTY_U002.dgn

9/22/2020

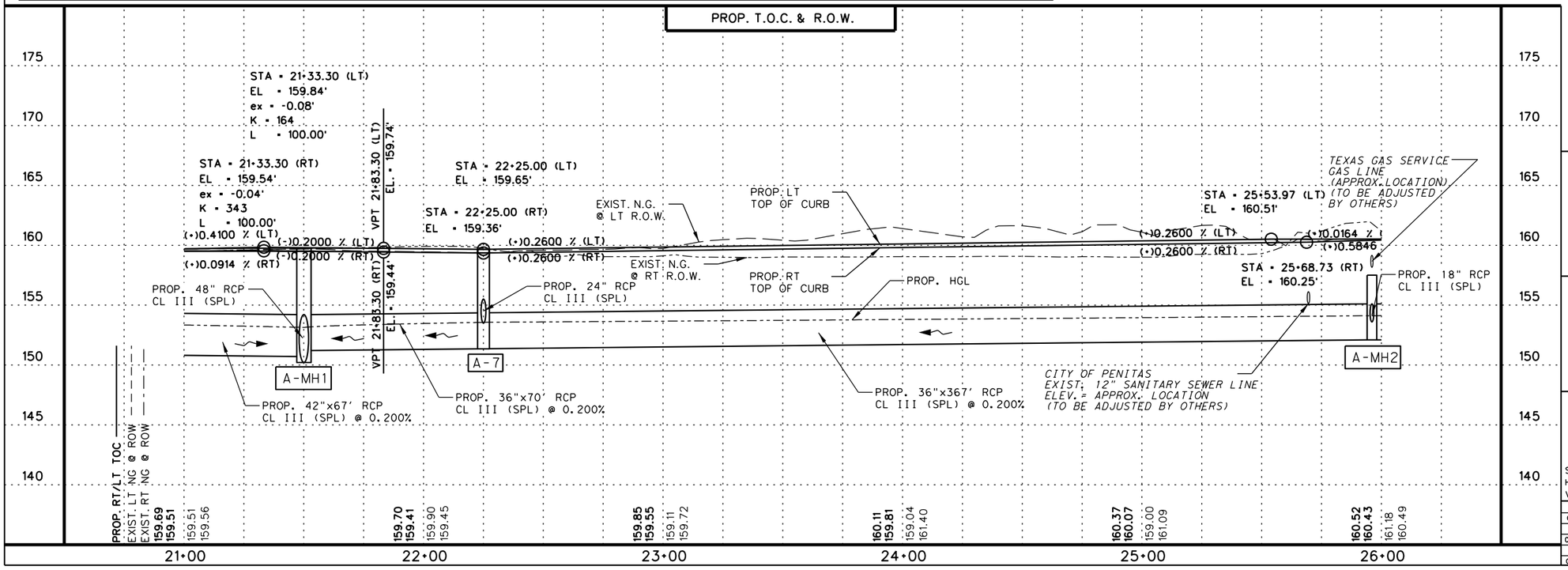


STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
A-7	PCU15-4x5	22+25.00 -34.50	159.65	151.36	151.36	151.36	153.50	
A-8	PCU15-3x5	22+25.00 46.50	159.35	153.70				153.70
A-9	PCU10R-3x5	25+93.90 -80.75	161.40	153.69	155.90		153.69	
A-MH1	PSL RC 6x6	21+50.00 -38.50	159.77	150.21	151.21	150.71	150.21	
A-MH2	PJB 4x4	25+96.00 -44.00	157.50	152.10	152.10	152.10		153.60
A-MH6	PSL RC 6x6	21+50.00 134.00	160.00	149.72			149.72	149.72

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	1287
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	756
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	784
464	18" RCP SEWER (CL III)(SPL)	LF	33
464	24" RCP SEWER (CL III)(SPL)	LF	77
464	36" RCP SEWER (CL III)(SPL)	LF	437
464	42" RCP SEWER (CL III)(SPL)	LF	67
464	48" RCP SEWER (CL III)(SPL)	LF	170

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
09/22/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

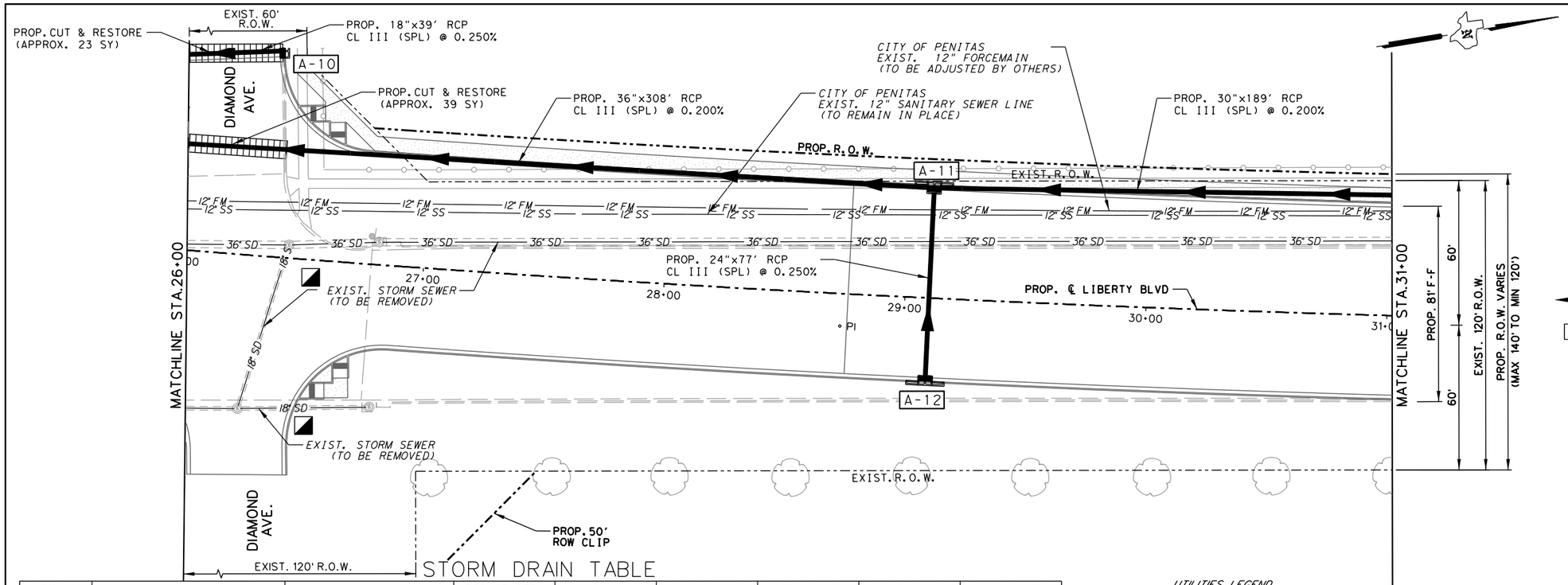
LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 21+00 TO STA. 26+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 3 OF 27

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.	SHEET NO.
						6	TEXAS		146
						STATE DIST. NO	COUNTY	CONTROL NO. / SECTION NO. / JOB NO.	HIGHWAY NO.
						PHR	HIDALGO	0921 / 02 / 194	LIBERTY

E:\Liberty Blvd\Design\05 DRAINAGE\03 U&D\LIBERTY_UD03.dgn
9/22/2020

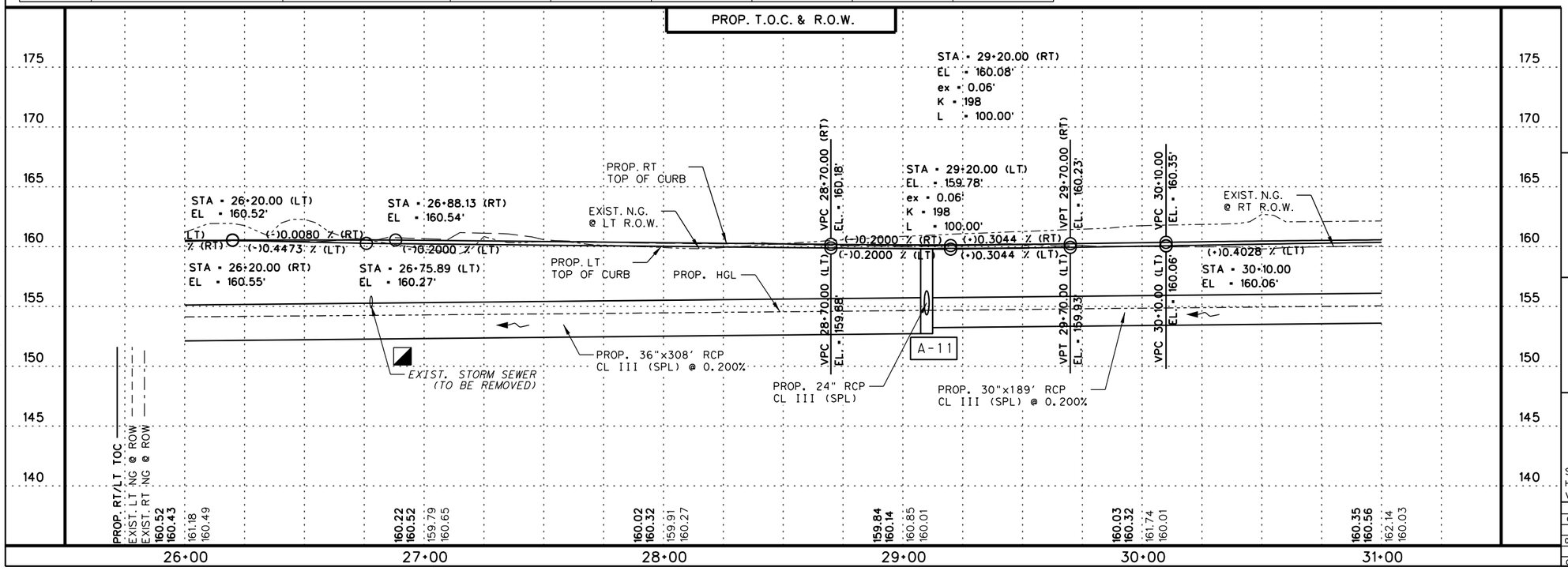


STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
A-10	PCU10L-3x5	26+36.00-85.50	161.30	156.00		156.00		
A-11	PCU15-4x5	29+10.00-46.50	159.84	152.73	153.23	152.73		
A-12	PCU15-3x5	29+10.0034.50	160.14	154.50				154.50

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	771
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	452
400	CUT & RESTORE	SY	62
402	TRENCH EXCAVATION PROT.	LF	613
464	18" RCP SEWER (CL III)(SPL)	LF	39
464	24" RCP SEWER (CL III)(SPL)	LF	77
464	30" RCP SEWER (CL III)(SPL)	LF	189
464	36" RCP SEWER (CL III)(SPL)	LF	308

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
09/22/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

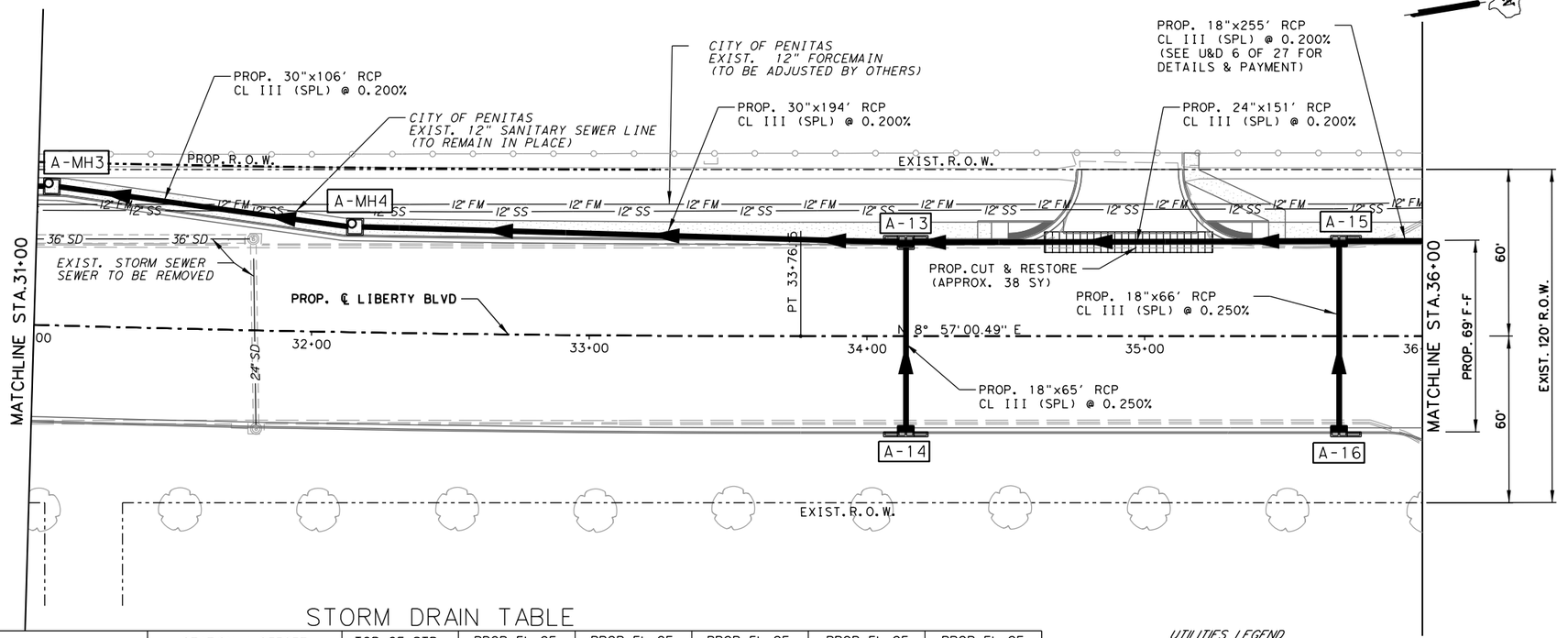
LIBERTY BLVD UTILITY AND DRAINAGE STA. 26+00 TO STA. 31+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 4 OF 27

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					147
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

E:\Liberty Blvd\Design\05 DRAINAGE\03 U&D\LIBERTY_UD04.dgn
9/22/2020

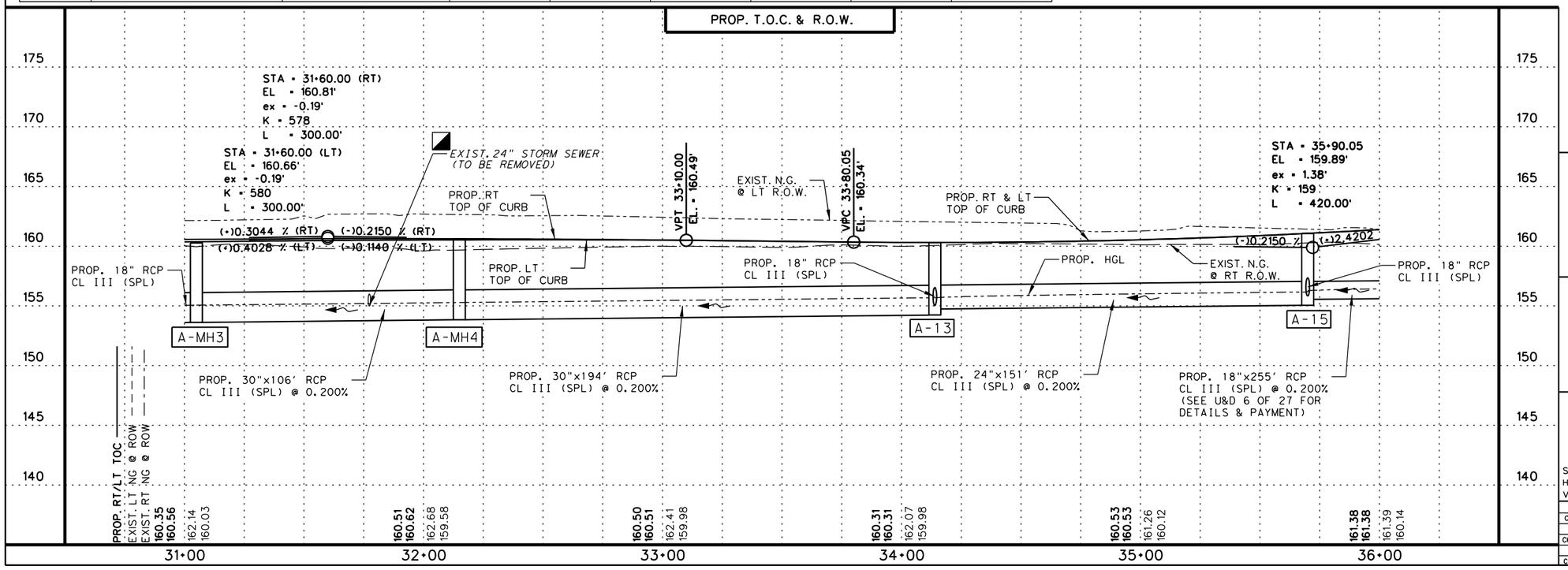


STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
A-MH3	PSL RC 5x5	31+05.00-50.00	160.26	153.61	153.61	153.61		
A-MH4	PSL RC 5x5	32+15.00-38.00	160.62	153.83	153.83	153.83		
A-13	PCU15-4x5	34+14.00-34.50	160.30	154.23	154.73	154.23	155.03	
A-14	PCU15-3x5	34+14.0034.50	160.30	155.20				155.20
A-15	PCU10R-3x5	35+70.00-34.50	161.06	155.04	155.54	155.04	155.83	
A-16	PCU10L-3x5	35+70.0034.50	161.06	156.00				156.00

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	629
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	365
400	CUT & RESTORE	SY	38
402	TRENCH EXCAVATION PROT.	LF	582
464	18" RCP SEWER (CL III)(SPL)	LF	131
464	24" RCP SEWER (CL III)(SPL)	LF	151
464	30" RCP SEWER (CL III)(SPL)	LF	300

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
09/22/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

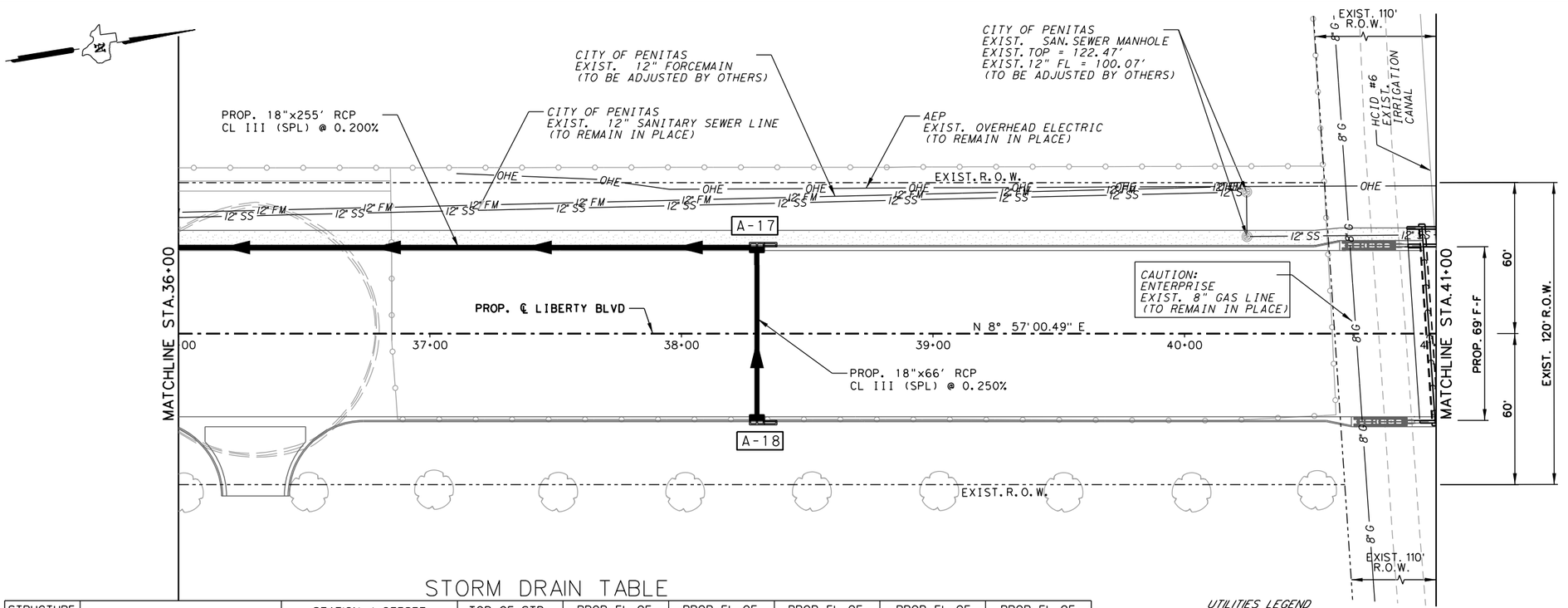
LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 31+00 TO STA. 36+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 5 OF 27

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
						6	TEXAS				148
						STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
						PHR	HIDALGO	0921	02	194	LIBERTY

E:\Liberty Blvd\Design\05 DRAINAGE\03 U&D\LIBERTY_U005.dgn
9/22/2020



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	383
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	155
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	321
464	18" RCP SEWER (CL III)(SPL)	LF	321

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

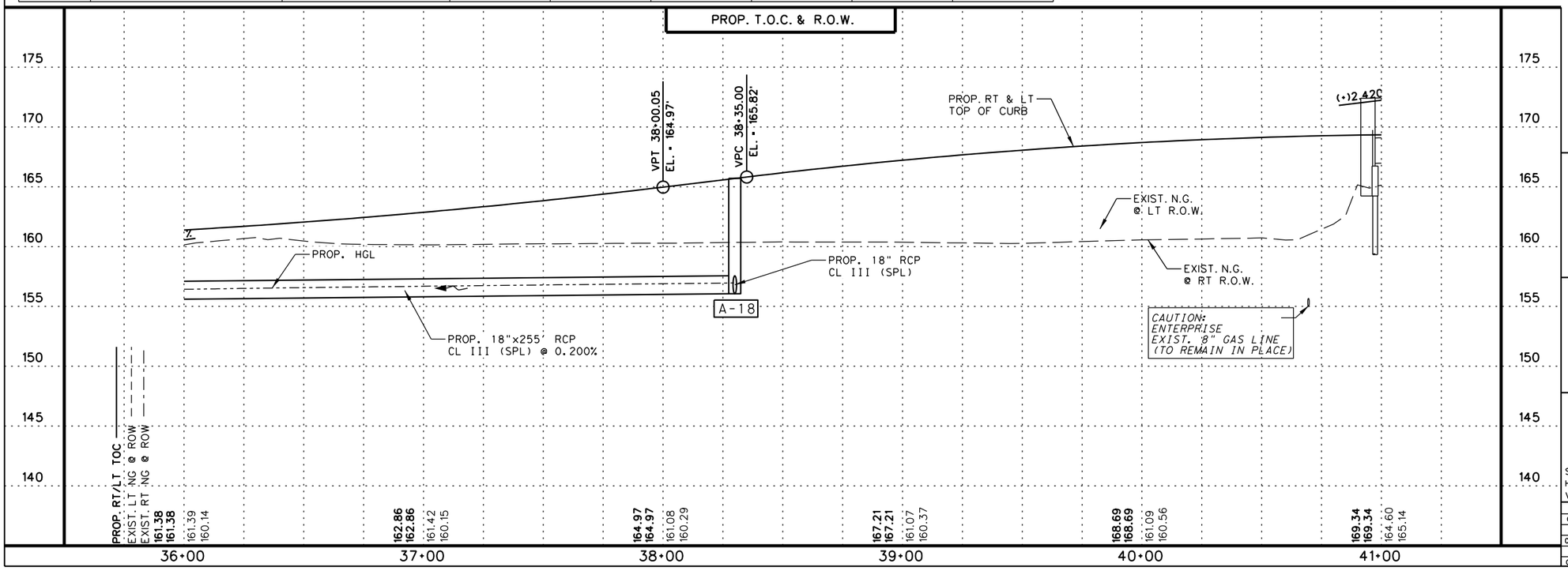
THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
A-17	PCU10R-3x5	38+30.00 -34.50	165.69	156.06		156.06	156.06	
A-18	PCU10L-3x5	38+30.00 34.50	165.69	156.23				156.23

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6



E:\Liberty Blvd\Design\05 DRAINAGE\03 U&D\LIBERTY_UD06.dgn

9/22/2020

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED
PROFESSIONAL ENGINEER
09/22/2020

THE COUNTY OF HIDALGO
TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

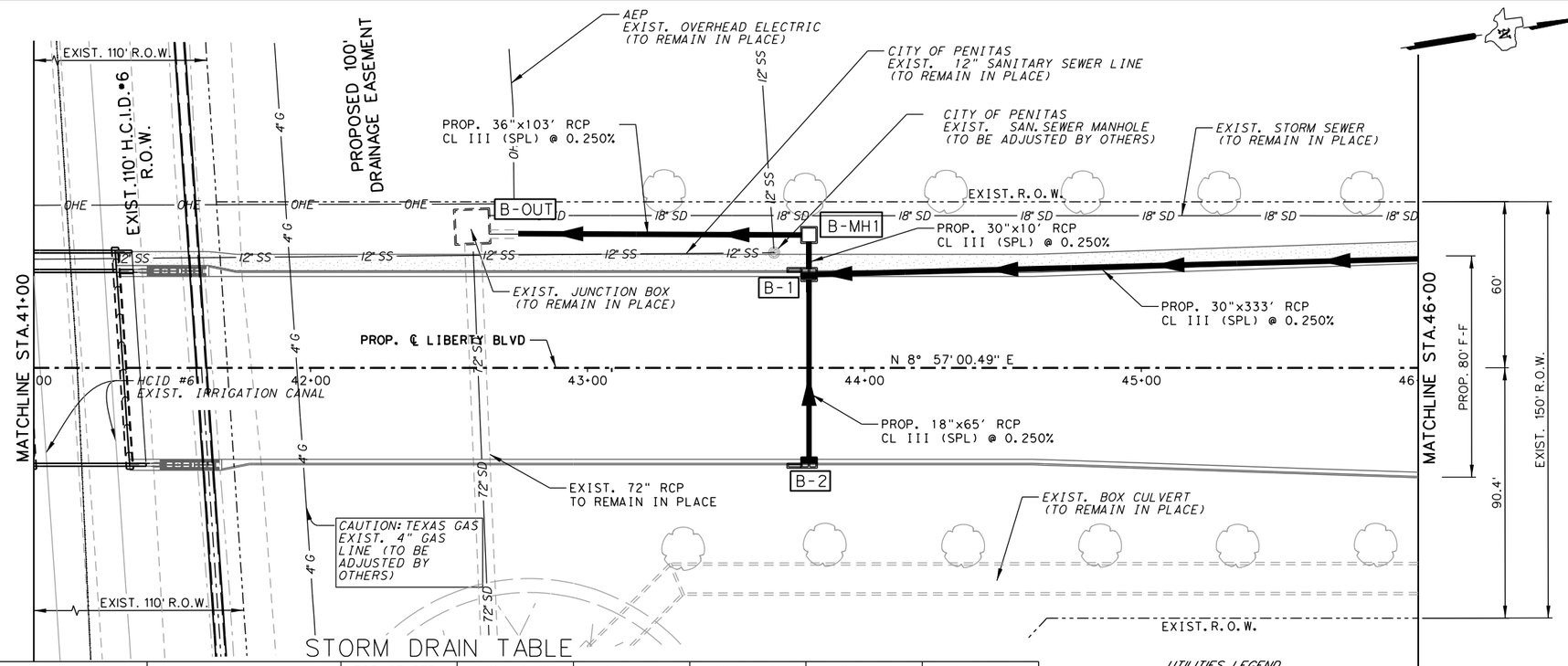
900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 36+00 TO STA. 41+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 6 OF 27

DN:	FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:	6	TEXAS				149
DW:	STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:	PHR	HIDALGO	0921	02	194	LIBERTY
TR:						
CK TR:						

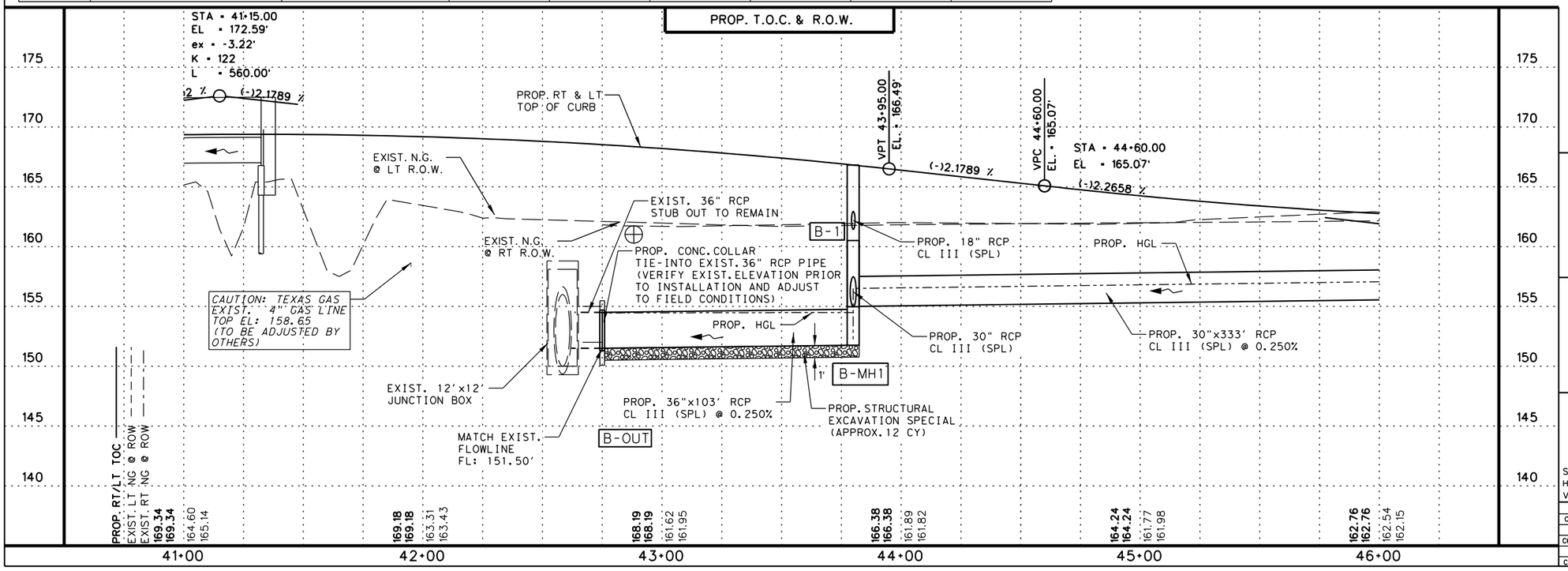


STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
B-1	PCU10L-4x5	43+80.00 -34.50	166.81	155.00	155.00		161.43	155.00
B-2	PCU10R-3x5	43+80.00 34.50	166.81	161.60				161.60
B-MH1	PJB 5x5	43+80.00 -48.00	160.50	151.76		151.76		
B-OUT	OUTLET	42+75.00 -48.50	161.80	151.50				

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	917
400	STRUCT EXCAVATION (SPL)	CY	24
400	SAND BACKFILL	CY	358
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	511
464	18" RCP SEWER (CL III)(SPL)	LF	65
464	30" RCP SEWER (CL III)(SPL)	LF	343
464	36" RCP SEWER (CL III)(SPL)	LF	103

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
09/22/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

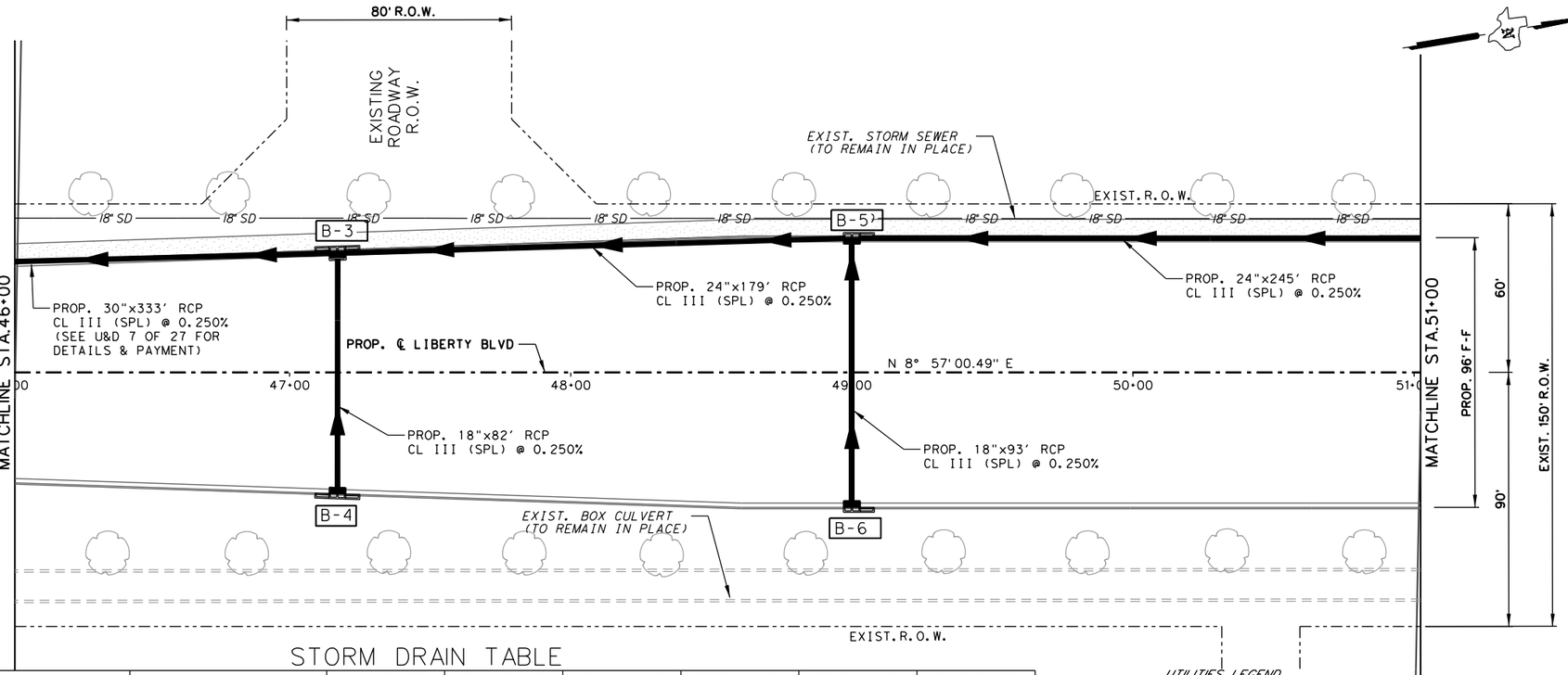
LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 41+00 TO STA. 46+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 7 OF 27

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
						6	TEXAS				150
						STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
						PHR	HIDALGO	0921	02	194	LIBERTY

E:\Liberty Blvd\Design\05 DRAINAGE\03 U&D\LIBERTY_UD07.dgn
9/22/2020



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	576
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	335
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	599
464	18" RCP SEWER (CL III)(SPL)	LF	175
464	24" RCP SEWER (CL III)(SPL)	LF	424

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

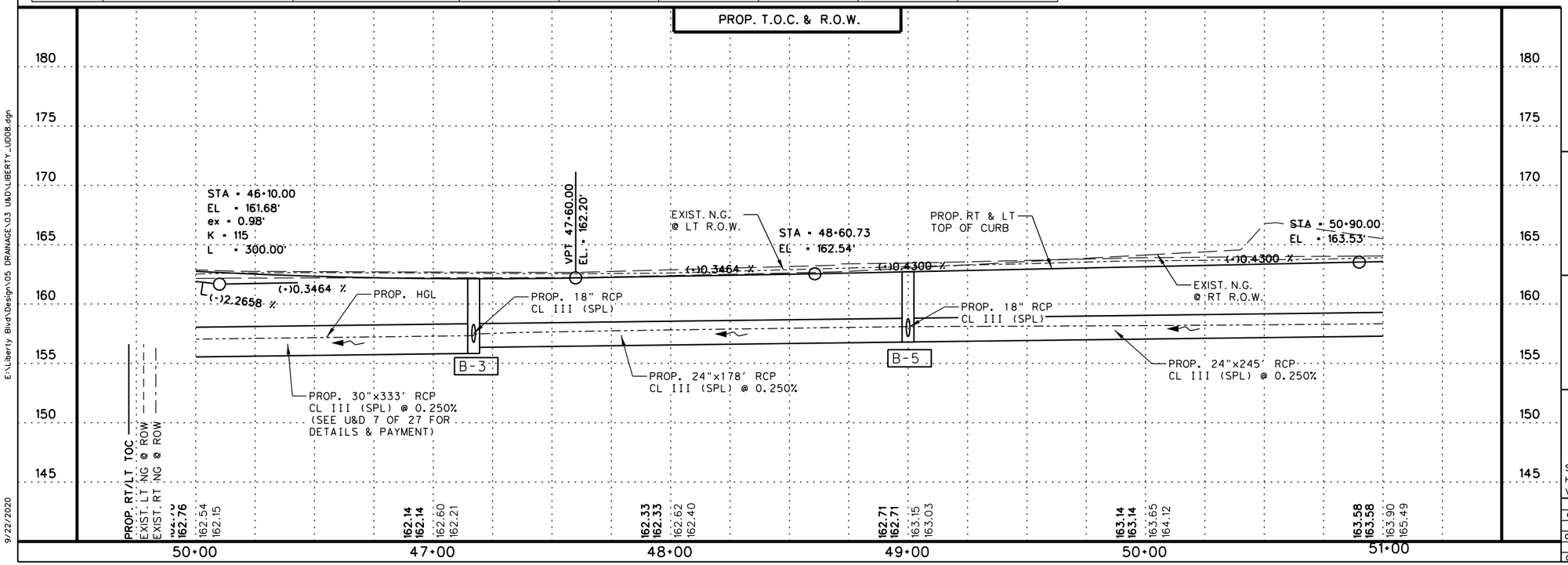
THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB		TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
B-3	PCU15-4x5	47+17.00	-43.20	162.16	155.84	156.34	155.84	156.79	
B-4	PCU15-3x5	47+17.00	43.20	162.16	157.00				157.00
B-5	PCU10R-3x5	49+00.00	-48.00	162.71	156.80	156.80	156.80	157.26	
B-6	PCU10L-3x5	49+00.00	48.00	162.71	157.50	157.50			

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6



STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
09/22/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

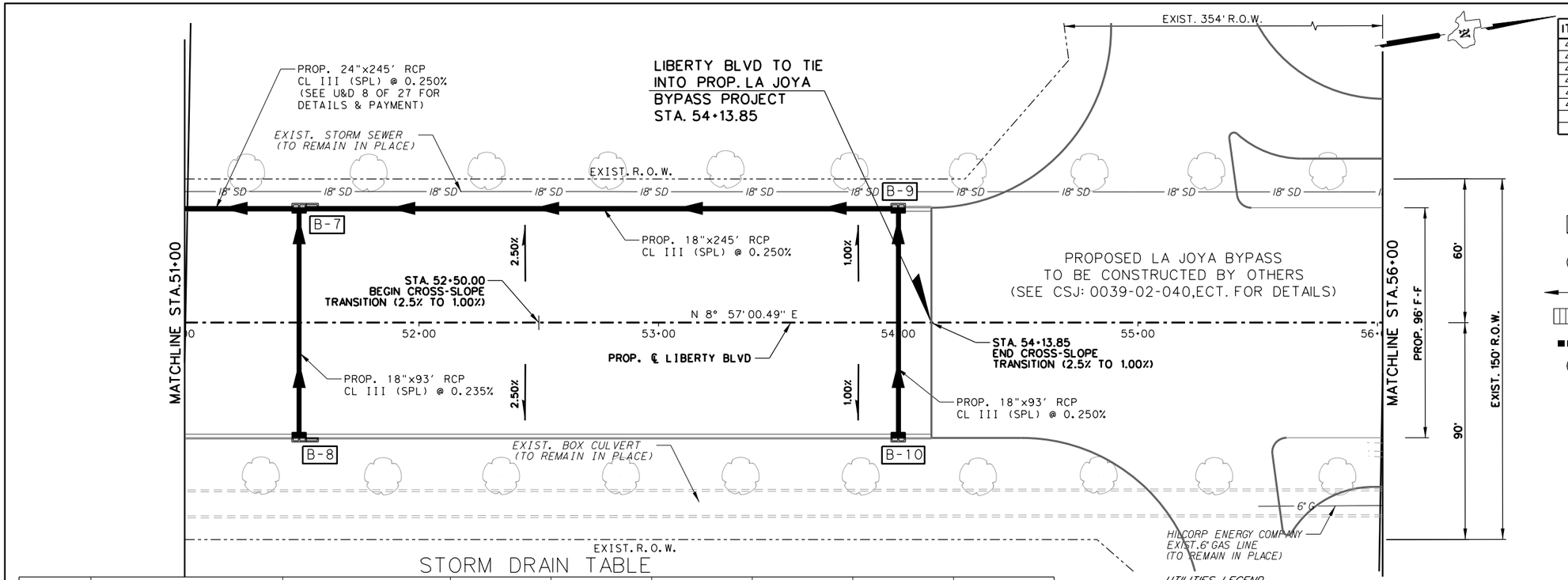
LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 46+00 TO STA. 51+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 8 OF 27

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
						6	TEXAS				151
						STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
						PHR	HIDALGO	0921	02	194	LIBERTY

E:\Liberty Blvd\Design\05 DRAINAGE\03 U&D\LIBERTY_U008.dgn
9/22/2020



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	389
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	208
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	431
464	18" RCP SEWER (CL III)(SPL)	LF	431

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- INST. OM ASSM (OM-2Z)(FLX) GND (BI)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

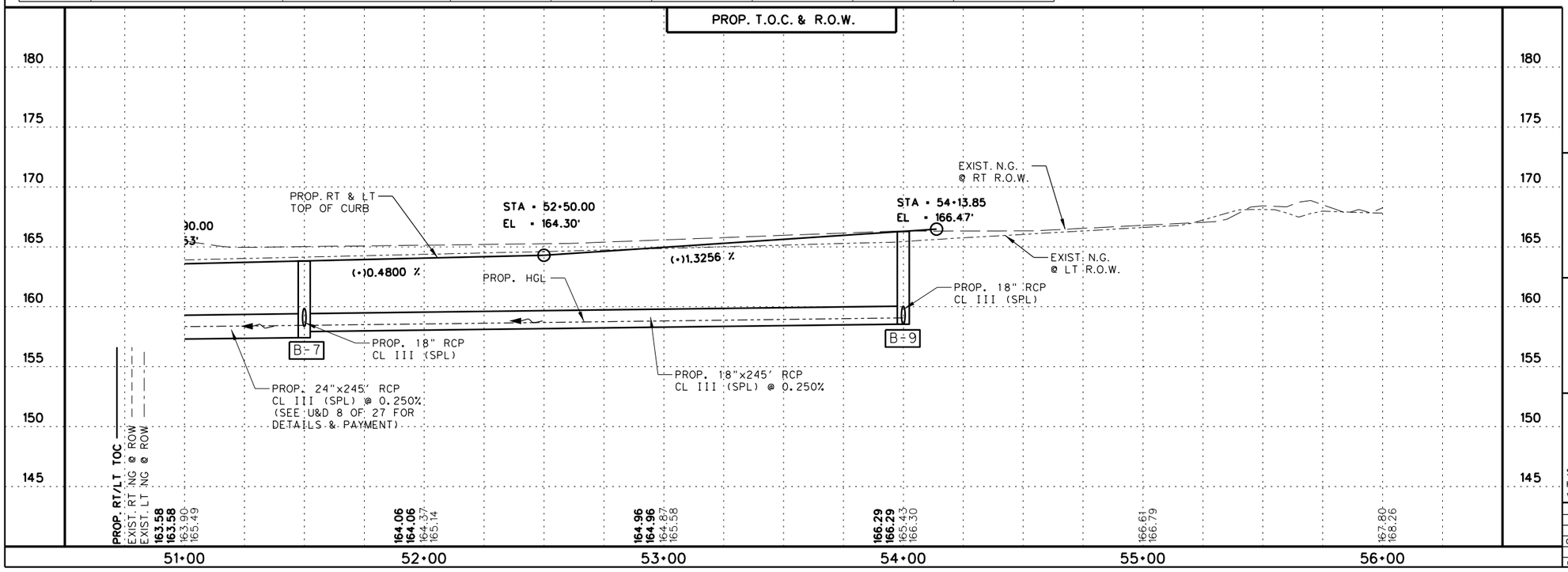
THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
B-7	PCU10R-3x5	51+50.00 -48.00	163.82	157.42	157.92		158.36	
B-8	PCU10L-3x5	51+50.00 48.00	163.82	158.60				158.60
B-9	PCU5-3x5	54+00.00 -48.00	166.29	158.55		158.55	158.55	
B-10	PCU5-3x5	54+00.00 48.00	166.29	158.79				158.79

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
04/07/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD UTILITY AND DRAINAGE STA. 51+00 TO STA. 56+00

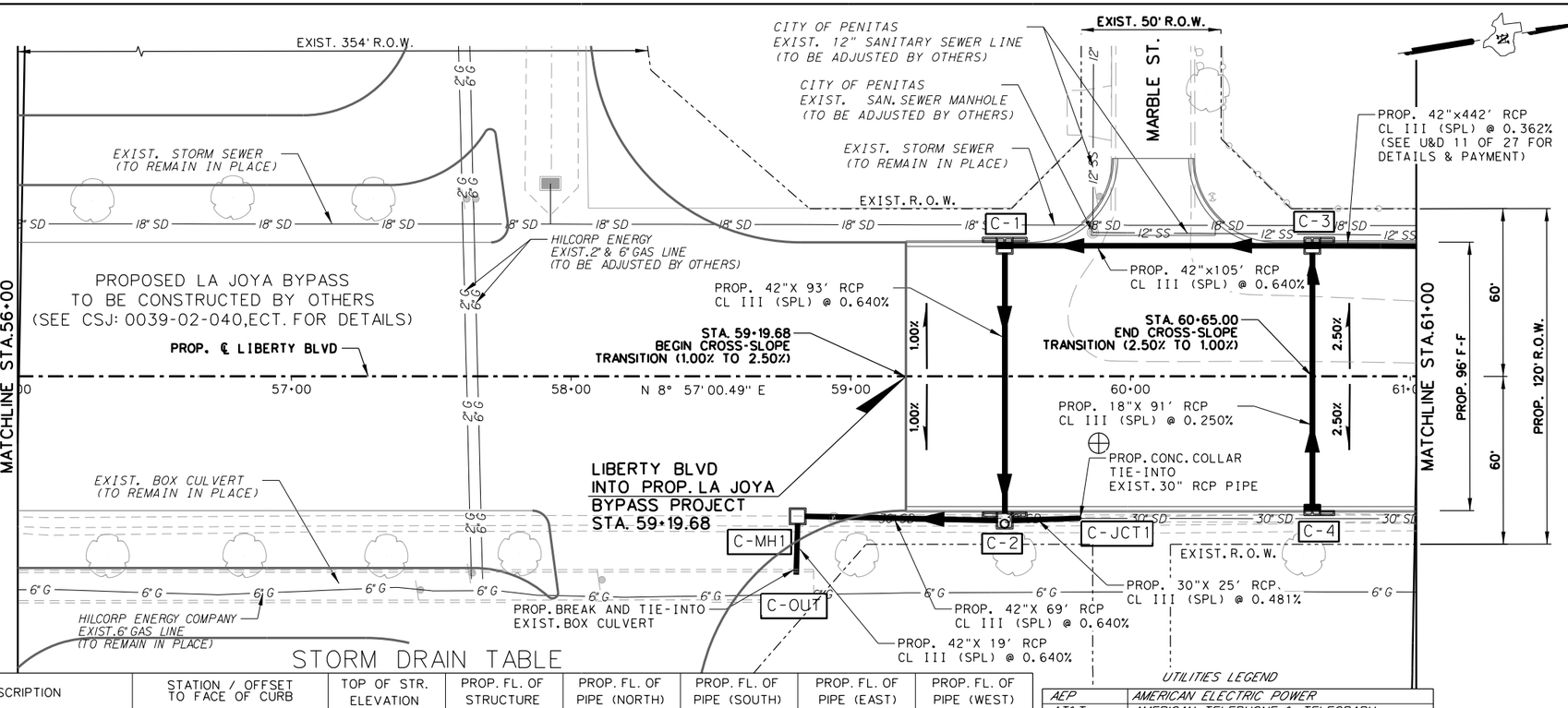
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 9 OF 27

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
6	TEXAS				152
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
PHR	HIDALGO	0921	02	194	LIBERTY

K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\05 DRAINAGE\03 U&D\LIBERTY_UD09.dgn
3/15/2022

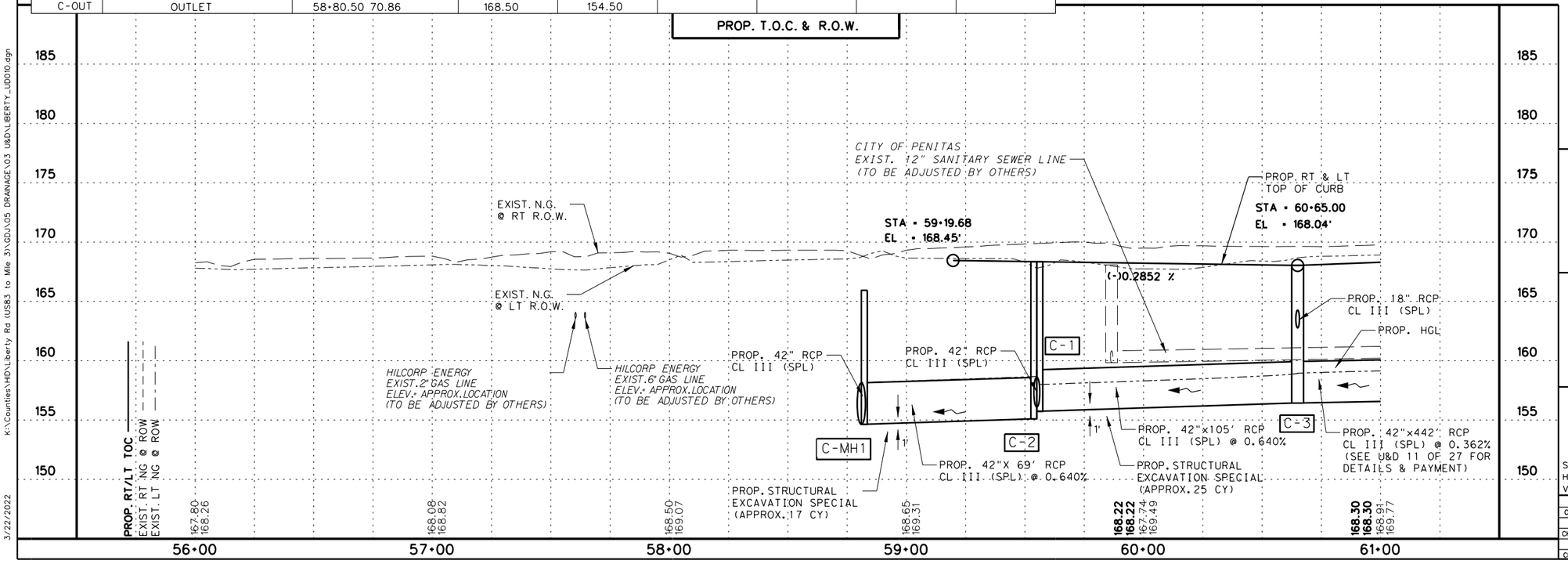


STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
C-1	PCU15-5x5	59+55.00 -48.00	168.35	155.74	155.74		155.74	
C-2	PCO15-5x5	59+55.00 48.00	168.35	155.11	156.10	155.11		155.11
C-3	PCU10R-5x5	60+65.00 -48.00	168.05	156.43	156.43	15643	162.77	
C-4	PCU10L-3x5	60+65.00 48.00	168.05	163.00				163.00
C-JCT1	JCT	59+82.00 50.70	169.80	156.24		156.24		
C-MH1	PJB 5x5	58+81.00 50.00	165.94	154.63	154.63		154.63	
C-OUT	OUTLET	58+80.50 70.86	168.50	154.50				

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	1000
400	STRUCT EXCAVATION (SPL)	CY	73
400	SAND BACKFILL	CY	246
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	402
464	18" RCP SEWER (CL III)(SPL)	LF	91
464	30" RCP SEWER (CL III)(SPL)	LF	25
464	42" RCP SEWER (CL III)(SPL)	LF	286

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- INST. OM ASSM (OM-2Z)(FLX) GND (BI)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED
PROFESSIONAL ENGINEER
04/07/2022

THE COUNTY OF HIDALGO
TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

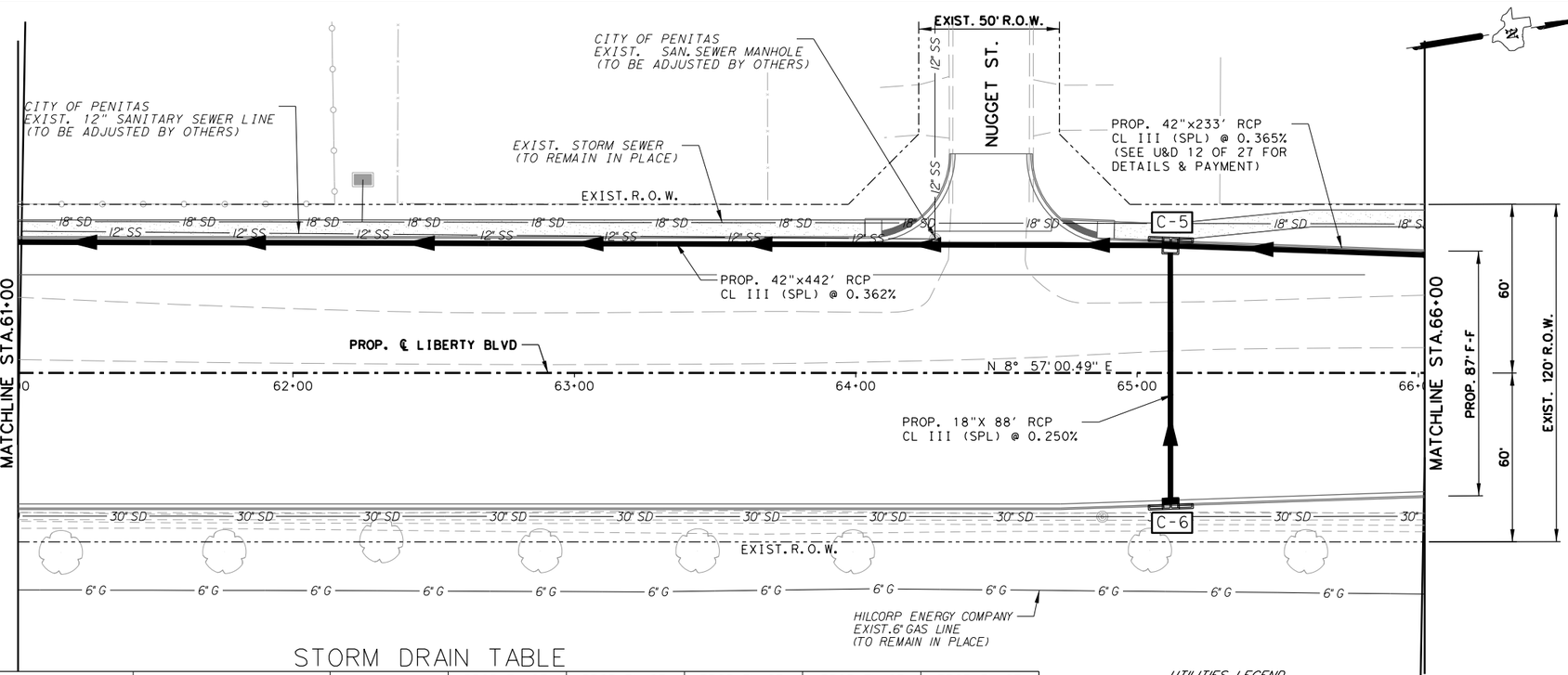
LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 56+00 TO STA. 61+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 10 OF 27

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					153
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

3/22/2022
K:\Counties\HDV\Liberty Rd (US83 to Mile 3)\GDJV05 DRAINAGE\03 U&D\LIBERTY_UD010.dgn



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	1360
400	STRUCT EXCAVATION (SPL)	CY	106
400	SAND BACKFILL	CY	343
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	530
464	18" RCP SEWER (CL III)(SPL)	LF	88
464	42" RCP SEWER (CL III)(SPL)	LF	442

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- INST. OM ASSM (OM-2Z)(FLX) GND (BI)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

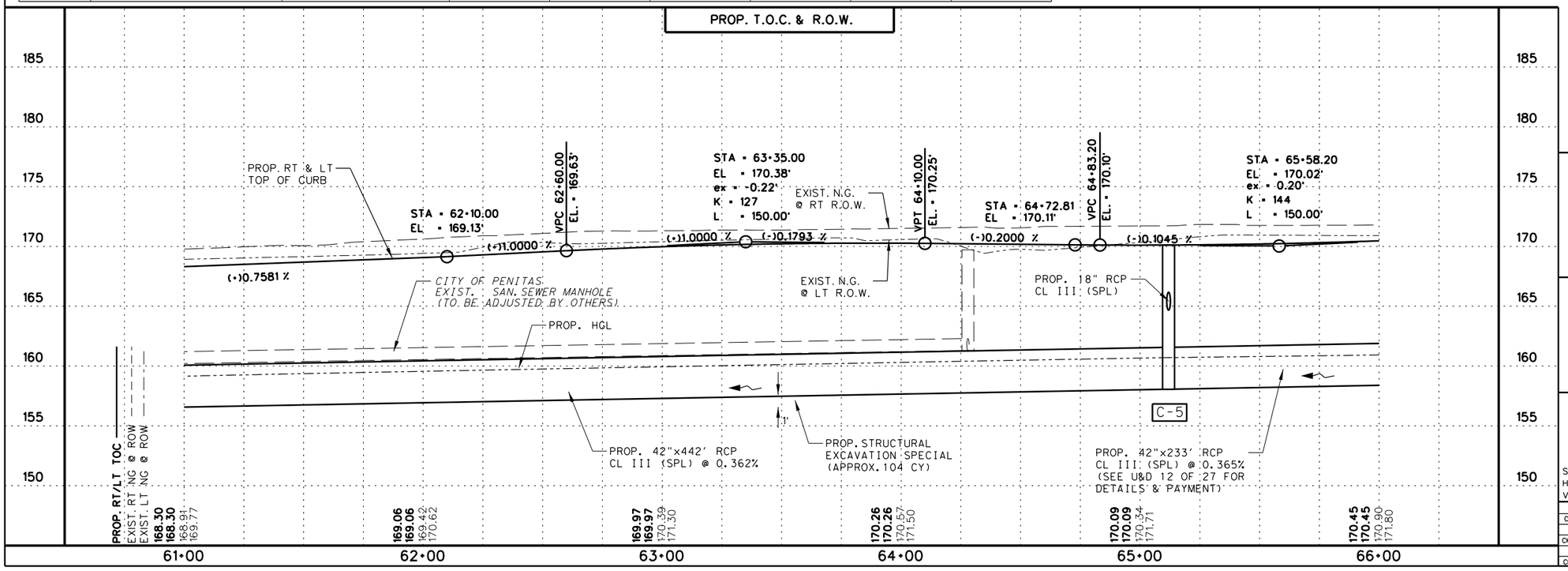
THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

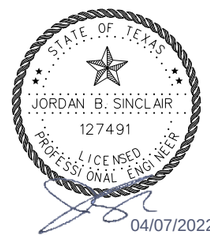
STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
C-5	PCU15-5x5	65+12.00 -46.60	170.10	158.06	158.06	158.06	164.67	
C-6	PCU15-3x5	65+12.00 46.70	170.10	164.90				164.90

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6





THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 61+00 TO STA. 66+00

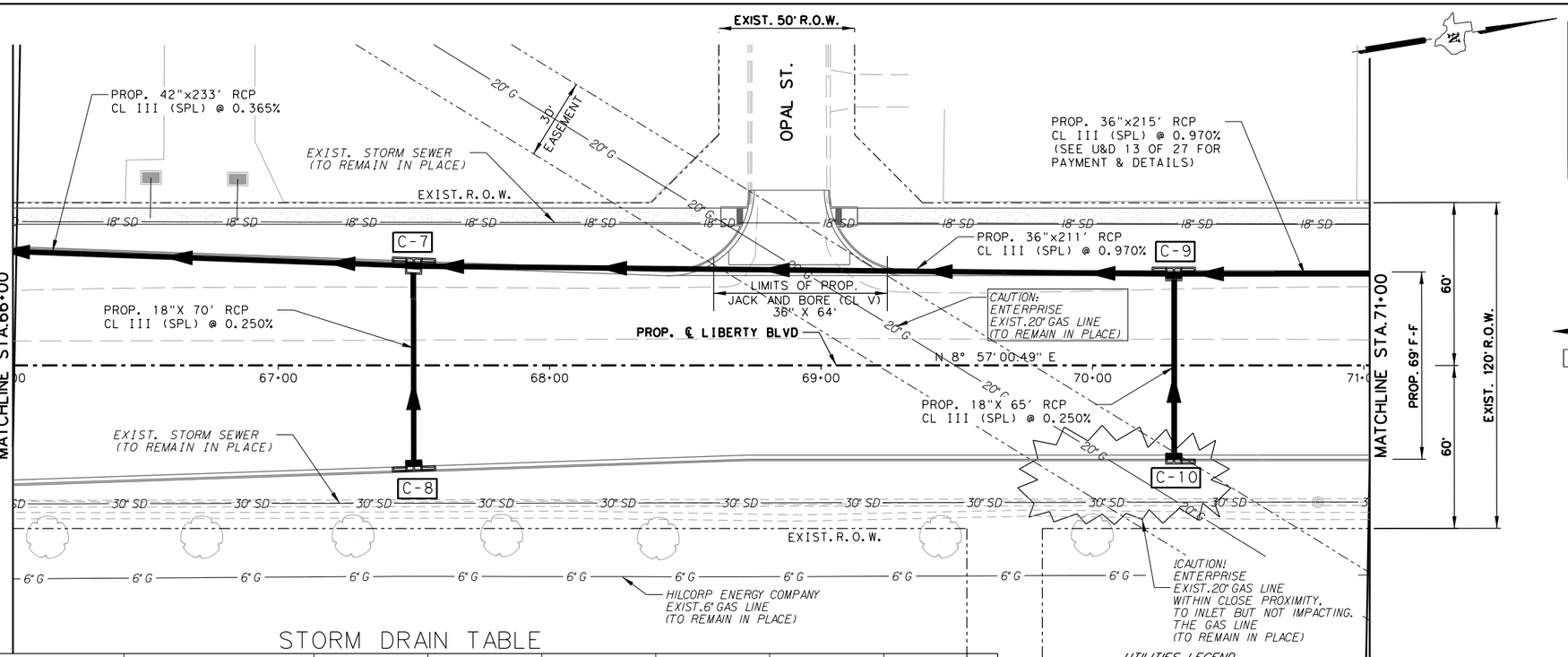
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 11 OF 27

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				154
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\05 DRAINAGE\03 U&D\LIBERTY_UD011.dgn

3/22/2022



STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
C-7	PCU15-5x5	67+50.00 -37.95	171.83	158.93	159.43	158.93	166.32	
C-8	PCU15-3x5	67+50.00 37.15	171.82	166.50				166.50
C-9	PCU15-4x5	70+30.00 -34.50	174.10	162.15	162.38	162.15	168.03	
C-10	PCU10L-3x5	70+30.00 34.50	174.10	168.20				168.20

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6

SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	1423
400	STRUCT EXCAVATION (SPL)	CY	100
400	SAND BACKFILL	CY	339
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	579
464	18" RCP SEWER (CL III)(SPL)	LF	135
464	36" RCP SEWER (CL III)(SPL)	LF	211
464	42" RCP SEWER (CL III)(SPL)	LF	233
476	JACK BORE OR TUN	LF	64
	PIPE(36 IN)(RC)(CL V)		

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

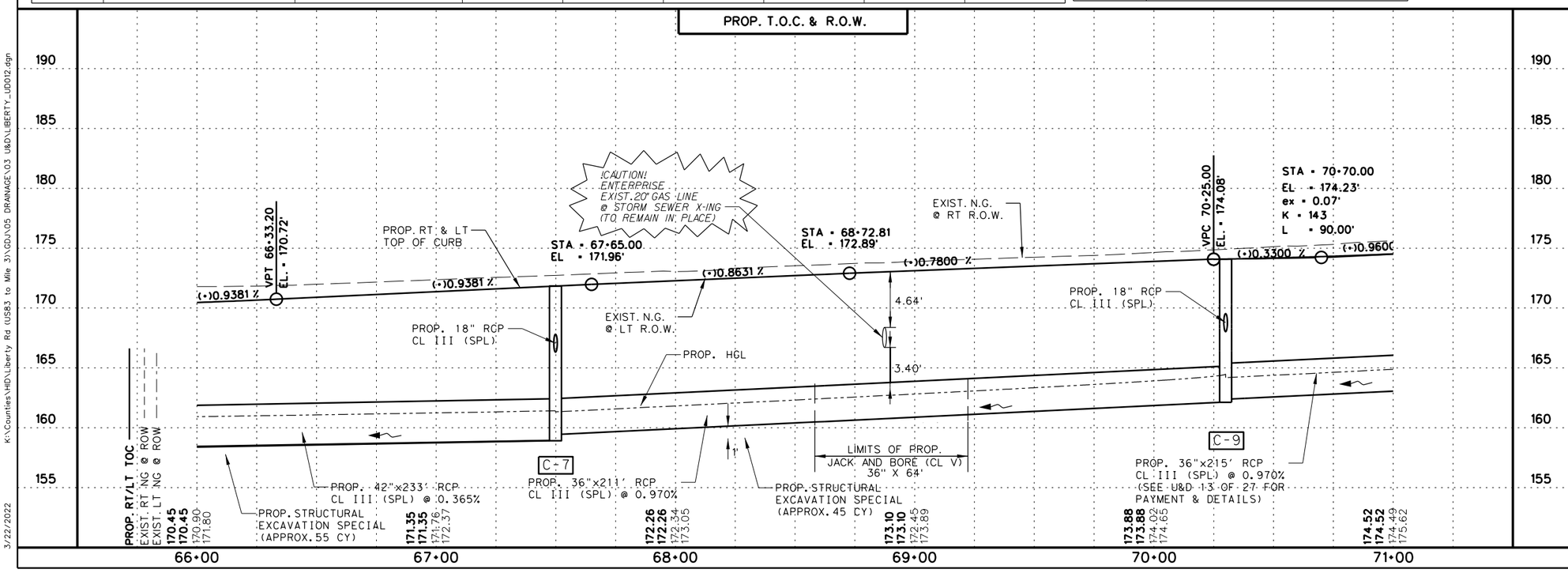
- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- INST. OM ASSM (OM-2Z)(FLX) GND (BI)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
04/07/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

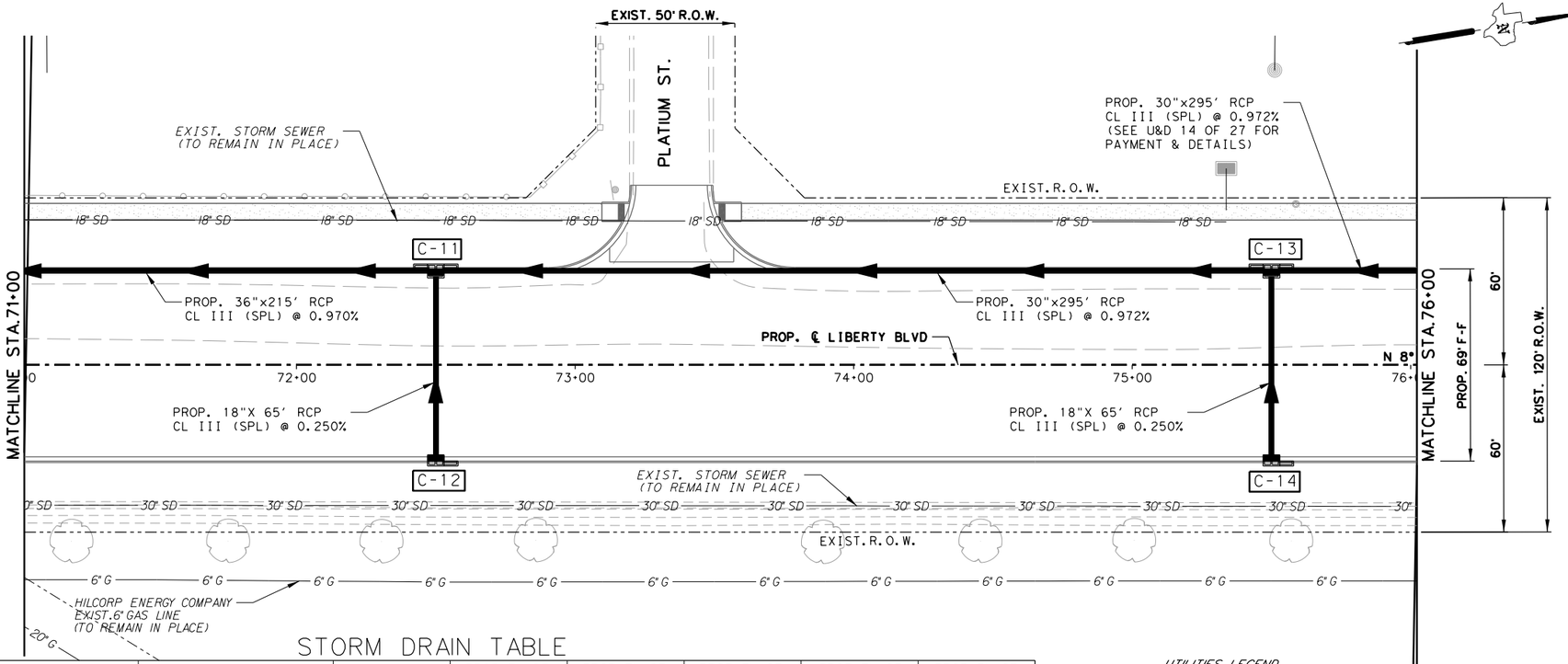
LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 66+00 TO STA. 71+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 12 OF 27

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				155
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:	
CK TR:	

K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\05 DRAINAGE\03 U&D\LIBERTY_UD012.dgn
3/22/2022



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	1306
400	STRUCT EXCAVATION (SPL)	CY	103
400	SAND BACKFILL	CY	325
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	640
464	18" RCP SEWER (CL III)(SPL)	LF	130
464	30" RCP SEWER (CL III)(SPL)	LF	295
464	36" RCP SEWER (CL III)(SPL)	LF	215

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- INST. OM ASSM (OM-2Z)(FLX) GND (BI)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

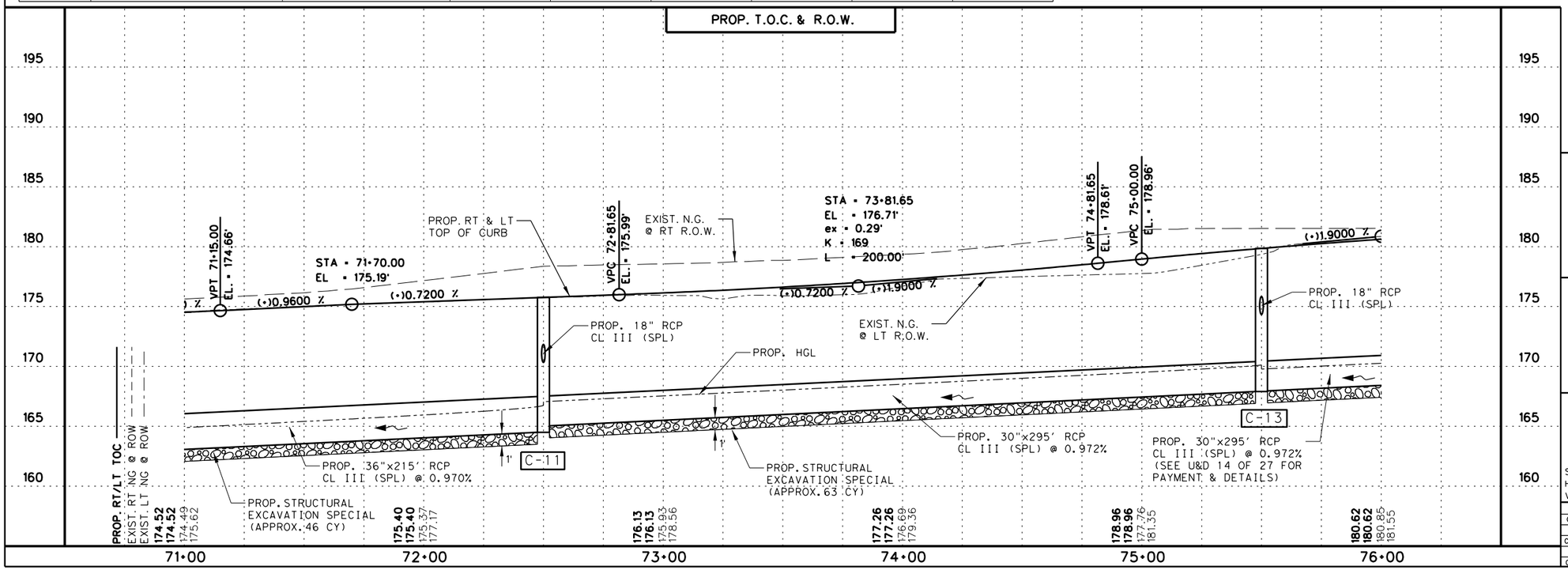
THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

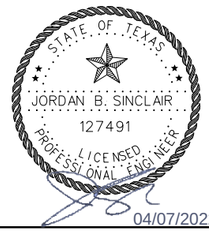
STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
C-11	PCU15-4x5	72+50.00 -34.50	175.76	164.51	165.01	164.51	170.33	
C-12	PCU10L-3x5	72+50.00 34.50	175.76	170.50				170.50
C-13	PCU15-4x5	75+50.00 -34.50	179.85	167.93	167.93	167.93	174.33	
C-14	PCU10L-3x5	75+50.00 34.50	179.85	174.50				174.50

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6







L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

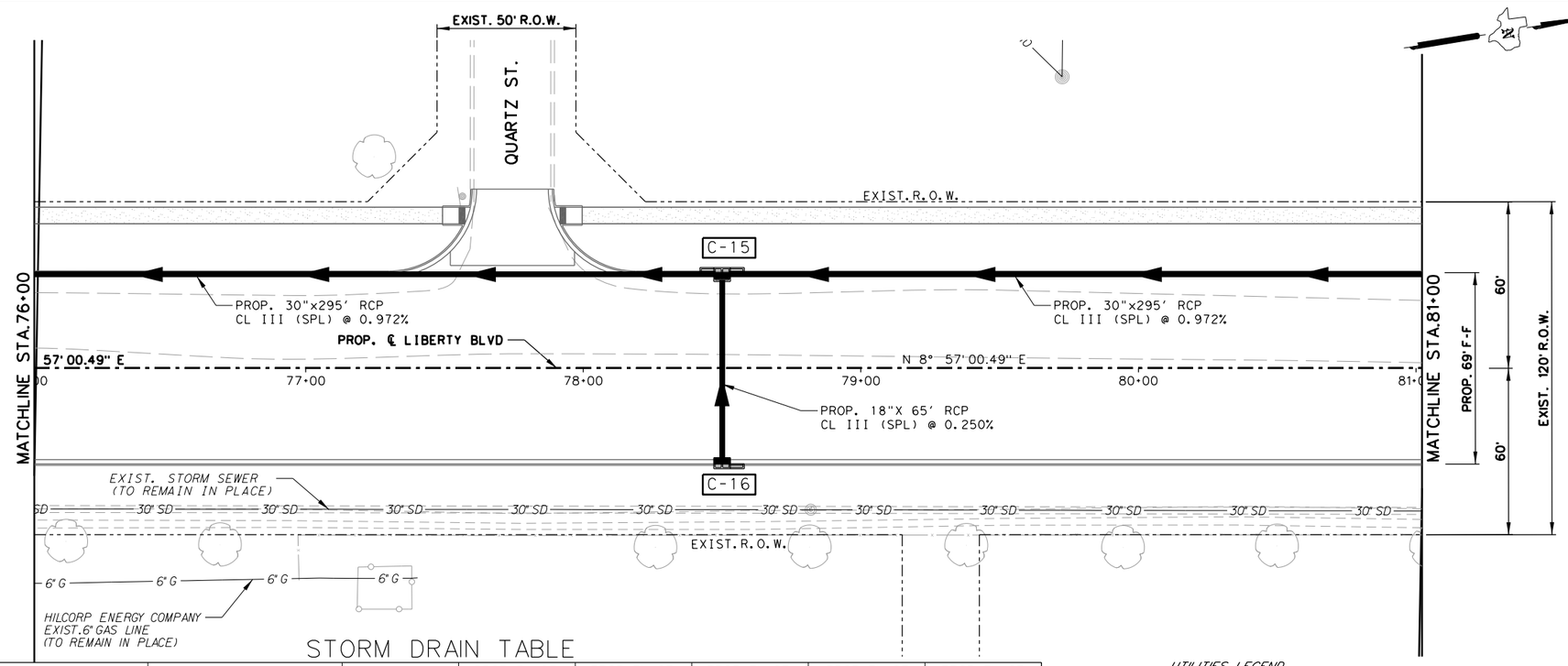
LIBERTY BLVD UTILITY AND DRAINAGE STA. 71+00 TO STA. 76+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 13 OF 27

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
						6	TEXAS				156
						STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
						PHR	HIDALGO	0921	02	194	LIBERTY

3/22/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\05 DRAINAGE\03 U&D\LIBERTY_UD013.dgn



STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
C-15	PCU15-4x5	78+50.00-34.50	183.23	170.84	170.84	170.84	177.83	
C-16	PCU10L-3x5	78+50.0034.50	183.23	178.00				178.00

UTILITIES LEGEND

AEP	*AMERICAN ELECTRIC POWER*
AT&T	*AMERICAN TELEPHONE & TELEGRAPH*
TGS	*TEXAS GAS SERVICE*
HILCORP	*HILCORP ENERGY COMPANY*
ENTERPRISE	*ENTERPRISE PRODUCTS*
UNITED	*UNITED IRRIGATION DISTRICT*
HCID#6	*HIDALGO COUNTY IRRIGATION DISTRICT No 6*

SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	1490
400	STRUCT EXCAVATION (SPL)	CY	114
400	SAND BACKFILL	CY	324
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	655
464	18" RCP SEWER (CL III)(SPL)	LF	65
464	30" RCP SEWER (CL III)(SPL)	LF	590

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

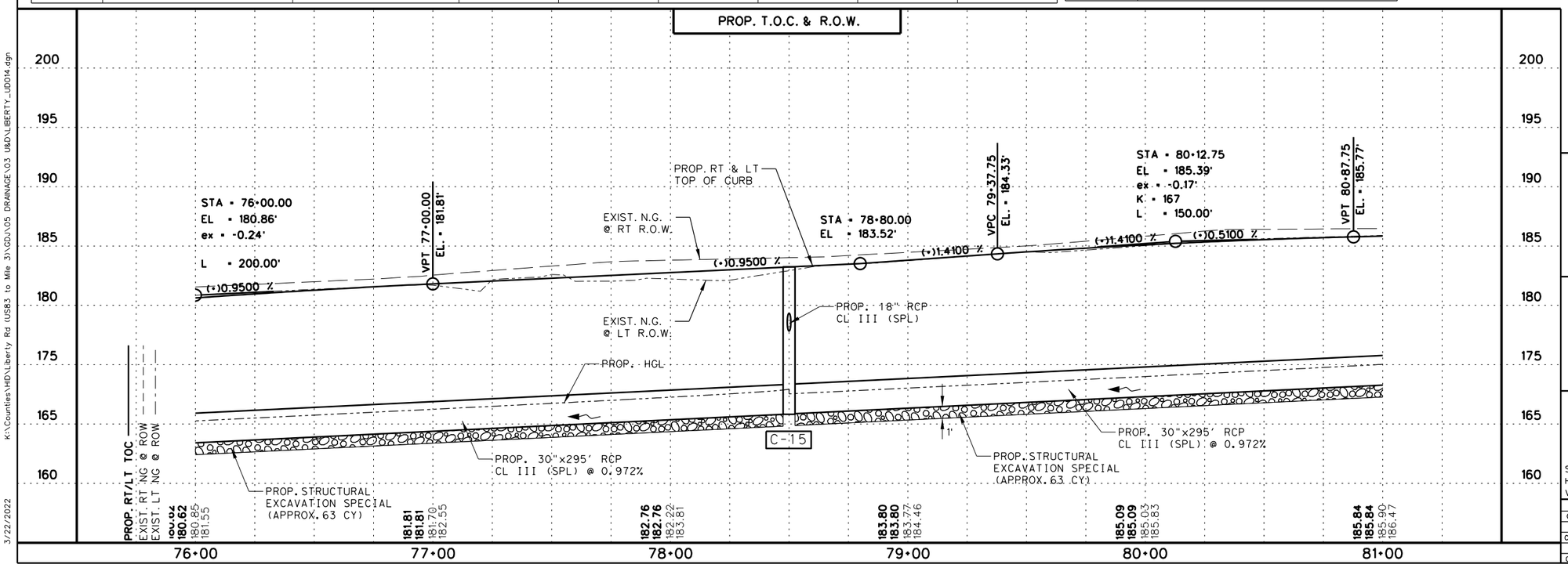
- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- INST. OM ASSM (OM-2Z)(FLX) GND (BI)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

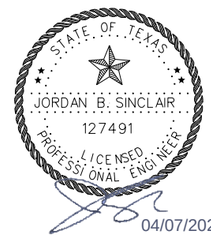
NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.







L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

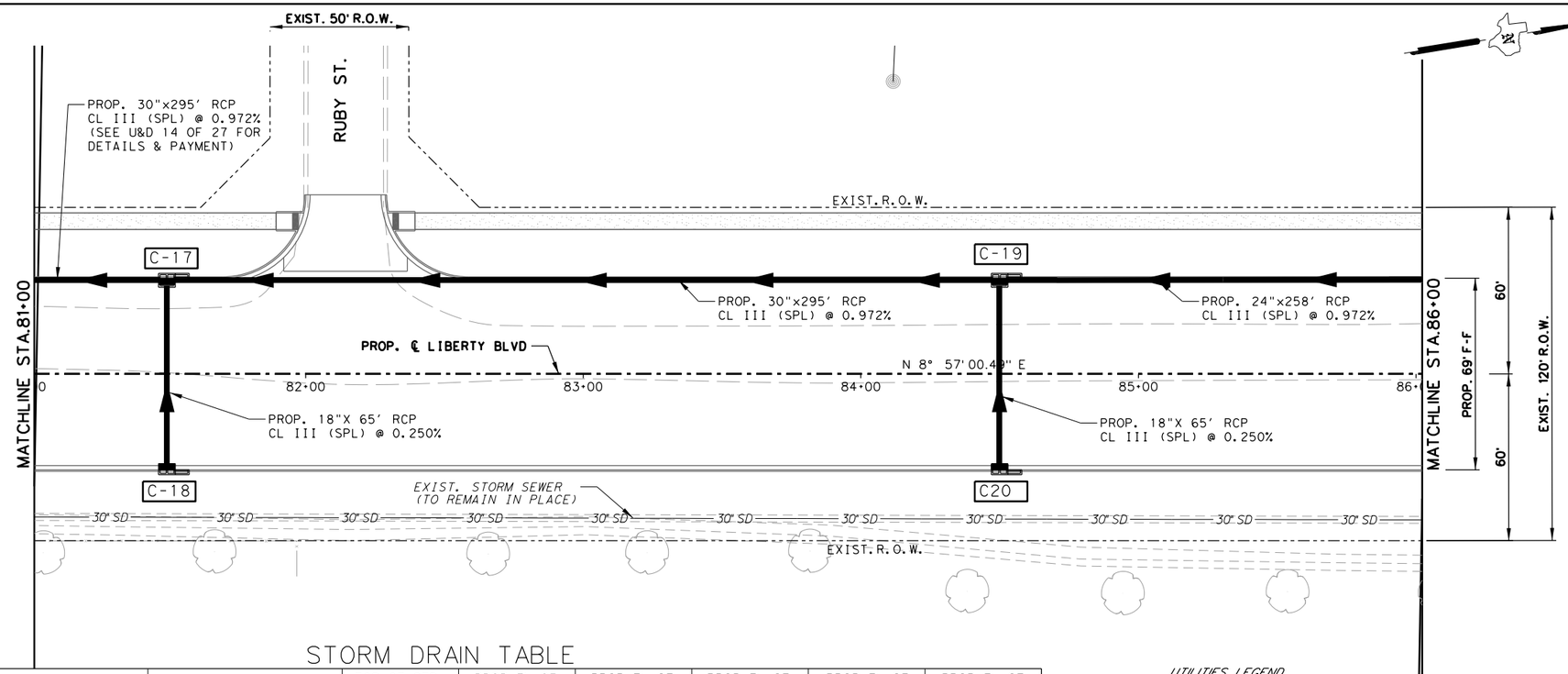
LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 76+00 TO STA. 81+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 14 OF 27

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				157
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

3/22/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\05 DRAINAGE\03 U&D\LIBERTY_UD014.dgn



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	1167
400	STRUCT EXCAVATION (SPL)	CY	57
400	SAND BACKFILL	CY	302
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	683
464	18" RCP SEWER (CL III)(SPL)	LF	130
464	24" RCP SEWER (CL III)(SPL)	LF	258
464	30" RCP SEWER (CL III)(SPL)	LF	295

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- INST. OM ASSM (OM-2Z)(FLX) GND (BI)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

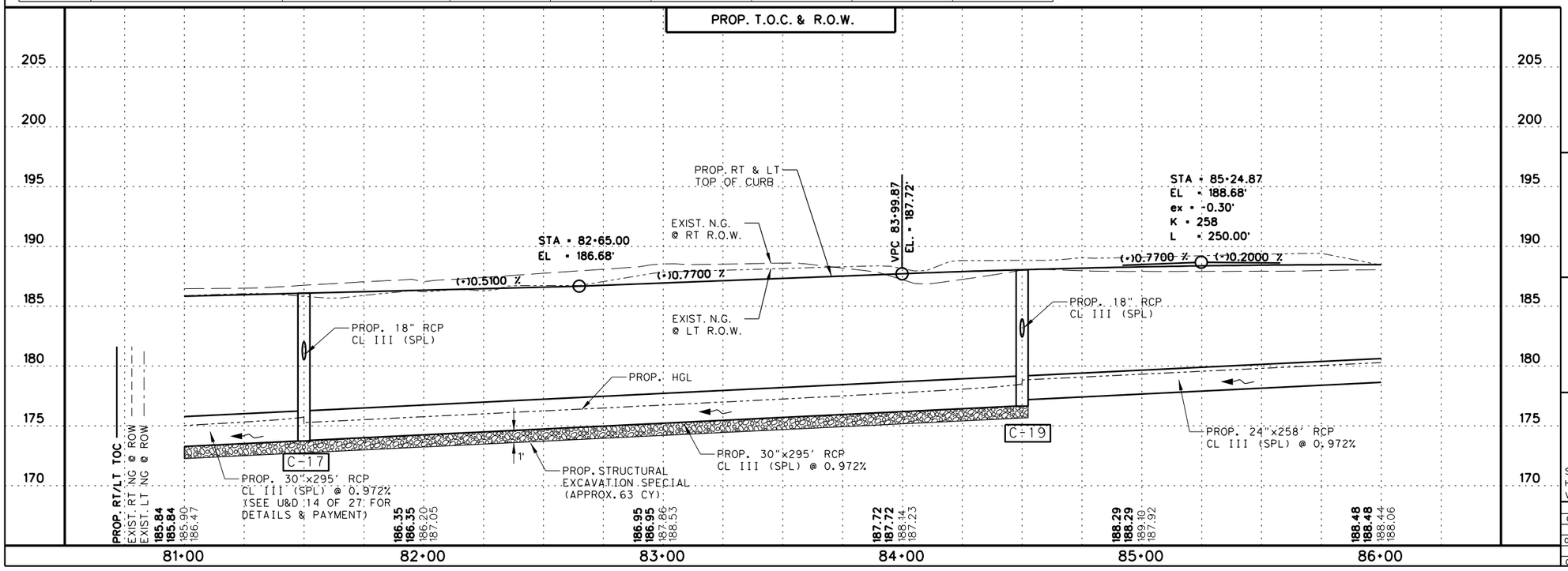
THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

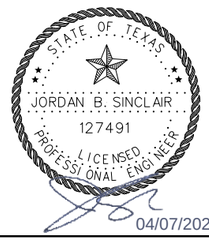
STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
C-17	PCU10R-4x5	81+50.00 -34.50	186.09	173.76	173.76	173.76	180.53	
C-18	PCU10L-3x5	81+50.00 34.50	186.09	180.70				180.70
C-19	PCU10R-4x5	84+50.00 -34.50	188.05	176.67	176.67	176.67	182.43	
C-20	PCU10L-3x5	84+50.00 34.50	188.05	182.60				182.60

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6







L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 81+00 TO STA. 86+00

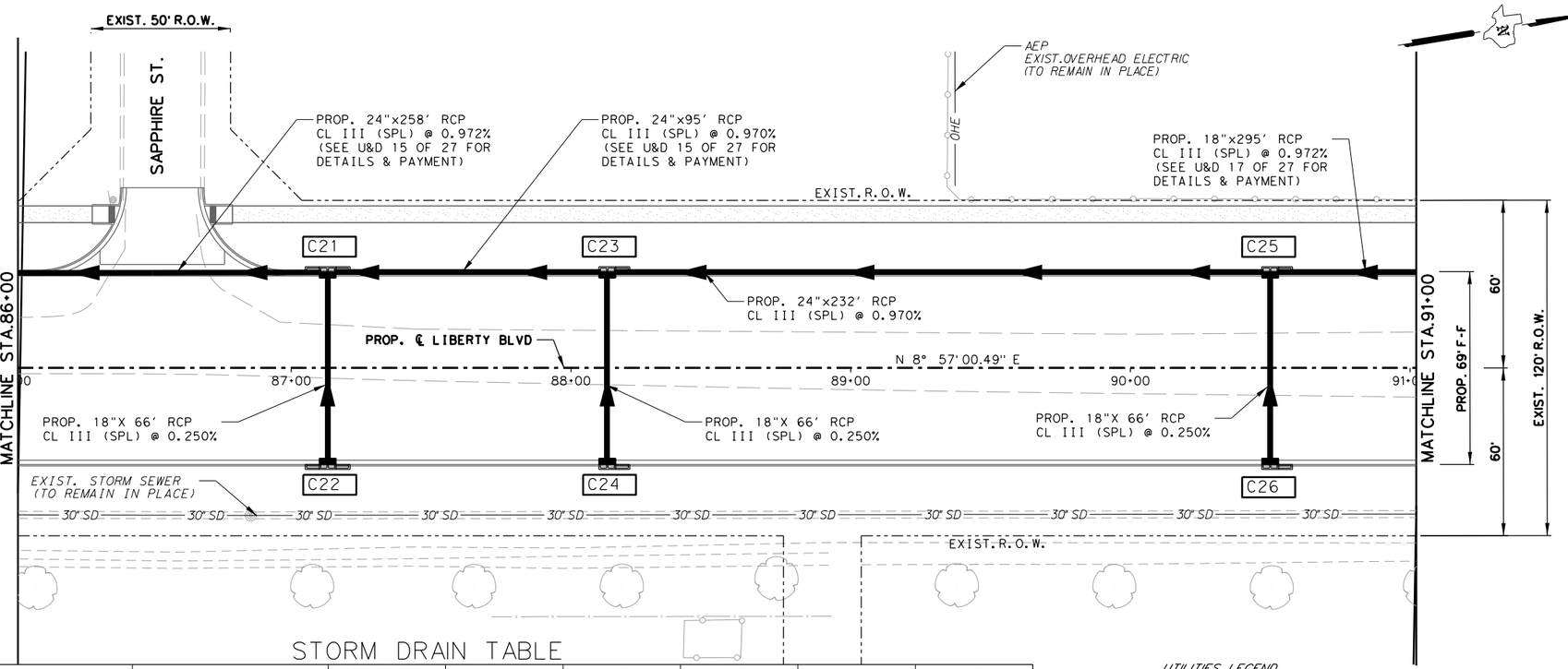
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 15 OF 27

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				158
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\05 DRAINAGE\03 U&D\LIBERTY_UD015.dgn

3/22/2022

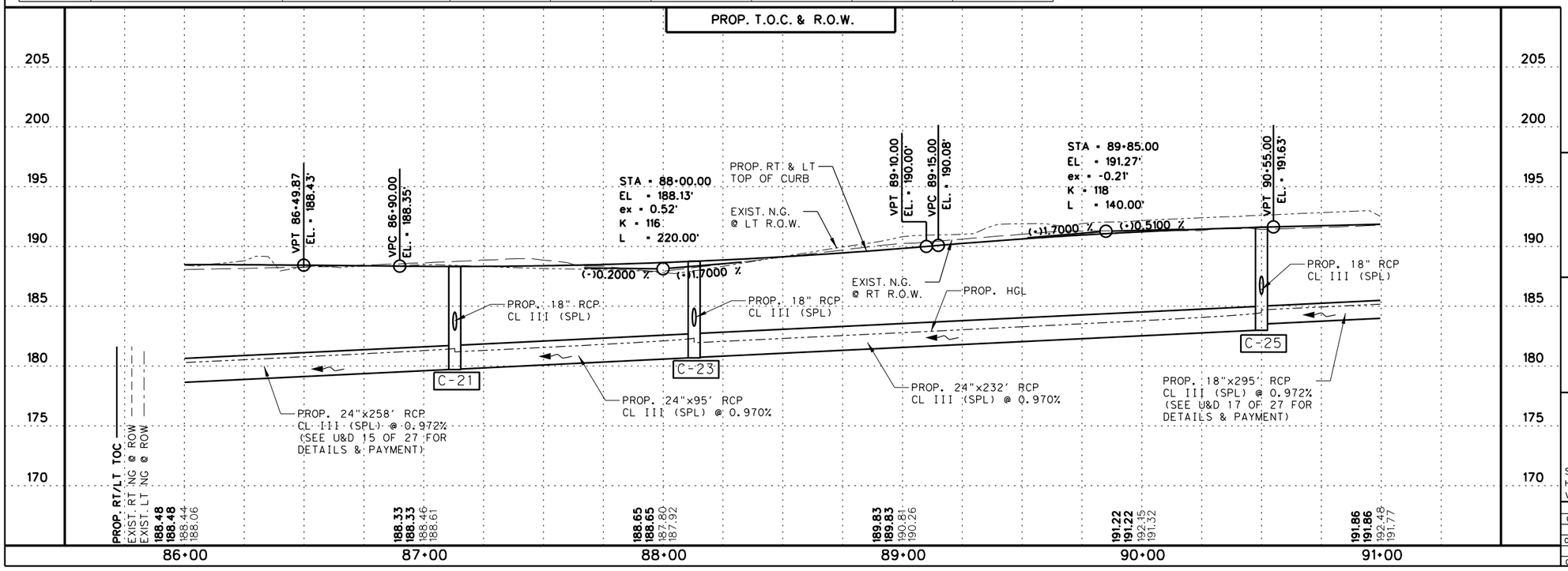


STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
C-21	PCU15-3x5	87+13.00 -34.50	188.33	179.73	179.73	179.73	183.00	
C-22	PCU15-3x5	87+13.00 34.50	188.33	183.17				183.17
C-23	PCU10R-3x5	88+13.00 -34.50	188.76	180.70	180.71	180.70	183.50	
C-24	PCU10L-3x5	88+13.00 34.50	188.76	183.33				183.33
C-25	PCU15R-3x5	90+50.00 -34.50	191.60	183.00	183.50	183.00	186.00	
C-26	PCU15L-3x5	90+50.00 34.50	191.60	186.17				186.17

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	679
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	203
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	525
464	18" RCP SEWER (CL III)(SPL)	LF	198
464	24" RCP SEWER (CL III)(SPL)	LF	327

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- INST. OM ASSM (OM-2Z)(FLX) GND (BI)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
04/07/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

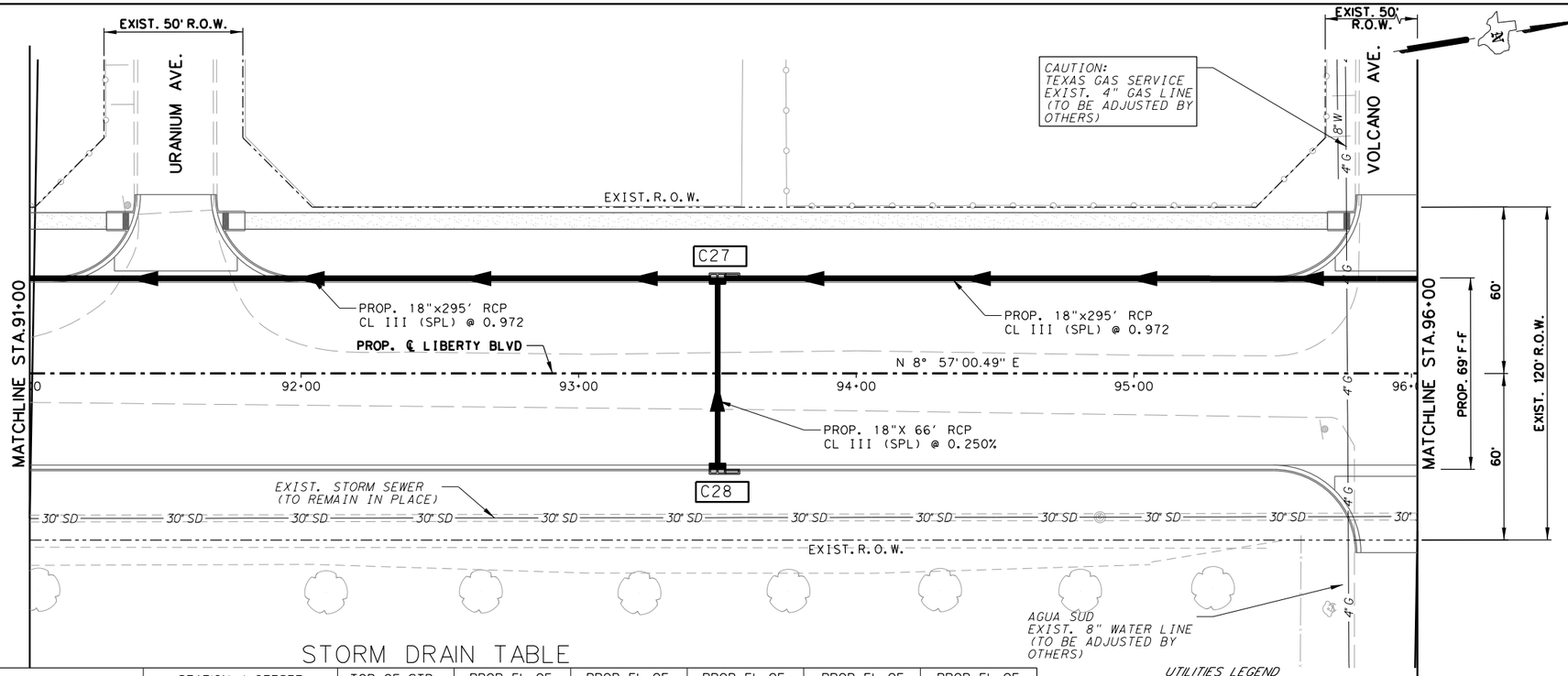
LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 86+00 TO STA. 91+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 16 OF 27

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				159
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:	
CK TR:	

3/22/2022
K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\05 DRAINAGE\03 U&D\LIBERTY_UD016.dgn

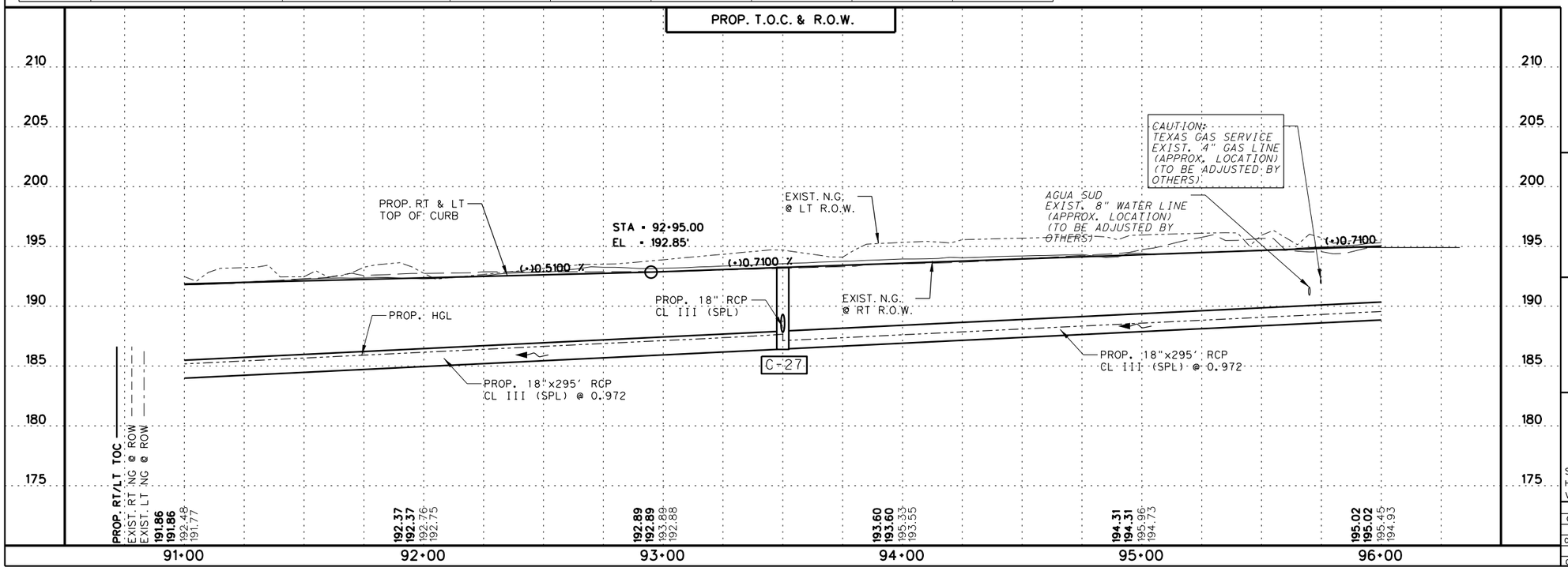


STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
C-27	PCU10R-3x5	93+50.00 -34.50	193.24	186.42	186.42	186.42	187.83	
C-28	PCU10L-3x5	93+50.00 34.50	193.24	188.00				188.00

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	658
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	219
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	656
464	18" RCP SEWER (CL III)(SPL)	LF	656

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- INST. OM ASSM (OM-2Z)(FLX) GND (BI)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
04/07/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

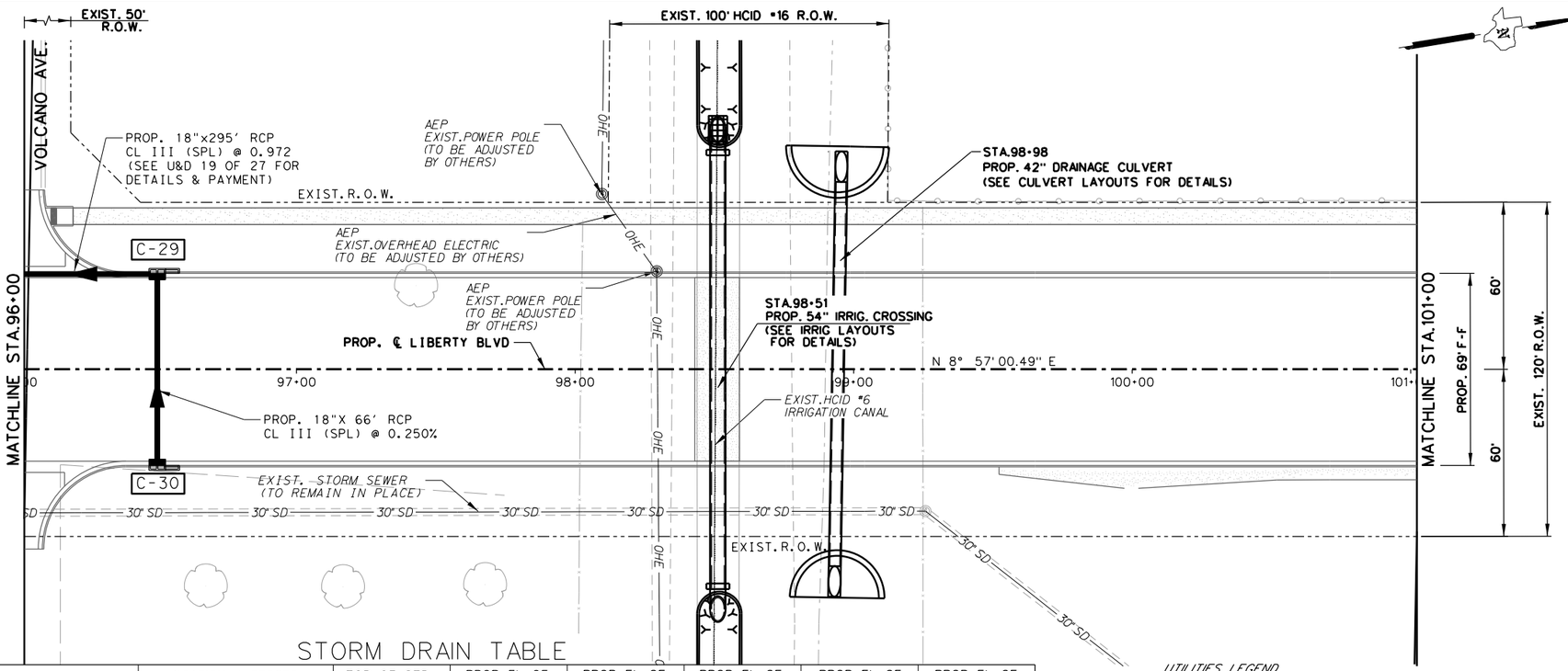
LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 91+00 TO STA. 96+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 17 OF 27

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				160
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:	
CK TR:	

K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\05 DRAINAGE\03 U&D\LIBERTY_UD017.dgn
3/22/2022



STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
C-29	PCU10R-3x5	96+50.00-34.50	195.42	189.34		189.34	190.03	
C-30	PCU10L-3x5	96+50.0034.50	195.42	190.20				190.20

UTILITIES LEGEND

AEP	*AMERICAN ELECTRIC POWER*
AT&T	*AMERICAN TELEPHONE & TELEGRAPH*
TGS	*TEXAS GAS SERVICE*
HILCORP	*HILCORP ENERGY COMPANY*
ENTERPRISE	*ENTERPRISE PRODUCTS*
UNITED	*UNITED IRRIGATION DISTRICT*
HCID#6	*HIDALGO COUNTY IRRIGATION DISTRICT No 6*

SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	55
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	22
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	66
464	18" RCP SEWER (CL III)(SPL)	LF	66

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

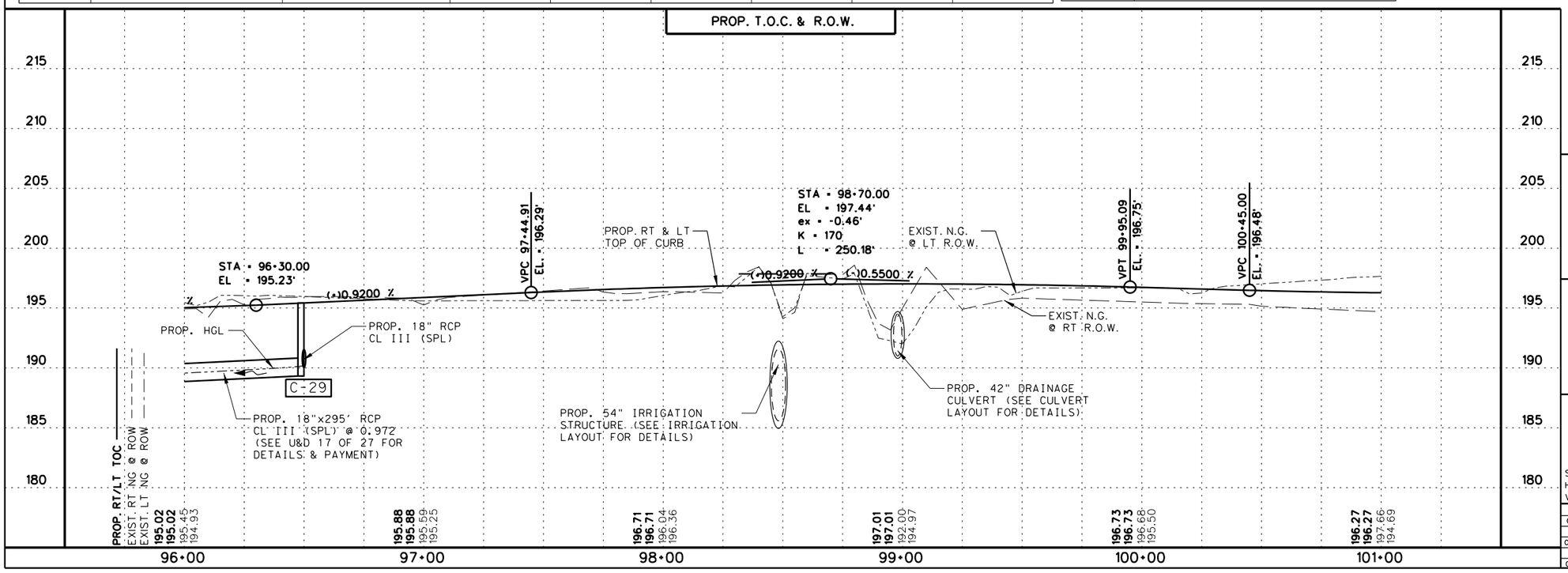
- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- INST. OM ASSM (OM-2Z)(FLX) GND (BI)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

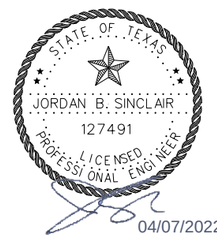
NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.





THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

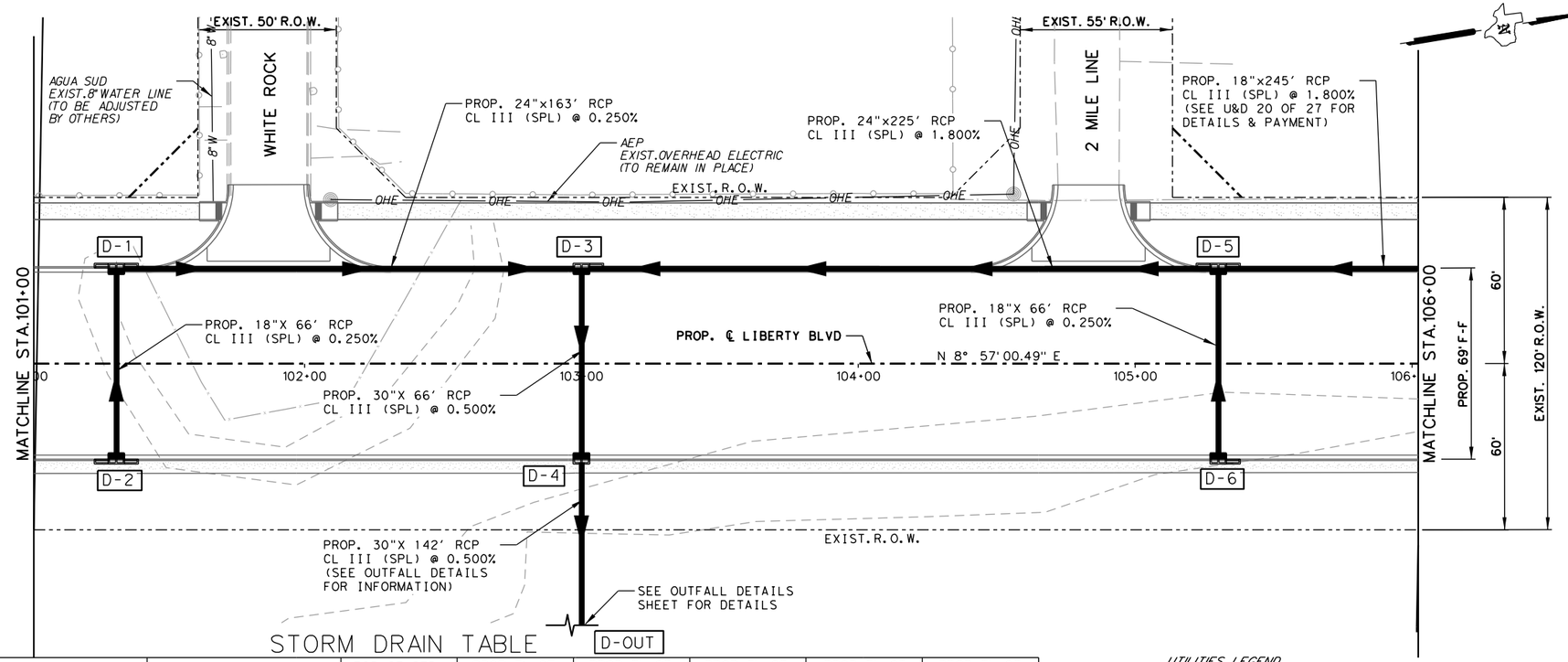
LIBERTY BLVD UTILITY AND DRAINAGE STA. 96+00 TO STA. 101+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 18 OF 27

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				161
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

3/22/2022
K:\Counties\HID\Liberty Rd (US83 to Mile 3\GDJ\05 DRAINAGE\03 U&D\LIBERTY_UD018.dgn

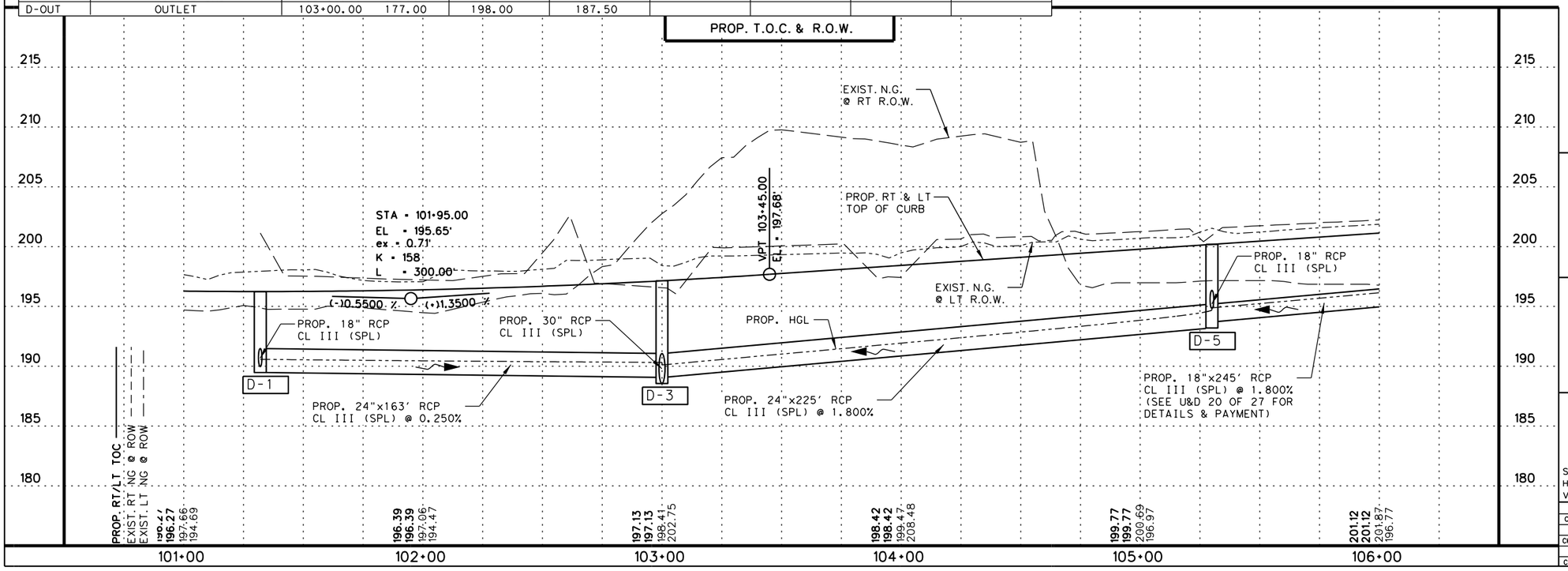


STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB		TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
D-1	PCU15-3x5	101+32.00	-34.50	196.24	189.48	189.48		189.98	
D-2	PCU15-3x5	101+32.00	34.50	196.24	190.15				190.15
D-3	PCU10R-3x5	103+00.00	-34.50	197.13	188.56	189.06	189.06	188.56	
D-4	PCU5-3x5	103+00.00	34.50	197.13	188.21	188.21			188.21
D-5	PCU15-3x5	105+30.00	-34.50	200.18	193.20	193.70	193.20	194.83	
D-6	PCU10L-3x5	105+30.00	34.50	200.17	195.00				195.00
D-OUT	OUTLET	103+00.00	177.00	198.00	187.50				

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	985
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	441
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	728
464	18" RCP SEWER (CL III)(SPL)	LF	132
464	24" RCP SEWER (CL III)(SPL)	LF	388
464	30" RCP SEWER (CL III)(SPL)	LF	208

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- INST. OM ASSM (OM-2Z)(FLX) GND (BI)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED
PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO
TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

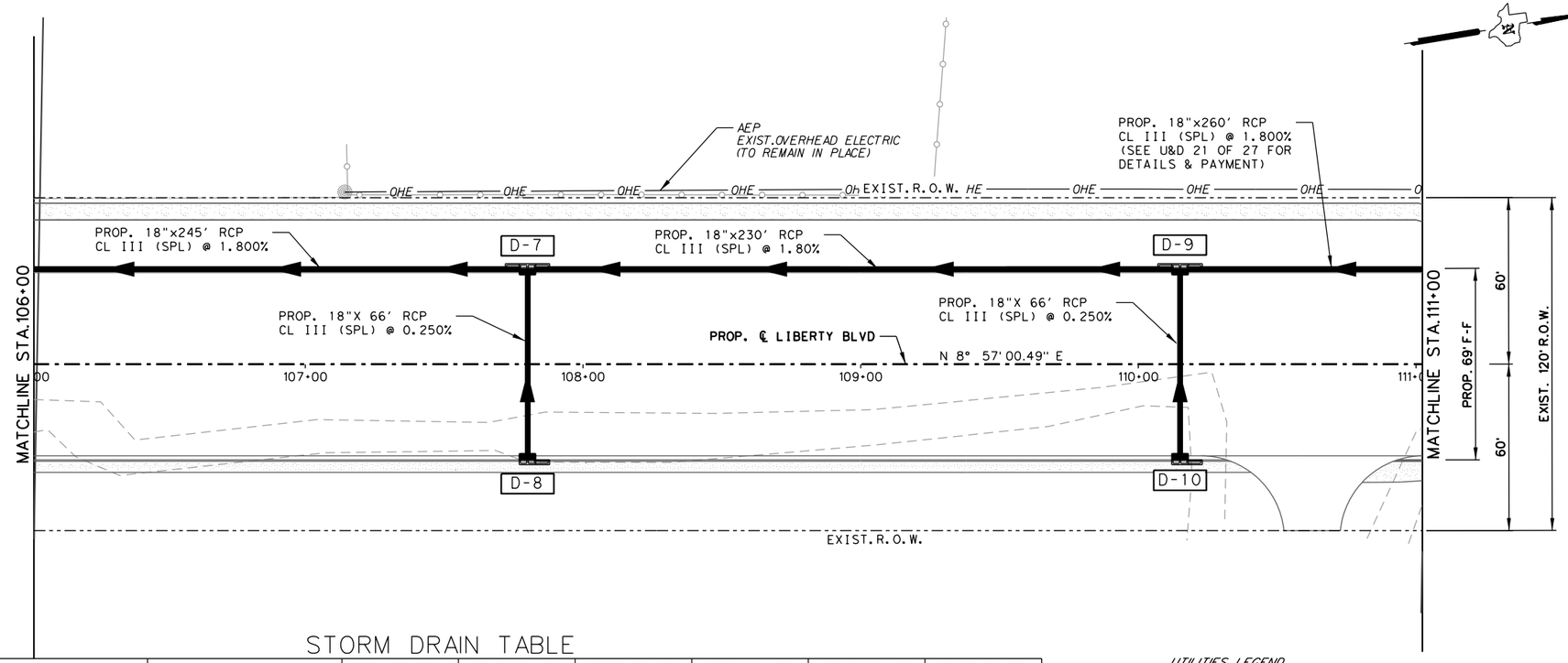
LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 101+00 TO STA. 106+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 19 OF 27

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
						6	TEXAS				162
						STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
						PHR	HIDALGO	0921	02	194	LIBERTY

11/19/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\03 U&D\LIBERTY_UD019.dgn



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	529
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	294
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	607
464	18" RCP SEWER (CL III)(SPL)	LF	607

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

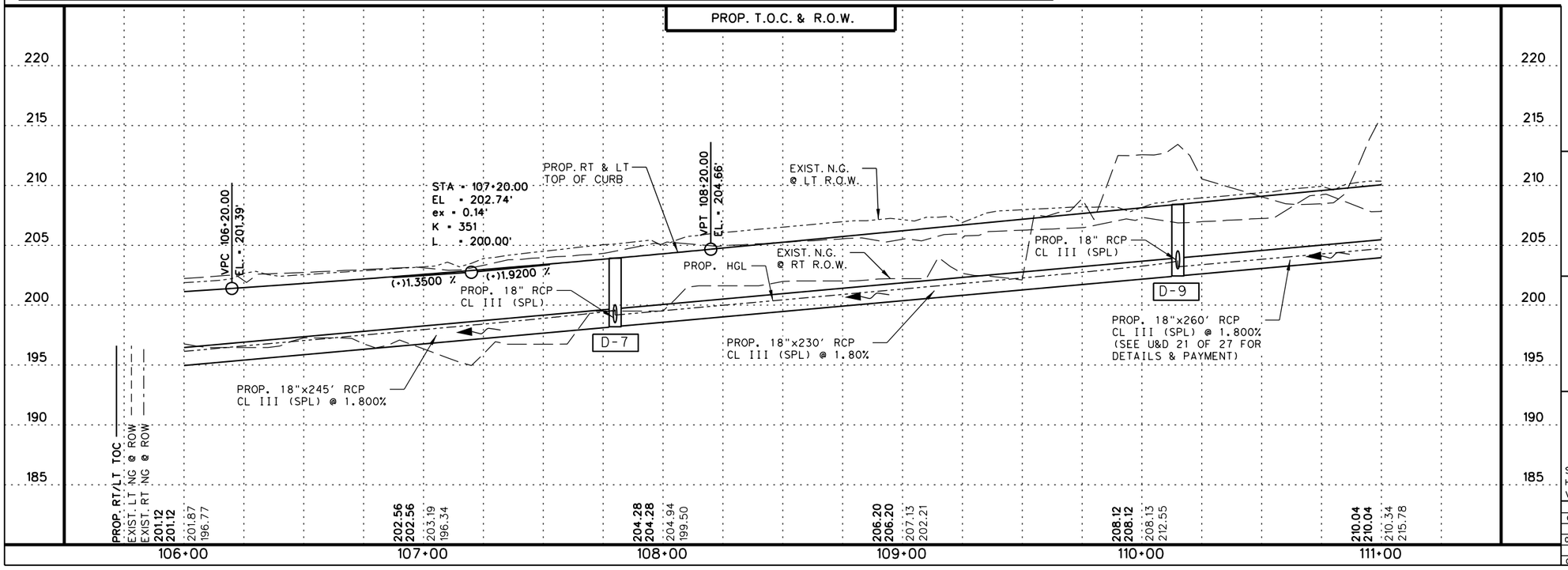
THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

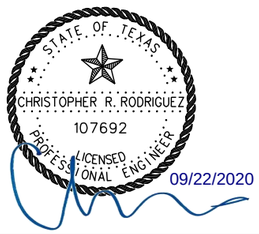
STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
D-7	PCU15-3x5	107+80.00 -34.50	203.92	198.20	198.20	198.20	198.53	
D-8	PCU10L-3x5	107+80.00 34.50	203.92	198.70				198.70
D-9	PCU15-3x5	110+15.00 -34.50	208.40	202.43	202.43	202.43	203.03	
D-10	PCU10L-3x5	110+15.00 34.50	208.40	203.20				203.20

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6





THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

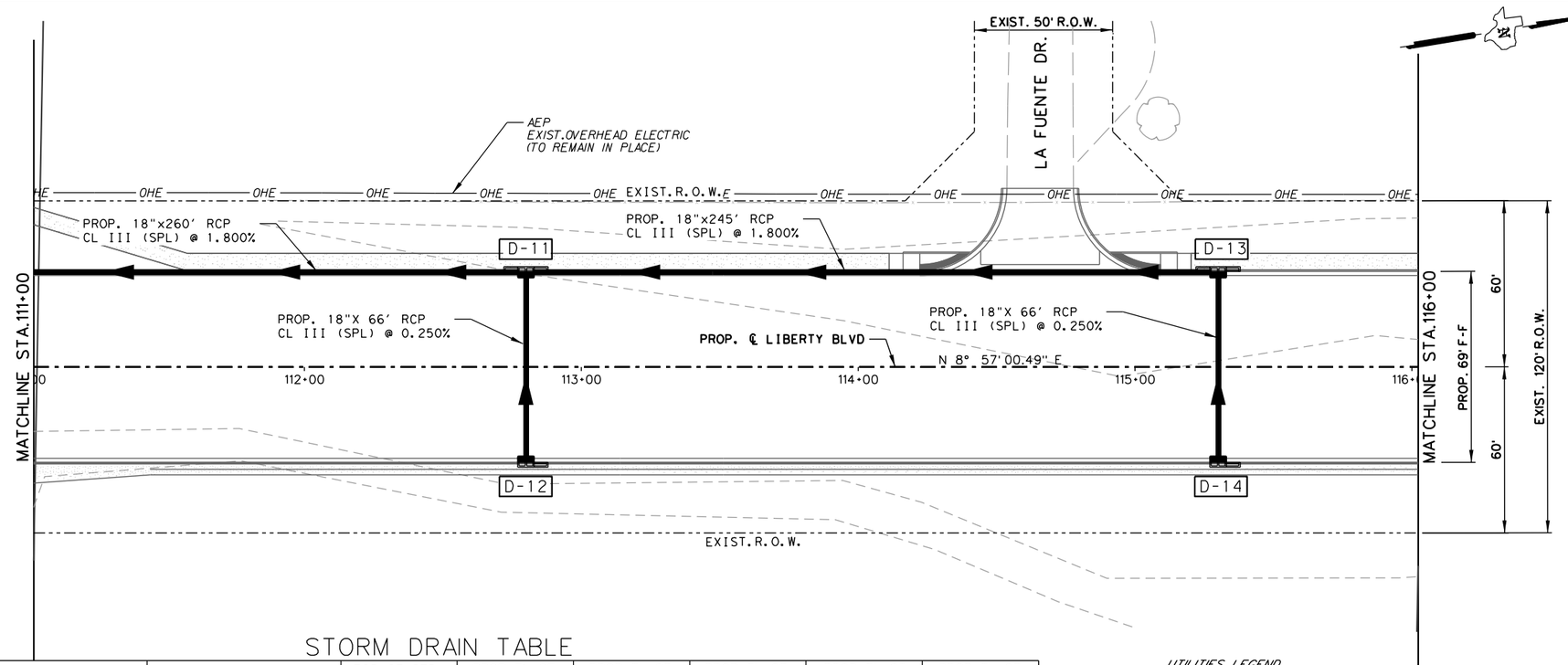
LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 106+00 TO STA. 111+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 20 OF 27

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
						6	TEXAS					163
						STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
						PHR	HIDALGO	0921	02	194		LIBERTY

E:\Liberty Blvd\Design\05 DRAINAGE\03 U&D\LIBERTY_U0020.dgn
9/22/2020



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	584
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	308
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	637
464	18" RCP SEWER (CL III)(SPL)	LF	637

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

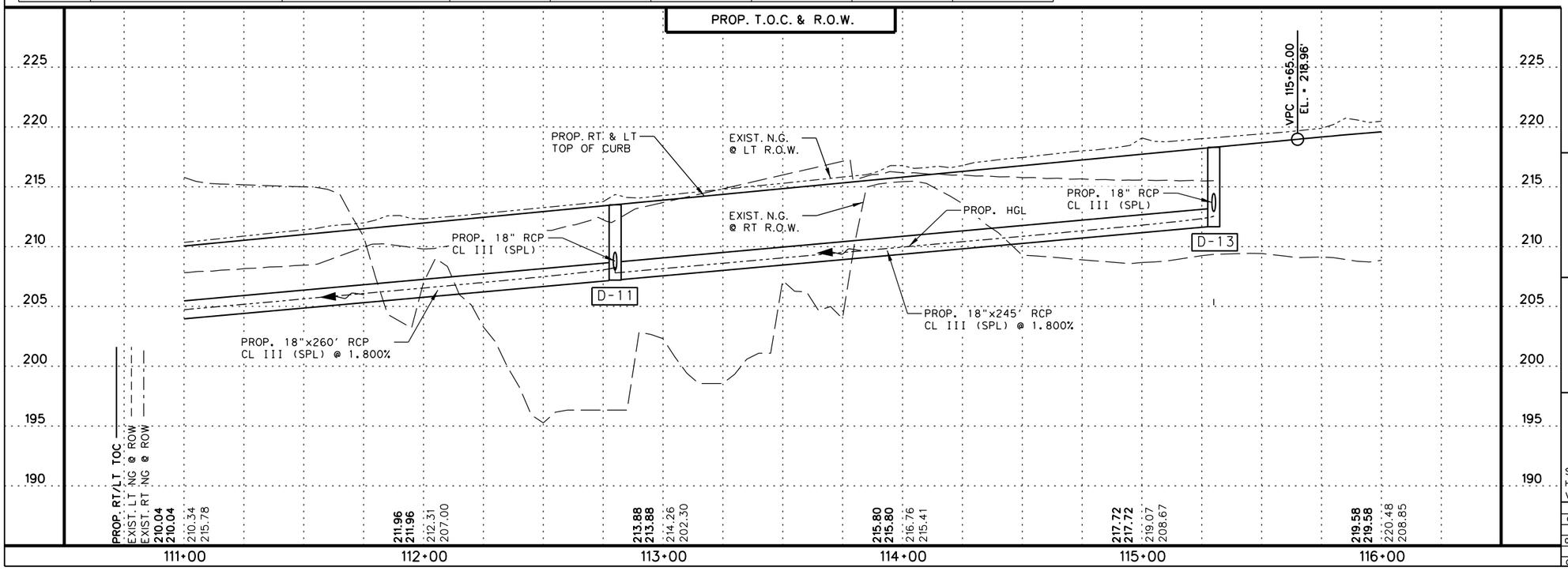
THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

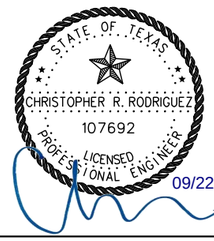
STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB		TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
D-11	PCU15-3x5	112+80.00	-34.50	213.49	207.20	207.20	207.20	208.03	
D-12	PCU10L-3x5	112+80.00	34.50	213.49	208.20				208.20
D-13	PCU15-3x5	115+30.00	-34.50	218.29	211.70		211.70	212.93	
D-14	PCU10L-3x5	115+30.00	34.50	218.29	213.10				213.10

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6





THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

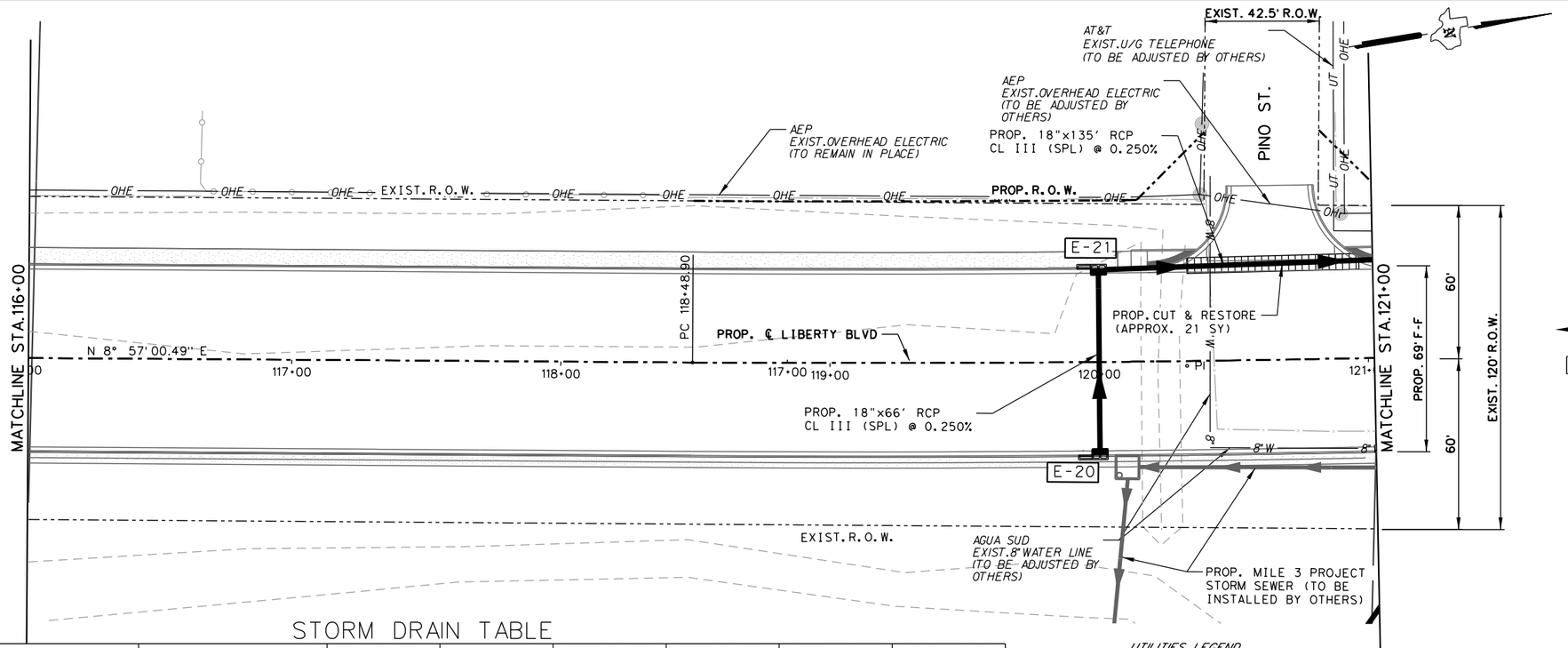
LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 111+00 TO STA. 116+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 21 OF 27

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
						6	TEXAS				164
						STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
						PHR	HIDALGO	0921	02	194	LIBERTY

9/22/2020
E:\Liberty Blvd\Design\05 DRAINAGE\03 U&D\LIBERTY_U0021.dgn

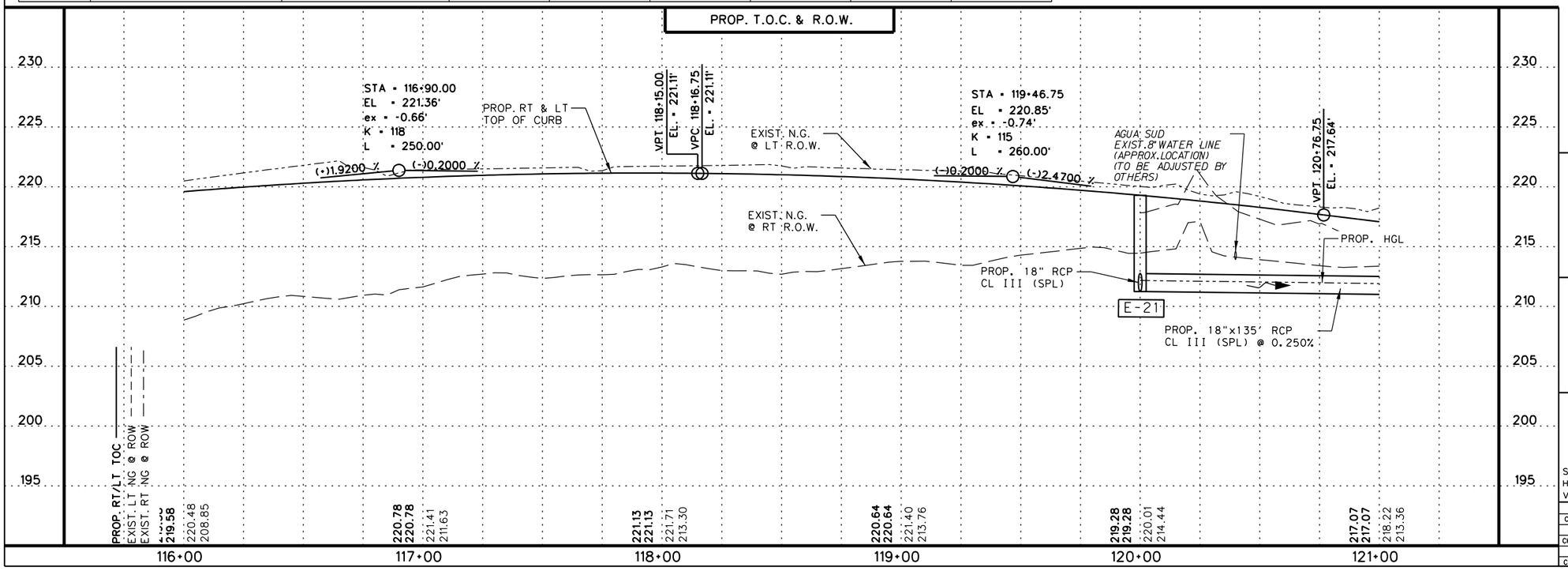


STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
E-20	PCU10R-3x5	120+00.00 34.50	219.28	211.42				211.42
E-21	PCU10L-3x5	120+00.00 -34.50	219.28	211.25	211.25		211.25	

UTILITIES LEGEND

AEP	*AMERICAN ELECTRIC POWER*
AT&T	*AMERICAN TELEPHONE & TELEGRAPH*
TGS	*TEXAS GAS SERVICE*
HILCORP	*HILCORP ENERGY COMPANY*
ENTERPRISE	*ENTERPRISE PRODUCTS*
UNITED	*UNITED IRRIGATION DISTRICT*
HCID#6	*HIDALGO COUNTY IRRIGATION DISTRICT No 6*



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	212
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	97
400	CUT & RESTORE	SY	21
402	TRENCH EXCAVATION PROT.	LF	201
464	18" RCP SEWER (CL III)(SPL)	LF	201

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
09/22/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 116+00 TO STA. 121+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 22 OF 27

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					165
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

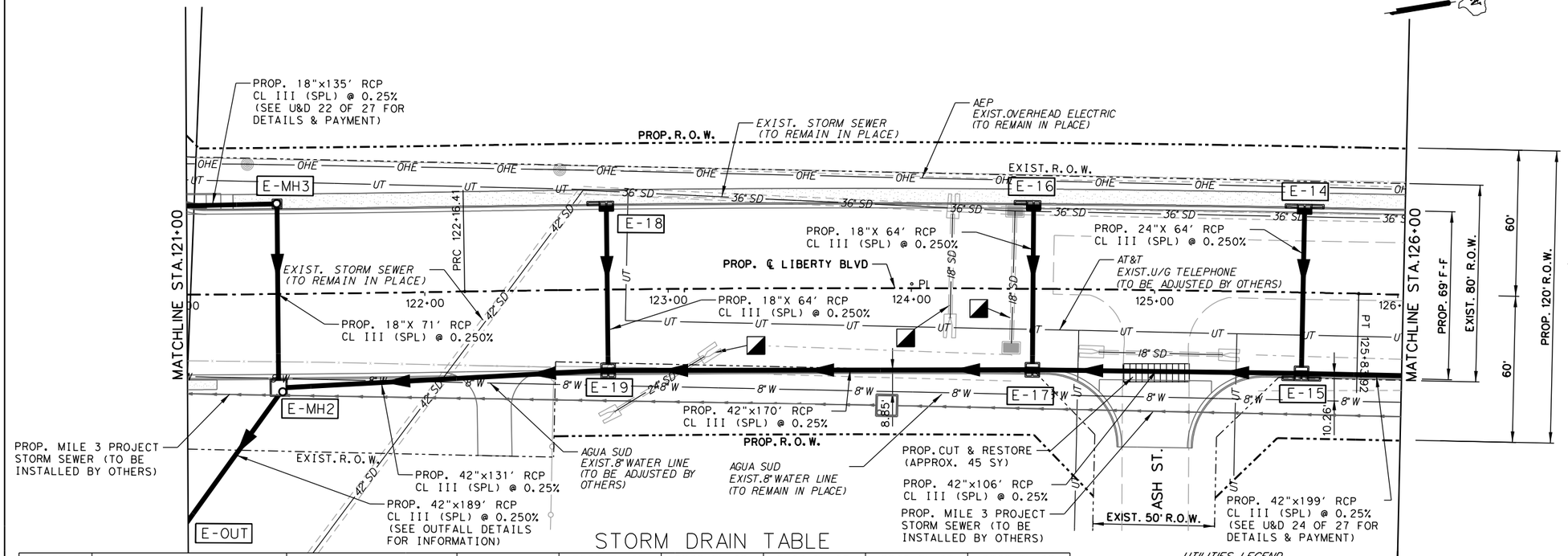
E:\Liberty Blvd\Design\05 DRAINAGE\03 U&D\LIBERTY_U0022.dgn

9/22/2020

SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	2257
400	STRUCT EXCAVATION (SPL)	CY	82
400	SAND BACKFILL	CY	700
400	CUT & RESTORE	SY	45
402	TRENCH EXCAVATION PROT.	LF	859
464	18" RCP SEWER (CL III)(SPL)	LF	199
464	24" RCP SEWER (CL III)(SPL)	LF	64
464	42" RCP SEWER (CL III)(SPL)	LF	596

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

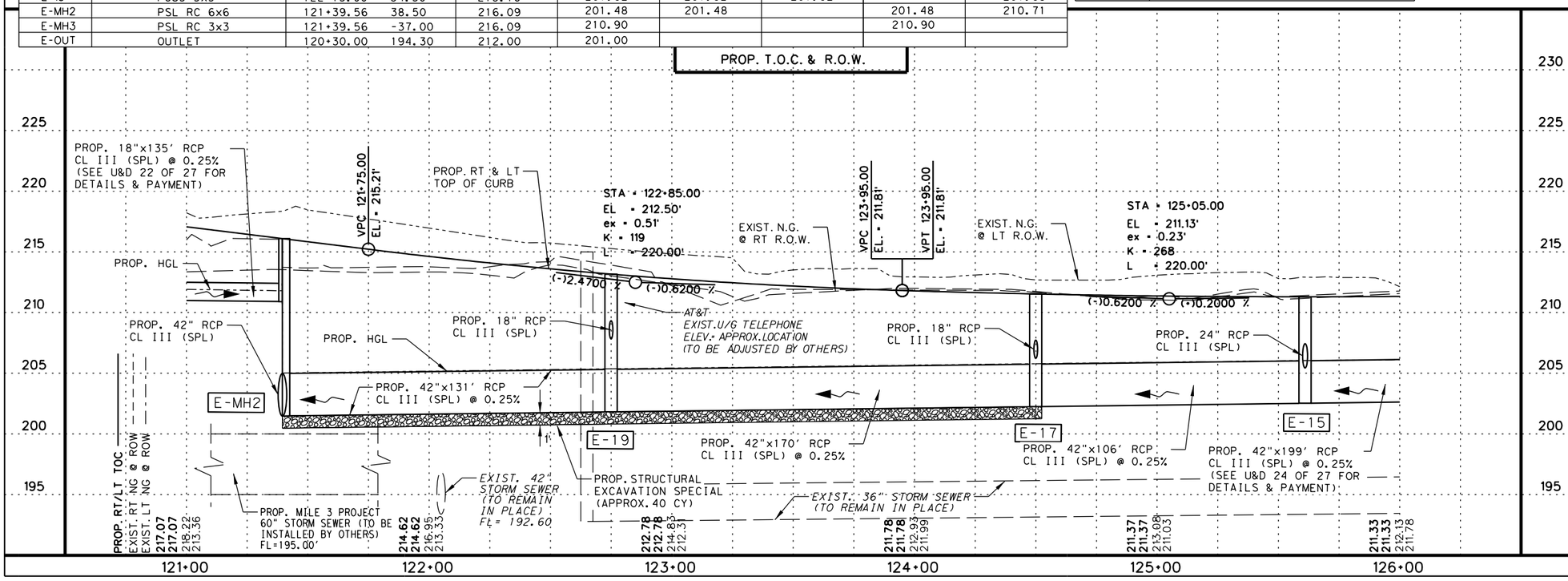


STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB		TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
E-14	PCU15-3x5	125+61.00	-34.50	211.30	205.60			205.60	
E-15	PCU15-5x5	125+61.00	34.50	211.30	202.53	202.53	202.53		205.43
E-16	PCU10L-3x5	124+50.00	-34.50	211.53	206.40			206.40	
E-17	PCU5-5x5	124+50.00	34.50	211.53	202.26	202.26	202.26		206.23
E-18	PCU10L-3x5	122+75.00	-34.50	213.16	208.00			208.00	
E-19	PCU5-5x5	122+75.00	34.50	213.16	201.82	201.82	201.82		207.83
E-MH2	PSL RC 6x6	121+39.56	38.50	216.09	201.48	201.48		201.48	210.71
E-MH3	PSL RC 3x3	121+39.56	-37.00	216.09	210.90			210.90	
E-OUT	OUTLET	120+30.00	194.30	212.00	201.00				

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6



LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- INST. OM ASSM (OM-2Z)(FLX) GND (BI)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

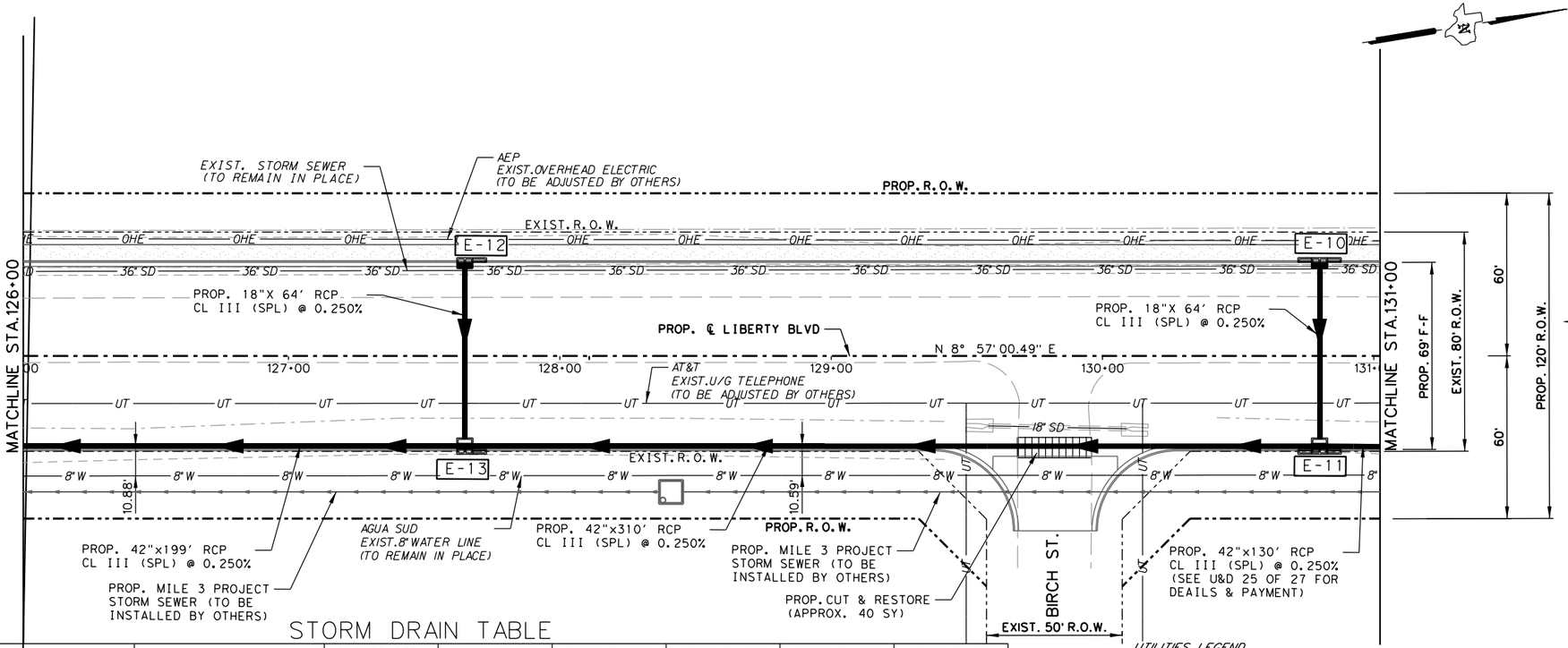
LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 121+00 TO STA. 126+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 23 OF 27

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.		SHEET NO.
CK DN:		6	TEXAS			166
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:						
CK TR:						

11/20/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\03 U&D\LIBERTY_UD023.dgn



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	1107
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	545
400	CUT & RESTORE	SY	40
402	TRENCH EXCAVATION PROT.	LF	637
464	18" RCP SEWER (CL III)(SPL)	LF	128
464	42" RCP SEWER (CL III)(SPL)	LF	509

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- INST. OM ASSM (OM-2Z)(FLX) GND (BI)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

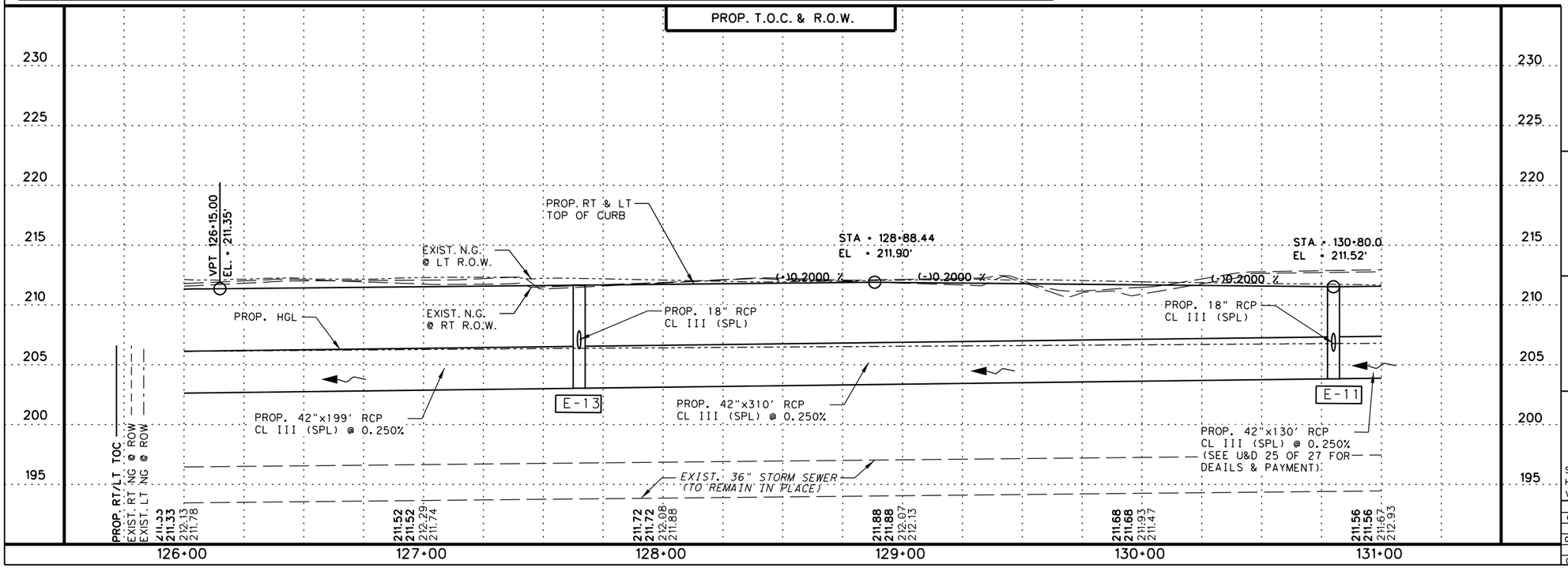
THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
E-10	PCU15-3x5	130+80.00-34.50	211.52	206.30			206.30	
E-11	PCU15-5x5	130+80.00 34.50	211.52	203.83	203.83	203.83		206.13
E-12	PCU10R-3x5	127+65.00-34.50	211.65	206.50			206.50	
E-13	PCU10L-5x5	127+65.00 34.50	211.65	203.04	203.04	203.04		206.33

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6



STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

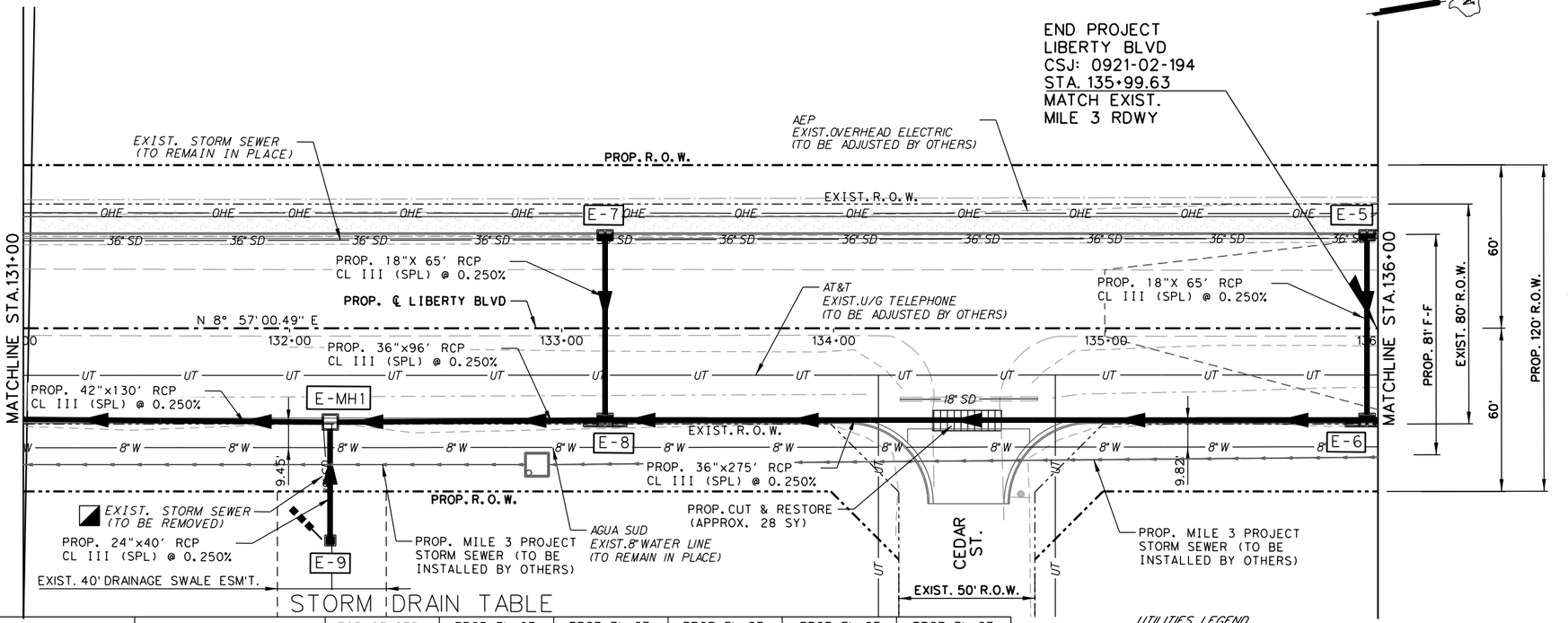
LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 126+00 TO STA. 131+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 24 OF 27

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
						6	TEXAS					167
						STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
						PHR	HIDALGO	0921	02	194		LIBERTY

P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\03 U&D\LIBERTY_UD024.dgn
11/20/2020



STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB		TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
E-5	PCU10R-3x5	135+96.00	-34.50	213.42	208.20			208.20	
E-6	PCU15-4x5	135+96.00	34.50	213.42	205.62	206.12	205.62		208.03
E-7	PCU5-3x5	133+16.00	-34.50	211.99	206.70			206.70	
E-8	PCU15-4x5	133+16.00	34.50	211.99	204.92	204.92	204.92		206.53
E-9	PSL FG 3x3 w 3x3 gr	132+15.00	78.00	210.46	206.70				206.70
E-MH1	PJB 5x5	132+15.00	34.50	210.00	204.17	204.67	204.17	206.59	

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6

SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	879
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	516
400	CUT & RESTORE	SY	28
402	TRENCH EXCAVATION PROT.	LF	631
464	18" RCP SEWER (CL III)(SPL)	LF	130
464	24" RCP SEWER (CL III)(SPL)	LF	40
464	36" RCP SEWER (CL III)(SPL)	LF	371
464	42" RCP SEWER (CL III)(SPL)	LF	130
658	INST. OM ASSM (OM-2Z)(FLX) GND (BI)	EA	1

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

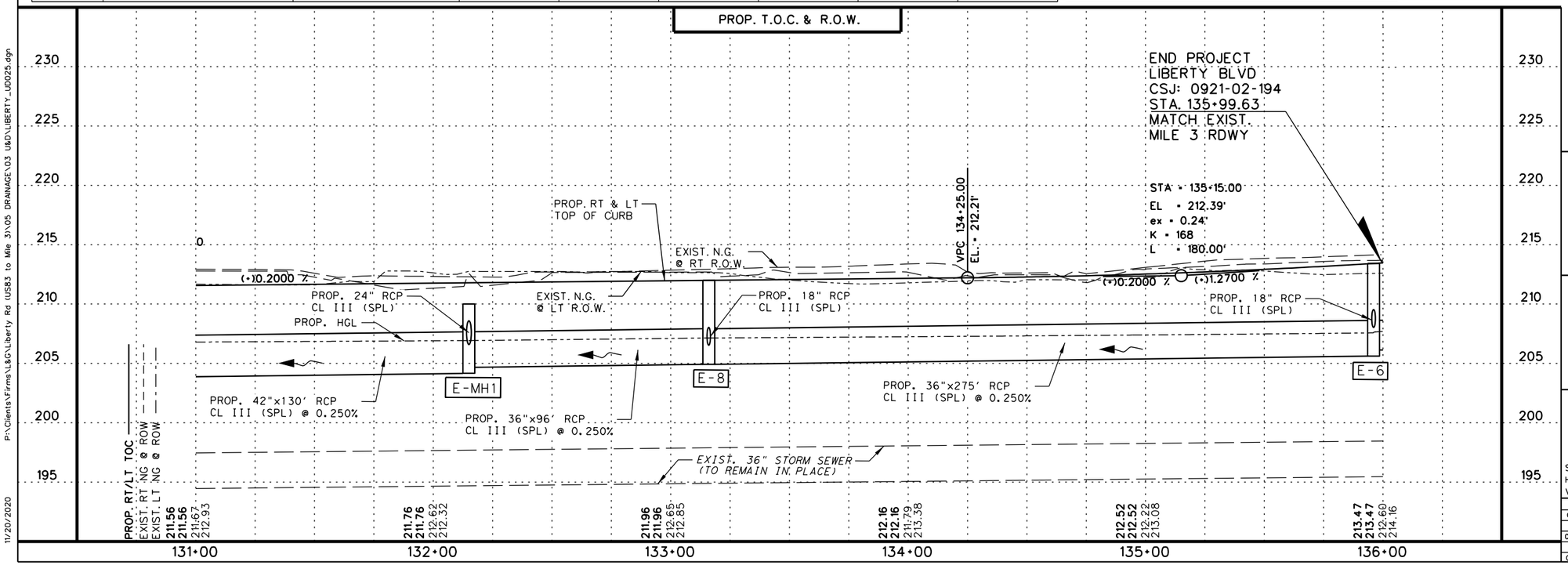
- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- INST. OM ASSM (OM-2Z)(FLX) GND (BI)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.





THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

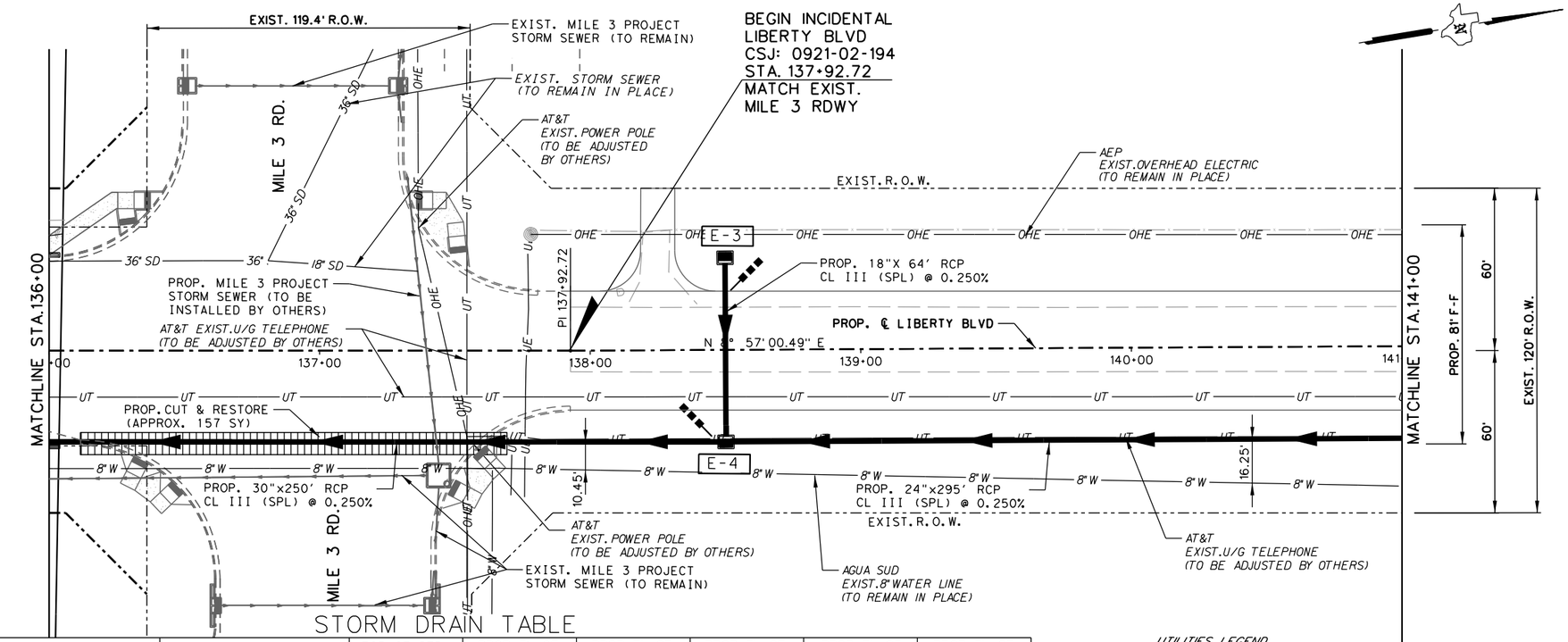
LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 131+00 TO STA. 136+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 25 OF 27

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				168
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:	
CK TR:	

11/20/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\03 U&D\LIBERTY_UD025.dgn

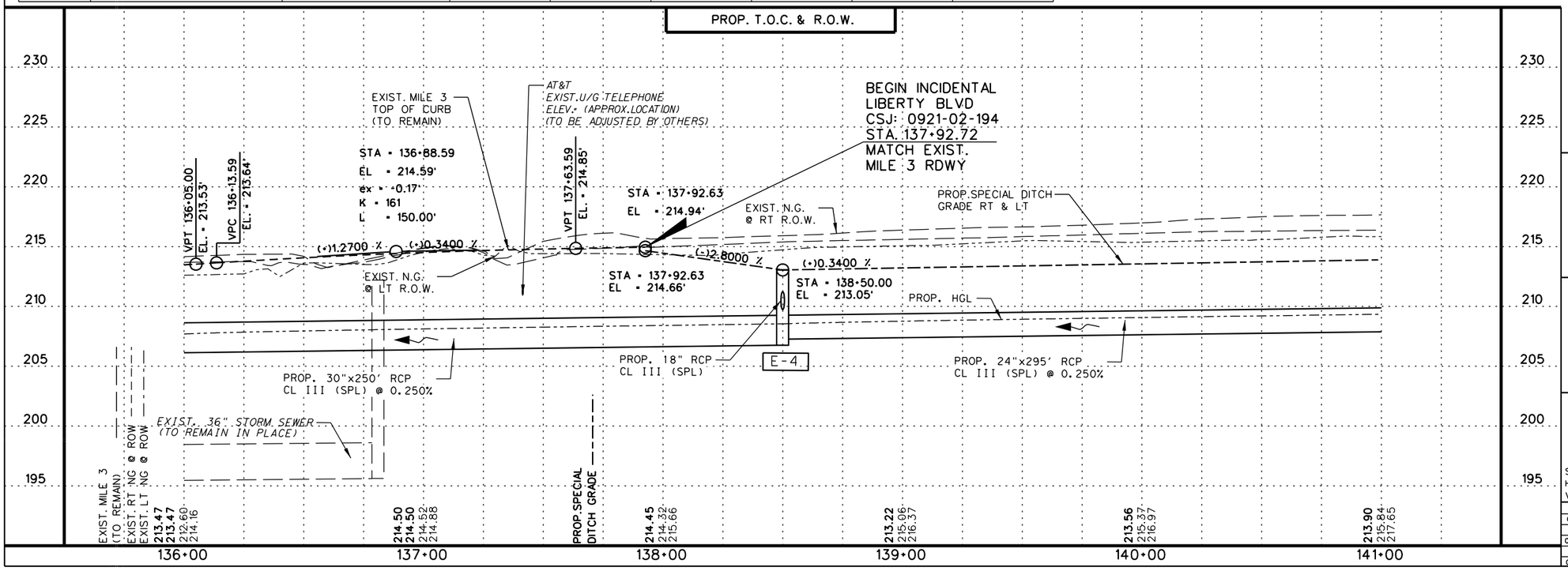


STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
E-3	PSL FG 4x5 w 3x5 gr	138+50.00-34.00	213.05	209.90			209.90	
E-4	PSL FG 4x5 w 3x5 gr	138+50.00 34.00	213.05	206.75	207.25	206.75		209.73

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	619
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	382
400	CUT & RESTORE	SY	157
402	TRENCH EXCAVATION PROT.	LF	250
464	18" RCP SEWER (CL III)(SPL)	LF	64
464	24" RCP SEWER (CL III)(SPL)	LF	295
464	30" RCP SEWER (CL III)(SPL)	LF	250
658	INST. OM ASSM (OM-2Z)(FLX) GND (BI)	EA	2

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- INST. OM ASSM (OM-2Z)(FLX) GND (BI)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

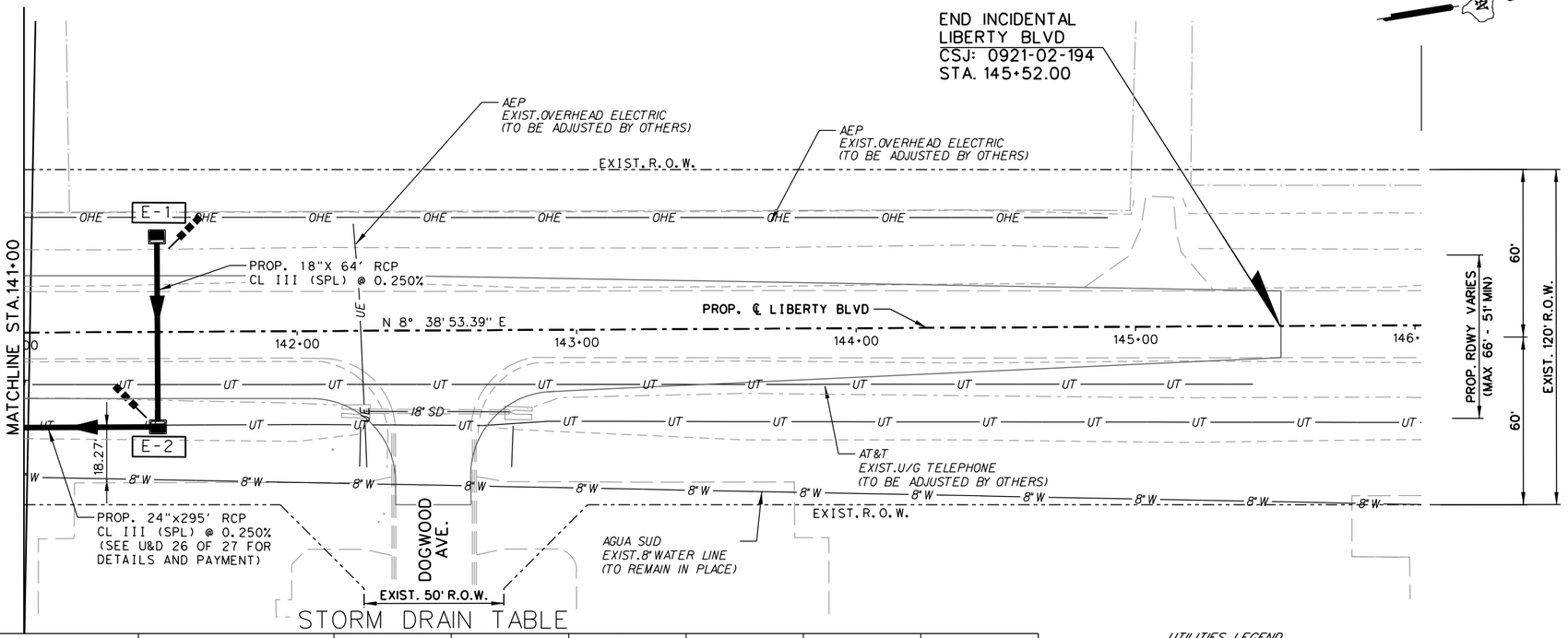
LIBERTY BLVD UTILITY AND DRAINAGE STA. 136+00 TO STA. 141+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 26 OF 27

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					169
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

11/20/2020
P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\03 U&D\LIBERTY_UD026.dgn

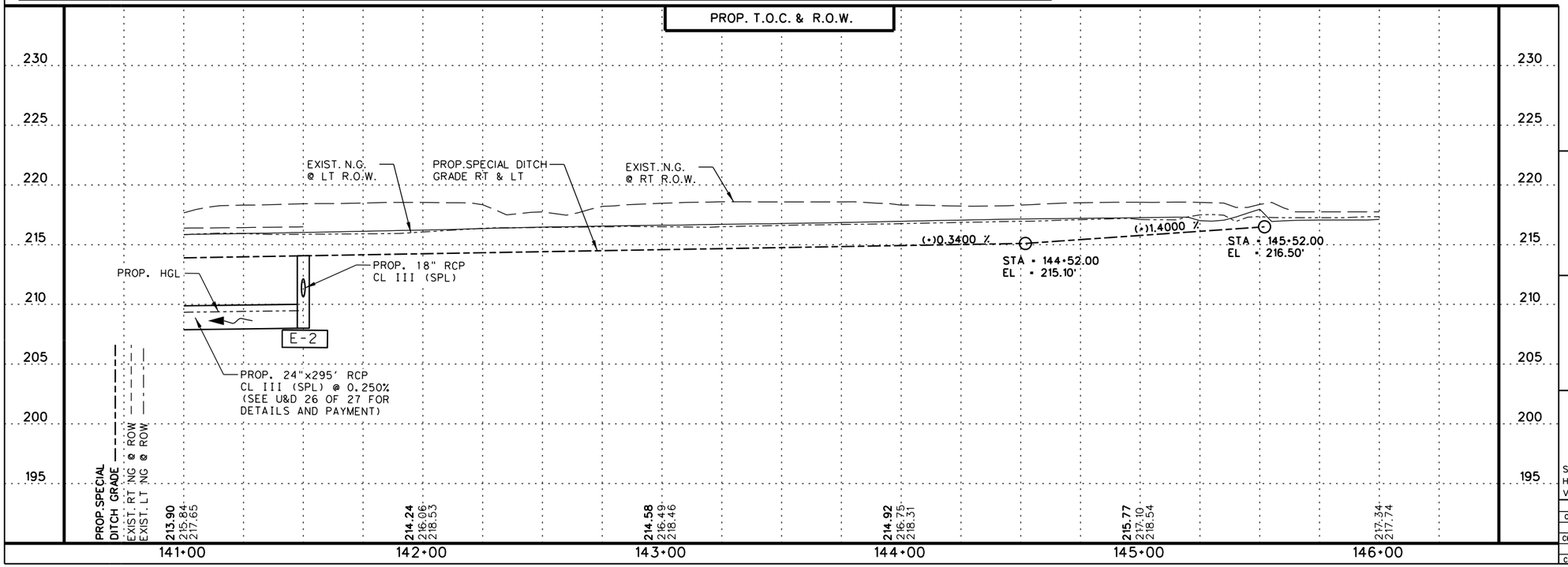


STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
E-1	PSL FG 4x5 w 3x5 gr	141+50.00 -34.00	214.07	210.80			210.80	
E-2	PSL FG 4x5 w 3x5 gr	141+50.00 34.00	214.07	208.00		208.00		210.63

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	32
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	31
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	
464	18" RCP SEWER (CL III)(SPL)	LF	64
658	INST. OM ASSM (OM-2Z)(FLX) GND (BI)	EA	2

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- INST. OM ASSM (OM-2Z)(FLX) GND (BI)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED
PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO
TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

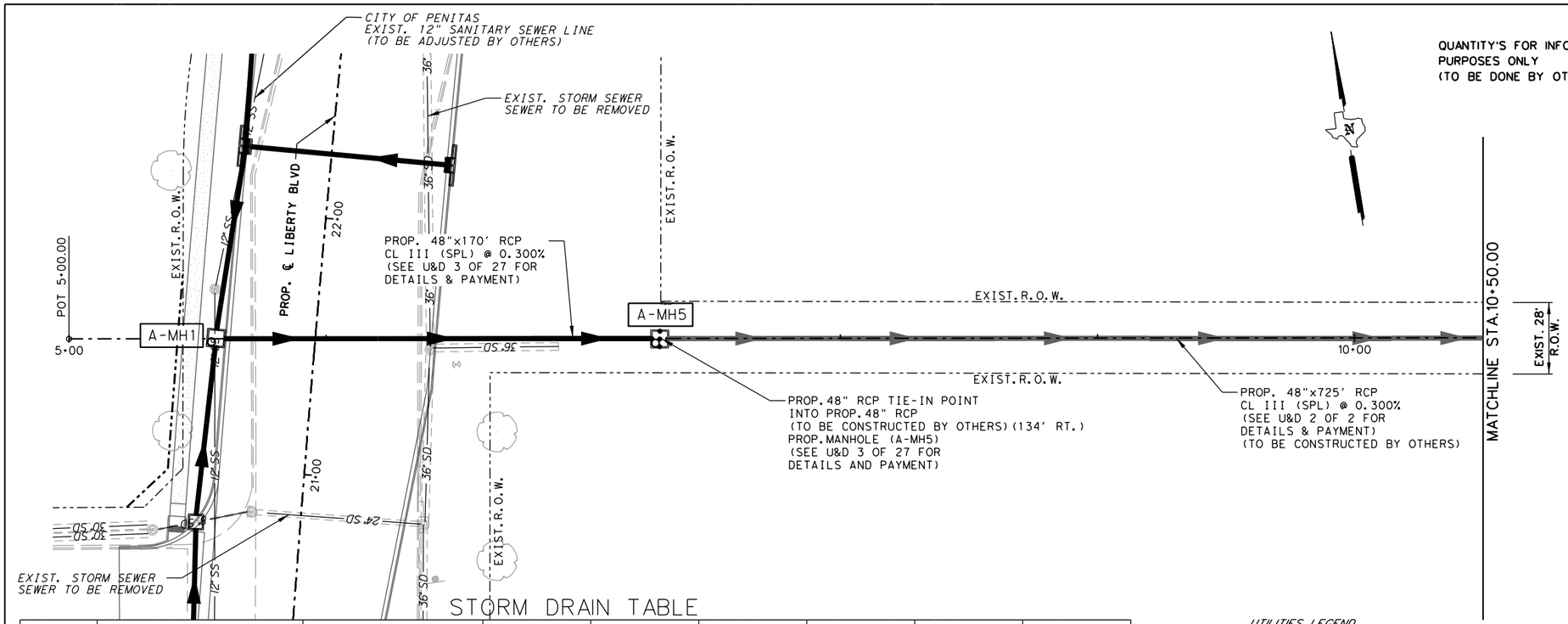
LIBERTY BLVD
UTILITY AND DRAINAGE
STA. 141+00 TO STA. 146+00

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 27 OF 27

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
						6	TEXAS				170
						STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
						PHR	HIDALGO	0921	02	194	LIBERTY

11/20/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\03 U&D\LIBERTY_UD027.dgn



QUANTITY'S FOR INFORMATION PURPOSES ONLY (TO BE DONE BY OTHERS)

SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	-
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	-
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	-
464	18" RCP SEWER (CL III)(SPL)	LF	-
464	30" RCP SEWER (CL III)(SPL)	LF	-
464	48" RCP SEWER (CL III)(SPL)	LF	-

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- INST. OM ASSM (OM-2Z)(FLX) GND (BI)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

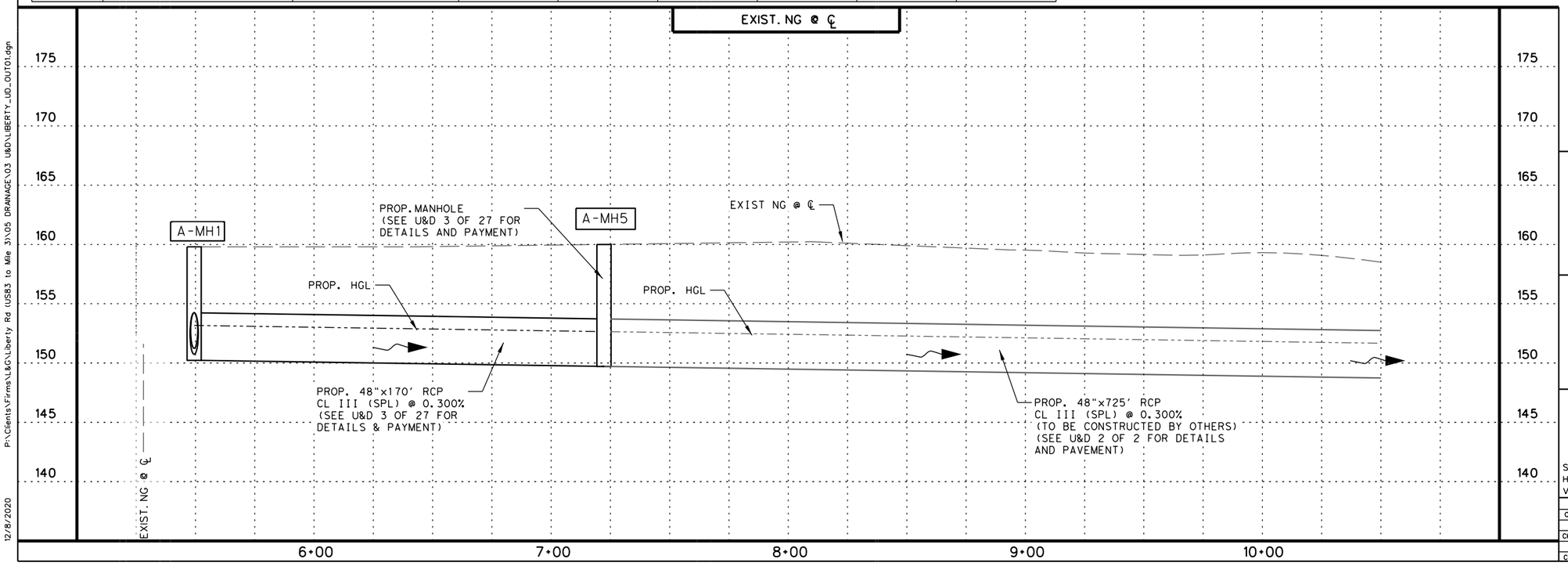
THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
A-MH1	PSL RC 6x6	21+50.00 -38.50	159.77	150.21			150.21	
A-MH5	PSL RC 6x6	21+50.00 134.00	160.00	149.70			149.70	149.70

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6



STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED
PROFESSIONAL ENGINEER
12/08/2020

THE COUNTY OF HIDALGO
TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

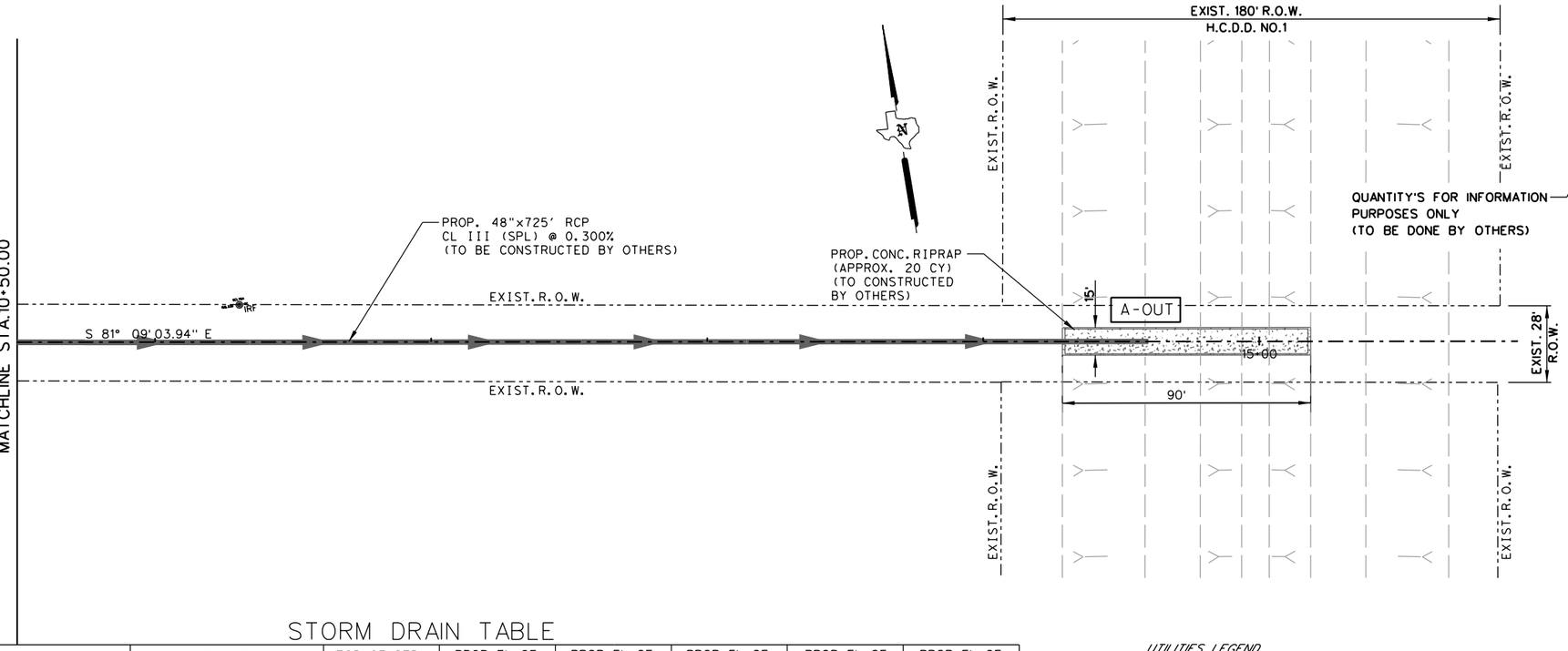
900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD UTILITY AND DRAINAGE OUTFALL A-OUT

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
						6	TEXAS					171
						STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
						PHR	HIDALGO	0921	02	194		LIBERTY

P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\03 U&D\LIBERTY_UD_OUT01.dgn
12/8/2020



SHEET SUMMARY			
ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	2213
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	894
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	725
432	RIPRAP (CONC.) (4")	CY	20
464	18" RCP SEWER (CL III)(SPL)	LF	-
464	30" RCP SEWER (CL III)(SPL)	LF	-
464	48" RCP SEWER (CL III)(SPL)	LF	725

SEE STORM DRAINAGE TABLE FOR PROPOSED DRAINAGE INLET STRUCTURE INFORMATION

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF PROPOSED DITCH
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)
- INST. OM ASSM (OM-2Z)(FLX) GND (BI)
- NON-PAY, SUBSIDIARY TO PERTINENT ITEMS

NOTES:
SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

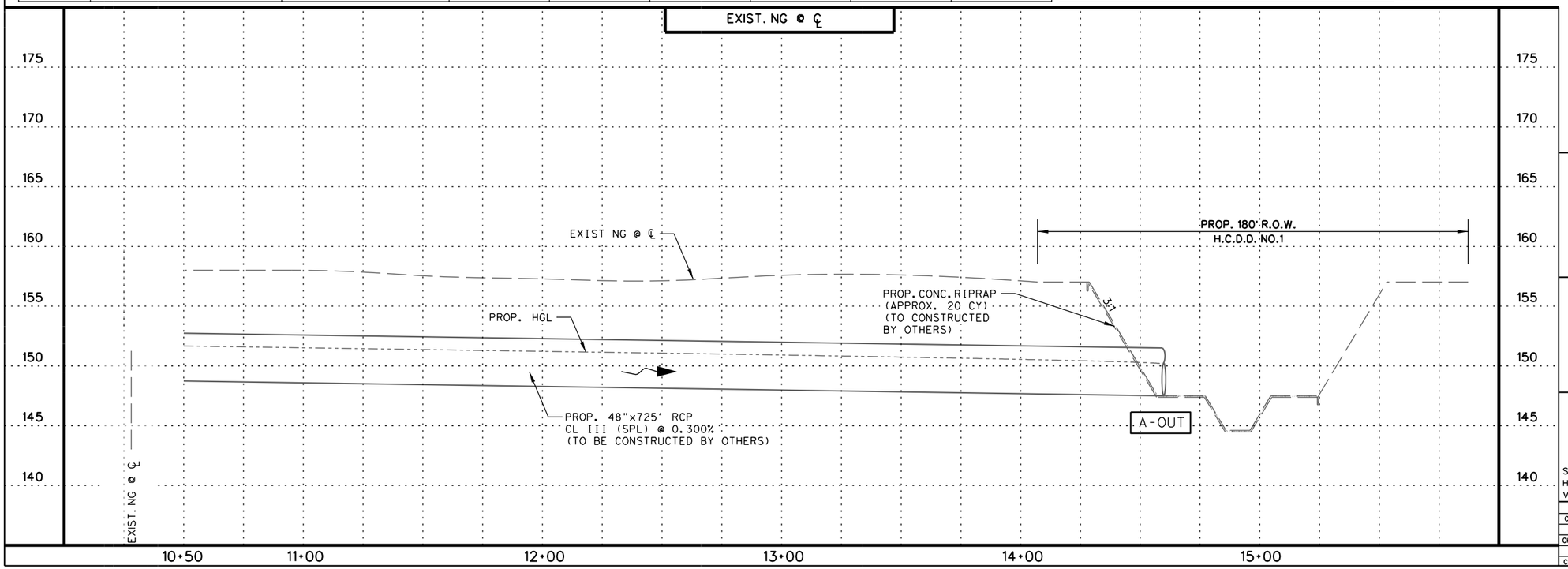
THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
A-OUT	OUTLET	21+57.17 890.00	158.00	147.50				

UTILITIES LEGEND

AEP	AMERICAN ELECTRIC POWER
AT&T	AMERICAN TELEPHONE & TELEGRAPH
TGS	TEXAS GAS SERVICE
HILCORP	HILCORP ENERGY COMPANY
ENTERPRISE	ENTERPRISE PRODUCTS
UNITED	UNITED IRRIGATION DISTRICT
HCID#6	HIDALGO COUNTY IRRIGATION DISTRICT No 6



STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL ENGINEER
12/08/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

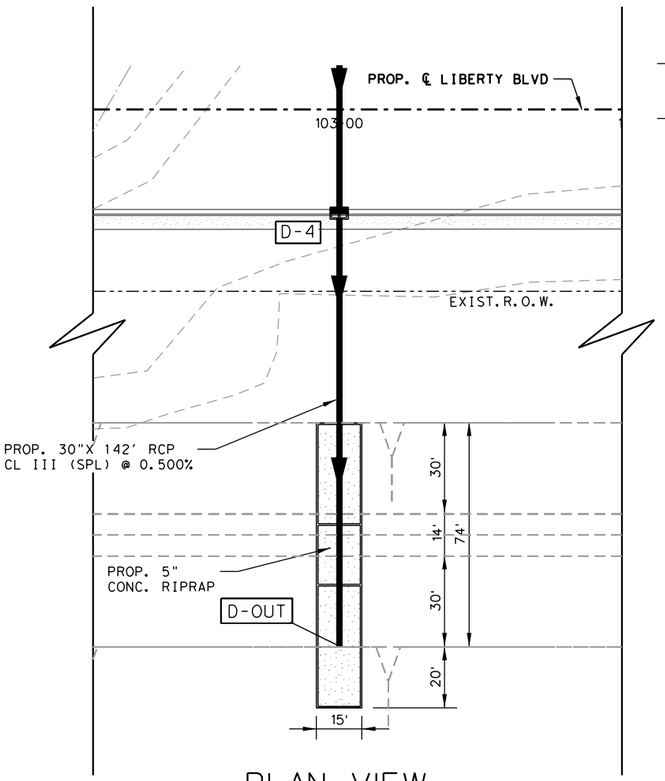
LIBERTY BLVD UTILITY AND DRAINAGE OUTFALL A-OUT

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

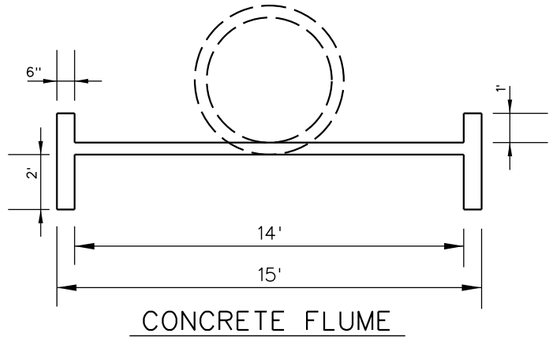
SHEET 2 OF 2

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
						6	TEXAS				172
						STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
						PHR	HIDALGO	0921	02	194	LIBERTY

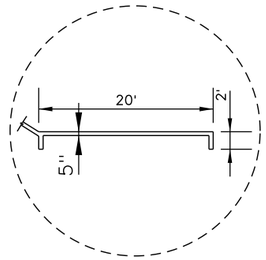
P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3\05 DRAINAGE\03 U&D\LIBERTY_UD_OUT02.dgn
12/8/2020



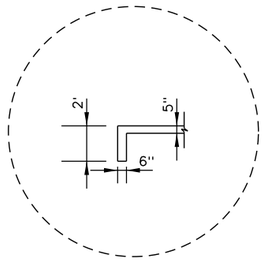
PLAN VIEW



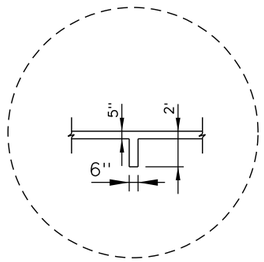
CONCRETE FLUME



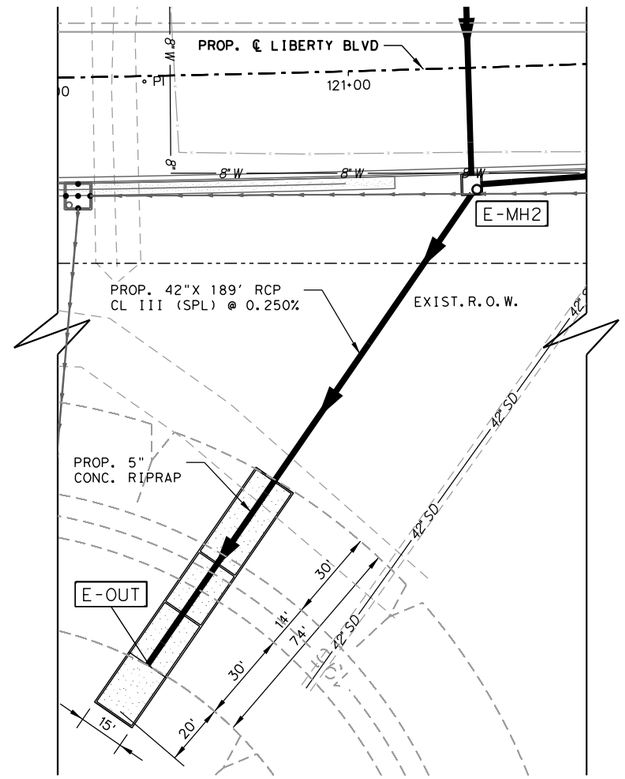
DETAIL "A"
(N.T.S)



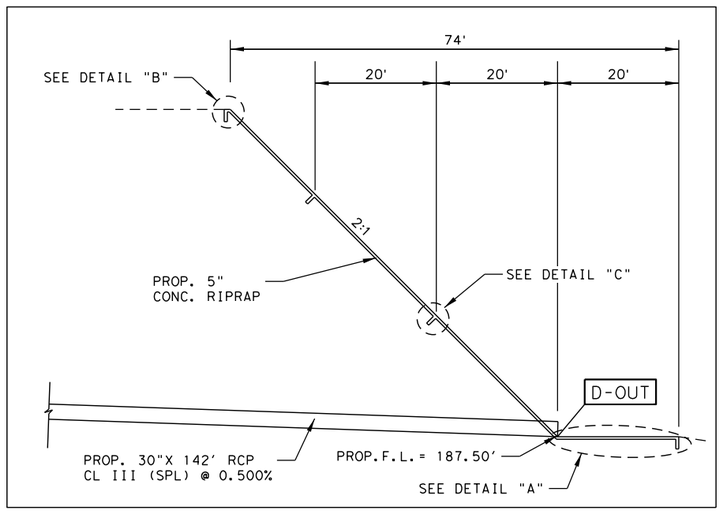
DETAIL "B"
(N.T.S)



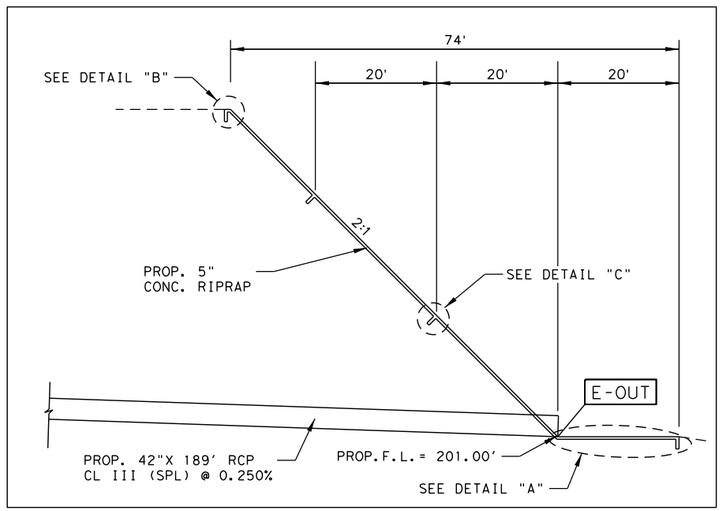
DETAIL "C"
(N.T.S)



PLAN VIEW



PROFILE VIEW
(N.T.S)



PROFILE VIEW
(N.T.S)

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED
PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO
TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

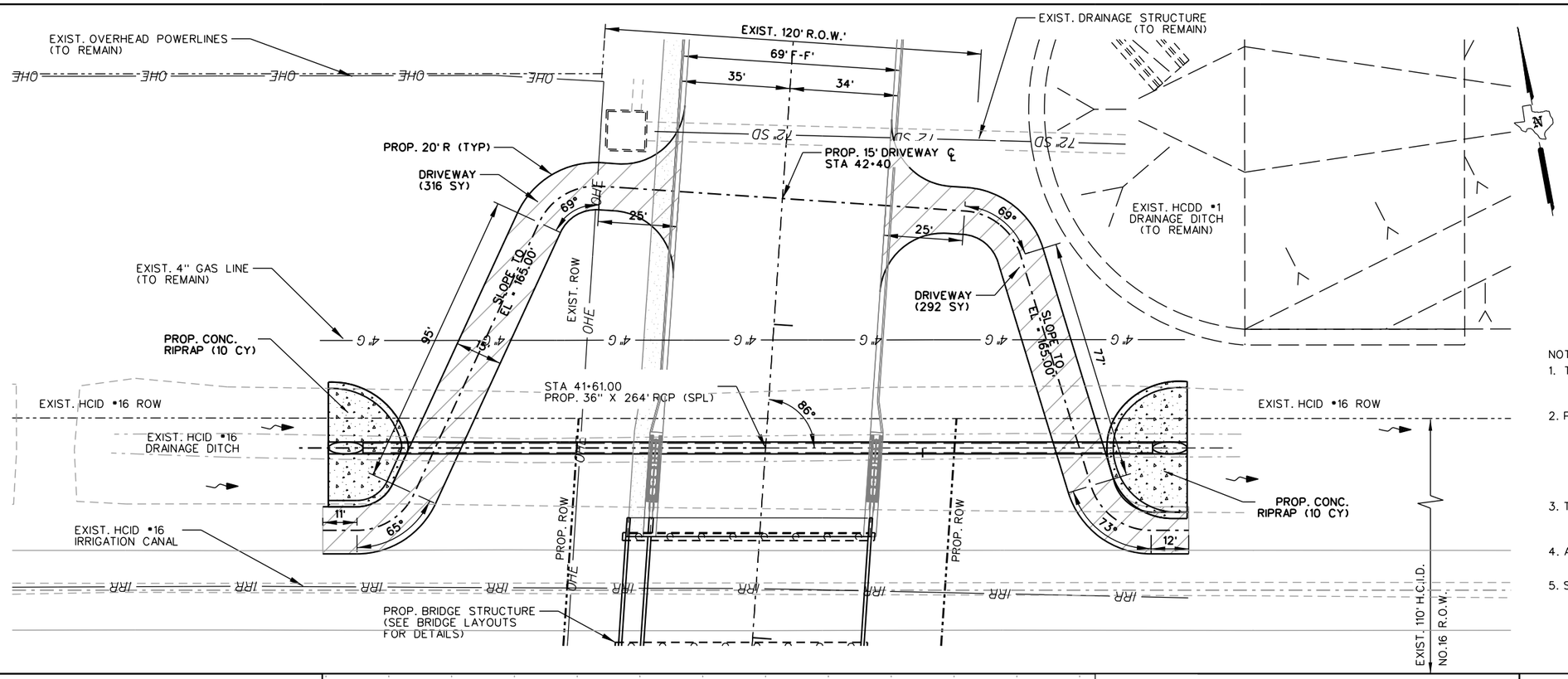
900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD OUTFALL DETAILS

SCALE: 1"= 50'

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					173
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

11/20/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\03 U&D\LIBERTY_DOUT & EOUT DETAILS.dgn



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT. EXCAVATION (NON-PAY)	CY	---
400	STRUCT. EXCAVATION (SPL)	CY	47
400	SAND BACKFILL	CY	187
402	TRENCH EXCAV. PROTECTION	LF	264
432	RIPRAP (CONC.) (4")	CY	20
464	RC PIPE (CL III)(36 IN)(SPL)	LF	264

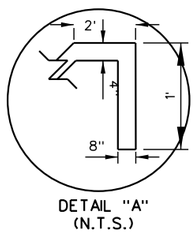
* FOR CONTRACTORS INFORMATION ONLY

LEGEND

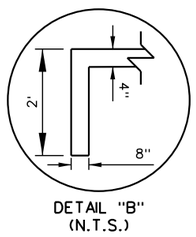
- SEE P&P SHEETS FOR DETAILS
- NON-PAY, SUBSIDIARY TO PERTINENT BID ITEMS.
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/ TURNOUT TABLE FOR QUANTITIES AND DETAILS)

NOTE:

1. THE CONTRACTOR WILL COORDINATE WITH HIDALGO COUNTY IRRIG DISTRICT #16. 72 HOURS PRIOR TO ANY WORK DONE ON OR NEAR THE IRRIGATION STRUCTURES.
2. PRIOR TO WORKING OUTSIDE THE ROW THE CONTRACTOR SHALL CONTACT THE PROJECT ENGINEER, CAUTION SHALL BE TAKEN NOT TO DAMAGE EXISTING FENCES, TREES, ETC. THE CONTRACTOR SHALL NOTIFY PROPERTY OWNERS WHEN WORKING OUTSIDE THE ROW. ANY DAMAGES DONE TO THEIR PROPERTY SHALL BE REPAIRED AT CONTRACTORS EXPENSE.
3. THE CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO FIELD VERIFY UTILITIES PRIOR TO CONSTRUCTION.
4. ALL PVC ELBOWS, AND CONNECTIONS SHALL BE SUBSIDIARY TO PERTINENT BID ITEMS.
5. SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.



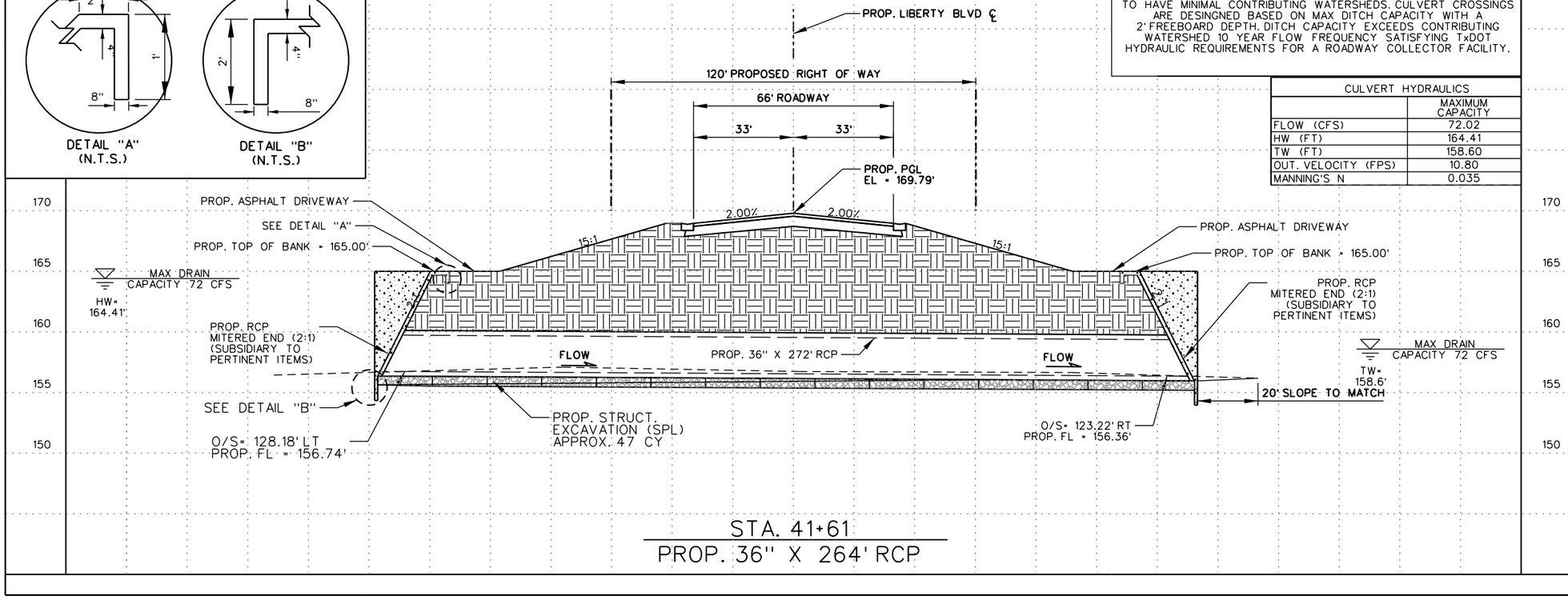
DETAIL "A" (N.T.S.)



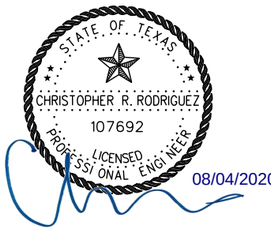
DETAIL "B" (N.T.S.)

* EXISTING IRRIGATION OWNED BORROW DITCHES WERE DETERMINED TO HAVE MINIMAL CONTRIBUTING WATERSHEDS. CULVERT CROSSINGS ARE DESIGNED BASED ON MAX DITCH CAPACITY WITH A 2' FREEBOARD DEPTH. DITCH CAPACITY EXCEEDS CONTRIBUTING WATERSHED 10 YEAR FLOW FREQUENCY SATISFYING TxDOT HYDRAULIC REQUIREMENTS FOR A ROADWAY COLLECTOR FACILITY.

CULVERT HYDRAULICS	MAXIMUM CAPACITY
FLOW (CFS)	72.02
HW (FT)	164.41
TW (FT)	158.60
OUT. VELOCITY (FPS)	10.80
MANNING'S N	0.035



STA. 41+61
PROP. 36" X 264' RCP



THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

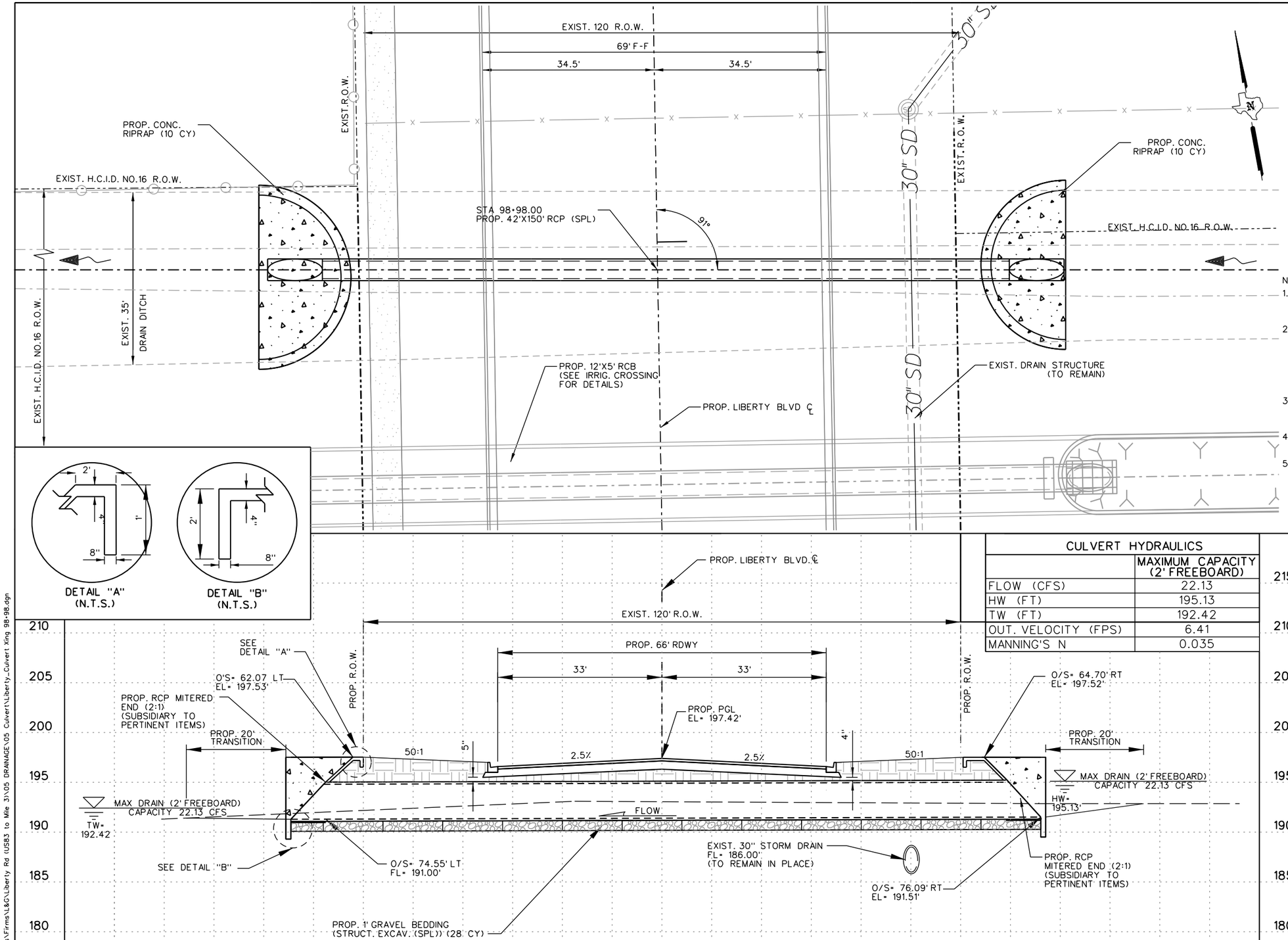
LIBERTY BLVD CULVERT CROSSING STA 41+61

SCALE:
HOR: 1"= 40'
VER: 1"= 10'

SHEET 1 OF 2

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					174
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

8/4/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\05 Culvert\Liberty_Culvert Xing 41+63.dgn



STA. 98+98
PROP. 42" X 150' RCP (CL III)(SPL)

SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
132	EMBANKMENT (FINAL)(DC)(TY C)	CY	111
400	STRUCT. EXCAVATION (NON-PAY)	-	-
400	STRUCT. EXCAVATION (SPL)	CY	28
400	CEMENT STABILIZED BACKFILL	CY	77
432	RIPRAP (CONC.) (4")	CY	20
464	RC PIPE (CL III) (42 IN)	LF	150

* FOR CONTRACTORS INFORMATION ONLY

LEGEND

- SEE P&P SHEETS FOR DETAILS
- ⊗ NON-PAY, SUBSIDIARY TO PERTINENT BID ITEMS.
- ⊕ TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- ★ TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- PROPOSED DRIVEWAY OR TURNOUT (SEE DRIVEWAY/ TURNOUT TABLE FOR QUANTITIES AND DETAILS)

NOTE:

1. THE CONTRACTOR WILL COORDINATE WITH HIDALGO COUNTY IRRIG DISTRICT •16. 72 HOURS PRIOR TO ANY WORK DONE ON OR NEAR THE IRRIGATION STRUCTURES.
2. PRIOR TO WORKING OUTSIDE THE ROW THE CONTRACTOR SHALL CONTACT THE PROJECT ENGINEER, CAUTION SHALL BE TAKEN NOT TO DAMAGE EXISTING FENCES, TREES, ETC. THE CONTRACTOR SHALL NOTIFY PROPERTY OWNERS WHEN WORKING OUTSIDE THE ROW. ANY DAMAGES DONE TO THEIR PROPERTY SHALL BE REPAIRED AT CONTRACTORS EXPENSE.
3. THE CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO FIELD VERIFY UTILITIES PRIOR TO CONSTRUCTION.
4. ALL PVC ELBOWS, AND CONNECTIONS SHALL BE SUBSIDIARY TO PERTINENT BID ITEMS.
5. SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

CULVERT HYDRAULICS

	MAXIMUM CAPACITY (2' FREEBOARD)
FLOW (CFS)	22.13
HW (FT)	195.13
TW (FT)	192.42
OUT. VELOCITY (FPS)	6.41
MANNING'S N	0.035

• EXISTING IRRIGATION OWNED BORROW DITCHES WERE DETERMINED TO HAVE MINIMAL CONTRIBUTING WATERSHEDS. CULVERT CROSSING IS DESIGNGNED BASED ON MAX DITCH CAPACITY WITH A 2' FREEBOARD DEPTH. DITCH CAPACITY EXCEEDS CONTRIBUTING WATERSHED 10 YEAR FLOW FREQUENCY SATISFYING TxDOT HYDRAULIC REQUIREMENTS FOR A ROADWAY COLLECTOR FACILITY.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD CULVERT CROSSING STA 98+98

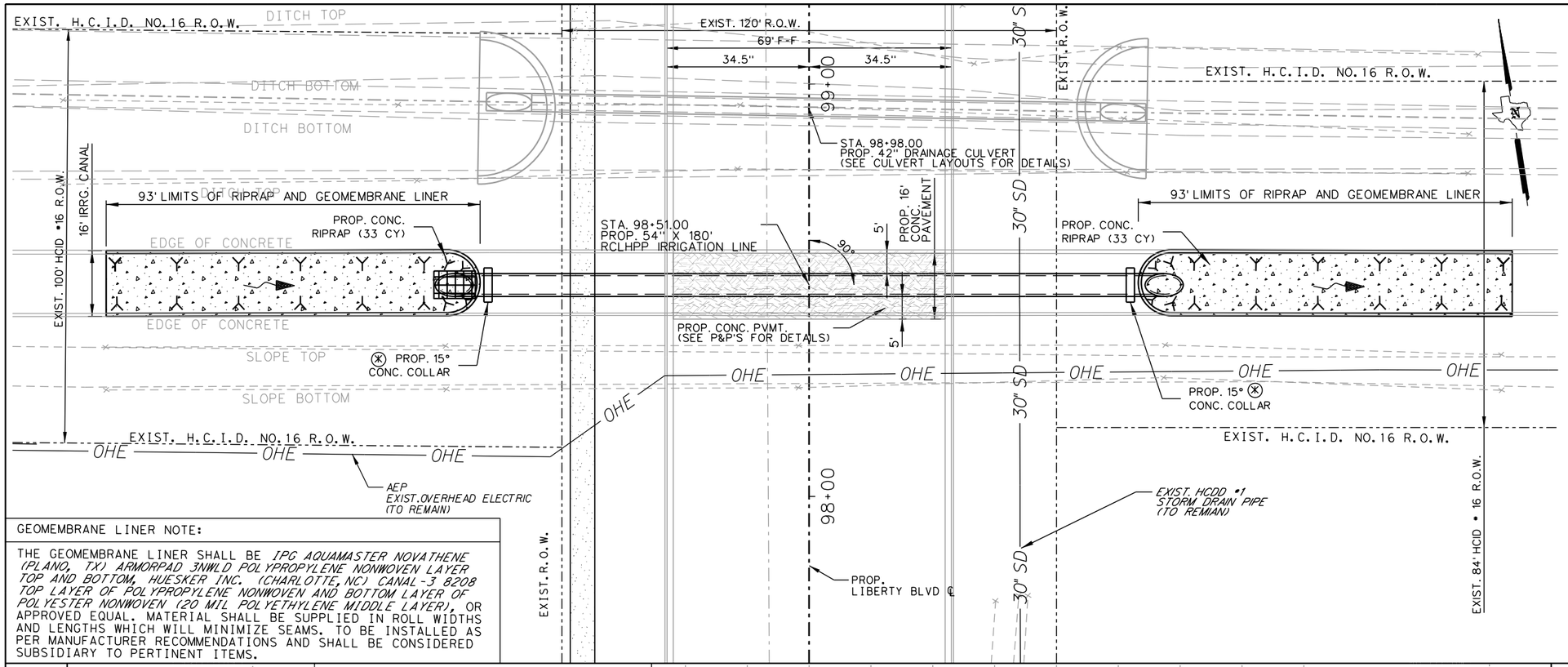
SCALE:
HOR: 1"= 20'
VER: 1"= 10'

SHEET 2 OF 2

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
6	TEXAS				175
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
PHR	HIDALGO	0921	02	194	LIBERTY

11/13/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\05 Culvert\Liberty_Culvert Xing 98-98.dgn



SHEET SUMMARY			
ITEM	DESCRIPTION	UNIT	QUANTITY
104	REMOVING CONC. (RIPRAP)	SY	490
132	EMBANKMENT (FINAL)(DC)(TY C)	CY	56
⊛ 400	STRUCT. EXCAVATION (NON-PAY)	CY	809
400	STRUCT. EXCAVATION (SPL)	CY	33
400	CEMENT STABILIZED BACKFILL	CY	275
402	TRENCH EXCAV. PROTECTION	LF	180
432	RIPRAP (CONC.) (4")	CY	66
4024	RCLHPP CLIII (54")	LF	180
⊛ ••••	GEOMEMBRANE LINER (NON-PAY)	SY	331
⊛ ••••	REMOVEABLE STEEL GRATE	EA	1

LEGEND

- SEE P&P SHEETS FOR DETAILS
- ⊛ NON-PAY, SUBSIDIARY TO PERTINENT BID ITEMS.
- ⊕ TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- ✱ TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)

NOTE:

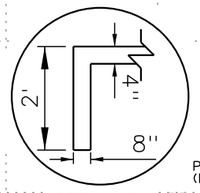
1. THE CONTRACTOR WILL COORDINATE WITH HIDALGO COUNTY IRRIG DISTRICT •16. 72 HOURS PRIOR TO ANY WORK DONE ON OR NEAR THE IRRIGATION STRUCTURES.
2. PRIOR TO WORKING OUTSIDE THE ROW THE CONTRACTOR SHALL CONTACT THE PROJECT ENGINEER. CAUTION SHALL BE TAKEN NOT TO DAMAGE EXISTING FENCES, TREES, ETC. THE CONTRACTOR SHALL NOTIFY PROPERTY OWNERS WHEN WORKING OUTSIDE THE ROW. ANY DAMAGES DONE TO THEIR PROPERTY SHALL BE REPAIRED AT CONTRACTORS EXPENSE.
3. THE CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO FIELD VERIFY UTILITIES PRIOR TO CONSTRUCTION.
4. ALL PVC ELBOWS, AND CONNECTIONS SHALL BE SUBSIDIARY TO PERTINENT BID ITEMS.
5. SEE ALIGNMENT DATA SHEET FOR PROPOSED CENTERLINE DATA.

GEOMEMBRANE LINER NOTE:

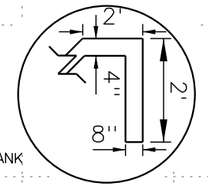
THE GEOMEMBRANE LINER SHALL BE *IPG AQUAMASTER NOVATHENE (PLANO, TX) ARMORPAD 3NWLD POLYPROPYLENE NONWOVEN LAYER TOP AND BOTTOM, HUESKER INC. (CHARLOTTE, NC) CANAL-3 8208 TOP LAYER OF POLYPROPYLENE NONWOVEN AND BOTTOM LAYER OF POLYESTER NONWOVEN (20 MIL POLYETHYLENE MIDDLE LAYER)*, OR APPROVED EQUAL. MATERIAL SHALL BE SUPPLIED IN ROLL WIDTHS AND LENGTHS WHICH WILL MINIMIZE SEAMS. TO BE INSTALLED AS PER MANUFACTURER RECOMMENDATIONS AND SHALL BE CONSIDERED SUBSIDIARY TO PERTINENT ITEMS.

REMOVABLE STEEL GRATE NOTE:

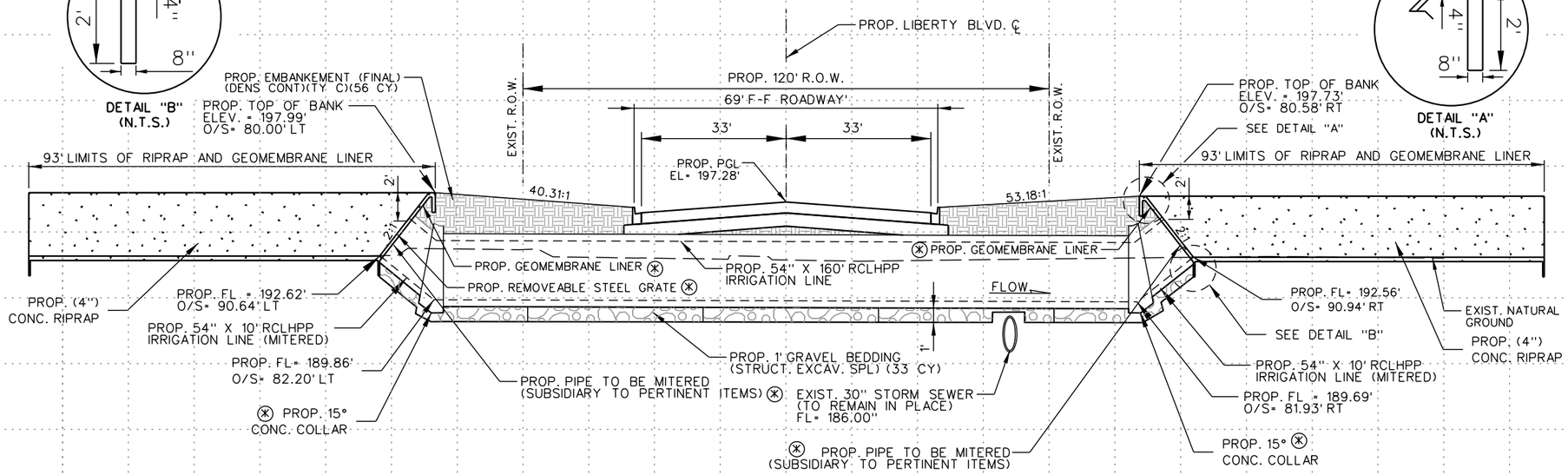
FOR REMOVEABLE GRATE, THE CONTRACTOR SHALL PROVIDE SUBMITTAL TO HCID #16 FOR DISTRICT SPECIFICATIONS AND APPROVAL



DETAIL "B" (N.T.S.)



DETAIL "A" (N.T.S.)



STA. 98+51
PROP. 54" X 180' RCLHPP

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD IRRIGATION LAYOUT STA. 98+51

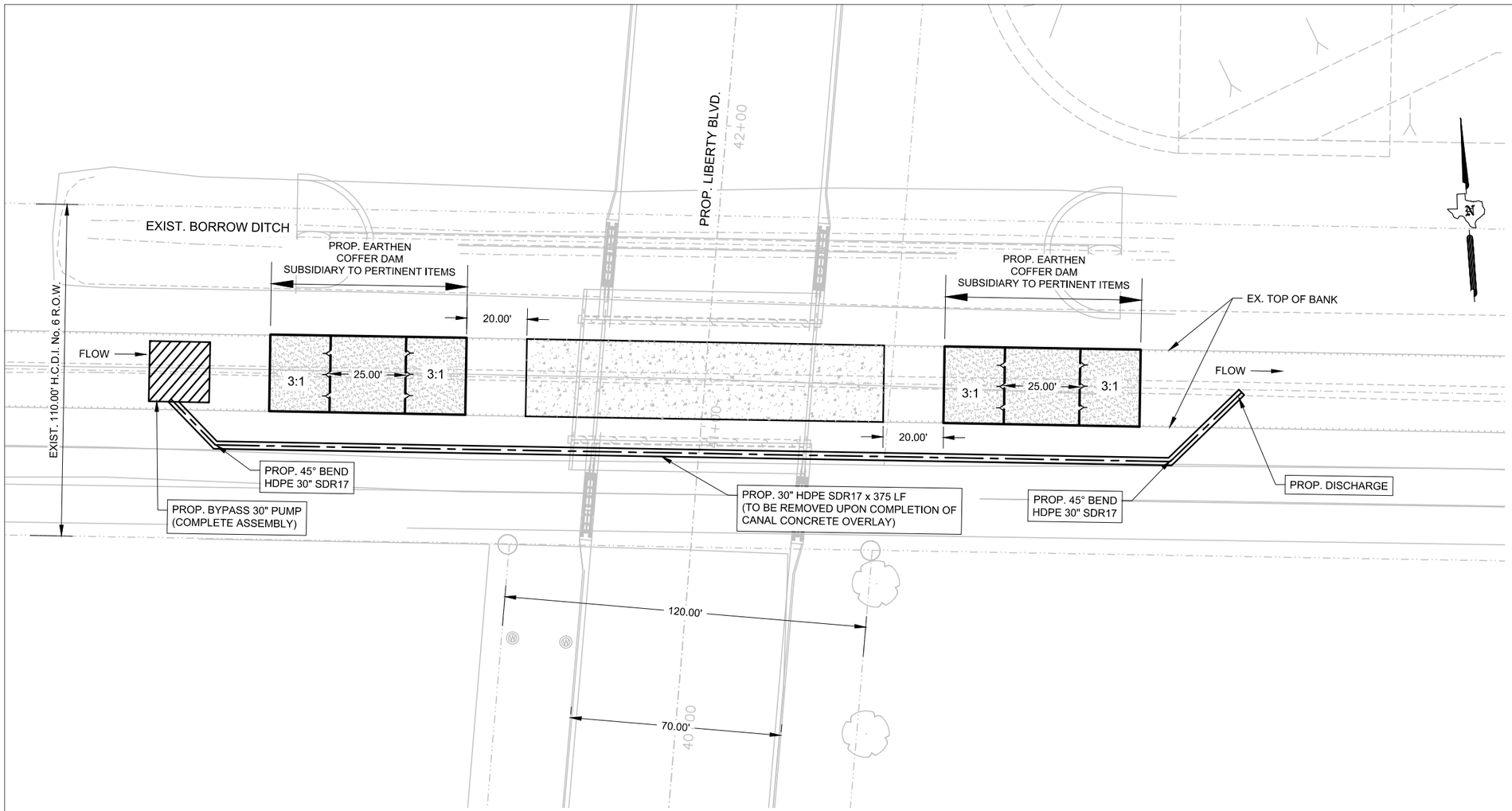
SCALE:
HOR: 1"= 30'
VER: 1"= 10'

SHEET 1 OF 1

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					176A
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\06 Irrigation\Liberty_IRRIG XING.dgn

12/8/2020



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
4122	THERMOPLASTIC PIPE (30 IN) (HDPE)	LF	375
496	REMOVE STRUCT. (PIPE)	LF	375

LEGEND:

COFFER DAM

PROP. BYPASS PUMP

NOTES:

1. THE CONTRACTOR WILL COORDINATE WITH HIDALGO COUNTY IRRIGATION DISTRICT NUMBER 6 TO SETUP A PRE CONSTRUCTION CONFERENCE PRIOR TO ANY WORK DONE ON OR NEAR IRRIGATION STRUCTURES.
2. PRIOR TO WORKING OUTSIDE THE R.O.W. THE CONTRACTOR SHALL CONTACT THE PROJECT ENGINEER. CAUTION SHALL BE TAKEN NOT TO DAMAGE EXISTING FENCES, TREES, ETC. THE CONTRACTOR SHALL NOTIFY PROPERTY OWNERS WHEN WORKING OUTSIDE THE R.O.W. ANY DAMAGES DONE TO THEIR PROPERTY SHALL BE REPAIRED AT CONTRACTORS EXPENSE.
3. THE CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO FIELD VERIFY UTILITIES PRIOR TO CONSTRUCTION.
4. ALL HDPE ELBOWS, CONNECTIONS AND APPURTENANCES SHALL BE SUBSIDIARY TO PERTINENT BID ITEMS.
5. ALL HDPE ELBOWS AND CONNECTIONS SHALL BE SUBSIDIARY TO PERTINENT BID ITEM 4122.
6. 30" PUMP COMPLETE ASSEMBLY SHALL BE SUBSIDIARY TO PERTINENT BID ITEM 4122.
7. 30" PUMP SHALL BE RATED FOR MINIMUM 26,540 GPM DELIVERY OF RAW WATER.

PUMP DATA

30" HEIDRA 750AX OR APPROVED EQUAL
26,540 GPM
225 HP
1800 RPM

HIDALGO COUNTY IRRIGATION DISTRICT NUMBER 6
3735 N. FM 492
MISSION, TX 78574
OFFICE 956-585-8389

STATE OF TEXAS
RUBEN JAMES DE JESUS
126282
LICENSED
PROFESSIONAL ENGINEER
05/27/2022

MELDEN & HUNT, INC.
TEXAS REGISTRATION F-1435

115 W. McINTYRE
EDINBURG, TX 78541
PH: (956) 381-0981
FAX: (956) 381-1839 ESTABLISHED 1947
www.meldenandhunt.com

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9818

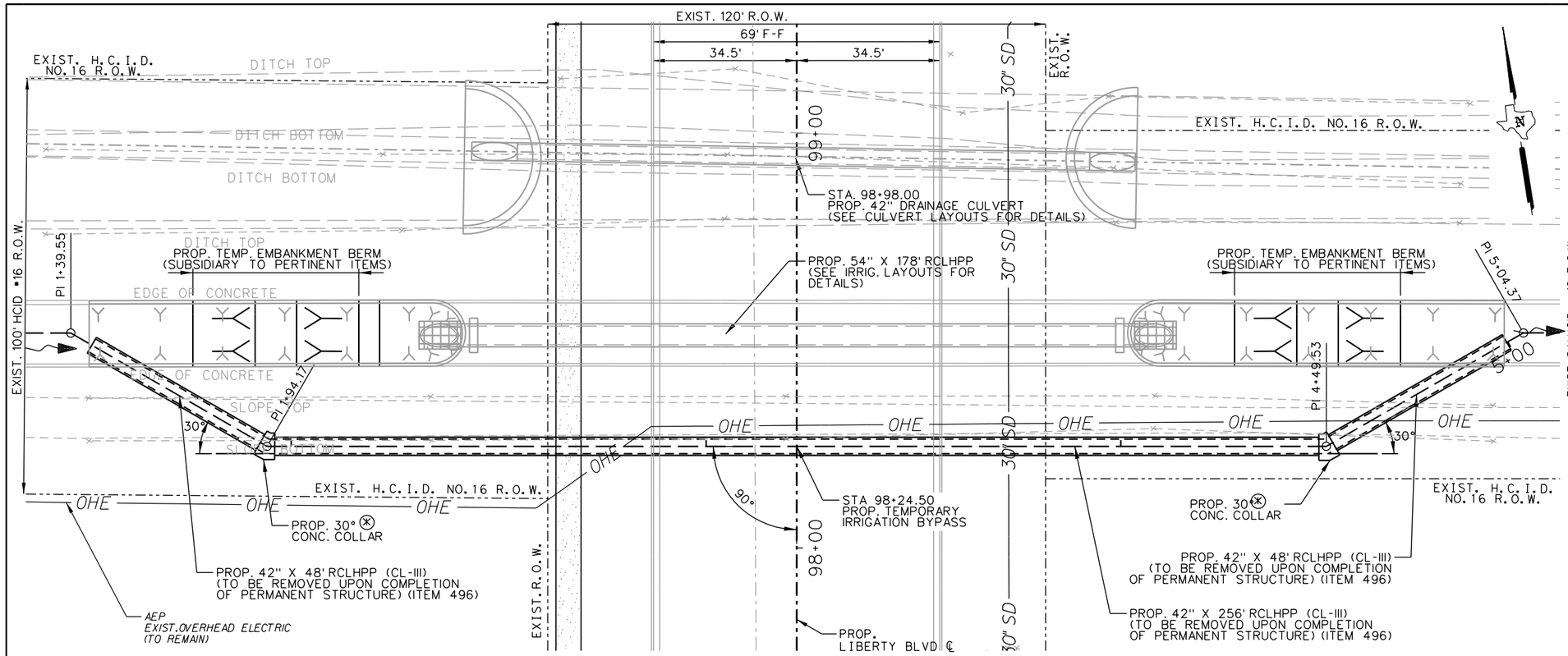
900 S. Stewart Rd., Ste. 12
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD.
IRRIGATION BY PASS
STA. 41+15

SCALE:
HOR: 1"=40'
VER:

SHEET 1 OF 1

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		02	TEXAS				176B
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHARR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT. EXCAVATION (NON-PAY)	CY	72
402	TRENCH EXCAV. PROTECTION	LF	352
496	REMOV STRUCT. (PIPE)	LF	352
4024	RCLHPP (CL III)(42")	LF	352

LEGEND

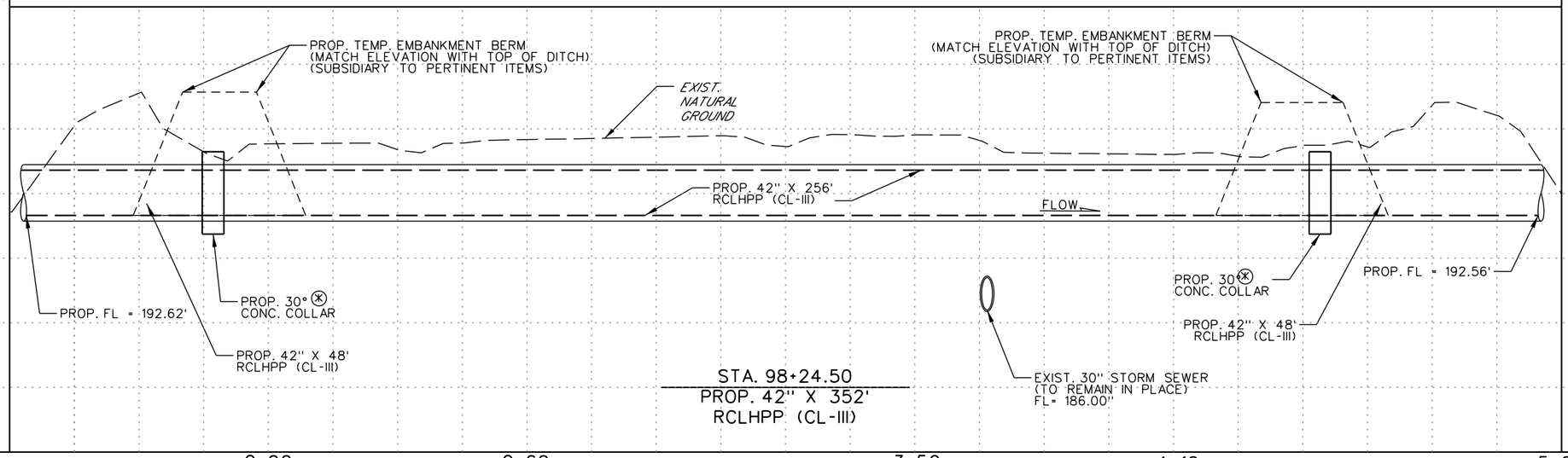
- SEE P&P SHEETS FOR DETAILS
- NON-PAY, SUBSIDIARY TO PERTINENT BID ITEMS.
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)

NOTE:

1. THE CONTRACTOR WILL COORDINATE WITH HIDALGO COUNTY IRRIG DISTRICT •16. 72 HOURS PRIOR TO ANY WORK DONE ON OR NEAR THE IRRIGATION STRUCTURES.
2. PRIOR TO WORKING OUTSIDE THE ROW THE CONTRACTOR SHALL CONTACT THE PROJECT ENGINEER, CAUTION SHALL BE TAKEN NOT TO DAMAGE EXISTING FENCES, TREES, ETC. THE CONTRACTOR SHALL NOTIFY PROPERTY OWNERS WHEN WORKING OUTSIDE THE ROW. ANY DAMAGES DONE TO THEIR PROPERTY SHALL BE REPAIRED AT CONTRACTORS EXPENSE.
3. THE CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO FIELD VERIFY UTILITIES PRIOR TO CONSTRUCTION.
4. ALL PVC ELBOWS, AND CONNECTIONS SHALL BE SUBSIDIARY TO PERTINENT BID ITEMS.

IRRIGATION BYPASS ALIGNMENT DATA

Point 279	X	1,004,899.82 Y	16,623,028.55 Sta	1+00.00	
Course from 279 to 280 S 81° 02' 59.51" E Dist 39.55					
Point 280	X	1,004,938.88 Y	16,623,022.40 Sta	1+39.55	
Course from 280 to 281 S 51° 02' 59.51" E Dist 54.63					
Point 281	X	1,004,981.36 Y	16,622,988.06 Sta	1+94.17	
Course from 281 to 282 S 81° 02' 59.51" E Dist 255.35					
Point 282	X	1,005,233.61 Y	16,622,948.33 Sta	4+49.53	
Course from 282 to 283 N 69° 02' 32.82" E Dist 54.84					
Point 283	X	1,005,284.82 Y	16,622,967.95 Sta	5+04.37	
Course from 283 to 284 S 81° 02' 59.51" E Dist 42.51					
Point 284	X	1,005,326.82 Y	16,622,961.34 Sta	5+46.88	



STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED
PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD IRRIGATION BYPASS
STA. 98+24.50

SCALE:
HOR: 1"= 30'
VER: 1"= 10'

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					176C
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	322	LIBERTY	
TR:								
CK TR:								

11/13/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\06 Irrigation\Liberty_IRRIG BYPASS.dgn

CONCRETE:

CONCRETE PROPOSED FOR THE CANAL LINER SHALL BE TYPE IPORTLAND CEMENT, AND SHALL HAVE A COMPRESSIVE STRENGTH (F'c) OF 3,000 PSIAT 28 DAYS.

MINIMUM CEMENT RATIO TO BE: 5 SACKS PER CUBIC YARD FOR 3,00 PSICONCRETE, MAXIMUM WATER CEMENT RATIO TO BE 0.50.

CHAMFER ALL EXPOSED CONC, CORNERS 1"

ALL CONCRETE REINFORCEMENT BARS SHALL CONFORM TO ASTM A615, GRADE 60, ALL WELDED WIRE FABRIC TO BE HOT DIPPED GALVANIZED AND SHALL CONFORM TO ASTM 185.

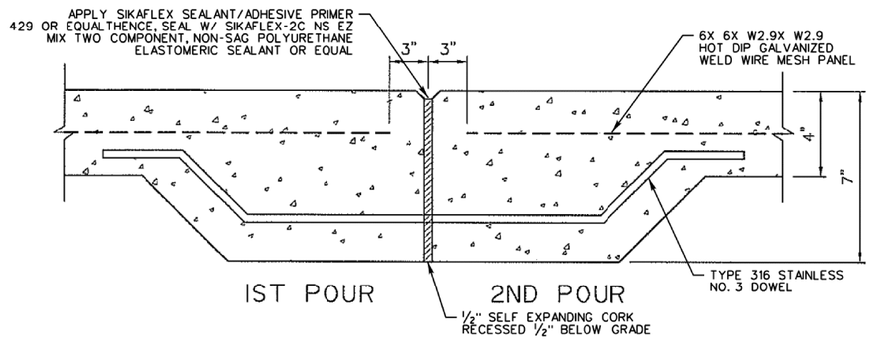
DETAILING, FABRICATION AND PLACING CONCRETE REINFORCEMENT AND ACCESSORIES SHALL BE IN ACCORDANCE WITH ASISP-66, LATEST EDITION.

CONTINUOUS REINFORCEMENTSHALL HAVE A MINIMUMLAP AT SPLICED AS FOLLOWS (UNLESS OTHERWISE NOTED):

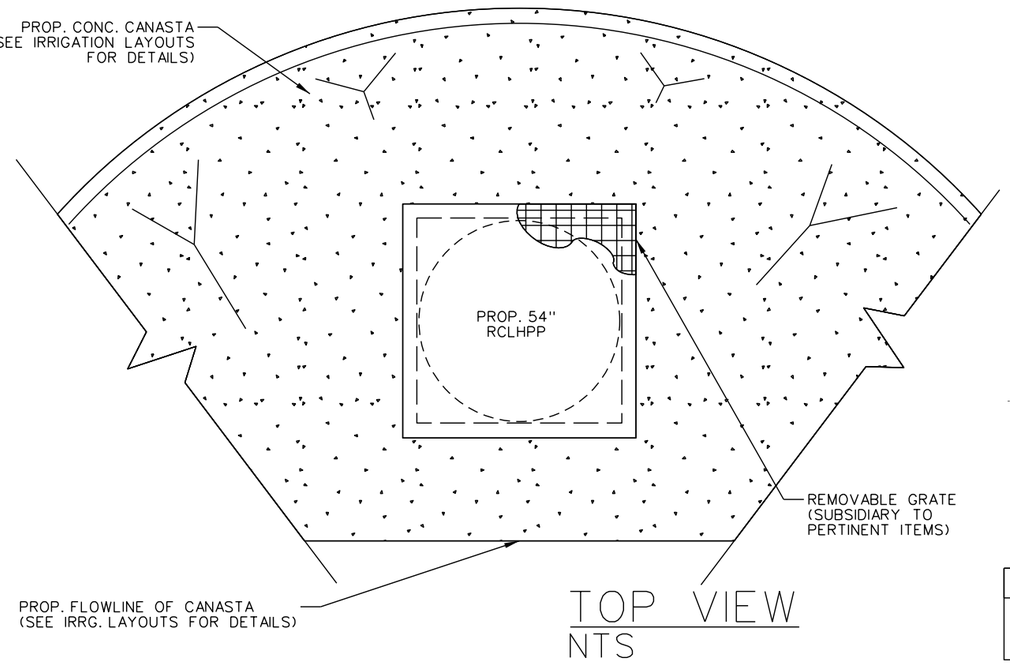
NO. 3 BARS...16"	NO. 4 BARS 22"	NO.5 BARS...27"
NO. 6 BARS...36"	NO. 7 BARS 48"	NO.5 BARS...63"
NO. 9 BARS...80"	NO. 10 BARS 101"	NO.5 BARS...125"

WELDEING WIRE FABRIC SHALL LAP SO THAT THE OVERLAP MEASURED BETWEEN OUTMOST CROSS WIRES OF EACH FABRIC SHEET IS NOT LESS THAN THE SPACING OF THE WIRES PLUS 2".

REINFORCING BARS MAY NOT BE WELDED WITHOUT OF THE APPROVAL OF THE ENGINEER.



CONSTRUCTION JOINT DETAIL AS NEEDED



TOP VIEW
NTS

CONCRETE PROTECTION FOR REINFORCEMENT SHALL BE AS FOLLOWS, (SEE SECTION 7.7 ACI 38, LATEST EDITION, FOR CONDITIONS NOT NOTED):

ALL CONCRETE FORMED AGAINST THE GROUND.....3"
ALL CONCRETE FORMED AGAINST THE WATER.....3"
SIDES AND BOTTOMS OF GRADE BEAMS.....3"
WALLS AND SIDES OF BEAMS ABOVE GRADE.....1 1/2"
SLABS ABOVE GRADE.....3/4"

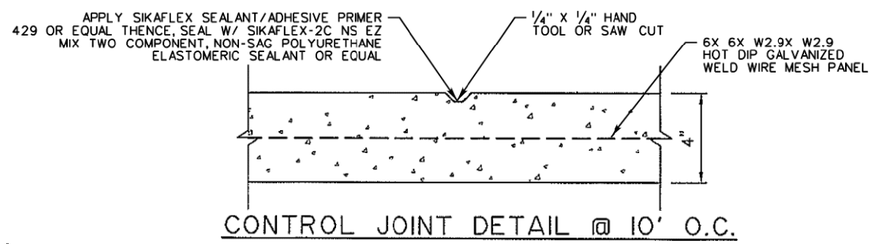
ALL MIXING, TRANSPORTING, PLACING AND CURING OF CONCRETE SHALL BE DONE IN ACCORDANCE WITH THE RECOMMENDATION OF THE LATEST EDITIONS OF THE AMERICAN CONCRETE INSTITUTE ACI 318, ACI 301, ACI 309, ACI 305 AND ACI 306. MAXIMUM FREE FALL FOR CONCRETE TO BE 3'-0".

NO HORIZONTAL JOINTS WILL BE PERMITEED IN CONCRETE EXCEPT AT CONSTRUCTIONS JOINTS EXCEPT WHERE THEY NORMALLY OCCUR OR WHERE DETAILED.

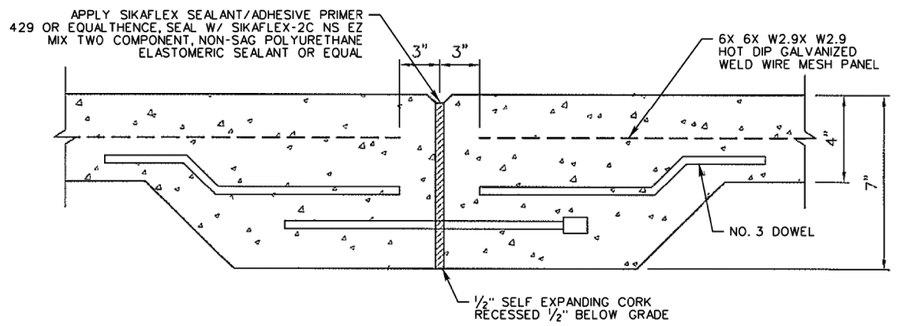
HORIZONTAL REINFORCING SHALL BE CONTINUOUS THROUGH CONSTRUCTION JOINTS.

FRESHLY DEPOSITED CONCRETE SHALL BE PROTECTED FROM PREMATURE DRYING AND EXCESSIVE HOT OR COLD TEMPERATURES FOR THE PERIOD OF TIME NECESSARY FOR THE HYDRATION OF THE CEMENT AND PROPER HARDENING OF THE CONCRETE. THIS SHALL BE A MINIMUM OF SEVEN DAYS AFTER THE CONCRETE IS POURED.

ALL CONCRETE, INCLUDING DRILLED FOOTINGS, SHALL BE CONSOLIDATED BY VIBRATION, SPADING OR RODDING, SO THAT THE CONCRETE IS THOROUGHLY WORKED AROUND THE REINFORCEMENT. EMBEDDED ITEMS, AND INTO CORNERS OF FORMS, ELIMINATING ALL AIR OR STONE POCCKETES WHICH MAY CAUSE HONEYCOMBING. CARE SHALL BE TAKEN NOT TO OVER VIBRATE AND CAUSE SEGREGATION.



CONTROL JOINT DETAIL @ 10' O.C.



EXPANSION JOINT DETAIL @ 50' APART

REMOVABLE STEEL GRATE NOTE:
FOR REMOVABLE GRATE, THE CONTRACTOR SHALL PROVIDE SUBMITTAL TO HCID #16 FOR DISTRICT SPECIFICATIONS AND APPROVAL.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED
PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

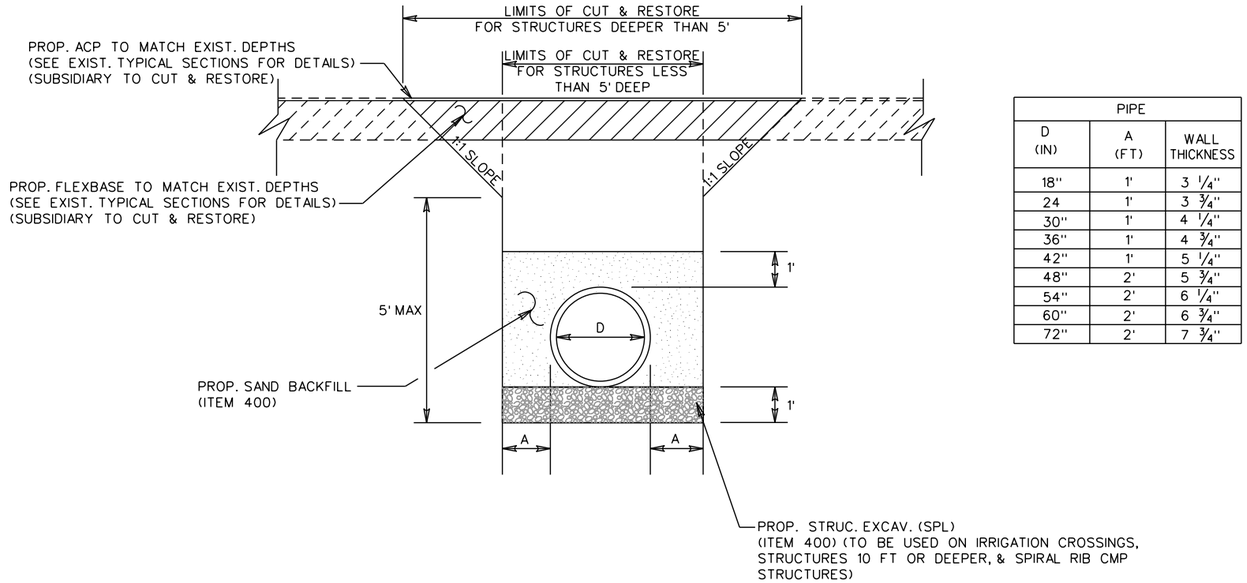
2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

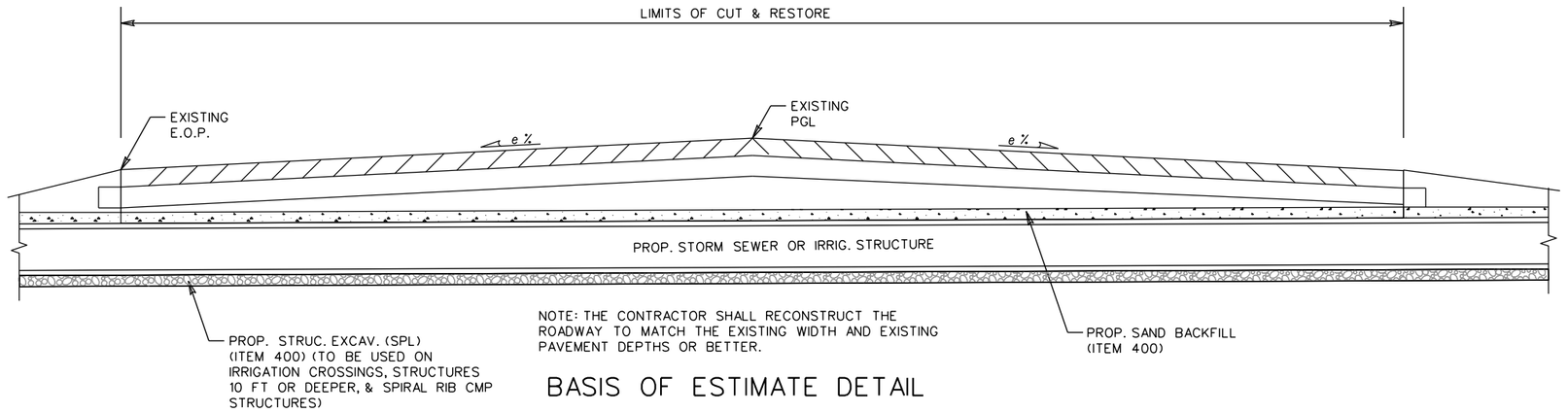
LIBERTY BLVD
MISC IRRIGATION
DETAILS

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					176D
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

12/8/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\06 Irrigation\Liberty_IRRIG MISC DETAILS.dgn



PIPE		
D (IN)	A (FT)	WALL THICKNESS
18"	1'	3 1/4"
24	1'	3 3/4"
30"	1'	4 1/4"
36"	1'	4 3/4"
42"	1'	5 1/4"
48"	2'	5 3/4"
54"	2'	6 1/4"
60"	2'	6 3/4"
72"	2'	7 3/4"



BASIS OF ESTIMATE DETAIL

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

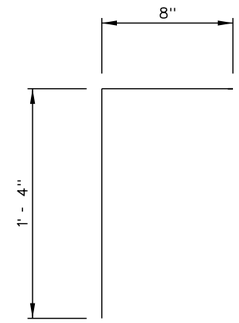
2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

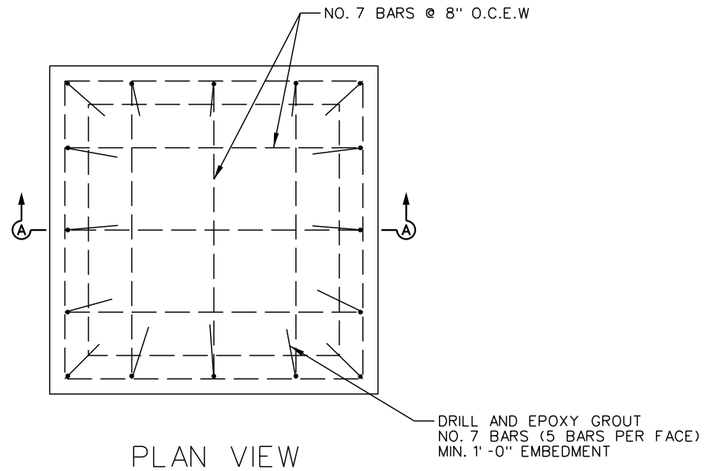
LIBERTY ROAD
CUT & RESTORE DETAILS

CONT	SECT	JOB	HIGHWAY
0921	02	194	LIBERTY
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		177A

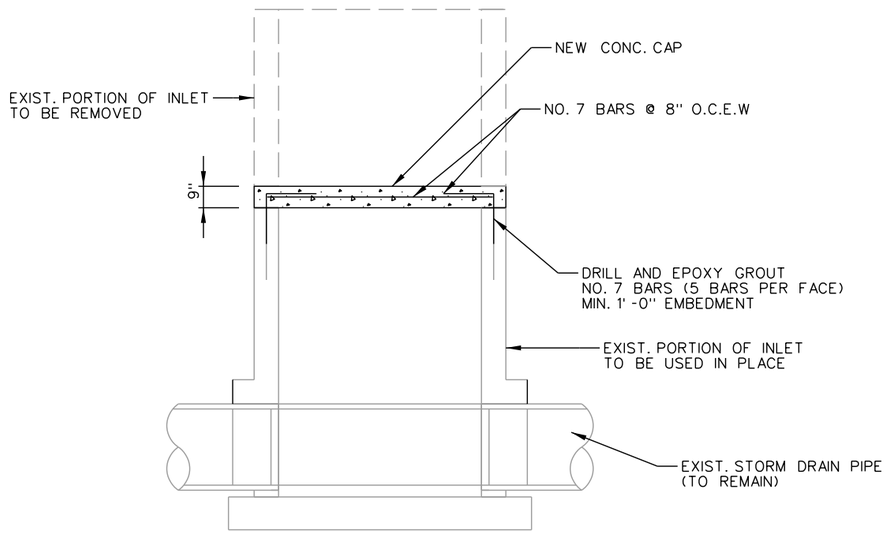
11/18/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3\10 STANDARDS\03 DRAINAGE\cmnstab-details.dgn



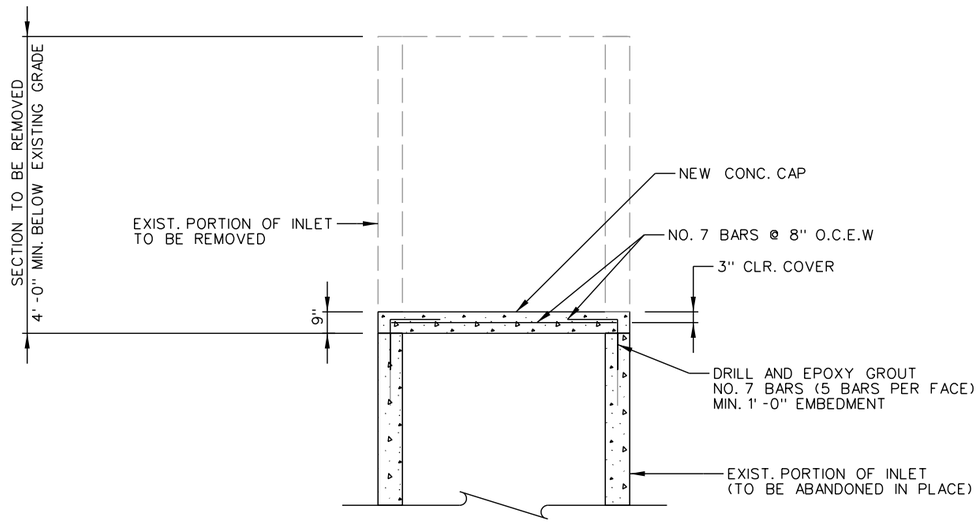
ANCHOR HOOK NO. 7



PLAN VIEW



SIDE VIEW
INLET (CAP)



SECTION A-A
INLET (CAP)

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED
PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO
TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

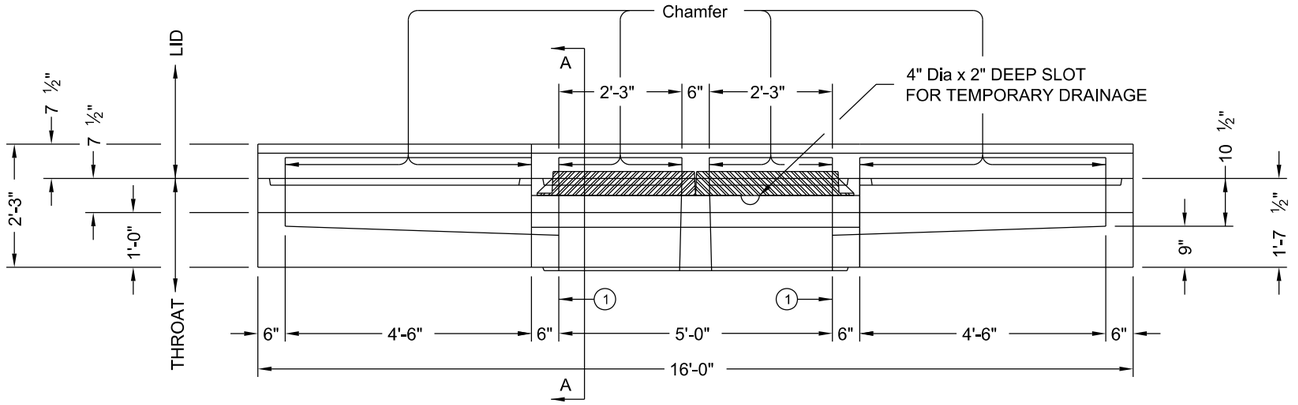
LIBERTY BLVD
INLET CAPPING
DETAILS

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					177B
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.		JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02		194	LIBERTY
TR:								
CK TR:								

11/19/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\05 DRAINAGE\Liberty_GATE WELL CAP DETAILS.dgn

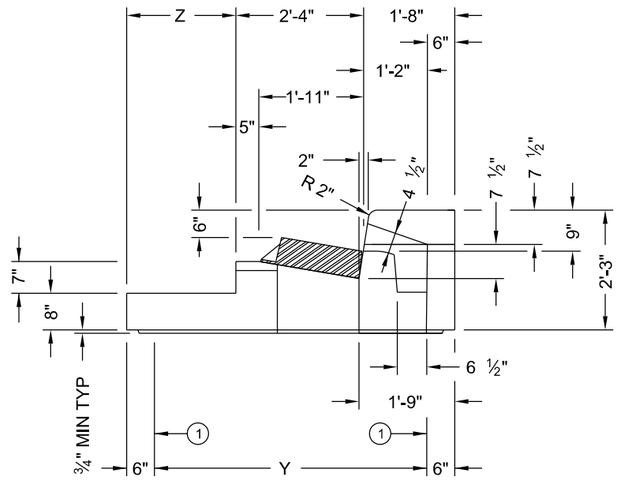
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

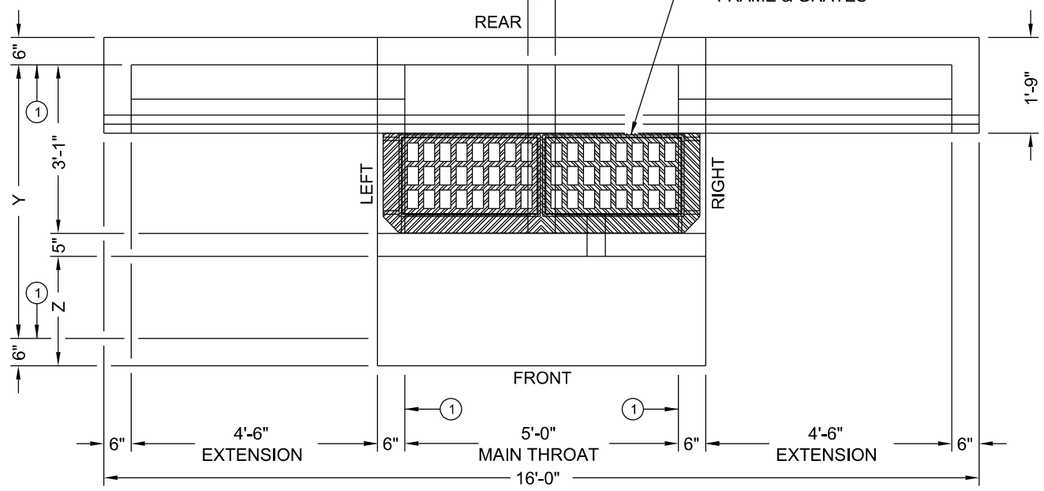


FRONT VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)



SECTION A-A



PLAN VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)

(1) Matches inside face of wall of precast base or riser below inlet.

HS20 LOADING SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

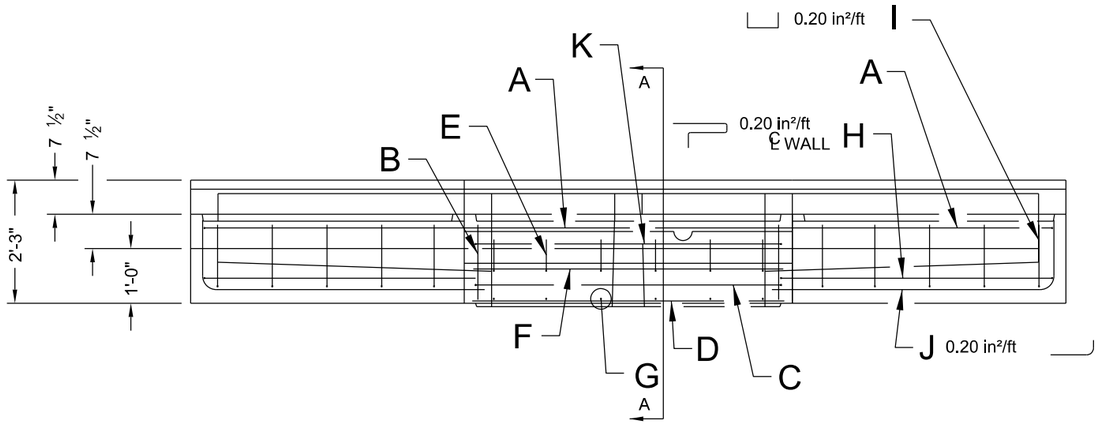
PRECAST CURB INLET UNDER ROADWAY

PCU

FILE: prestd04-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		178

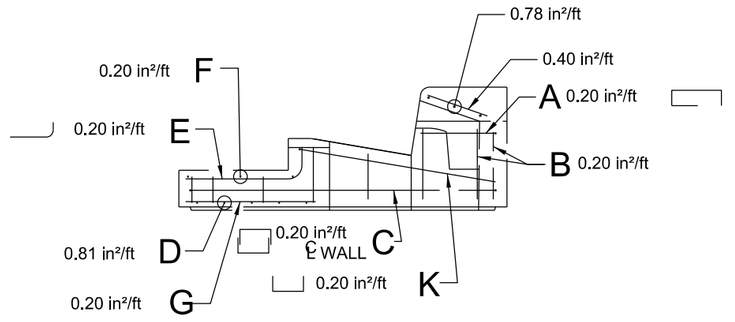
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

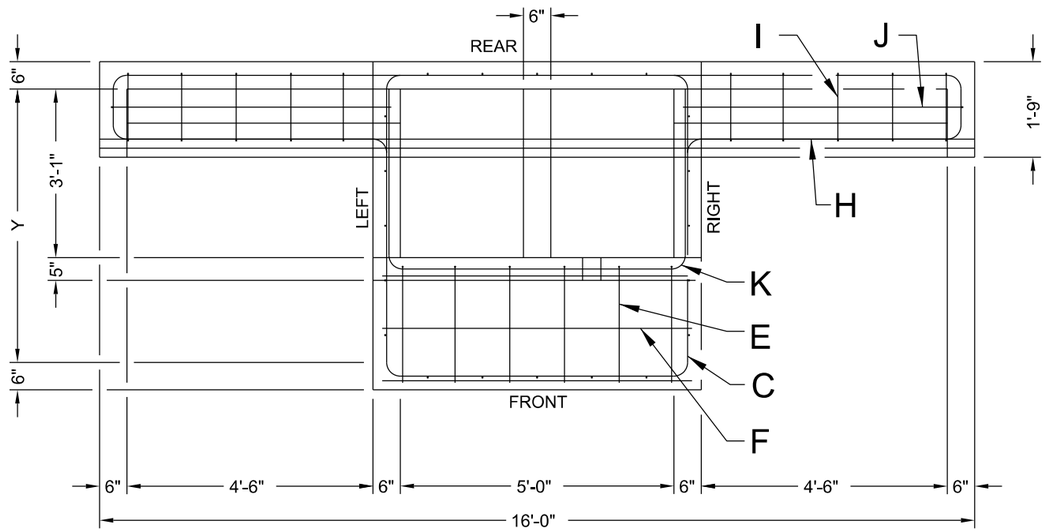


FRONT VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)



SECTION A-A



PLAN VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)

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 from surface of concrete or lower outside shoulder.
4. Extensions may be right, left, both or none. Provide extensions as specified elsewhere in plans.
5. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾". Top slab may employ a butt joint with dowels at the Contractor's option.
6. Provide lifting devices in conformance with Manufacturer's recommendations.
7. Chamfer vertical edges on inlet lid ¾" as shown in Front View, sheet 1.

INSTALLATION NOTES:

1. Inlet throat is placed under roadway and intended for direct traffic. Inlet lid is not for direct traffic. Do not place Inlet lid in roadway.
2. Seal tongue and groove joints and butt 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. Open area of main throat = 324 sq in. Open area of one extension throat = 324 sq in.
3. Payment for inlet is per Item 465, "Junction Boxes, Manholes and Inlets" by type, size and extension placement. Extensions are subsidiary to inlet.

SIZE (Y)	Z
3'	0'
4'	1'
5'	2'
6'	3'

HS20 LOADING SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

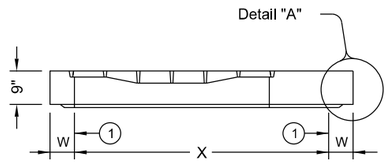
PRECAST CURB INLET UNDER ROADWAY

PCU

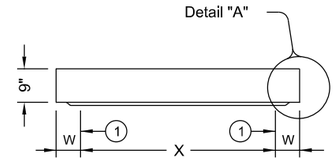
FILE: prestd04-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		179

DISCLAIMER:
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.

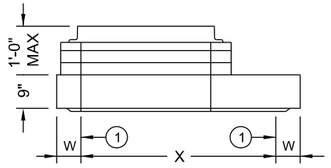
DATE:
FILE:



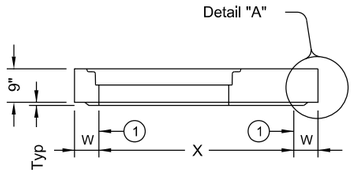
STYLE 'FG'



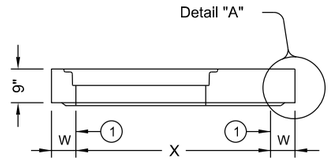
ELEVATION VIEW



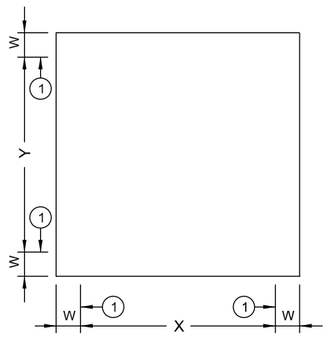
ELEVATION VIEW



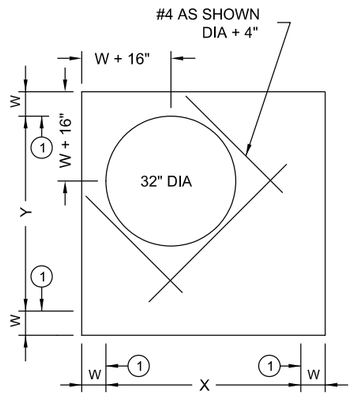
ELEVATION VIEW



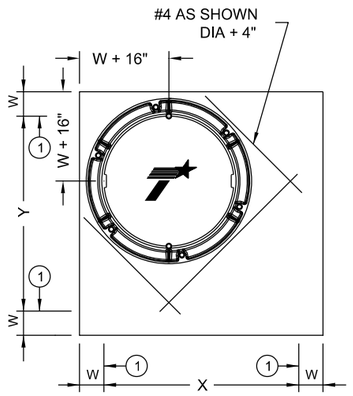
ELEVATION VIEW



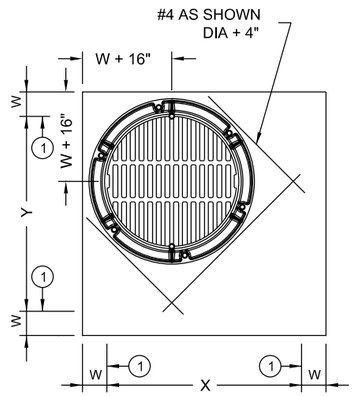
PLAN VIEW
NO OPENINGS
STYLE 'SL'



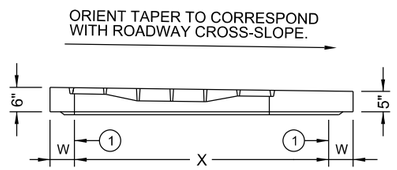
PLAN VIEW
SHIP LOOSE RING & COVER
STYLE 'RH'



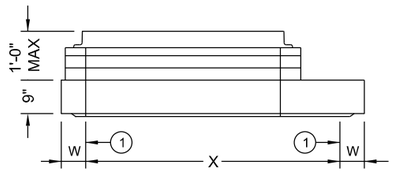
PLAN VIEW
32" DIA CAST-IN RING & COVER
STYLE 'RC'



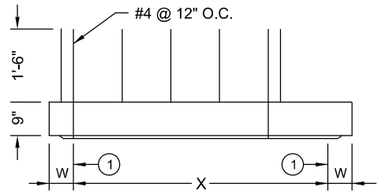
PLAN VIEW
32" DIA CAST-IN RING & GRATE
STYLE 'RG'



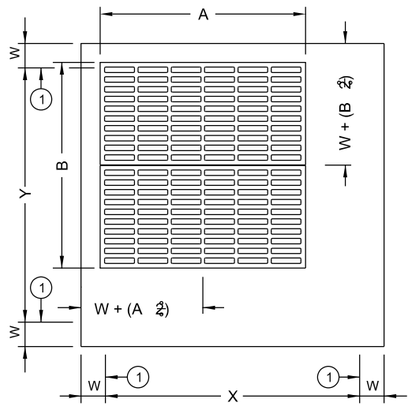
STYLE 'SFG'
ELEVATION VIEW



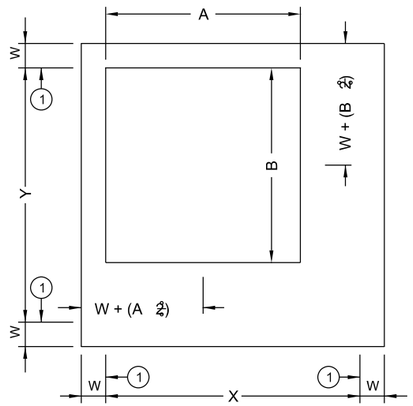
ELEVATION VIEW



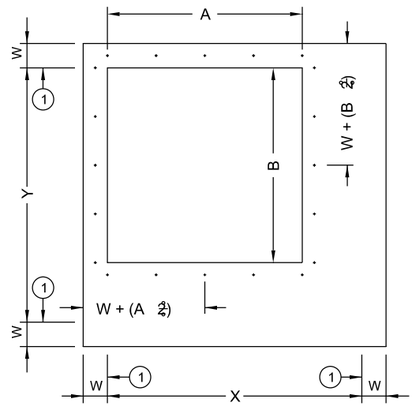
ELEVATION VIEW



PLAN VIEW
CAST-IN FRAME & GRATE
STYLES 'FG' & 'SFG'



PLAN VIEW
SHIP LOOSE FRAME & GRATE
STYLE 'SH'



PLAN VIEW
EXPOSED REBAR
STYLE 'S1'

(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	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		180

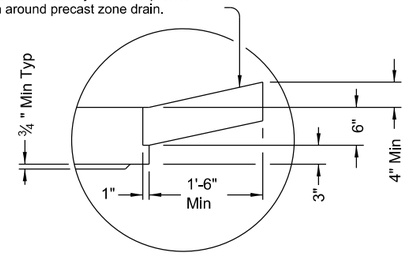
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

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 in□/ft	0.37 in□/ft
RH,RC,RG,SH,S1,FG	3'x3'	6"	3'x3' or 32" Dia	0.37 in□/ft	0.37 in□/ft
SFG	3'x3'	6"	3'x3'	0.32 in□/ft	0.32 in□/ft
SL	4'x4'	6"	n/a	0.34 in□/ft	0.34 in□/ft
RH,RC,RG,SH,S1,FG	4'x4'	6"	3'x3' or 32" Dia	0.41 in□/ft	0.41 in□/ft
SH,S1,FG	4'x4'	6"	4'x4'	0.41 in□/ft	0.41 in□/ft
SFG	4'x4'	6"	4'x4'	0.32 in□/ft	0.32 in□/ft
SL	3'x5'	6"	n/a	0.39 in□/ft	0.39 in□/ft
RH,RC,RG,SH,S1,FG	3'x5'	6"	3'x3' or 32" Dia	0.48 in□/ft	0.48 in□/ft
SH,S1,FG	3'x5'	6"	3'x5'	0.48 in□/ft	0.48 in□/ft
SFG	3'x5'	6"	3'x5'	0.32 in□/ft	0.32 in□/ft
SL	4'x5'	6"	n/a	0.42 in□/ft	0.42 in□/ft
RH,RC,RG,SH,S1,FG	4'x5'	6"	3'x3' or 32" Dia	0.42 in□/ft	0.42 in□/ft
SH,S1,FG	4'x5'	6"	4'x4'	0.63 in□/ft	0.63 in□/ft
SH,S1,FG	4'x5'	6"	3'x5'	0.66 in□/ft	0.66 in□/ft
SL	5'x5'	6"	n/a	0.36 in□/ft	0.36 in□/ft
RH,RC,RG,SH,S1,FG	5'x5'	6"	3'x3' or 32" Dia	0.43 in□/ft	0.43 in□/ft
SH,S1,FG	5'x5'	6"	4'x4'	0.63 in□/ft	0.63 in□/ft
SH,S1,FG	5'x5'	6"	3'x5'	0.63 in□/ft	0.63 in□/ft
SL	5'x6'	6"/8"	n/a	0.48 in□/ft	0.48 in□/ft
RH,RC,RG,SH,S1,FG	5'x6'	6"/8"	3'x3' or 32" Dia	0.48 in□/ft	0.48 in□/ft
SH,S1,FG	5'x6'	6"/8"	4'x4'	0.60 in□/ft	0.60 in□/ft
SH,S1,FG	5'x6'	6"/8"	3'x5'	0.60 in□/ft	0.60 in□/ft
SL	6'x6'	6"/8"	n/a	0.43 in□/ft	0.43 in□/ft
RH,RC,RG,SH,S1,FG	6'x6'	6"/8"	3'x3' or 32" Dia	0.56 in□/ft	0.56 in□/ft
SH,S1,FG	6'x6'	6"/8"	4'x4'	0.56 in□/ft	0.56 in□/ft
SH,S1,FG	6'x6'	6"/8"	3'x5'	0.59 in□/ft	0.59 in□/ft
SL	8'x8'	8"/10"	n/a	0.45 in□/ft	0.45 in□/ft
RH,RC,RG,SH,S1,FG	8'x8'	8"/10"	3'x3' or 32" Dia	0.45 in□/ft	0.45 in□/ft
SH,S1,FG	8'x8'	8"/10"	4'x4'	0.45 in□/ft	0.45 in□/ft
SH,S1,FG	8'x8'	8"/10"	3'x5'	0.45 in□/ft	0.45 in□/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.

Texas Department of Transportation

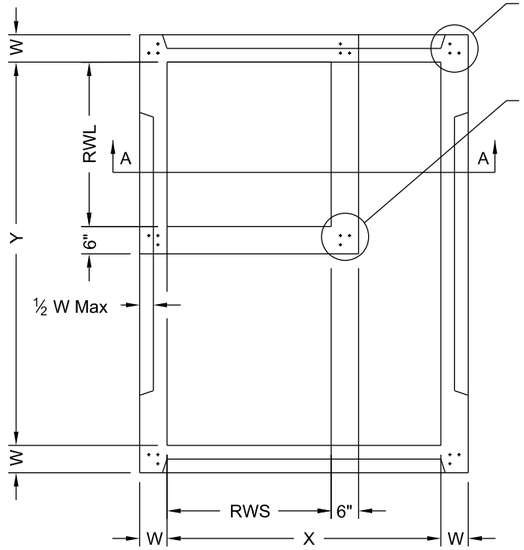
Bridge Division Standard

PRECAST SLAB LID

PSL

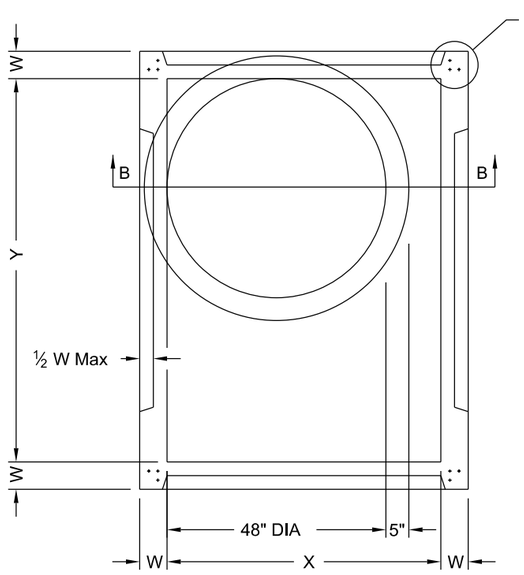
FILE: prestd05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		181

DISCLAIMER:
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.



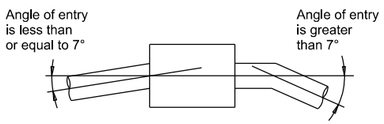
PLAN VIEW "A"

SQUARE REDUCED RISER OPTION



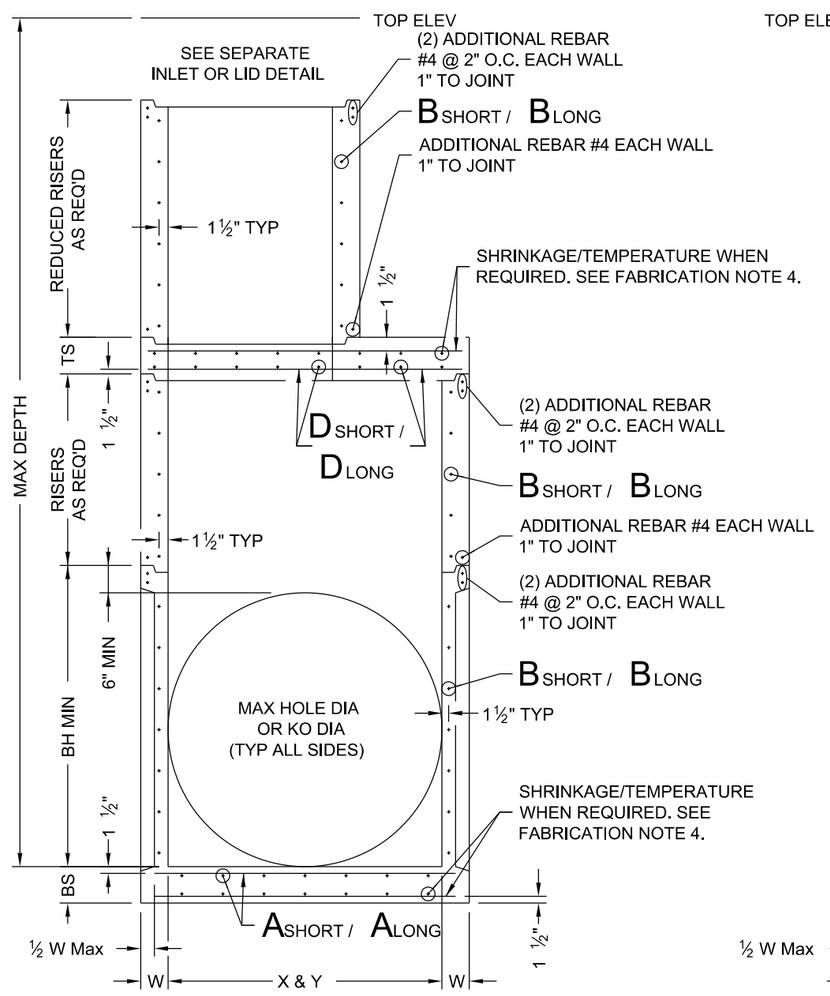
PLAN VIEW "B"

ROUND REDUCED RISER OPTION



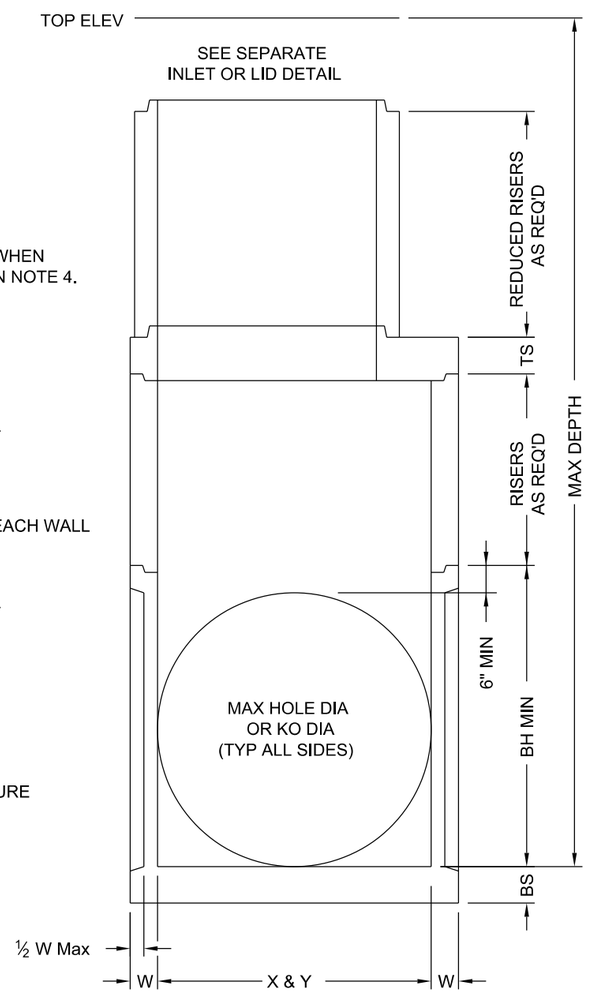
PIPE CONNECTION DETAIL

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 in²/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

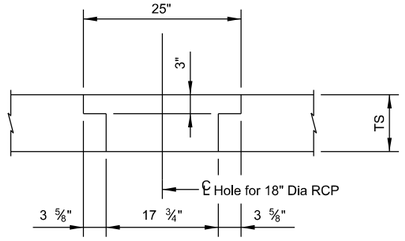
PB

FILE: prestd01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		182

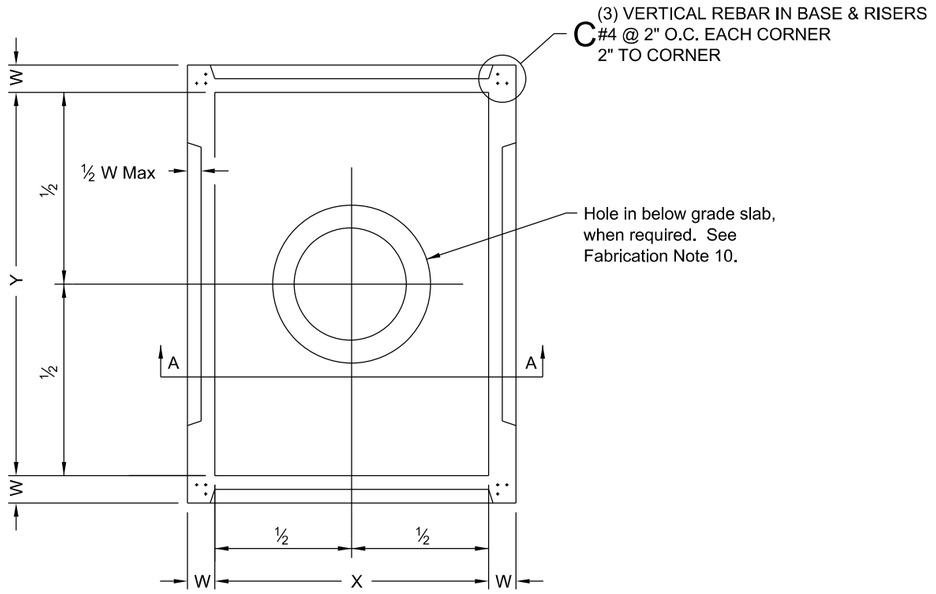
DATE:
FILE:

DISCLAIMER:
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.

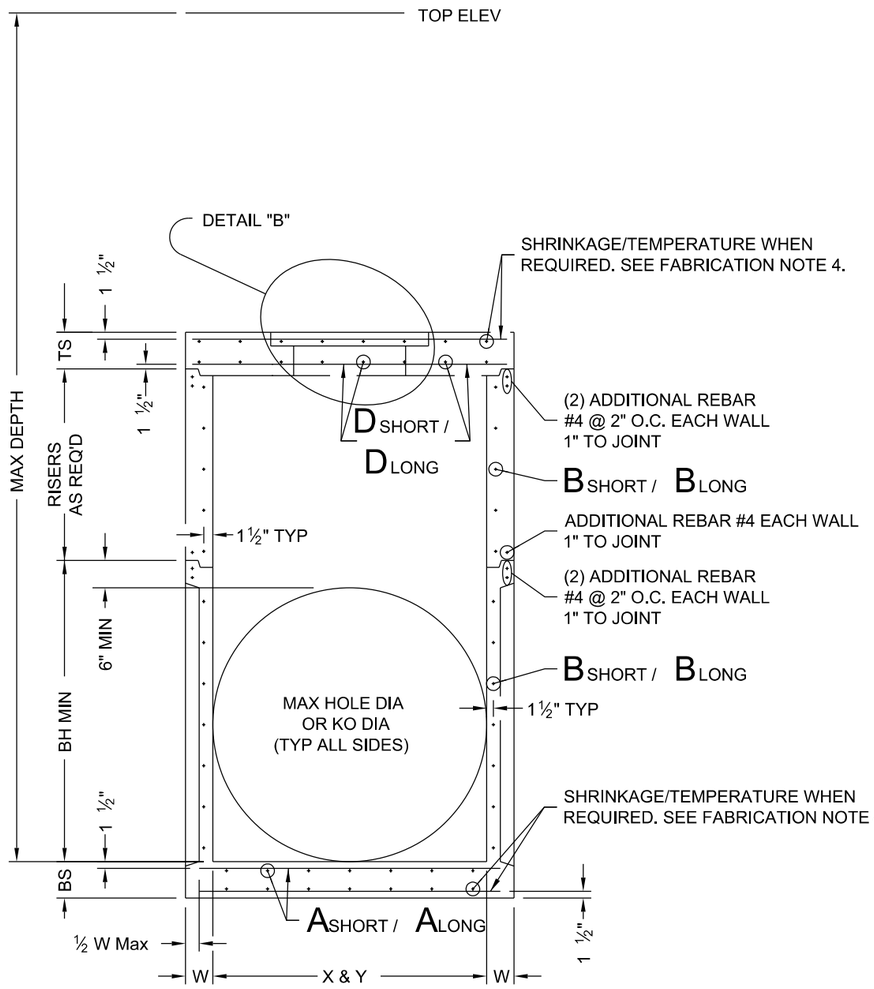
DATE:
FILE:



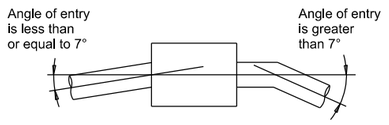
DETAIL "B"



PLAN VIEW



SECTION A-A



PIPE CONNECTION DETAIL

Connect pipes within 7° of normal to PJB wall.
If necessary, use pipe elbow or curved approach alignment to stay within this limit.

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 in²/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.
10. Provide hole in below grade slab only when PJB is installed with inlet type POD.

INSTALLATION NOTES:

1. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to junction box.
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 Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for junction box is per Item 465 "Junction Boxes, Manholes, and Inlets" by type and size.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRECAST JUNCTION BOX

PJB

FILE: prestd09-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT		
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY		
REVISIONS	0921	02	194	LIBERTY		
	DIST	COUNTY		SHEET NO.		
	PHR	HIDALGO		183		

	Size	MAX DEPTH = 15 ft. to top of BASE SLAB										MAX DEPTH = 25 ft. to top of BASE SLAB										Min Height (See Gen Note 3)	Max HOLE DIA (See Fab Note 2)	Max KO DIA (See Fab Note 2)
		Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)				Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)						
		Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness			
	X x Y	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	BH MIN	HOLE DIA	KO DIA
	ft.	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	ft. **	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	ft. **	in^2/ft	in^2/ft	in.	ft.	in.	in.
Precast Junction Box (PJB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	0.37	0.37	9	0.29	0.29	6	0.24	0.24	6	N/A	0.37	0.37	9	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	0.41	0.41	9	0.47	0.47	6	0.38	0.38	6	N/A	0.41	0.41	9	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	N/A	0.48	0.48	9	0.39	0.18	6	0.23	0.59	6	N/A	0.48	0.48	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	N/A	0.42	0.42	9	0.53	0.26	6	0.39	0.59	6	N/A	0.42	0.42	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	N/A	0.43	0.43	9	0.62	0.62	6	0.59	0.59	6	N/A	0.43	0.43	9	5.5	60	60
	5x6	0.27	0.27	9	0.34	0.45	6	N/A	0.48	0.48	9	0.47	0.45	9	0.38	0.54	8	N/A	0.48	0.48	9	5.5	60/72	60/72
	6x6	0.27	0.27	9	0.45	0.45	6	N/A	0.56	0.56	9	0.52	0.52	9	0.54	0.54	8	N/A	0.56	0.56	9	6.5	72	72
	8x8	0.46	0.46	9	0.51	0.51	8	N/A	0.45	0.45	12	0.87	0.87	9	0.59	0.59	10	N/A	0.45	0.45	12	8.5	96	72
Precast Base (PB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	N/A	N/A	N/A	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	0.47	0.47	6	0.38	0.38	6	N/A	N/A	N/A	N/A	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	3x3	0.30	0.34	9	0.39	0.18	6	0.23	0.59	6	3x3	0.40	0.40	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x3	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	3x3	0.46	0.37	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	4x4	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	4x4	0.39	0.39	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	48"	0.39	0.39	9	0.53	0.26	6	0.39	0.59	6	48"	0.47	0.47	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x5	0.33	0.40	9	0.53	0.26	6	0.39	0.59	6	3x5	0.48	0.48	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	3x3	0.34	0.34	9	0.62	0.62	6	0.59	0.59	6	3x3	0.53	0.53	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	4x4	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	4x4	0.64	0.64	9	5.5	60	60
	5x5	0.38	0.38	6	0.34	0.34	6	48"	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	48"	0.64	0.64	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	3x5	0.34	0.40	9	0.62	0.62	6	0.59	0.59	6	3x5	0.53	0.53	9	5.5	60	60
	5x6	0.31	0.31	9	0.34	0.45	6	3x3	0.34	0.34	9	0.47	0.45	9	0.38	0.54	8	3x3	0.61	0.50	9	5.5	60/72	60/72
	5x6	0.27	0.27	9	0.34	0.45	6	4x4	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	4x4	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	48"	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	48"	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	3x5	0.45	0.45	9	0.47	0.45	9	0.38	0.54	8	3x5	0.61	0.61	9	5.5	60/72	60/72
	6x6	0.29	0.29	9	0.45	0.45	6	3x3	0.41	0.41	9	0.52	0.52	9	0.54	0.54	8	3x3	0.74	0.74	9	6.5	72	72
	6x6	0.27	0.27	9	0.45	0.45	6	4x4	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	4x4	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	48"	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	48"	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	3x5	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	3x5	0.87	0.87	9	6.5	72	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x3	0.61	0.61	12	0.91	0.91	9	0.70	0.70	10	3x3	0.85	0.85	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	4x4	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	4x4	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	48"	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	48"	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x5	0.70	0.85	12	0.87	0.87	9	0.70	0.70	10	3x5	1.01	1.01	12	8.5	96	72

** Unless otherwise indicated.

FABRICATION NOTES:
1. Maximum spacing of reinforcement is 8".
2. At manufacturer's option, provide cast or cored holes or thin wall panels (KO) to the maximum diameter shown for each. When no penetration is required, it is acceptable to provide a wall with no sectional reduction.

GENERAL NOTES:
1. Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PJB for details.
2. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PB for details.
3. Min Height shown is for stock base units. Use stock base units whenever practical. Smaller height base units can be used in special installation circumstances, when noted elsewhere in the plans. Absolute minimum height of base units is 2'-6".

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

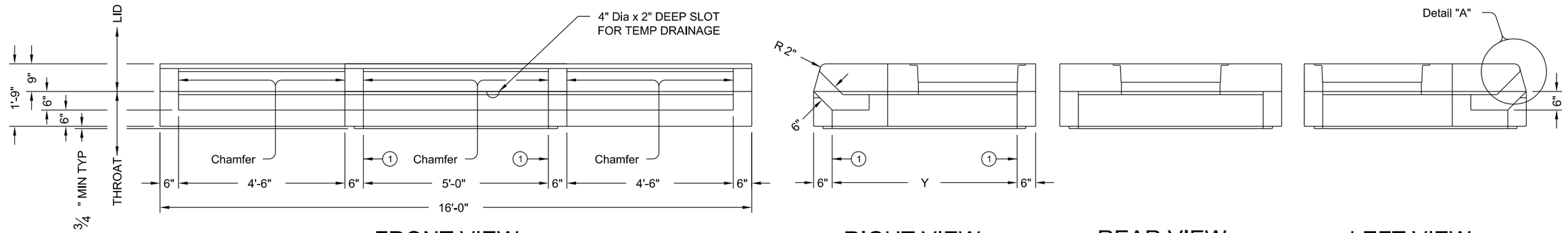
DESIGN DATA FOR PRECAST BASE AND JUNCTION BOX

PDD

FILE: prestd10-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		184

DISCLAIMER:
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:
FILE:



FRONT VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)

RIGHT VIEW

REAR VIEW

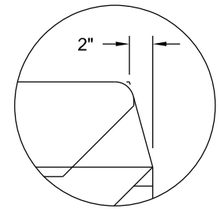
(EXTENSIONS NOT SHOWN)

LEFT VIEW

(1) Matches inside face of wall of precast base or riser below inlet.

PLAN VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)



DETAIL "A"

DISCLAIMER:
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:
FILE:

HS20 LOADING SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

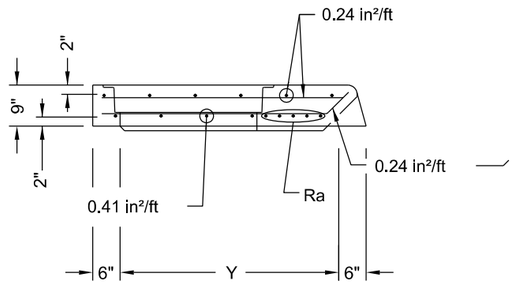
PRECAST CURB INLET OUTSIDE ROADWAY

PCO

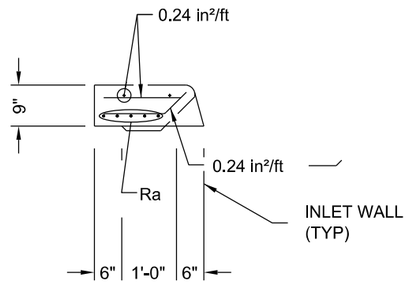
FILE: prestd03-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		185

DISCLAIMER:
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.

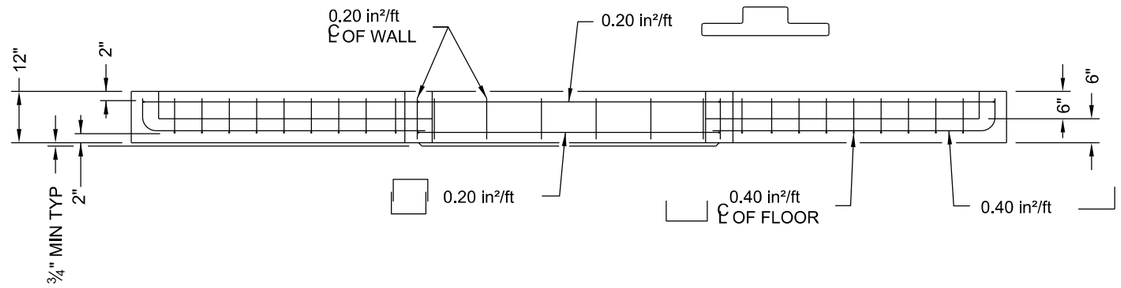
DATE:
FILE:



LID SECTION A-A

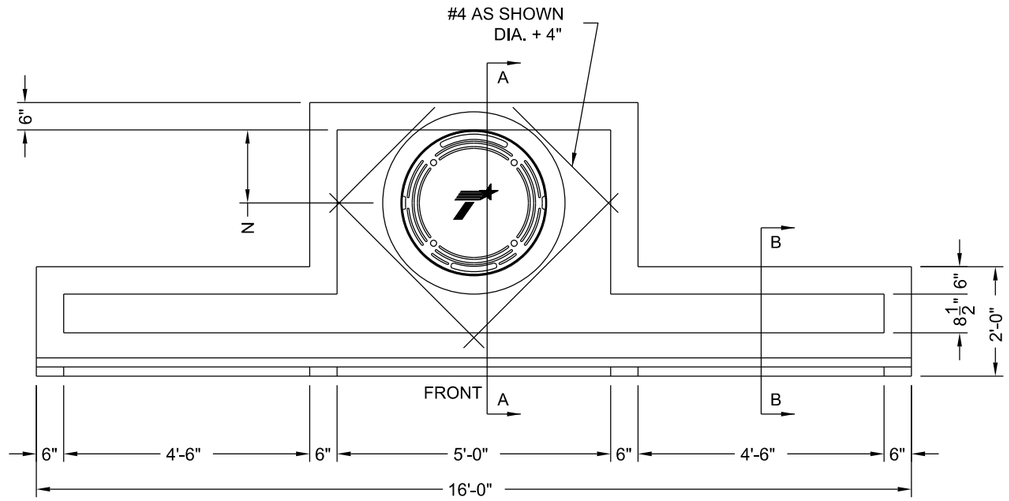


LID SECTION B-B



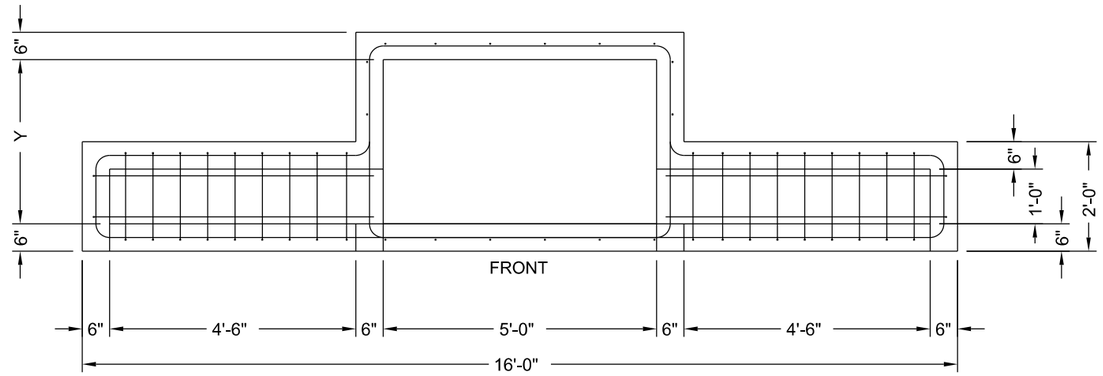
THROAT ELEVATION VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)



LID PLAN VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)



THROAT PLAN VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)

SIZE (Y)	N	MH DIA *	Ra
3'	9"	18"	(4) #5 Additional
4'	16"	32"	(4) #5 Additional
5'	16"	32"	(4) #5 Additional
6'	16"	32"	(4) #5 Additional

* Nominal ring and cover size.

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. Extensions may be right, left, both or none. Provide extensions as specified elsewhere in the plans.
4. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾". Lid may employ a butt joint with dowels at the Contractor's option.
5. Provide lifting devices in conformance with Manufacturer's recommendations.
6. Provide cast iron solid cover, unless noted otherwise elsewhere in the plans.
7. Chamfer vertical edges of inlet lid ¾" as shown in Front View, sheet 1.

INSTALLATION NOTES:

1. Inlet throat and lid are not intended for direct traffic. Do not place in roadway.
2. Seal tongue and groove joints and butt 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. Open area of main throat = 360 sq in. Open area of one extension throat = 324 sq in.
3. Payment for inlet is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, size, and extension placement. Extensions are subsidiary to inlet.

Cover dimensions are clear dimensions, unless noted otherwise.

HS20 LOADING SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

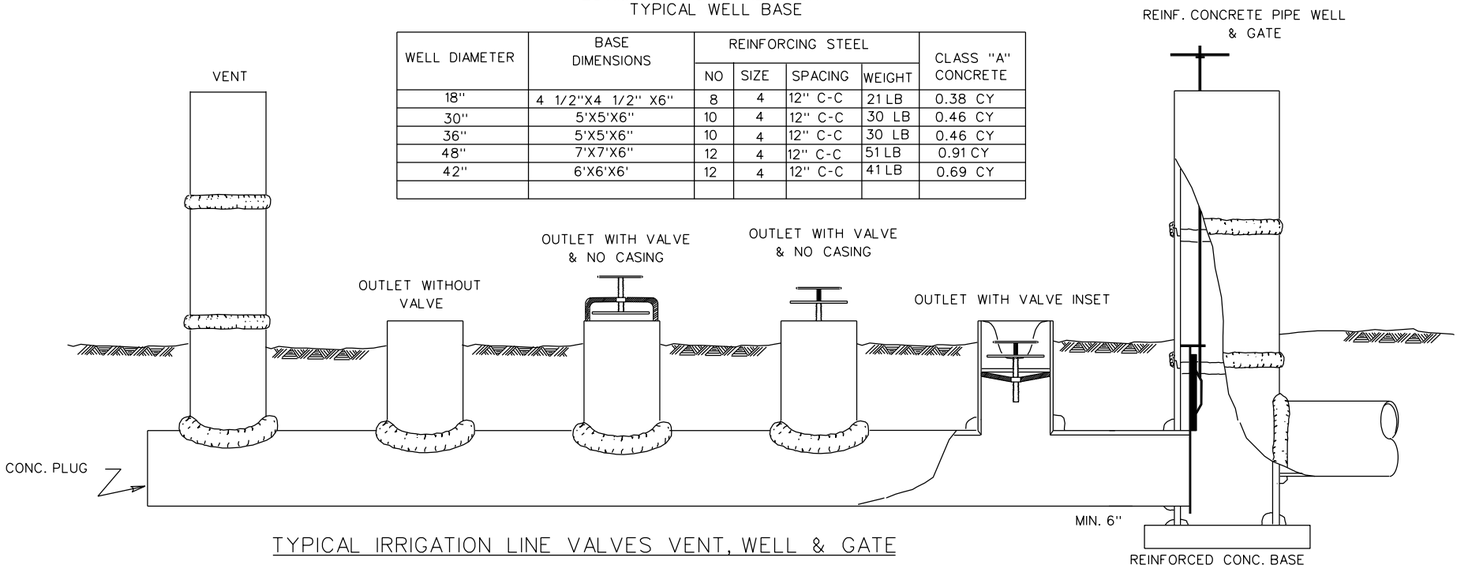
PRECAST CURB INLET OUTSIDE ROADWAY

PCO

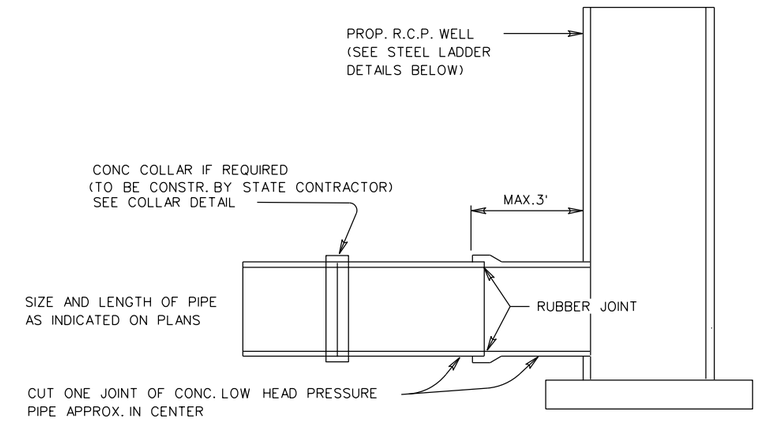
FILE: prestd03-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		186

ESTIMATED QUANTITIES FOR TYPICAL WELL BASE

WELL DIAMETER	BASE DIMENSIONS	REINFORCING STEEL				CLASS "A" CONCRETE
		NO	SIZE	SPACING	WEIGHT	
18"	4 1/2"X4 1/2" X6"	8	4	12" C-C	21 LB	0.38 CY
30"	5'X5'X6"	10	4	12" C-C	30 LB	0.46 CY
36"	5'X5'X6"	10	4	12" C-C	30 LB	0.46 CY
48"	7'X7'X6"	12	4	12" C-C	51 LB	0.91 CY
42"	6'X6'X6'	12	4	12" C-C	41 LB	0.69 CY



TYPICAL IRRIGATION LINE VALVES VENT, WELL & GATE



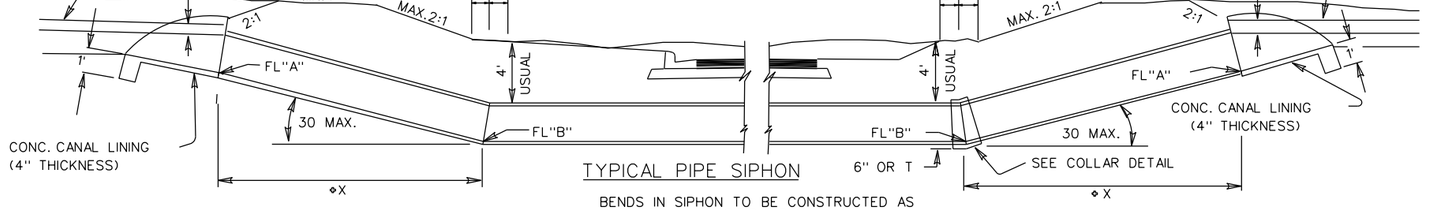
TYPICAL CONC. PIPE WELL DETAILS FOR CONNECTING CONC. LOW HEAD PRESSURE PIPE

GENERAL NOTES

HEIGHT OF RELOCATED WELLS AND VENTS TO BE EQUIVALENT TO THAT OF EXISTING STRUCTURES OR AS REQUIREDFOR PROPER OPERATION.

CONCRETE REQUIRED FOR BASE, PLUGS, OR CAPS WILL NOT BE PAID FOR DIRECTLY BUT SHALL BE CONSIDERED AS SUB-SIDIARY TO THE VARIOUS BID ITEMS OF THIS CONTRACT.

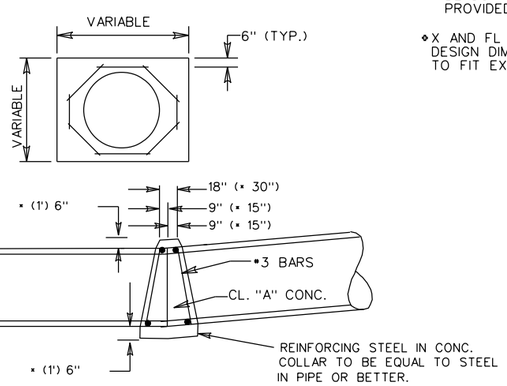
IN GENERAL THE PARTICULAR TYPE OR DESIGN OF THE EXISTING FACILITY TO BE EXTENDED OR RELOCATED SHALL BE DUPLICATED.



TYPICAL PIPE SIPHON

BENDS IN SIPHON TO BE CONSTRUCTED AS PROVIDED IN SPECIFICATIONS

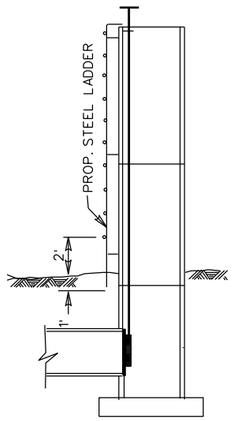
* X AND FL "A" AS SHOWN ON PLANS ARE NOMINAL DESIGN DIMENSIONS AND MAY BE VARIED IN FIELD TO FIT EXISTING CONDITIONS.



DETAIL FOR CONC. COLLARS DRAINAGE STRUCTURES AND PIPE SIPHONS (HORIZ. & VERT. BENDS)

NOTE: PROP. CONC. COLLAR WILL NOT BE PAID FOR DIRECTLY BUT WILL BE SUBSIDIARY TO THE BIDS ITEMS INVOLVED.

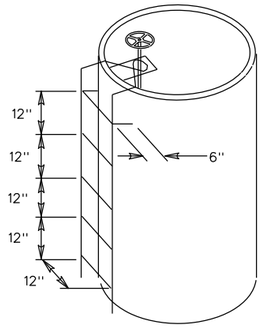
* FOR 42" AND LARGER PIPE



LADDER TO BE CONSTRUCTED OF ¾" DIA. REINF. STEEL. THE PARALLEL SIDEPIECES SPACED 12" APART TO BE HOOKED OVER TOP OF WELL AND STAND-OFFS WELDED AT TOP RUNG, AT THEIR MID-POINT AND BOTTOM. RUNGS TO BE WELDED TO SIDEPIECES AT 12" INTERVALS THE FIRST RUNG TO BE 2' FROM NATURAL GROUND.

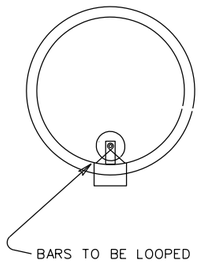
STEEL LADDER TO BE PAID FOR AS SUBSIDIARY TO PRICE OF WELL.

NOTE: COMMERCIAL FABRICATED OR CAST METAL STEPS MAY BE USED IF APPROVED BY THE ENGINEER AND/OR THE WATER DISTRICT INVOLVED.



STEEL LADDER DETAILS

TO BE USED ON ALL WELLS WITH GATES WHEN THE DISTANCE FROM NATURAL GROUND TO TOP OF WELL IS 6 FT. OR MORE.



© TxDOT 2015

PHARR DISTRICT STANDARD

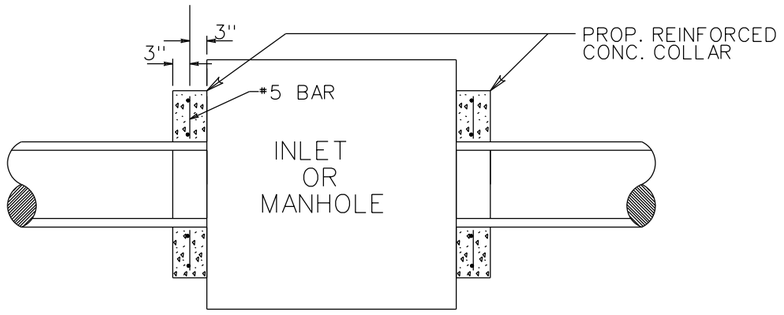
TEXAS DEPARTMENT OF TRANSPORTATION

IRRIGATION CROSSING DETAIL

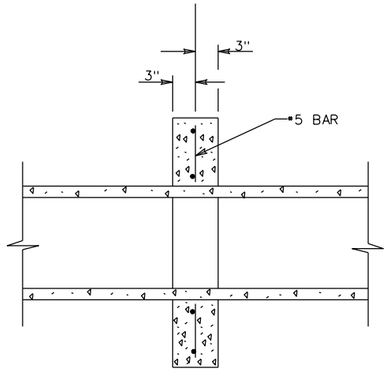
REV. 4/15

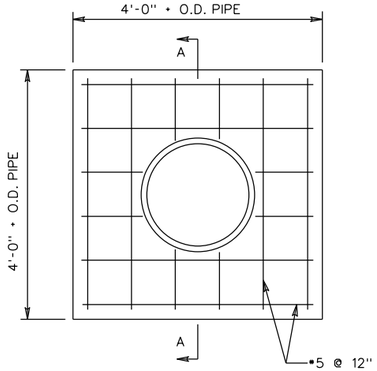
IRRIG1.DGN

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		FILE NO.			SHEET NO.
6						187
STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	21	HIDALGO	0921	02	194	LIBERTY



INLET OR MANHOLE CONNECTION
PLAN VIEW

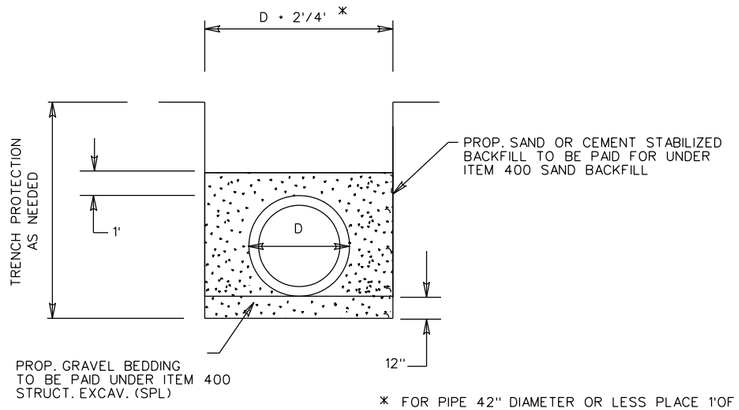




SECTION A-A

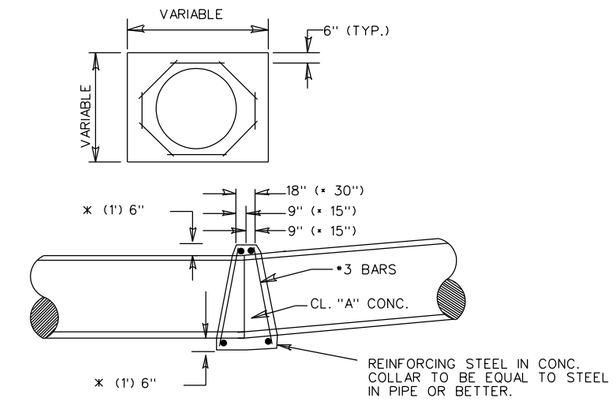
FRONT ELEVATION

CONCRETE PIPE COLLAR



* FOR PIPE 42" DIAMETER OR LESS PLACE 1'OF FILL
ON EACH SIDE OF THE PIPE.
FOR PIPE LARGER THAN 42" DIAMETER PLACE 2' OF FILL
ON EACH SIDE OF THE PIPE.

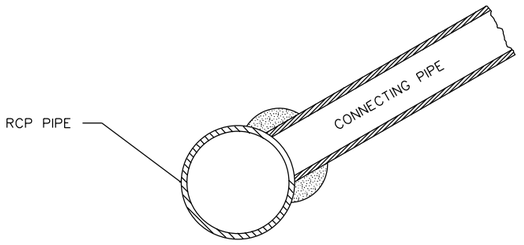
SPIRAL RIB CMP
TYPICAL BACKFILL DETAIL
GRAVEL & SAND

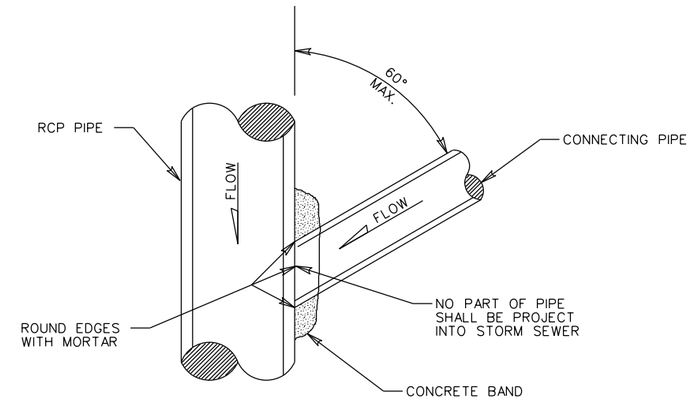


DETAIL FOR CONC. COLLARS
DRAINAGE STRUCTURES AND PIPE
SIPHONS (HORIZ. & VERT. BENDS)

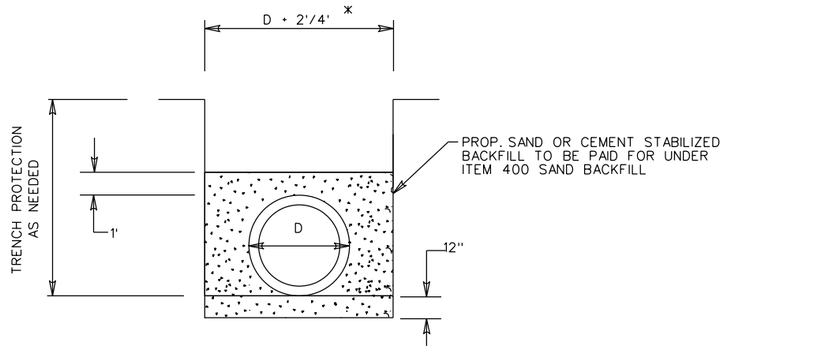
NOTE: PROP. CONC. COLLAR WILL NOT BE PAID
FOR DIRECTLY BUT WILL BE SUBSIDIARY
TO THE BIDS ITEMS INVOLVED.

* FOR 42" DIAMETER AND LARGER PIPE





TYPICAL REINFORCED CONC. PIPE
CONNECTION WITHOUT MANHOLE



* FOR PIPE 42" DIAMETER OR LESS PLACE 1'OF FILL
ON EACH SIDE OF THE PIPE.
FOR PIPE LARGER THAN 42" DIAMETER PLACE 2' OF FILL
ON EACH SIDE OF THE PIPE.

REINFORCED CONCRETE PIPE
TYPICAL BACKFILL DETAIL-GRAVEL & SAND

© TxDOT 2019

PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

MISCELLANEOUS
PIPE STANDARD

REV. 2/19

MISC.PIPE.DGN

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		FILE NO.			SHEET NO.
6						188
STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	21	HIDALGO	0921	02	194	LIBERTY

FILE: P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\10 STANDARDS\03 DRAINAGE\MISC. PIPE.dgn
DATE: 8/4/2020 6:24:04 PM

LIBERTY BLVD TRAFFIC SIGNAL QUANTITIES

ITEM	DESCR CODE	DESCRIPTION	UNIT	US 83	DIAMOND AVE	LA JOYA BYPASS	MILE 3 ROAD	TOTALS
*0416	6030	DRILL SHAFT (TRF SIG POLE) (24 IN)	LF	45.6	28.5	68.4	28.5	171
0416	6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	15.2	60.8	30.4	60.8	167.2
0416	6034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF	0	0	87.6	0	87.6
0618	6016	CONDT (PVC) (SCHD 40) (1")	LF	135	170	0	150	455
0618	6023	CONDT (PVC) (SCHD 40) (2")	LF	1660	1215	370	1740	4985
0618	6047	CONDT (PVC) (SCHD 80) (2") BORE	LF	110	100	65	120	395
0618	6033	CONDT (PVC) (SCHD 40) (4")	LF	195	105	570	150	1020
0618	6059	CONDT (PVC) (SCHD 80) (4")(BORE)	LF	155	90	200	225	670
0620	6007	ELEC CONDR (NO. 8) BARE	LF	590	500	940	530	2560
0620	6009	ELEC CONDR (NO. 6) BARE	LF	40	55	280	60	435
0620	6010	ELEC CONDR (NO. 6) INSULATED	LF	80	110	560	120	870
0621	6005	TRAY CABLE (4 CONDR) (12 AWG)	LF	385	405	1700	425	2915
0624	6002	GROUND BOX TY A (122311) W/APRON	EA	20	15	11	16	62
0624	6008	GROUND BOX TY C (162911) W/APRON	EA	2	1	1	4	8
625	6003	ZINC - COAT STL WIRE STRAND (3/8 IN)	LF	599	2243	0	2731	5573
0628	6125	ELC SRV TY D 120/240 060 (NS)GS(L)TS(O)	EA	0	1	1	1	3
*0636		ALUMINIUM SIGNS (TYPE A) (STREET NAME)	SF	54	70	113	62	299
*0636		ALUMINIUM SIGNS (TYPE A) (REGULATORY)	SF	15	42	0	42	99
0680	6002	INSTALL HWY TRF SIG (ISOLATED)**	EA	1	1	1	1	4
0680	6004	REMOVING TRAFFIC SIGNALS	EA	1	0	0	0	1
0681	6001	TEMP TRAF SIGNALS	EA	1	0	0	0	1
6292	6001	RADAR VEHICLE SENSING DEVICE	EA	0	0	12	0	12
0682	6001	VEH SIG SEC (12 IN) LED (GRN)	EA	10	8	16	8	42
0682	6002	VEH SIG SEC (12 IN) LED (GRN ARW)	EA	6	6	2	6	20
0682	6003	VEH SIG SEC (12 IN) LED (YEL)	EA	10	8	18	8	44
0682	6004	VEH SIG SEC (12 IN) LED (YEL ARW)	EA	6	10	2	10	28
0682	6005	VEH SIG SEC (12 IN) LED (RED)	EA	10	8	20	8	46
0682	6006	VEH SIG SEC (12 IN) LED (RED ARROW)	EA	6	6	4	6	22
0682	6018	PED SIG SEC (12 IN) LED (COUNTDOWN)	EA	8	8	12	8	36
0682	6060	BACK PLATE (12 IN) (3 SEC) W/REFL BRDR	EA	16	10	16	10	52
0682	6049	BACK PLATE (12 IN) (4 SEC) W/REFL BRDR	EA	0	4	2	4	10
0684	6010	TRF SIG CBL (TY A) (12 AWG) (5 CONDR)	LF	4000	2655	4315	2660	13630
0684	6012	TRF SIG CBL (TY A) (12 AWG) (7 CONDR)	LF	905	940	590	1200	3635
*0684	6027	TRF SIG CBL (TY A)(14 AWG)(1 CONDR)	LF	270	340	0	300	910
0684	6080	TRF SIG CBL (TY C) (14 AWG) (2 CONDR)	LF	4945	2645	0	3600	11190
0686	6019	INS TRF SIG PL AM(S) STR (TY D)	EA	0	2	0	2	4
0686	6020	INS TRF SIG PL AM(S) STR (TY D) LUM	EA	1	2	0	2	5
0686	6045	INS TRF SIG PL AM(S)1 ARM(44')	EA	0	0	2	0	2
0686	6055	INS TRF SIG PL AM(S)1 ARM(50')LUM	EA	0	0	3	0	3
0686	6059	INS TRF SIG PL AM(S)1 ARM(55')LUM	EA	0	0	1	0	1
0687	6001	PED POLE ASSEMBLY	EA	8	5	12	5	30
0688	6001	ACCESSIBLE PEDESTRIAN SIGNAL UNITS	EA	8	8	12	8	36
0688	6004	VEH LP DETECT (SAWCUT)	LF	2210	1938	0	2560	6708
*		CONTROLLER, FULL ACTUATED	EA	0	1	1	1	3
*		CONTROLLER FOUNDATION	EA	0	1	1	1	3
*		CONTROLLER CABINET	EA	0	1	1	1	3
*		LOOP AMPLIFIER (1 CHANNEL)	EA	12	10	0	12	34

* QUANTITIES ARE SHOWN FOR CONTRACTOR'S INFORMATION ONLY. THESE ITEMS ARE SUBSIDIARY TO VARIOUS OTHER ITEMS.

** FURNISH AND INSTALL TRAFFIC SIGNAL CONTROLLER EQUIPMENT COMPATIBLE WITH EXISTING TRAFFIC MANAGEMENT SOFTWARE ATMS NOW

THE COUNTY OF HIDALGO TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

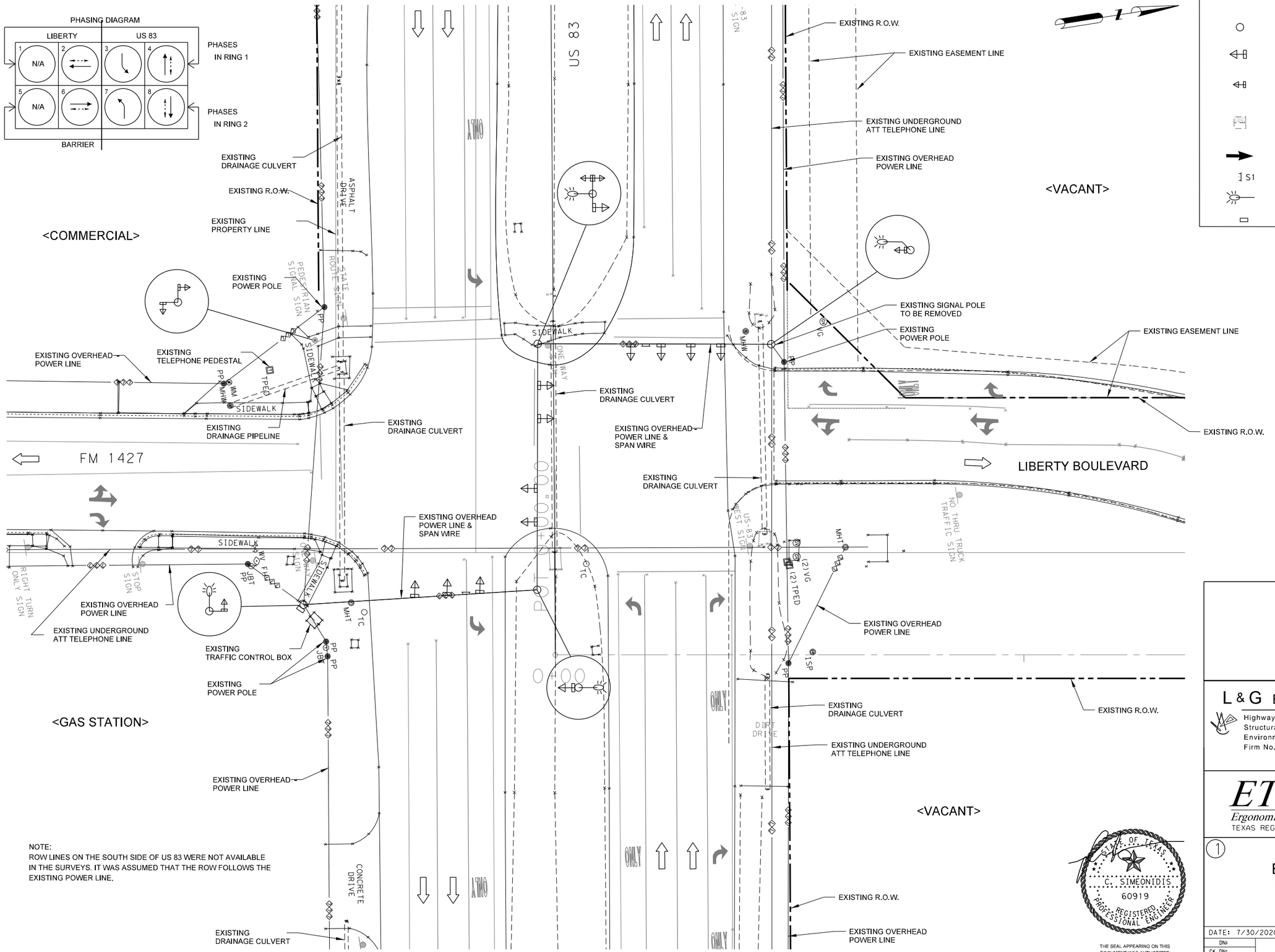
900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

LIBERTY BLVD
PROPOSED
TRAFFIC SIGNALS
BASIS OF ESTIMATE

DATE: 12/1/2021	CONT	SECT	JOB	HIGHWAY
DN:	0921	02	194	LIBERTY RD
CK DN:	DIST	COUNTY		SHEET NO.
DW:	PHR	HIDALGO		189
CK DW:				

12/1/2021 N:\CLIENTS\L&G\LIBERTY+US83+SIGNALS\ETSI+WORK\Liberty Blvd BASIS OF ESTIMATE.dgn



NOTE:
ROW LINES ON THE SOUTH SIDE OF US 83 WERE NOT AVAILABLE IN THE SURVEYS. IT WAS ASSUMED THAT THE ROW FOLLOWS THE EXISTING POWER LINE.

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS, P.E. 60919
7/30/2020

STATE OF TEXAS · C. SIMEONIDIS · 60919 · REGISTERED PROFESSIONAL ENGINEER

COUNTY OF HIDALGO · THE · TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

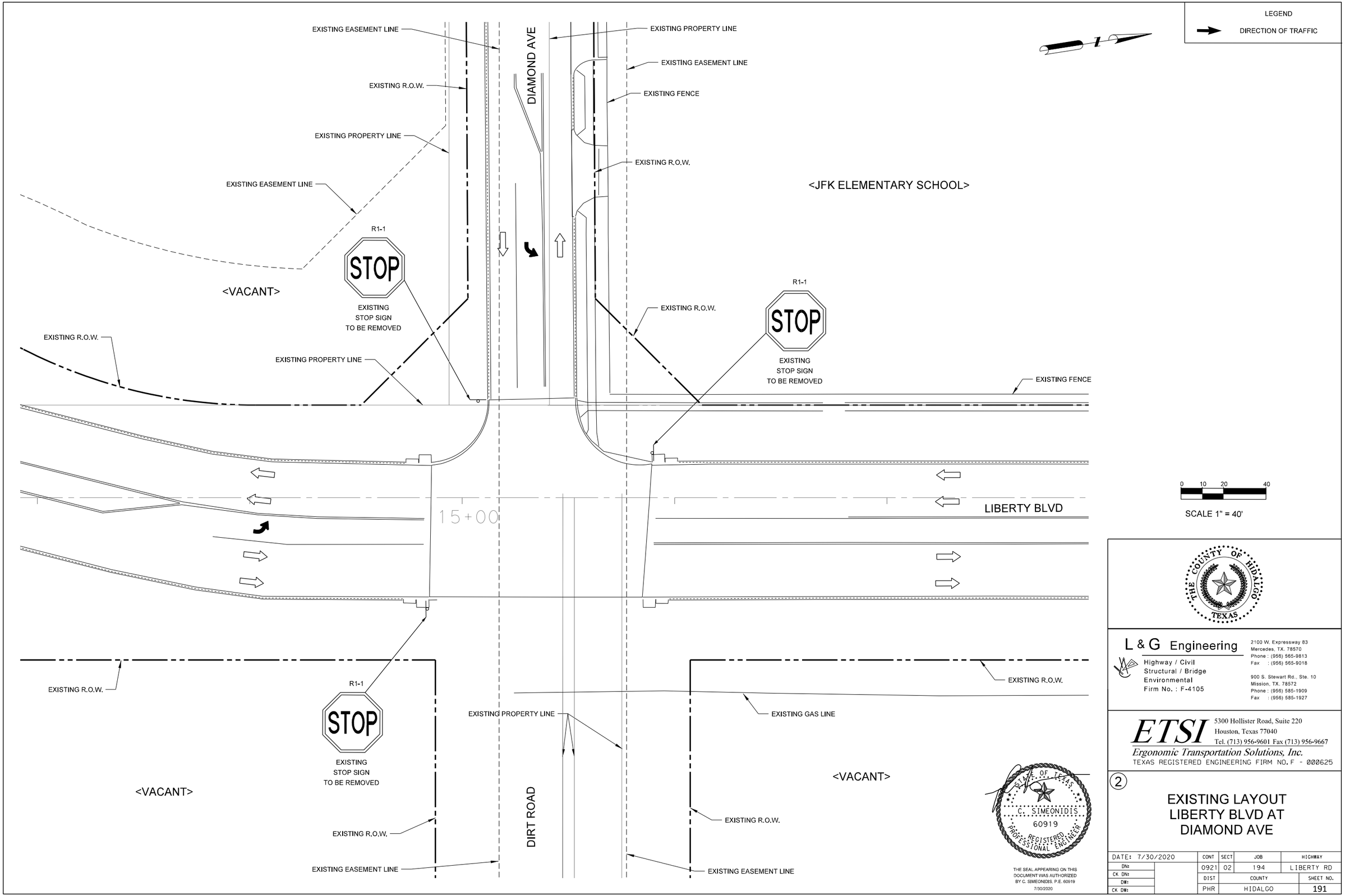
ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

1

EXISTING LAYOUT LIBERTY BLVD AT US 83

DATE: 7/30/2020	CONT	SECT	JOB	HIGHWAY
DN:	0921	02	194	LIBERTY RD
CK DN:	DIST	COUNTY		SHEET NO.
DW:	PHR	HIDALGO		190
CK DW:				

7/30/2020 N:\CLIENTS\L&G\LIBERTY*US83*SIGNALS\ETSI*WORK\EXISTING\EXISTING*US 83.dgn



N:\CLIENTS\L&G\LIBERTY*US83*SIGNALS\ETSI*WORK\EXISTING\EXISTING-DIAMOND AVE.dgn

7/30/2020

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS, P.E. 60919 7/30/2020

STATE OF TEXAS · C. SIMEONIDIS · 60919 · REGISTERED PROFESSIONAL ENGINEER

THE COUNTY OF HIDALGO TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
Ergonomic Transportation Solutions, Inc.
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

2

EXISTING LAYOUT LIBERTY BLVD AT DIAMOND AVE

DATE: 7/30/2020	CONT	SECT	JOB	HIGHWAY
DN:	0921	02	194	LIBERTY RD
CK DN:	DIST	COUNTY		SHEET NO.
DW:	PHR	HIDALGO		191
CK DW:				

LEGEND

DIRECTION OF TRAFFIC

EXISTING ROW

<VACANT>

FUTURE LA JOYA BYPASS

EXISTING OVERHEAD TELEPHONE LINE

EXISTING PROPERTY LINE

EXISTING PROPERTY LINE

EXISTING ROW

<RESIDENTIAL>

EXISTING EASEMENT LINE

EXISTING FENCE

EXISTING PROPERTY LINE

EXISTING GAS LINE

FUTURE LIBERTY BLVD

45+00

EXISTING PROPERTY LINE

EXISTING DRAINAGE DITCH

EXISTING FENCE

EXISTING GAS LINE

EXISTING DRAINAGE DITCH

EXISTING GAS LINE

EXISTING GAS LINE

<VACANT>

EXISTING ROW

<VACANT>

EXISTING ROW

0 10 20 40

SCALE 1" = 40'

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS, P.E. 60919 7/30/2020

STATE OF TEXAS · C. SIMEONIDIS · 60919 · REGISTERED PROFESSIONAL ENGINEER

COUNTY OF HIDALGO THE TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

3

EXISTING LAYOUT LIBERTY BLVD AT LA JOYA BYPASS

DATE: 7/30/2020	CONT	SECT	JOB	HIGHWAY
DN:	0921	02	194	LIBERTY RD
CK DN:	DIST	COUNTY		SHEET NO.
DW:	PHR	HIDALGO		192
CK DW:				

7/30/2020 N:\CLIENTS\L&G\LIBERTY*US83*SIGNALS\ETSI*WORK\EXISTING\EXISTING*LA JOYA BYPASS.dgn

NOTE:

EXISTING STOP SIGNS ALONG LIBERTY BOULEVARD WILL BE REMOVED BY CONSTRUCTION OF THE MILE 3 ROAD WIDENING PROJECT.

LEGEND

DIRECTION OF TRAFFIC

EXISTING ROW

EXISTING ROW

EXISTING EASEMENT LINE

EXISTING OVERHEAD POWER LINE

EXISTING PROPERTY LINE

R1-1

STOP

EXISTING STOP SIGN TO BE REMOVED

<VACANT>

<RESIDENTIAL>

EXISTING PROPERTY LINE

EXISTING OVERHEAD POWER LINE

EXISTING ROW

EXISTING ROW

EXISTING PROPERTY LINE

EXISTING OVERHEAD POWER LINE

EXISTING ROADWAY

EXISTING ROADWAY

LIBERTY BLVD

125+00

EXISTING ROADWAY

EXISTING ROW

EXISTING EASEMENT LINE

R1-1

STOP

EXISTING STOP SIGN TO BE REMOVED

FUTURE MILE 3 RD WIDENING

<VACANT>

EXISTING EASEMENT LINE

EXISTING ROW

MILE 3 RD

FUTURE MILE 3 RD WIDENING

EXISTING ROW

<VACANT>

EXISTING WATER LINE

EXISTING EASEMENT LINE

EXISTING OVERHEAD POWER LINE

EXISTING ROW

0 10 20 40

SCALE 1" = 40'

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS. P.E. 60919

7/30/2020

THE COUNTY OF HIDALGO TEXAS

L & G Engineering

Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

4

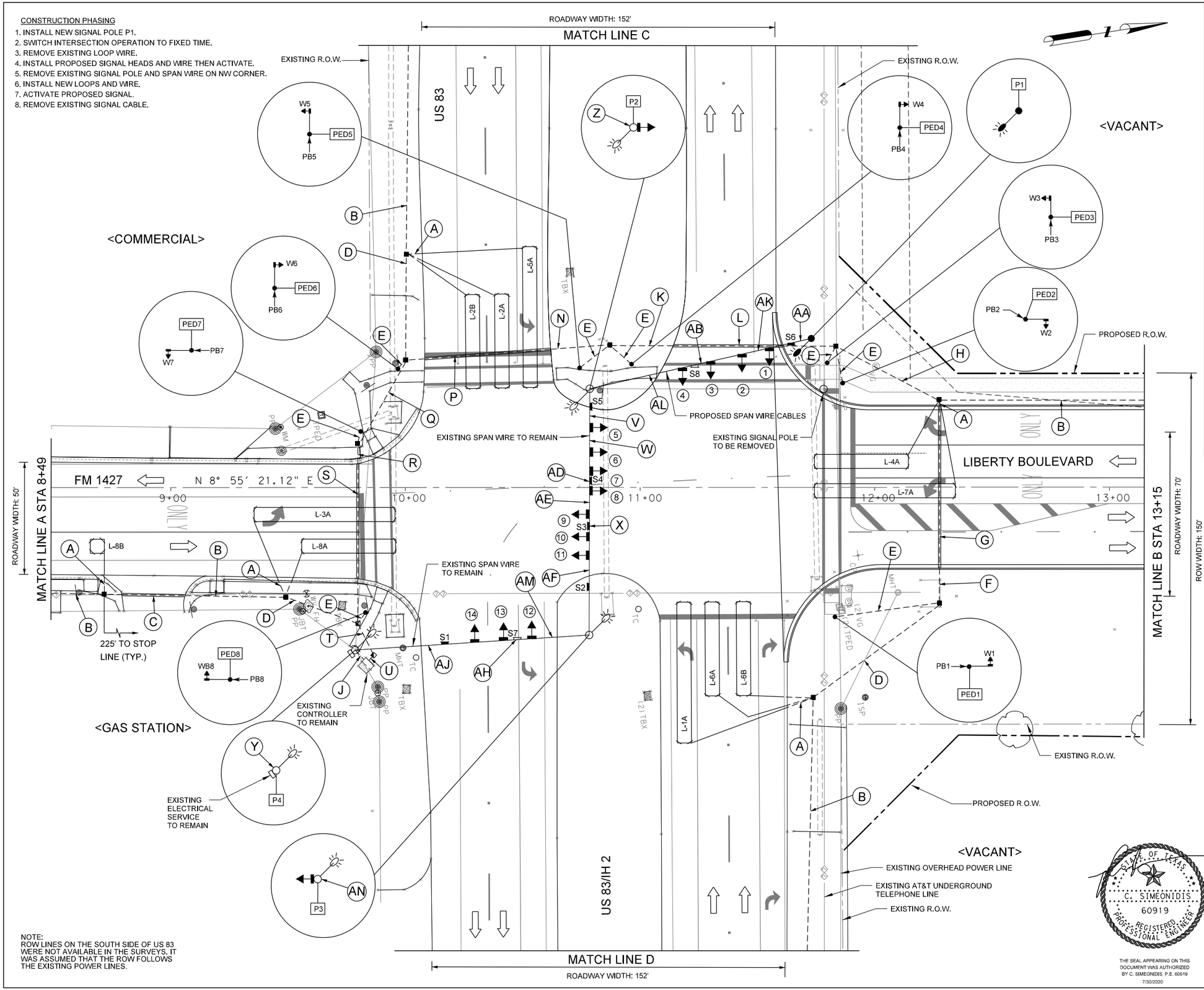
EXISTING LAYOUT LIBERTY BLVD AT MILE 3 ROAD

DATE: 7/30/2020	CONT	SECT	JOB	HIGHWAY
DN:	0921	02	194	LIBERTY RD
CK DN:	DIST	COUNTY		SHEET NO.
DW:	PHR	HIDALGO		193
CK DW:				

7/30/2020 N:\CLIENTS\L&G\LIBERTY*US83*SIGNALS\ETSI*WORK\EXISTING\MILE 3 RD.dgn

CONSTRUCTION PHASING

1. INSTALL NEW SIGNAL POLE P1.
2. SWITCH INTERSECTION OPERATION TO FIXED TIME.
3. REMOVE EXISTING LOOP WIRE.
4. INSTALL PROPOSED SIGNAL HEADS AND WIRE THEN ACTIVATE.
5. REMOVE EXISTING SIGNAL POLE AND SPAN WIRE ON NW CORNER.
6. INSTALL NEW LOOPS AND WIRE.
7. ACTIVATE PROPOSED SIGNAL.
8. REMOVE EXISTING SIGNAL CABLE.



NOTE:
ROW LINES ON THE SOUTH SIDE OF US 83 WERE NOT AVAILABLE IN THE SURVEYS. IT WAS ASSUMED THAT THE ROW FOLLOWS THE EXISTING POWER LINES.

LEGEND

- PROPOSED PEDESTRIAN POLE
- EXISTING STRAIN POLE
- PROPOSED STRAIN POLE WITH LUMINAIRE
- PROPOSED TRAFFIC SIGNAL HEAD
- PROPOSED PEDESTRIAN SIGNAL HEAD
- PB3 → PROPOSED PEDESTRIAN PUSH BUTTON & SIGN
- PROPOSED GROUND BOX (TY-A W/APRON)
- PROPOSED GROUND BOX (TY-C W/APRON)
- EXISTING LUMINAIRE ARM TO REMAIN
- PROPOSED CONDUIT (TRENCHED)
- PROPOSED CONDUCTOR (SAWCUT)
- PROPOSED CONDUIT (BORED)
- SX PROPOSED SPAN WIRE MOUNTED SIGN
- SX EXISTING SPAN WIRE MOUNTED SIGN TO REMAIN
- EXISTING GROUND MOUNTED CONTROLLER CABINET TO REMAIN
- L-XX EXISTING LOOP DETECTOR
- L-XX PROPOSED LOOP DETECTOR
- X CONDUIT RUN.
- EXISTING ELECTRICAL SERVICE TO REMAIN

0 10 20 40
SCALE 1" = 40'

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS. P.E. 60919 7/30/2020

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

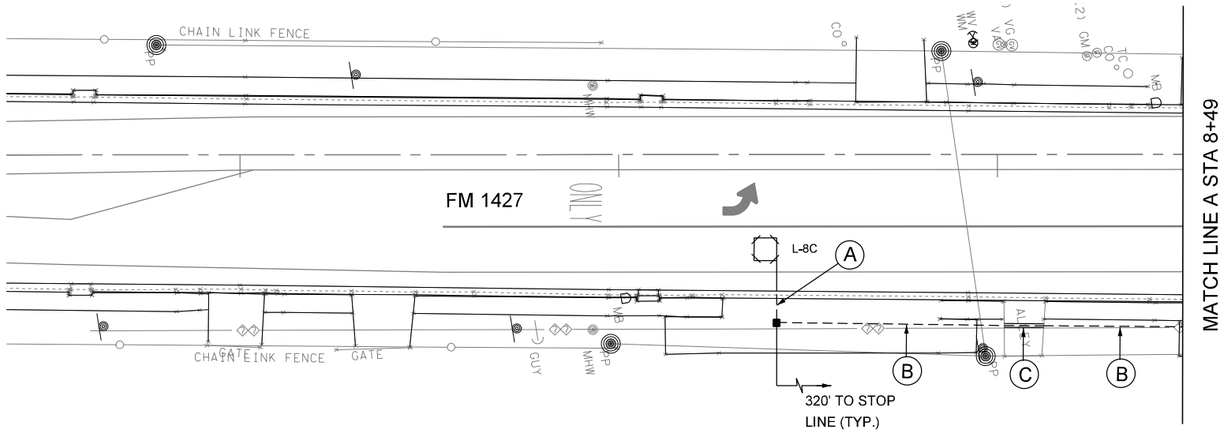
1

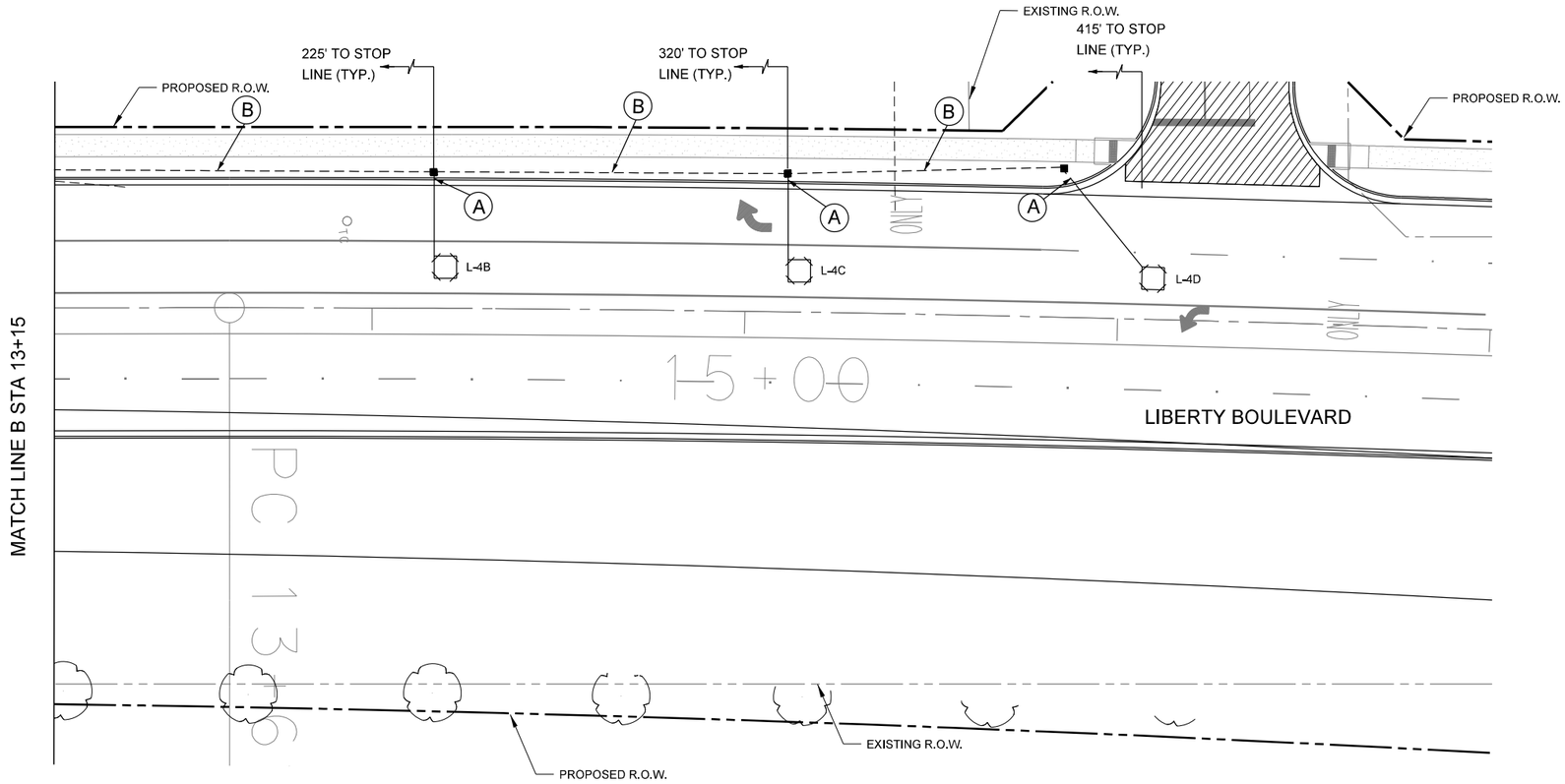
PROPOSED LAYOUT LIBERTY BLVD AT US 83

SHEET 1 OF 4

DATE: 7/30/2020	CONT	SECT	JOB	HIGHWAY
DN:	0921	02	194	LIBERTY RD
CK DN:	DIST	COUNTY		SHEET NO.
DW:	PHR	HIDALGO		194
CK DW:				

7/30/2020 N:\CLIENTS\L&G\LIBERTY*US83*SIGNALS\ETSI*WORK\PROPOSED\PROPOSED*US 83.dgn





LEGEND

- PROPOSED PEDESTRIAN POLE
- EXISTING STRAIN POLE
- PROPOSED STRAIN POLE
- PROPOSED TRAFFIC SIGNAL HEAD
- PROPOSED PEDESTRIAN SIGNAL HEAD
- PB3 — PROPOSED PEDESTRIAN PUSH BUTTON & SIGN
- PROPOSED GROUND BOX (TY-A W/APRON)
- PROPOSED GROUND BOX (TY-C W/APRON)
- EXISTING LUMINAIRE ARM TO REMAIN
- PROPOSED CONDUIT (TRENCHED)
- PROPOSED CONDUCTOR (SAWCUT)
- PROPOSED CONDUIT (BORED)
- SX — PROPOSED SPAN WIRE MOUNTED SIGN
- SX — EXISTING SPAN WIRE MOUNTED SIGN TO REMAIN
- EXISTING GROUND MOUNTED CONTROLLER CABINET TO REMAIN
- L-XX — EXISTING LOOP DETECTOR
- L-XX — PROPOSED LOOP DETECTOR
- X — CONDUIT RUN.
- EXISTING ELECTRICAL SERVICE TO REMAIN

0 10 20 40

SCALE 1" = 40'

THE COUNTY OF HIDALGO TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

STATE OF TEXAS
C. SIMEONIDIS
60919
REGISTERED PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS, P.E. 60919
7/30/2020

1

PROPOSED LAYOUT LIBERTY BLVD AT US 83

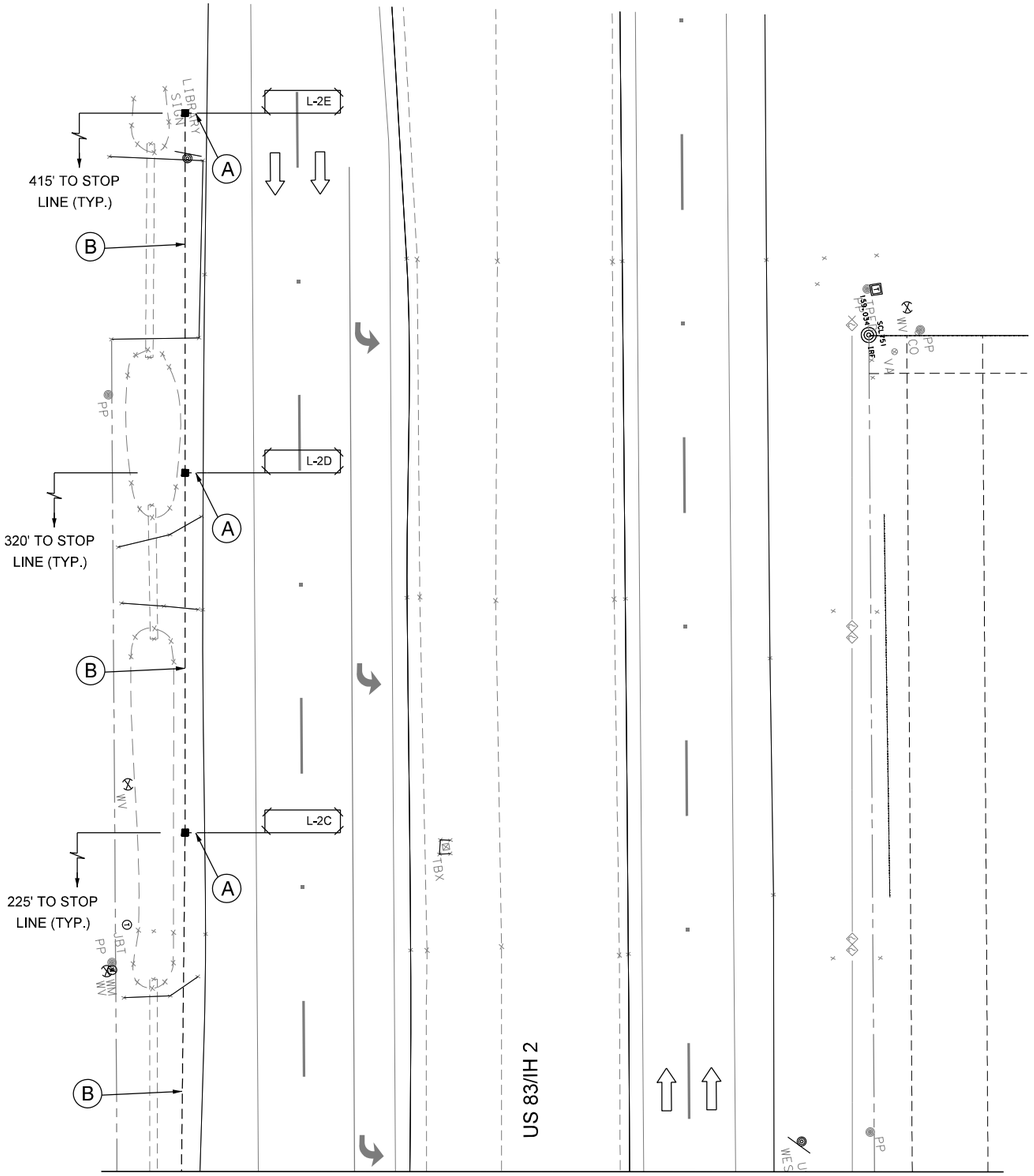
SHEET 2 OF 4

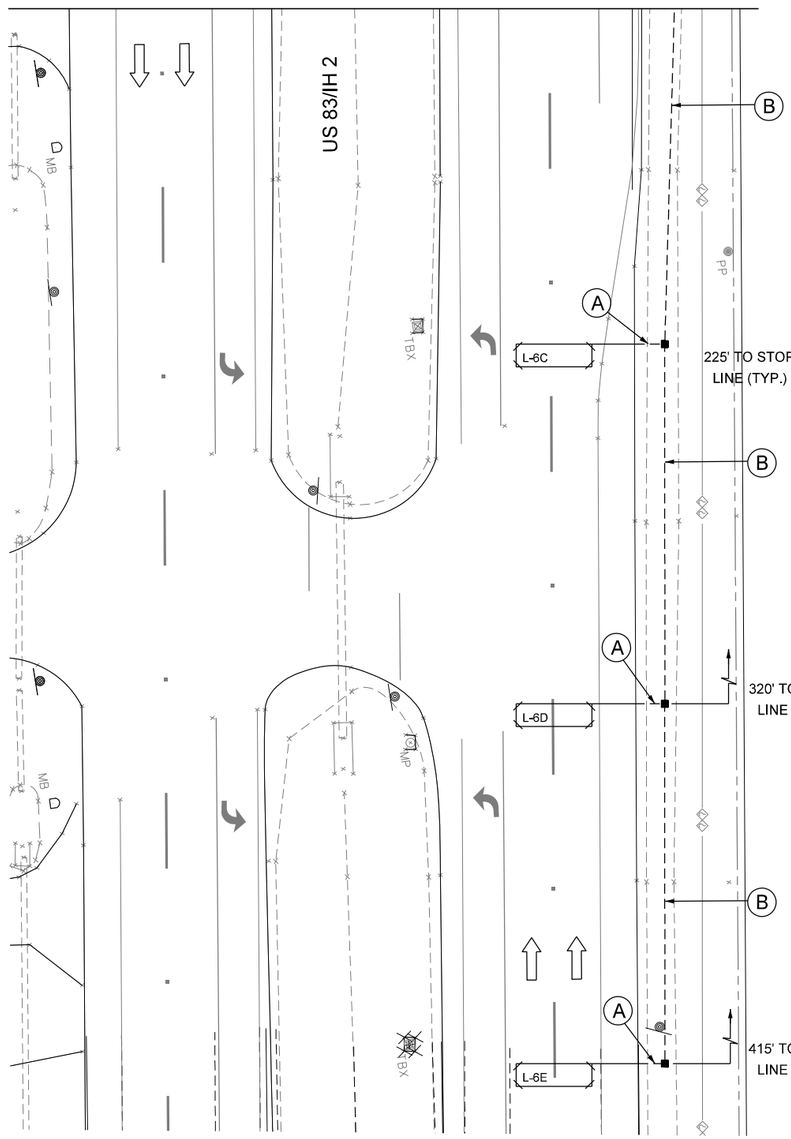
DATE: 7/30/2020	CONT	SECT	JOB	HIGHWAY
DN:	0921	02	194	LIBERTY RD
CK DN:	DIST	COUNTY		SHEET NO.
DW:	PHR	HIDALGO		195
CK DW:				

7/30/2020 N:\CLIENTS\L&G\LIBERTY*US83*SIGNALS\ETSI*WORK\PROPOSED\PROPOSED*US 83.dgn

PROPOSED TRAFFIC SIGNAL PHASING

Ø3 + Ø8	Ø4 + Ø8	Ø4 + Ø7	Ø1 + Ø6	Ø2 + Ø6	Ø2 + Ø5
Ø3, Ø8	Ø4 PED, Ø4, Ø8	Ø4 PED, Ø4, Ø7	Ø1, Ø6, Ø6 PED	Ø2 PED, Ø2, Ø6, Ø6 PED	Ø2 PED, Ø2, Ø5





LEGEND

- PROPOSED PEDESTRIAN POLE
- EXISTING STRAIN POLE
- PROPOSED STRAIN POLE
- PROPOSED TRAFFIC SIGNAL HEAD
- PROPOSED PEDESTRIAN SIGNAL HEAD
- PB3 — PROPOSED PEDESTRIAN PUSH BUTTON & SIGN
- PROPOSED GROUND BOX (TY-A W/APRON)
- PROPOSED GROUND BOX (TY-C W/APRON)
- EXISTING LUMINAIRE ARM TO REMAIN
- PROPOSED CONDUIT (TRENCHED)
- PROPOSED CONDUCTOR (SAWCUT)
- PROPOSED CONDUIT (BORED)
- SX — PROPOSED SPAN WIRE MOUNTED SIGN
- SX — EXISTING SPAN WIRE MOUNTED SIGN TO REMAIN
- EXISTING GROUND MOUNTED CONTROLLER CABINET TO REMAIN
- L-XX — EXISTING LOOP DETECTOR
- L-XX — PROPOSED LOOP DETECTOR
- X — CONDUIT RUN.
- EXISTING ELECTRICAL SERVICE TO REMAIN

0 10 20 40

SCALE 1" = 40'

THE COUNTY OF HIDALGO TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

STATE OF TEXAS
C. SIMEONIDIS
60919
REGISTERED PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS, P.E. 60919
7/30/2020

1

PROPOSED LAYOUT LIBERTY BLVD AT US 83

SHEET 3 OF 4

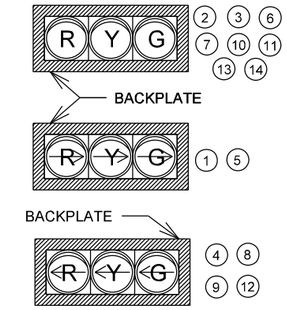
DATE: 7/30/2020	CONT	SECT	JOB	HIGHWAY
DN:	0921	02	194	LIBERTY RD
CK DN:	DIST	COUNTY		SHEET NO.
DW:	PHR	HIDALGO		196
CK DW:				

7/30/2020 N:\CLIENTS\L&G\LIBERTY*US83*SIGNALS\ETSI*WORK\PROPOSED\PROPOSED*US 83.dgn

ELECTRICAL SCHEDULE

ITEM	TOTAL QTY.	RUN NUMBER	A	B	C	D	E	F	G	H	J	K	L	N	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AD	AE	AF	AH	AK	AJ	AL	AM	AN
		RUN LENGTH (.)	135'	1290'	40'	175'	115'	20'	70'	50'	10'	50'	50'	35'	55'	40'	30'	50'	20'	5'	20'	10'	10'	30'	40'	20'	25'	20'	10'	70'	15'	15'	65'	40'	25'	30'
POWER	80'	1/C - # 6									2													2												
GROUND	40'	1/C - # 6 BARE									1													1												
	590'	1/C - # 8 BARE					1	1	1	1		1	1	1	1	1	1	1	1	1																
SIGNAL WIRE SIZE TYPE	2005'	3/C # 12 (PUSH BUTTON)					1	1	1	1		3	3	5	5	6	7	7	8	8																
	385'	4/C # 12 (TRAY CABLE)									1										1	1	1	1		1	1	1	1	1	1	1	1	1	1	
	3560'	5/C # 12					1	1	1	1	6	3	3	5	5	6	7	7	8	8	2	3	4	6	1		2	4	4	4	5	1	6	2	5	1
	905'	7/C # 12									4										1	1	3	4				1	2	3	4		4	1	3	
LOOP	270'	1/C # 14 LOOP WIRE	2																																
	4945'	2/C # 14 (SHIELDED)		1	1	3		3	3	6		6	6	6	6	9	9	9	12	12															
CONDUIT	135'	1" PVC	1																																
	1660'	2" PVC		1		1	1	1		1	1																								
	195'	4" PVC										1		1		1	1		1	4															
	110'	2" PVC (BORE)			1				1																										
	155'	4" PVC (BORE)											1		1			1																	
AERIAL																					X	X	X			X	X	X	X	X	X	X	X	X	X	
INSIDE STRAIN POLE																								X	X										X

PROPOSED SIGNAL EQUIPMENT



ACCESSIBLE PEDESTRIAN SIGNAL UNITS TO INCLUDE PEDESTRIAN PUSH BUTTONS



R10-3eR(L)
(9"X15")
W/ PEDESTRIAN PUSH BUTTON
PB1, PB2, PB3, PB4, PB5, PB6, PB7 AND PB8



18"x16"

PEDESTRIAN SIGNALS W1, W2, W3, W4, W5, W6, W7 AND W8



R10-05L
(30"X36")
S3 AND S4

LOOP DETECTOR SCHEDULE

LOOP	SIZE	SAW CUT	WIRE LENGTH	AMP. NO.	SETTING	FUNCTION
L-1A	6' x 60'	185'	346'	1	PRESENCE	CALL AND EXTEND Ø1
L-2A	6' x 40'	134'	252'	2	PRESENCE	CALL AND EXTEND Ø2
L-2B	6' x 40'	127'	230'	2	PRESENCE	CALL AND EXTEND Ø2
L-2C	6' x 20'	79'	134'	9	PULSE	CALL AND EXTEND Ø2
L-2D **	6' x 20'	79'	134'	10	PULSE	CALL AND EXTEND Ø2
L-2E	6' x 20'	79'	134'	10	PULSE	CALL AND EXTEND Ø2
L-3A	6' x 60'	170'	316'	3	PRESENCE	CALL AND EXTEND Ø3
L-4A	6' x 40'	124'	224'	4	PRESENCE	CALL AND EXTEND Ø4
L-4B	6' x 6'	57'	88'	4	PRESENCE	CALL AND EXTEND Ø4
L-4C **	6' x 6'	57'	88'	11	PULSE	CALL AND EXTEND Ø4
L-4D	6' x 6'	64'	104'	11	PULSE	CALL AND EXTEND Ø4
L-5A	6' x 60'	187'	350'	5	PRESENCE	CALL AND EXTEND Ø5
L-6A	6' x 40'	134'	246'	6	PRESENCE	CALL AND EXTEND Ø6
L-6B	6' x 40'	122'	220'	6	PRESENCE	CALL AND EXTEND Ø6
L-6C	6' x 20'	75'	126'	12	PULSE	CALL AND EXTEND Ø6
L-6D **	6' x 20'	75'	126'	12	PULSE	CALL AND EXTEND Ø6
L-6E	6' x 20'	76'	128'	12	PULSE	CALL AND EXTEND Ø6
L-7A	6' x 60'	181'	338'	7	PRESENCE	CALL AND EXTEND Ø7
L-8A	6' x 40'	115'	206'	8	PULSE	CALL AND EXTEND Ø8
L-8B **	6' x 6'	45'	66'	8	PULSE	CALL AND EXTEND Ø8
L-8C	6' x 6'	45'	66'	13	PULSE	CALL AND EXTEND Ø8
TOTAL		2210'	3788'			

** SPLICED IN SERIES

SPEED LIMIT ON BUS 83 : 55 MPH SPEED LIMIT ON LIBERTY BLVD : 55 MPH SPEED LIMIT ON FM 1427: 40 MPH

POLE & CONTROLLER LOCATIONS

POLE NO.	DESCRIPTION	STA.	OFFSET	FOUNDATION SIZE
P1	PROPOSED 34' STRAIN POLE WITH LUMINAIRE	11+72.96	63.42' LT	36-B/15.2'
P2	EXISTING STRAIN POLE WITH LUM AND NEW SIGNAL HEAD TO REMAIN	EXISTING	EXISTING	EXISTING
P3	EXISTING STRAIN POLE WITH LUM AND NEW SIGNAL HEAD TO REMAIN	EXISTING	EXISTING	EXISTING
P4	EXISTING STRAIN POLE WITH LUMINAIRE TO REMAIN	EXISTING	EXISTING	EXISTING
PED1	10' STEEL PEDESTAL POLE WITH W8 & PB8	11+83.00	55.23' RT	24-A x 5.7'
PED2	10' STEEL PEDESTAL POLE WITH W2 & PB2	11+86.34	44.37' LT	24-A x 5.7'
PED3	10' STEEL PEDESTAL POLE WITH W10 & PB10	11+79.75	53.05' LT	24-A x 5.7'
PED4	10' STEEL PEDESTAL POLE WITH W9 & PB9	10+96.37	52.50' LT	24-A x 5.7'
PED5	10' STEEL PEDESTAL POLE WITH W5 & PB5	10+74.26	50.93' LT	24-A x 5.7'
PED6	10' STEEL PEDESTAL POLE WITH W6 & PB6	9+96.83	50.60' LT	24-A x 5.7'
PED7	10' STEEL PEDESTAL POLE WITH W7 & PB7	9+80.93	23.89' LT	24-A x 5.7'
PED8	10' STEEL PEDESTAL POLE WITH W7 & PB7	9+82.96	53.29' RT	24-A x 5.7'
CONTROLLER CABINET	EXISTING NEMA CONTROLLER IN A GROUND MOUNTED CABINET TO REMAIN	EXISTING	EXISTING	EXISTING

NOTE:

STATION NUMBERS ARE WITH REFERENCE TO THE CENTER LINE OF LIBERTY ROAD. EXACT LOCATION SHALL BE DETERMINED AND VERIFIED WITH THE ENGINEER PRIOR TO ANY CONSTRUCTION.

NOTES:

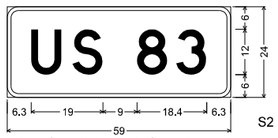
1. THE LOCATION SHOWN FOR STEEL POLES, LOOP DETECTORS AND CONDUIT RUNS IS APPROXIMATE. THE EXACT LOCATION WILL BE DETERMINED IN THE FIELD BY THE ENGINEER IN COORDINATION WITH THE PHARR DISTRICT TRAFFIC SECTION.
2. ALL SIGNAL CABLE SHALL BE #12 AWG, SERVICE CABLE SHALL BE #6 AWG, 2/C LOOP LEAD- IN CABLE SHALL BE #14 AWG SHIELDED AND LOOP WIRES IN STREET SHALL BE #14 AWG.
3. THE CONTRACTOR SHALL FURNISH AND INSTALL NEW LED TRAFFIC SIGNAL AND PEDESTRIAN SIGNAL HEADS.
4. ALL SIGNAL HEADS SHALL HAVE BACKPLATES.
5. PEDESTRIAN SIGNAL HEADS SHALL BE ALIGNED WITH CROSSWALKS.
6. THE CONTRACTOR SHALL VERIFY WITH THE UTILITY COMPANIES AS TO THE EXACT LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION TO AVOID CONFLICT WITH OR DAMAGE TO THESE UTILITIES.
7. THE CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO UTILITY CONFLICTS, AS DEFINED IN THE SPECIFICATIONS OR DEEMED NECESSARY BY THE ENGINEER.
9. REFER TO STATE STANDARD LD(1)-03 AND LD(2)-03 FOR ADDITIONAL LOOP DETECTOR INSTALLATION DETAILS.
10. ALL LUMINAIRES SHALL BE 150W LED.
11. THE EXISTING ELECTRICAL SERVICE, TRAFFIC CONTROLLER AND TRAFFIC POLES SHALL REMAIN UNLESS OTHERWISE NOTED.

EXISTING SIGNS TO REMAIN



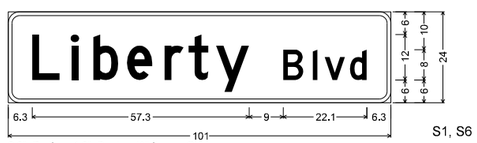
R10-05L
S7 AND S8

PROPOSED SIGNS



S2 , S5

3.0" Radius, 1.0" Border, White on Green;
[US] D; [83] D;



S1, S6

3.0" Radius, 1.0" Border, White on Green;
[Liberty] D; [Blvd] D;

TIMING CHART								
PHASE	1	2	3	4	5	6	7	8
STREET	US 83		LIBERTY		US 83		LIBERTY	
MOVEMENT	WBLT	EB	SBLT	NB	EBLT	WB	SB	NBLT
MIN. GREEN	8	8	8	8	8	8	8	8
EXTENSION	3	3	3	3	3	3	3	3
MAXIMUM I	20	40	10	20	20	40	20	10
MAXIMUM II								
YELLOW	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
ALL RED	2.0	1.5	2.5	2.5	2	1.5	2.5	2.5
WALK		7				7	7	
PED CLEAR		18		12		18		
RECALL	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
MEMORY	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS. P.E. 60919 7/30/2020

THE COUNTY OF HIDALGO TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

1

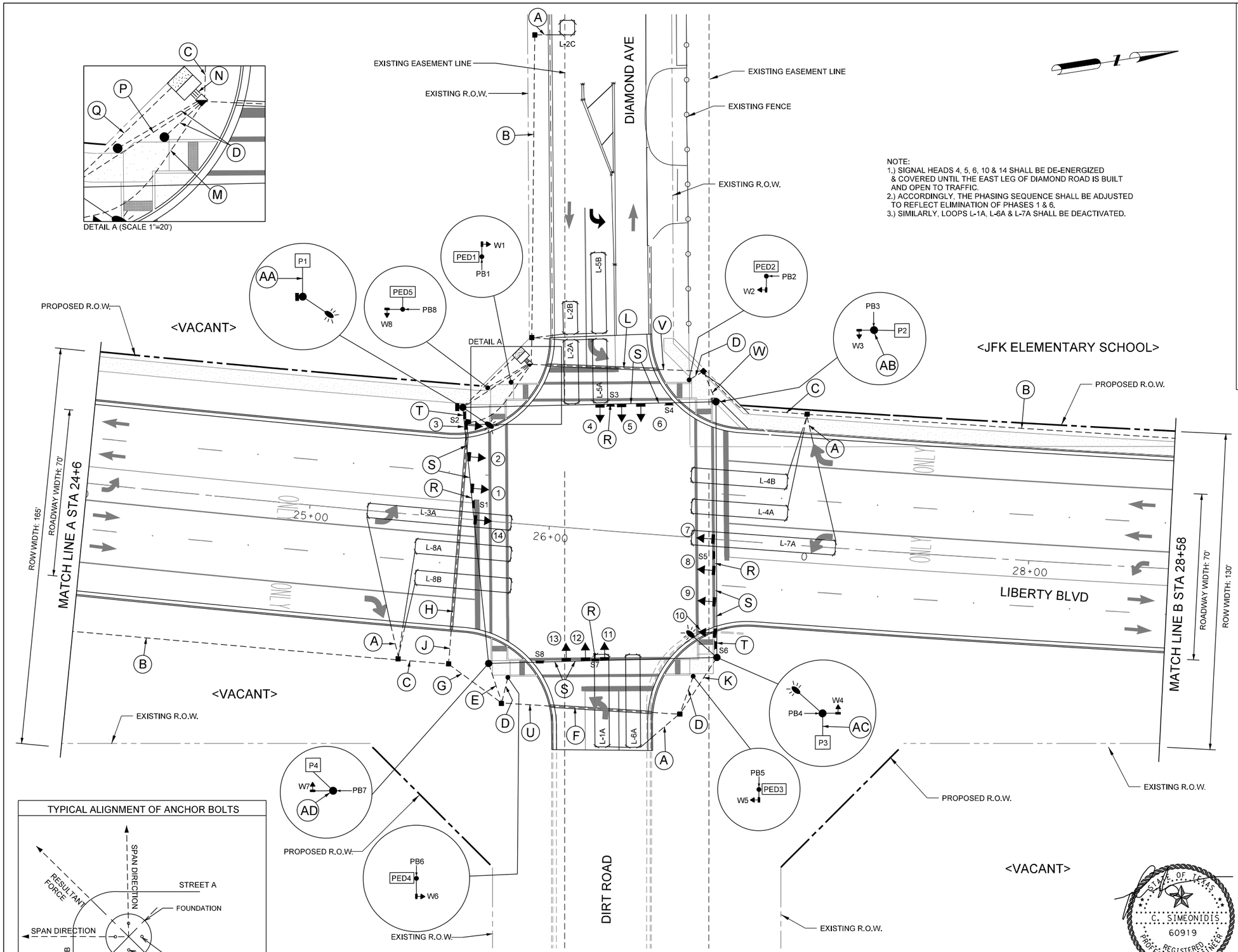
PROPOSED LAYOUT LIBERTY BLVD AT US 83

SHEET 4 OF 4

DATE: 7/30/2020		CONT	SECT	JOB	HIGHWAY
DN:		0921	02	194	LIBERTY RD
CK DN:		DIST	COUNTY		SHEET NO.
DW:		PHR	HIDALGO		197
CK DW:					

N:\CLIENTS\L&G\LIBERTY*US83*SIGNALS\ETSI*WORK\PROPOSED\PROPOSED*US 83.dgn

7/30/2020

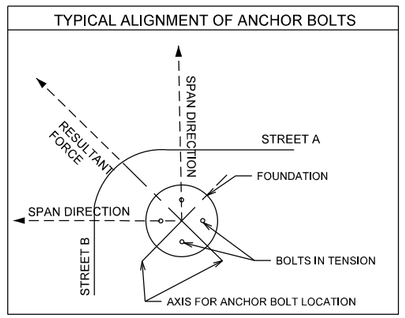


NOTE:
1.) SIGNAL HEADS 4, 5, 6, 10 & 14 SHALL BE DE-ENERGIZED & COVERED UNTIL THE EAST LEG OF DIAMOND ROAD IS BUILT AND OPEN TO TRAFFIC.
2.) ACCORDINGLY, THE PHASING SEQUENCE SHALL BE ADJUSTED TO REFLECT ELIMINATION OF PHASES 1 & 6.
3.) SIMILARLY, LOOPS L-1A, L-6A & L-7A SHALL BE DEACTIVATED.

LEGEND

- PROPOSED PEDESTRIAN POLE
- PROPOSED SIGNAL POLE
- PROPOSED HORIZONTAL SIGNAL HEAD
- PROPOSED PEDESTRIAN SIGNAL HEAD
- PB3 → PROPOSED PEDESTRIAN PUSH BUTTON & SIGN
- PROPOSED GROUND BOX (TY-A W/APRON)
- PROPOSED GROUND BOX (TY-C W/APRON)
- PROPOSED LUMINAIRE ARM
- PROPOSED CONDUIT (TRENCHED)
- PROPOSED CONDUCTOR (SAWCUT)
- PROPOSED CONDUIT (BORED)
- SX PROPOSED SPAN WIRE MOUNTED SIGN
- PROPOSED GROUND MOUNTED CONTROLLER CABINET
- L-XX PROPOSED LOOP DETECTOR
- X CONDUIT RUN
- PROPOSED ELECTRICAL SERVICE

TYPICAL ALIGNMENT OF ANCHOR BOLTS



0 10 20 40

SCALE 1" = 40'

THE COUNTY OF HIDALGO TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

STATE OF TEXAS
C. SIMEONIDIS
60919
REGISTERED PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS, P.E. 60919
7/30/2020

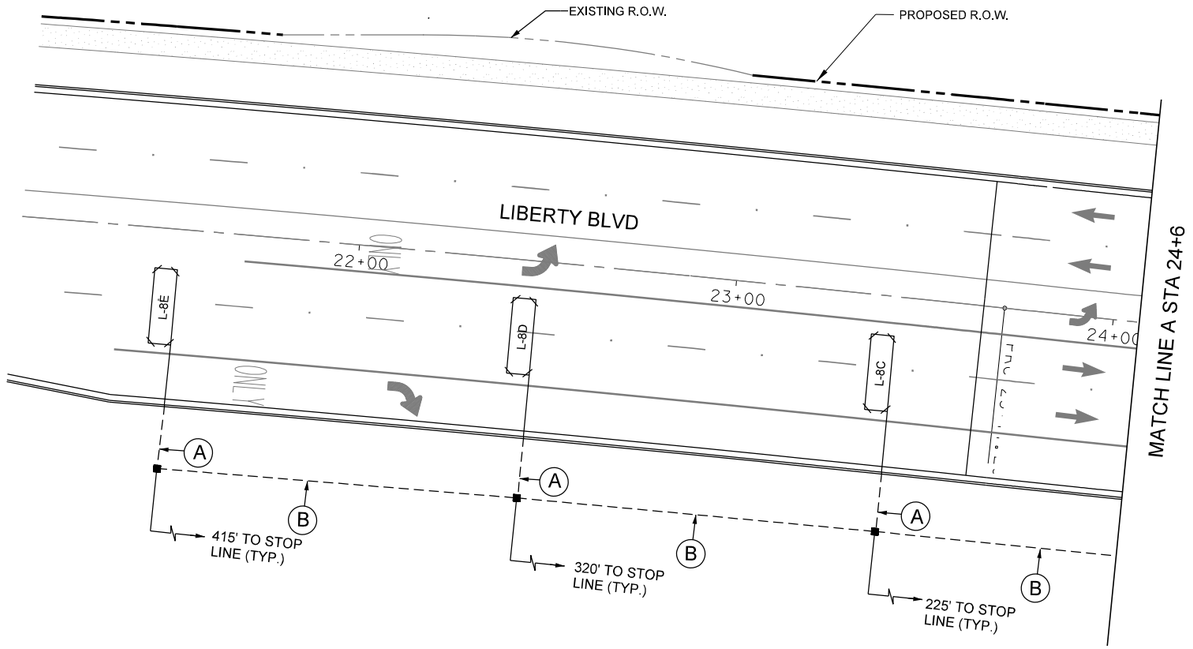
2

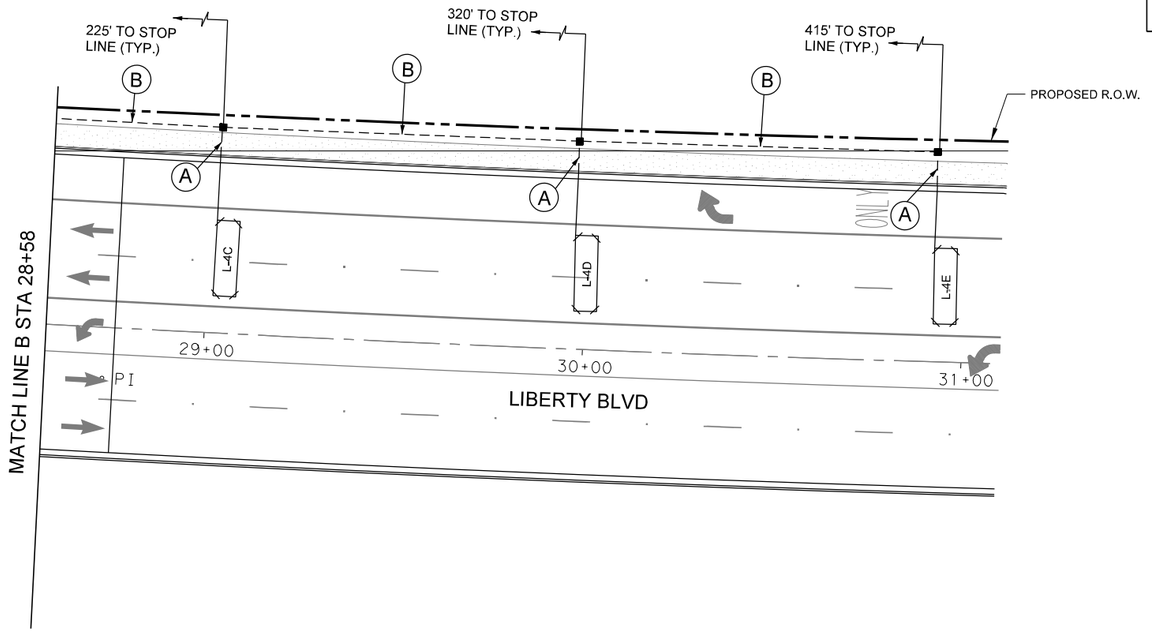
PROPOSED LAYOUT LIBERTY BLVD AT DIAMOND AVE

SHEET 1 OF 3

DATE: 7/30/2020		CONT	SECT	JOB	HIGHWAY
DN:		0921	02	194	LIBERTY RD
CK DN:		DIST	COUNTY		SHEET NO.
DW:		PHR	HIDALGO		198
CK DW:					

7/30/2020 N:\CLIENTS\L&G\LIBERTY+US83+SIGNALS\ETSI+WORK\PROPOSED\PROPOSED+DIAMOND AVE.dgn

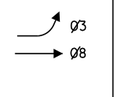
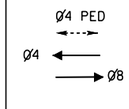
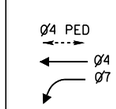
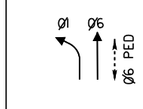
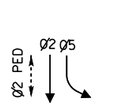




LEGEND

- PROPOSED PEDESTRIAN POLE
- PROPOSED SIGNAL POLE
- PROPOSED HORIZONTAL SIGNAL HEAD
- PROPOSED PEDESTRIAN SIGNAL HEAD
- PB3 — PROPOSED PEDESTRIAN PUSH BUTTON & SIGN
- PROPOSED GROUND BOX (TY-A W/APRON)
- PROPOSED GROUND BOX (TY-C W/APRON)
- PROPOSED LUMINAIRE ARM
- PROPOSED CONDUIT (TRENCHED)
- PROPOSED CONDUCTOR (SAWCUT)
- PROPOSED CONDUIT (BORED)
- SX PROPOSED SPAN WIRE MOUNTED SIGN
- PROPOSED GROUND MOUNTED CONTROLLER CABINET
- L-XX PROPOSED LOOP DETECTOR
- X CONDUIT RUN
- PROPOSED ELECTRICAL SERVICE

PROPOSED TRAFFIC SIGNAL PHASING

Ø3 + Ø8	Ø4 + Ø8	Ø4 + Ø7	Ø1 + Ø6	Ø2 + Ø6	Ø2 + Ø5
					

0 10 20 40

SCALE 1" = 40'

TIMING CHART								
PHASE	1	2	3	4	5	6	7	8
STREET	DIAMOND		LIBERTY		DIAMOND		LIBERTY	
MOVEMENT	WBLT	EB	NBLT	SB	EBLT	WB	SBLT	NB
MIN. GREEN	8	8	8	8	8	8	8	8
EXTENSION	3	3	3	3	3	3	3	3
MAXIMUM I	5	15	10	30	5	15	10	30
MAXIMUM II								
YELLOW	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
ALL RED	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
WALK		8		8		8		8
PED CLEAR		24		12		24		12
RECALL	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON
MEMORY	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

STATE OF TEXAS
C. SIMEONIDIS
60919
REGISTERED PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS, P.E. 60919
7/30/2020

THE COUNTY OF HIDALGO TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

2

PROPOSED LAYOUT LIBERTY BLVD AT DIAMOND AVE

SHEET 2 OF 3

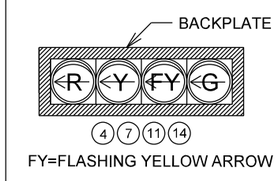
DATE: 7/30/2020		CONT	SECT	JOB	HIGHWAY
DN:		0921	02	194	LIBERTY RD
CK DN:		DIST	COUNTY		SHEET NO.
DW:		PHR	HIDALGO		199
CK DW:					

7/30/2020 N:\CLIENTS\L&G\LIBERTY*US83*SIGNALS\ETSI*WORK\PROPOSED\PROPOSED*DIAMOND AVE.dgn

ELECTRICAL SCHEDULE

ITEM	TOTAL QTY.	RUN NUMBER	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	AA	AB	AC	AD
		RUN LENGTH (.)	170'	890'	95'	65'	20'	45'	30'	90'	15'	30'	55'	40'	5'	25'	25'	50'	140'	20'	30'	20'	15'	30'	30'	30'	30'
POWER	110'	1/C - # 6															2							2			
GROUND	55'	1/C - # 6 BARE															1							1			
	500'	1/C - # 8 BARE				1	1	1	1	1	1	1	1	1	4	1					1	1	1				
SIGNAL WIRE SIZE TYPE	1340'	3/C # 12 (PUSH BUTTON)				1	1	2	4	4	4	1	3	4	9						2	3	1		1	1	1
	405'	4/C # 12 (TRAY CABLE)						1	1	1	1	1		1	2	1					1			2		1	
	2655'	5/C # 12				1	2	4	7	7	7	3	4	7	15	2			1	2	4	4	2	3	2	3	2
	940'	7/C # 12					1	1	2	2	2	1	1	2	4	1		1	1	1	1	1	1	1	1	1	1
LOOP	340'	1/C # 14 LOOP WIRE	2																								
	2645'	2/C # 14 (SHIELDED)		1	3			3	3	6	6		3	6	12						3	3					
CONDUIT	170'	1" PVC	1																								
	1215'	2" PVC		1	1	1	1		1							1	1				1	1	1				
	105'	4" PVC									1	1		1	4												
	100'	2" PVC (BORE)						1					1														
	90'	4" PVC (BORE)								1																	
AERIAL																		*	*	*							
INSIDE STRAIN POLE																								*	*	*	*

PROPOSED SIGNAL EQUIPMENT



ACCESSIBLE PEDESTRIAN SIGNAL UNITS TO INCLUDE PEDESTRIAN PUSH BUTTONS



R10-3eR(L)
(9"X15")
W/ PEDESTRIAN PUSH BUTTON
PB1, PB2, PB3, PB4, PB5, PB6, PB7 AND PB8



PEDESTRIAN SIGNALS
W1, W2, W3, W4, W5, W6, W7 AND W8



R10-17T
(36"X42")
S1, S3, S5, S7

Elec. Service No.	Sheet No.	Electrical Service Description (see ED (5) & (6) - 14)	Service Conduit Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amp	Two-Pole Contactor Amps	Panelbd/ Loadcenter Amp Rating	Circuit No.	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
TS1	DIAMOND	ELC SRV TY D 120/240 060 (NS)GS(L)TS(O)	1 1/4"	3/#6	N/A	2P/60	N/A	100	TS	2P/15	2	5.3
									LIGHT	1P/50	40	

LOOP DETECTOR SCHEDULE

LOOP	SIZE	SAW CUT	WIRE LENGTH	AMP. NO.	SETTING	FUNCTION
L-1A	6' x 40'	123'	210'	1	PRESENCE	CALL AND EXTEND Ø1
L-2A	6' x 30'	89'	154'	2	PRESENCE	CALL AND EXTEND Ø2
L-2B	6' x 10'	49'	74'	2	PRESENCE	CALL AND EXTEND Ø2
L-2C	6' x 6'	42'	55'	2	PULSE	CALL AND EXTEND Ø2
L-3A	6' x 60'	190'	356'	3	PRESENCE	CALL AND EXTEND Ø3
L-4A **	6' x 40'	135'	246'	4	PRESENCE	CALL AND EXTEND Ø4
L-4B **	6' x 40'	122'	220'	4	PRESENCE	CALL AND EXTEND Ø4
L-4C	6' x 20'	81'	138'	10	PULSE	CALL AND EXTEND Ø4
L-4D **	6' x 20'	81'	138'	10	PULSE	CALL AND EXTEND Ø4
L-4E	6' x 20'	81'	138'	10	PULSE	CALL AND EXTEND Ø4
L-5A	6' x 30'	95'	166'	5	PRESENCE	CALL AND EXTEND Ø5
L-5B	6' x 30'	95'	166'	5	PRESENCE	CALL AND EXTEND Ø5
L-6A	6' x 40'	110'	196'	6	PRESENCE	CALL AND EXTEND Ø6
L-7A	6' x 60'	190'	356'	7	PRESENCE	CALL AND EXTEND Ø7
L-8A **	6' x 40'	135'	246'	8	PRESENCE	CALL AND EXTEND Ø8
L-8B **	6' x 40'	122'	220'	8	PRESENCE	CALL AND EXTEND Ø8
L-8C	6' x 20'	80'	136'	12	PULSE	CALL AND EXTEND Ø8
L-8D **	6' x 20'	80'	136'	12	PULSE	CALL AND EXTEND Ø8
L-8E	6' x 20'	80'	136'	12	PULSE	CALL AND EXTEND Ø8
TOTAL		1938'	3294'			

** SPLICED IN SERIES
SPEED LIMIT ON LIBERTY ROAD : 55 MPH
SPEED LIMIT ON DIAMOND AVENUE : 30 MPH

POLE & CONTROLLER LOCATIONS

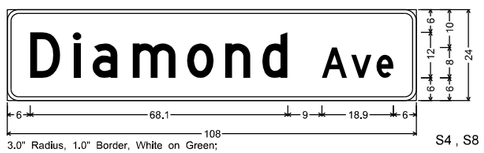
POLE NO.	DESCRIPTION	STA.	OFFSET	FOUNDATION SIZE
P1	34' STRAIN POLE WITH LUM AND ELEC SERVICE	25+59.84	46.25' LT	36-B/15.2'
P2	34' STRAIN POLE WITH W3 & PB3	26+65.23	57.10' LT	36-B/15.2'
P3	34' STRAIN POLE WITH LUM, W4 AND PB4	26+73.61	49.04' RT	36-B/15.2'
P4	34' STRAIN POLE WITH W7 AND PB7	25+79.67	59.05' RT	36-B/15.2'
PED1	10' STEEL PEDESTAL POLE WITH W1 & PB1	25+79.06	58.40' LT	24-A x 5.7'
PED2	10' STEEL PEDESTAL POLE WITH W2 & PB2	26+53.31	65.34' LT	24-A x 5.7'
PED3	10' STEEL PEDESTAL POLE WITH W5 & PB5	26+64.41	57.58' RT	24-A x 5.7'
PED4	10' STEEL PEDESTAL POLE WITH W6 & PB6	25+88.06	64.19' RT	24-A x 5.7'
PED5	10' STEEL PEDESTAL POLE WITH W8 & PB8	25+69.51	55.26' LT	24-A x 5.7'
CONTROLLER CABINET	PROPOSED NEMA CONTROLLER IN A GROUND MOUNTED CABINET	25+83.23	69.10' LT	5' X 7'

NOTE:
STATION NUMBERS ARE WITH REFERENCE TO THE CENTER LINE OF LIBERTY ROAD. EXACT LOCATION SHALL BE DETERMINED AND VERIFIED WITH THE ENGINEER PRIOR TO ANY CONSTRUCTION.

NOTES:

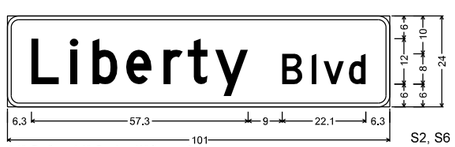
1. THE LOCATION SHOWN FOR THE TRAFFIC CONTROLLER, STEEL POLES, LOOP DETECTORS, CONDUIT RUNS AND CONTROLLER FOUNDATION IS APPROXIMATE. THE EXACT LOCATION WILL BE DETERMINED IN THE FIELD BY THE ENGINEER IN COORDINATION WITH THE PHARR DISTRICT TRAFFIC SECTION.
2. ALL SIGNAL CABLE SHALL BE #12 AWG, SERVICE CABLE SHALL BE #6 AWG, 2/C LOOP LEAD- IN CABLE SHALL BE #14 AWG SHIELDED AND LOOP WIRES IN STREET SHALL BE #14 AWG.
3. THE CONTRACTOR SHALL FURNISH AND INSTALL NEW LED TRAFFIC SIGNAL AND PEDESTRIAN SIGNAL HEADS.
4. ALL SIGNAL HEADS SHALL HAVE BACKPLATES.
5. THE LUMINAIRES SHALL BE OPERATED UNDER THEIR OWN PHOTO ELECTRIC CONTROL.
6. PEDESTRIAN SIGNAL HEADS SHALL BE ALIGNED WITH CROSSWALKS.
7. THE CONTRACTOR SHALL VERIFY WITH THE UTILITY COMPANIES AS TO THE EXACT LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION TO AVOID CONFLICT WITH OR DAMAGE TO THESE UTILITIES.
8. THE CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO UTILITY CONFLICTS, AS DEFINED IN THE SPECIFICATIONS OR DEEMED NECESSARY BY THE ENGINEER.
9. REFER TO STATE STANDARD LD(1)-03 AND LD(2)-03 FOR ADDITIONAL LOOP DETECTOR INSTALLATION DETAILS.
10. ALL LUMINAIRES SHALL BE 150W LED.

PROPOSED SIGNS



3.0" Radius, 1.0" Border, White on Green;
[Diamond] D; [Ave] D;

S4 , S8



3.0" Radius, 1.0" Border, White on Green;
[Liberty] D; [Blvd] D;

S2, S6

THE COUNTY OF HIDALGO TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

STATE OF TEXAS
C. SIMEONIDIS
60919
REGISTERED PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS, P.E. 60919
7/30/2020

2

PROPOSED LAYOUT LIBERTY BLVD AT DIAMOND AVE

SHEET 3 OF 3

DATE: 7/30/2020		CONT	SECT	JOB	HIGHWAY
DN:		0921	02	194	LIBERTY RD
CK DN:		DIST	COUNTY		SHEET NO.
DW:		PHR	HIDALGO		200
CK DW:					

N:\CLIENTS\L&G\LIBERTY*US83*SIGNALS\ETSI*WORK\PROPOSED\PROPOSED-DIAMOND AVE.dgn
7/30/2020

MATCH LINE B STA 485+50

EXISTING R.O.W.

ONLY

486+00

LA JOYA BYPASS

EXISTING R.O.W.

P1 Z

PED1 W1 PB1

PED2 PB8 W8

W9 PED3 PB9

W10 PB10 PED12

P2 U

P3 M

W2 PED4 PB2

PED5 PB3 W3

AB D-2C D-2B D-2A

AA AD AJ E J H Q K

S1 AC 3 V MW2 2 MW1 1 R

D-8A D-8B D-8C

D-7A

OLA

D-3A

FUTURE LIBERTY BLVD P

OLB

T 13 MW3 14 S MW4 15 M S2 G N

X AE E F MW6 17 MW5 16 18 S3 M S T

W7 PB7 PED11

PB6 PED10 W6

P6 M

EXISTING R.O.W.

PB14 PED9 W14

P5 U

PED8 PB13 W13

PED7 W4 PB4

MATCH LINE D STA 488+50

486+00

T S M F E S5 4 MW9 5 MW10 6 AE X

G S M S4 10 MW8 S 11 MW7 T 12

D-4C D-4B D-4A

R 7 MW11 8 V MW12 9 AC S6

AH AG AF E

D-6A D-6B D-6C

PED6 PB5 W5

EXISTING ROW

MATCH LINE A STA 54+14.57

MATCH LINE C STA 59+14.82

P4 Y

0 10 20 40

SCALE 1" = 40'

LEGEND

- PROPOSED PEDESTRIAN POLE
- PROPOSED SIGNAL POLE
- PROPOSED SIGNAL POLE WITH 4' FOUNDATION
- PROPOSED HORIZONTAL SIGNAL HEAD
- PROPOSED PEDESTRIAN SIGNAL HEAD
- PB3 — PROPOSED PEDESTRIAN PUSH BUTTON & SIGN
- PROPOSED GROUND BOX (TY-A W/APRON)
- PROPOSED GROUND BOX (TY-C W/APRON)
- PROPOSED LUMINAIRE ARM
- PROPOSED CONDUIT (TRENCHED)
- PROPOSED CONDUCTOR (SAWCUT)
- PROPOSED CONDUIT (BORED)
- SX — PROPOSED SPAN WIRE MOUNTED SIGN
- PROPOSED GROUND MOUNTED CONTROLLER CABINET
- X — CONDUIT RUN
- PROPOSED ELECTRICAL SERVICE
- MICROWAVE DETECTION
- D-XX — DETECTION ZONE

THE COUNTY OF HIDALGO TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
Ergonomic Transportation Solutions, Inc.
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

3

PROPOSED LAYOUT LIBERTY BLVD AT LA JOYA BYPASS

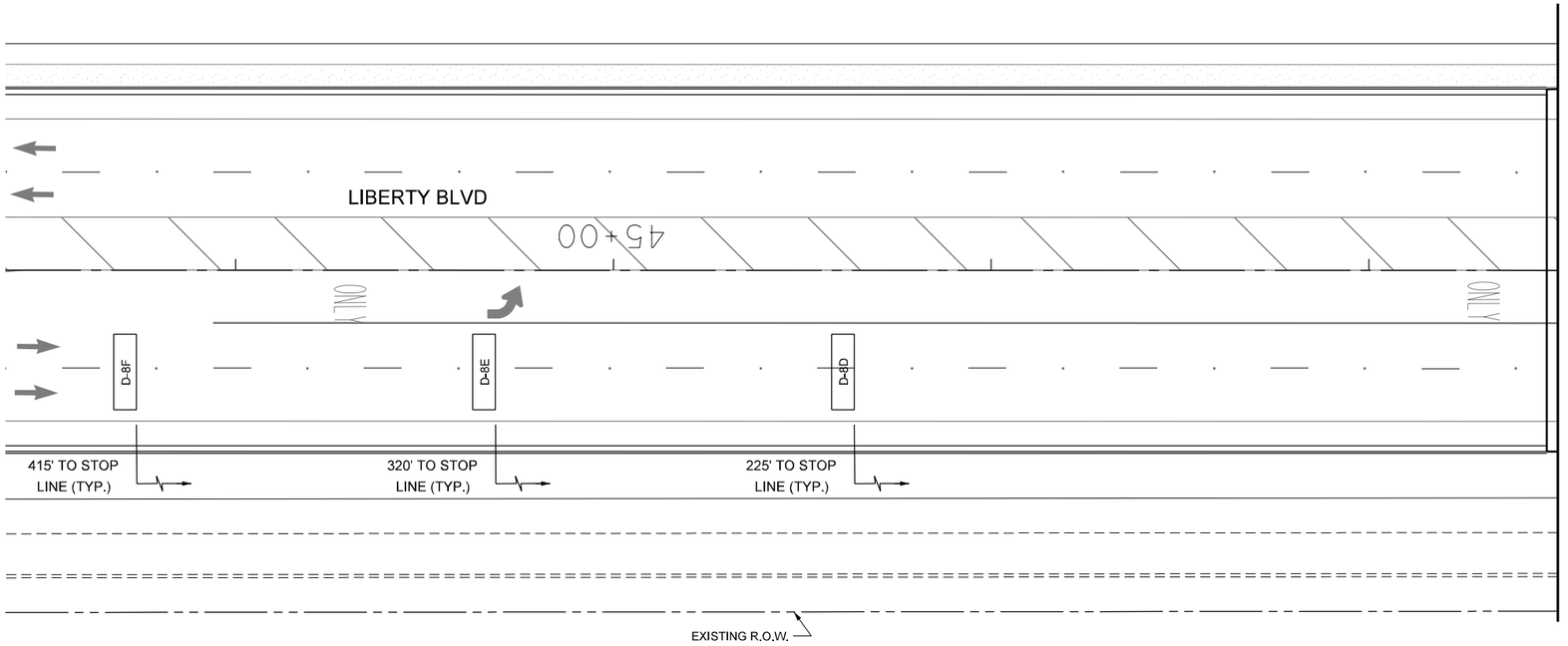
SHEET 1 OF 4

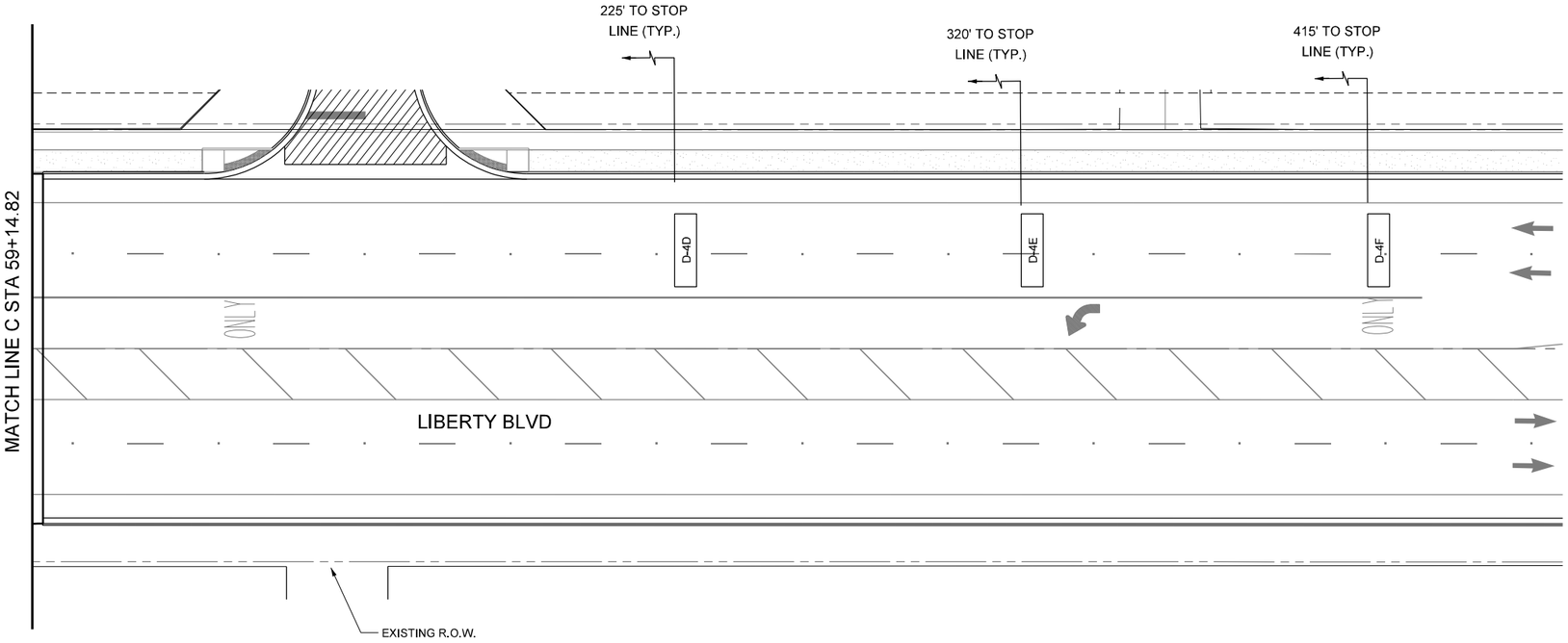
DATE: 7/30/2020	CONT	SECT	JOB	HIGHWAY
DN:	0921	02	194	LIBERTY RD
CK DN:	DIST	COUNTY		SHEET NO.
DW:	PHR	HIDALGO		201
CK DW:				

STATE OF TEXAS
C. SIMEONIDIS
60919
REGISTERED PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS. P.E. 60919
7/30/2020

7/30/2020 N:\CLIENTS\L&G\LIBERTY*US83*SIGNALS\ETSI*WORK\PROPOSED\PROPOSED+LA JOYA BYPASS.dgn





LEGEND

- PROPOSED PEDESTRIAN POLE
- PROPOSED SIGNAL POLE
- PROPOSED SIGNAL POLE WITH 4' FOUNDATION
- PROPOSED HORIZONTAL SIGNAL HEAD
- PROPOSED PEDESTRIAN SIGNAL HEAD
- PB3 — PROPOSED PEDESTRIAN PUSH BUTTON & SIGN
- PROPOSED GROUND BOX (TY-A W/APRON)
- PROPOSED GROUND BOX (TY-C W/APRON)
- PROPOSED LUMINAIRE ARM
- PROPOSED CONDUIT (TRENCHED)
- PROPOSED CONDUCTOR (SAWCUT)
- PROPOSED CONDUIT (BORED)
- SX — PROPOSED SPAN WIRE MOUNTED SIGN
- PROPOSED GROUND MOUNTED CONTROLLER CABINET
- X — CONDUIT RUN
- PROPOSED ELECTRICAL SERVICE
- MICROWAVE DETECTION
- D-XX — DETECTION ZONE

0 10 20 40

SCALE 1" = 40'

THE COUNTY OF HIDALGO TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

STATE OF TEXAS
C. SIMEONIDIS
60919
REGISTERED PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS. P.E. 60919
7/30/2020

3

PROPOSED LAYOUT LIBERTY BLVD AT LA JOYA BYPASS

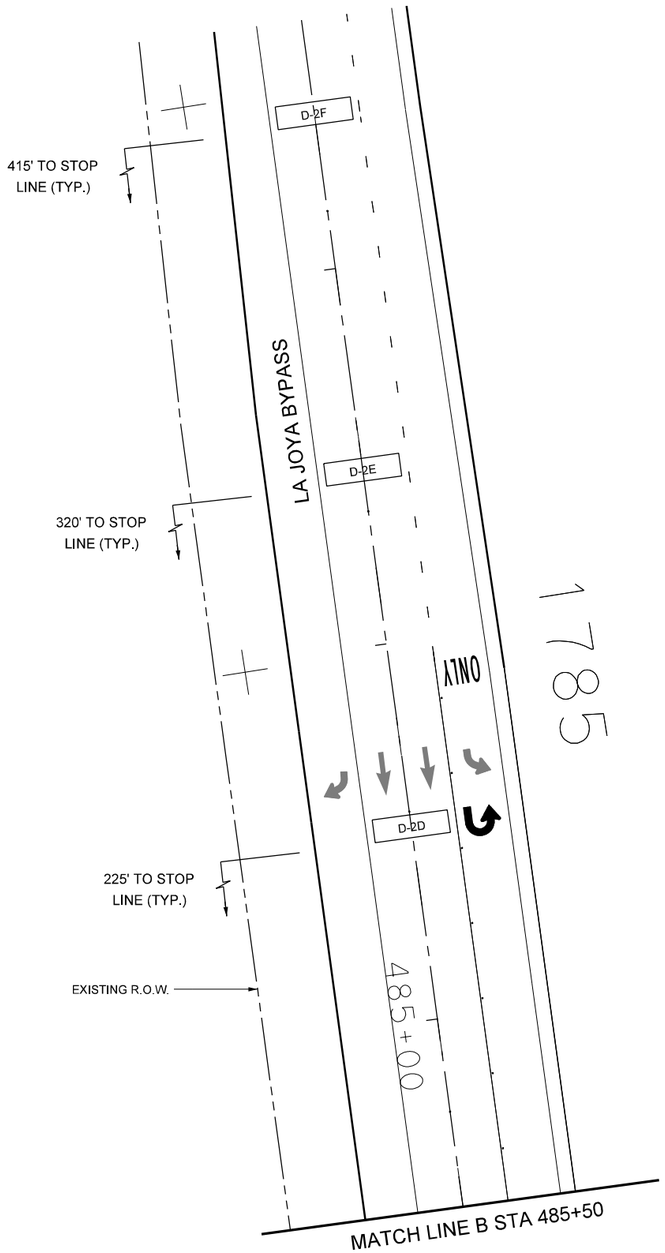
SHEET 2 OF 4

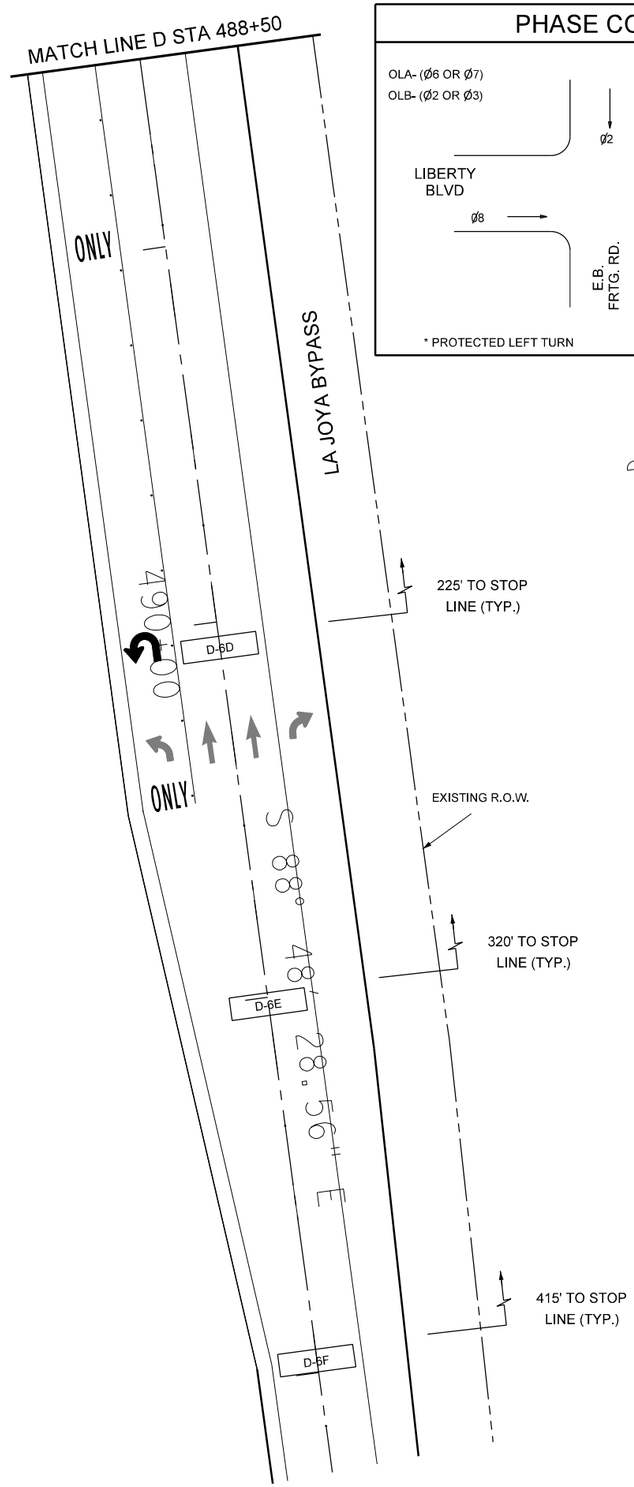
DATE: 7/30/2020	CONT	SECT	JOB	HIGHWAY
DN:	0921	02	194	LIBERTY RD
CK DN:	DIST	COUNTY		SHEET NO.
DW:	PHR	HIDALGO		202
CK DW:				

7/30/2020 N:\CLIENTS\L&G\LIBERTY-US83\SIGNALS\ETSI\WORK\PROPOSED\PROPOSED-LA JOYA BYPASS.dgn

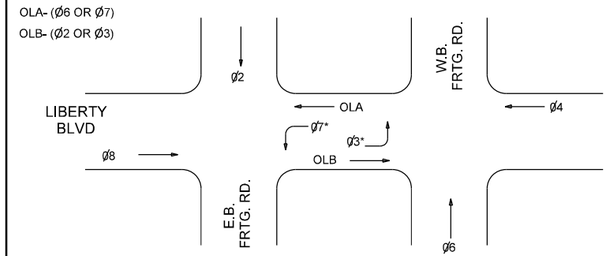
PROPOSED TRAFFIC SIGNAL PHASING

Ø2 + Ø4	Ø6 + Ø7	Ø6 + Ø8	Ø3 + Ø2
Ø2, Ø4, OLB	OLA, Ø6, Ø7	OLA, Ø6, Ø8	OLB, Ø2, Ø3





PHASE CONFIGURATION



* PROTECTED LEFT TURN

LEGEND

- PROPOSED PEDESTRIAN POLE
- PROPOSED SIGNAL POLE
- PROPOSED SIGNAL POLE WITH 4' FOUNDATION
- PROPOSED HORIZONTAL SIGNAL HEAD
- PROPOSED PEDESTRIAN SIGNAL HEAD
- PB3 — PROPOSED PEDESTRIAN PUSH BUTTON & SIGN
- PROPOSED GROUND BOX (TY-A W/APRON)
- PROPOSED GROUND BOX (TY-C W/APRON)
- PROPOSED LUMINAIRE ARM
- PROPOSED CONDUIT (TRENCHED)
- PROPOSED CONDUCTOR (SAWCUT)
- PROPOSED CONDUIT (BORED)
- SX — PROPOSED SPAN WIRE MOUNTED SIGN
- PROPOSED GROUND MOUNTED CONTROLLER CABINET
- X — CONDUIT RUN
- PROPOSED ELECTRICAL SERVICE
- MICROWAVE DETECTION
- D-XX — DETECTION ZONE

0 10 20 40

SCALE 1" = 40'

THE COUNTY OF HIDALGO TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

STATE OF TEXAS
C. SIMEONIDIS
60919
REGISTERED PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS, P.E. 60919
7/30/2020

3

PROPOSED LAYOUT LIBERTY BLVD AT LA JOYA BYPASS

SHEET 3 OF 4

DATE: 7/30/2020	CONT	SECT	JOB	HIGHWAY
DN:	0921	02	194	LIBERTY RD
CK DN:	DIST	COUNTY		SHEET NO.
DW:	PHR	HIDALGO		203
CK DW:				

7/30/2020 N:\CLIENTS\L&G\LIBERTY*US83*SIGNALS\ETSI*WORK\PROPOSED\PROPOSED*LA JOYA BYPASS.dgn

ELECTRICAL SCHEDULE

ITEM	TOTAL QTY.	RUN NUMBER	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AJ
		RUN LENGTH (.)	125'	40'	20'	120'	100'	215'	135'	165'	20'	100'	5'	25'	50'	30'	60'	20'	60'	30'	30'	185'	65'	45'	35'	110'	45'	25'	70'	20'
POWER	560'	1/C - # 6																			2	2	2							
GROUND	280'	1/C - # 6 BARE																			1	1	1							
	940'	1/C - # 8 BARE	1	1	1	1	1	1	1		1	1	1						1						1	1	1	1	1	1
SIGNAL WIRE SIZE TYPE	1700'	4/C # 12 (TRAY CABLE)			1	4	4	1	1		2	2					1			1	4				4		1	1	1	4
	2635'	3/C #12 (PUSH BUTTONS)	1			3	2	3	3		6	6	12						2							2		2	2	2
	4315'	5/C # 12	1	1	1	4	3	5	4	1	9	9	18		1	1	1	1	3	1	1			1	1	3	1	3	3	3
	590'	7/C # 12				1	1		1		1	1	2	1				1		1	1			1	1		1	1	1	1
DETECTOR	3150'	RADAR DETECTOR WIRE		2	2	2	2	4	2	2	6	6	12		1		2		2	1	1			1	2	2	2	2	2	2
CONDUIT	0'	1" PVC																												
	370'	2" PVC	1	1	1																	1			1		1			
	570'	4" PVC				1		1	1		1		4						1									1		1
	65'	2" PVC (BORE)																					1							
	200'	4" PVC (BORE)					1					1														1			1	
INSIDE MAST ARM														*	*	*		*						*					
INSIDE TRAFFIC POLE										*							*			*	*								

Elec. Service No.	Sheet No.	Electrical Service Description (see ED (5) & (6) - 14)	Service Conduit Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amp	Two-Pole Contactor Amps	Panelbd/ Loadcenter Amp Rating	Circuit No.	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
2	LA JOYA	ELC SRV TY D 120/240 060 (NS)GS(L)TS(O)	1 1/4"	3/#6	N/A	2P/60	N/A	100	TS	2P/15	4	5.8
									LIGHT	1P/50	40	

PROPOSED DETECTION ZONE SCHEDULE

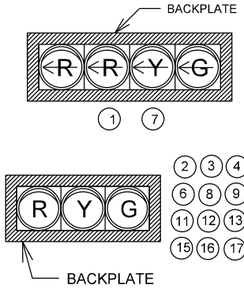
DETECTOR NUMBER	ZONE	SIZE	SETTING	FUNCTION
MW5	D-2A	6' x 40'	PRESENCE	CALL AND EXTEND Ø2
	D-2B	6' x 40'	PRESENCE	CALL AND EXTEND Ø2
	D-2C	6' x 40'	PRESENCE	CALL AND EXTEND Ø2
MW6	D-2D	6' X 20'	PULSE	CALL AND EXTEND Ø2
	D-2E	6' X 20'	PULSE	CALL AND EXTEND Ø2
	D-2F	6' X 20'	PULSE	CALL AND EXTEND Ø2
MW7	D-4A	6' x 40'	PRESENCE	CALL AND EXTEND Ø4
	D-4B	6' x 40'	PRESENCE	CALL AND EXTEND Ø4
	D-4C	6' x 40'	PRESENCE	CALL AND EXTEND Ø4
MW8	D-4D	6' x 20'	PULSE	CALL AND EXTEND Ø4
	D-4E	6' x 20'	PULSE	CALL AND EXTEND Ø4
	D-4F	6' x 20'	PULSE	CALL AND EXTEND Ø4
MW1	D-7A	6' x 40'	PRESENCE	CALL AND EXTEND Ø4
MW2	OLA	6' x 20'	PULSE	CALL AND EXTEND Ø4
MW9	D-6A	6' x 40'	PRESENCE	CALL AND EXTEND Ø6
	D-6B	6' x 40'	PRESENCE	CALL AND EXTEND Ø6
	D-6C	6' x 40'	PRESENCE	CALL AND EXTEND Ø6
MW10	D-6D	6' x 20'	PULSE	CALL AND EXTEND Ø6
	D-6E	6' x 20'	PULSE	CALL AND EXTEND Ø6
	D-6F	6' x 20'	PULSE	CALL AND EXTEND Ø6
MW3	D-8A	6' x 40'	PRESENCE	CALL AND EXTEND Ø8
	D-8B	6' x 40'	PRESENCE	CALL AND EXTEND Ø8
	D-8C	6' x 40'	PRESENCE	CALL AND EXTEND Ø8
MW4	D-8D	6' x 20'	PULSE	CALL AND EXTEND Ø8
	D-8E	6' x 20'	PULSE	CALL AND EXTEND Ø8
	D-8F	6' x 20'	PULSE	CALL AND EXTEND Ø8
MW11	D-3A	6' x 40'	PRESENCE	CALL AND EXTEND Ø8
MW12	OLB	6' x 20'	PULSE	CALL AND EXTEND Ø8

POLE & CONTROLLER LOCATIONS

POLE NO.	DESCRIPTION	STA.	OFFSET	FOUNDATION SIZE
P1	SIGNAL POLE WITH 55' MAST ARM & ELECTRICAL SERVICE	54+27.44	56.64' LT	48-A/21.9
P2	SIGNAL POLE WITH 50' MAST ARM	57+68.07	57.05' LT	48-A/21.9
P3	SIGNAL POLE WITH 44' MAST ARM	58+26.06	87.48' LT	36-B/15.2'
P4	SIGNAL POLE WITH 50' MAST ARM	59+06.08	59.96' RT	48-A/21.9
P5	SIGNAL POLE WITH 50' MAST ARM	55+58.22	57.16' RT	48-A/21.9
P6	SIGNAL POLE WITH 44' MAST ARM	55+10.26	90.24' RT	36-B/15.2'
PED1	10' STEEL PEDESTAL POLE WITH W1 & PB1	54+49.12	70.24' LT	24-A x 5.7'
PED2	10' STEEL PEDESTAL POLE WITH W8 & PB8	54+61.36	81.76' LT	24-A x 5.7'
PED3	10' STEEL PEDESTAL POLE WITH W9 & PB9	55+47.35	69.17' LT	24-A x 5.7'
PED4	10' STEEL PEDESTAL POLE WITH W2 & PB2	58+42.18	71.14' LT	24-A x 5.7'
PED5	10' STEEL PEDESTAL POLE WITH W3 & PB3	58+60.69	63.12' LT	24-A x 5.7'
PED6	10' STEEL PEDESTAL POLE WITH W5 & PB5	58+79.54	70.81' RT	24-A x 5.7'
PED7	10' STEEL PEDESTAL POLE WITH W4 & PB4	58+60.64	92.54' RT	24-A x 5.7'
PED8	10' STEEL PEDESTAL POLE WITH W13 & PB13	57+83.46	67.00' RT	24-A x 5.7'
PED9	10' STEEL PEDESTAL POLE WITH W14 & PB14	55+51.12	68.88' RT	24-A x 5.7'
PED10	10' STEEL PEDESTAL POLE WITH W6 & PB6	54+98.02	80.63' RT	24-A x 5.7'
PED11	10' STEEL PEDESTAL POLE WITH W7 & PB7	54+61.57	58.30' RT	24-A x 5.7'
PED12	10' STEEL PEDESTAL POLE WITH W10 & PB10	57+65.19	73.20' LT	24-A x 5.7'
CONTROLLER CABINET	PROPOSED NEMA CONTROLLER IN A GROUND MOUNTED CABINET	56+57.74	63.63' LT	5' X 7'

NOTE:
STATION NUMBERS ARE WITH REFERENCE TO THE CENTER LINE OF LIBERTY ROAD. EXACT LOCATION SHALL BE DETERMINED AND VERIFIED WITH THE ENGINEER PRIOR TO ANY CONSTRUCTION.

PROPOSED SIGNAL EQUIPMENT



ACCESSIBLE PEDESTRIAN SIGNAL UNITS TO INCLUDE PEDESTRIAN PUSH BUTTONS



R10-3eR(L)
(9"X15")
W/ PEDESTRIAN PUSH BUTTON
PB1, PB2, PB3, PB4, PB5, PB6, PB7, PB8, PB9, PB10, PB13, PB14

18"x16"



PEDESTRIAN SIGNALS
W1, W2, W3, W4, W5, W6, W7, W8, W9, W10, W13, W14

TIMING CHART						
PHASE	2	3	4	6	7	8
STREET	LA JOYA	LIBERTY		LA JOYA	LIBERTY	
MOVEMENT	EB	NBLT	SB	WB	SBLT	NB
MIN. GREEN	8	8	8	8	8	8
EXTENSION	3	3	3	3	3	3
MAXIMUM I	70	10	40	70	10	40
MAXIMUM II						
YELLOW	4.5	4.5	4.5	4.5	4.5	4.5
ALL RED	1.0	1.0	1.0	1.0	1.0	1.0
WALK	7		7	7		7
PED CLEAR	33		18	33		18
RECALL	ON	OFF	OFF	ON	OFF	OFF
MEMORY	OFF	OFF	OFF	OFF	OFF	OFF

NOTES:

1. THE LOCATION SHOWN FOR THE TRAFFIC CONTROLLER, STEEL POLES, MICROWAVE DETECTION DEVICES, CONDUIT RUNS AND CONTROLLER FOUNDATION IS APPROXIMATE. THE EXACT LOCATION WILL BE DETERMINED IN THE FIELD BY THE ENGINEER IN COORDINATION WITH THE PHARR DISTRICT TRAFFIC SECTION.

2. ALL SIGNAL CABLE SHALL BE #12 AWG, SERVICE CABLE SHALL BE #6 AWG, 2/C LOOP LEAD- IN CABLE SHALL BE #14 AWG SHIELDED AND LOOP WIRES IN STREET SHALL BE #14 AWG.

3. THE CONTRACTOR SHALL FURNISH AND INSTALL NEW LED TRAFFIC SIGNAL AND PEDESTRIAN SIGNAL HEADS.

4. ALL SIGNAL HEADS SHALL HAVE BACKPLATES.

5. THE LUMINAIRES SHALL BE OPERATED UNDER THEIR OWN PHOTO ELECTRIC CONTROL.

6. PEDESTRIAN SIGNAL HEADS SHALL BE ALIGNED WITH CROSSWALKS.

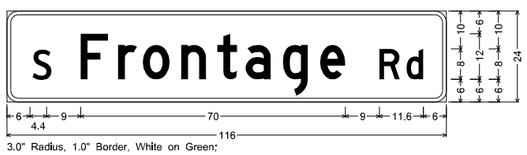
7. THE CONTRACTOR SHALL VERIFY WITH THE UTILITY COMPANIES AS TO THE EXACT LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION TO AVOID CONFLICT WITH OR DAMAGE TO THESE UTILITIES.

8. THE CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO UTILITY CONFLICTS, AS DEFINED IN THE SPECIFICATIONS OR DEEMED NECESSARY BY THE ENGINEER.

9. REFER TO STATE STANDARD LD(1)-03 AND LD(2)-03 FOR ADDITIONAL LOOP DETECTOR INSTALLATION DETAILS.

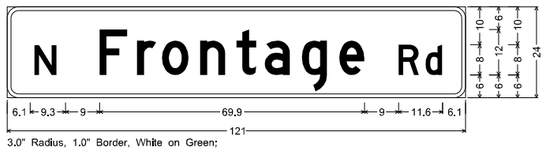
10. ALL LUMINAIRES SHALL BE 150W LED.

PROPOSED SIGNS



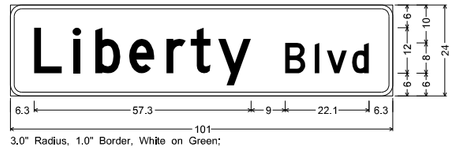
3.0" Radius, 1.0" Border, White on Green:
[E] ClearviewHwy-3-W; [Frontage] D; [Rd] D;

S1 & S2



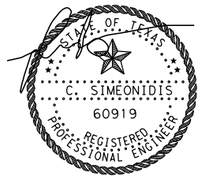
3.0" Radius, 1.0" Border, White on Green:
[W] ClearviewHwy-3-W; [Frontage] D; [Rd] D;

S4 & S6



3.0" Radius, 1.0" Border, White on Green:
[Liberty] D: [Blvd] D;

S3 & S5



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS. P.E. 60919
7/30/2020



L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

3

PROPOSED LAYOUT LIBERTY BLVD AT LA JOYA BYPASS

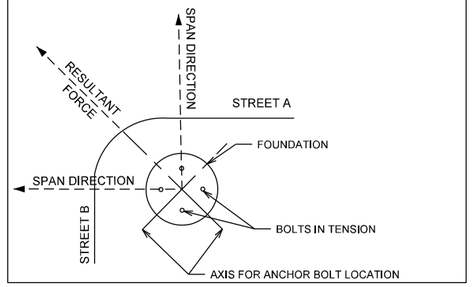
SHEET 4 OF 4

DATE: 7/30/2020	CONT	SECT	JOB	HIGHWAY
DN:	0921	02	194	LIBERTY RD
CK DN:	DIST	COUNTY		SHEET NO.
DW:	PHR	HIDALGO		204
CK DW:				

N:\CLIENTS\L&G\LIBERTY*US83*SIGNALS\ETSI*WORK\PROPOSED\PROPOSED*LA JOYA BYPASS.dgn
7/30/2020

ROW WIDTH: 120'
ROADWAY WIDTH: 81'
MATCH LINE C STA 156+70
EXISTING R.O.W.
EXISTING R.O.W.
EXISTING OVERHEAD POWER LINE
MILE 3 RD
157+00
<VACANT>
<RESIDENTIAL>
PROPOSED R.O.W.
SEE DETAIL A
EXISTING OVERHEAD POWER LINE
EXISTING R.O.W.
DETAIL A (SCALE 1"=20')
MATCH LINE A STA 123+73
ROW WIDTH: 120'
ROADWAY WIDTH: 69'
135+00
136+00
137+00
137+92.72
138+00
139+00
ONLY
L-2B
L-2A
L-5A
L-3A
L-8A
L-4A
L-7A
LIBERTY BLVD
MATCH LINE B
ROADWAY WIDTH: 69'
ROW WIDTH: 120'
PROPOSED R.O.W.
EXISTING R.O.W.
<VACANT>
<VACANT>
156+00
L-6A
L-6B
L-1A
EXISTING WATER LINE
EXISTING OVERHEAD POWER LINE
EXISTING R.O.W.
MATCH LINE D STA 160+63
ROADWAY WIDTH: 81'
ROW WIDTH: 120'
W7
P4
AD
PB7
W8
PED1
PB8
PED2
PB1
W1
PED5
PB6
W6
P1
AA
W5
PED4
PB5
W2
PED3
PB2
PB4
W4
P3
AC
W3
PB3
P2
AB
P
K
E
U
T
Q
N

TYPICAL ALIGNMENT OF ANCHOR BOLTS



LEGEND

- PROPOSED PEDESTRIAN POLE
- PROPOSED SIGNAL POLE
- PROPOSED HORIZONTAL SIGNAL HEAD
- PROPOSED PEDESTRIAN SIGNAL HEAD
- PB3 — PROPOSED PEDESTRIAN PUSH BUTTON & SIGN
- PROPOSED GROUND BOX (TY-A W/APRON)
- PROPOSED GROUND BOX (TY-C W/APRON)
- PROPOSED LUMINAIRE ARM
- PROPOSED CONDUIT (TRENCHED)
- PROPOSED CONDUCTOR (SAWCUT)
- PROPOSED CONDUIT (BORED)
- SX — PROPOSED SPAN WIRE MOUNTED SIGN
- PROPOSED GROUND MOUNTED CONTROLLER CABINET
- L-XX — PROPOSED LOOP DETECTOR
- X — CONDUIT RUN
- PROPOSED ELECTRICAL SERVICE
- DIRECTION OF TRAFFIC

0 10 20 40

SCALE 1" = 40'

THE COUNTY OF HIDALGO TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

STATE OF TEXAS
C. SIMEONIDIS
60919
REGISTERED PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS, P.E. 60919
7/30/2020

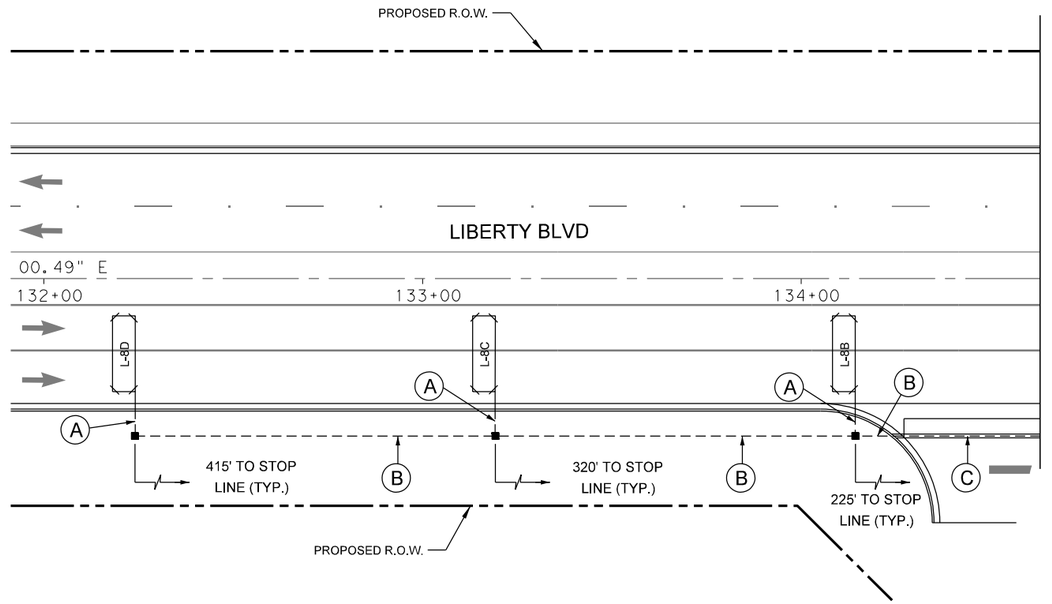
4

PROPOSED SIGNAL LAYOUT
LIBERTY BLVD AT MILE 3 ROAD

SHEET 1 OF 4

DATE: 7/30/2020	CONT	SECT	JOB	HIGHWAY
DN:	0921	02	194	LIBERTY RD
CK DN:	DIST	COUNTY		SHEET NO.
DW:	PHR	HIDALGO		205
CK DW:				

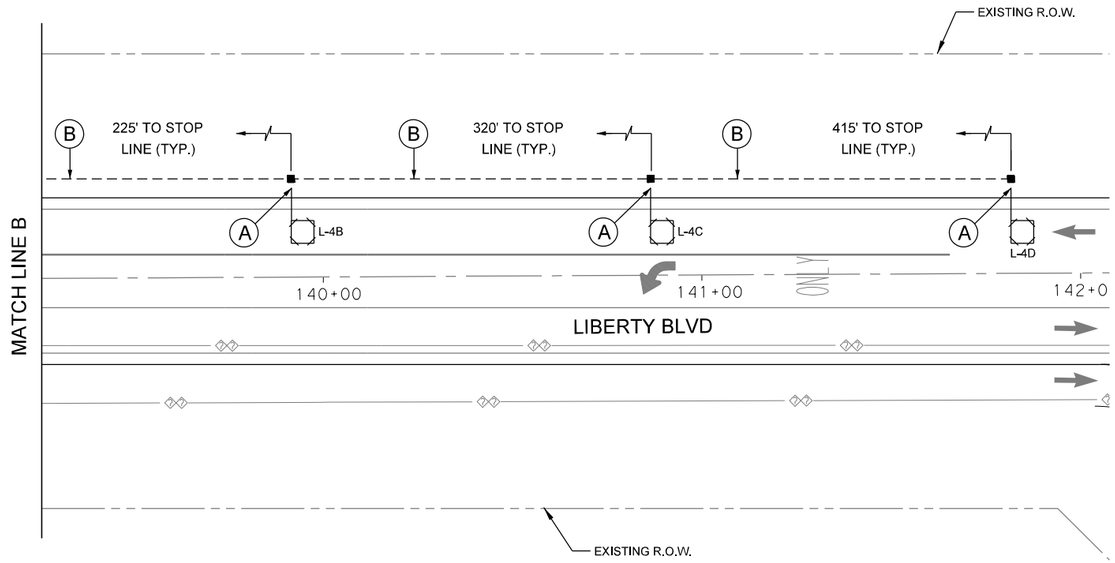
7/30/2020
N:\CLIENTS\L&G\LIBERTY*US83*SIGNALS\ETSI*WORK\PROPOSED\PROPOSED*MILE 3 RD.dgn





LEGEND

- PROPOSED PEDESTRIAN POLE
- PROPOSED SIGNAL POLE
- PROPOSED HORIZONTAL SIGNAL HEAD
- PROPOSED PEDESTRIAN SIGNAL HEAD
- PB3 — PROPOSED PEDESTRIAN PUSH BUTTON & SIGN
- PROPOSED GROUND BOX (TY-A W/APRON)
- PROPOSED GROUND BOX (TY-C W/APRON)
- PROPOSED LUMINAIRE ARM
- PROPOSED CONDUIT (TRENCHED)
- PROPOSED CONDUCTOR (SAWCUT)
- PROPOSED CONDUIT (BORED)
- SX — PROPOSED SPAN WIRE MOUNTED SIGN
- PROPOSED GROUND MOUNTED CONTROLLER CABINET
- L-XX — PROPOSED LOOP DETECTOR
- X — CONDUIT RUN
- PROPOSED ELECTRICAL SERVICE
- DIRECTION OF TRAFFIC



PROPOSED TRAFFIC SIGNAL PHASING					
Ø3 + Ø8	Ø4 + Ø8	Ø4 + Ø7	Ø1 + Ø6	Ø2 + Ø6	Ø2 + Ø5
Ø3, Ø8	Ø4 PED, Ø4, Ø8	Ø4 PED, Ø4, Ø7	Ø1, Ø6, Ø6 PED	Ø2 PED, Ø2, Ø6, Ø6 PED	Ø2 PED, Ø2, Ø5

0 10 20 40

SCALE 1" = 40'

THE COUNTY OF HIDALGO TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

STATE OF TEXAS
C. SIMEONIDIS
60919
REGISTERED PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS. P.E. 60919
7/30/2020

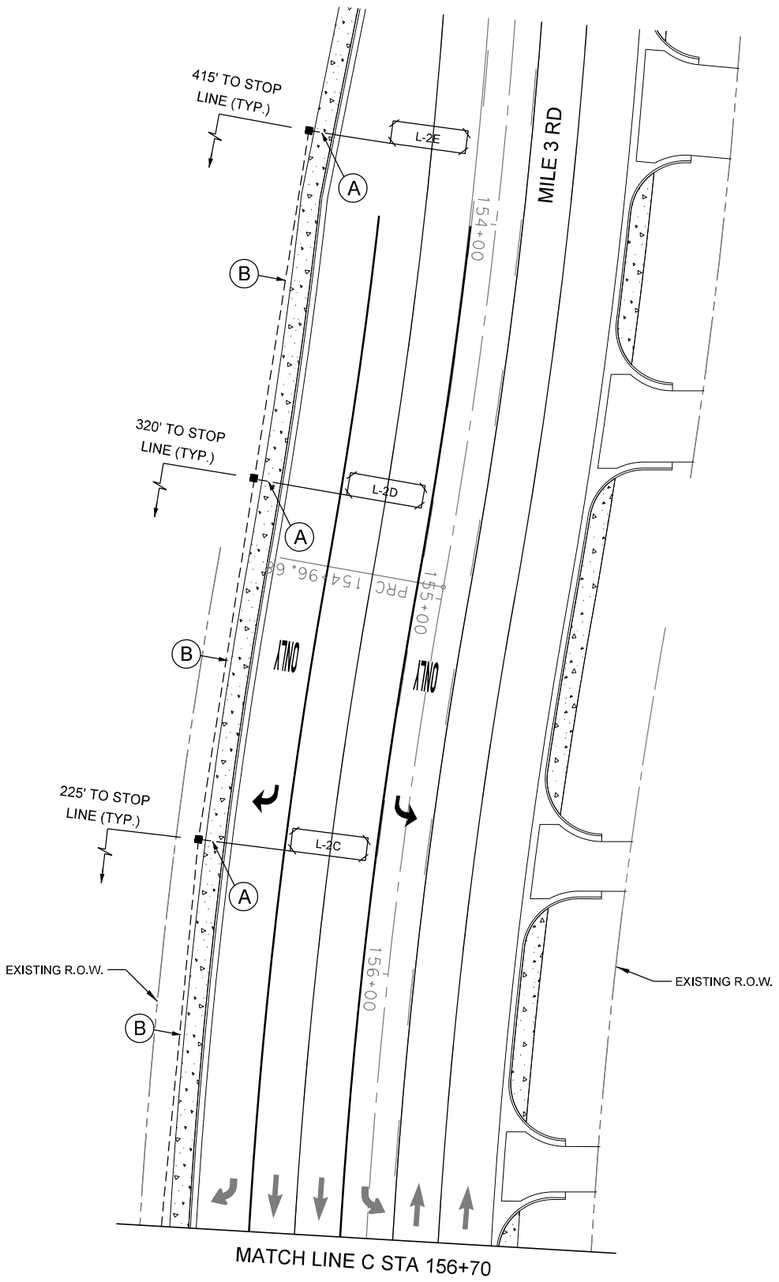
4

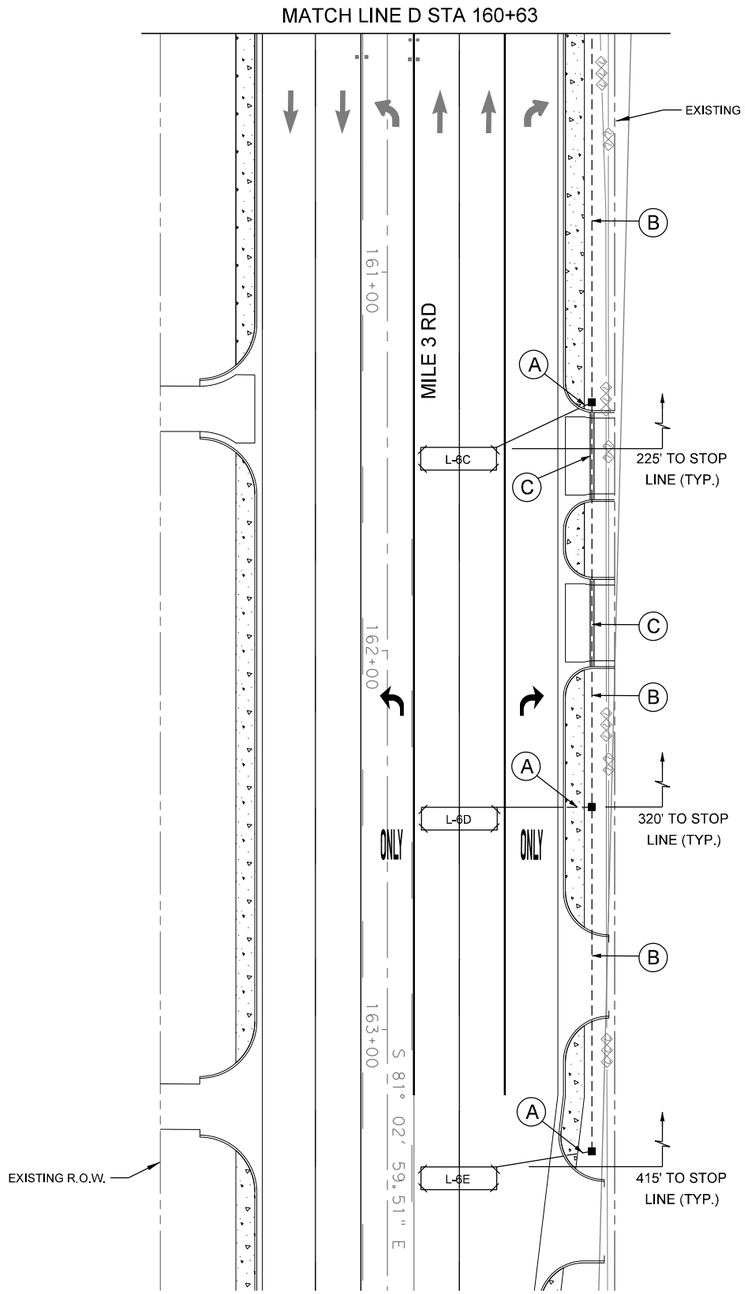
PROPOSED SIGNAL LAYOUT LIBERTY BLVD AT MILE 3 ROAD

SHEET 2 OF 4

DATE: 7/30/2020	CONT	SECT	JOB	HIGHWAY
DN:	0921	02	194	LIBERTY RD
CK DN:	DIST	COUNTY		SHEET NO.
DW:	PHR	HIDALGO		206
CK DW:				

7/30/2020 N:\CLIENTS\L&G\LIBERTY*US83*SIGNALS\ETSI*WORK\PROPOSED\PROPOSED*MILE 3 RD.dgn





LEGEND

- PROPOSED PEDESTRIAN POLE
- PROPOSED SIGNAL POLE
- PROPOSED HORIZONTAL SIGNAL HEAD
- PROPOSED PEDESTRIAN SIGNAL HEAD
- PB3 — PROPOSED PEDESTRIAN PUSH BUTTON & SIGN
- PROPOSED GROUND BOX (TY-A W/APRON)
- PROPOSED GROUND BOX (TY-C W/APRON)
- PROPOSED LUMINAIRE ARM
- PROPOSED CONDUIT (TRENCHED)
- PROPOSED CONDUCTOR (SAWCUT)
- PROPOSED CONDUIT (BORED)
- SX — PROPOSED SPAN WIRE MOUNTED SIGN
- PROPOSED GROUND MOUNTED CONTROLLER CABINET
- L-XX — PROPOSED LOOP DETECTOR
- X — CONDUIT RUN
- PROPOSED ELECTRICAL SERVICE
- DIRECTION OF TRAFFIC

0 10 20 40
SCALE 1" = 40'

THE COUNTY OF HIDALGO TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

STATE OF TEXAS
C. SIMEONIDIS
60919
REGISTERED PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS, P.E. 60919
7/30/2020

4

PROPOSED SIGNAL LAYOUT
LIBERTY BLVD AT MILE 3 ROAD

SHEET 3 OF 4

DATE: 7/30/2020	CONT	SECT	JOB	HIGHWAY
DN:	0921	02	194	LIBERTY RD
CK DN:	DIST	COUNTY		SHEET NO.
DW:	PHR	HIDALGO		207
CK DW:				

7/30/2020 N:\CLIENTS\L&G\LIBERTY+US83+SIGNALS\ETSI+WORK\PROPOSED\PROPOSED+MILE 3 RD.dgn

ELECTRICAL SCHEDULE

ITEM	TOTAL QTY.	RUN NUMBER	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	AA	AB	AC	AD
		RUN LENGTH (.)	150'	1380'	120'	185'	80'	30'	30'	85'	20'	50'	90'	50'	60'	20'	15'	235'	190'	45'	5'	40'	30'	40'	30'
POWER	120'	1/C - # 6														2						2			
GROUND	60'	1/C - # 6 BARE														1						1			
	530'	1/C - # 8 BARE					1	1	1	1	1	1	1	1	1		1				4				
SIGNAL WIRE SIZE TYPE	425'	4/C # 12 (TRAY CABLE)							1	1	1	1	1				2					2		1	
	1270'	3/C #12 (PUSH BUTTONS)					1	1	1	2	2	4	4	2	2						8		1	1	1
	2660'	5/C # 12					1	2	3	4	4	7	7	3	3		2		1	2	14	2	2	3	2
	1200'	7/C # 12						1	1	1	1	2	2	1	1		1	1	1	1	4	1	1	1	1
LOOP	300'	1/C # 14 LOOP WIRE	2																						
	3600'	2/C # 14 (SHIELDED)		1	1	3				3	3	6	6	3	3						12				
CONDUIT	150'	1" PVC	1																						
	1740'	2" PVC		1		1	1	1	1							1	1								
	150'	4" PVC									1	1			1						4				
	120'	2" PVC (BORE)			1																				
	225'	4" PVC (BORE)								1			1	1											
AERIAL																		*	*	*					
INSIDE STRAIN POLE																						*	*	*	*

Elec. Service No.	Sheet No.	Electrical Service Description (see ED (5) & (6) - 14)	Service Conduit Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amp	Two-Pole Contactor Amps	Panelbd/ Loadcenter Amp Rating	Circuit No.	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
TS3	MILE 3	ELC SRV TY D 120/240 060 (NS)GS(L)TS(O)	1 1/4"	3/#6	N/A	2P/60	N/A	100	TS	2P/15	2	5.3
									LIGHT	1P/50	40	

LOOP DETECTOR SCHEDULE

LOOP		SIZE	SAW CUT	WIRE LENGTH	AMP. NO.	SETTING	FUNCTION
L-1A		6' x 60'	188'	352'	1	PRESENCE	CALL AND EXTEND Ø1
L-2A	**	6' x 40'	135'	246'	2	PRESENCE	CALL AND EXTEND Ø2
L-2B		6' x 40'	123'	222'	2	PRESENCE	CALL AND EXTEND Ø2
L-2C		6' x 20'	81'	138'	9	PULSE	CALL AND EXTEND Ø2
L-2D	**	6' x 20'	81'	138'	9	PULSE	CALL AND EXTEND Ø2
L-2E		6' x 20'	79'	134'	9	PULSE	CALL AND EXTEND Ø2
L-3A		6' x 60'	179'	334'	3	PRESENCE	CALL AND EXTEND Ø3
L-4A		6' x 40'	112'	200'	4	PRESENCE	CALL AND EXTEND Ø4
L-4B		6' x 6'	42'	60'	10	PULSE	CALL AND EXTEND Ø4
L-4C	**	6' x 6'	42'	60'	10	PULSE	CALL AND EXTEND Ø4
L-4D		6' x 6'	42'	60'	10	PULSE	CALL AND EXTEND Ø4
L-5A		6' x 60'	189'	354'	5	PRESENCE	CALL AND EXTEND Ø5
L-6A	**	6' x 40'	140'	256'	6	PRESENCE	CALL AND EXTEND Ø6
L-6B		6' x 40'	129'	234'	6	PRESENCE	CALL AND EXTEND Ø6
L-6C		6' x 20'	88'	152'	11	PULSE	CALL AND EXTEND Ø6
L-6D	**	6' x 20'	82'	140'	11	PULSE	CALL AND EXTEND Ø6
L-6E		6' x 20'	82'	140'	11	PULSE	CALL AND EXTEND Ø6
L-7A		6' x 60'	164'	304'	7	PRESENCE	CALL AND EXTEND Ø7
L-8A		6' x 40'	123'	218'	8	PRESENCE	CALL AND EXTEND Ø8
L-8B		6' x 20'	70'	116'	12	PULSE	CALL AND EXTEND Ø8
L-8C	**	6' x 20'	69	114'	12	PULSE	CALL AND EXTEND Ø8
L-8D		6' x 20'	69'	114'	12	PULSE	CALL AND EXTEND Ø8
TOTAL			2309'	4086'			

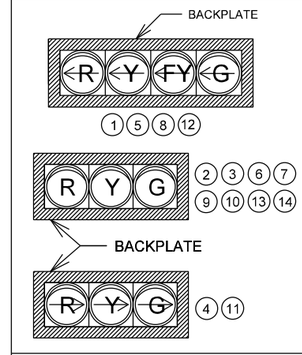
**SPLICED IN SERIES
SPEED LIMIT ON LIBERTY BLVD : 55 MPH
SPEED LIMIT ON MILE 3 ROAD : 55 MPH

POLE & CONTROLLER LOCATIONS

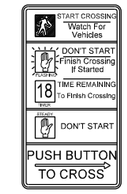
POLE NO.	DESCRIPTION	STA.	OFFSET	FOUNDATION SIZE
P1	34' STRAIN POLE WITH LUMINAIRE AND ELEC SERVICE	137+60.42	52.12' LT	36-B/15.2'
P2	34' STRAIN POLE WITH W3 & PB3	137+59.14	58.17' RT	36-B/15.2'
P3	34' STRAIN POLE WITH LUMINAIRE, W4 & PB4	136+43.60	60.46' RT	36-B/15.2'
P4	34' STRAIN POLE WITH W7 & PB7	136+30.00	60.09' LT	36-B/15.2'
PED1	10' STEEL PEDESTAL POLE WITH W8 & PB8	137+43.14	59.55' LT	24-A x 5.7'
PED2	10' STEEL PEDESTAL POLE WITH W1 & PB1	137+52.87	50.22' LT	24-A x 5.7'
PED3	10' STEEL PEDESTAL POLE WITH W2 & PB2	137+68.90	41.86' RT	24-A x 5.7'
PED4	10' STEEL PEDESTAL POLE WITH W5 & PB5	136+26.07	47.20' RT	24-A x 5.7'
PED5	10' STEEL PEDESTAL POLE WITH W6 & PB6	136+24.02	50.52' LT	24-A x 5.7'
CONTROLLER CABINET	PROPOSED NEMA CONTROLLER IN A GROUND MOUNTED CABINET	137+75.58	67.42' LT	5' X 7'

NOTE:
STATION NUMBERS ARE WITH REFERENCE TO THE CENTER LINE OF LIBERTY ROAD. EXACT LOCATION SHALL BE DETERMINED AND VERIFIED WITH THE ENGINEER PRIOR TO ANY CONSTRUCTION.

PROPOSED SIGNAL EQUIPMENT



ACCESSIBLE PEDESTRIAN SIGNAL UNITS TO INCLUDE PEDESTRIAN PUSH BUTTONS

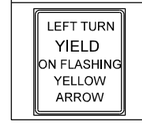


R10-3eR(L)
(9"X15")
W/ PEDESTRIAN PUSH BUTTON
PB1, PB2, PB3, PB4, PB5, PB6, PB7 AND PB8

18"x16"

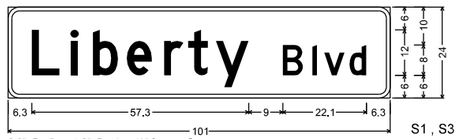


PEDESTRIAN SIGNALS
W1, W2, W3, W4, W5, W6, W7 AND W8



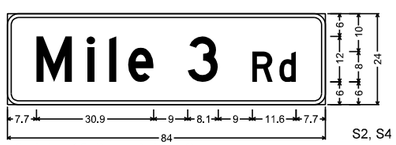
R10-17T
(36"X42")
S5, S6, S7, S8

PROPOSED SIGNS



S1 , S3

3.0" Radius, 1.0" Border, White on Green;
[Liberty] D; [Blvd] D;



S2, S4

3,0" Radius, 1,0" Border, White on Green;
[Mile] D; [3] D; [Rd] D;

NOTES:

1. THE LOCATION SHOWN FOR THE TRAFFIC CONTROLLER, STEEL POLES, LOOP DETECTORS, CONDUIT RUNS AND CONTROLLER FOUNDATION IS APPROXIMATE. THE EXACT LOCATION WILL BE DETERMINED IN THE FIELD BY THE ENGINEER IN COORDINATION WITH THE PHARR DISTRICT TRAFFIC SECTION.
2. ALL SIGNAL CABLE SHALL BE #12 AWG, SERVICE CABLE SHALL BE #6 AWG, 2/C LOOP LEAD- IN CABLE SHALL BE #14 AWG SHIELDED AND LOOP WIRES IN STREET SHALL BE #14 AWG.
3. THE CONTRACTOR SHALL FURNISH AND INSTALL NEW LED TRAFFIC SIGNAL AND PEDESTRIAN SIGNAL HEADS.
4. ALL SIGNAL HEADS SHALL HAVE BACKPLATES.
5. THE LUMINAIRES SHALL BE OPERATED UNDER THEIR OWN PHOTO ELECTRIC CONTROL.
6. PEDESTRIAN SIGNAL HEADS SHALL BE ALIGNED WITH CROSSWALKS.
7. THE CONTRACTOR SHALL VERIFY WITH THE UTILITY COMPANIES AS TO THE EXACT LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION TO AVOID CONFLICT WITH OR DAMAGE TO THESE UTILITIES.
8. THE CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO UTILITY CONFLICTS, AS DEFINED IN THE SPECIFICATIONS OR DEEMED NECESSARY BY THE ENGINEER.
9. REFER TO STATE STANDARD LD(1)-03 AND LD(2)-03 FOR ADDITIONAL LOOP DETECTOR INSTALLATION DETAILS.
10. ALL LUMINAIRES SHALL BE 150W LED.
11. MILE 3 IS EXPECTED TO BE CONSTRUCTED PRIOR TO THE PROJECT. LOOP DETECTOR PLACEMENT TO BE DETERMINED BY THE ENGINEER.

TIMING CHART

PHASE	1	2	3	4	5	6	7	8
STREET	MILE 3		LIBERTY		MILE 3		LIBERTY	
MOVEMENT	WBLT	EB	NBLT	SB	EBLT	WB	SBLT	NB
MIN. GREEN	8	8	8	8	8	8	8	8
EXTENSION	3	3	3	3	3	3	3	3
MAXIMUM I	15	30	15	30	15	30	15	30
MAXIMUM II								
YELLOW	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
ALL RED	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
WALK		7		7		7		7
PED CLEAR		21		17		21		17
RECALL	OFF	ON	OFF	ON	OFF	ON	OFF	ON
MEMORY	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS, P.E. 60919 7/30/2020

THE COUNTY OF HIDALGO TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

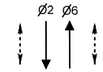
4

PROPOSED SIGNAL LAYOUT LIBERTY BLVD AT MILE 3 ROAD

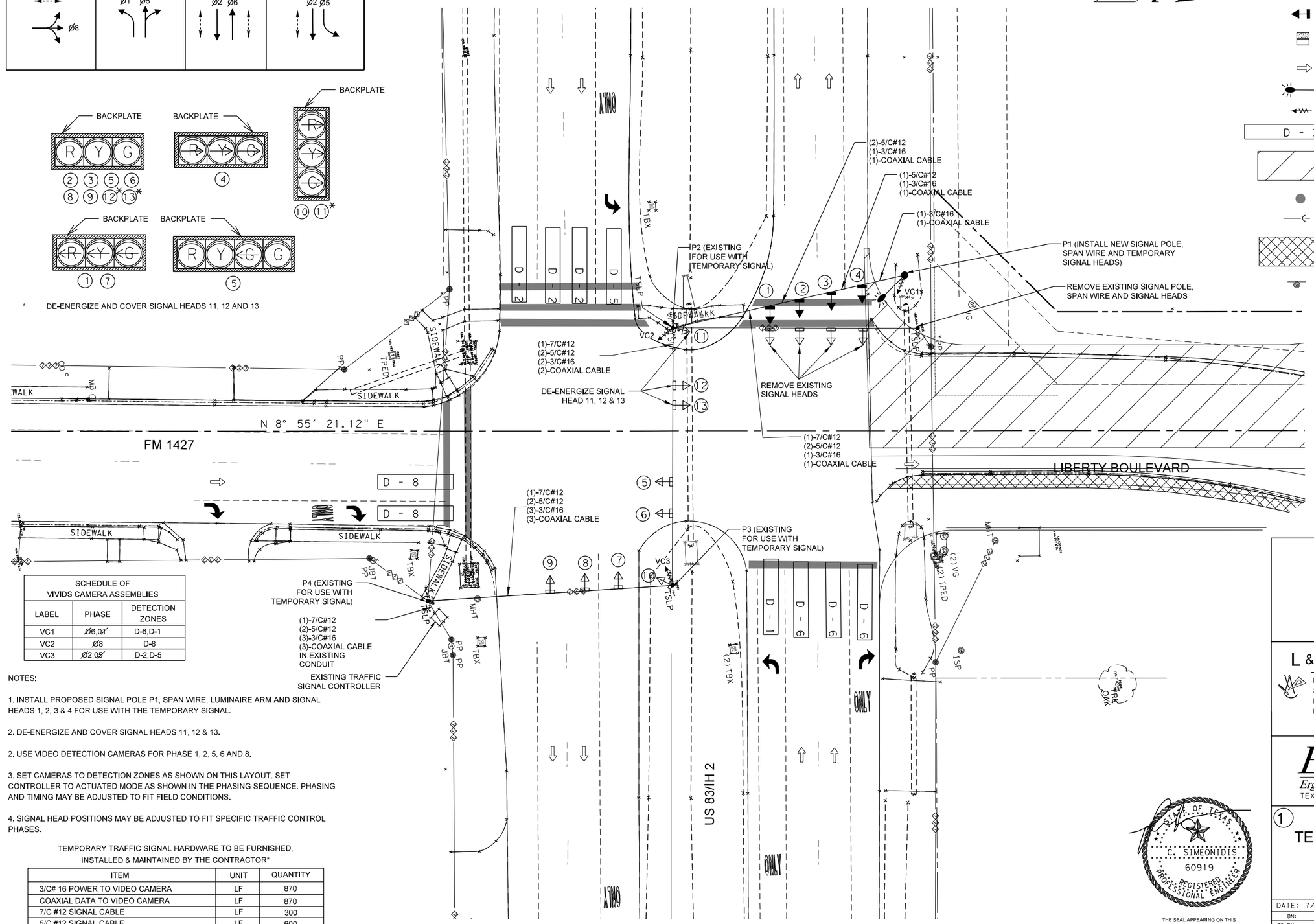
SHEET 4 OF 4

DATE: 7/30/2020		CONT	SECT	JOB	HIGHWAY
DN:		0921	02	194	LIBERTY RD
CK DN:		DIST	COUNTY		SHEET NO.
DW:		PHR	HIDALGO		208
CK DW:					

N:\CLIENTS\L&G\LIBERTY*US83*SIGNALS\ETSI*WORK\PROPOSED\PROPOSED*MILE 3 RD.dgn
7/30/2020

PROPOSED TRAFFIC SIGNAL PHASING			
Ø8	Ø1 + Ø6	Ø2 + Ø6	Ø2 + Ø5
			

* DE-ENERGIZE AND COVER SIGNAL HEADS 11, 12 AND 13



LEGEND

- TEMPORARY WOOD POLE
- TEMPORARY HORIZONTAL SIGNAL HEAD
- PROPOSED SIGNAL HEAD
- PROPOSED GROUND MOUNTED CONTROLLER CABINET
- TEMPORARY DIRECTION OF TRAFFIC FLOW
- TEMPORARY LUMINAIRE ARM
- VIVIDS CAMERAS
- D - X VIDEO DETECTION ZONE
- CONSTRUCTION ZONE
- VERTICAL PANELS
- GUY ANCHOR
- TEMPORARY CONSTRUCTION DETOUR
- TEMPORARY GROUND MOUNTED SIGN

SCALE: 1"=40'

SCHEDULE OF VIVIDS CAMERA ASSEMBLIES		
LABEL	PHASE	DETECTION ZONES
VC1	Ø6,Ø4	D-6,D-1
VC2	Ø8	D-8
VC3	Ø2,Ø5	D-2,D-5

NOTES:

1. INSTALL PROPOSED SIGNAL POLE P1, SPAN WIRE, LUMINAIRE ARM AND SIGNAL HEADS 1, 2, 3 & 4 FOR USE WITH THE TEMPORARY SIGNAL.

2. DE-ENERGIZE AND COVER SIGNAL HEADS 11, 12 & 13.

2. USE VIDEO DETECTION CAMERAS FOR PHASE 1, 2, 5, 6 AND 8.

3. SET CAMERAS TO DETECTION ZONES AS SHOWN ON THIS LAYOUT. SET CONTROLLER TO ACTUATED MODE AS SHOWN IN THE PHASING SEQUENCE. PHASING AND TIMING MAY BE ADJUSTED TO FIT FIELD CONDITIONS.

4. SIGNAL HEAD POSITIONS MAY BE ADJUSTED TO FIT SPECIFIC TRAFFIC CONTROL PHASES.

TEMPORARY TRAFFIC SIGNAL HARDWARE TO BE FURNISHED, INSTALLED & MAINTAINED BY THE CONTRACTOR*

ITEM	UNIT	QUANTITY
3/C# 16 POWER TO VIDEO CAMERA	LF	870
COAXIAL DATA TO VIDEO CAMERA	LF	870
7/C #12 SIGNAL CABLE	LF	300
5/C #12 SIGNAL CABLE	LF	600

* ALL ITEMS ARE SUBSIDIARY TO ITEM 681 - TEMPORARY TRAFFIC SIGNALS

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS, P.E. 60919 7/30/2020

STATE OF TEXAS · C. SIMEONIDIS · 60919 · REGISTERED PROFESSIONAL ENGINEER

THE COUNTY OF HIDALGO TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

1

TEMPORARY SIGNAL LAYOUT LIBERTY BLVD AT US 83 ROAD PHASE V

DATE: 7/30/2020	CONT	SECT	JOB	HIGHWAY
DN:	0921	02	194	LIBERTY RD
CK DN:	DIST	COUNTY		SHEET NO.
DW:	PHR	HIDALGO		209
CK DW:				

7/30/2020 N:\CLIENTS\L&G\LIBERTY*US83*SIGNALS\ETSI*WORK\TEMPORARY\TEMPORARY*US 83*PHASE 5.dgn

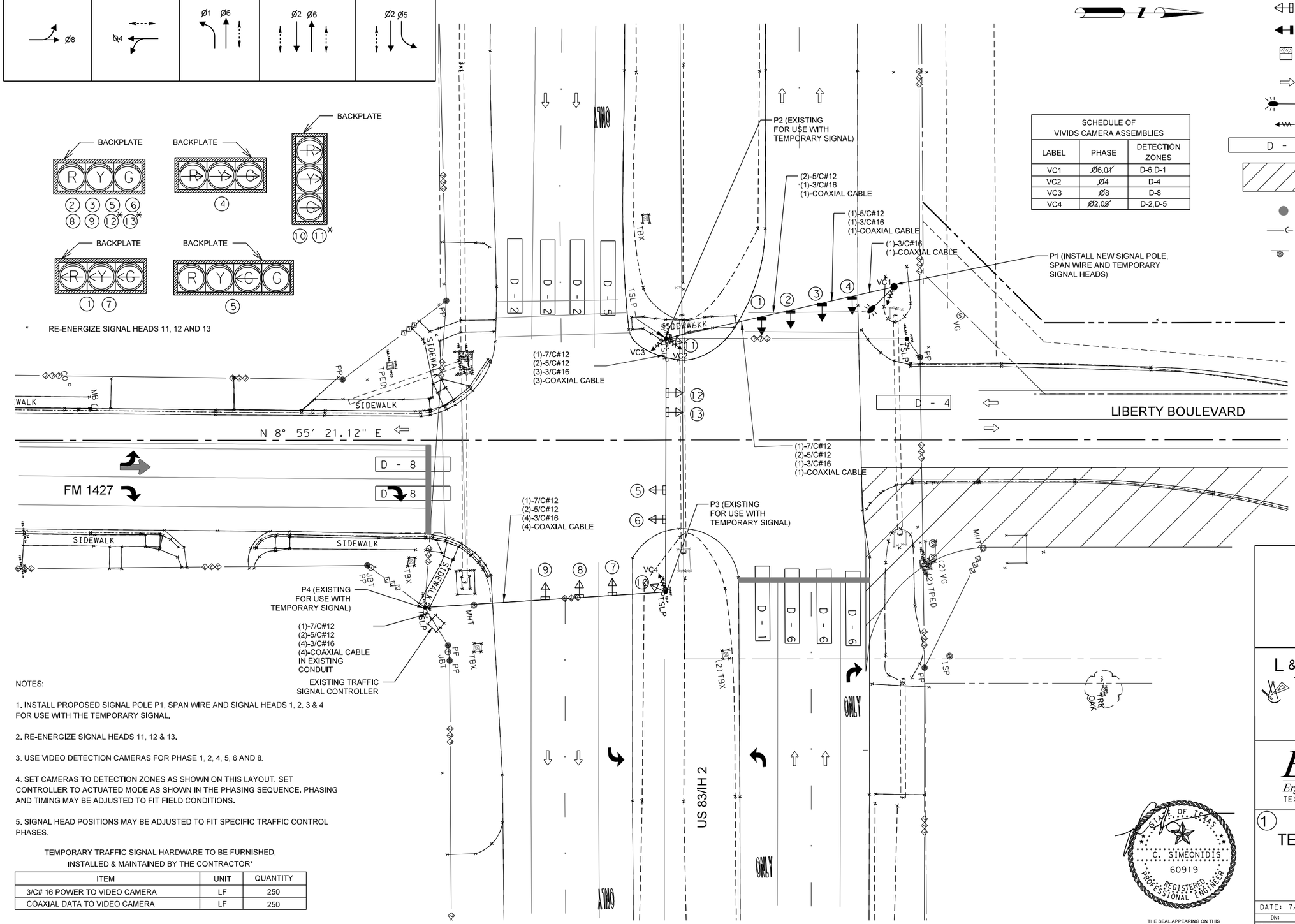
PROPOSED TRAFFIC SIGNAL PHASING				
Ø8	Ø4	Ø1 + Ø6	Ø2 + Ø6	Ø2 + Ø5

* RE-ENERGIZE SIGNAL HEADS 11, 12 AND 13

SCHEDULE OF VIVIDS CAMERA ASSEMBLIES		
LABEL	PHASE	DETECTION ZONES
VC1	Ø6,Ø1	D-6,D-1
VC2	Ø4	D-4
VC3	Ø8	D-8
VC4	Ø2,Ø5	D-2,D-5

LEGEND

- TEMPORARY WOOD POLE
- TEMPORARY HORIZONTAL SIGNAL HEAD
- PROPOSED HORIZONTAL SIGNAL HEAD
- PROPOSED GROUND MOUNTED CONTROLLER CABINET
- TEMPORARY DIRECTION OF TRAFFIC FLOW
- PROPOSED LUMINAIRE ARM
- VIVIDS CAMERAS
- D - X VIDEO DETECTION ZONE
- CONSTRUCTION ZONE
- VERTICAL PANELS
- GUY ANCHOR
- TEMPORARY GROUND MOUNTED SIGN



0 20 40
SCALE: 1"=40'

NOTES:

1. INSTALL PROPOSED SIGNAL POLE P1, SPAN WIRE AND SIGNAL HEADS 1, 2, 3 & 4 FOR USE WITH THE TEMPORARY SIGNAL.

2. RE-ENERGIZE SIGNAL HEADS 11, 12 & 13.

3. USE VIDEO DETECTION CAMERAS FOR PHASE 1, 2, 4, 5, 6 AND 8.

4. SET CAMERAS TO DETECTION ZONES AS SHOWN ON THIS LAYOUT. SET CONTROLLER TO ACTUATED MODE AS SHOWN IN THE PHASING SEQUENCE. PHASING AND TIMING MAY BE ADJUSTED TO FIT FIELD CONDITIONS.

5. SIGNAL HEAD POSITIONS MAY BE ADJUSTED TO FIT SPECIFIC TRAFFIC CONTROL PHASES.

TEMPORARY TRAFFIC SIGNAL HARDWARE TO BE FURNISHED, INSTALLED & MAINTAINED BY THE CONTRACTOR*

ITEM	UNIT	QUANTITY
3/C# 16 POWER TO VIDEO CAMERA	LF	250
COAXIAL DATA TO VIDEO CAMERA	LF	250

* ALL ITEMS ARE SUBSIDIARY TO ITEM 681 - TEMPORARY TRAFFIC SIGNALS

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS. P.E. 60919
7/30/2020

THE COUNTY OF HIDALGO TEXAS

L & G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ETSI
5300 Hollister Road, Suite 220
Houston, Texas 77040
Tel. (713) 956-9601 Fax (713) 956-9667
Ergonomic Transportation Solutions, Inc.
TEXAS REGISTERED ENGINEERING FIRM NO. F - 000625

1

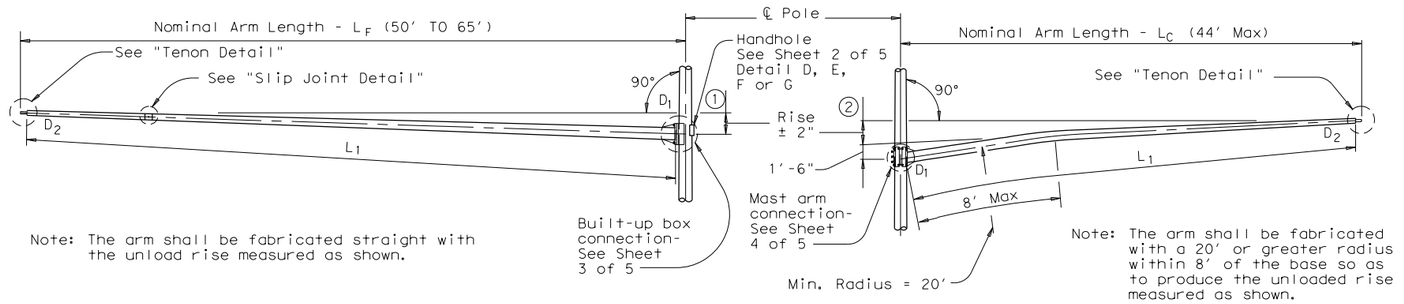
TEMPORARY SIGNAL LAYOUT LIBERTY BLVD AT US 83 ROAD PHASE VI

DATE: 7/30/2020	CONT	SECT	JOB	HIGHWAY
DN:	0921	02	194	LIBERTY RD
CK DN:	DIST	COUNTY		SHEET NO.
DW:	PHR	HIDALGO		210
CK DW:				

N:\CLIENTS\L&G\LIBERTY*US83*SIGNALS\ETSI*WORK\TEMPORARY\TEMPORARY*US 83*PHASE 6.dgn
7/30/2020

DISCLAIMER:
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:
FILE:



Note: The arm shall be fabricated straight with the unload rise measured as shown.

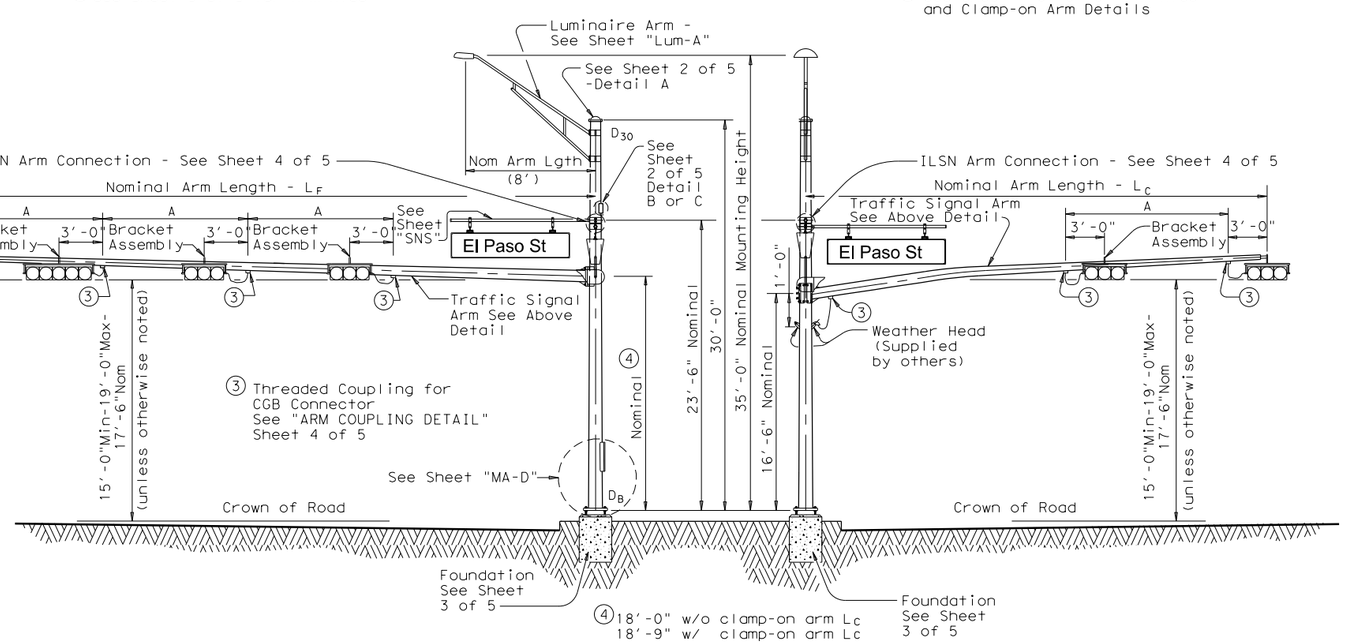
Note: The arm shall be fabricated with a 20' or greater radius within 8' of the base so as to produce the unloaded rise measured as shown.

FIXED MOUNT TRAFFIC SIGNAL ARM

CLAMP-ON TRAFFIC SIGNAL ARM (IF REQUIRED)

① See Sheet 3 of 5 for Arm Rise

② See Sheet 4 of 5 for Arm Rise and Clamp-on Arm Details

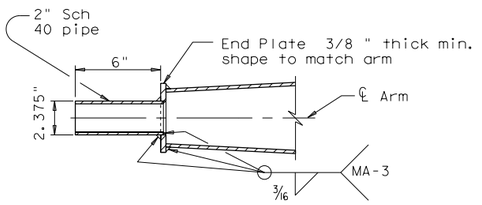


ELEVATION
(Showing fixed mount arm)

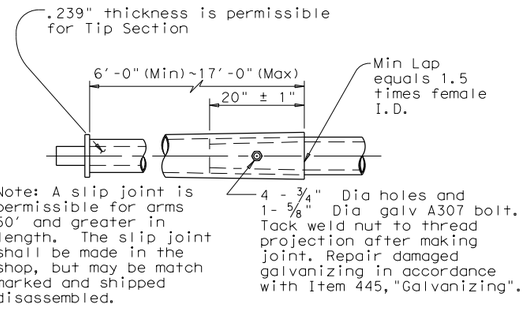
STRUCTURE ASSEMBLY

ELEVATION
(Showing clamp-on arm)

TABLE OF DIMENSIONS "A"										
Arm Length	24'	28'	32'	36'	40'	44'	50'	55'	60'	65'
Arm Type II	10'	11'	12'	13'						
Arm Type III			10'	11'	12'	12'				
Arm Type IV							12'	12'	12'	12'



TENON DETAIL



Note: A slip joint is permissible for arms 50' and greater in length. The slip joint shall be made in the shop, but may be match marked and shipped disassembled.

SLIP JOINT DETAIL(FIXED MOUNT ARM)

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 can be either 100 mph or 80 mph plus a 1.3 gust factor. If clamp-on traffic signal is required, designs are based on an arm included angle of 90 degrees or more. Angles of less than approximately 75 degrees will require a special design.

Poles are designed to support one 8'-0" luminaire arm, two 9'-0" internally lighted street name (ILSN) signs and two traffic signal arms with limited length combinations.

Each arm with its related attachment is shown below

Arm	Equivalent DL ⑤	WL EPA ⑤⑥
8' Luminaire Arm	Luminaire 60 lbs	1.6 sq ft
9' ILSN Arm	Sign 85 lbs	11.5 sq ft
50' to 65' Fixed Mount Arm	Signal Loads 310 lbs	52 sq ft
Up to 44' Clamp-on Arm	Signal Loads 180 lbs	32.4 sq ft

⑤ Equivalent dead load plus horizontal wind load applied at the end of arm except ILSN arm, which applied 4.5' from the centerline of the pole.

⑥ Effective projected area (actual area times drag coefficient) for the application of horizontal wind load.

Except as noted in Sheet 1 thru 5 of 5, other details not covered shall refer to Standard Sheet "MA-D" for pole details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "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. Material, fabrication tolerances, and shipping practices shall also 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.

Deviations from the details and dimensions shown herein require submission of shop drawings in accordance with the Item 441, "Steel Structures". Alternate designs are not acceptable.

Installation of damping plate for the long mast arm is not recommended.

Provision of the bracket assembly used to support the traffic signal heads shall be under the direction of the Engineer for approval.

Design also conforms to NCHRP Report 412 for fatigue resistance except that there are no stiffeners at the base plate. TxDOT is conducting tests to determine if stiffeners at the base plate will or will not result in optimal performance; depending upon the results of the tests, poles may need a retrofit to ensure optimal fatigue performance.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)
LMA(1)-12

Sheet 1 of 5

© TxDOT July 2000

DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT

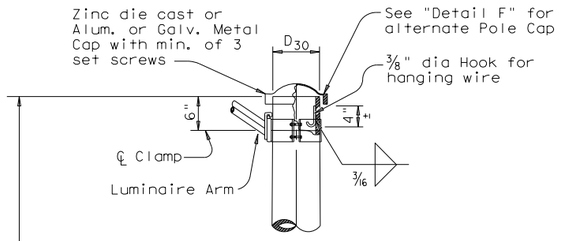
REVISIONS
4-20-01
1-12

CONT	SECT	JOB	HIGHWAY
0921	02	194	LIBERTY BLVD
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		211

131A

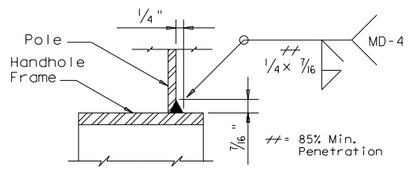
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

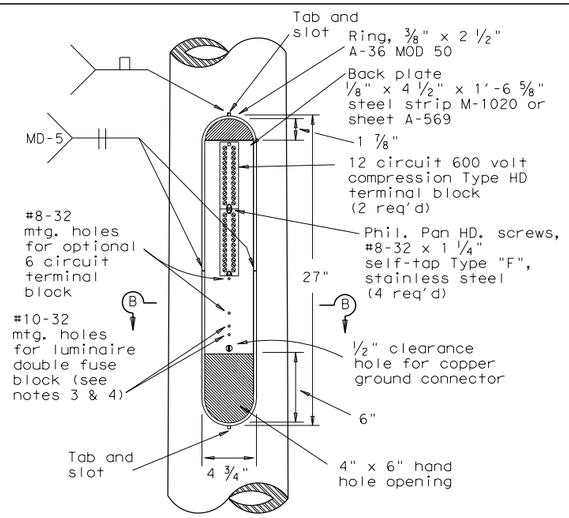


DETAIL A

(for pole with luminaire)



DETAIL H

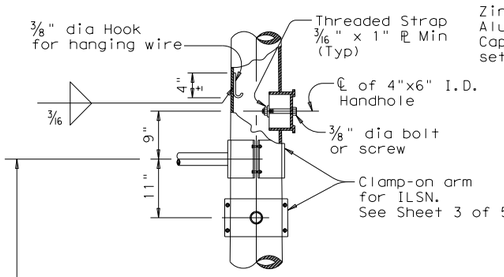


ACCESS COMPARTMENT

MATERIALS	
Round Shafts or Polygonal Shafts (7)	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 (8)
Plates (7)	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325, or A449 except where noted
Pin Bolts	ASTM A325
Pipe (7)	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Misc. Hardware	Galvanized steel or stainless steel or as noted

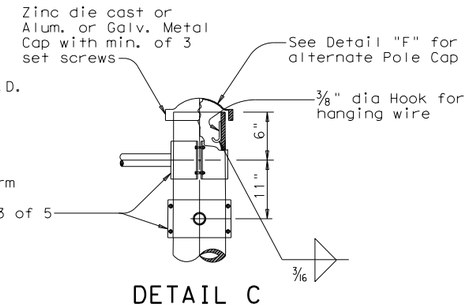
(7) ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F, or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

(8) 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.

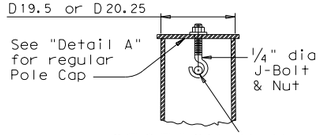


DETAIL B

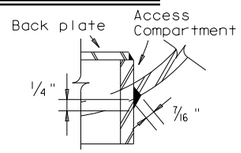
(If ILSN applied)



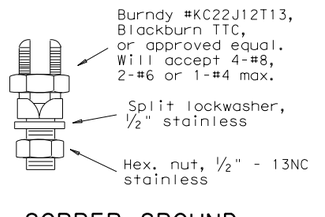
DETAIL C



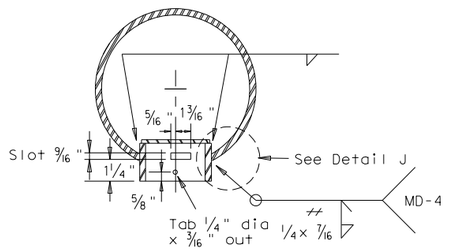
SECTION Y-Y



DETAIL J



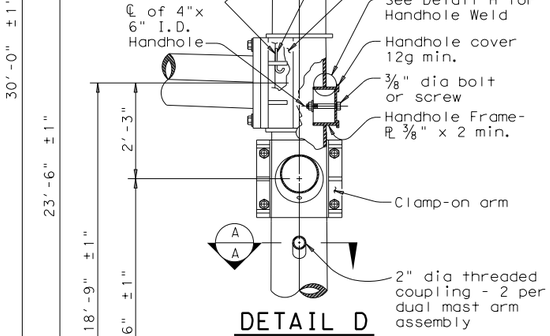
COPPER GROUND CONNECTOR



SECTION B-B

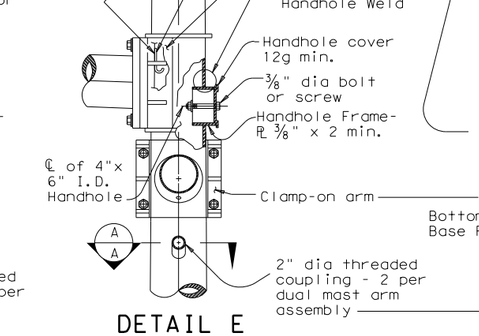
// = 85% Min. Penetration

Opening for access compartment shall be no more than 1/16 inch wider than the access compartment itself.



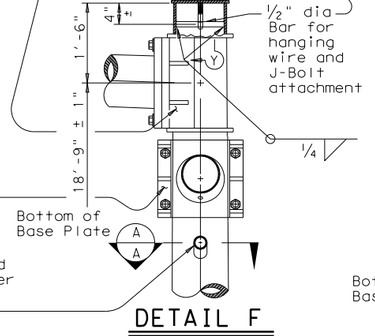
DETAIL D

(for 30' pole with luminaire and ILSN sign)



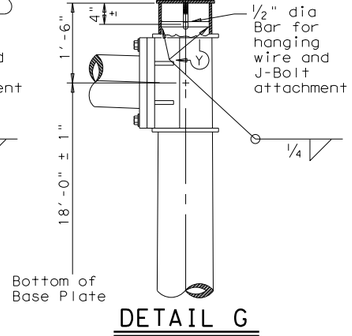
DETAIL E

(for 24' pole with ILSN sign and no luminaire, single or dual mast arm)



DETAIL F

(for 20.25' pole with no ILSN sign and no luminaire, dual mast arm)

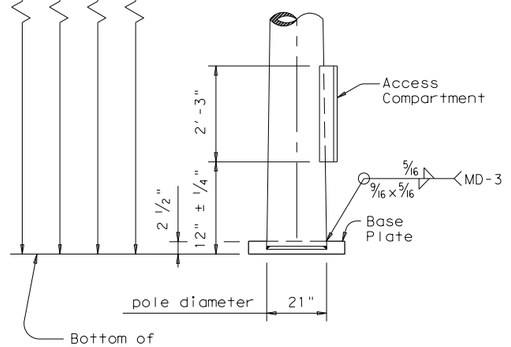


DETAIL G

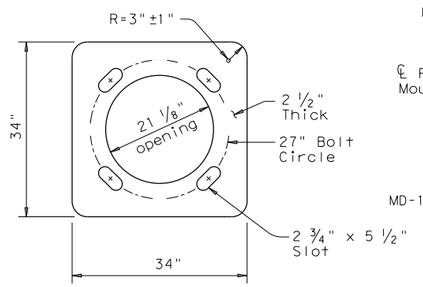
(for 19.5' pole with no ILSN sign and no luminaire, single mast arm)

ACCESS COMPARTMENT NOTES:

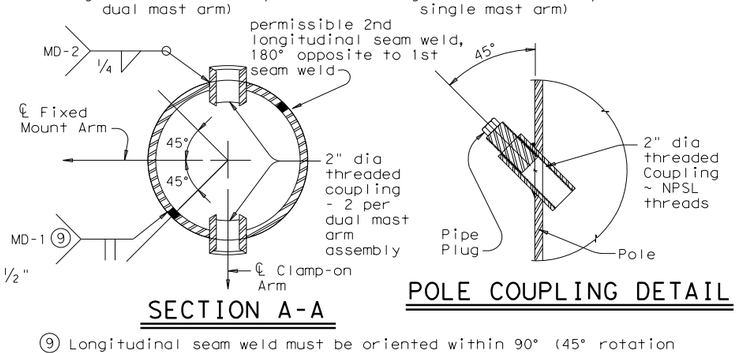
1. The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
2. The pole manufacturer shall provide with each pole a separate kit consisting of: one cover with two latching assemblies, two terminal strips (Marathon #985GP12CU or approved equal), four #8-32 x 1 1/4" self tapping type "F" stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or Ilsco SSS-5). The traffic signal contractor shall install the kit items in the field.
3. The screw hole spacing on the enclosure back plate shall be for two Marathon #985GP12 terminal strips, one Marathon #985GP06CU terminal strip, and one Bussmann #BM6032B fuse block.
4. Install one Bussmann #BM6032B, Littelfuse #L60030M-2C, or Ferraz-Shawmut #30352 fuse block for poles where luminaires are to be installed.



POLE ELEVATION



BASE PLATE



SECTION A-A

POLE COUPLING DETAIL

(9) Longitudinal seam weld must be oriented within 90° (45° rotation each side) along the fixed mount arm. 60% min penetration required, 100% penetration within 6" of circumferential base weld.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)

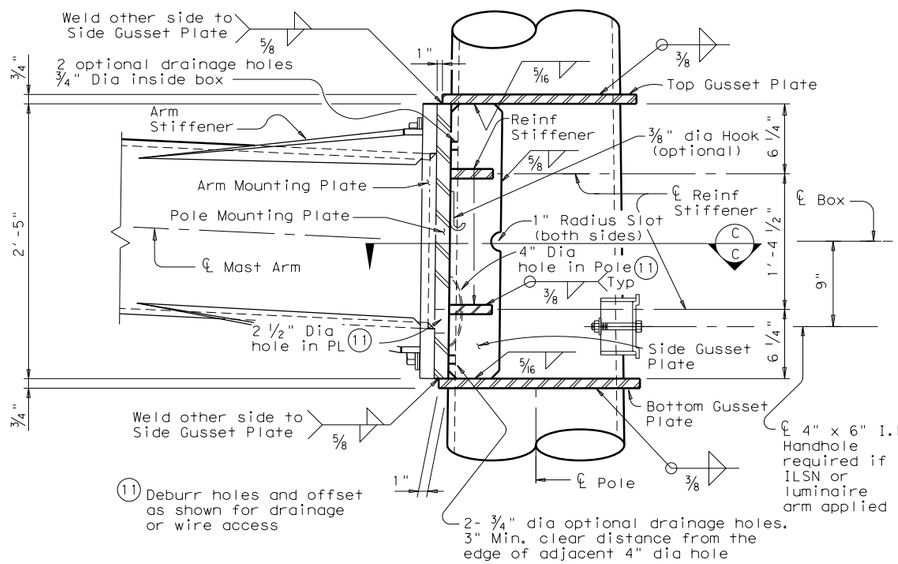
Sheet 2 of 5

LMA(2)-12

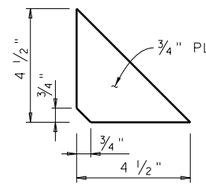
©TxDOT July 2000	DN: JSY	CK: ARC	DW: TGG	CK: JSY
REVISIONS	CONT	SECT	JOB	HIGHWAY
4-20-01	0921	02	194	LIBERTY BLVD
1-12	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		212

131B

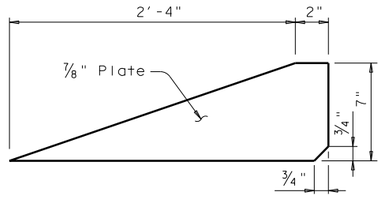
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



BUILT-UP BOX CONNECTION

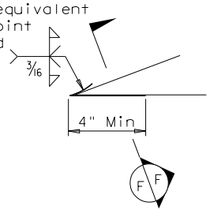


REINFORCING STIFFENER



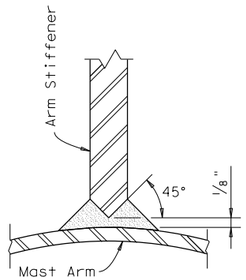
ARM STIFFENER
(Cut to match arm inclination and taper)

Provide Detail shown in SECTION F-F or equivalent 100% complete joint penetration weld from both sides.



Only 4" length at tip of Arm Stiffener requires a complete joint penetration weld. Smooth weld radius to connect Stiffener. Only a fillet weld is required for the remaining weld length.

DETAIL "K"



SECTION F-F

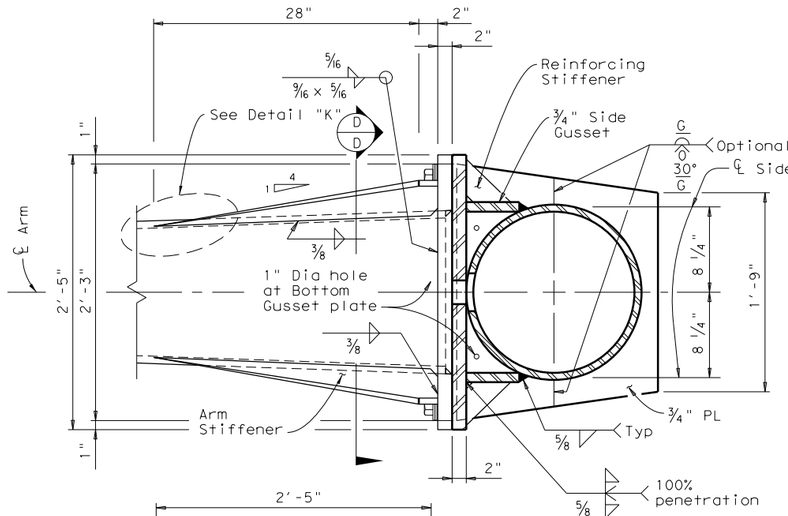
Fixed Mount Arm L_F	ROUND POLES (13)					Foundation Type
	D_B	$D_{19.5}$ or $D_{20.25}$	D_{24}	D_{30}	(12) thk	
ft.	in.	in.	in.	in.	in.	
50', 55' 60', 65'	21.0	18.2	17.6	16.8	.3125	48-A

Fixed Mount Arm L_F	ROUND ARMS (13)				
	L_1	D_1	D_2	(12) thk	Rise
ft.	ft.	in.	in.	in.	
50	49	18.5	11.7	.3125	3'- 3"
55	54	18.5	11.0	.3125	3'- 7"
60	59	18.5	10.3	.3125	3'-11"
65	64	18.5	9.6	.3125	4'- 4"

D_B = Pole Base O.D.
$D_{19.5}$ = Pole Top O.D. with no Luminaire and no ILSN (single mast arm)
$D_{20.25}$ = Pole Top O.D. with no Luminaire and no ILSN (dual mast arm)
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L_F = Fixed Arm Length

(12) Thickness shown is minimum, thicker materials may be used.

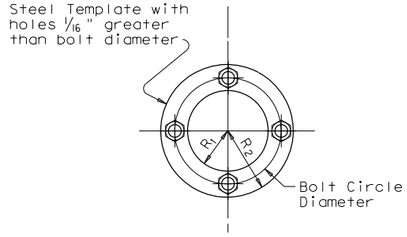
(13) Shaft profile 16-sided or 18-sided is considered to be equivalent to round section.



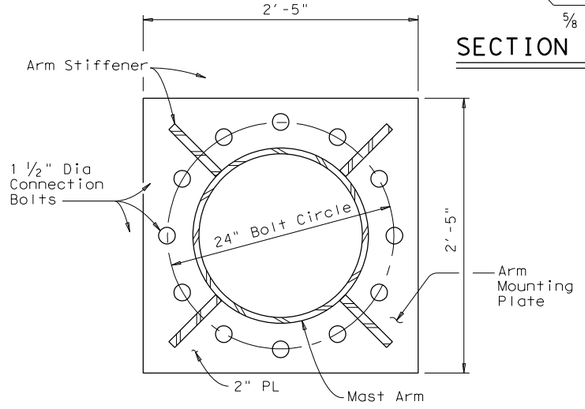
SECTION C-C

NUT ANCHOR
(TYPE 2)

ANCHOR BOLT ASSEMBLY



TEMPLATE DETAIL



SECTION D-D

FOUNDATION DESIGN TABLE													
FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		DRILLED SHAFT LENGTH-ft (16), (17), (18)			ANCHOR BOLT DESIGN (14)				FOUNDATION DESIGN LOAD (15)		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft			ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
				10	15	40							
48-A	48"	20 #9	#4 at 6"	21.9	19.5	14.7	2 1/2"	55	27"	2	490	10	50' to 65' Mast arm assembly.

SEE SHEET "TS-FD" FOR ADDITIONAL DETAILS.

(14) Anchor bolt design develops the foundation capacity given under Foundation Design Loods.

(15) Foundation Design Loads are the allowable moments and shears at the base of the structure.

(16) Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

(17) If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

(18) Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

GENERAL NOTES:

Built-up Box Connection: For the welded arm-to-pole connection as a build-up box configuration illustrated here is an example only, fabricators are required to submit a shop drawing of box connection for approval. The drawing shall specify the details of each box element, welds of arm-to-pole connection, arm-to-plate socket connection, and arm rise creation. Specify the proper location of drain holes along the pole. 2 1/2" dia hole in the pole mounting plate and 4" dia hole in the pole need to be aligned for wiring access or drainage. Arm stiffeners cut to match arm inclination and taper shall also be included.

The deviation from flat for either arm or pole mounting plate shall not exceed 1/32 in., which is measured along the center of mounting plate to a radial distance of 13.5 in. The deformed-from-flat connection between arm and pole mounting plates shall not be allowed if the center of both mounting plates cannot contact directly.

Fixed mount details are used for single mast arm assemblies and for the first arm on dual mast arm assemblies.

ANCHOR BOLT & TEMPLATE SIZE						
Bolt Dia in.	Length ‡	Top Thread	Bottom Thread	Bolt Circle	R_2	R_1
2 1/2"	5'-2"	10"	6 1/2"	27"	16"	11"

‡ Min dimension given, longer bolts are acceptable.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)

Sheet 3 of 5 LMA(3)-12

©TxDOT July 2000

DN: JSY	CK: ARC	DW: TGG	CK: JSY

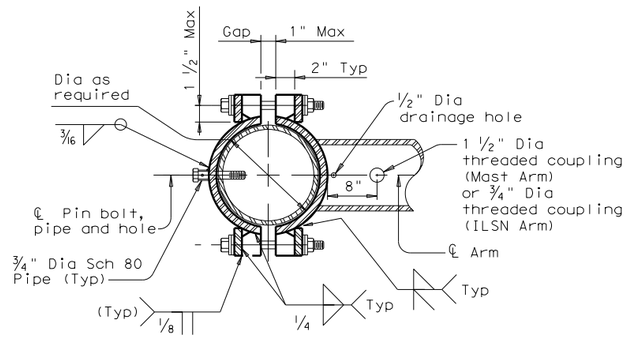
REVISIONS
4-20-01
1-12

CONT	SECT	JOB	HIGHWAY
0921	02	194	LIBERTY BLVD
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		213

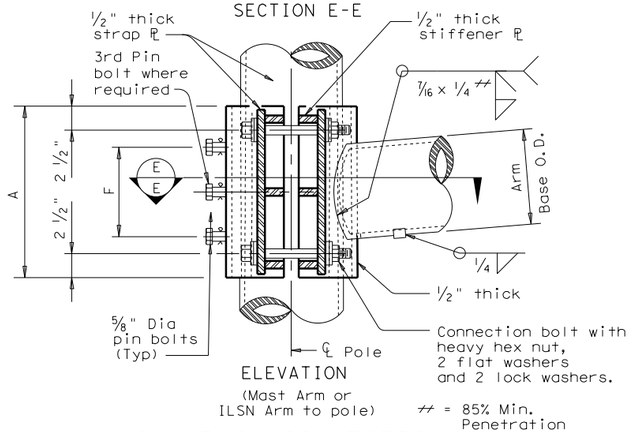
131C

DATE:
FILE:

DISCLAIMER:
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.



SECTION E-E



ELEVATION
(Mast Arm or ILSN Arm to pole)

= 85% Min. Penetration

CLAMP-ON CONNECTION

80 MPH WIND

Clamp-on Arm Lc	ROUND ARMS					POLYGONAL ARMS				
	L1	D1	D2	thk (12)	Rise	L1	D1	D2	thk (12)	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	6.5	3.8	.179	1'-9"	19.1	7.0	3.5	.179	1'-8"
24	23.1	7.5	4.3	.179	1'-10"	23.1	7.5	3.5	.179	1'-9"
28	27.1	8.0	4.2	.179	1'-11"	27.1	8.0	3.5	.179	1'-10"
32	31.0	9.0	4.7	.179	2'-1"	31.0	9.0	3.5	.179	2'-0"
36	35.0	9.5	4.6	.179	2'-4"	35.0	10.0	3.5	.179	2'-1"
40	39.0	9.5	4.1	.239	2'-8"	39.0	9.5	3.5	.239	2'-3"
44	43.0	10.0	4.1	.239	2'-11"	43.0	10.0	3.5	.239	2'-6"

100 MPH WIND

Clamp-on Arm Lc	ROUND ARMS					POLYGONAL ARMS				
	L1	D1	D2	thk (12)	Rise	L1	D1	D2	thk (12)	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	8.0	5.3	.179	1'-8"	19.1	8.0	3.5	.179	1'-7"
24	23.1	9.0	5.8	.179	1'-9"	23.1	9.0	3.5	.179	1'-8"
28	27.1	9.5	5.7	.179	1'-10"	27.1	10.0	3.5	.179	1'-9"
32	31.0	9.5	5.2	.239	1'-11"	31.0	9.5	3.5	.239	1'-10"
36	35.0	10.0	5.1	.239	2'-0"	35.0	10.0	3.5	.239	1'-11"
40	39.0	10.5	5.1	.239	2'-3"	39.0	11.0	3.5	.239	2'-1"
44	43.0	11.0	5.1	.239	2'-8"	43.0	11.5	4.0	.239	2'-3"

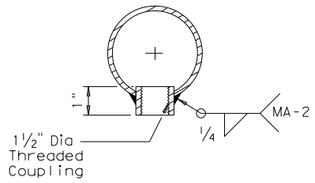
D1 = Arm Base O.D.
D2 = Arm End O.D.
L1 = Shaft Length
Lc = Clamp-on Arm Length

(12) Thickness shown is minimum, thicker materials may be used.

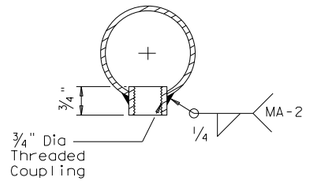
CLAMP-ON ARM CONNECTION

ILSN Arm Size		A	F	4 Conn. Bolts	5/8" Dia. Pin Bolts
Sch 40 pipe Dia	Thick			Dia	No.
in.	in.	in.	in.	in.	ea
3	.216	10	4	¾	2

Mast Arm Size		A	F	4 Conn. Bolts	5/8" Dia. Pin Bolts
Base Dia	Thick			Dia	No.
in.	in.	in.	in.	in.	ea
6.5	.179	12	6	1	2
7.5	.179	14	8	1	2
8.0	.179	14	8	1	2
9.0	.179	16	10	1	2
9.5	.179	18	12	1 ¼	3
9.5	.239	18	12	1 ¼	3
10.0	.239	18	12	1 ¼	3
10.5	.239	18	12	1 ¼	3
11.0	.239	18	12	1 ¼	3
11.5	.239	18	12	1 ¼	3



ARM COUPLING DETAIL



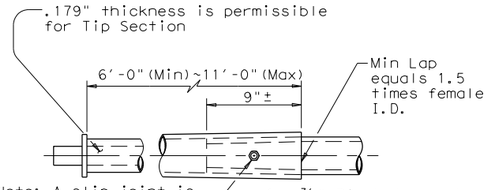
ILSN ARM COUPLING DETAIL

GENERAL NOTES:

Clamp-on details are used for the second arm on dual mast arm assemblies or ILSN arm support. For a clamp-on mast arm, a maximum 1 ½" wide vertical slotted hole may be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1". For an ILSN arm, a 1 ½" diameter hole shall be cut in the front clamp plate for wire access. A matched hole shall be field drilled through the pole to provide wire access after arm is oriented. Deburr both holes.

Where duplicate parts occur on a detail, welds shown for part shall apply to all similar parts on the detail.

Pin bolts are required to prevent rotation of clamp-on arms under design wind forces. Pin bolts shall be ASTM A325 with threads excluded from the shear plane. Pin bolt and ¾" diameter pipe shall have 3/16" diameter holes for a 1/8" diameter galvanized cotter pin. Back clamp plate shall be furnished with a ¾" diameter hole for each pin bolt. An 11/16" diameter hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.

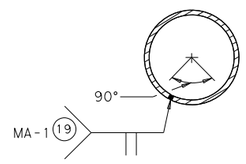


Note: A slip joint is permissible for arms 40' and greater in length. The slip joint shall be made in the shop, but may be match marked and shipped disassembled.

SLIP JOINT DETAIL (CLAMP-ON ARM)

Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 ½" Dia Threaded Coupling.

BRACKET ASSEMBLY



ARM WELD DETAIL

(19) Longitudinal Seam Weld must be oriented within the lower 90° of the signal arm.
60% Min penetration
100% penetration within 6" of circumferential base welds.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)

Sheet 4 of 5 LMA(4)-12

©TxDOT November 2000

DN: JK	CK: GRB	DW: FDN	CK: CAL

REVISIONS
4-20-01
1-12

CONT	SECT	JOB	HIGHWAY
0921	02	194	LIBERTY BLVD
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		214

131D

DATE:
FILE:

DISCLAIMER: 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:
FILE:

Shipping Parts List

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed arm connection bolts and washers, and any additional hardware listed in the table.

Nominal Arm Length	30′ Poles with Luminaire: See note above plus: one (or two if ILSN attached) small hand hole, clamp-on simplex	24′ Poles with ILSN: See note above plus one small hand hole	19.50′ (Single Mast Arm) 20.25′ (Dual Mast Arm) Poles with no Luminaire and no ILSN: See note above

Single Mast Arm

Lf ft.	30′ Poles with Luminaire: Designation	Quantity	24′ Poles with ILSN: Designation	Quantity	19.50′ (Single Mast Arm) 20.25′ (Dual Mast Arm) Poles with no Luminaire and no ILSN: Designation	Quantity
50	50L	3	50S		50	
55	55L	1	55S		55	
60	60L		60S		60	
65	65L		65S		65	

Dual Mast Arm

Lf ft.	Lc ft.	30′ Poles with Luminaire: Designation	Quantity	24′ Poles with ILSN: Designation	Quantity	19.50′ (Single Mast Arm) 20.25′ (Dual Mast Arm) Poles with no Luminaire and no ILSN: Designation	Quantity
50	20	5020L		5020S		5020	
	24	5024L		5024S		5024	
	28	5028L		5028S		5028	
	32	5032L		5032S		5032	
	36	5036L		5036S		5036	
	40	5040L		5040S		5040	
	44	5044L		5044S		5044	
55	20	5520L		5520S		5520	
	24	5524L		5524S		5524	
	28	5528L		5528S		5528	
	32	5532L		5532S		5532	
	36	5536L		5536S		5536	
	40	5540L		5540S		5540	
	44	5544L		5544S		5544	
60	20	6020L		6020S		6020	
	24	6024L		6024S		6024	
	28	6028L		6028S		6028	
	32	6032L		6032S		6032	
	36	6036L		6036S		6036	
	40	6040L		6040S		6040	
	44	6044L		6044S		6044	
65	20	6520L		6520S		6520	
	24	6524L		6524S		6524	
	28	6528L		6528S		6528	
	32	6532L		6532S		6532	
	36	6536L		6536S		6536	
	40	6540L		6540S		6540	
	44	6544L		6544S		6544	

Foundation Summary Table **

Location Ident.	Avg. N Blow/ft.	No. Each	Drill Shaft *** Length (feet)
			48-A
LIBERTY AT LAJOYA BYPASS FR RD	10	4	21.9
Total Drill Shaft Length			87.6

Notes

** Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

*** Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

Shipping Parts List

Traffic Signal Arms (Fixed Mount) (1 per pole)
Ship each arm with listed equipment attached

Nominal Arm Length ft.	Type IV Arm (4 Signals) 3 Bracket Assembly and 4 CGB Connectors: Designation	Quantity
50	50IV	3
55	55IV	1
60	60IV	
65	65IV	

Luminaire Arms (1 per 30′ pole)

Nominal Arm Length	Quantity
10′ Arm	4

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7′ Arm	
9′ Arm	

Traffic Signal Arms (80 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached

Nominal Arm Length ft.	Type I Arm (1 Signal) 2 CGB connector and 1 clamp w/bolts and washers: Designation	Quantity	Type II Arm (2 Signals) 1 Bracket Assembly and 3 CGB connectors, and 1 clamp w/bolts and washers: Designation	Quantity	Type III Arm (3 Signals) 2 Bracket Assembly and 4 CGB connectors, and 1 clamp w/bolts and washers: Designation	Quantity
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	
40					40III-80	
44					44III-80	

Traffic Signal Arms (100 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached

Nominal Arm ft.	Type I Arm (1 Signal) 2 CGB connector and 1 clamp w/bolts and washers: Designation	Quantity	Type II Arm (2 Signals) 1 Bracket Assembly and 3 CGB connectors, and 1 clamp: Designation	Quantity	Type III Arm (3 Signals) 2 Bracket Assembly and 4 CGB connectors, and 1 clamp: Designation	Quantity
20	20I-100					
24	24I-100		24II-100			
28	28I-100		28II-100			
32			32II-100		32III-100	
36			36II-100		36III-100	
40					40III-100	
44					44III-100	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
2 1/2 "	5′ - 3"	4

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". Templates may be removed for shipment.

Abbreviations
Lf= Fixed Arm Length
Lc= Clamp-on Arm Length (44′ Max.)

* NOTE:
1.) THIS SHEET HAS BEEN MODIFIED TO SHOW QUANTITIES.
2.) LUMINAIRE ARM HAS BEEN MODIFIED TO A 10' ARM.

STATE OF TEXAS
C. SIMEONIDIS
60919
REGISTERED PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS, P.E. 60919
7/30/2020

Texas Department of Transportation
Traffic Operations Division

LONG MAST ARM ASSEMBLY PARTS LIST

LMA(5)-12

Sheet 5 of 5

©TxDOT November 2000

DN: JK	CK: GRB	DW: FDN	CK: CAL

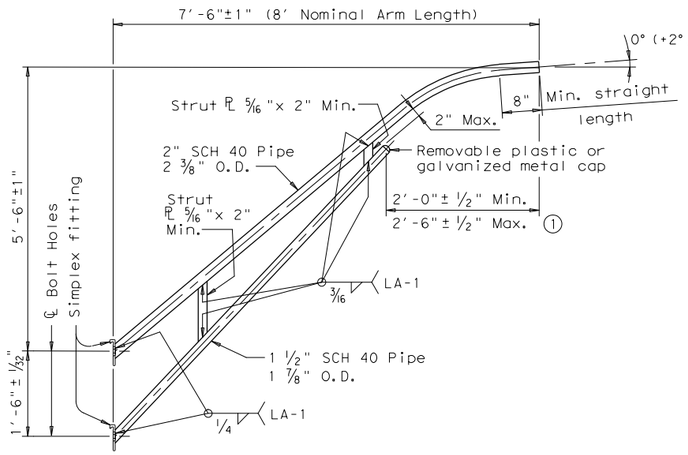
REVISIONS
4-20-01
1-12

CONT	SECT	JOB	HIGHWAY
0921	02	194	LIBERTY BLVD
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		215

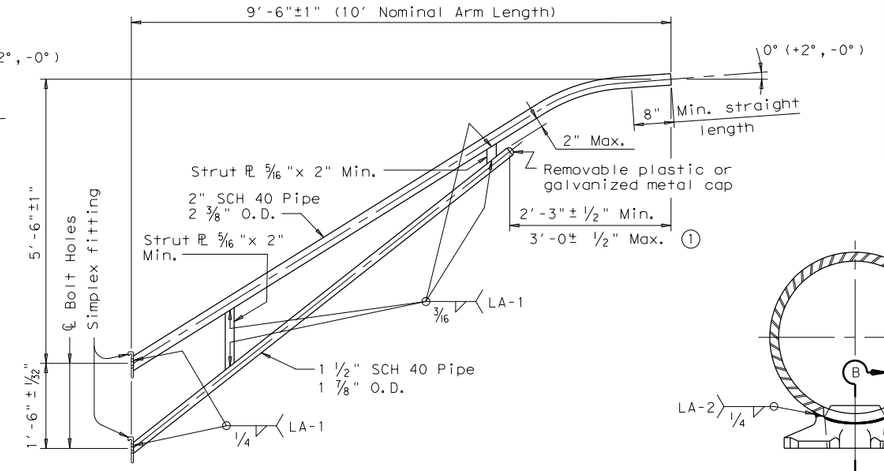
131E

DISCLAIMER: 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.

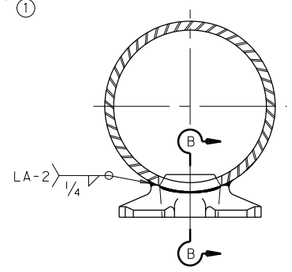
DATE:
FILE:



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.

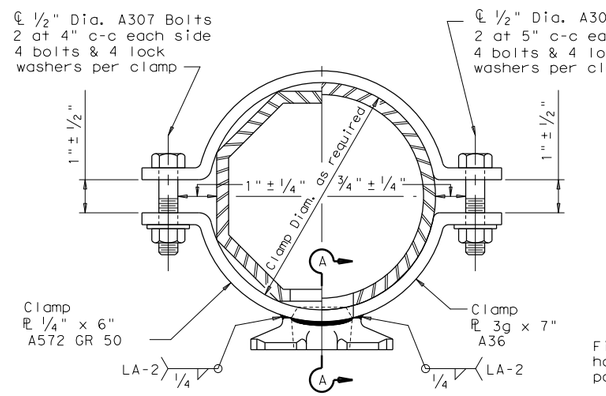
Materials and fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absense of specified 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.

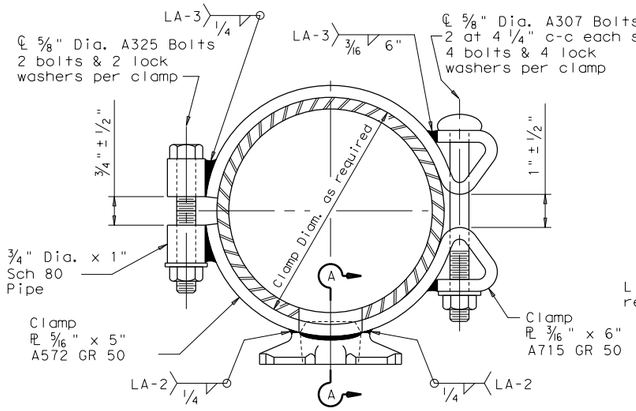
Each pole simplex fitting shall be supplied with 2 ASTM A325 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans. When clamp attachment is specified, the Fabricator shall ship the clamp assembly 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.



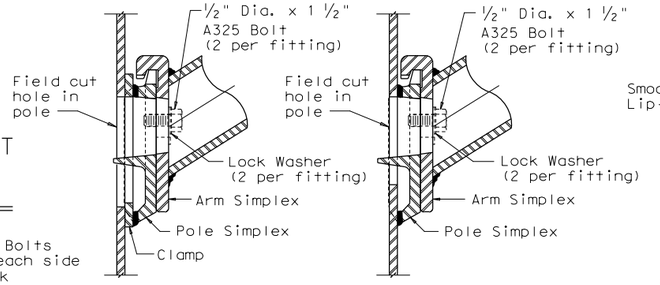
CLAMP ATTACHMENT DETAIL NO. 1 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 2 (HALF SECTION)



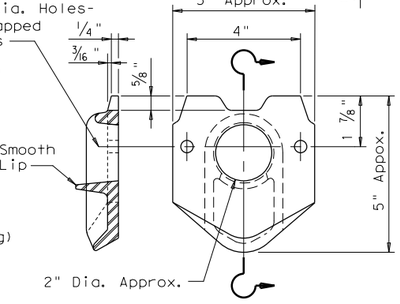
CLAMP ATTACHMENT DETAIL NO. 3 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 4 (HALF SECTION)

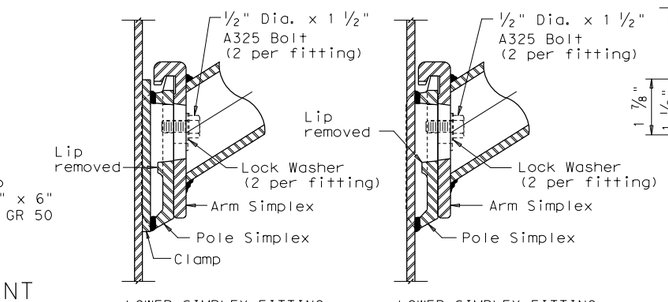


UPPER SIMPLEX FITTING

UPPER SIMPLEX FITTING



POLE SIMPLEX DETAIL

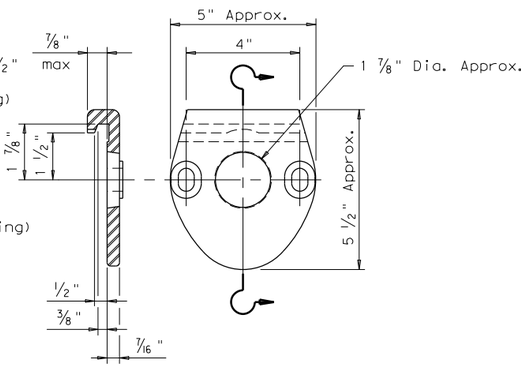


LOWER SIMPLEX FITTING

SECTON A-A

LOWER SIMPLEX FITTING

SECTON B-B



ARM SIMPLEX DETAIL

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY DRAWINGS FOR LUMINAIRE SUPPORT STRUCTURES

ARM DETAILS

LUM-A-12

© TxDOT August 1995

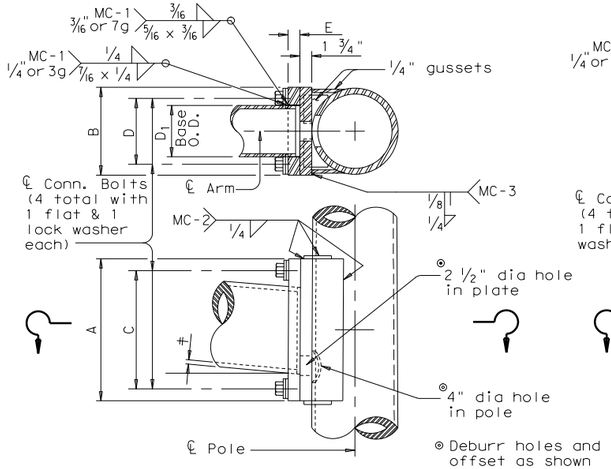
DN: LEH	CK: JSY	DW: LTT	CK: TEB

REVISIONS	CONT	SECT	JOB	HIGHWAY
5-96	0921	02	194	LIBERTY BLVD
1-99	DIST	COUNTY		SHEET NO.
1-12	PHR	HIDALGO		216

DISCLAIMER: 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:
FILE:

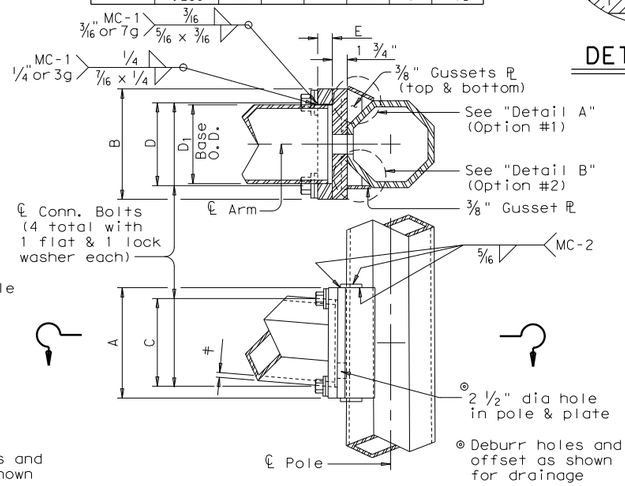
ARM SIZE D_1 in.	ARM SIZE ϯ in.	A in.	B in.	C in.	D in.	E in.	CONN BOLT DIA in.
6.5	.179	12	9	9	6	1 ¾	1
7.5	.179	13	9	10	6	1 ¾	1
8.0	.179	14	10	11	7	2	1 ¼
9.0	.179	16	11	13	8	2	1 ¼
9.5	.179	17	12	14	9	2	1 ¼
9.5	.239	18	12	15	9	2	1 ¼
10.0	.239	18	12	15	9	2	1 ¼
10.5	.239	18	13	15	10	3	1 ½
11.0	.239	18	13	15	10	3	1 ½



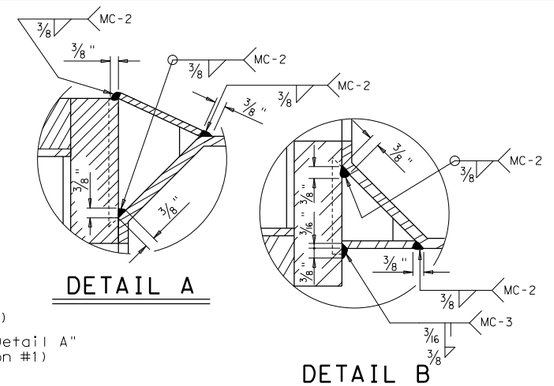
FIXED MOUNT DETAIL 1

ARM SIZE D_1 in.	ARM SIZE ϯ in.	A in.	F in.	CONN. BOLTS No. ea.	CONN. BOLTS Dia in.	PIN BOLTS No. ea.	PIN BOLTS Dia in.
6.5	.179	12	6	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	4	1 ¼	3	5/8
9.5	.239	18	12	4	1 ¼	3	5/8
10.0	.239	18	12	4	1 ¼	3	5/8

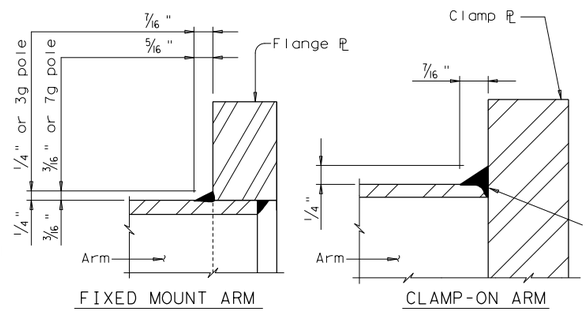
ARM SIZE D_1 in.	ARM SIZE ϯ in.	A in.	B in.	C in.	D in.	E in.	CONN BOLT DIA in.
7.0	.179	11	11	8	8	1 ¾	1 ¼
7.5	.179	11	11	8	8	1 ¾	1 ¼
8.0	.179	11	11	8	8	2	1 ¼
9.0	.179	13	13	10	10	2	1 ¼
10.0	.179	13	13	10	10	2	1 ¼
9.5	.239	13	13	10	10	2	1 ¼
10.0	.239	14	14	11	11	2	1 ½
11.0	.239	14	14	11	11	3	1 ½
11.5	.239	14	14	11	11	3	1 ½



FIXED MOUNT DETAIL 2



ARM SIZE D_1 in.	ARM SIZE ϯ in.	A in.	F in.	T in.	CONN. BOLTS No. ea.	CONN. BOLTS Dia in.	PIN BOLTS No. ea.	PIN BOLTS Dia in.
7.0	.179	12	6	¾	4	¾	2	5/8
7.5	.179	14	8	¾	4	¾	2	5/8
8.0	.179	14	8	¾	4	¾	2	5/8
9.0	.179	16	10	⅞	4	1	2	5/8
10.0	.179	18	10	⅞	4	1	2	5/8
9.5	.239	18	10	1	6	1	3	5/8
10.0	.239	18	10	1	6	1	3	5/8



ARM BASE WELD DETAILS

ARM SIZE D_1 in.	ARM SIZE ϯ in.	A in.	F in.	CONN. BOLTS No. ea.	CONN. BOLTS Dia in.	PIN BOLTS No. ea.	PIN BOLTS Dia in.
6.5	.179	12	6	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	6	1	3	5/8
9.5	.239	18	12	6	1	3	5/8
10.0	.239	18	12	6	1	3	5/8

MATERIALS	
Round Shafts or Polygonal Shafts ①	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 ②
Plates ①	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325 or A449, except where noted
Pin Bolts	ASTM A325
Pipe ①	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Misc. Hardware	Galvanized steel or stainless steel or as noted

① 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.

② ASTM A1011 SS Gr.50 material 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:

Clamp-on details are used for the second arm on dual mast arm assemblies. A Maximum 1 ½" wide vertical slotted hole shall be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1"

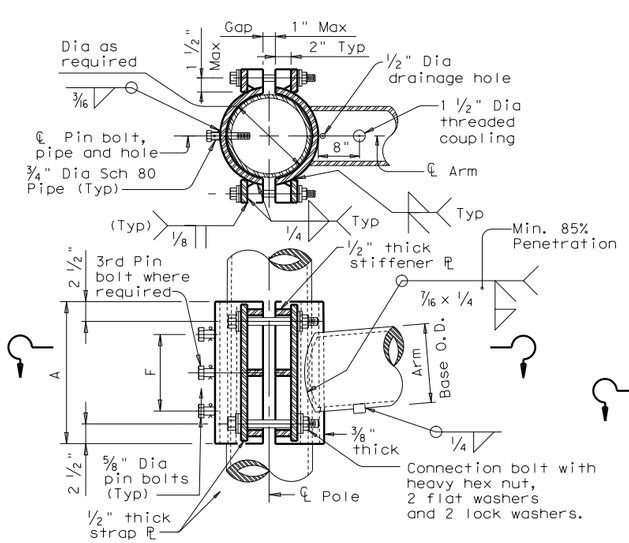
Fixed mount details are used for single mast arm assemblies and for the first arm on dual mast arm assemblies.

Where duplicate parts occur on a detail, welds shown for one part shall apply to all similar parts on the detail.

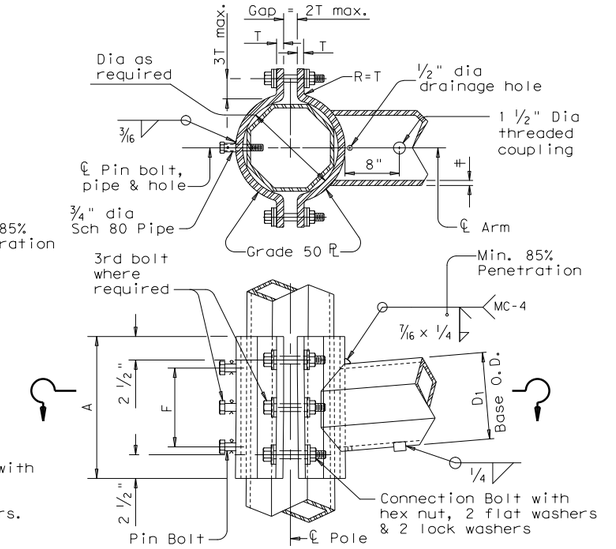
Pin bolts are required to prevent rotation of clamp-on arms under design wind forces.

NOTE:

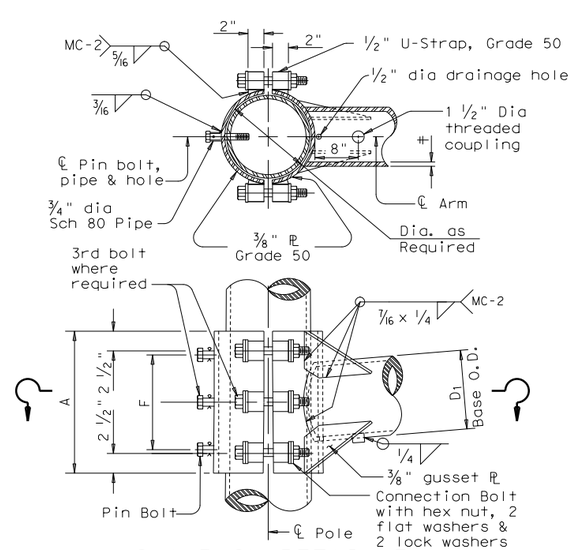
Pin bolts shall be A325 with threads excluded from the shear plane. Pin bolt and ¾" dia pipe shall have 5/16" dia holes for a 1/8" dia galvanized cotter pin. Back clamp plate shall be furnished with a ¾" dia hole for each pin bolt. An 11/16" dia hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.



CLAMP-ON DETAIL 1



CLAMP-ON DETAIL 2



CLAMP-ON DETAIL 3

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY FOR TRAFFIC SIGNAL SUPPORT STRUCTURES

MAST ARM CONNECTIONS

MA-C-12

©TxDOT August 1995

REVISIONS
5-96
5-09
1-12

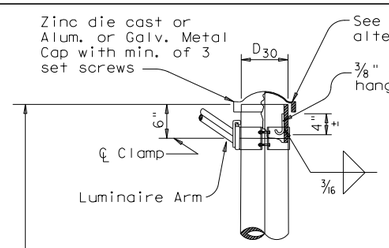
DN: MS	CK: JSY	DW: MMF	CK: JSY

CONT	SECT	JOB	HIGHWAY
0921	02	194	LIBERTY BLVD
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		217

126A

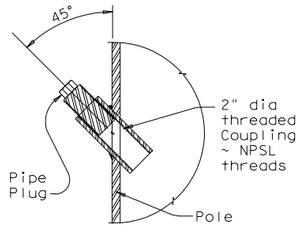
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

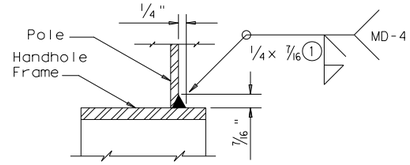


DETAIL A

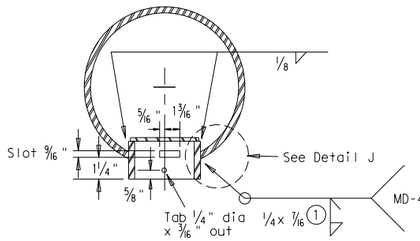
(for pole with luminaire)



POLE COUPLING DETAIL

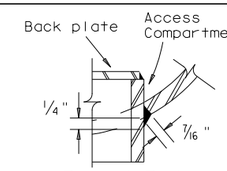


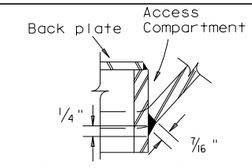
DETAIL G



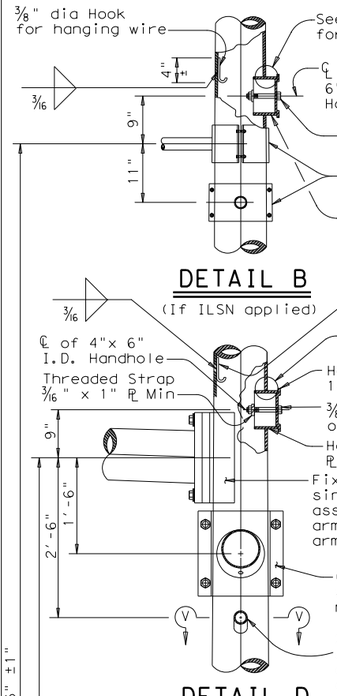
SECTION X-X

Opening for access compartment shall be no more than 1/16 inch wider than the access compartment itself.

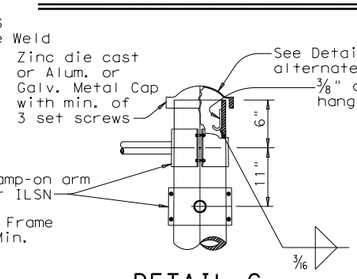




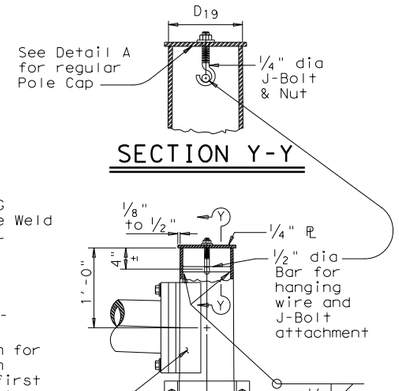
DETAIL J



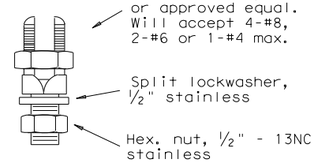
DETAIL B



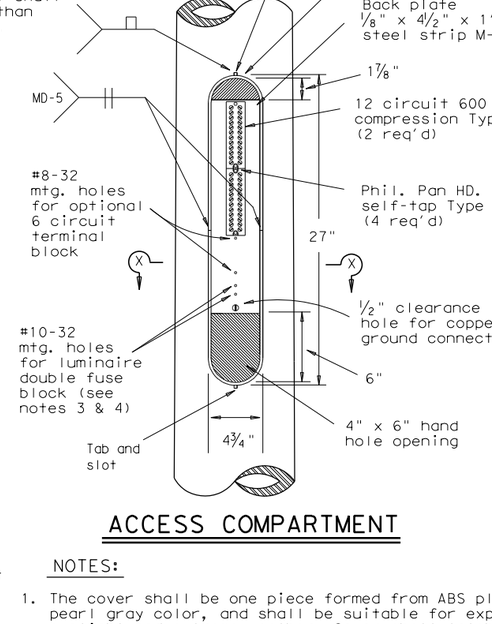
DETAIL C



SECTION Y-Y



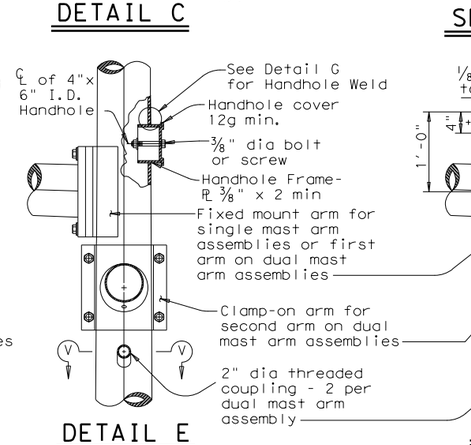
COPPER GROUND CONNECTOR



ACCESS COMPARTMENT

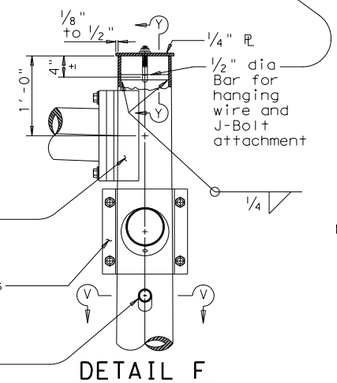
DETAIL D

(for 30' pole with luminaire and ILSN sign)



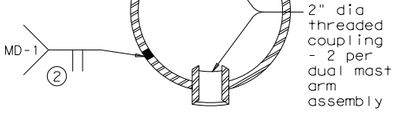
DETAIL E

(for 24' pole with ILSN sign and no luminaire)

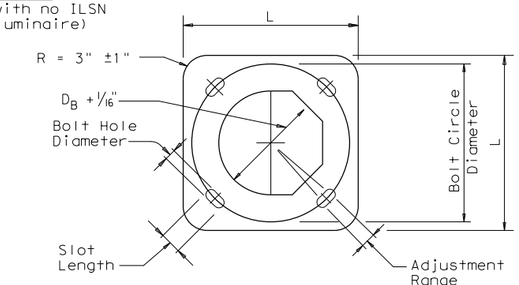


DETAIL F

(for 19' pole with no ILSN sign and no luminaire)

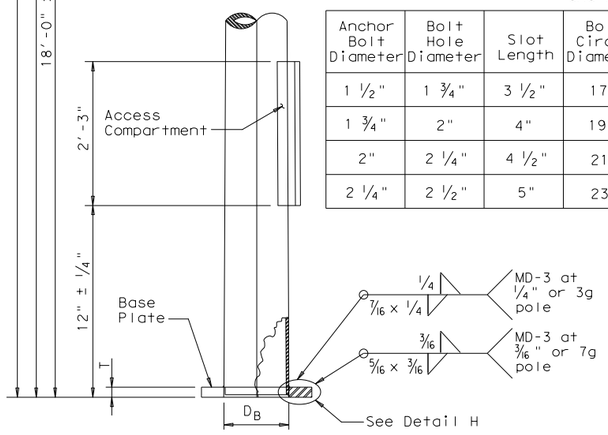


SECTION V-V

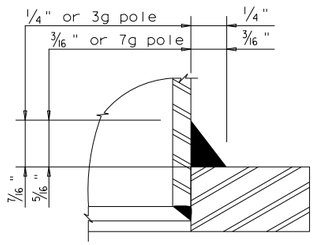


BASE PLATE PLAN

Anchor Bolt Diameter	Bolt Hole Diameter	Slot Length	Bolt Circle Diameter	Base ℞ Dim. L x T	Adjust. Range
1 1/2"	1 3/4"	3 1/2"	17"	18" x 1 1/2"	13.4°
1 3/4"	2"	4"	19"	20" x 1 3/4"	13.5°
2"	2 1/4"	4 1/2"	21"	22" x 2"	13.6°
2 1/4"	2 1/2"	5"	23"	24" x 2 1/4"	13.7°



POLE ELEVATION



DETAIL H

(1) 85% Min. penetration

(2) 60% Min. penetration 100% pemetration within 6" of circumferential base welds.

NOTES:

1. The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
2. The pole manufacturer shall provide with each pole a separate kit consisting of: one cover with two latching assemblies, two terminal strips (Marathon #985GP12CU or approved equal), four #8-32 x 1 1/4" self tapping type "F" stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or Ilsco SSS-5). The traffic signal contractor shall install the kit items in the field.
3. The screw hole spacing on the enclosure back plate shall be for two Marathon #985GP12 terminal strips, one Marathon #985GP06CU terminal strip, and one Bussmann #BM6032B fuse block.
4. Install one Bussmann #BM6032B, Littelfuse #L60030M-2C, or Ferraz-Shawmut #30352 fuse block for poles where luminaires are to be installed.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES MAST ARM POLE DETAILS

MA-D-12

© TxDOT August 1995

DN: MS	CK: JSY	DW: FDN	CK: CAL

REVISIONS
8-99
1-12

CONT	SECT	JOB	HIGHWAY
0921	02	194	LIBERTY BLVD
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		218

DISCLAIMER: 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:
FILE:

ROADWAY ILLUMINATION LIGHT FIXTURES

Fixture Housing:

A. Provide *UL listed fixture suitable for use in wet locations. Ensure optical compartment meets IEC Standard 60529-IP 65. Place a permanent label inside fixture indicating fixture meets *UL, IP 65 optical, and shows date of manufacture. Meet ANSI 136.15 wattage label requirements.
B. Construct fixture housing, lens frame, and door from 96% copper-free, die cast aluminum. Provide fixture mounting to a 2-in. pipe arm. Equip fixture with a 4-bolt clamp capable of adjustments plus or minus 5 degrees from level. Meet ANSI 136.31 3.0 G vibration requirements.
C. Attach a level bubble to the fixture housing. Ensure the level bubble is sensitive to 1 degree changes in position at any point within 5 degrees of the level position. Ensure the level bubble is clearly visible from the ground up to a 50 ft. mounting height. Ensure level bubble corresponds to level position of fixture.
D. Do not exceed 1.6 sq. ft. effective projected area. Do not exceed 60 lb. maximum weight.
E. Equip fixture with a 3-prong photocell receptacle with shorting cap installed.
F. Paint inside and outside of fixture light gray, when installing on galvanized poles. For all other fixtures, paint to match the color of the pole as directed by the Department.
G. Use a thermoset powder coat system. Ensure paint exceeds 1000-hr. salt-spray test in accordance with ASTM B117. Ensure a nominal thickness of 2.5 mil and no pigment loss upon 50 double-rubs using Methyl Ethyl Ketone (MEK) solvent in accordance with ASTM D5402, "Standard Practice for Assessing the Solvent Resistance of Organic Coatings Using Solvent Rubs."
H. Fabricate brackets, nuts, bolts, washers, ballast tray, and parts from stainless-steel, or aluminum of adequate thickness as approved by the Department except that:
   1. The 4 bolts/studs, 4 flat washers, 4 lock washers, and clamp that attach the luminaire to the arm may be galvanized in accordance with ASTM A123, A153 or B633. Provide means to ensure clamp is in the open position when installing.
   2. Glass lens retainer spring clips may be fabricated from galvanized steel in accordance with ASTM A153.
   3. Provide nylon throat or other approved locking means for all stainless steel nuts.
I. Provide optical assemblies which meet the following:
   1. Polished aluminum reflectors with Alzak or equal coating.
   2. Do not paint reflectors, except that, when approved by the Engineer, some surfaces may be painted with 92% reflective white paint.
   3. Reflectors may be one piece or segmented as follows.
      a. One piece reflectors:
         1. Seal photometric compartment by the use of a seamless or vulcanized seam, closed-cell silicone gasket, or other method approved by the Department.
         2. Provide a non-adjustable lamp socket mounting method so the lamp center is consistent with the reflector.
      b. Segmented reflectors:
         1. Attach segments at both ends (or opposite sides if segments are square) of the segment to a rigid aluminum base plate and side wall support assembly. Seal glass lens to lens frame with a one piece seamless silicone gasket.
   4. Equip the optical assembly with a lamp support in addition to the lamp socket to ensure the outer envelope is positioned as intended.
J. Provide 5/32 in. thick (min.) clear heat tempered or borosilicate glass.

Electrical Components:

K. Meet the following ballast requirements and pass tests in accordance with Test Method Tex-1130-T, "Ballasts of Lighting Assemblies."
   1. Mount electrical components on a removable stainless steel or aluminum tray of adequate thickness.
   2. Provide a fixture wiring diagram on or near the ballast.
   3. Use a copper wound magnetic regulating three isolated coil ballast.
   4. Provide ballast factor between 0.95 and 1.0.
   5. When the circuit voltage indicated on the plans is applied, the ballast input wattage during fluctuations of the test voltage of plus 10 percent and minus 10 percent, do not exceed the following:
      a. 220 Watts for 150 watt nominal lamp rating
      b. 440 Watts for 250 watt nominal lamp rating
      c. 552 Watts for 400 watt nominal lamp rating
   6. During fluctuation of the test voltage of plus 10 percent and minus 10 percent, ensure the lamp wattage fluctuation does not exceed a total of 20 percent and ballast maintains lamp wattage within the following limits.
      a. 110 Watts minimum and 180 Watts maximum for 150 Watt nominal lamp rating
      b. 175 Watts minimum and 370 Watts maximum for 250 Watt nominal lamp rating
      c. 280 Watts minimum and 475 Watts maximum for 400 Watt nominal lamp rating
   7. Ensure the ballast power factor, when tested at circuit voltage indicated on the plans, is not less than 90%.
   8. Permanently and clearly mark ballast or fixture to indicate following:
      a. Lamp type
      b. Catalog number
      c. Voltage rating
      d. Connection diagram
      e. Manufacturer
      f. *UL listing
L. Meet the following electronic starting aid requirements and pass tests in accordance with Test Method Tex-1140-T, "Electronic Starting Aids of High Pressure Sodium Vapor Lighting Assemblies."
   1. Provide a starting pulse with an amplitude of 2500 volts minimum, 4000 volts maximum.
   2. Ensure the pulse width is a minimum of 0.8 microseconds at 2250 volts.
   3. Ensure the pulse occurs when the open circuit voltage is equal to or greater than 90 percent of peak open circuit voltage.
   4. Ensure pulse repetition rate is a minimum of one per cycle.
   5. Provide a pulse current of 0.18 amperes (min.).
   6. Discontinue to pulse when, either,
      a. the lamp starts, or
      b. after a minimum of 3 minutes and a maximum of 10 minutes if the lamp fails to start.
M. Do not place fuses inside pole mounted luminaires. For wall mount or underpass mounted luminaires, provide internal 10 amp time-delay fuses.
N. Provide a two position terminal block for connecting supply wires which meet the following requirements:
   1. Insulate using nylon, porcelain, or phenolic material. Ensure phenolic terminal block is of adequate construction as approved by the Department.
   2. Fabricate terminals from nickel, tin plated brass, or aluminum.
O. Equip fixture with MOV surge protection in accordance with IEEE recommendations.
   1. Connect MOV from line to neutral or from line to line.
   2. Install MOV on the terminal block.

Lamp & Socket:

P. Provide *UL listed mogul base lamp sockets rated for 600 V, 1500 W that can withstand a 5000 V pulse. Meet *UL 496 requirements. Use porcelain-insulated lamp sockets with nickel plated copper alloy screw shells. Equip socket shell with a spring tensioned contact. Use nickel-plated copper alloy or stainless steel for the spring and contact.
Q. Supply and secure lamps inside the fixture that meet the following:
   1. Use pre-qualified high pressure sodium (HPS) lamps from TxDOT's material producers list of the wattages shown on the plans. No alternatives allowed.
   2. Average rated lamp life 30,000 hours.
   3. Fully extinguish at end of usable lamp life and remain extinguished without cycling.
   4. Do not provide lamps that burn at reduced output at end of life.
   5. Meet the Federal Toxic Characteristic Leachate Procedure (TCLP) limits.

Performance:

R. Meet the following photometric requirements using published photometric data and photometric data obtained by testing sampled fixtures.
   1. 150 Watt mast arm (underpass) mounted luminaire. Meet IESNA Cutoff requirements. Provide a minimum intensity of 0.20 foot-candle in a rectangular area measuring 110.0 ft. by 30.0 ft., when mounted in a level position as indicated on the properly mounted fixture level bubble 20.0 ft. above the midpoint of either long side of the surface area. Do not exceed 50:1 maximum to minimum horizontal illuminance uniformity ratio within the rectangular area.
   2. 250-watt mast arm mounted luminaire. Meet IESNA Cutoff requirements. Provide a minimum intensity of 0.20 foot-candle in a rectangular area measuring 190.0 ft. by 45.0 ft., when mounted properly in a level position as indicated on the level bubble 40.0 ft. above the midpoint either long side of the surface area. Ensure light intensities along a line parallel to and 20.0 ft. in from the long side of this rectangular area do not decrease by more than 0.50 foot-candles in any 5.0 ft. interval along the line from 10.0 ft. to 90.0 ft. on both sides of the luminaire and provide a minimum intensity of 0.30 foot-candles at any point along the line.Do not exceed 20:1 maximum-to-minimum horizontal illuminance uniformity ratio within the rectangular area.
   3. 400-watt mast arm mounted luminaire. Meet IESNA Cutoff requirements. Provide a minimum intensity of 0.20 foot-candle in a rectanglular area measuring 220.0 ft. by 60.0 ft. when mounted properly in a level position as indicated on the level bubble 50.0 ft. above the midpoint of either long side of the surface area. Ensure light intensities along a line parallel to and 30.0 ft. in from the long side of this rectangular area do not decrease by more than 0.75 foot-candle in any 10.0 ft. interval along the line from 10.0 ft. to 90.0 ft. on both sides of the luminaire and provide a minimum intensity of 0.30 foot-candle at any point along the line. Do not exceed 20:1 maximum-to-minimum horizontal illuminance uniformity ratio within the rectangular area.
S. Ensure photometric data is consistent from fixture to fixture. Match published photometric data (or approved photometric reports submitted during the prequalification process as the typical photometric output instead of published data) as follows:
   1. Point of maximum candela within 5 degrees horizontally and vertically.
   2. Maximum candela within 20% of published maximum candela.
   3. Fixture efficiency within 10% of published efficiency.

* When reference is made to UL, it can be considered to mean a Nationally Recognized Independent Testing Lab (NRTL). Comperable standards of Canadian Standard Association, Electrical Testing Laboratories or Factory Mutual can be equal to the referenced UL standard.

Sheet 1 of 2

Texas Department of Transportation
Traffic Operations Division

ROADWAY ILLUMINATION DETAILS
(RDWY ILLUM LIGHT FIXTURES)
RID(LUM1)-07

©TxDOT January 2007

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS

CONT	SECT	JOB	HIGHWAY
0921	02	194	LIBERTY BLVD
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		219

72A

DISCLAIMER: 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:
FILE:

Prequalification:

T. Use only pre-qualified fixtures. No alternates will be considered.
   1. Only materials with approved product codes or designations from prequalified producers are accepted on bids. The Construction Division (CST) of the Texas Department of Transportation (TxDOT) maintains the material producers list of approved producer product codes or designations. Use the following website to view this list:
      http://www.dot.state.tx.us/business/producer_list.htm
      Use of prequalified material does not relieve the contractor of the responsibility to provide materials that meet the specifications. All materials, including those shown on the prequalified material list, may be inspected and tested at any time and may be rejected if not in compliance with the specifications.
   2. Notify the Department in writing as to which fixture from the prequalified list of approved fixtures will be supplied on each project.
   3. To have a fixture listed as pre-qualified:
      a. Submit a sample of each type of luminaire and all pertinent data, including published photometric data and recently tested photometric data (IES format, both "averaged" and both sides of "un-averaged" data) to:
         TXDOT- TRF 118 East Riverside Dr. Austin, TX 78704
      b. Demonstrate a commitment to quality.
      c. Submit the following documentation:
         1. QA/QC program documentation with the following minimum requirements;
            a. Written statement of the companies QA/QC policy.
            b. QA/QC person employed that has special QA/QC training and has QA/QC as their primary job responsibility.
            c. A written procedure specifically for handling orders for fixtures built to TxDOT specifications.
            d. A written procedure for keeping track of fixtures built, certified, and tested for TxDOT orders.
            e. A check list of features for TxDOT fixtures with QA/QC person signature.
         2. Fixture UL certification
         3. IP 65 certification
         4. 3G certification
         5. Aluminum casting and paint analysis
         6. Socket, MOV, and shutoff ignitor data
         7. Stainless steel and aluminum bracket data
         8. Ballast electrical data
         9. Photometric data
         10. Lamp data
      d. Prequalification samples, if approved, will not be returned to the manufacturer but will be retained by the the Department for comparison testing. Once a fixture has been approved, do not change any material or manufacturing method without prior approval of the Department. Unapproved changes will result in rejection of the fixture.
      e. In addition, luminaires will be tested for compliance with this specification. Luminaires that inconsistently pass testing or that are inconsistent with published photometric information will be removed from the pre-qualified list at the discretion of the Department.

Sampling:

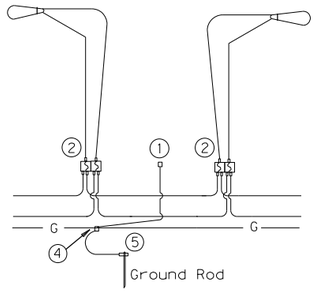
U. Sample in accordance with Test Method Tex-1110-T, "Sampling Lighting Assemblies."

Manufacturer Warranty:

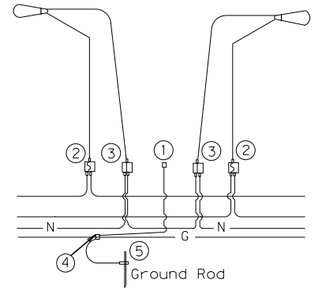
V. Replace failed fixtures, when non-operable due to defects in materials or workmanship within five years of installation with a fixture that passes all testing, delivered to the project location. Lamps and photocells are subject to the warranties of their respective manufacturers.

Testing:

W. Conduct electrical testing required in the Ballast section. Provide photometric testing of fixtures. Test fixtures at the following rates.
   1. Manufactuer Testing. Before fixtures are shipped from the manufacturer, test fixtures as follows. From each lot or manufacturing run, select one completed fixture of each 25, with a minimum of 2 and a maximum of 5. Test photometrics at an independent test lab inspected and approved by TxDOT. Electrical testing may be performed at manufacturer's facility.
      a. Provide IES photometric report in two formats:
         1. Standard averaged format for asymmetric fixtures.
         2. Un-averaged format showing both sides. Un-averaged data may be supplied in two files or as approved by the Department.
      b. Provide electrical and photometric test data directly to TRF-TE electronically for evaluation prior to shipping fixtures to the project. Do not ship fixtures until test data for each lot is approved by TRF-TE.
      c. Provide the following information on test reports:
         1. TxDOT's Control-Section-Job number, maintenance contract number, or purchase order number the fixtures are assigned to,
         2. a unique fixture test number per fixture,
         3. date of manufacture, and
         4. quantities supplied and lot number per fixture type.
      d. Write the unique lab report number on the top of the fixture housing with permanent marker. Ensure the test lab retains the results for 5 years. Provide the Department access to documentation.
      e. Retain records of manufacturing lots, test reports, lot quantities, and other pertinent details. Submit records to the Department upon request.
      f. Submit to TRF-TE a daily shipment report for shipments to each job.
      g. Make available to TxDOT inspectors upon request, all manufacturing facilities involved in the production of fixtures for use on Department projects, inventories of fixtures produced to Department specifications, and records of fixture testing and tracking.
   2. Departmental Test Reporting. Departmental test reports will be issued in accordance with Tex 1110-T.



FOR THREE-WIRE CIRCUIT-CENTER GROUNDED
LUMINAIRES SERVED AT 480V ON 240/480 VOLT SERVICE OR LUMINAIRES SERVED AT 240V FOR FOR 120/240 VOLT SERVICE.



FOUR-WIRE CIRCUIT-CENTER GROUNDED
LUMINAIRES SERVED AT 240V
(240/480 VOLT SERVICE)

NOTES:

① Use 1/2 in.-13 UNC threaded, copper or tin-plated copper, pole bonding connector, sized appropriately for conductors.
②③ Use pre-qualified Breakaway Connectors for both T-Base and Shoe-Base installations.
④ Split Bolt or other connector.
⑤ Use Ground Rod Clamp listed for its intended purpose (i.e. concrete, direct burial...)

Texas Department of Transportation
Traffic Operations Division

ROADWAY ILLUMINATION DETAILS

(RDWY ILLUM LIGHT FIXTURES)

RID(LUM2)-07

©TxDOT January 2007

REVISIONS

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
0921	02	194	LIBERTY BLVD
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		220

DISCLAIMER: 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.

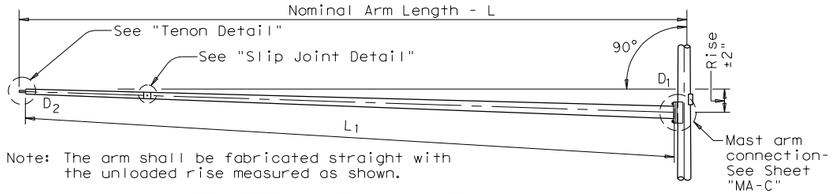
Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D_B	D_{19}	D_{24}	D_{30}	① thk	D_B	D_{19}	D_{24}	D_{30}	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	12.0	9.3	8.6	7.8	.239	12.5	9.5	8.7	7.8	.239	36-A
24	12.0	9.3	8.6	7.8	.239	13.0	10.0	9.2	8.3	.239	36-A
28	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
32	13.0	10.3	9.6	8.8	.239	14.0	11.0	10.2	9.3	.239	36-A
36	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
40	14.0	11.3	10.6	9.8	.239	16.0	13.0	12.2	11.3	.239	36-B
44	14.5	11.8	11.1	10.3	.239	16.5	13.5	12.7	11.8	.239	36-B

Arm Length	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	① thk	Rise	L_1	D_1	② D_2	① thk	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	8.0	5.3	.179	1'-8"	19.1	8.0	3.5	.179	1'-7"
24	23.1	9.0	5.8	.179	1'-9"	23.1	9.0	3.5	.179	1'-8"
28	27.1	9.5	5.7	.179	1'-10"	27.1	10.0	3.5	.179	1'-9"
32	31.0	9.5	5.2	.239	1'-11"	31.0	9.5	3.5	.239	1'-10"
36	35.0	10.0	5.1	.239	2'-0"	35.0	10.0	3.5	.239	1'-11"
40	39.0	10.5	5.1	.239	2'-3"	39.0	11.0	3.5	.239	2'-1"
44	43.0	11.0	5.1	.239	2'-8"	43.0	11.5	4.0	.239	2'-3"

D_B = Pole Base O.D.
D_{19} = Pole Top O.D. with no Luminaire and no ILSN
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L = Nominal Arm Length

① Thickness shown are minimums, thicker materials may be used.

② D_2 may be increased by up to 1" for polygonal arms.



Note: The arm shall be fabricated straight with the unloaded rise measured as shown.

TRAFFIC SIGNAL ARM

(Fixed Mount)

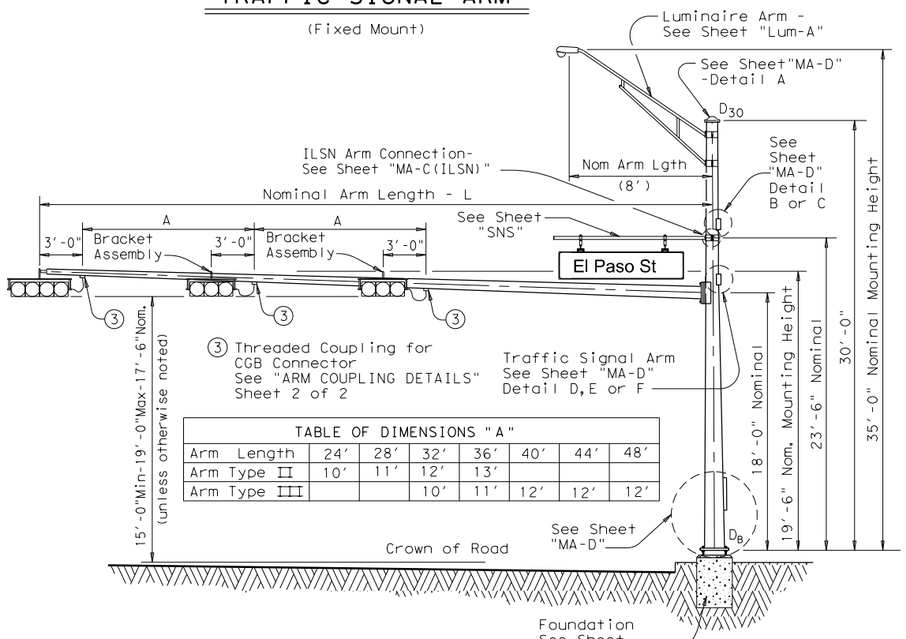


TABLE OF DIMENSIONS "A"							
Arm Length	24'	28'	32'	36'	40'	44'	48'
Arm Type II	10'	11'	12'	13'			
Arm Type III			10'	11'	12'	12'	12'

STRUCTURE ASSEMBLY

SHIPPING PARTS LIST

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed-arm connection bolts and washers and any additional hardware listed in the table.

Nominal Arm Length	30' Poles With Luminaire		24' Poles With ILSN		19' Poles With No Luminaire and No ILSN	
	Above hardware plus: One (or two if ILSN attached) small hand hole, clamp-on simplex		Above hardware plus one small hand hole		See note above	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20L-100		20S-100		20-100	
24	24L-100		24S-100		24-100	
28	28L-100		28S-100		28-100	
32	32L-100		32S-100		32-100	
36	36L-100		36S-100		36-100	
40	40L-100		40S-100		40-100	
44	44L-100		44S-100		44-100	2

Traffic Signal Arms (1 per pole) Ship each arm with the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	1 CGB connector		1 Bracket Assembly and 2 CGB Connectors		2 Bracket Assemblies and 3 CGB Connectors	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-100					
24	24I-100		24II-100			
28	28I-100		28II-100			
32			32II-100		32III-100	
36			36II-100		36III-100	
40					40III-100	
44					44III-100	

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 ½"	3'-4"	
1 ¾"	3'-10"	
2"	4'-3"	2

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".

Templates may be removed for shipment.

SHEET 1 OF 2

*NOTE: THIS SHEET HAS BEEN MODIFIED TO SHOW QUANTITIES.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS, P.E. 60919
7/29/2020

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY (100 MPH WIND ZONE)

SMA-100(1)-12

© TxDOT August 1995

DN: MS	CK: JSY	DW: MMF	CK: JSY

REVISIONS
5-96
11-99
1-12

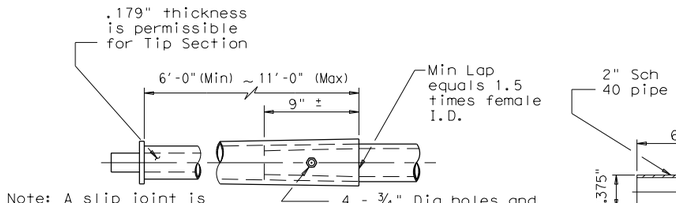
CONT	SECT	JOB	HIGHWAY
0921	02	194	LIBERTY BLVD
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		221

123A

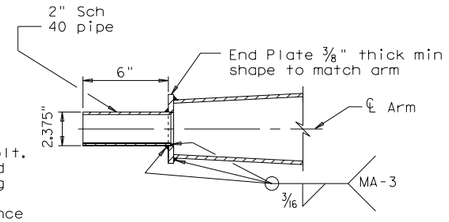
DATE:
FILE:

DISCLAIMER:
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:
FILE:



SLIP JOINT DETAIL



TENON DETAIL

VIBRATION WARNING

Mast Arms of SMA and DMA structures and clamp-on Arms of LMA structures of approximately 40 ft or longer are subject to harmonic vertical vibrations in light wind conditions due to the aeroelastic characteristics of a few of the myriads of possible combinations of the following: signal numbers, weights and positions; existence/solidity of backplates; presence of additional attachments to the arm, such as signs and cameras; arm-wind orientation; and arm-pole stiffness.

Such vibrations may cause fatigue damage to the structure and may lead to galloping in moderate wind conditions which may further damage the structure and alarm the public. Tests have indicated that when wind is blowing toward the back side of signal heads having un-vented backplates attached the probability of unacceptable harmonic vibration and/or galloping is rather high.

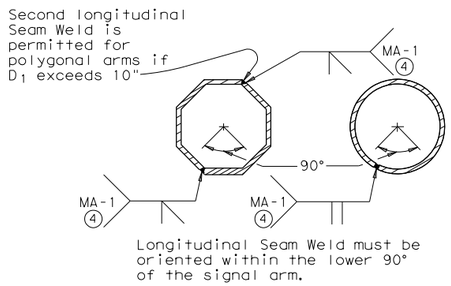
If backplates are not required for improved visibility they should not be applied to the signal heads or, if they must be applied, they should be vented as a first and inexpensive measure to mitigate vibrations.

The traffic signal mast arms shall be visually inspected in 5 to 20 mph wind conditions after installation of signal heads and any attachments, including any required backpates. If vertical movements with a total excursion (maximum upward excursion to maximum downward excursion) of more than approximately 8" are observed at the arm tip, a damping plate shall be fitted to the arm. See "Damping Plate Mounting Details" on standard sheet, MA-DPD-10.

This visual inspection shall be repeated after each modification of the structure that could affect its aeroelastic response. Excessive vibrations shall not be allowed to continue for more than two days.

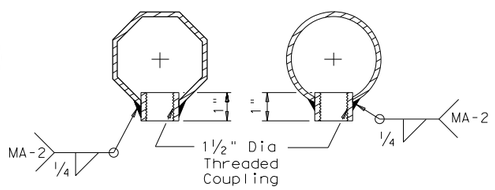
Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 ½" Dia Threaded Coupling.

BRACKET ASSEMBLY



ARM WELD DETAIL

④ 60% Min. penetration
100% pemetration within 6" of circumferential base welds.



ARM COUPLING DETAILS

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 100 mph plus a 1.3 gust factor.

Poles are designed to support one 8'-0" luminaire arm, one 9'-0" internally lighted street name sign and one traffic signal arm with a length as tabulated. The specified luminaire load applied at the end of the luminaire arm equals 60 lbs vertical dead load plus the horizontal wind load on an effective projected area of 1.6 sq ft. The specified internally lighted street name sign load applied 4.5 ft from the centerline of the pole equals 85 lbs vertical dead load plus horizontal wind load on an effective projected area of 11.5 sq ft. The specified signal load applied at the end of the traffic signal arm equals 180 lbs vertical dead load plus the horizontal wind load on an effective projected area of 32.4 sq ft (actual area times drag coefficient).

See Standard Sheet "MA-D" for pole details, "MA-C" for traffic signal arm connection details, "MA-C (ILSN)" for internally lighted street name sign arm connection details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details. See "MA-C" for material specifications.

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.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(100 MPH WIND ZONE)

SMA-100(2)-12

© TxDOT August 1995

DN: MS	CK: JSY	DW: MWF	CK: JSY

REVISIONS
5-96
1-12

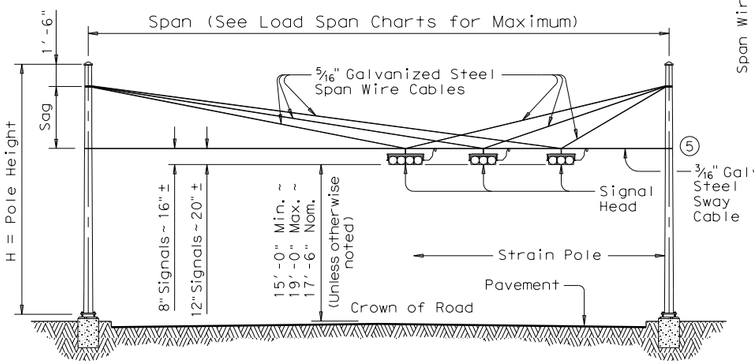
CONT	SECT	JOB	HIGHWAY
0921	02	194	LIBERTY BLVD
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		222

123B

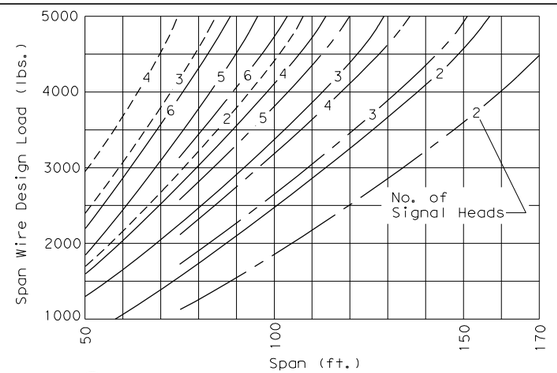
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

STRAIN POLE DESCRIPTION	Pole Type	Found-ation Type	Maximum Permissible Span Wire Load (lbs.)
26′ Pole	A	36-A	4900
30′ Pole	B	36-A	4300
30′ Pole with Lum.	B	36-A	4000
30′ Pole with 20′ Mast Arm	C	36-B	4400
30′ Pole with 24′ Mast Arm	C	36-B	4000
30′ Pole with 28′ Mast Arm	C	36-B	3600
30′ Pole with 32′ Mast Arm	C	36-B	3300
30′ Pole with 36′ Mast Arm	C	36-B	2900
30′ Pole with 20′ Mast Arm & Lum.	C	36-B	4100
30′ Pole with 24′ Mast Arm & Lum.	C	36-B	3800
30′ Pole with 28′ Mast Arm & Lum.	C	36-B	3400
30′ Pole with 32′ Mast Arm & Lum.	C	36-B	3000
30′ Pole with 36′ Mast Arm & Lum.	C	36-B	2500
34′ Pole	D	36-B	5200
34′ Pole with Lum.	D	36-B	4900

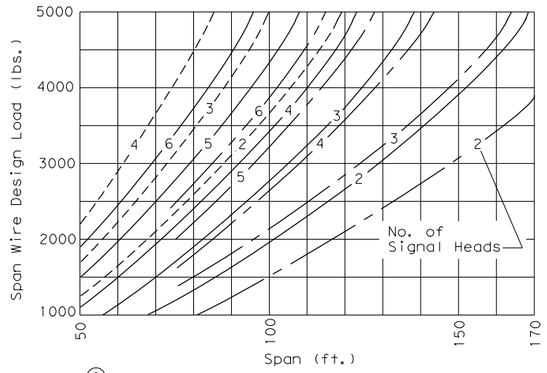
② Numbers on Load Span Charts indicate the number of signal heads on the span. The total span wire design load is based on one 5-section head and one or more additional 3-section head(s). Design wind pressures on cables are assumed as 1.6 lb/ft. Weight of span wire cables (one per signal head) is assumed 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

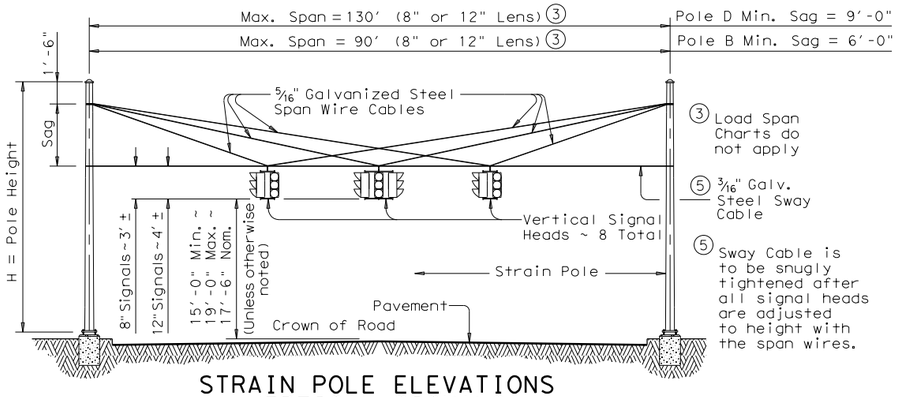


② SIGNALS WITH 8-INCH LENS

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)

Pole Type	ROUND POLES D_B in.	D_T in.	④thk in.	H ft.	POLYGONAL POLES 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

D_B = Pole Base O.D. D_T = Pole Top O.D. H = Pole Height

④ Thickness shown are minimum, thicker materials may be used.

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-100	
B	30′ Strain Pole	SPL 30 B-100		30′ Strain Pole	SP 30 B-100	
D	34′ Strain Pole	SPL 34 D-100	5	34′ Strain Pole	SP 34 D-100	4

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-100		30′ SPw/TS Arm	SP 30 C-100	

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 1 Bracket Assembly, 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: ① 2 Bracket Assemblies, 4 CGB Connectors and 1 clamp with bolts and washers	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-100					
24	24I-100		24 II -100			
28	28I-100		28 II -100			
32			32 II -100		32 III -100	
36			36 II -100		36 III -100	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Templates may be removed for shipment. Quantity
1 3/4"	3′-10"	
2"	4′-3"	9

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
10′ Arm	4

① See Sheet "DMA-100"

NOTE: THIS SHEET WAS MODIFIED TO SHOW QUANTITIES.

STATE OF TEXAS C. SIMEONIDIS 60919 REGISTERED PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS, P.E. 60919 7/29/2020

SHEET 1 OF 2

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES STRAIN POLE ASSEMBLIES

(100 MPH WIND ZONE)

SP-100(1)-12

©TxDOT March 1996

DN: MS	CK: JSY	DW: BR	CK: JSY

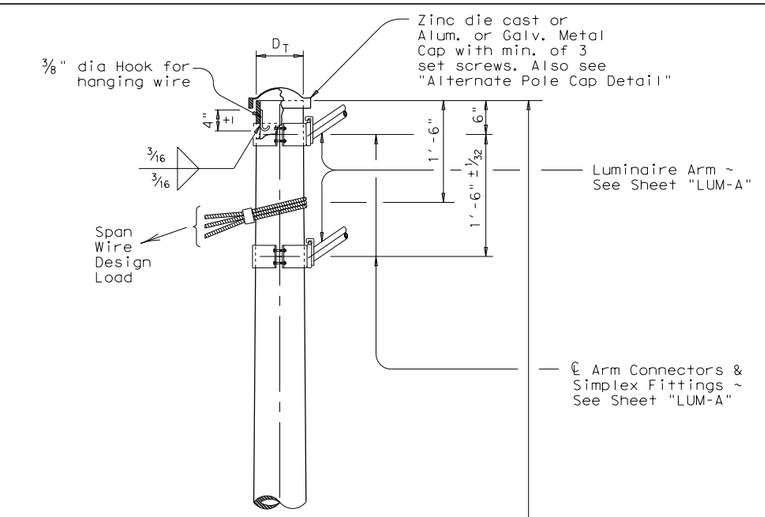
REVISIONS
6-96
1-12

CONT	SECT	JOB	HIGHWAY
0921	02	194	LIBERTY BLVD
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		223

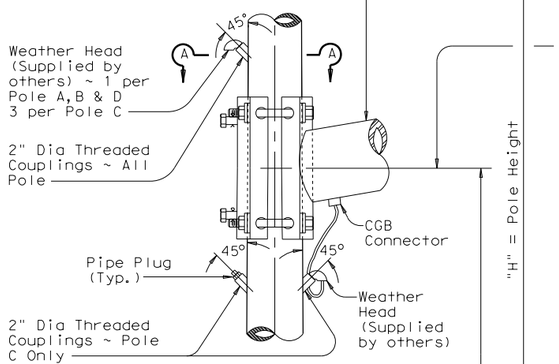
121A

DATE:
FILE:

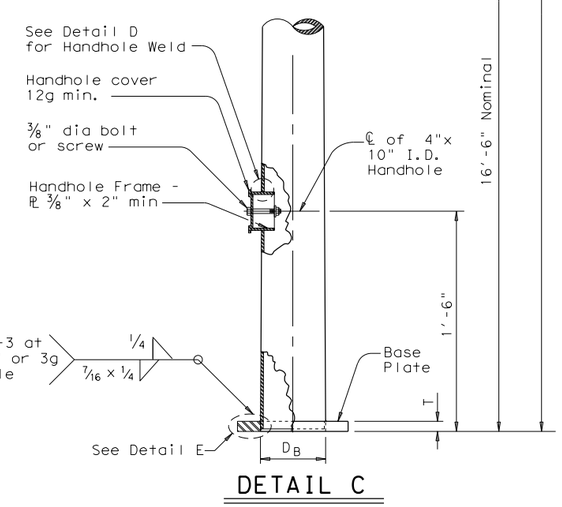
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



DETAIL A

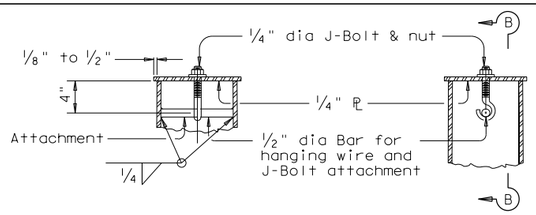


DETAIL B



DETAIL C

POLE ELEVATION



SECTION B-B

ALTERNATE POLE CAP DETAIL

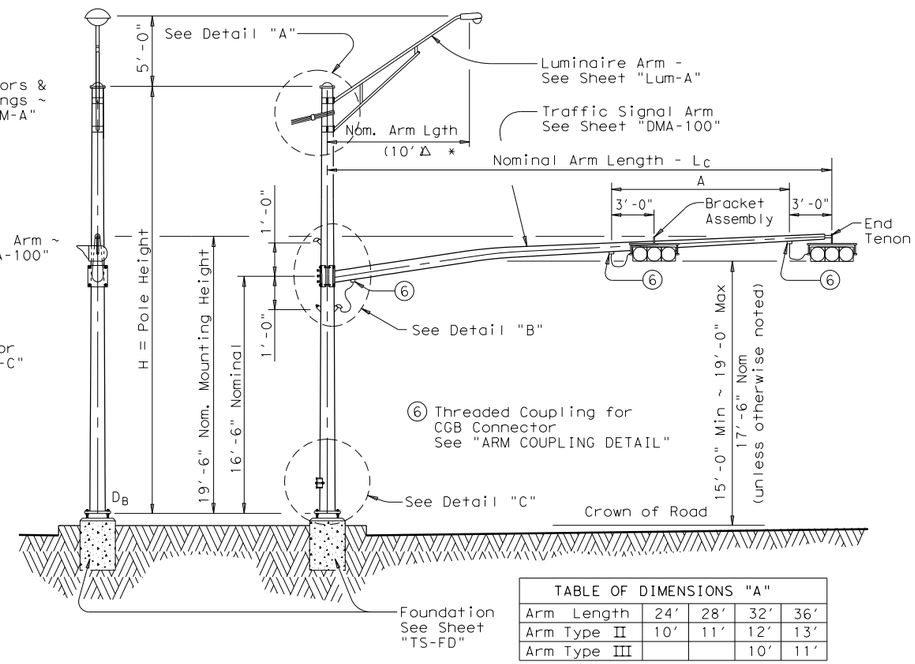
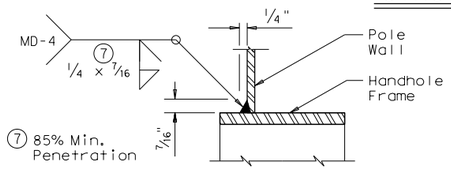
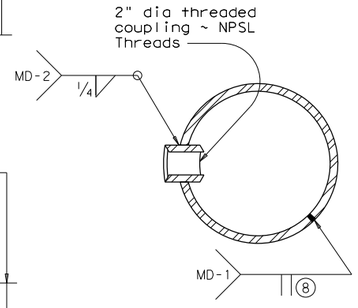


TABLE OF DIMENSIONS "A"				
Arm Length	24'	28'	32'	36'
Arm Type II	10'	11'	12'	13'
Arm Type III			10'	11'

STRUCTURE ASSEMBLY

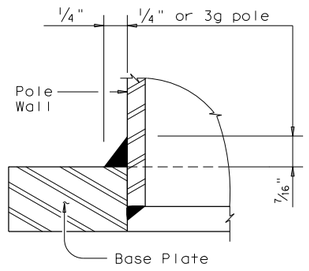


DETAIL D



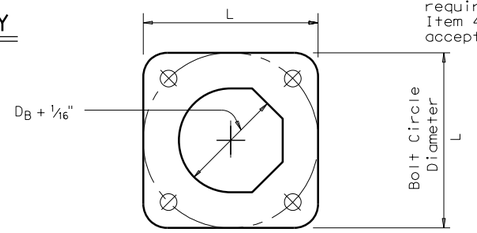
SECTION A-A

(Pole Coupling and Seam Weld Details)



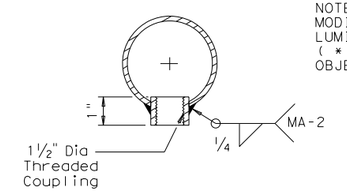
DETAIL E

8 60% Min. penetration, except 100% penetration within 6" of circumferential base welds.



BASE PLATE PLAN

Foundation Type	Anchor Bolt Diameter	Bolt Hole Diameter	Bolt Circle Diameter	Base PL 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"



ARM COUPLING DETAIL

NOTE: THIS SHEET WAS MODIFIED TO SHOW 10' LUMINAIRE ARMS. (* IDENTIFIES MODIFIED OBJECTS)

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 100 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-100" 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.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES STRAIN POLE ASSEMBLIES

(100 MPH WIND ZONE)

SP-100(2)-12

© TxDOT March 1996

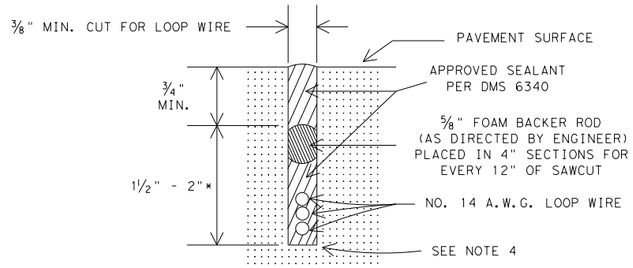
REVISIONS	DN: MS	CK: JSY	DW: BR	CK: JSY
6-96	CONT	SECT	JOB	HIGHWAY
1-12	0921	02	194	LIBERTY BLVD
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		224

STATE OF TEXAS C. SIMEONIDIS 60919 REGISTERED PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS, P.E. 60919 7/29/2020

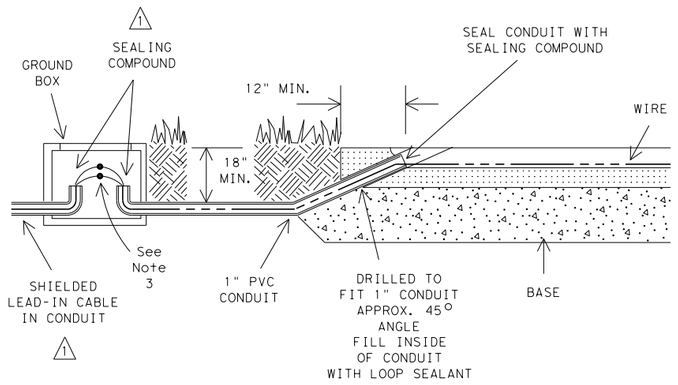
DATE:
FILE:

DISCLAIMER: 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.

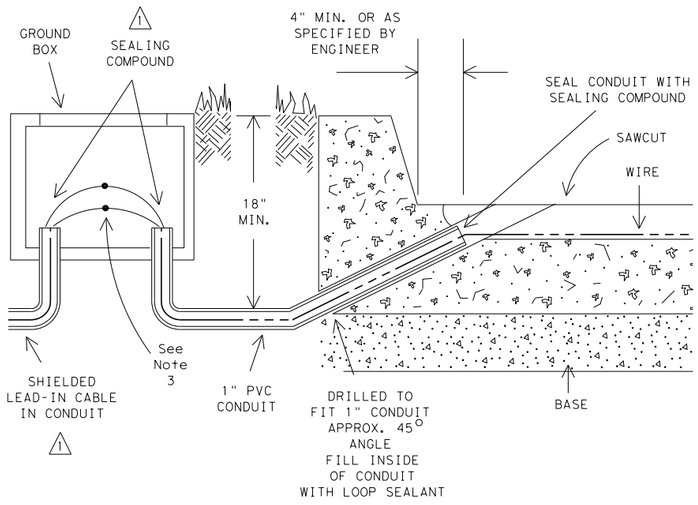


LOOP SAW CUT CROSS-SECTION

* SAWCUTS IN BRIDGE DECKS ARE TYPICALLY 1" DEPTH MAXIMUM
SAWCUTS IN BRIDGE DECKS AND ACROSS EXPANSION JOINTS
SHALL BE AS APPROVED BY ENGINEER



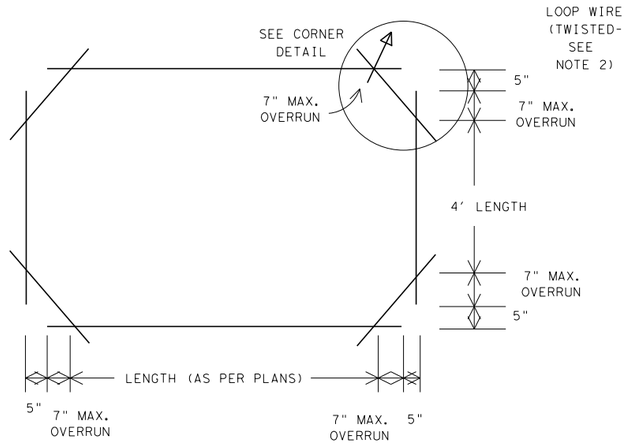
TYPICAL LEAD IN CONFIGURATION (WITHOUT CURBING)



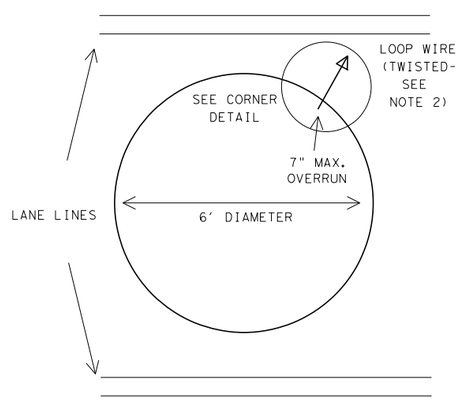
TYPICAL LEAD IN CONFIGURATION (WITH CURBING)

TYPICAL LOOP DETECTOR LAYOUTS

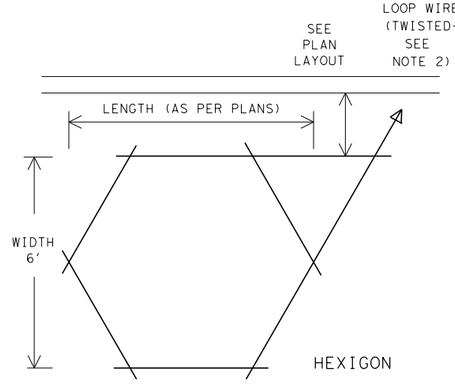
(AS SPECIFIED IN PLANS)



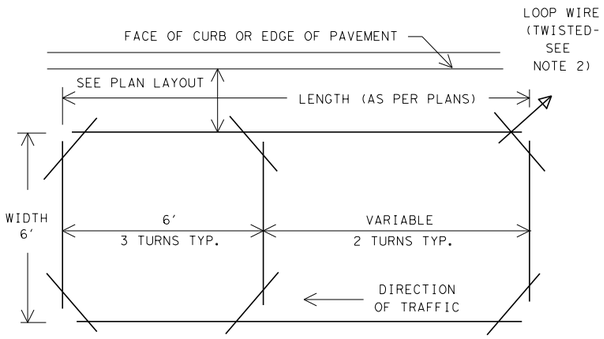
RECTANGULAR



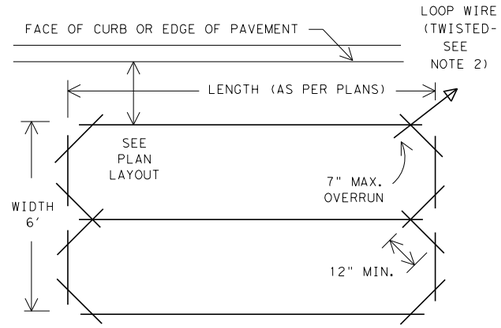
CIRCULAR



HEXIGON



POWER HEADER



QUADRAPOLE

GENERAL NOTES:

1. The pavement cut is to be made with a concrete saw to neat lines and loose material removed. The cut shall be clean and dry when the wire and sealing compound is placed.
2. Loop wire shall be 14 AWG Stranded Type XHHW. Wire from the loop to the ground box shall be twisted a minimum of 5 turns per foot. No splices shall be permitted in the loop or in the run to the ground box.
3. The home run cable from the pull box to the controller shall be IMSA 50-2 shielded cable and shall be soldered to the loop wire. The solder joints shall be sealed with Scotchcast or other method acceptable to the Engineer. The shield shall be grounded only at the controller end. Loop home run cable shall be two conductor 14 AWG shielded, Type XHHW.
4. All wire placed in the saw cut shall be sealed by fully encapsulating it in a sealant acceptable to the Engineer. Sealing compound shall be in accordance with DMS 6340.
5. The loop location, confirguration and number of turns shall be as indicated on the plans or as directed by the Engineer.

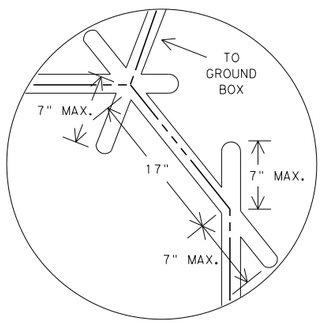
Recommended Number of Turns for Loop Detectors

LOOP PERIMETER SIZE (FT.)	NUMBER OF TURNS	APPROXIMATE LOOP SIZES INCLUDED
24' or Less	3 or 4	5' x 5', 6' x 6'
25' - 110'	2 or 3	6' x 10', 6' x 45'
110' or More	1 or 2	6' x 50' or Longer

6. A separate saw cut shall be made from each loop to the edge of pavement or as specified by the Engineer.
7. Splices between the loop lead-in cable and loop detector shall be made only in the ground box near the loop it is serving.
8. Circular loops may use prewound loops encased in continuous pvc tubing. Sawcut width may be adjusted to accommodate tubing.
9. The lead-in wire in the circular loop shall be coiled at the 3 inch drilled corner to reduce bending stress.
10. Loop duct may be used as specified by Engineer.

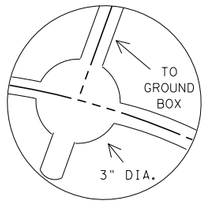
For additionhal information refer to "Texas Traffic Signal Detector" manual, TTI Report 1163-1.

TYPICAL CORNER DETAILS

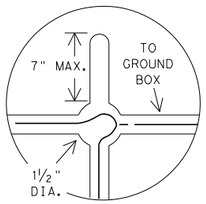


RECTANGULAR & HEXIGON LOOP
SAWCUT CORNER DETAIL

7" OVERRUN BASED ON 24" DIAMETER SAW BLADE



CIRCULAR LOOP
DRILLED CORNER DETAIL



RECTANGULAR & HEXIGON LOOP (ALT.)
DRILLED CORNER DETAIL

Texas Department of Transportation
Traffic Operations Division

LOOP DETECTOR INSTALLATION DETAILS

LD(1)-03

©TxDOT December 1998

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

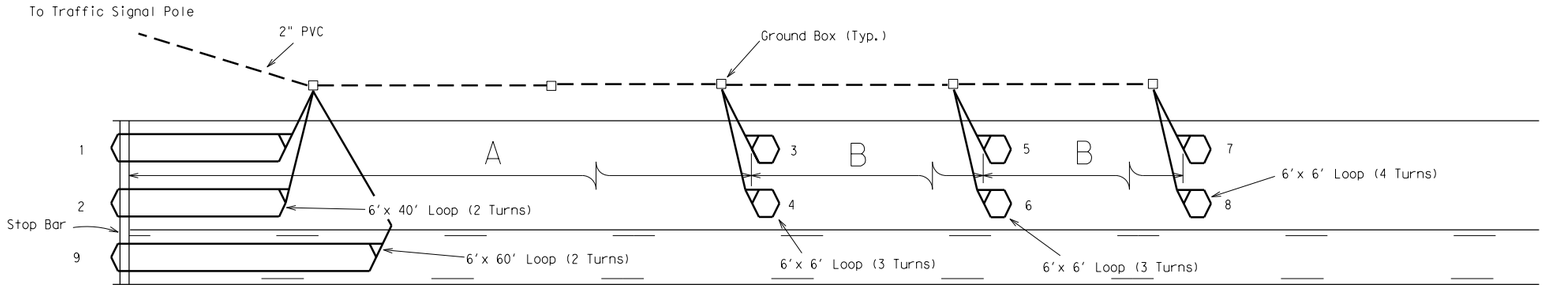
REVISIONS
2-99
1-03

CONT	SECT	JOB	HIGHWAY
0921	02	194	LIBERTY BLVD
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		225

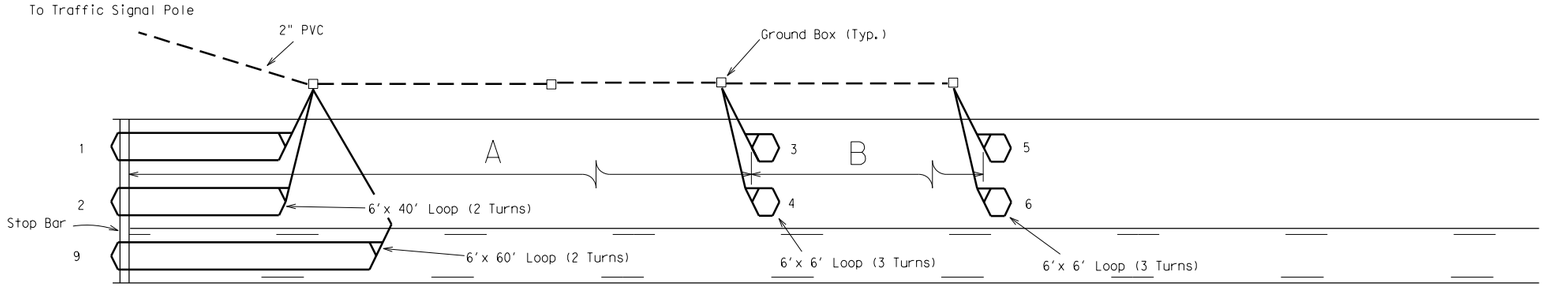
79A

DATE:
FILE:

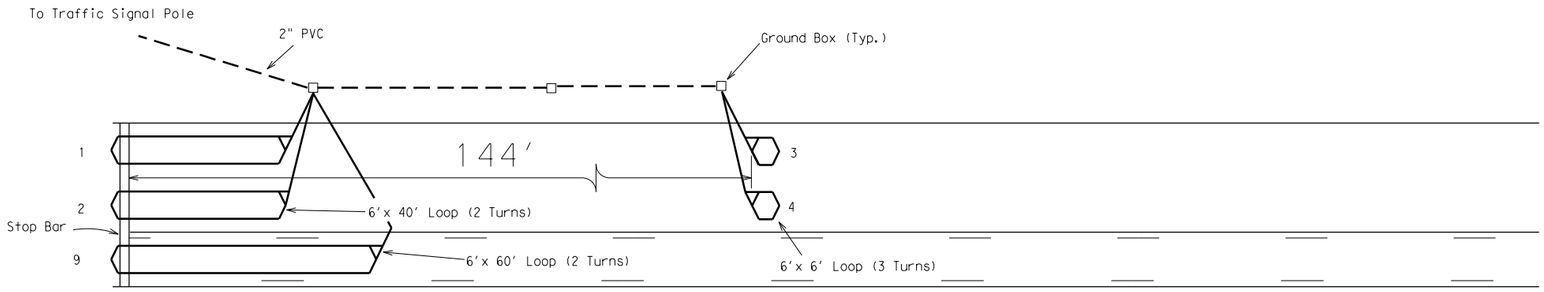
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



55 MPH (A=225', B=95') 60 MPH (A=275', B=100')
65 MPH (A=320', B=110') 70 MPH (A=350', B=125')



35 MPH (A=90', B=100') 40 MPH (A=110', B=130')
45 MPH (A=175', B=115') 50 MPH (A=220', B=130')



30 MPH

GENERAL NOTES:

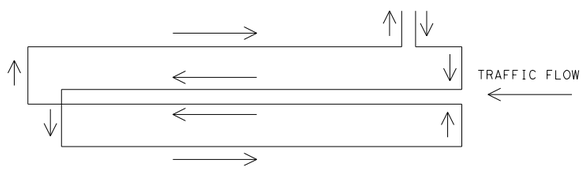
Loops 1 and 2 shall be connected to the controller cabinet by means of the same loop lead-in (2/C #14 AWG).

Loops 3 thru 6 shall be connected to the controller cabinet by means of the same loop lead-in (2/C #14 AWG).

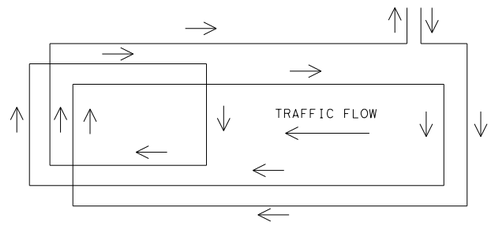
Loops 7 and 8 shall be connected to the controller cabinet by means of the same loop lead-in (2/C #14 AWG).

Loop 9 shall be connected to the controller cabinet by means of a loop lead-in (2/C #14 AWG). Loop 9 shall be placed only when a left turn lane exists.

LOOP WINDING DETAILS



QUADRAPOLE LOOP



POWER HEADER LOOP

DATE:
FILE:

Texas Department of Transportation
Traffic Operations Division

LOOP DETECTOR PLACEMENT DETAILS

LD(2)-03

©TxDOT January 2003
REVISIONS

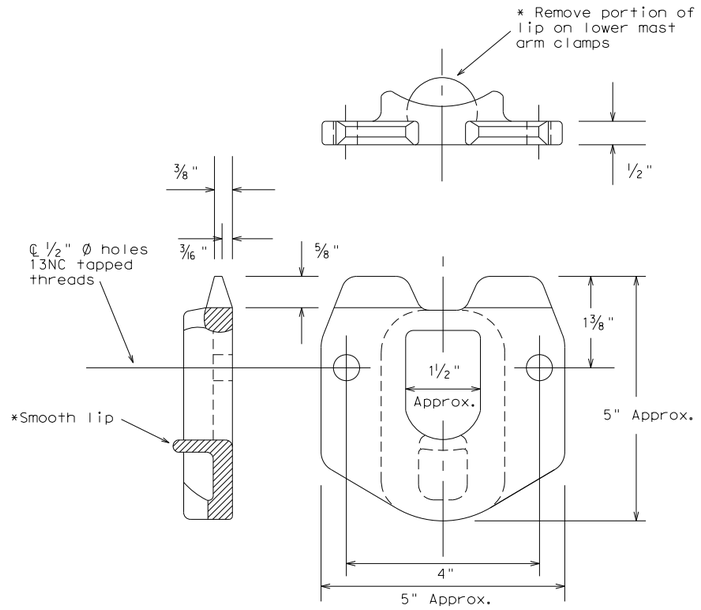
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
0921	02	194	LIBERTY BLVD
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		226

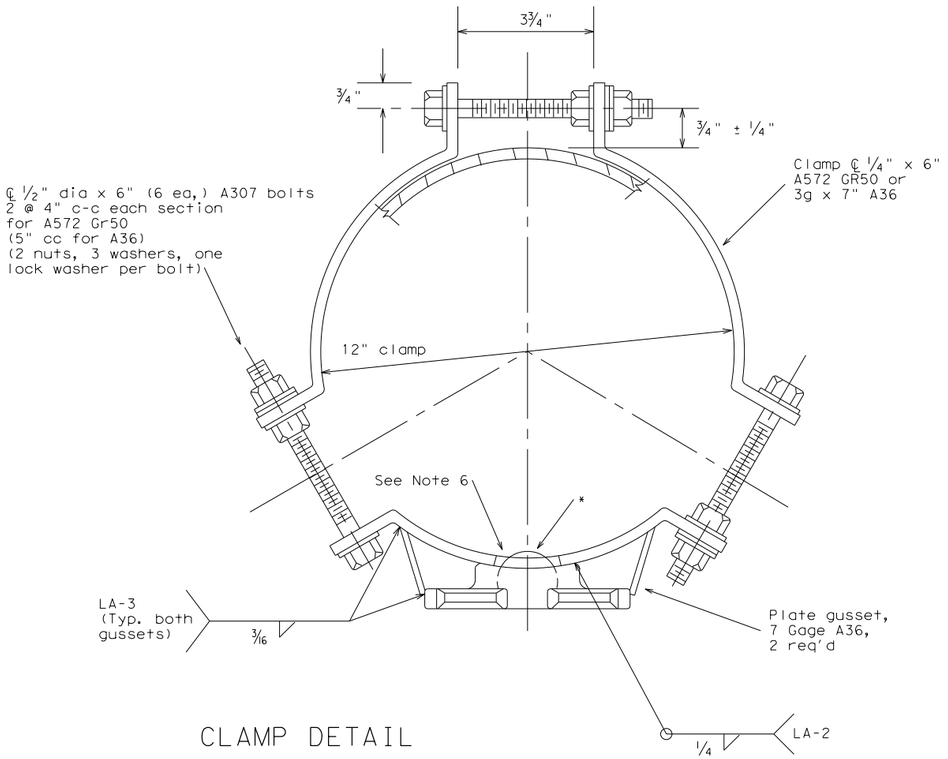
79B

DISCLAIMER:
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:
FILE:



POLE SIMPLEX DETAILS



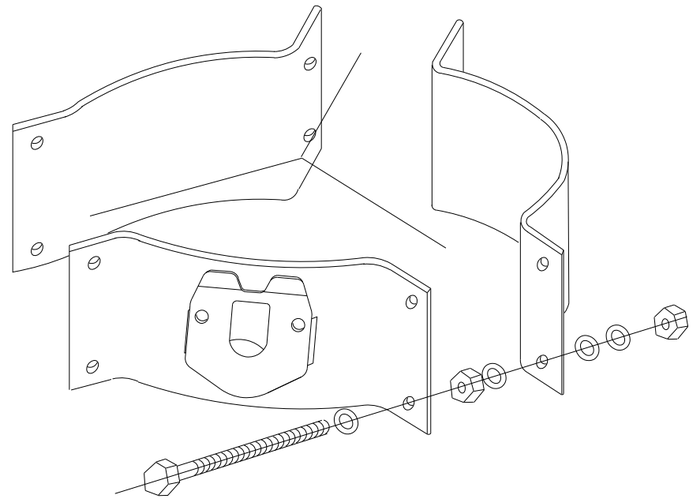
CLAMP DETAIL

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	0921	02	194	LIBERTY BLVD
1-12	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		227

130

DISCLAIMER:
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:
FILE:

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

FILE:	ed1-14.dgn	DN:	CK:	DW:	CK:
© TxDOT	October 2014	CONT	SECT	JOB	HIGHWAY
	REVISIONS	0921	02	194	LIBERTY BLVD
		DIST	COUNTY		SHEET NO.
		PHR	HIDALGO		228

71A

DISCLAIMER:
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.

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.

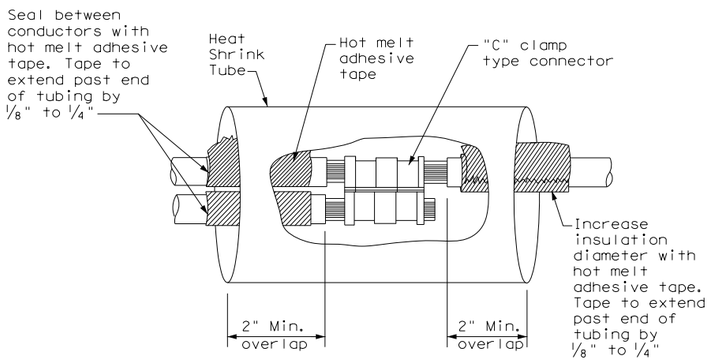
GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

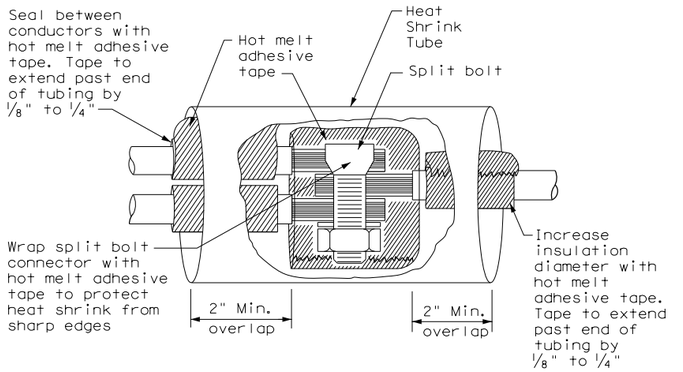
1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in specific locations including electrical service, see individual plan sheets.

B. CONSTRUCTION METHODS

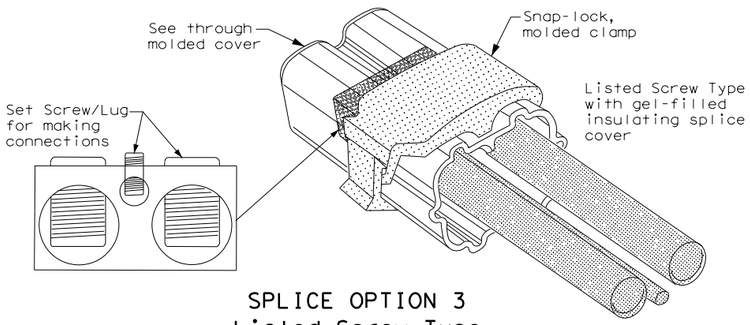
1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, 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

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUCTORS

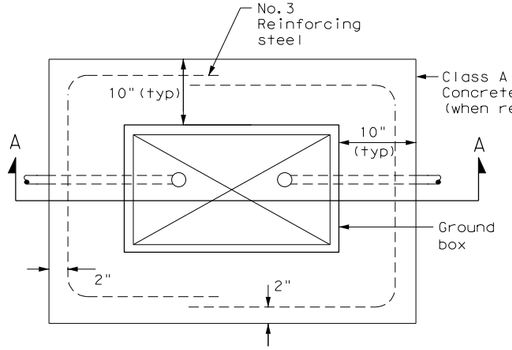
ED(3)-14

FILE:	ed3-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS		0921	02	194	LIBERTY BLVD
		DIST	COUNTY		SHEET NO.
		PHR	HIDALGO		229

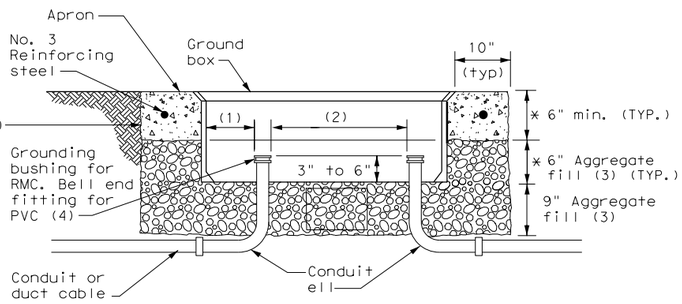
71C

DATE:
FILE:

DISCLAIMER:
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.



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.

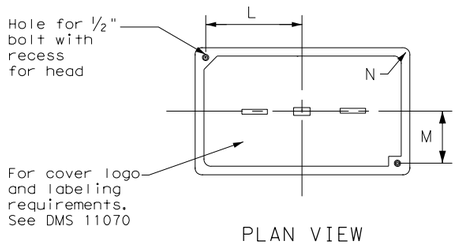
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

(3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.

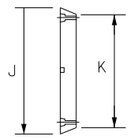
(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

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

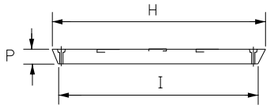
GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



PLAN VIEW



END



SIDE

GROUND BOX COVER

* = REVISED, PHARR DISTRICT

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 six inches below the finished grade. 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.

Texas Department of Transportation

Pharr District Standard

ELECTRICAL DETAILS
GROUND BOXES

ED(4)-14 (PHR)

FILE: ed4-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY BLVD
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		230

71D

ED(4)-14(PHR) 01-21-15.dgn

DISCLAIMER:
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:
FILE:

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

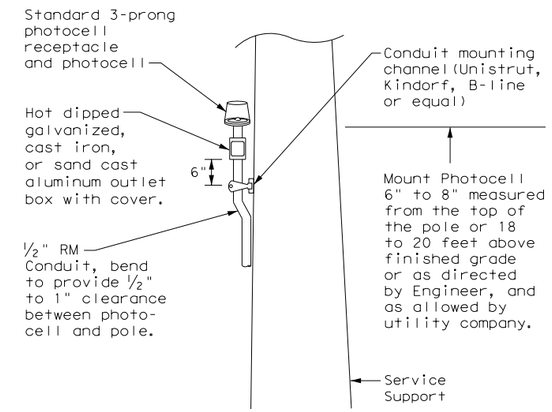
(SS)= Safety Switch Ahead of Meter-Check with Utility
(NS)= No safety Switch Ahead of Meter-Check with Utility

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

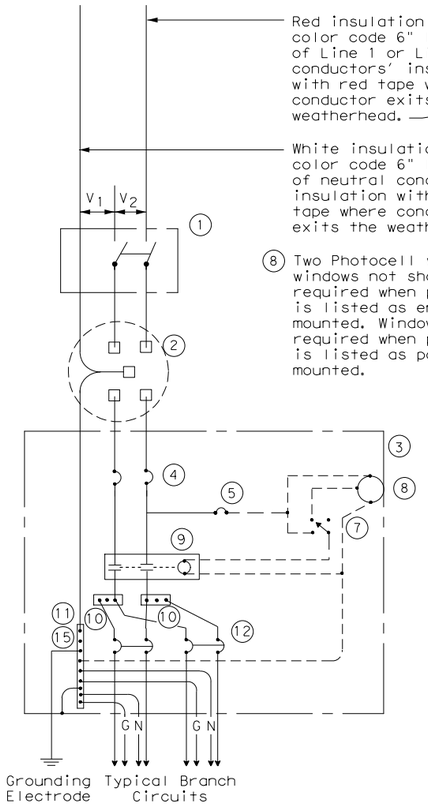
ED(5)-14

FILE: ed5-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY BLVD
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		231

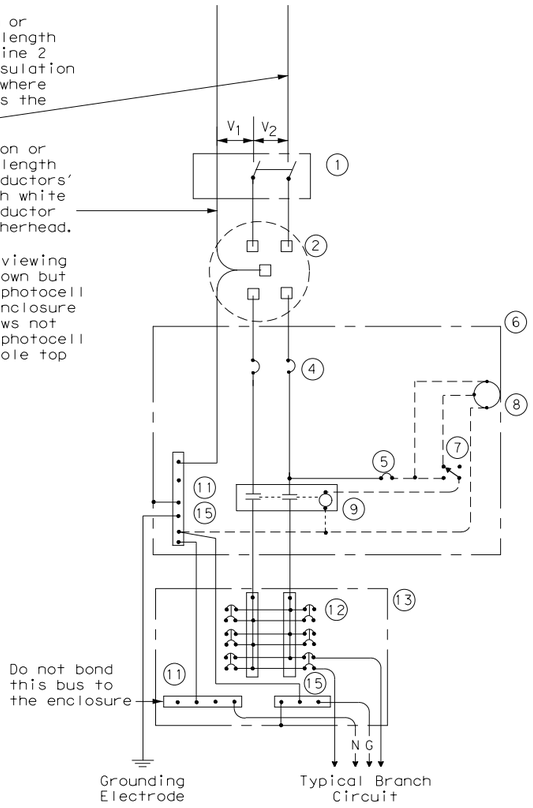
71E

DISCLAIMER:
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.

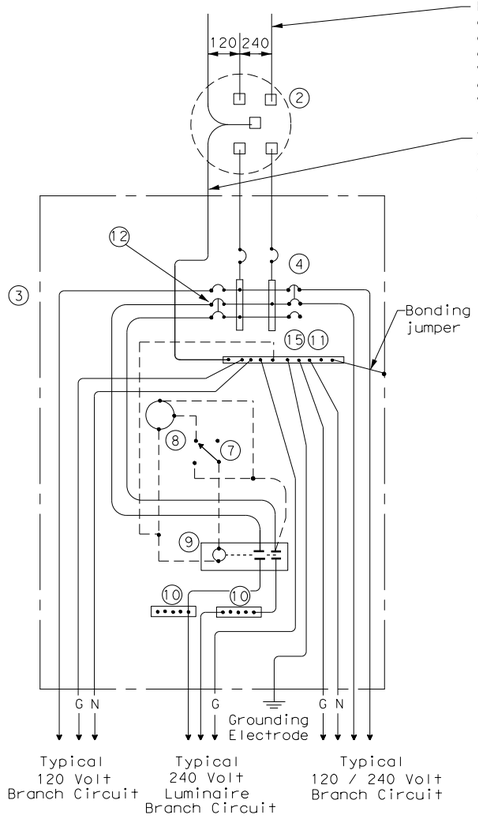
DATE:
FILE:



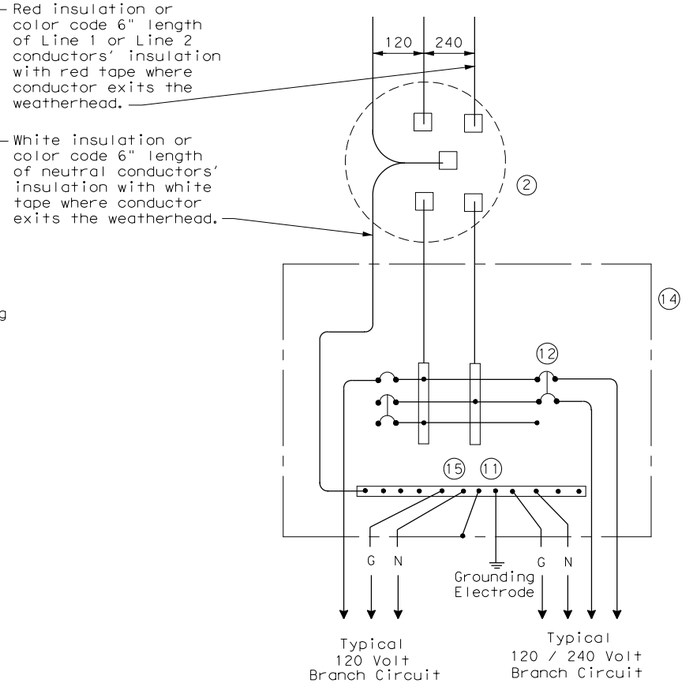
SCHEMATIC TYPE A
THREE WIRE



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

FILE: ed6-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY BLVD
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		232

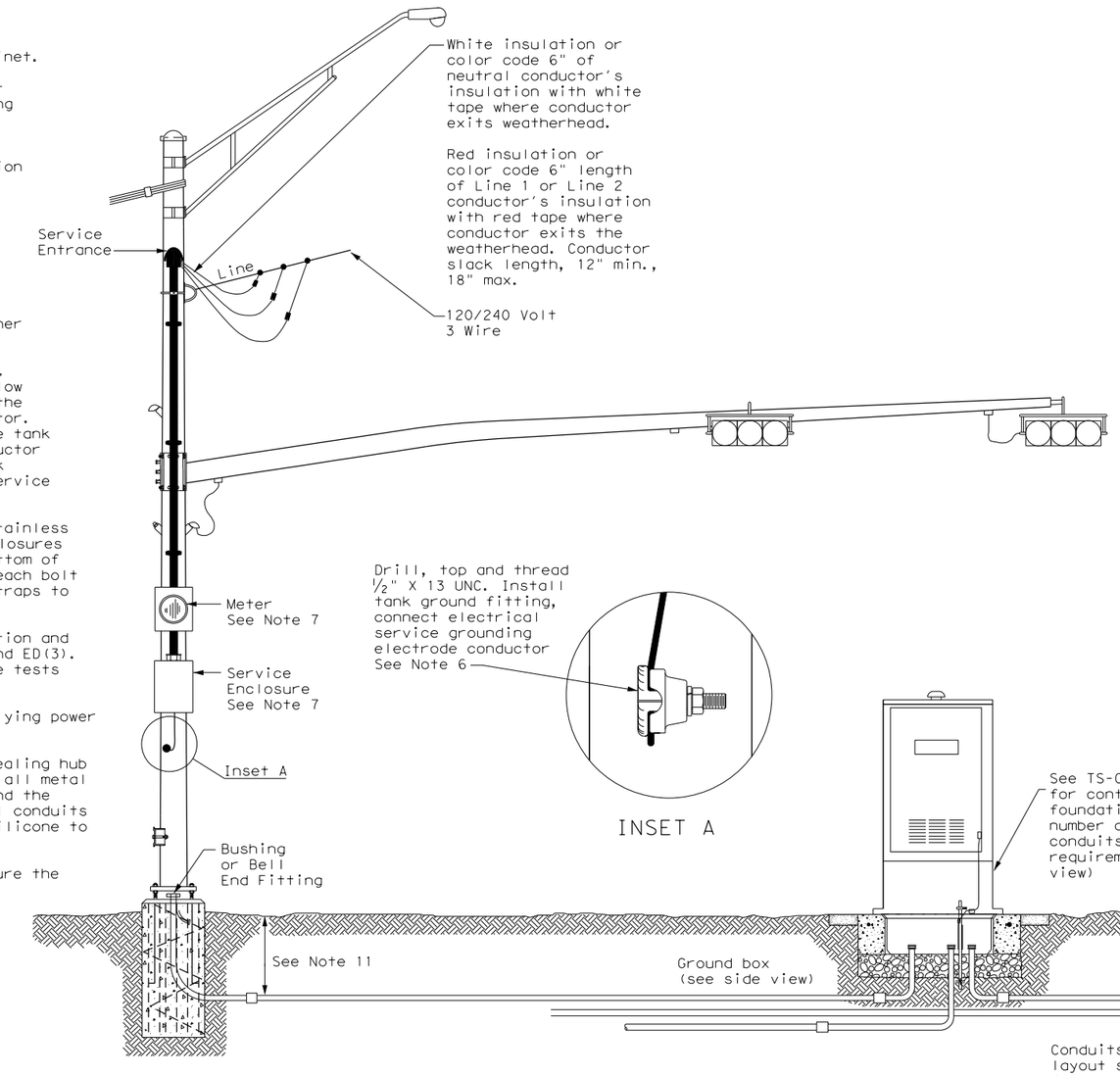
71F

DISCLAIMER:
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:
FILE:

TRAFFIC SIGNAL NOTES

1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TXDOT standard TS-FD for further details.
6. Drill and tap signal poles for ½ in. X 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.
7. Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are a minimum width of ¾ in. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.
8. Conduct pull tests and insulation resistance tests on all illumination and power conductors as required in Item 620 "Electrical Conductors" and ED(3). To prevent electronics damage, do not conduct insulation resistance tests on traffic signal cables after termination.
9. Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.
10. Terminate conduits entering the top of enclosures with a conduit-sealing hub or threaded boss such as meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.
11. For all conduits, ensure the burial depth is a minimum of 18". Ensure the minimum burial depth for conduit placed under a roadway is 24".



SIGNAL POLE WITH SERVICE

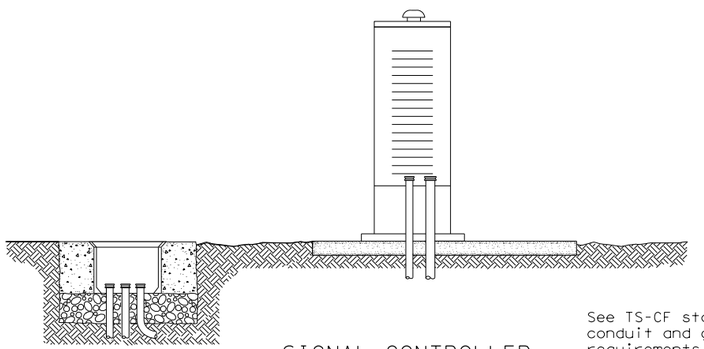
Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.

INSET A

NOTE:
SHADING IN INSET A WAS REMOVED FOR DISPLAY PURPOSE.

SIGNAL CONTROLLER FRONT VIEW

SIGNAL POLE



SIGNAL CONTROLLER SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS, P.E. 60919
7/29/2020

Texas Department of Transportation

Traffic Operations Division Standard

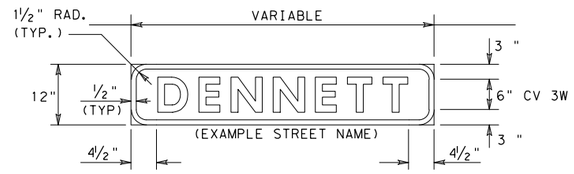
ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS

ED(8)-14

FILE: ed8-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY BLVD
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		233

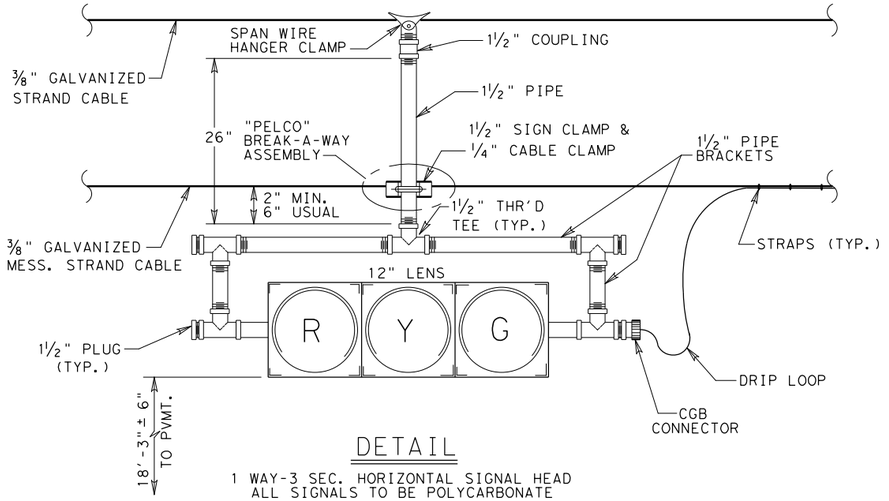
71H

D3-1



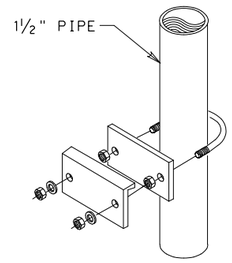
LETTERS & BORDER - WHITE (REFL)
BACKGROUND - GREEN (REFL)
MOUNT TYPE - SPAN WIRE OR MAST ARM

STREET NAME SIGN

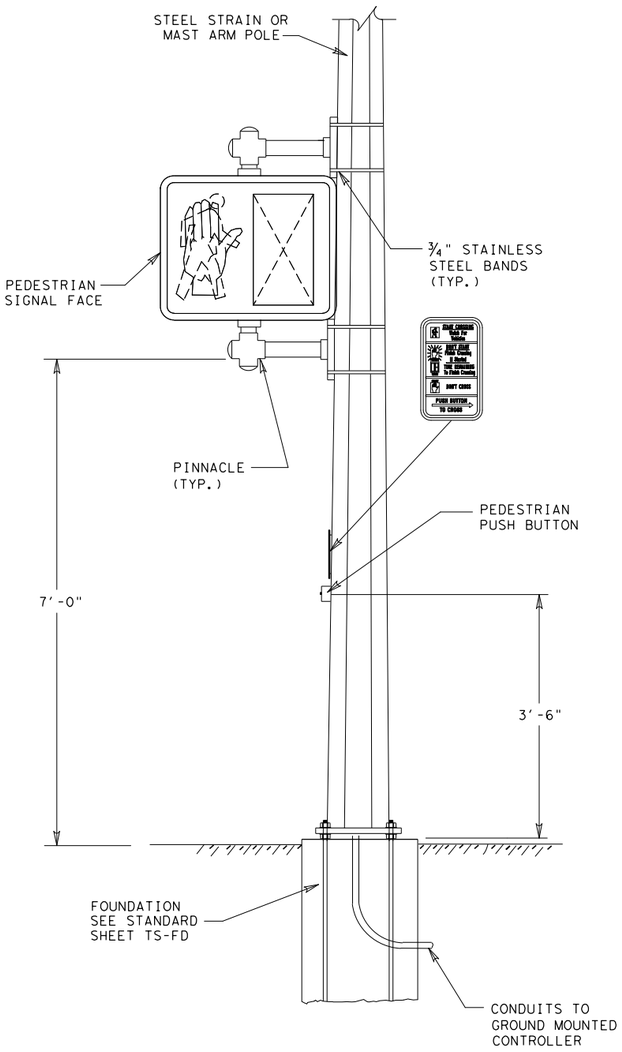


DETAIL

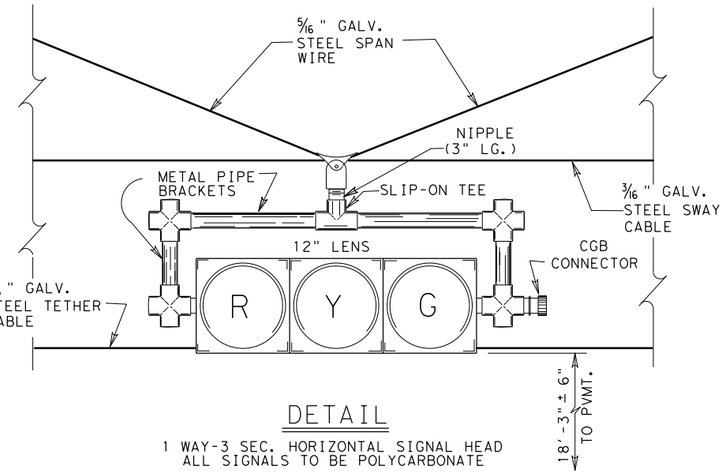
1 WAY-3 SEC. HORIZONTAL SIGNAL HEAD
ALL SIGNALS TO BE POLYCARBONATE
(TO BE USED ON SKEWED INTERSECTIONS OR WHEN SIGNAL POLES ARE NOT SQUARED TO EACH OTHER)



DETAIL-"PELCO" BREAK-A-WAY ASSEMBLY

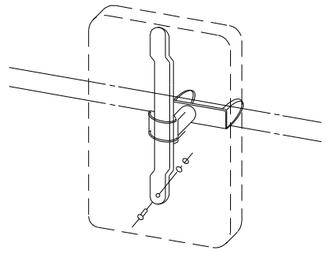


DETAIL-PEDESTRIAN SIGNALS



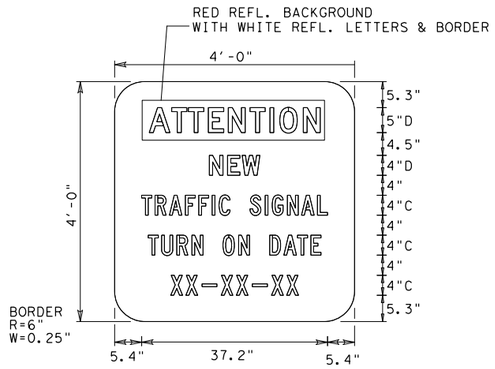
DETAIL

1 WAY-3 SEC. HORIZONTAL SIGNAL HEAD
ALL SIGNALS TO BE POLYCARBONATE

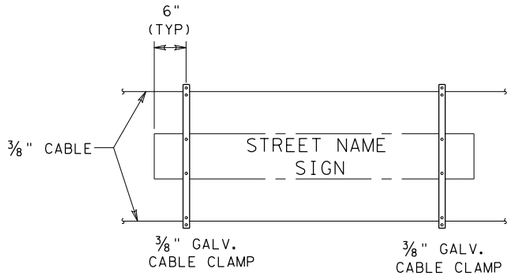


SIGN BRACKET

NOTE: THESE BRACKETS, USED IN PAIRS FOR LONGER SIGN, OR IN SINGLE UNITS FOR SMALLER SIGNS.



SPECIAL SIGN DETAIL



STREET NAME SIGN MOUNTING DETAIL

DISTRICT STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
PHARR DISTRICT STANDARD

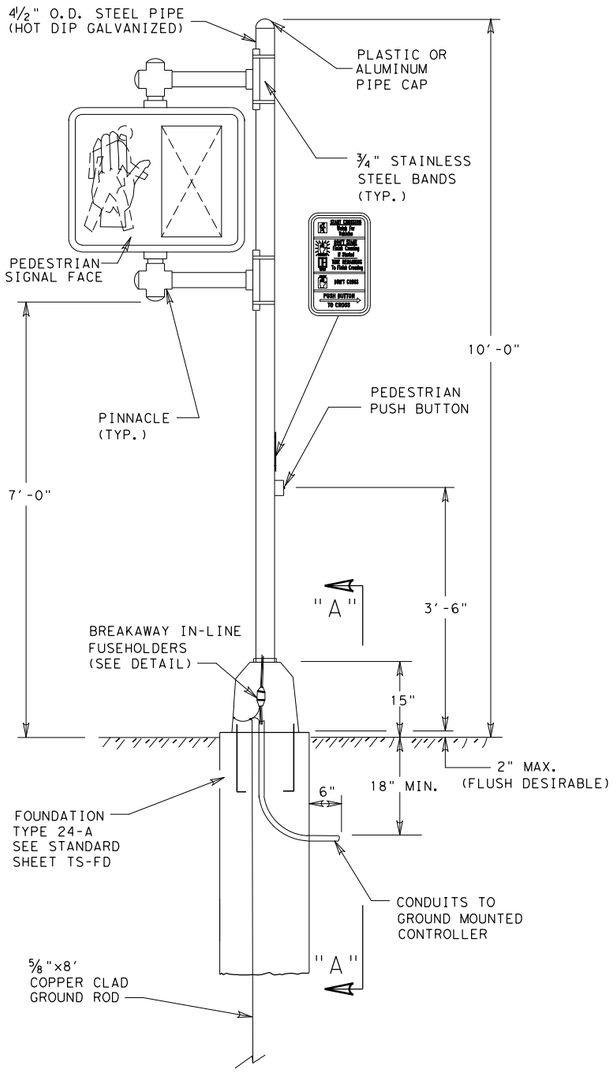
TRAFFIC SIGNAL CONSTRUCTION DETAILS

MISCELLANEOUS DETAILS

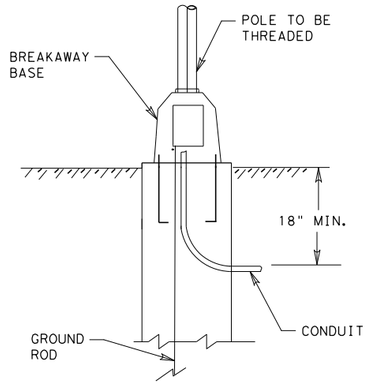
© 2010 TxDOT

SHEET 2 OF 3

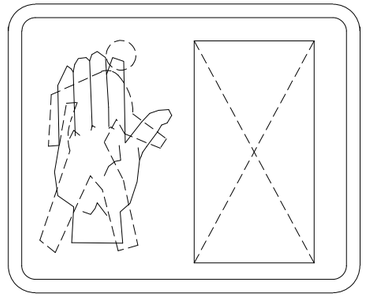
DN: OG	DRAWING	DATE	FED.RD. DIV.NO.	STATE	PROJECT NO.	SHEET NO.
CK DN: JSL	ORIGINAL	APR. 2010	6	TEXAS		234
DW: OG	REV. MAY 2016 AUG 2016		STATE DIST.NO.	COUNTY	CONTROL NO. / SECTION NO. / JOB NO.	HIGHWAY NO.
CK DW: JSL			PHARR	HIDALGO	0921 / 02 / 194	LIBERTY



PEDESTAL POLE DETAIL



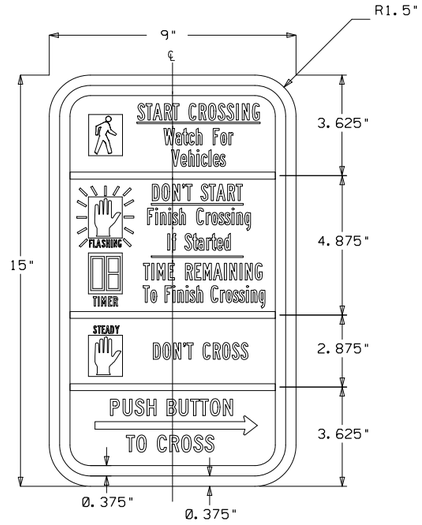
SECTION "A A"

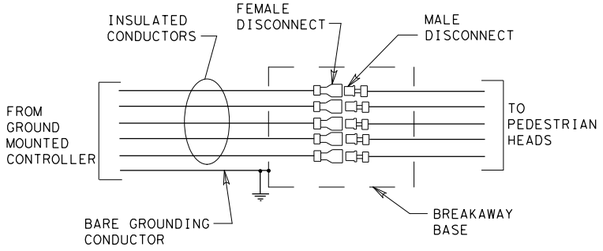


18"x16" LED PEDESTRIAN SIGNAL HEAD w/COUNTDOWN

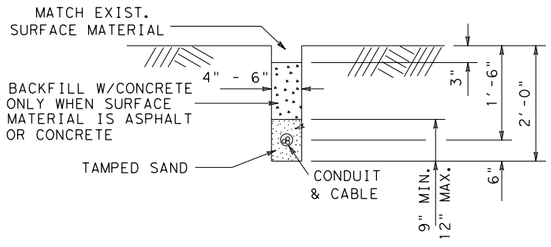
- LEGEND:
  BLACK
- BACKGROUND:
  WHITE (RETROREFLECTIVE)
- 08, HAND SYMBOL:
  ORANGE (RETROREFLECTIVE)
  ON BLACK
- PEDESTRIAN SYMBOL:
  WHITE (RETROREFLECTIVE)
  ON BLACK

NOTE:
REFER TO THE STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD) FOR MORE DETAILS AND DIMENSIONS REGARDING SIGN R10-3e



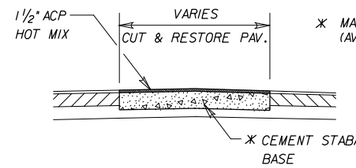


BREAKAWAY IN-LINE FUSEHOLDERS



NOTE:
ALL TRENCHES ARE TO BE MADE ONLY PARALLEL TO THE STREET. ALL CONDUIT RUNS CROSSING THE STREET SHALL BE PUSHED AND NO CUTS MADE IN THE SURFACE.

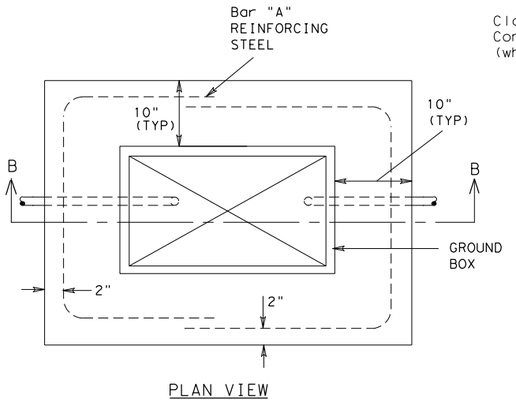
DETAIL - TRENCH LAY CONDUIT

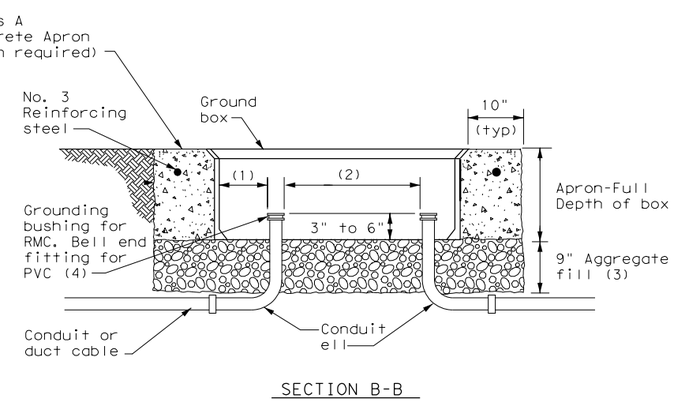


DETAIL - CUT AND RESTORE PAVEMENT

NOTES:

1. BREAKAWAY ELECTRICAL QUICK-DISCONNECTS SHALL BE WATERTIGHT BUSSMANN HEB SERIES OR EQUAL.
2. DRILL POLE FOR WIRE ENTRY. USE BUSHING OR RUBBER GROMMET TO PROTECT CONDUCTORS.
3. POLE SHAFT SHALL BE STEEL PIPE, ASTM A-53 GRADE A OR B, OR SCHEDULE 40 UL APPROVED RIGID STEEL ELECTRICAL CONDUIT. SHAFT MATERIAL SHALL BE HOT-DIPPED GALVANIZED INSIDE AND OUT IN ACCORDANCE WITH ASTM A-123.





APRON FOR GROUND BOXES

(Where required)

DISTRICT STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
PHARR DISTRICT STANDARD

TRAFFIC SIGNAL CONSTRUCTION DETAILS

MISCELLANEOUS DETAILS

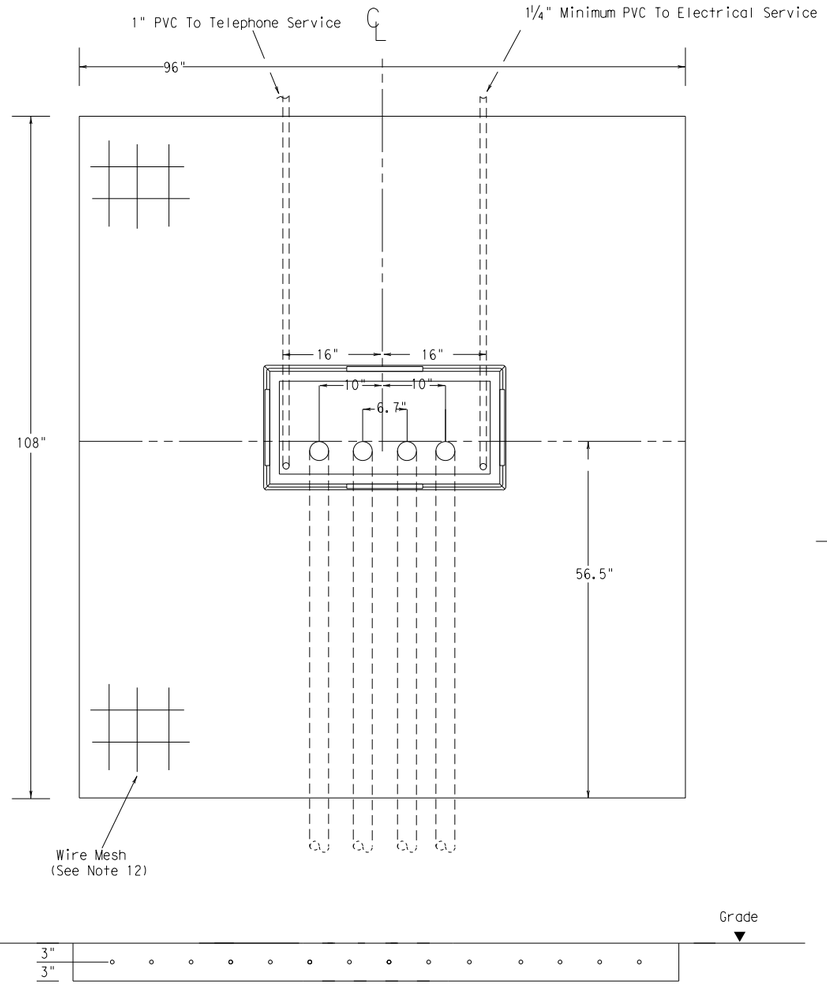
© 2015 TxDOT

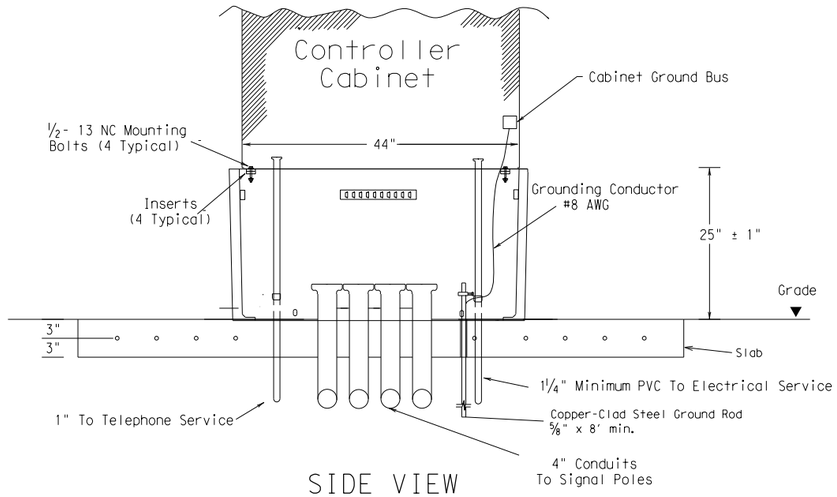
SHEET 3 OF 3

DN: OG	DRAWING	DATE	FED.RD. DIV.NO.	STATE	PROJECT NO.	SHEET NO.
CK DN: JSL	ORIGINAL	APR. 2010	6	TEXAS		235
DW: OG	REV. JUL. 2015 MAY 2016 AUG 2016		STATE DIST. NO.	COUNTY	CONTROL NO. / SECTION NO. / JOB NO.	HIGHWAY NO.
CK DW: JSL			PHARR	HIDALGO	0921 / 02 / 194	LIBERTY

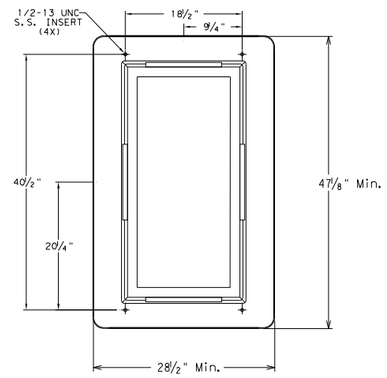
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

TOP VIEW
(Slab & Base)





SIDE VIEW
(Slab & Base)



CABINET BASE

TRAFFIC SIGNAL CONTROLLER BASE:

1. Provide a traffic signal controller base (cabinet base) manufactured of polymer concrete material consisting of calcareous and siliceous stone; glass fibers and thermoset polyester resin. The polymer concrete cabinet base must be reinforced on the inside of the cabinet base with fiberglass matting. Provide one of the following bases: Armorcast Part # A6001848X24, Quazite Model # PG3048Z709, or other as approved by TxDOT Traffic Operation Division.
2. The polymer concrete material must have a minimum compressive strength of 10,300 pounds per square inch (psi), minimum flexural strength of 3600 psi, and minimum shear strength of 3600 psi.
3. The polymer concrete cabinet base must conform to the dimensions shown and must accommodate a standard TxDOT basemount cabinet.
4. Supply the cabinet base with four ½"-13 UNC stainless steel inserts for attachment of the cabinet to the base. Inserts must withstand a minimum torque of 50 ft-lb and a minimum straight pull out strength of 750 lbs.
5. Provide the cabinet base with 4 cable racks mounted one on each side of the base 2" to 7 " from the top edge of the base. Unless approved otherwise, cable racks must be 1-1/2 x ⅜ x ⅜ inch steel channel with eight T-slots spaced at 1-1/2 inches. The cable racks must easily accommodate the insertion of tie wraps to attach field wiring to the racks to serve as strain relief. Secure cable racks to the base using ½"-13 UNC stainless steel screws and inserts.
6. The cabinet base, when secured to the concrete slab with controller cabinet attached, must withstand a minimum wind load of 125 mph or a 850 lb force applied at 49" above the bottom of the base without causing the base or cabinet to come out of their anchored position or cause any permanent deformation. The manufacturer must supply certification by an independent testing laboratory or sealed by a Texas Licensed Professional Engineer. Provide the cabinet base with hardware for attachment to a concrete slab.
7. The traffic signal base must be permanently marked either by impress or by permanent ink with the manufacturer's model number and name or logo.
8. Seal the base to the concrete with a silicone caulk bead and fastened to the slab per manufacturer's instructions.

CONCRETE SLAB:

9. Traffic signal controller pad must be a portland cement concrete slab poured in place, must conform to the dimensions shown, and must be level.
10. Bond a #8 AWG copper ground wire and an 8 ft ground rod bonded to the reinforcing mesh by a suitable UL Listed clamp and terminated to the cabinet grounding bus for the purpose of providing a local ground for the electrical grounding conductor. The electrical grounding conductor specified in Item 680-3.A.4 is required and must be terminated to the cabinet ground bus.
11. Install a PVC sleeve to prevent the ground rod from direct embedment in the slab.
12. Provide welded wire mesh 6X6-W2.9 X W2.9 for reinforcement. Provide joints and splices in the mesh with a minimum 6-inch overlap. Center the mesh between top and bottom and provide a minimum 3 inch cover on the edges.
13. Provide Class B concrete minimum for the slab in accordance with Item 421. Construct the slab in accordance with Item 531.

CONDUITS:

14. Stub up and run 4-inch conduits through the slab to the various traffic signal poles and ground boxes as shown on the layouts. Install the number of conduits as shown on layouts plus two additional 4 inch conduits for future use. Terminate the conduits with a bushing between 2 and 4-inches above the slab.
15. Extend conduits for future use at least 18-inches from the edge of the slab, terminate underground with a coupling, and cap and seal so that the seal can be removed without damaging the coupling. This must also apply to unused telephone conduit.
16. Stub up two separate conduits through the slab from the electrical and telephone services. Run the conduit for the electrical feed directly to the electrical service enclosure. Run the conduit for the telephone line directly to the telephone service, usually located on the same pole as the electrical service. Telephone must not under any circumstance share a conduit with any other function.
17. Terminate electric and telephone conduits above the slab with a coupling. After the base is installed, extend the conduits above the top of the base and secure to the base using a steel one-hole strap or similar suitable substitute.

CONTROLLER CABINET:

18. Anchor the controller cabinet to the base using four stainless steel 1/2-13 NC bolts.
19. The silicone caulk bead specified in Item 680.3.B must be RTV 133.

PAYMENT:

20. Bid TS-CF as subsidiary to Item 680.

NOTE:
THE CONTROLLER CABINET FOUNDATION WAS MODIFIED TO SHOW 4-4" CONDUITS

STATE OF TEXAS
C. SIMEONIDIS
60919
REGISTERED PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY C. SIMEONIDIS, P.E. 60919
7/29/2020

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL CONTROLLER CABINET BASE AND PAD

TS-CF-04

©TxDOT October 2000

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
0921	02	194	LIBERTY BLVD
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		236

12-04 REVISIONS

DATE:
FILE:

DISCLAIMER: 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:
FILE:

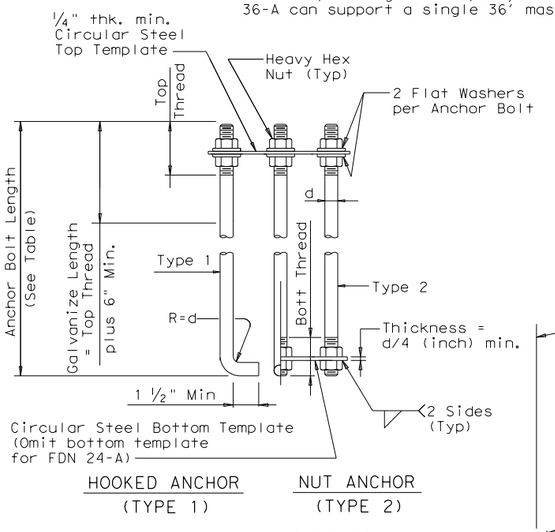
FOUNDATION DESIGN TABLE

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			ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
				10	15	40							
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)

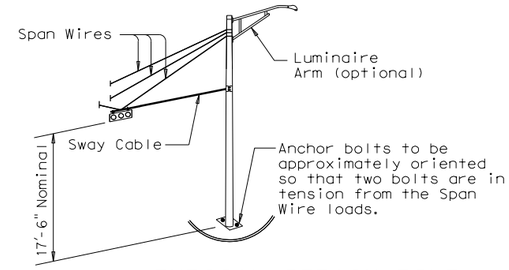
FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)

		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'

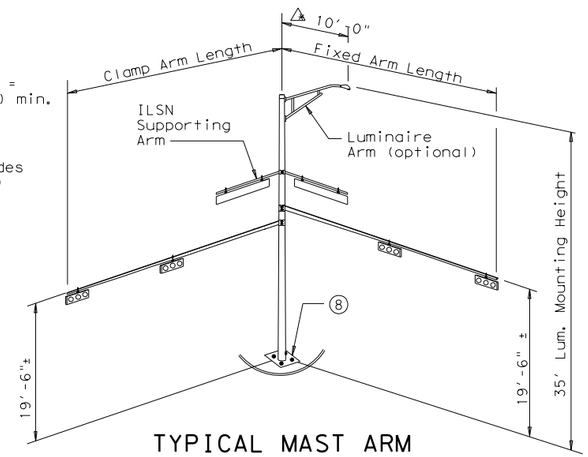
EXAMPLE:
1. For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
2. For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.



ANCHOR BOLT ASSEMBLY

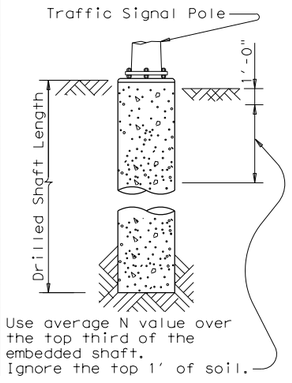


TYPICAL STRAIN POLE ASSEMBLY



TYPICAL MAST ARM ASSEMBLY

⑧ Orient anchor bolts orthogonal with the fixed arm direction to ensure that two bolts are in tension under dead load.



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.

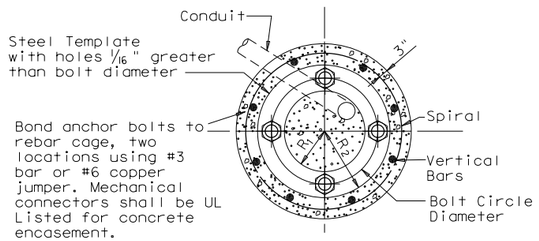
⑤ If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

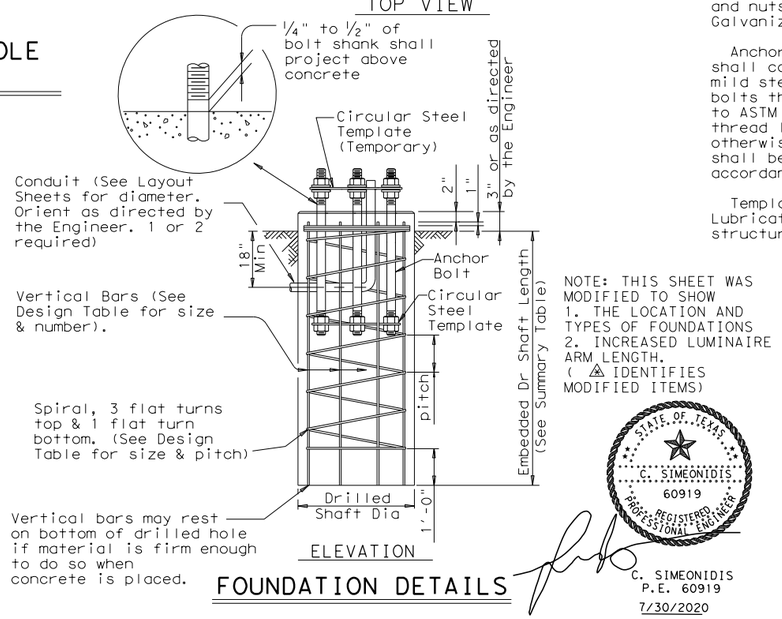
⑥ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

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.





FOUNDATION DETAILS

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
① LIBERTY BLVD AT US 83	10	24-A	8	45.6				
		36-B	1				15.2	
② LIBERTY BLVD AT DIAMOND AVE	10	24-A	5	28.5				
		36-B	4				60.8	
③ LIBERTY BLVD AT LA JOLLA	10	24-A	12	68.4				
		36-B	1				15.2	
④ LIBERTY BLVD AT MILE 3 RD	10	24-A	5	28.5				
		36-B	4				60.8	
TOTAL DRILLED SHAFT LENGTHS				171			152	

* INCIDENTAL TO ITEM 687

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".

NOTE: THIS SHEET WAS MODIFIED TO SHOW
1. THE LOCATION AND TYPES OF FOUNDATIONS
2. INCREASED LUMINAIRE ARM LENGTH.
(⚠ IDENTIFIES MODIFIED ITEMS)

STATE OF TEXAS
C. SIMEONIDIS
60919
REGISTERED PROFESSIONAL ENGINEER

C. SIMEONIDIS
P.E. 60919
7/30/2020

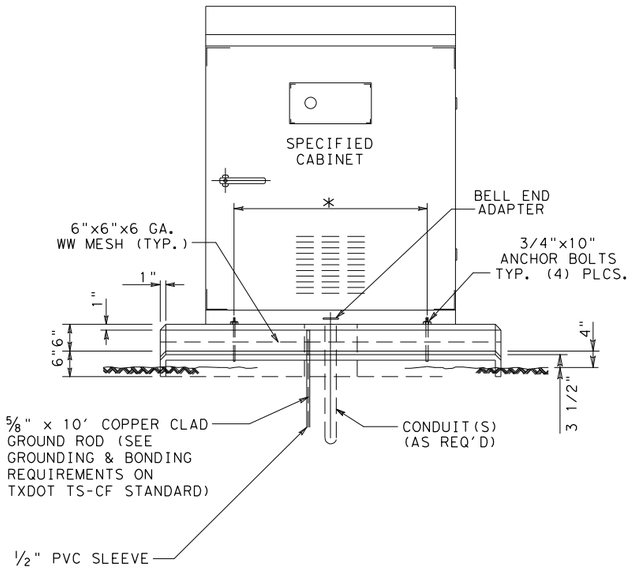
Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

©TxDOT August 1995

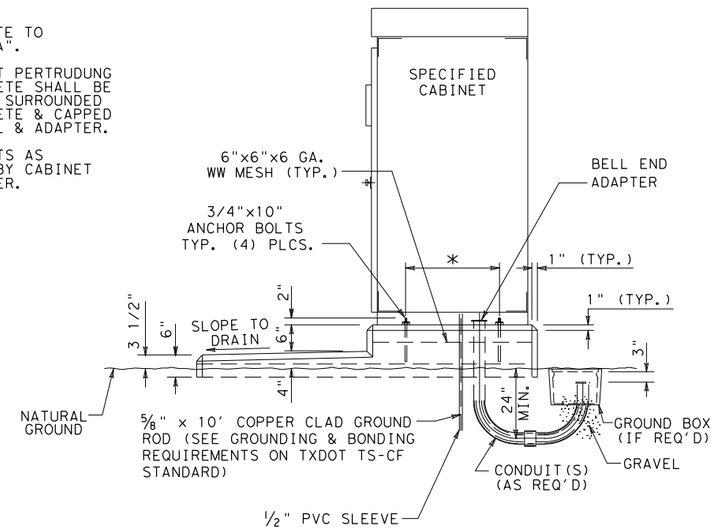
REVISIONS	DN: MS	CK: JSY	DW: MAO/MMF	CK: JSY/TEB
5-96 11-98 1-12	CONT	SECT	JOB	HIGHWAY
	0921	02	194	LIBERTY BLVD
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		237



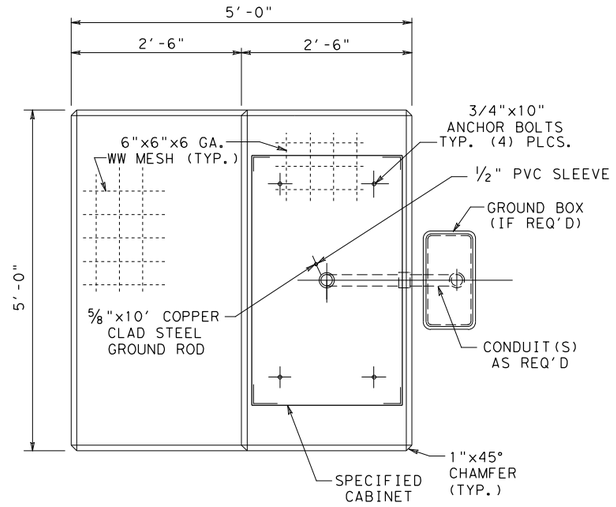
FRONT VIEW

NOTES:

1. ALL CONCRETE TO BE CLASS "A".
2. ALL CONDUIT PERTRUDUNG THRU CONCRETE SHALL BE COMPLETELY SURROUNDED WITH CONCRETE & CAPPED WITH A BELL & ADAPTER.
3. * ANCHOR BOLTS AS SPECIFIED BY CABINET MANUFACTURER.

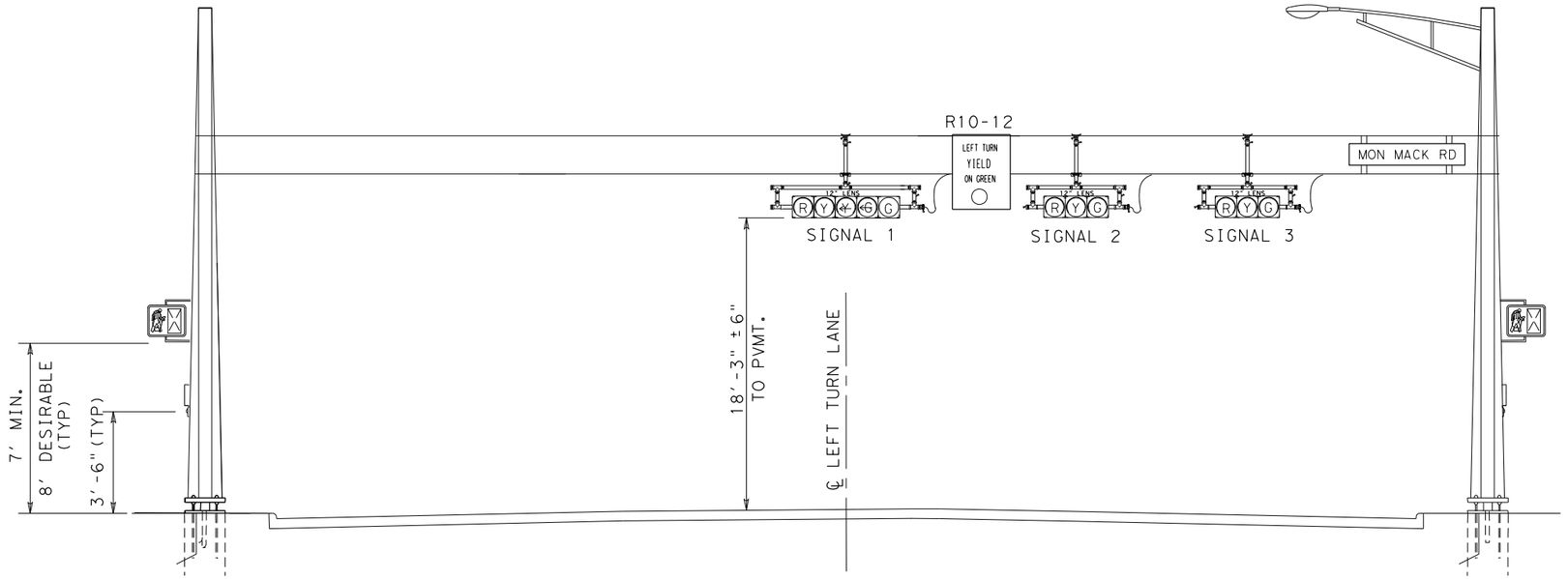


SIDE VIEW



TOP VIEW

DETAIL OF BASE MOUNT CABINET FOUNDATION



ELEVATION VIEW

DISTRICT STANDARD PLANS

TEXAS DEPARTMENT OF TRANSPORTATION

PHARR DISTRICT STANDARD

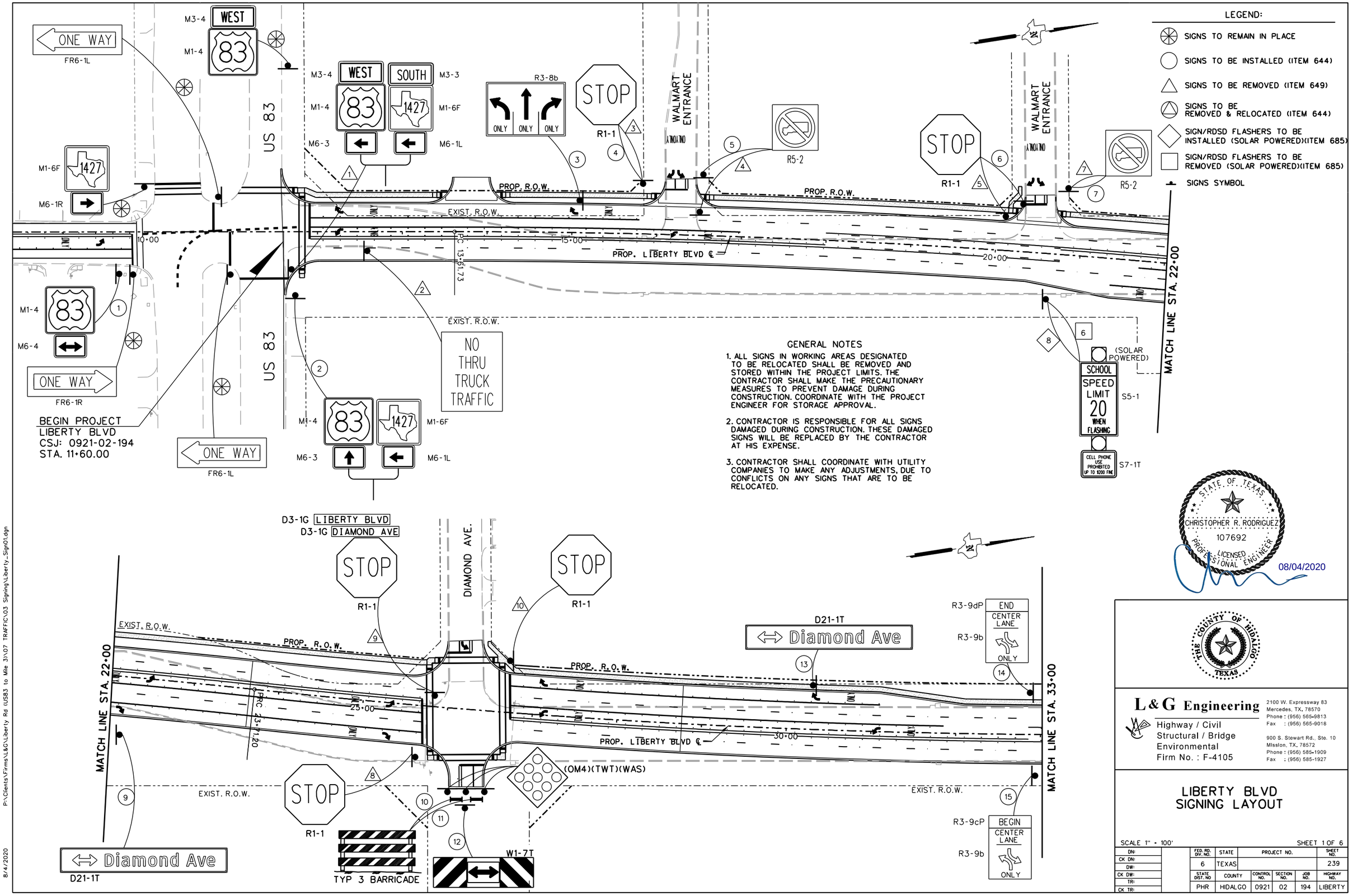
TRAFFIC SIGNAL CONSTRUCTION DETAILS

CONTROLLER FOUNDATON & LOOP DETECTOR INSTALLATION

© 2015 TxDOT

SHEET 1 OF 3

DN: OG	DRAWING	DATE	FED.RD. DIV.NO.	STATE	PROJECT NO.	SHEET NO.
CK DN: JSL	ORIGINAL	APR. 2010	6	TEXAS		238
DW: OG	REV. JUL. 2015 AUG 2016		STATE DIST. NO.	COUNTY	CONTROL NO. / SECTION NO. / JOB NO.	HIGHWAY NO.
CK DW: JSL			PHARR	HIDALGO	0921 / 02 / 194	LIBERTY



STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL LICENSED ENGINEER
08/04/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

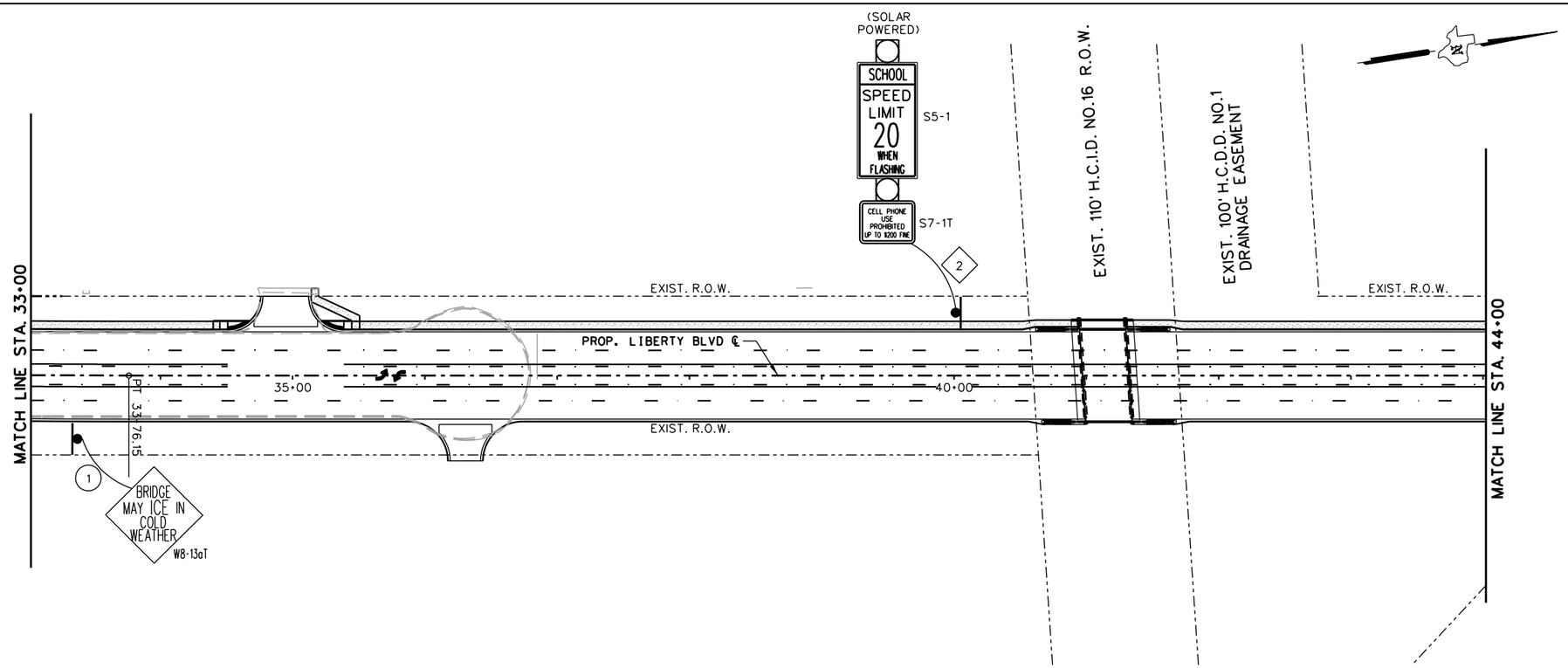
900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

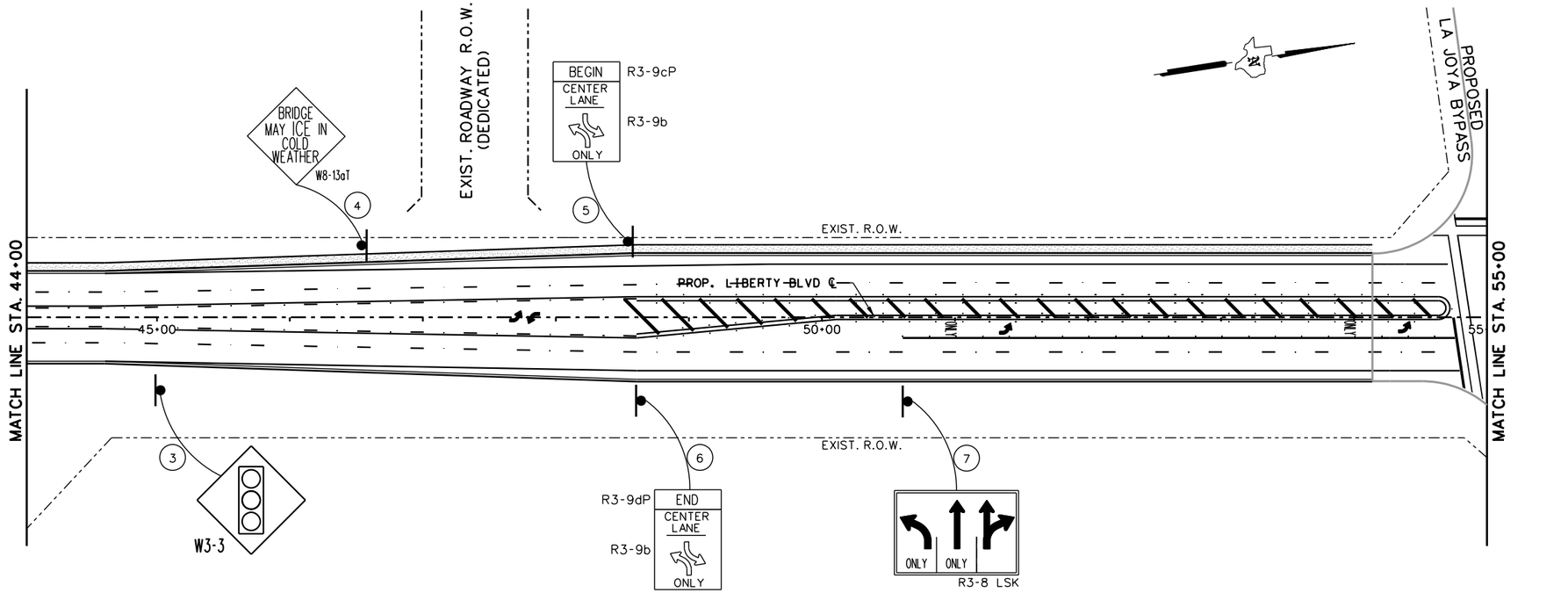
LIBERTY BLVD SIGNING LAYOUT

SCALE 1" = 100' SHEET 1 OF 6

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					239
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

8/4/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\07 TRAFFIC\03 Signing\Liberty_Sign01.dgn





LEGEND:

- SIGNS TO REMAIN IN PLACE
- SIGNS TO BE INSTALLED (ITEM 644)
- SIGNS TO BE REMOVED (ITEM 649)
- SIGNS TO BE REMOVED & RELOCATED (ITEM 644)
- SIGN/RDSD FLASHERS TO BE INSTALLED (SOLAR POWERED)(ITEM 685)
- SIGN/RDSD FLASHERS TO BE REMOVED (SOLAR POWERED)(ITEM 685)
- SIGNS SYMBOL

GENERAL NOTES

1. ALL SIGNS IN WORKING AREAS DESIGNATED TO BE RELOCATED SHALL BE REMOVED AND STORED WITHIN THE PROJECT LIMITS. THE CONTRACTOR SHALL MAKE THE PRECAUTIONARY MEASURES TO PREVENT DAMAGE DURING CONSTRUCTION. COORDINATE WITH THE PROJECT ENGINEER FOR STORAGE APPROVAL.
2. CONTRACTOR IS RESPONSIBLE FOR ALL SIGNS DAMAGED DURING CONSTRUCTION. THESE DAMAGED SIGNS WILL BE REPLACED BY THE CONTRACTOR AT HIS EXPENSE.
3. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO CONFLICTS ON ANY SIGNS THAT ARE TO BE RELOCATED.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
08/04/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

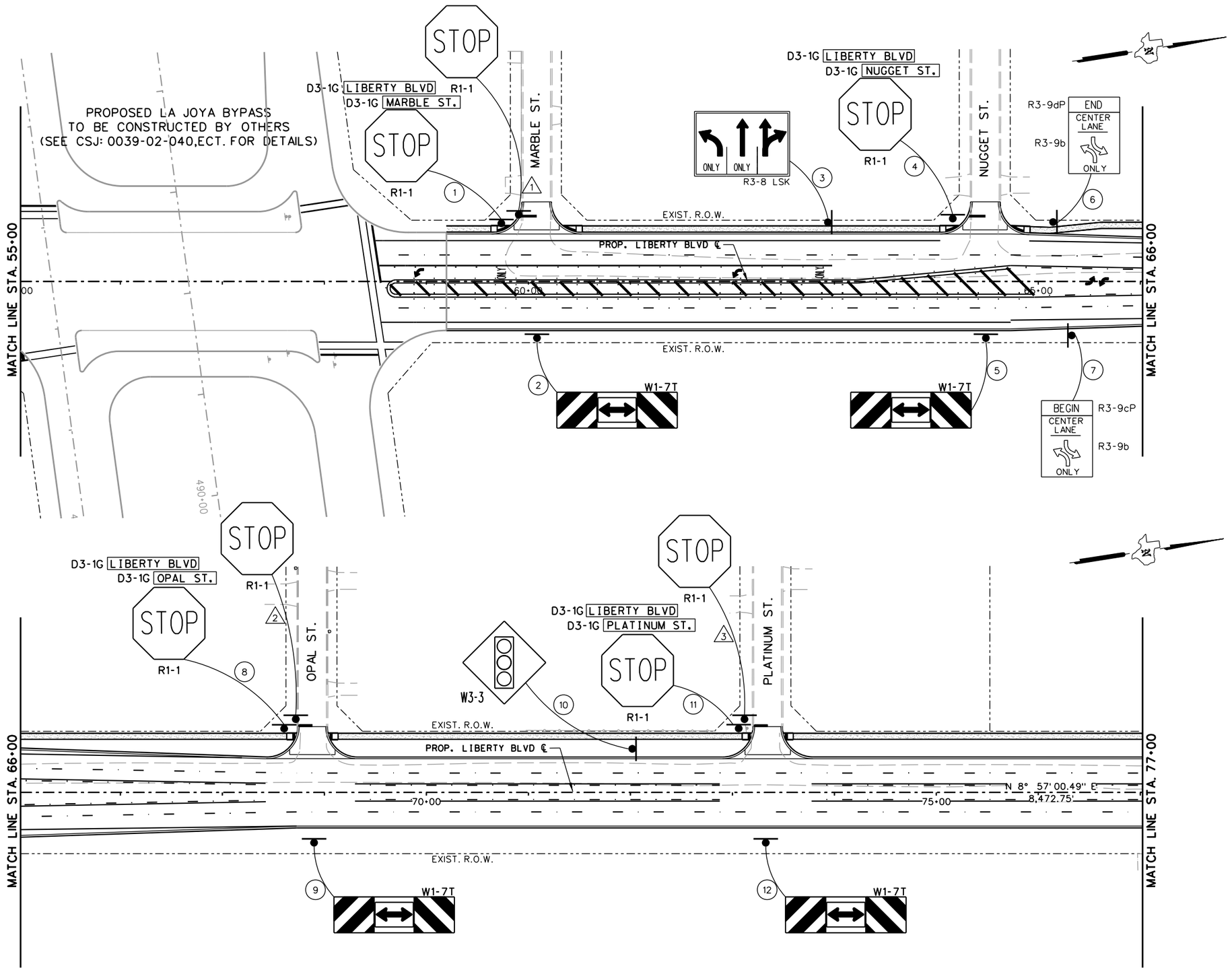
LIBERTY BLVD SIGNING LAYOUT

SCALE 1" = 100'

SHEET 2 OF 6

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					240
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

8/4/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3\07 TRAFFIC\03 Signing\Liberty_Sign02.dgn



LEGEND:

- SIGNS TO REMAIN IN PLACE
- SIGNS TO BE INSTALLED (ITEM 644)
- SIGNS TO BE REMOVED (ITEM 649)
- SIGNS TO BE REMOVED & RELOCATED (ITEM 644)
- SIGN/RDSD FLASHERS TO BE INSTALLED (SOLAR POWERED)(ITEM 685)
- SIGN/RDSD FLASHERS TO BE REMOVED (SOLAR POWERED)(ITEM 685)
- SIGNS SYMBOL

GENERAL NOTES

1. ALL SIGNS IN WORKING AREAS DESIGNATED TO BE RELOCATED SHALL BE REMOVED AND STORED WITHIN THE PROJECT LIMITS. THE CONTRACTOR SHALL MAKE THE PRECAUTIONARY MEASURES TO PREVENT DAMAGE DURING CONSTRUCTION. COORDINATE WITH THE PROJECT ENGINEER FOR STORAGE APPROVAL.
2. CONTRACTOR IS RESPONSIBLE FOR ALL SIGNS DAMAGED DURING CONSTRUCTION. THESE DAMAGED SIGNS WILL BE REPLACED BY THE CONTRACTOR AT HIS EXPENSE.
3. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO CONFLICTS ON ANY SIGNS THAT ARE TO BE RELOCATED.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
08/04/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

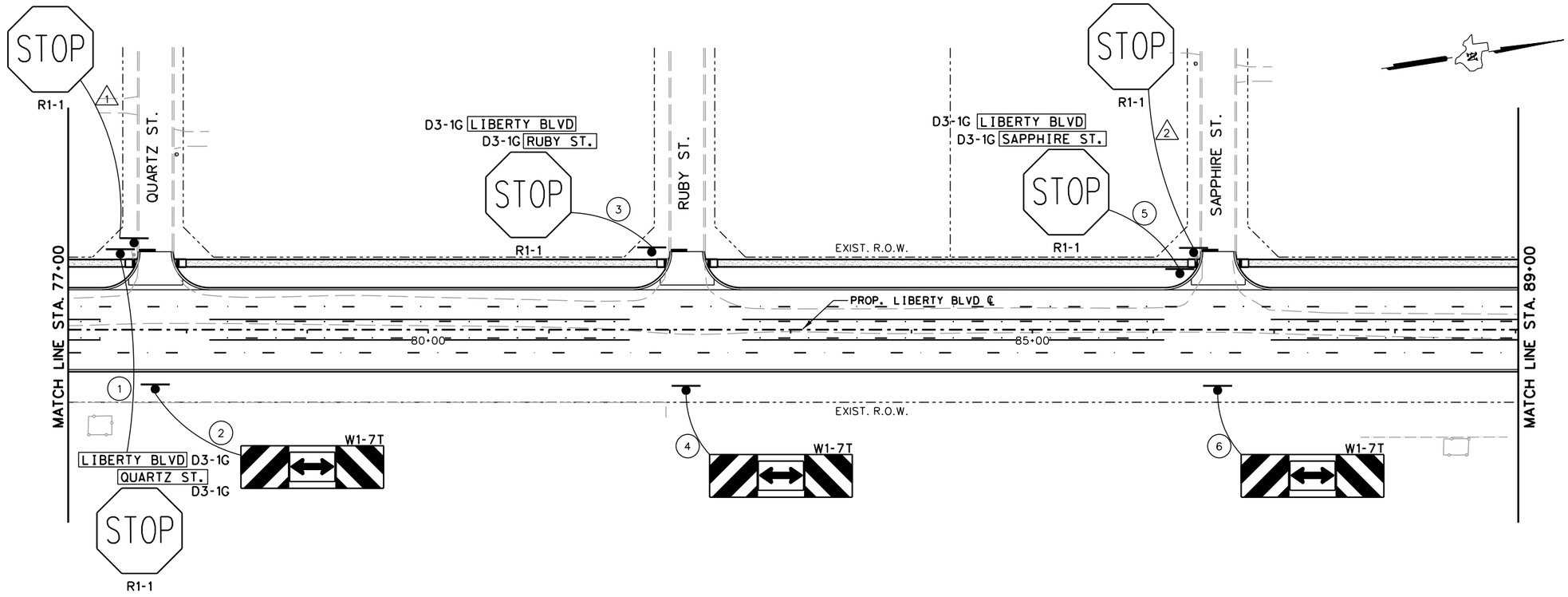
900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

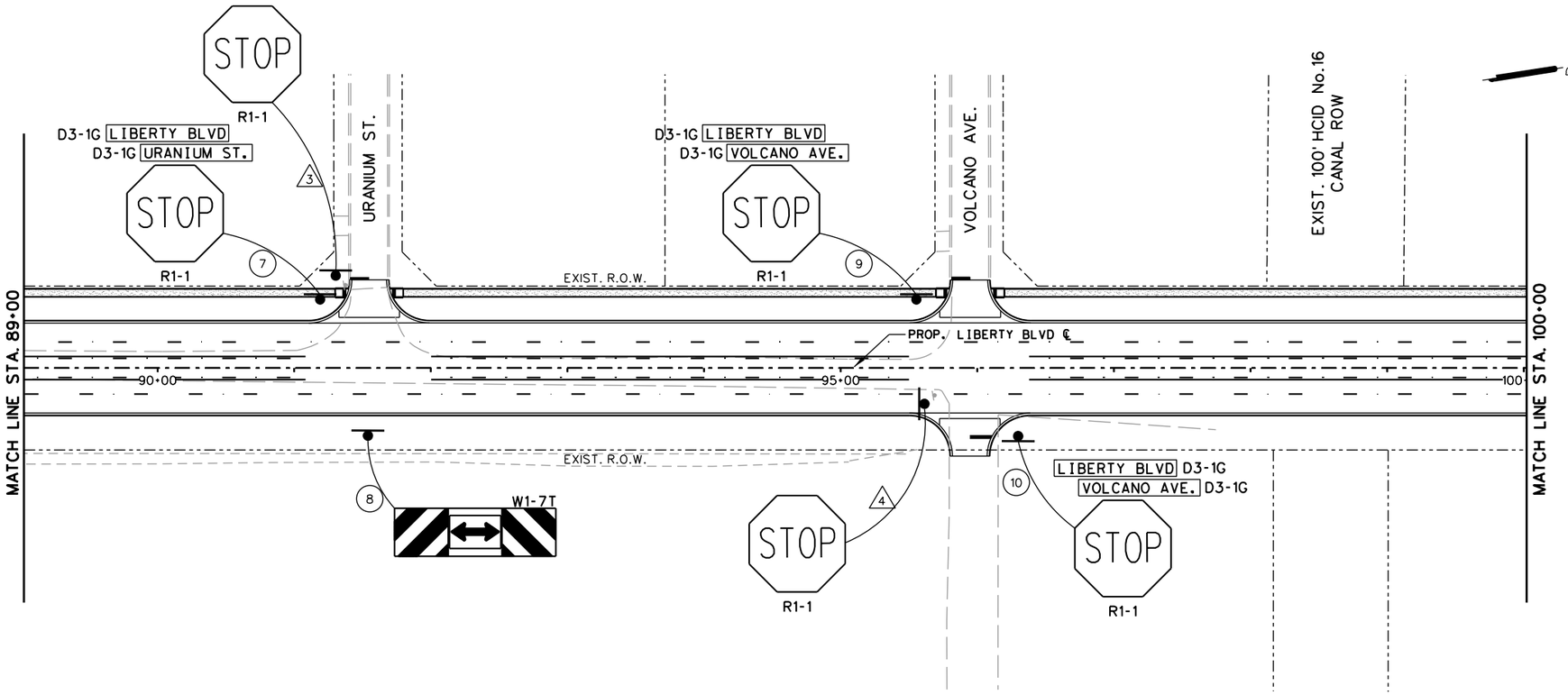
LIBERTY BLVD SIGNING LAYOUT

SCALE 1" = 100' SHEET 3 OF 6

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				241
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

8/4/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\07 TRAFFIC\03 Signing\Liberty_Sign03.dgn





LEGEND:

- SIGNS TO REMAIN IN PLACE
- SIGNS TO BE INSTALLED (ITEM 644)
- SIGNS TO BE REMOVED (ITEM 649)
- SIGNS TO BE REMOVED & RELOCATED (ITEM 644)
- SIGN/RDSD FLASHERS TO BE INSTALLED (SOLAR POWERED)(ITEM 685)
- SIGN/RDSD FLASHERS TO BE REMOVED (SOLAR POWERED)(ITEM 685)
- SIGNS SYMBOL

GENERAL NOTES

1. ALL SIGNS IN WORKING AREAS DESIGNATED TO BE RELOCATED SHALL BE REMOVED AND STORED WITHIN THE PROJECT LIMITS. THE CONTRACTOR SHALL MAKE THE PRECAUTIONARY MEASURES TO PREVENT DAMAGE DURING CONSTRUCTION. COORDINATE WITH THE PROJECT ENGINEER FOR STORAGE APPROVAL.
2. CONTRACTOR IS RESPONSIBLE FOR ALL SIGNS DAMAGED DURING CONSTRUCTION. THESE DAMAGED SIGNS WILL BE REPLACED BY THE CONTRACTOR AT HIS EXPENSE.
3. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO CONFLICTS ON ANY SIGNS THAT ARE TO BE RELOCATED.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL LICENSED ENGINEER
08/04/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

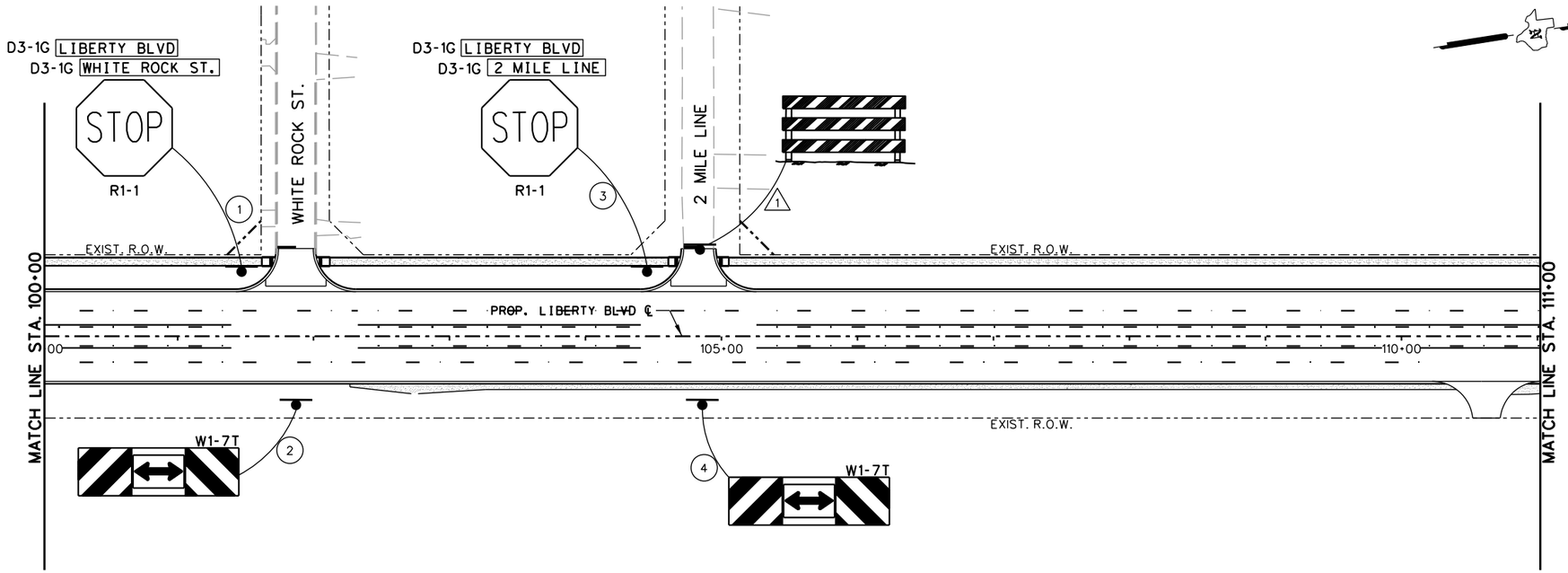
900 S. Stewart Rd. Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

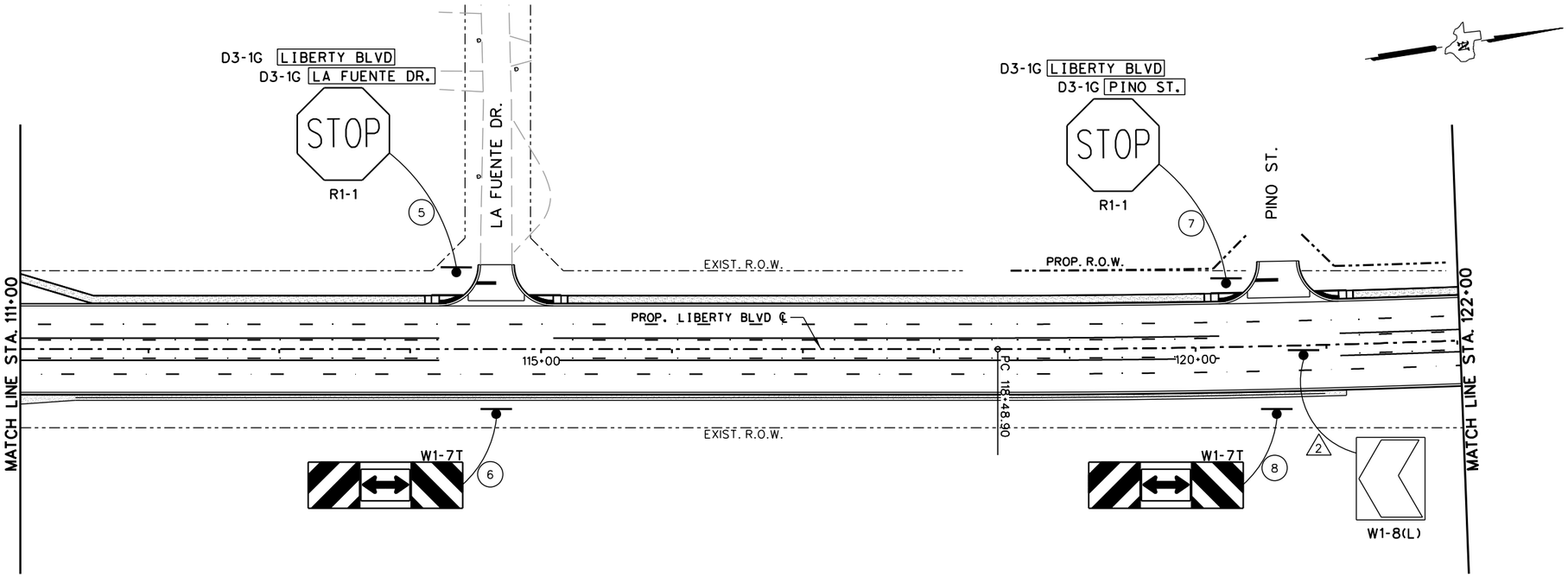
LIBERTY BLVD SIGNING LAYOUT

SCALE 1" = 100' SHEET 4 OF 6

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					242
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

8/4/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3\)07 TRAFFIC\03 Signing\Liberty_Sign04.dgn





LEGEND:

- SIGNS TO REMAIN IN PLACE
- SIGNS TO BE INSTALLED (ITEM 644)
- SIGNS TO BE REMOVED (ITEM 649)
- SIGNS TO BE REMOVED & RELOCATED (ITEM 644)
- SIGN/RDSD FLASHERS TO BE INSTALLED (SOLAR POWERED)(ITEM 685)
- SIGN/RDSD FLASHERS TO BE REMOVED (SOLAR POWERED)(ITEM 685)
- SIGNS SYMBOL

GENERAL NOTES

1. ALL SIGNS IN WORKING AREAS DESIGNATED TO BE RELOCATED SHALL BE REMOVED AND STORED WITHIN THE PROJECT LIMITS. THE CONTRACTOR SHALL MAKE THE PRECAUTIONARY MEASURES TO PREVENT DAMAGE DURING CONSTRUCTION. COORDINATE WITH THE PROJECT ENGINEER FOR STORAGE APPROVAL.
2. CONTRACTOR IS RESPONSIBLE FOR ALL SIGNS DAMAGED DURING CONSTRUCTION. THESE DAMAGED SIGNS WILL BE REPLACED BY THE CONTRACTOR AT HIS EXPENSE.
3. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO CONFLICTS ON ANY SIGNS THAT ARE TO BE RELOCATED.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
08/04/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

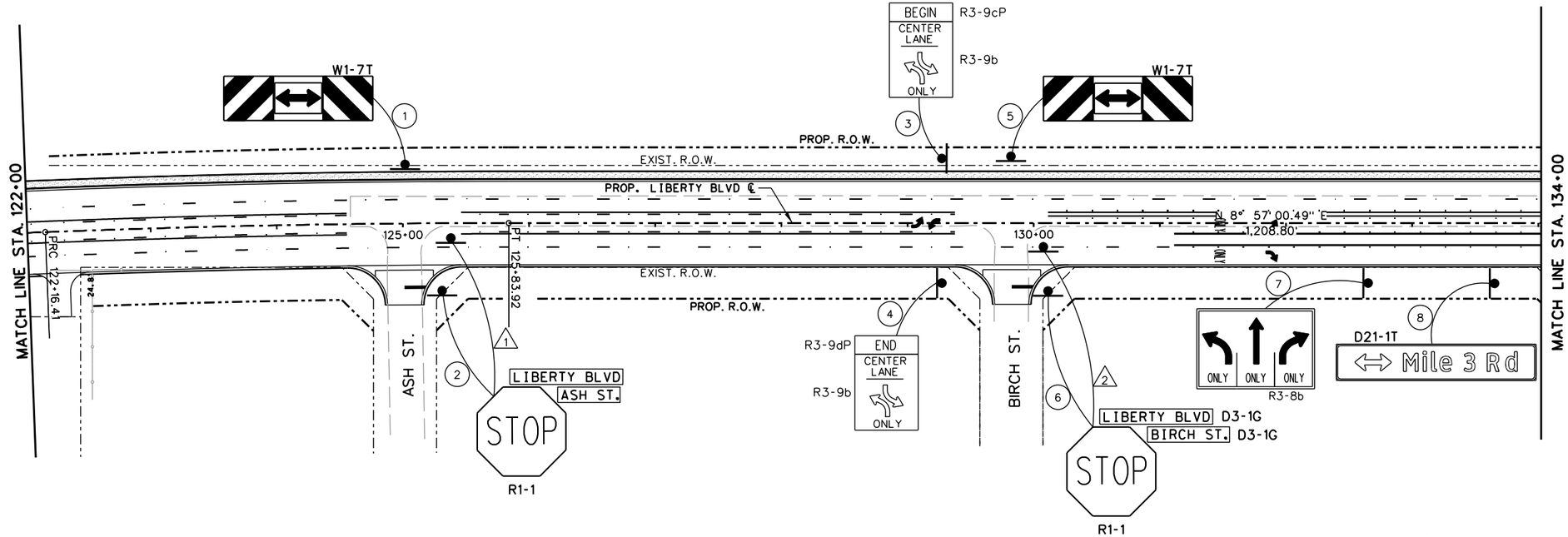
LIBERTY BLVD SIGNING LAYOUT

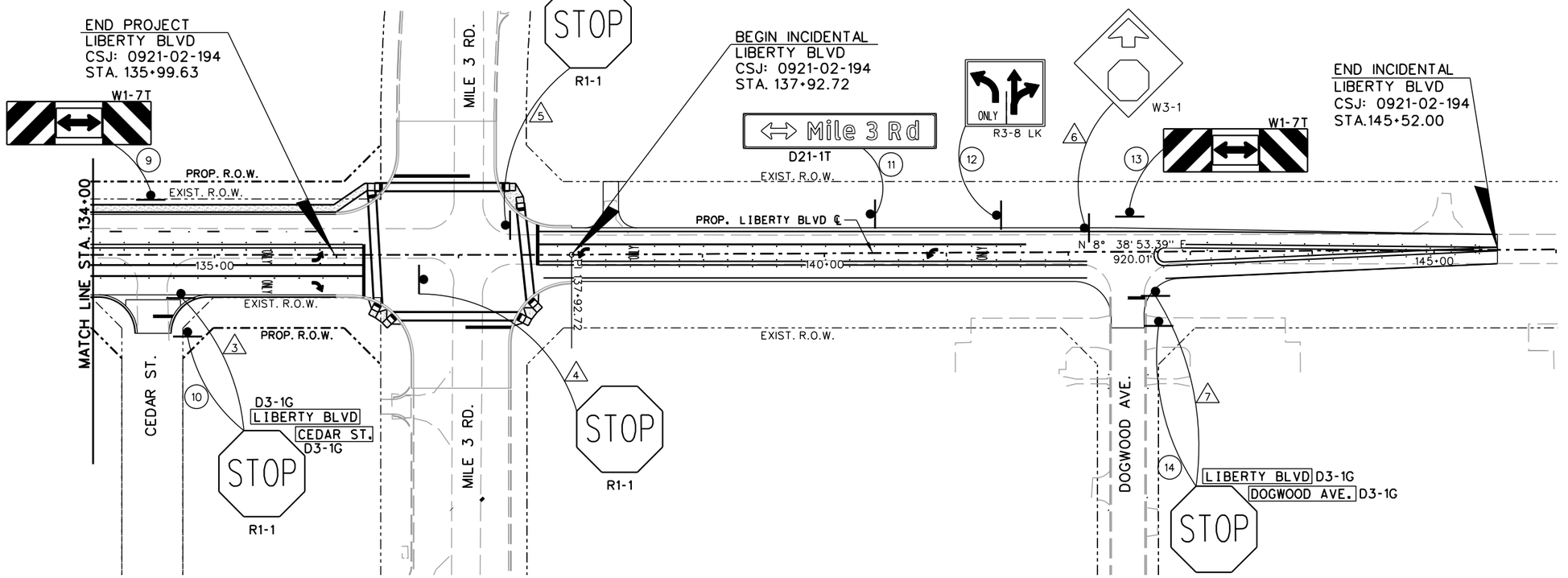
SCALE 1" = 100'

SHEET 5 OF 6

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					243
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

8/4/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\07 TRAFFIC\03 Signing\Liberty_Sign05.dgn





LEGEND:

- SIGNS TO REMAIN IN PLACE
- SIGNS TO BE INSTALLED (ITEM 644)
- SIGNS TO BE REMOVED (ITEM 649)
- SIGNS TO BE REMOVED & RELOCATED (ITEM 644)
- SIGN/RDSD FLASHERS TO BE INSTALLED (SOLAR POWERED)(ITEM 685)
- SIGN/RDSD FLASHERS TO BE REMOVED (SOLAR POWERED)(ITEM 685)
- SIGNS SYMBOL

GENERAL NOTES

1. ALL SIGNS IN WORKING AREAS DESIGNATED TO BE RELOCATED SHALL BE REMOVED AND STORED WITHIN THE PROJECT LIMITS. THE CONTRACTOR SHALL MAKE THE PRECAUTIONARY MEASURES TO PREVENT DAMAGE DURING CONSTRUCTION. COORDINATE WITH THE PROJECT ENGINEER FOR STORAGE APPROVAL.
2. CONTRACTOR IS RESPONSIBLE FOR ALL SIGNS DAMAGED DURING CONSTRUCTION. THESE DAMAGED SIGNS WILL BE REPLACED BY THE CONTRACTOR AT HIS EXPENSE.
3. CONTRACTOR TO COORDINATE WITH UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO CONFLICTS ON ANY SIGNS THAT ARE TO BE RELOCATED.

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
09/22/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD SIGNING LAYOUT

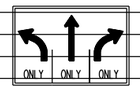
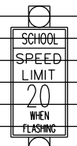
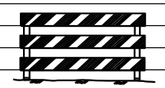
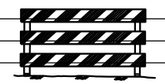
SCALE 1" = 100' SHEET 6 OF 6

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					244
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

9/22/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\07 TRAFFIC\03 Signing\Liberty_Sign06.dgn

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
1 OF 6												
	1	M1-4		24X24	✓		S80	1	SA	P		
		M6-4		21X15	✓							
	2	M1-4		24X24	✓		S80	1	SA	U		
		M6-4		21X15	✓							
		M1-6F		24X24	✓							
		M6-1L		21X15	✓							
	3	R3-8b		48X30	✓		S80	1	SA	U		
	4	R1-1		36X36	✓		S80	1	SA	P		
	5	R5-2		36X36	✓		S80	1	SA	P		
	6	R1-1		36X36	✓		S80	1	SA	P		
	7	R5-2		36X36	✓		S80	1	SA	P		
	8	S5-1	(SOLAR POWERED) 	24X48	✓		S80	1	SA	P		
		S7-1T		24X18	✓							
	9	D21-1TDBL		82X12	✓		S80	1	SA	T		
	10	TYP 3 BARRICADE		-	✓		S80	2	SA	P		
	11	TYP 3 BARRICADE		-	✓		S80	2	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).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 1 OF 7

FILE: sums16.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
4-16 8-16	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		245

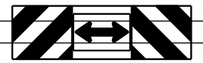
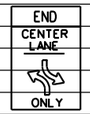
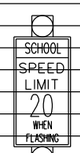
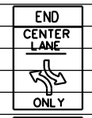
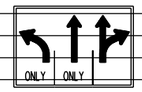
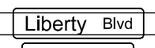
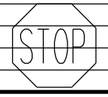
18

DISCLAIMER:
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: 8/4/2020 6:24:24 PM
FILE: P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\07 TRAFFIC\03 Signing\Working\sums16.dgn

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
1 OF 6												
	12	W1-7T		96X36	✓		S80	1	SA	T		
	13	D21-1T		82X12	✓		S80	1	SA	T		
	14	R3-9dP		24X8	✓		S80	1	SA	P		
		R3-9b		24X36	✓							
	15	R3-9cP		24X8	✓		S80	1	SA	P		
		R3-9b		24X36	✓							
2 OF 6												
	1	W8-13AT		36X36	✓		S80	1	SA	P		
	2	S5-1		24X48	✓		S80	1	SA	P		
		S7-1T		24X18	✓							
	3	W8-13AT		36X36	✓		S80	1	SA	P		
	4	R3-9dP		24X8	✓		S80	1	SA	P		
		R3-9b		24X36	✓							
	5	R3-9cP		24X8	✓		S80	1	SA	P		
		R3-9b		24X36	✓							
	6	R3-8 LSK		48X30	✓		S80	1	SA	U		
3 OF 6												
	1	D3-1G		35X8	✓							
		D3-1G		30X8	✓							
		R1-1		36X36	✓		S80	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).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 2 OF 7

FILE:	sums16.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0921	02	194	LIBERTY
4-16		DIST	COUNTY		SHEET NO.
8-16		PHR	HIDALGO		246

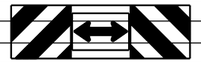
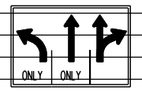
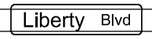
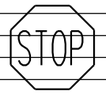
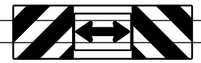
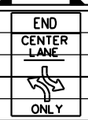
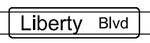
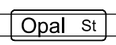
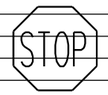
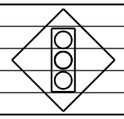
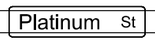
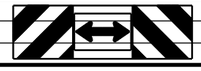
18

DISCLAIMER:
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: 8/4/2020 6:24:25 PM
FILE: P:\Clients\Firms\L&GL\Liberty Rd (US83 to Mile 3)\07 TRAFFIC\03 Signing\Sheets\sums16.dgn

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
3 OF 6												
	2	W1-7T		96X36	✓		S80	1	SA	T		
	3	R3-8 LSK		48X30	✓		S80	1	SA	U		
		D3-1G		35X8	✓							
	4	D3-1G		30X8	✓							
		R1-1		36X36	✓		S80	1	SA	P		
	5	W1-7T		96X36	✓		S80	1	SA	T		
	6	R3-9dP R3-9b		24X8 24X36	✓ ✓		S80	1	SA	P		
	7	R3-9cP R3-9b		24X8 24X36	✓ ✓		S80	1	SA	P		
		D3-1G		35X8	✓							
	8	D3-1G		25X8	✓							
		R1-1		36X36	✓		S80	1	SA	P		
	9	W1-7T		96X36	✓		S80	1	SA	T		
	10	W3-3		36X36	✓		S80	1	SA	P		
		D3-1G		35X8	✓							
	11	D3-1G		36X8	✓							
		R1-1		36X36	✓		S80	1	SA	P		
	12	W1-7T		96X36	✓		S80	1	SA	T		

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).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 3 OF 7

FILE:	sums16.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0921	02	194	LIBERTY
4-16		DIST	COUNTY		SHEET NO.
8-16		PHR	HIDALGO		247

18

DISCLAIMER:
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: 8/4/2020 6:24:26 PM
FILE: P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\07 TRAFFIC\03 Signing\sums16.dgn

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	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION: PREFABRICATED	MOUNTING DESIGNATION: 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
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
4 OF 6												
		D3-1G	Liberty Blvd	35X8	✓							
	1											
		D3-1G	Quartz St	30X8	✓							
		R1-1	STOP	36X36	✓		S80	1	SA	P		
	2	W1-7T		96X36	✓		S80	1	SA	T		
		D3-1G	Liberty Blvd	35X8	✓							
	3											
		D3-1G	Ruby St	25X8	✓							
		R1-1	STOP	36X36	✓		S80	1	SA	P		
	4	W1-7T		96X36	✓		S80	1	SA	T		
		D3-1G	Liberty Blvd	35X8	✓							
	5											
		D3-1G	Sapphire St	36X8	✓							
		R1-1	STOP	36X36	✓		S80	1	SA	P		
	6	W1-7T		96X36	✓		S80	1	SA	T		
		D3-1G	Liberty Blvd	35X8	✓							
		D3-1G	Uranium St	34X8	✓							
	7	R1-1	STOP	36X36	✓		S80	1	SA	P		
	8	W1-7T		96X36	✓		S80	1	SA	T		
		D3-1G	Liberty Blvd	35X8	✓							
	9											
		D3-1G	Volcano Ave	37X8	✓							
		R1-1	STOP	36X36	✓		S80	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).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 4 OF 7

FILE:	sums16.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0921	02	194	LIBERTY
4-16		DIST	COUNTY		SHEET NO.
8-16		PHR	HIDALGO		248

18

DISCLAIMER:
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: 8/4/2020
FILE: P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\07 TRAFFIC\03 Signing\Working\sums16.dgn

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")	MOUNTING DESIGNATION: 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
4 OF 6												
		D3-1G	Liberty Blvd	35X8	✓							
	10											
		D3-1G	Volcano Ave	37X8	✓							
		R1-1	STOP	36X36	✓		S80	1	SA	P		
5 OF 6												
		D3-1G	Liberty Blvd	35X8	✓							
	1											
		D3-1G	White Rock St	44X8	✓							
		R1-1	STOP	36X36	✓		S80	1	SA	P		
	2	W1-7T		96X36	✓		S80	1	SA	T		
		D3-1G	Liberty Blvd	35X8	✓							
	3											
		D3-1G	Mile 2 Rd	30X8	✓							
		R1-1	STOP	36X36	✓		S80	1	SA	P		
	4	W1-7T		96X36	✓		S80	1	SA	T		
		D3-1G	Liberty Blvd	35X8	✓							
	5											
		D3-1G	La Fuente Dr	40X8	✓							
		R1-1	STOP	36X36	✓		S80	1	SA	P		
	6	W1-7T		96X36	✓		S80	1	SA	T		
		D3-1G	Liberty Blvd	35X8	✓							
	7											
		D3-1G	Pino St	24X8	✓							
		R1-1	STOP	36X36	✓		S80	1	SA	P		
	8	W1-7T		96X36	✓		S80	1	SA	T		

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).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 5 OF 7

FILE: sums16.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
4-16	DIST	COUNTY		SHEET NO.
8-16	PHR	HIDALGO		249

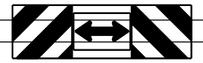
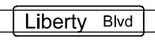
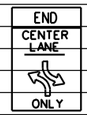
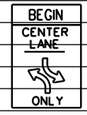
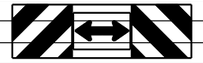
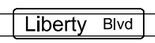
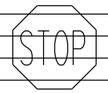
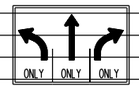
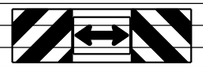
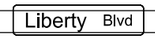
18

DISCLAIMER:
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: 8/4/2020
FILE: P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\07 TRAFFIC\03 Signing\Working\sums16.dgn

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"	MOUNTING DESIGNATION: 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
6 OF 6												
	1	W1-7T		96X36	✓		S80	1	SA	T		
		D3-1G		35X8	✓							
	2											
		D3-1G		22X8	✓							
		R1-1		36X36	✓		S80	1	SA	P		
	3	R3-9dP		24X8	✓		S80	1	SA	P		
		R3-9b		24X36	✓							
	4	R3-9cP		24X8	✓		S80	1	SA	P		
		R3-9b		24X36	✓							
	5	W1-7T		96X36	✓		S80	1	SA	T		
		D3-1G		35X8	✓							
	6											
		D3-1G		25X8	✓							
		R1-1		36X36	✓		S80	1	SA	P		
	7	R3-8b		48X30	✓		S80	1	SA	U		
	8	D21-1TDBL		66X12	✓		S80	1	SA	T		
	9	W1-7T		96X36	✓		S80	1	SA	T		
		D3-1G		35X8	✓							
	10											
		D3-1G		27X8	✓							
		R1-1		36X36	✓		S80	1	SA	P		
	11	D1-1		66X12	✓		S80	1	SA	T		

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).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 6 OF 7

FILE: sums16.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
4-16	DIST	COUNTY		SHEET NO.
8-16	PHR	HIDALGO		250

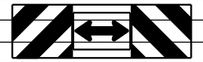
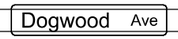
18

DISCLAIMER:
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: 8/4/2020
FILE: P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\07 TRAFFIC\03 Signing\sums16.dgn

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	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION: PREFABRICATED	MOUNTING DESIGNATION: 1EXT or 2EXT = # of Ext	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY - TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY N TY S
6 OF 6												
	12	R3-8 LK		36X30	✓		S80	1	SA	U		
	13	W1-7T		36X36	✓		S80	1	SA	T		
		D3-1G		35X8	✓							
	14											
		D3-1G		41X8	✓							
		R1-1		36X36	✓		S80	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).

DISCLAIMER:
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: 8/4/2020
FILE: P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\07 TRAFFIC\03 Signing\Working\sums16.dgn

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

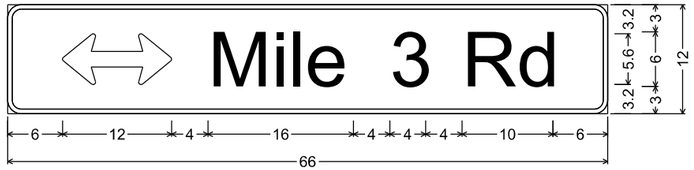
SOSS

SHEET 7 OF 7

FILE: sums16.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
4-16 8-16	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		251

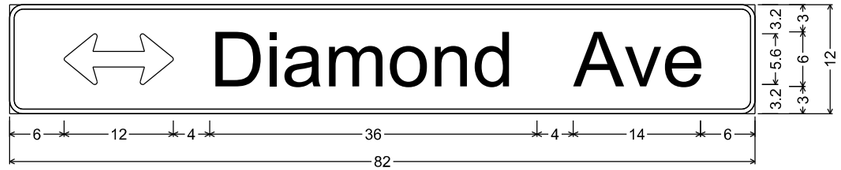
SUMMARY OF SMALL SIGNS

PLAN SHT. NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENS.	644 6076 REMOVE SMALL SIGN ASSM.	644 6070 RELOCATE SMALL SIGN ASSM.	685 6006 REMOVE RDSD FLSH BCN AM (SOLAR PWRD)
			CSJ: 0921-02-194	INCHES	EA.	EA.	EA.
1of6							
	1	M3-4	WEST	24X12	X		
		M1-4	83	24X24			
		M6-3	ARROW	21X15			
		M3-3	SOUTH	24X12			
		M1-6F	FM 1427	30X30			
		M6-1L	ARROW	21X15			
	2	-	NO THRU TRUCK TRAFFIC	30X30	X		
	3	R1-1	STOP	36X36	X		
	4	R5-2	NO THRU TRUCK TRAFFIC	30X30	X		
	5	R1-1	STOP	36X36	X		
	6	S5-1/S7-1T	SCHOOL ZONE	36X36			X
	7	R5-2	NO THRU TRUCK TRAFFIC	30X30	X		
	8	R1-1	STOP	36X36	X		
	9	R1-1	STOP W/STREET NAME	36X36	X		
	10	R1-1	STOP	36X36	X		
3of6							
	1	R1-1	STOP	36X36	X		
	2	R1-1	STOP	36X36	X		
	3	R1-1	STOP	36X36	X		
4of6							
	1	R1-1	STOP	36X36	X		
	2	R1-1	STOP	36X36	X		
	3	R1-1	STOP	36X36	X		
	4	R1-1	STOP	36X36	X		
5of6							
	1	-	BARRICADE	-	X		
	2	W1-8L	CHEVRON	24X30	X		
6of6							
	1	R1-1	STOP W/STREET NAME	36X36	X		
	2	R1-1	STOP W/STREET NAME	36X36	X		
	3	R1-1	STOP W/STREET NAME	36X36	X		
	4	R1-1	STOP	36X36	X		
	5	R1-1	STOP	36X36	X		
	6	W3-1	STOP AHEAD	30X30	X		
	7	R1-1	STOP W/STREET NAME	36X36	X		



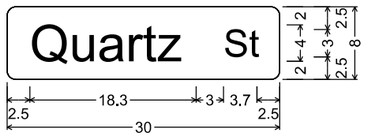
1.5" Radius, 0.5" Border, White on, Green;
Double Headed Arrow 1 - 12.0' 0"; "Mile" ClearviewHwy-3-W specified length;
"3" ClearviewHwy-3-W specified length; "Rd" ClearviewHwy-3-W specified length;
Table of widths and spaces

	⇔		M		i		l		e		3		R		d	
6.0	12.0	4.0	5.5	1.1	1.3	1.1	1.8	0.8	4.4	4.0	4.0	4.0	4.3	1.5	4.2	6.0



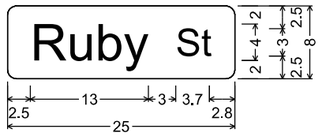
1.5" Radius, 0.5" Border, White on, Green;
Double Headed Arrow 1 - 12.0' 0"; "Diamond" ClearviewHwy-3-W specified length;
"Ave" ClearviewHwy-3-W specified length;
Table of widths and spaces

	⇔		D		i		a		m		o		n		d		A		v		e	
6.0	12.0	4.0	4.7	1.0	1.4	0.9	4.3	1.1	6.5	1.2	4.6	1.0	4.1	1.0	4.2	4.0	5.4	-0.1	4.4	-0.1	4.4	6.0



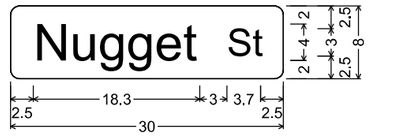
D3-1G;
1.0" Radius, 0.0" Border, White on, Green;
"Quartz" ClearviewHwy-3-W specified length;
"St" ClearviewHwy-3-W specified length;
Table of widths and spaces

	Q		u		a		r		t		z	
2.5	3.7	0.7	2.7	0.7	2.9	0.8	1.7	0.4	1.8	0.6	2.3	
	S		t									
3.0	2.1	0.2	1.4	2.5								



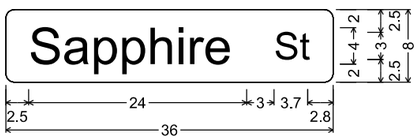
D3-1G;
1.0" Radius, 0.0" Border, White on, Green;
"Ruby" ClearviewHwy-3-W specified length;
"St" ClearviewHwy-3-W specified length;
Table of widths and spaces

	R		u		b		y	
2.5	2.9	0.6	2.7	0.6	2.8	0.4	3.0	
	S		t					
3.0	2.1	0.2	1.4	2.8				



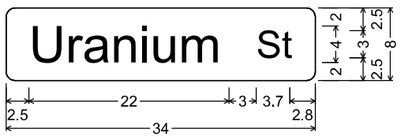
D3-1G;
1.0" Radius, 0.0" Border, White on, Green;
"Nugget" ClearviewHwy-3-W specified length;
"St" ClearviewHwy-3-W specified length;
Table of widths and spaces

	N		u		g		g		e		t	
2.5	3.2	0.5	2.7	0.3	2.9	0.4	2.9	0.3	3.0	0.3	1.8	
	S		t									
3.0	2.1	0.2	1.4	2.5								



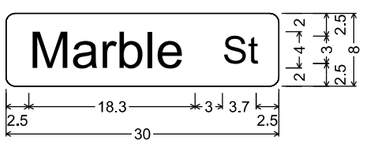
D3-1G;
1.0" Radius, 0.0" Border, White on, Green;
"Sapphire" ClearviewHwy-3-W specified length;
"St" ClearviewHwy-3-W specified length;
Table of widths and spaces

	S		a		p		p		h		i		r		e	
2.5	2.8	0.5	2.8	0.7	2.8	0.7	2.8	0.6	2.8	0.7	0.9	0.7	1.8	0.4	3.0	
	S		t													
3.0	2.1	0.2	1.4	2.8												



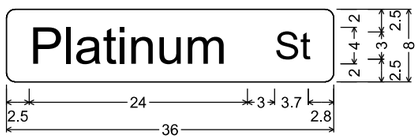
D3-1G;
1.0" Radius, 0.0" Border, White on, Green;
"Uranlum" ClearvlewHwy-3-W specllfied length;
"St" ClearviewHwy-3-W specified length;
Table of widths and spaces

	U		r		a		n		i		u		m	
2.5	3.1	0.7	1.7	0.4	2.9	0.6	2.7	0.6	1.0	0.6	2.7	0.6	4.4	
	S		t											
3.0	2.1	0.2	1.4	2.8										



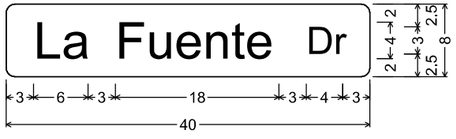
D3-1G;
1.0" Radius, 0.0" Border, White on, Green;
"Marble" ClearviewHwy-3-W specified length;
"St" ClearviewHwy-3-W specified length;
Table of widths and spaces

	M		a		r		b		l		e	
2.5	3.7	0.6	2.8	0.8	1.7	0.5	2.8	0.7	1.3	0.4	3.0	
	S		t									
3.0	2.1	0.2	1.4	2.5								



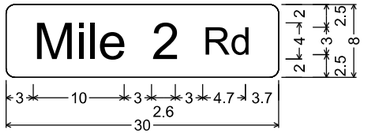
D3-1G;
1.0" Radius, 0.0" Border, White on, Green;
"Platinum" ClearviewHwy-3-W specified length;
"St" ClearviewHwy-3-W specified length;
Table of widths and spaces

	P		l		a		t		i		n		u		m	
2.5	2.9	0.6	1.3	0.4	2.9	0.5	1.8	0.7	0.9	0.7	2.7	0.8	2.7	0.7	4.4	
	S		t													
3.0	2.1	0.2	1.4	2.8												



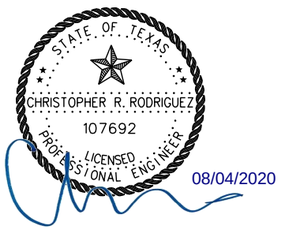
D3-1G;
1.0" Radius, 0.0" Border, White on, Green;
"La" ClearvlewHwy-3-W specllfied length;
"Fuente" ClearviewHwy-3-W specified length;
"Dr" ClearviewHwy-3-W specified length;
Table of widths and spaces

	L		a													
3.0	2.2	0.9	2.9													
	F		u		e		n		t		e					
3.0	2.3	0.5	2.7	0.5	3.0	0.5	2.8	0.4	1.9	0.4	3.0					
	D		r													
3.0	2.4	0.3	1.3	3.0												



D3-1G;
1.0" Radius, 0.0" Border, White on, Green;
"Mile" ClearviewHwy-3-W specified length;
"2" ClearviewHwy-3-W specified length;
"Rd" ClearviewHwy-3-W specified length;
Table of widths and spaces

	M		i		l		e	
3.0	3.7	0.4	0.9	0.5	1.2	0.3	3.0	
	2		R		d			
3.0	2.6	3.0	2.2	0.4	2.1	3.7		





L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY RD
SIGNING DETAILS

N.T.S

SHEET 1 OF 2

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				253
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

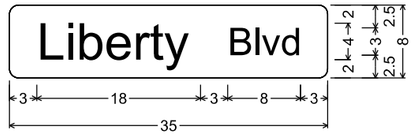
P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\07 TRAFFIC\03 Signing\SignDetails_1.dgn

8/4/2020



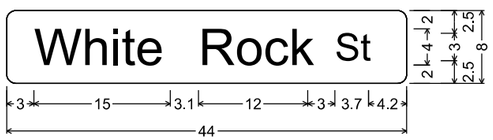
D3-1G;
1.0" Radius, 0.0" Border, White on, Green;
"Dogwood" ClearviewHwy-3-W specified length;
"Ave" ClearvlewHwy-3-W speclfled length;
Table of widths and spaces

2.5	D 3.2	0.5	o 3.1	0.5	g 2.9	0.6	w 4.7	0.4	o 3.1	0.6	o 3.0	0.6	d 2.8						
		3.0	A 2.7	-0.0	v 2.2	-0.1	e 2.2	2.5											



D3-1G;
1.0" Radius, 0.0" Border, White on, Green;
"Liberty" ClearviewHwy-3-W specified length;
"Blvd" ClearviewHwy-3-W specified length;
Table of widths and spaces

3.0	L 2.2	0.4	i 0.9	0.6	b 2.8	0.4	e 3.0	0.5	r 1.8	0.2	t 1.9	0.3	y 3.0						
		3.0	B 2.2	0.2	l 1.0	0.1	v 2.2	0.2	d 2.1	3.0									



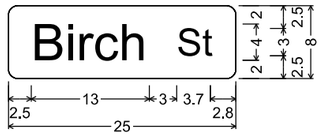
D3-1G;
1.0" Radius, 0.0" Border, White on, Green;
"White" ClearviewHwy-3-W specified length;
"Rock" ClearviewHwy-3-W specified length;
"St" ClearviewHwy-3-W specified length;
Table of widths and spaces

3.0	W 5.2	0.3	h 2.7	0.4	i 1.0	0.3	t 1.8	0.3	e 3.0										
		3.1	R 2.9	0.2	o 3.1	0.2	c 2.6	0.3	k 2.7										
		3.0	S 2.1	0.2	t 1.4	4.2													



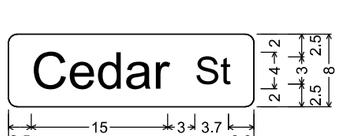
D3-1G;
1.0" Radius, 0.0" Border, White on, Green;
"Volcano" ClearviewHwy-3-W specified length;
"Ave" ClearviewHwy-3-W specified length;
Table of widths and spaces

2.5	V 3.2	0.3	o 3.0	0.5	l 1.2	0.3	c 2.6	0.4	a 2.8	0.5	n 2.7	0.4	o 3.1						
		3.0	A 2.7	0.4	v 2.2	0.5	e 2.2	2.5											



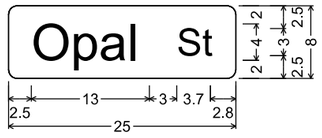
D3-1G;
1.0" Radius, 0.0" Border, White on, Green;
"Birch" ClearviewHwy-3-W specified length;
"St" ClearvlewHwy-3-W speclfled length;
Table of widths and spaces

2.5	B 2.9	0.5	i 1.0	0.6	r 1.8	0.4	c 2.6	0.5	h 2.7										
		3.0	S 2.1	0.2	t 1.4	2.8													



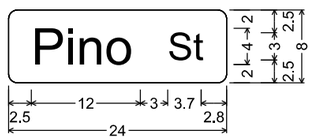
D3-1G;
1.0" Radius, 0.0" Border, White on, Green;
"Cedar" ClearviewHwy-3-W specified length;
"St" ClearviewHwy-3-W specified length;
Table of widths and spaces

2.5	C 3.2	0.2	e 3.0	0.3	d 2.8	0.4	a 2.9	0.4	r 1.8										
		3.0	S 2.1	0.2	t 1.4	2.8													



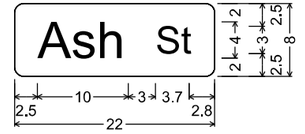
D3-1G;
1.0" Radius, 0.0" Border, White on, Green;
"Opal" ClearviewHwy-3-W specified length;
"St" ClearviewHwy-3-W specified length;
Table of widths and spaces

2.5	O 3.7	0.8	p 2.8	0.7	a 2.9	0.9	l 1.2												
		3.0	S 2.1	0.2	t 1.4	2.8													



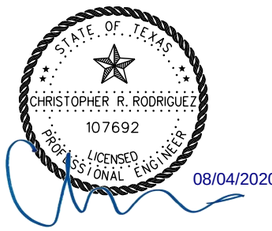
D3-1G;
1.0" Radius, 0.0" Border, White on, Green;
"Pino" ClearviewHwy-3-W specified length;
"St" ClearviewHwy-3-W specified length;
Table of widths and spaces

2.5	P 2.9	0.7	i 1.0	0.8	n 2.7	0.8	o 3.1												
		3.0	S 2.1	0.2	t 1.4	2.8													



D3-1G;
1.0" Radius, 0.0" Border, White on, Green;
"Ash" ClearviewHwy-3-W specified length;
"St" ClearviewHwy-3-W specified length;
Table of widths and spaces

2.5	A 3.6	0.5	s 2.5	0.7	h 2.7														
		3.0	S 2.1	0.2	t 1.4	2.8													



THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd. Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY RD
SIGNING DETAILS

N.T.S.

SHEET 2 OF 2

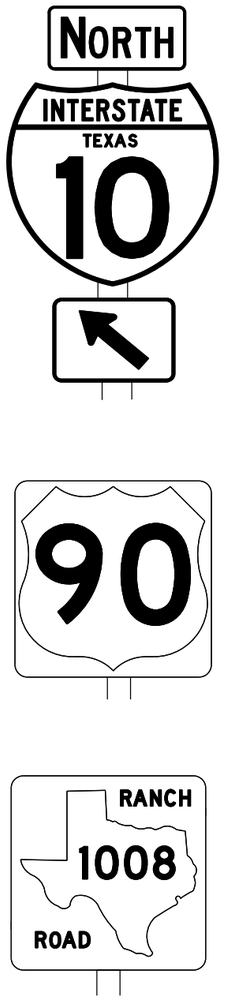
DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					254
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	322		LIBERTY
TR:								
CK TR:								

8/4/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\07 TRAFFIC\03 Signing\SignDetails_2.dgn

DISCLAIMER:
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.

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

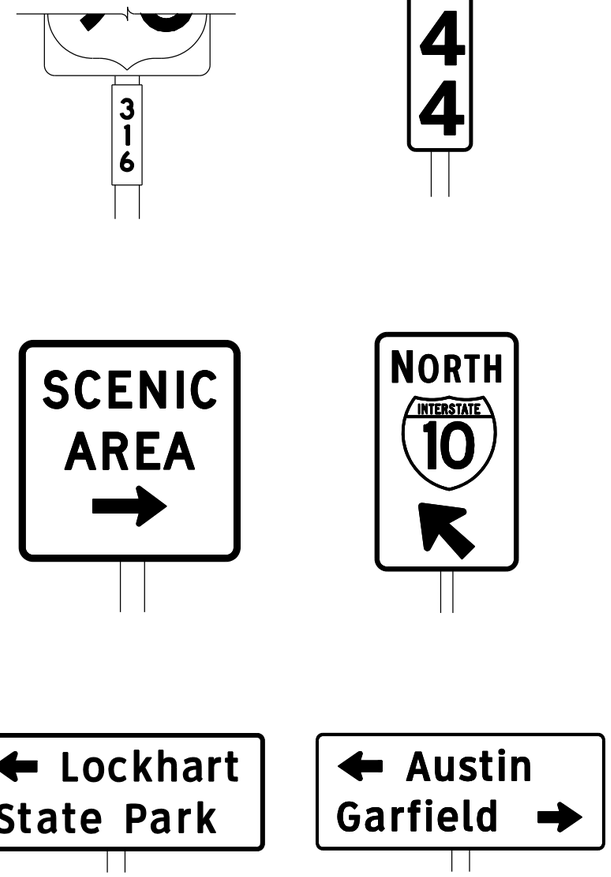
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

REQUIREMENTS FOR BLUE, BROWN & GREEN D AND I SERIES GUIDE SIGNS

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND, SYMBOLS & BORDERS	ALL OTHERS	TYPE B OR C SHEETING



TYPICAL EXAMPLES

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. White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W

3. Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).

4. 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.

5. Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.

6. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.

7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.

8. Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

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

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(3)-13

FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	PHR	HIDALGO		255

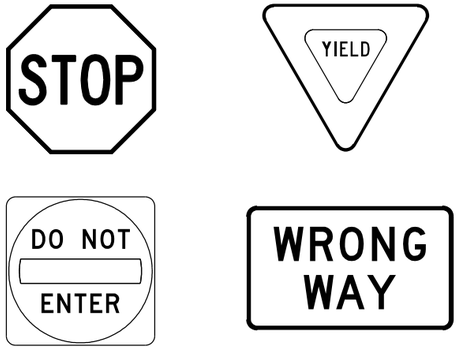
3

8/4/2020
P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\10 STANDARDS\07 SIGNING\tsr3-13.dgn

DISCLAIMER:
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.

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

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.

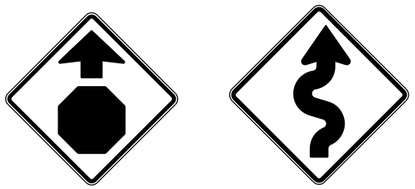
ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

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/

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

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	0921	02	194	LIBERTY
12-03 7-13 9-08	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		256

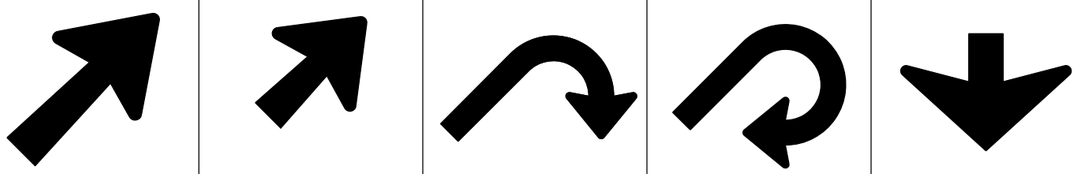
4

8/4/2020
P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\10 STANDARDS\07 SIGNING\tsr4-13.dgn

DISCLAIMER:
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.

ARROW DETAILS

for Large Ground-Mounted and Overhead Guide Signs



TYPE	LETTER SIZE	USE
A-1	10.67" U/L and 10" Caps	Single Lane Exits
A-2	13.33" U/L and 12" Caps	
A-3	16" & 20" U/L	
B-1	10.67" U/L and 10" Caps	Multiple Lane Exits
B-2	13.33" U/L and 12" Caps	
B-3	16" & 20" U/L	

CODE	USED ON SIGN NO.
E-3	E5-1aT
E-4	E5-1bT

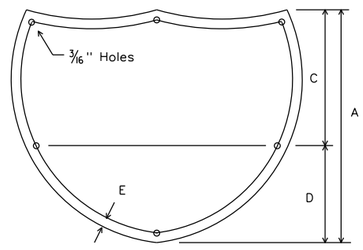
NOTE

Arrow dimensions are shown in the "Standard Highway Sign Designs for Texas" manual.

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

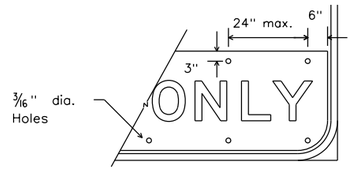
http://www.txdot.gov/

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)

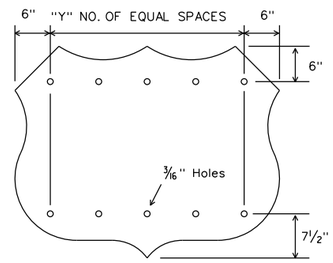


INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4

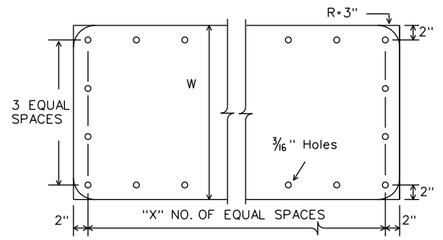


EXIT ONLY PANEL



U.S. ROUTE MARKERS

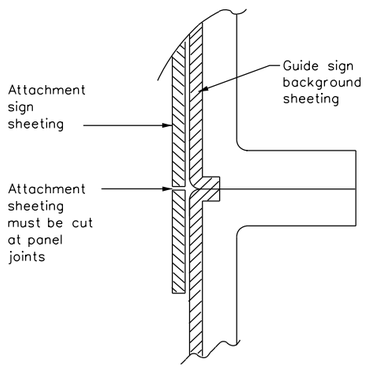
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



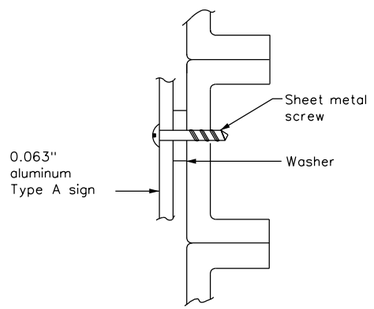
STATE ROUTE MARKERS

No. of Digits	W	X
4	24	4
4	36	5
4	48	6
3	24	3
3	36	4
3	48	5

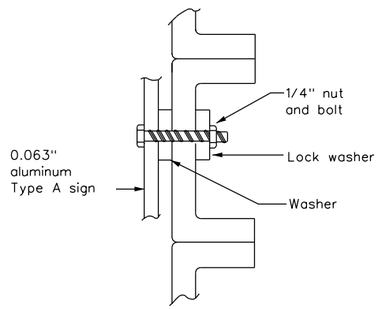
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



DIRECT APPLIED ATTACHMENT



SCREW ATTACHMENT



NUT/BOLT ATTACHMENT

NOTE:

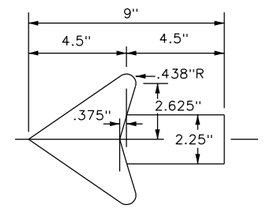
1. Sheeting for legend, symbols, and borders must be cut at panel joints.
2. Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".

NOTE:

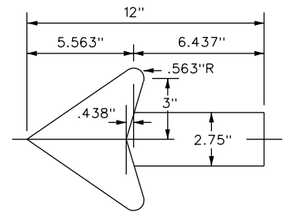
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

ARROW DETAILS

for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(5)-13

FILE: tsr5-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	PHR	HIDALGO		257

5

8/4/2020
C:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\10 STANDARDS\07 SIGNING\tsr5-13.dgn

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. Use materials specifically designed for attaching cabinets, beacon heads, solar panels, etc., to poles.

7. 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.

8. Conduit in foundation and within 6 in. of foundation is subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies."

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 on 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. Install the batteries in a battery box. Place the batteries on a 3/16" thick plastic sheet and connect together. Place a plastic cover (battery bell jar) over the top of each battery and secure the battery bell jar to the battery with a strap. The batteries, bell jars, straps and 3/16" plastic sheet are subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies." When required, install batteries in the flasher cabinet. Wire batteries according to manufacturers recommendations. Provide the number of batteries as required by the manufacturer.

12. See standard sheet Electrical Details (ED) for additional requirements regarding the installation of ground boxes/battery boxes, conduit, and cabinets.

13. 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.

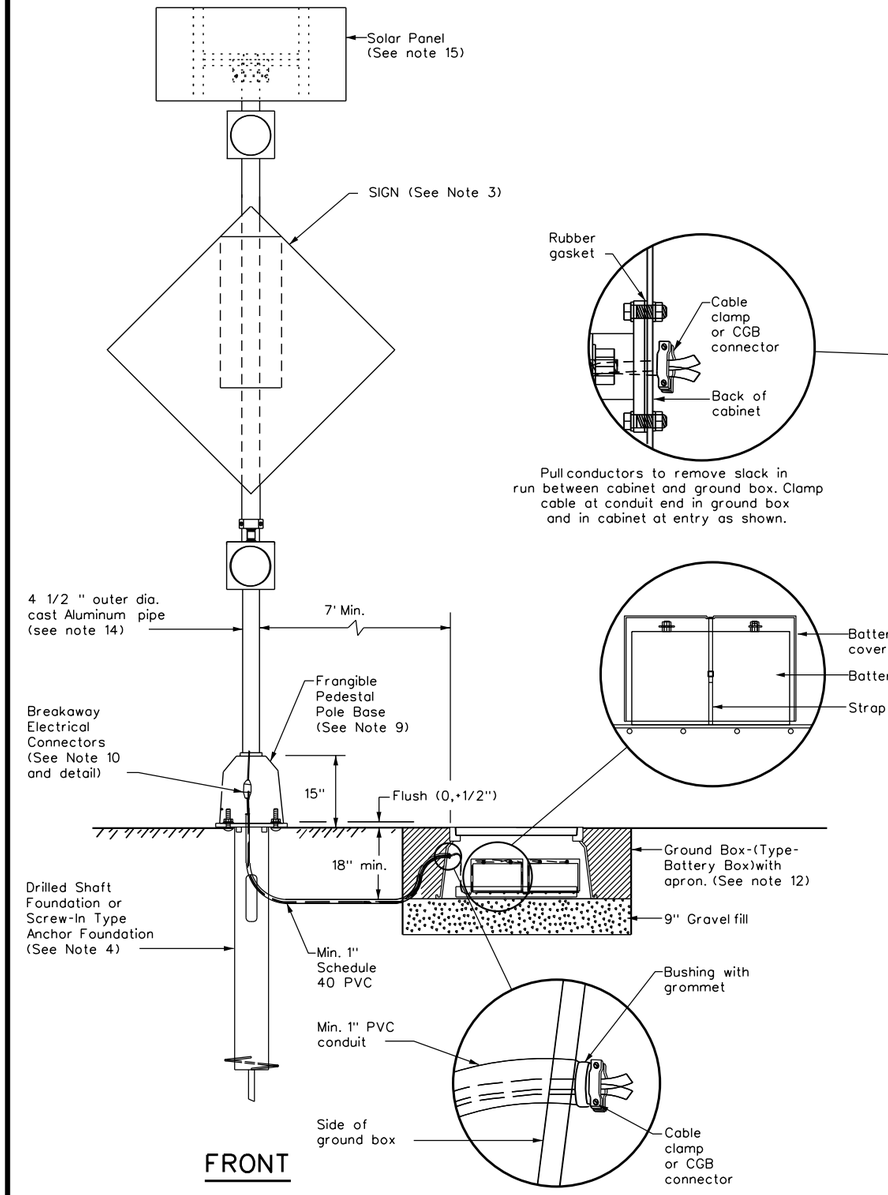
14. Unless otherwise shown on the plans, pole shaft shall be one piece, Schedule 40 Aluminum pipe, ASTM B429 or B221 (Alloy 6061-T6 only). Aluminum conduit will not develop the necessary strength and will not be allowed.

15. Orient solar panel for optimum exposure to sunlight (face to the south). Prior to installation, check the location to ensure there is no overhead obstruction that would block the solar panel from receiving full sunlight. Unless specified elsewhere, mount a minimum of 14' above grade.

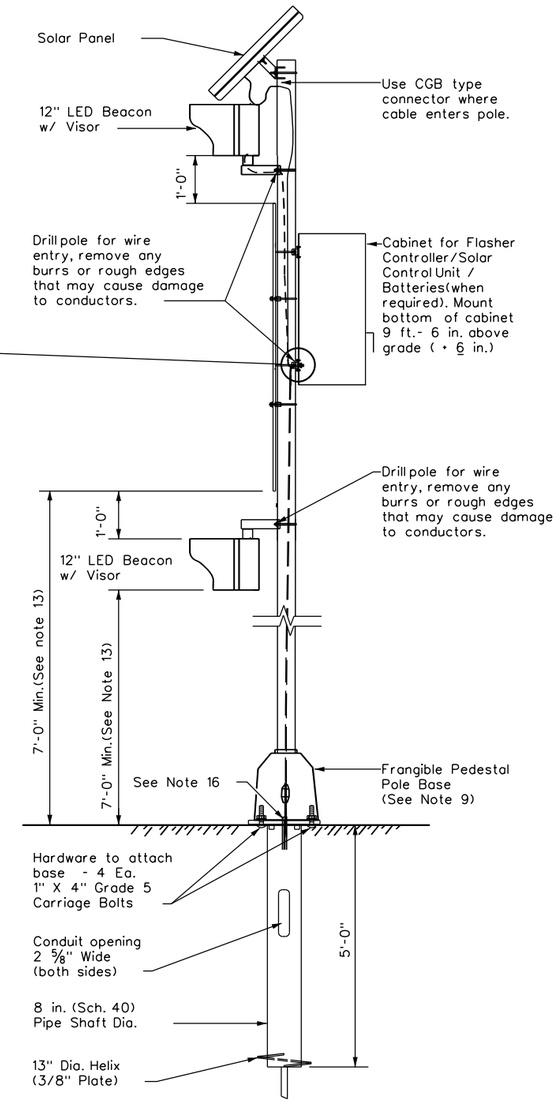
16. Ensure height of conduit is below top of anchor bolts.

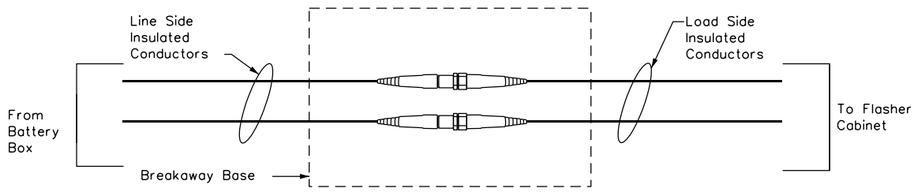
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

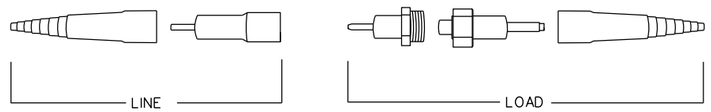


Pull conductors to remove slack in run between cabinet and ground box. Clamp cable at conduit end in ground box and in cabinet at entry as shown.





NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS



NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS
EXPLODED VIEW

Texas Department of Transportation

Traffic Operations Division Standard

SOLAR POWERED ROADSIDE FLASHING BEACON ASSEMBLY DETAILS

SPRFBA(1)-13

FILE: spb1-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
12-04	DIST	COUNTY		SHEET NO.
3-13	PHR	HIDALGO		258

75A

DISCLAIMER: 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.

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)

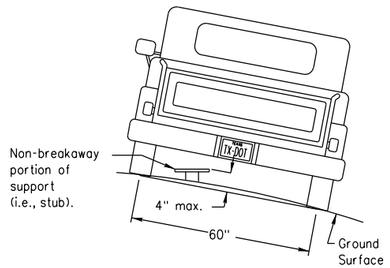
Anchor Type

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))

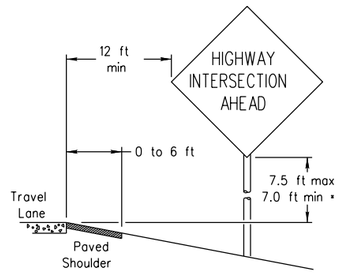
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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).

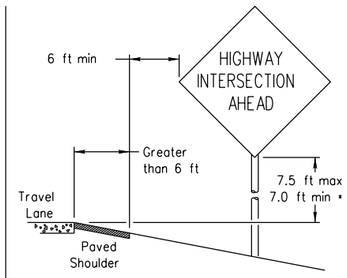
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

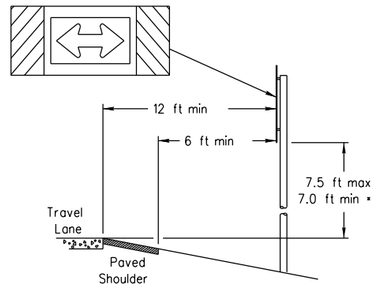
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



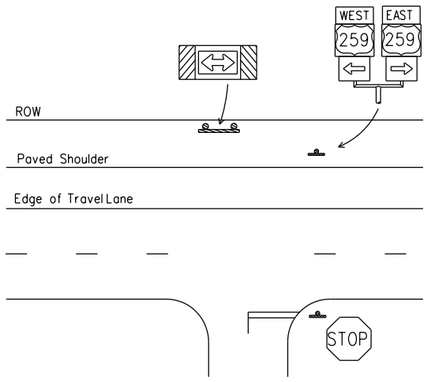
GREATER THAN 6 FT. WIDE

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.

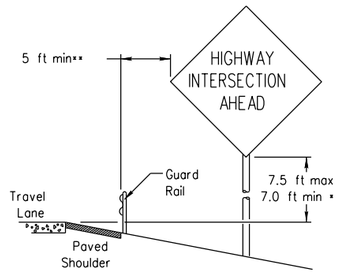
T-INTERSECTION



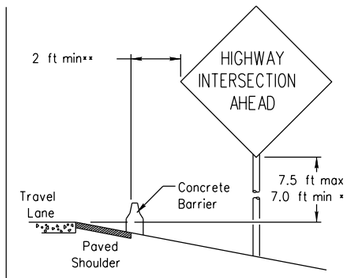
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

* 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

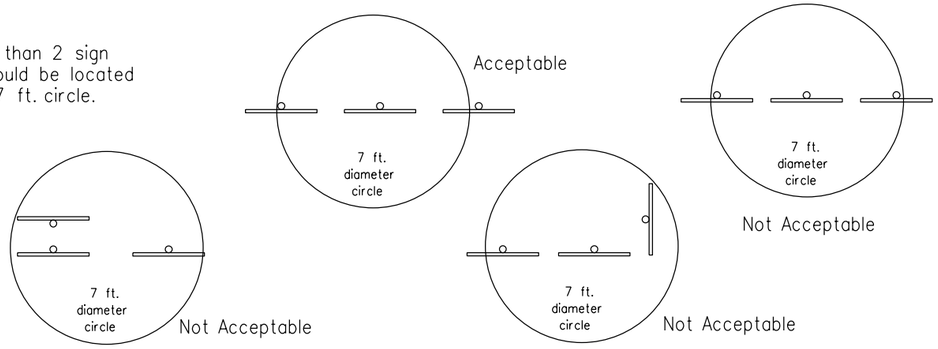
(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

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.

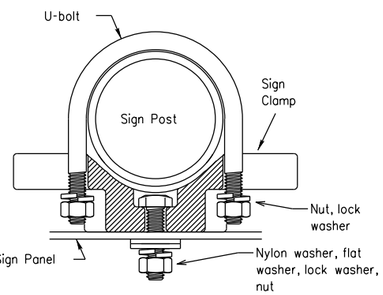
The website address is:
http://www.txdot.gov/publications/traffic.htm

No more than 2 sign posts should be located within a 7 ft. circle.

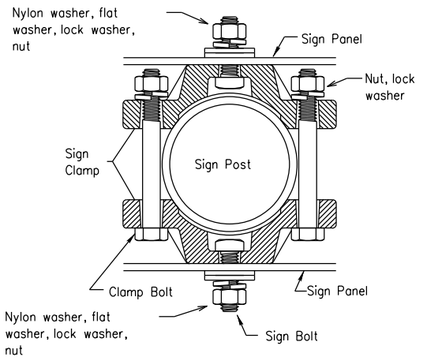


TYPICAL SIGN ATTACHMENT DETAIL

Single Signs



Back-to-Back Signs



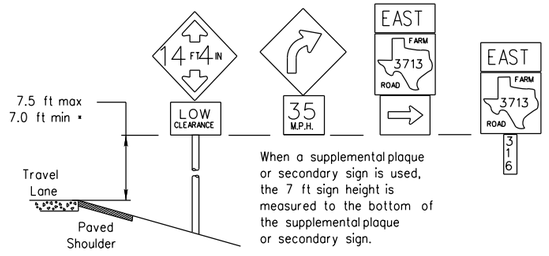
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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.

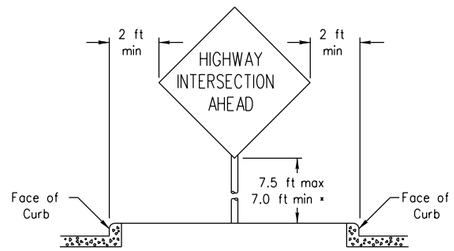
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



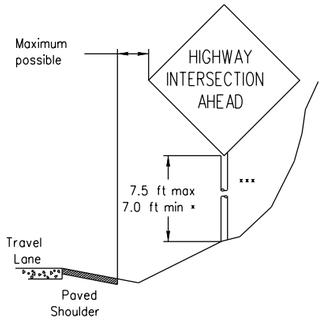
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

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.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

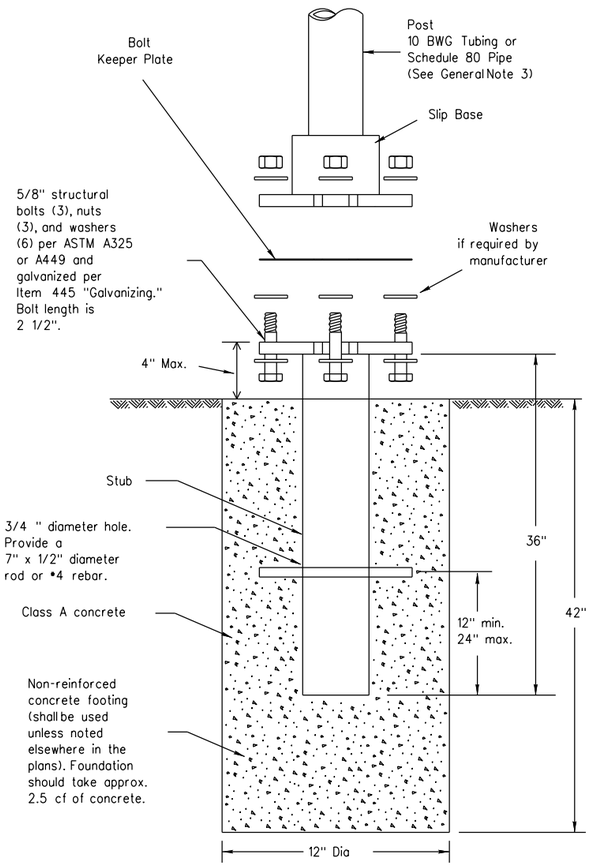
©TxDOT July 2002			DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS 9-08	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT			SHEET
	PHR	6				259
	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
	HIDALGO		0921	02	194	LIBERTY

26A

8/4/2020
...ents\Firms\L&G\Liberty Rd (US83 to Mile 3)\10 STANDARDS\07 SIGNING\smdgen.dgn

DISCLAIMER: 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.

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

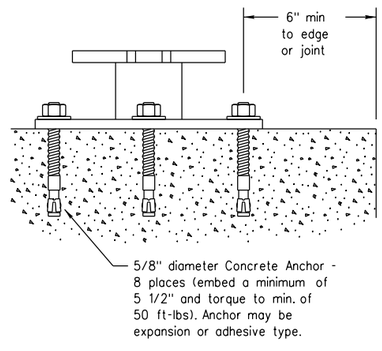
Foundation

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

© TxDOT July 2002

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
9-08

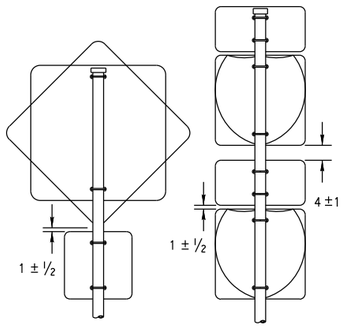
CONT	SECT	JOB	HIGHWAY
0921	02	194	LIBERTY

DIST	COUNTY	SHEET NO.
PHR	HIDALGO	260

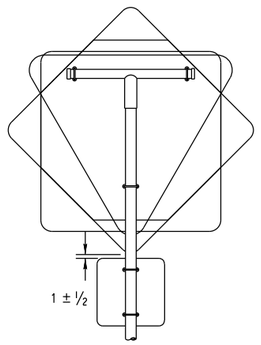
26B

8/4/2020
...ents\Firms\L&G\Liberty Rd (US83 to Mile 3)\10 STANDARDS\07 SIGNING\smds1.dgn

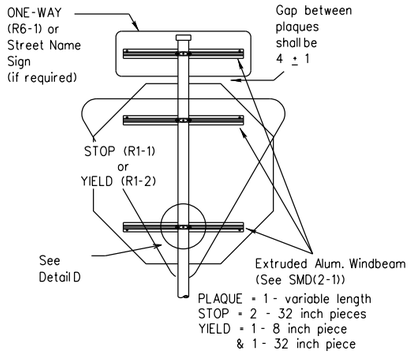
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



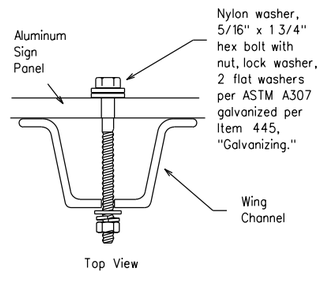
SM RD SGN ASSM TY XXXXX(1)XX(P)



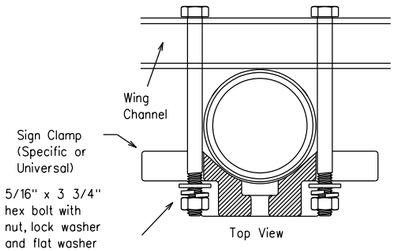
SM RD SGN ASSM TY XXXXX(1)XX(T)



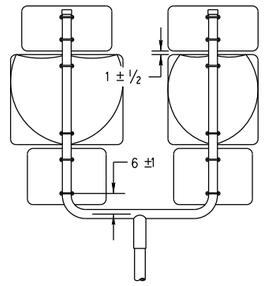
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



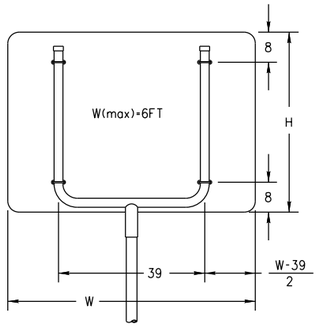
Detail A



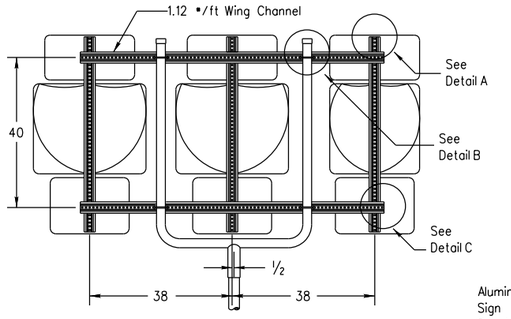
Detail B



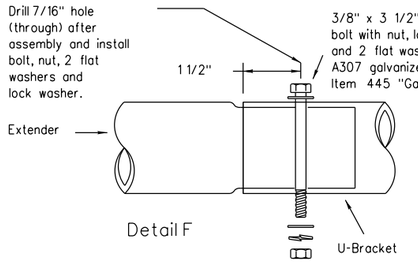
SM RD SGN ASSM TY XXXXX(1)XX(U)



SM RD SGN ASSM TY XXXXX(1)XX(U)

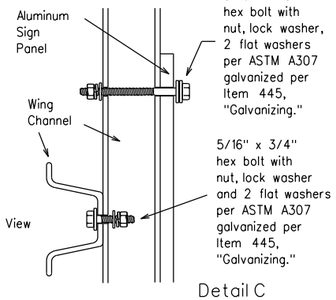


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

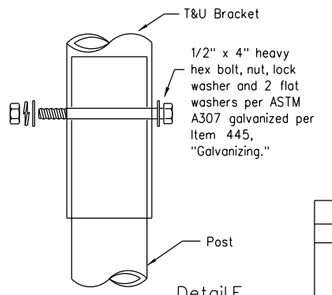


Detail F

Splices shall only be allowed behind the sign substrate.



Detail C



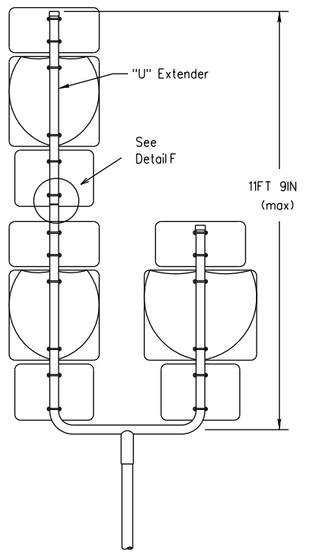
Detail E

GENERAL NOTES:

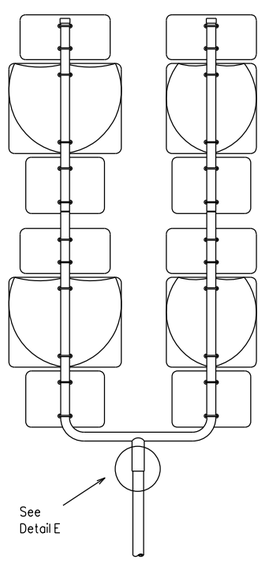
1.

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

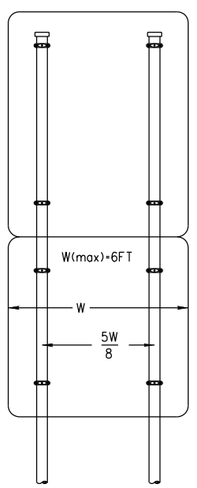
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material 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.



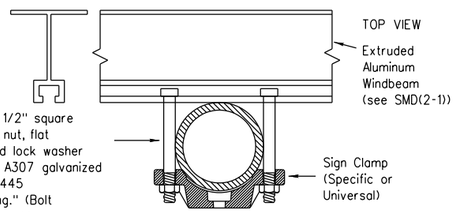
SM RD SGN ASSM TY S80(1)XX(U-1EXT)



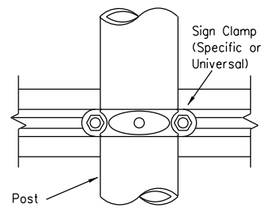
SM RD SGN ASSM TY S80(1)XX(U-2EXT)



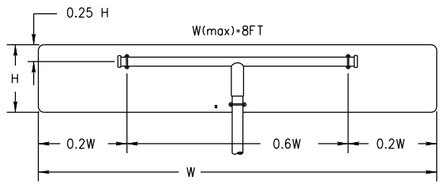
SM RD SGN ASSYM TY XXXXX(2)XX(P)



Detail D



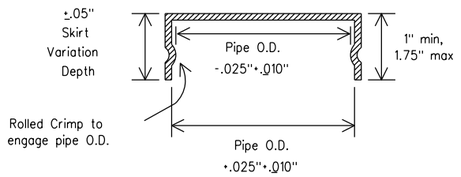
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	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

©TxDOT July 2002

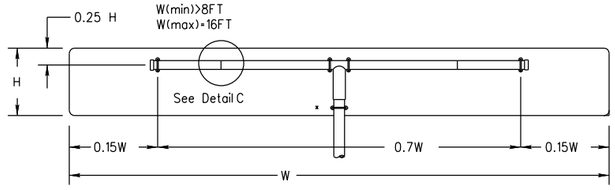
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		261

26C

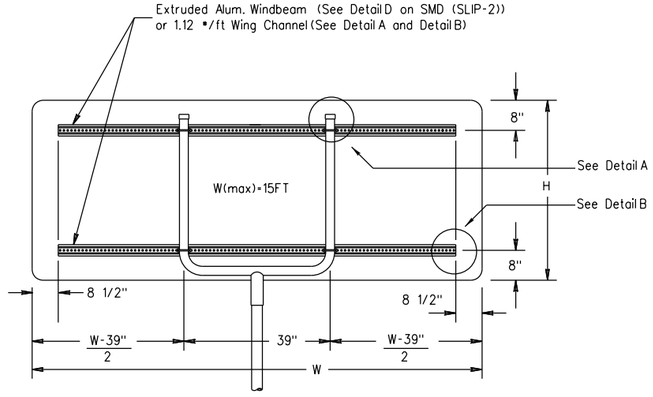
8/4/2020
...ients\Firms\L&G\Liberty Rd (US83 to Mile 3)\10 STANDARDS\07 SIGNING\smds2.dgn

DISCLAIMER: 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.

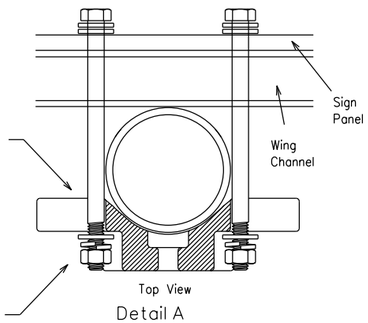


SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)

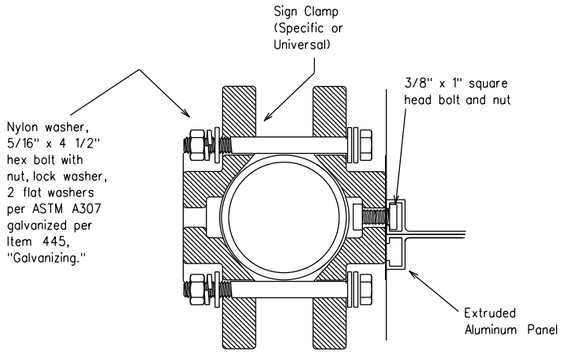
(* - See Note 12)



SM RD SGN ASSM TY XXXXX(1)XX(U-XX)

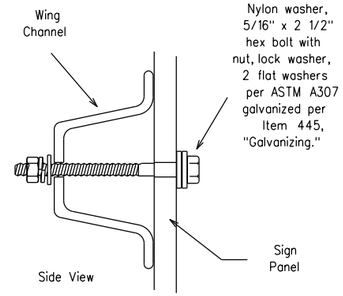


Detail A

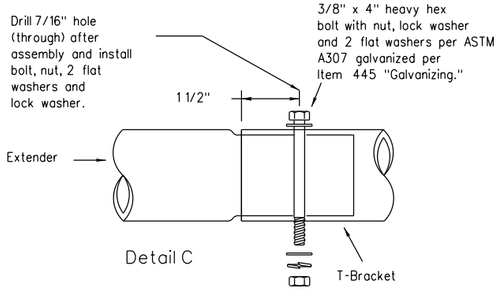


Detail D

EXTRUDED ALUMINUM SIGN WITH T BRACKET

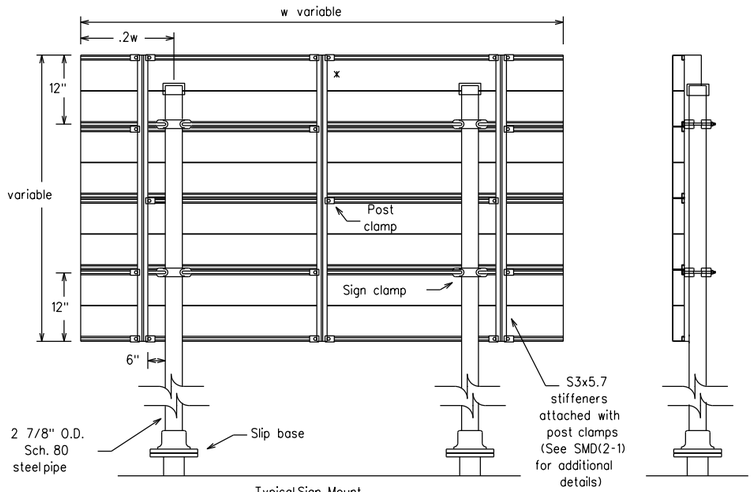


Detail B



Detail C

Splices shall only be allowed behind the sign substrate.

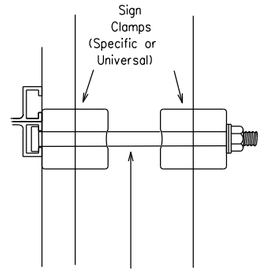


Typical Sign Mount

SM RD SGN ASSM TY S80(2)XX(P-EXAL)

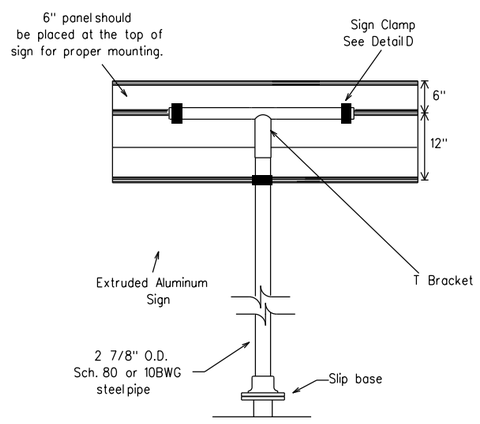
* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.

See Detail E
for clamp installation

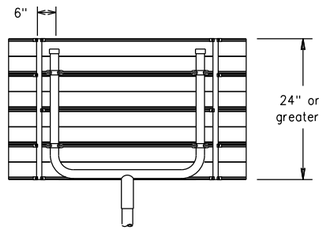


3/8" x 4 1/2"
square head
bolt, nut,
flat washer
and lock washer per
ASTM A307 galvanized
per Item 445,
"Galvanizing."

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

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

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.

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

© TxDOT July 2002

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0921	02	194	LIBERTY
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		262

26D

8/4/2020
...ients\Firms\L&G\Liberty Rd (US83 to Mile 3)\10 STANDARDS\07 SIGNING\smds3.dgn

SHEET SUMMARY

STATION LIMITS	REFLECTORIZED PAVEMENT MARKINGS ITEM 666									PREFAB PAV MRKS ITEM 668					RAISED PAV MRKS ITEM 672	
	TY I(W) 4" (BRK) (100 MIL)	TY I(W) 4" (SLD) (100 MIL)	TY I(W) 4" (DOT) (100 MIL)	TY I(W) 8" (SLD) (100 MIL)	TY I(W) 12" (SLD) (100 MIL)	TY I(W) 24" (SLD) (100 MIL)	TY I(Y) 24" (SLD) (100 MIL)	TY I(Y) 4" (BRK) (100 MIL)	TY I(Y) 4" (SLD) (100 MIL)	TY C (W) (ARROW)	TY C (W) (WORD)	TY C (W) (ARROW) (CNTST)	TY C (W) (WORD) (CNTST)	TY B (W) 4" (BRK) (CNTST)	REFL PAV MRK TY I-C	REFL PAV MRK TY II-A-A
	(LF)	(LF)	(LF)	(LF)	(LF)	(LF)	(LF)	(LF)	(LF)	(EA)	(EA)	(EA)	(EA)	(EA)	(EA)	(EA)
5+00 - 11+00	-	1160	217	327	230	166	-	-	1550	2	2	-	-	-	17	78
11+60 - 22+00	620	-	75	600	279	152	-	-	2021	8	9	-	-	-	30	74
22+00 - 33+00	514	-	-	1678	564	168	-	-	1966	4	3	6	4	200	131	100
SHEET TOTAL	1134	1160	292	2605	1073	486	-	-	5537	14	14	6	4	200	178	252

NOTES:

1. THE PAVEMENT SURFACE SHALL BE FREE OF DELETERIOUS MATERIAL BEFORE APPLICATION OF PERMANENT STRIPING AND PAVEMENT MARKERS. IF THE SURFACE NEEDS TO BE CLEANED, AS DETERMINED BY THE ENGINEER, THE CONTRACTOR SHALL PREPARE SURFACE IN ACCORDANCE WITH ITEM 678, "PAVEMENT SURFACE PREPARATION FOR MARKINGS", EXCEPT FOR "MEASUREMENT" AND "PAYMENT". THE PREPARATION OF PAVEMENT SURFACE SHALL BE SUBSIDIARY TO ITEM 666, 668 AND 672.
2. ALL PERMANENT PAVEMENT MARKINGS SHALL BE THERMOPLASTIC 100 MIL.

PAVEMENT MARKINGS LEGEND:

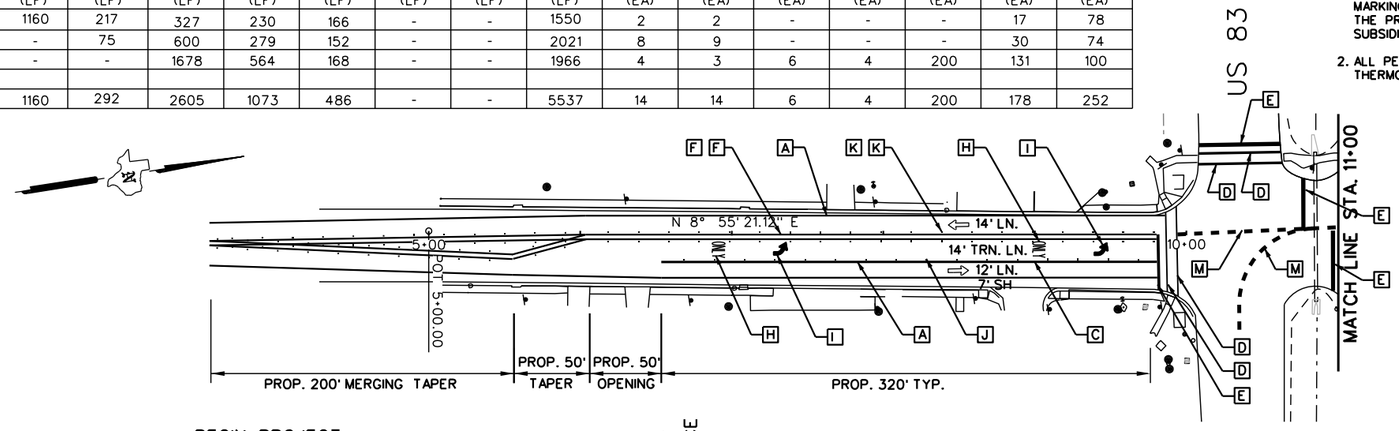
TYPE I-THERMOPLASTIC W/ RETROREFLECTIVITY REQUIREMENTS (ITEM 666)
- [A] 4" WHITE SOLID
- [B] 4" WHITE BROKEN
- [M] 4" WHITE DOT
- [F] 4" YELLOW SOLID
- [G] 4" YELLOW BROKEN

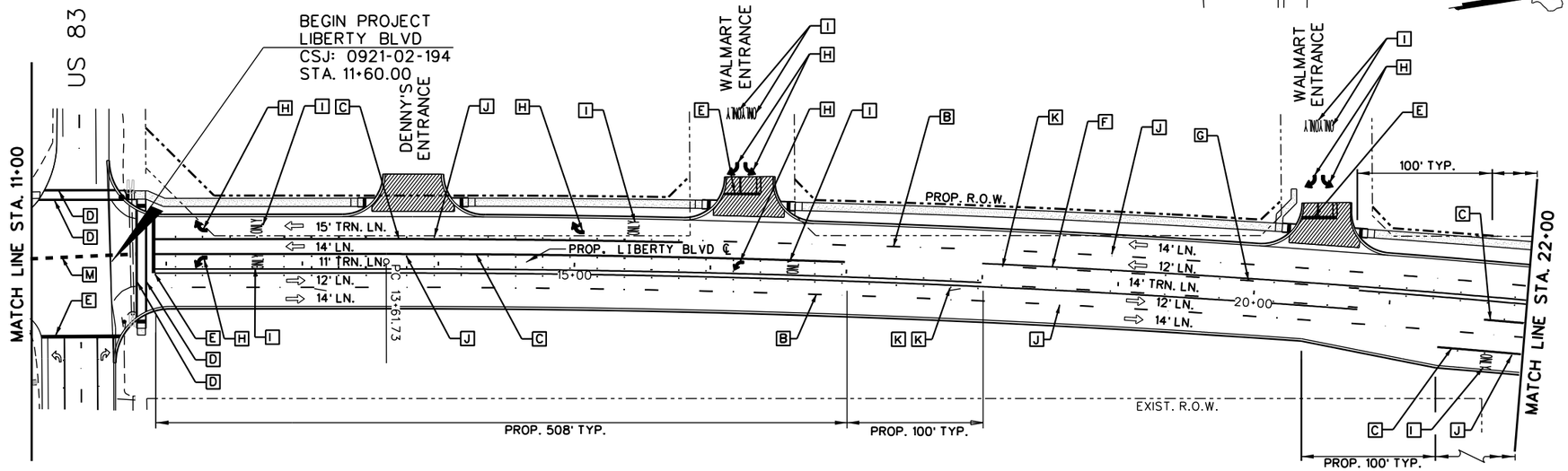
TYPE I-THERMOPLASTIC (ITEM 666)
- [C] 8" WHITE SOLID
- [D] 12" WHITE SOLID
- [E] 24" WHITE SOLID
- [L] 24" YELLOW SOLID

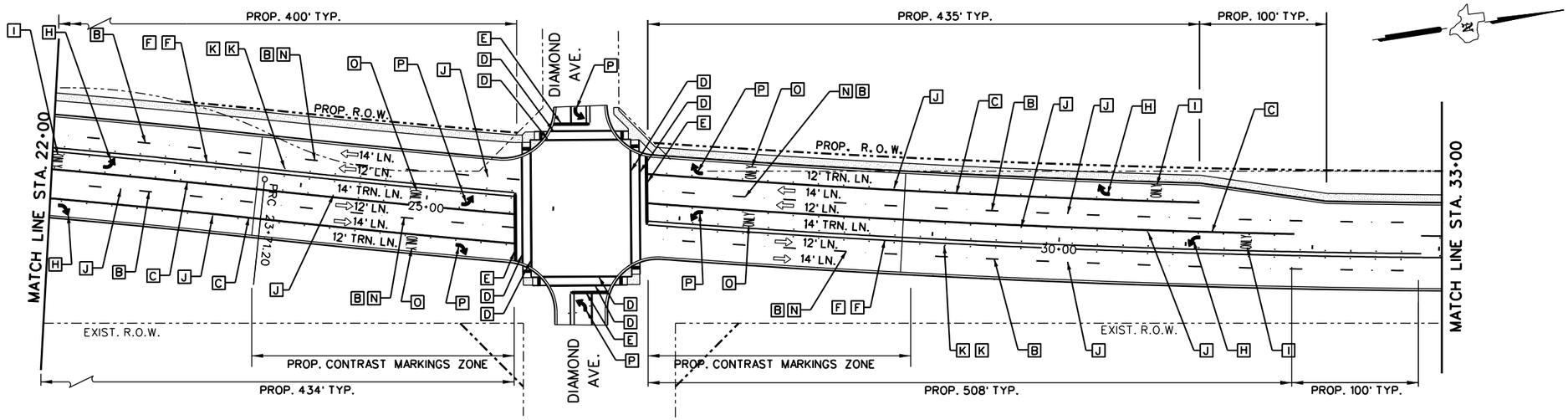
PREFAB. PAVEMENT MARKERS TYPE C (ITEM 668)
- [H] SINGLE ARROW WHITE
- [I] WORD "ONLY" WHITE
- [P] SINGLE ARROW WHITE CONTRAST
- [Q] WORD "ONLY" WHITE CONTRAST

PREFAB. PAVEMENT MARKERS TYPE B (ITEM 668)
- [N] 4" WHITE BROKEN CONTRAST

REFLECTIVE PAVEMENT MARKERS (ITEM 672)
- [J] TYPE I-C REFLECTIVE CL B
- [K] TYPE II-AA REFLECTIVE CL B
- ⟵ TRAFFIC FLOW







STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL LICENSED ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PAVEMENT MARKINGS LAYOUT

SCALE 1" = 100' SHEET 1 OF 6

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				263
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:							
TR:		PHR	HIDALGO	0921	02	194	LIBERTY
CK TR:							

11/19/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\07 TRAFFIC\04 Pavement Markings\Liberty_PM01.dgn

SHEET SUMMARY

STATION LIMITS	REFLECTORIZED PAVEMENT MARKINGS ITEM 666								PREFAB PAV MRKS ITEM 668			RAISED PAV MRKS ITEM 672		DEL & OBJ MRKS ITEM 658	
	TY I(W) 4" (BRK) (100 MIL) (LF)	TY I(W) 4" (SLD) (100 MIL) (LF)	TY I(W) 8" (SLD) (100 MIL) (LF)	TY I(W) 12" (SLD) (100 MIL) (LF)	TY I(W) 24" (SLD) (100 MIL) (LF)	TY I(Y) 24" (SLD) (100 MIL) (LF)	TY I(Y) 4" (BRK) (100 MIL) (LF)	TY I(Y) 4" (SLD) (100 MIL) (LF)	TY C (W) (ARROW) (EA)	TY C (W) (WORD) (EA)	TY B (W) 4" (BRK) CONTRAST (EA)	REFL PAV MRK TY I-C (EA)	REFL PAV MRK TY II-A-A (EA)	(D-SW) SZ (BRF) CTB (EA)	(D-SW) SZ 1 (WFLX) GND (EA)
33+00 - 44+00	520	-	-	-	-	-	500	2028	2	-	40	28	50	6	12
44+00 - 55+00	825	2027	415	489	111	500	40	3380	4	2	-	51	204	-	-
SHEET TOTAL	1345	2027	415	489	111	500	540	5408	6	2	40	79	254	6	12

NOTES:

1. THE PAVEMENT SURFACE SHALL BE FREE OF DELETERIOUS MATERIAL BEFORE APPLICATION OF PERMANENT STRIPING AND PAVEMENT MARKERS. IF THE SURFACE NEEDS TO BE CLEANED, AS DETERMINED BY THE ENGINEER, THE CONTRACTOR SHALL PREPARE SURFACE IN ACCORDANCE WITH ITEM 678, "PAVEMENT SURFACE PREPARATION FOR MARKINGS", EXCEPT FOR "MEASUREMENT" AND "PAYMENT". THE PREPARATION OF PAVEMENT SURFACE SHALL BE SUBSIDIARY TO ITEM 666, 668 AND 672.
2. ALL PERMANENT PAVEMENT MARKINGS SHALL BE THERMOPLASTIC 100 MIL.

PAVEMENT MARKINGS LEGEND:

TYPE I-THERMOPLASTIC W/ RETROREFLECTIVITY REQUIREMENTS (ITEM 666)
- [A] 4" WHITE SOLID
- [B] 4" WHITE BROKEN
- [F] 4" YELLOW SOLID
- [G] 4" YELLOW BROKEN

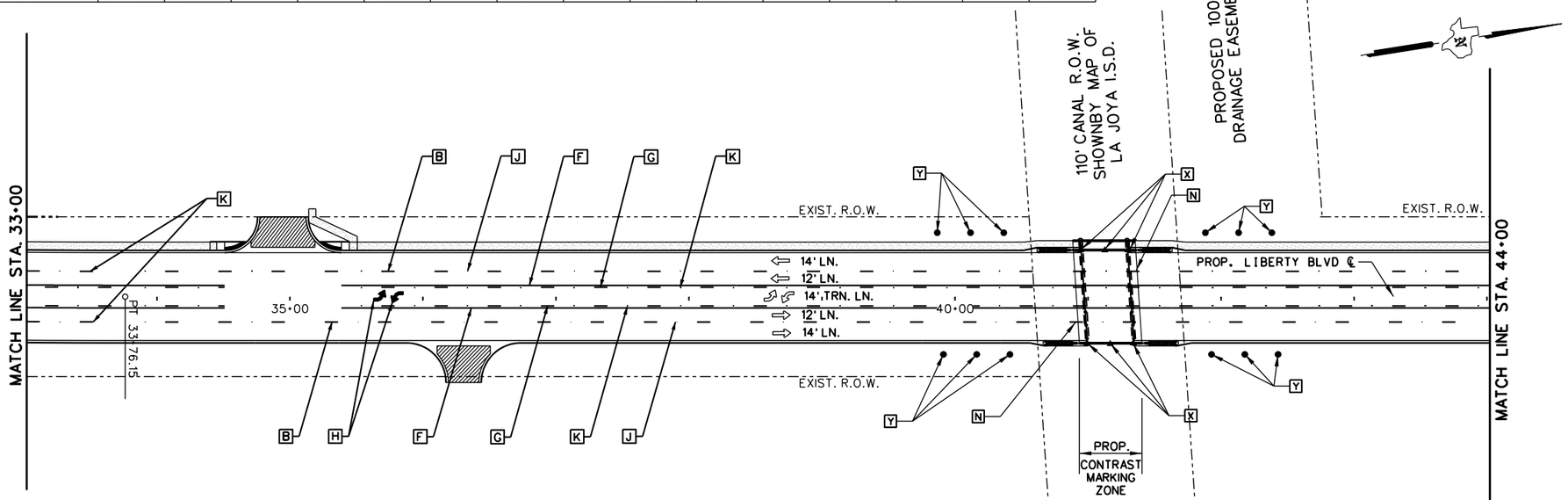
TYPE I-THERMOPLASTIC (ITEM 666)
- [C] 8" WHITE SOLID
- [D] 12" WHITE SOLID
- [E] 24" WHITE SOLID
- [L] 24" YELLOW SOLID

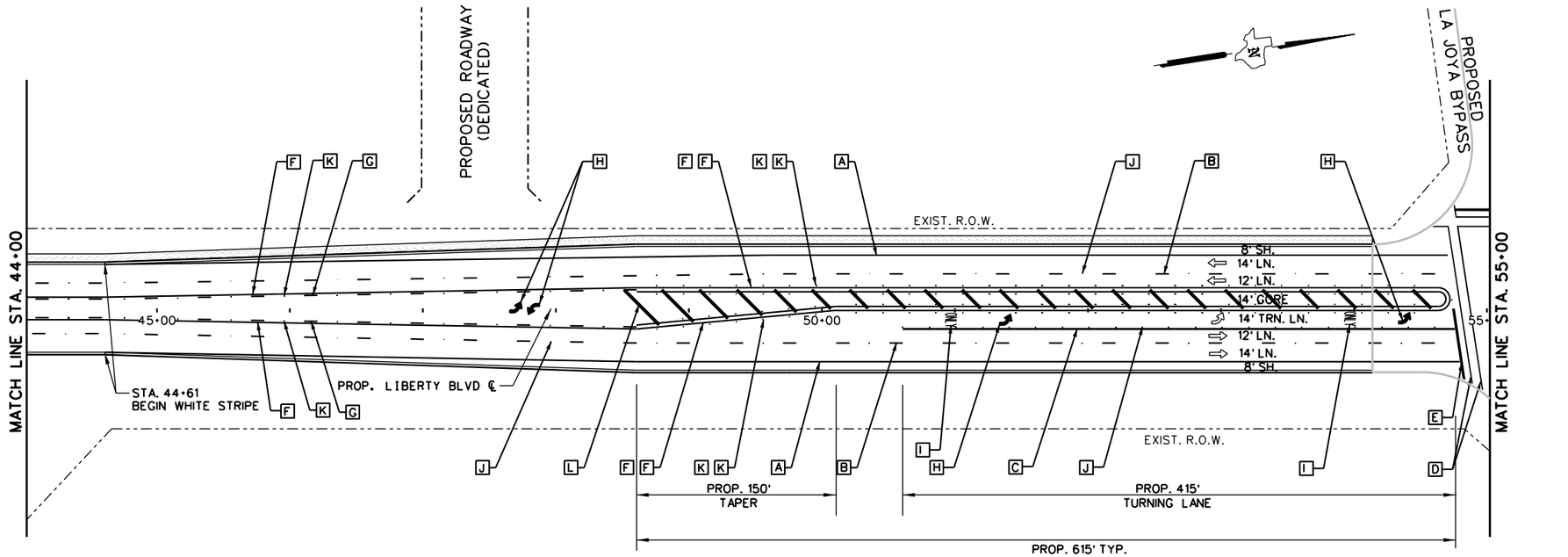
PREFAB. PAVEMENT MARKERS TYPE C (ITEM 668)
- [H] SINGLE ARROW WHITE
- [I] WORD "ONLY" WHITE

PREFAB. PAVEMENT MARKERS TYPE B (ITEM 668)
- [N] 4" WHITE BROKEN CONTRAST

REFLECTIVE PAVEMENT MARKERS (ITEM 672)
- [J] TYPE I-C REFLECTIVE CL B
- [K] TYPE II-AA REFLECTIVE CL B
- ⟵ TRAFFIC FLOW

DELINEATORS AND OBJECT MARKERS (ITEM 658)
- [X] (D-SW) SZ (BRF)CTB
- [Y] (D-SW) SZ 1(WFLX)GND





STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PAVEMENT MARKINGS LAYOUT

SCALE 1" = 100' SHEET 2 OF 6

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.	SHEET NO.
						6	TEXAS		264
						STATE DIST. NO	COUNTY	CONTROL NO. / SECTION NO. / JOB NO.	HIGHWAY NO.
						PHR	HIDALGO	0921 / 02 / 194	LIBERTY

11/19/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\07 TRAFFIC\04 Pavement Markings\Liberty_PM02.dgn

SHEET SUMMARY

STATION LIMITS	REFLECTORIZED PAVEMENT MARKINGS ITEM 666								PREFAB PAV MRKS ITEM 668		RAISED PAV MRKS ITEM 672	
	TY I(W) 4" (BRK) (100 MIL) (LF)	TY I(W) 4" (SLD) (100 MIL) (LF)	TY I(W) 8" (SLD) (100 MIL) (LF)	TY I(W) 12" (SLD) (100 MIL) (LF)	TY I(W) 24" (SLD) (100 MIL) (LF)	TY I(Y) 24" (SLD) (100 MIL) (LF)	TY I(Y) 4" (BRK) (100 MIL) (LF)	TY I(Y) 4" (SLD) (100 MIL) (LF)	TY C (W) (ARROW) (EA)	TY C (W) (WORD) (EA)	REFL PAV MRK TY I-C (EA)	REFL PAV MRK TY II-A-A (EA)
55+00 - 66+00	281	1404	444	1021	192	500	-	2736	-	-	42	132
66+00 - 77+00	825	484	-	-	24		345	1842	-	-	50	28
SHEET TOTAL	1106	1888	444	1021	216	500	345	4578	-	-	92	160

NOTES:

1. THE PAVEMENT SURFACE SHALL BE FREE OF DELETERIOUS MATERIAL BEFORE APPLICATION OF PERMANENT STRIPING AND PAVEMENT MARKERS. IF THE SURFACE NEEDS TO BE CLEANED, AS DETERMINED BY THE ENGINEER, THE CONTRACTOR SHALL PREPARE SURFACE IN ACCORDANCE WITH ITEM 678, "PAVEMENT SURFACE PREPARATION FOR MARKINGS", EXCEPT FOR "MEASUREMENT" AND "PAYMENT". THE PREPARATION OF PAVEMENT SURFACE SHALL BE SUBSIDIARY TO ITEM 666, 668 AND 672.
2. ALL PERMANENT PAVEMENT MARKINGS SHALL BE THERMOPLASTIC 100 MIL.

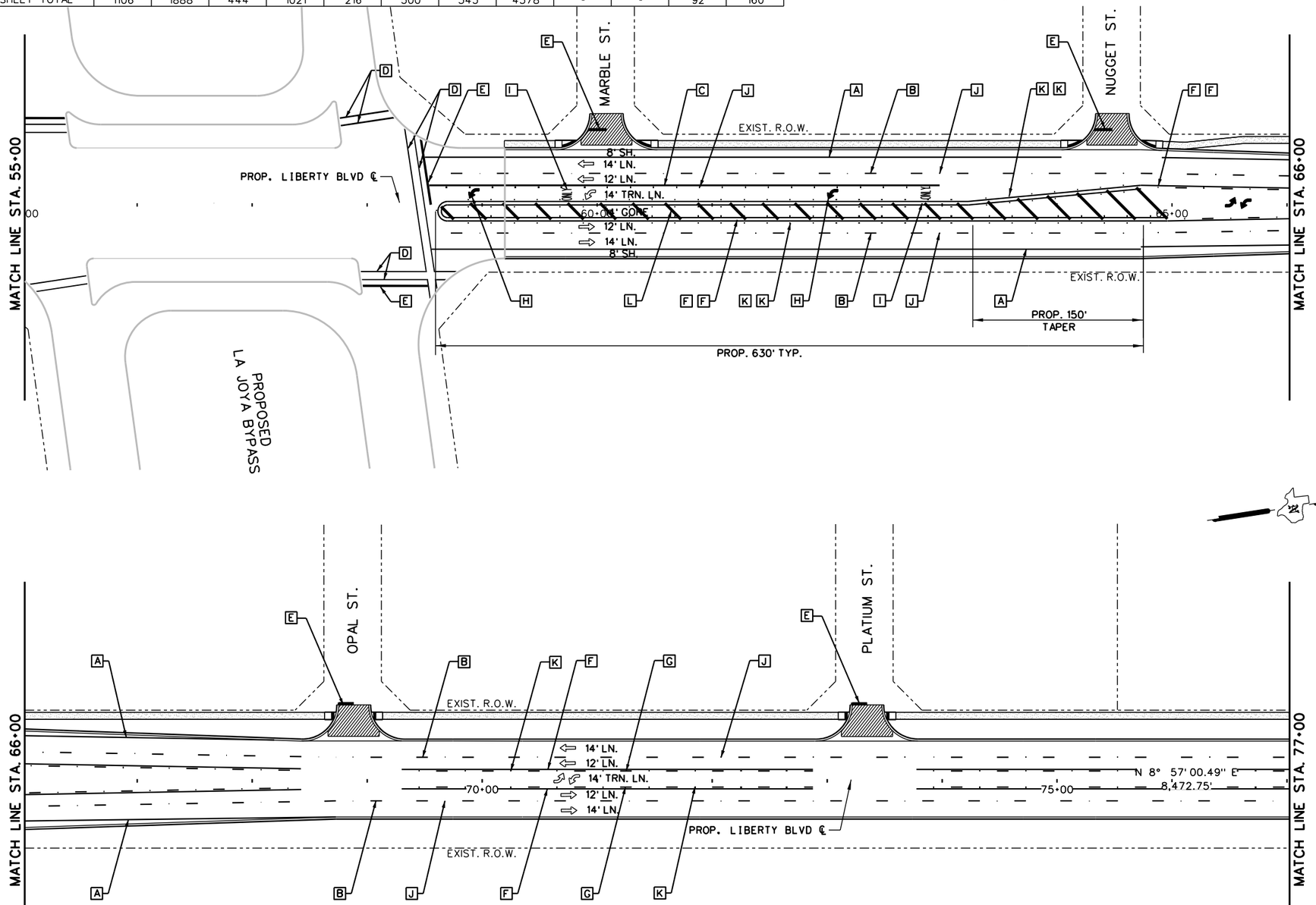
PAVEMENT MARKINGS LEGEND:

TYPE I-THERMOPLASTIC W/ RETROREFLECTIVITY REQUIREMENTS (ITEM 666)
- [A] 4" WHITE SOLID
- [B] 4" WHITE BROKEN
- [F] 4" YELLOW SOLID
- [G] 4" YELLOW BROKEN

TYPE I-THERMOPLASTIC (ITEM 666)
- [C] 8" WHITE SOLID
- [D] 12" WHITE SOLID
- [E] 24" WHITE SOLID
- [L] 24" YELLOW SOLID

PREFAB. PAVEMENT MARKERS TYPE B (ITEM 668)
- [H] SINGLE ARROW WHITE
- [I] WORD "ONLY" WHITE

REFLECTIVE PAVEMENT MARKERS (ITEM 672)
- [J] TYPE I-C REFLECTIVE CL B
- [K] TYPE II-AA REFLECTIVE CL B
- ⟵ TRAFFIC FLOW



STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL LICENSED ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PAVEMENT MARKINGS LAYOUT

SCALE 1" = 100' SHEET 3 OF 6

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					265
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

11/19/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3\\07 TRAFFIC\04 Pavement Markings\Liberty_PM03.dgn

SHEET SUMMARY

STATION LIMITS	REFLECTORIZED PAVEMENT MARKINGS ITEM 666								PREFAB PAV MRKS ITEM 668		RAISED PAV MRKS ITEM 672	
	TY I(W) 4" (BRK) (100 MIL) (LF)	TY I(W) 4" (SLD) (100 MIL) (LF)	TY I(W) 8" (SLD) (100 MIL) (LF)	TY I(W) 12" (SLD) (100 MIL) (LF)	TY I(W) 24" (SLD) (100 MIL) (LF)	TY I(Y) 24" (SLD) (100 MIL) (LF)	TY I(Y) 4" (BRK) (100 MIL) (LF)	TY I(Y) 4" (SLD) (100 MIL) (LF)	TY C (W) (ARROW) (EA)	TY C (W) (WORD) (EA)	REFL PAV MRK TY I-C (EA)	REFL PAV MRK TY II-A-A (EA)
77+00 - 89+00	825	-	-	-	36	-	698	1862	-	-	27	50
89+00 - 100+00	825	-	-	-	24	-	687	1834	-	-	27	46
SHEET TOTAL	1650	-	-	-	60	-	1385	3696	-	-	54	96

NOTES:

1. THE PAVEMENT SURFACE SHALL BE FREE OF DELETERIOUS MATERIAL BEFORE APPLICATION OF PERMANENT STRIPING AND PAVEMENT MARKERS. IF THE SURFACE NEEDS TO BE CLEANED, AS DETERMINED BY THE ENGINEER, THE CONTRACTOR SHALL PREPARE SURFACE IN ACCORDANCE WITH ITEM 678, "PAVEMENT SURFACE PREPARATION FOR MARKINGS", EXCEPT FOR "MEASUREMENT" AND "PAYMENT". THE PREPARATION OF PAVEMENT SURFACE SHALL BE SUBSIDIARY TO ITEM 666, 668 AND 672.
2. ALL PERMANENT PAVEMENT MARKINGS SHALL BE THERMOPLASTIC 100 MIL.

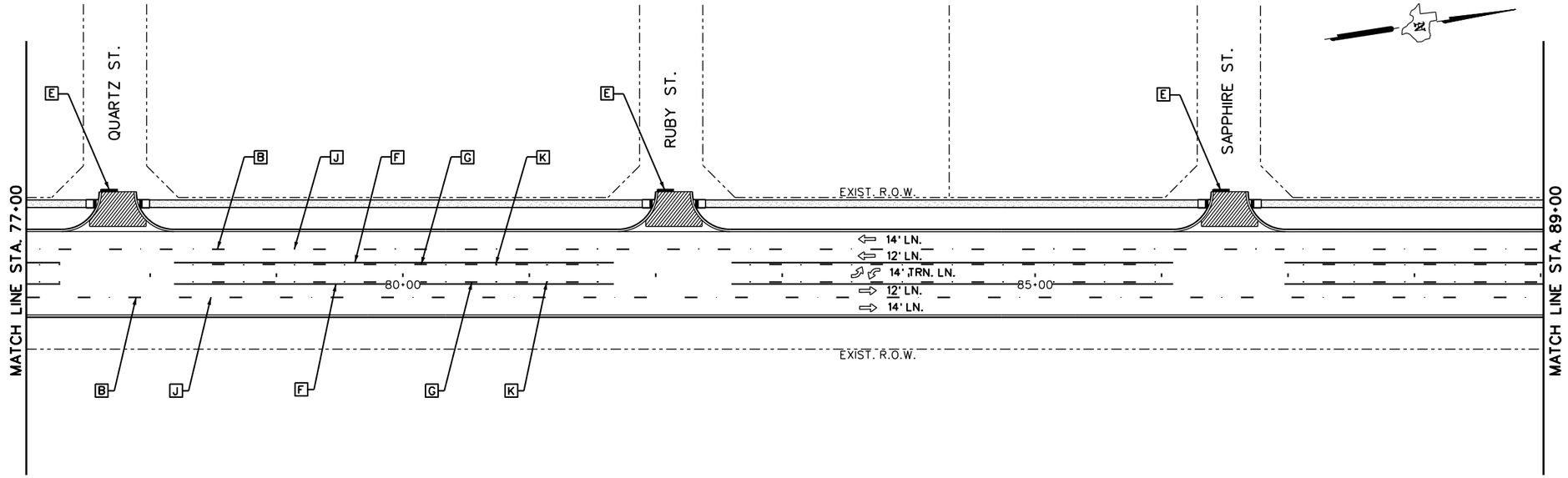
PAVEMENT MARKINGS LEGEND:

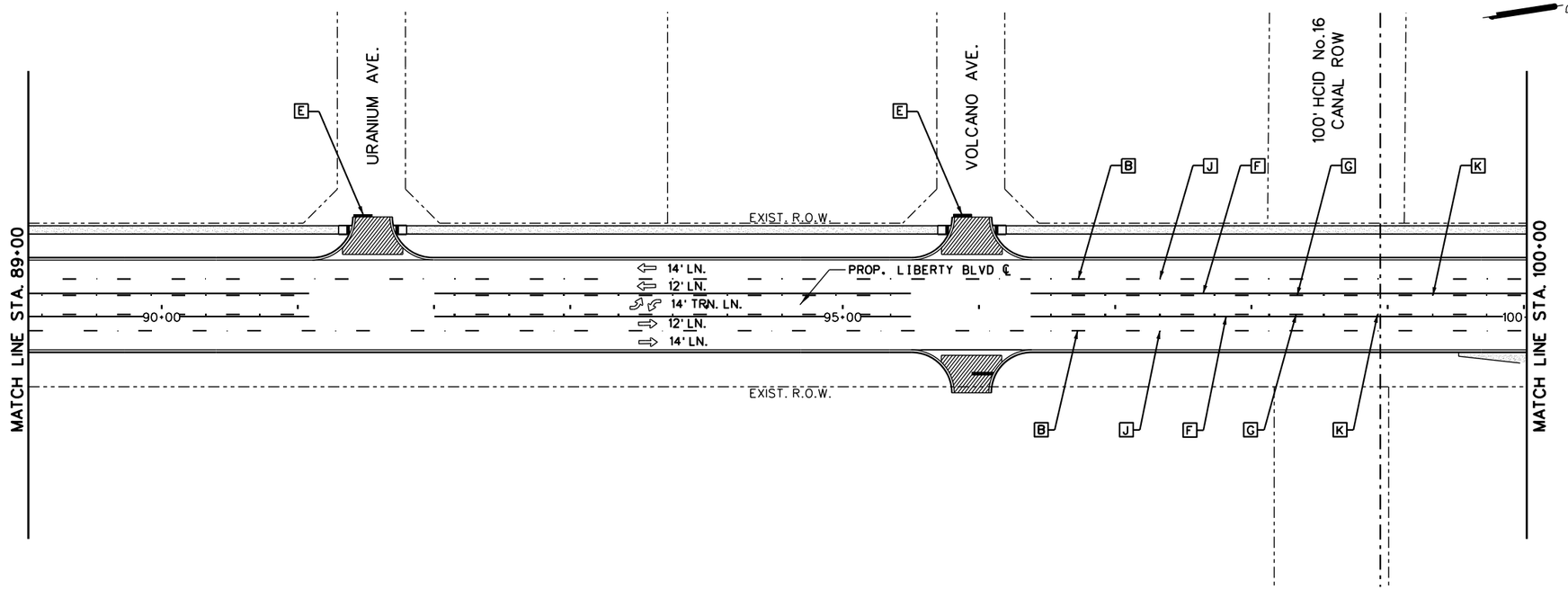
TYPE I-THERMOPLASTIC W/ RETROREFLECTIVITY REQUIREMENTS (ITEM 666)
- [A] 4" WHITE SOLID
- [B] 4" WHITE BROKEN
- [F] 4" YELLOW SOLID
- [G] 4" YELLOW BROKEN

TYPE I-THERMOPLASTIC (ITEM 666)
- [C] 8" WHITE SOLID
- [D] 12" WHITE SOLID
- [E] 24" WHITE SOLID
- [L] 24" YELLOW SOLID

PREFAB. PAVEMENT MARKERS TYPE B (ITEM 668)
- [H] SINGLE ARROW WHITE
- [I] WORD "ONLY" WHITE

REFLECTIVE PAVEMENT MARKERS (ITEM 672)
- [J] TYPE I-C REFLECTIVE CL B
- [K] TYPE II-AA REFLECTIVE CL B
- ⟵ TRAFFIC FLOW





STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL ENGINEER
LICENSED
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PAVEMENT MARKINGS LAYOUT

SCALE 1" = 100'

SHEET 4 OF 6

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				266
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

11/19/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\07 TRAFFIC\04 Pavement Markings\Liberty_PM04.dgn

SHEET SUMMARY

STATION LIMITS	REFLECTORIZED PAVEMENT MARKINGS ITEM 666								PREFAB PAV MRKS ITEM 668		RAISED PAV MRKS ITEM 672		D & OM ITEM 658
	TY I(W) 4" (BRK) (100 MIL) (LF)	TY I(W) 4" (SLD) (100 MIL) (LF)	TY I(W) 8" (SLD) (100 MIL) (LF)	TY I(W) 12" (SLD) (100 MIL) (LF)	TY I(W) 24" (SLD) (100 MIL) (LF)	TY I(Y) 24" (SLD) (100 MIL) (LF)	TY I(Y) 4" (BRK) (100 MIL) (LF)	TY I(Y) 4" (SLD) (100 MIL) (LF)	TY C (W) (ARROW) (EA)	TY C (W) (WORD) (EA)	REFL PAV MRK TY I-C (EA)	REFL PAV MRK TY II-A-A (EA)	(D-SW)SZ (BRF)GF2 (EA)
100+00 - 111+00	825	-	-	-	24	-	690	1840	-	-	27	46	11
111+00 - 122+00	825	-	-	-	24	-	690	1840	-	-	27	46	10
SHEET TOTAL	1650	-	-	-	48	-	1390	3680	-	-	54	92	21

NOTES:

1. THE PAVEMENT SURFACE SHALL BE FREE OF DELETERIOUS MATERIAL BEFORE APPLICATION OF PERMANENT STRIPING AND PAVEMENT MARKERS. IF THE SURFACE NEEDS TO BE CLEANED, AS DETERMINED BY THE ENGINEER, THE CONTRACTOR SHALL PREPARE SURFACE IN ACCORDANCE WITH ITEM 678, "PAVEMENT SURFACE PREPARATION FOR MARKINGS", EXCEPT FOR "MEASUREMENT" AND "PAYMENT". THE PREPARATION OF PAVEMENT SURFACE SHALL BE SUBSIDIARY TO ITEM 666, 668 AND 672.
2. ALL PERMANENT PAVEMENT MARKINGS SHALL BE THERMOPLASTIC 100 MIL.

PAVEMENT MARKINGS LEGEND:

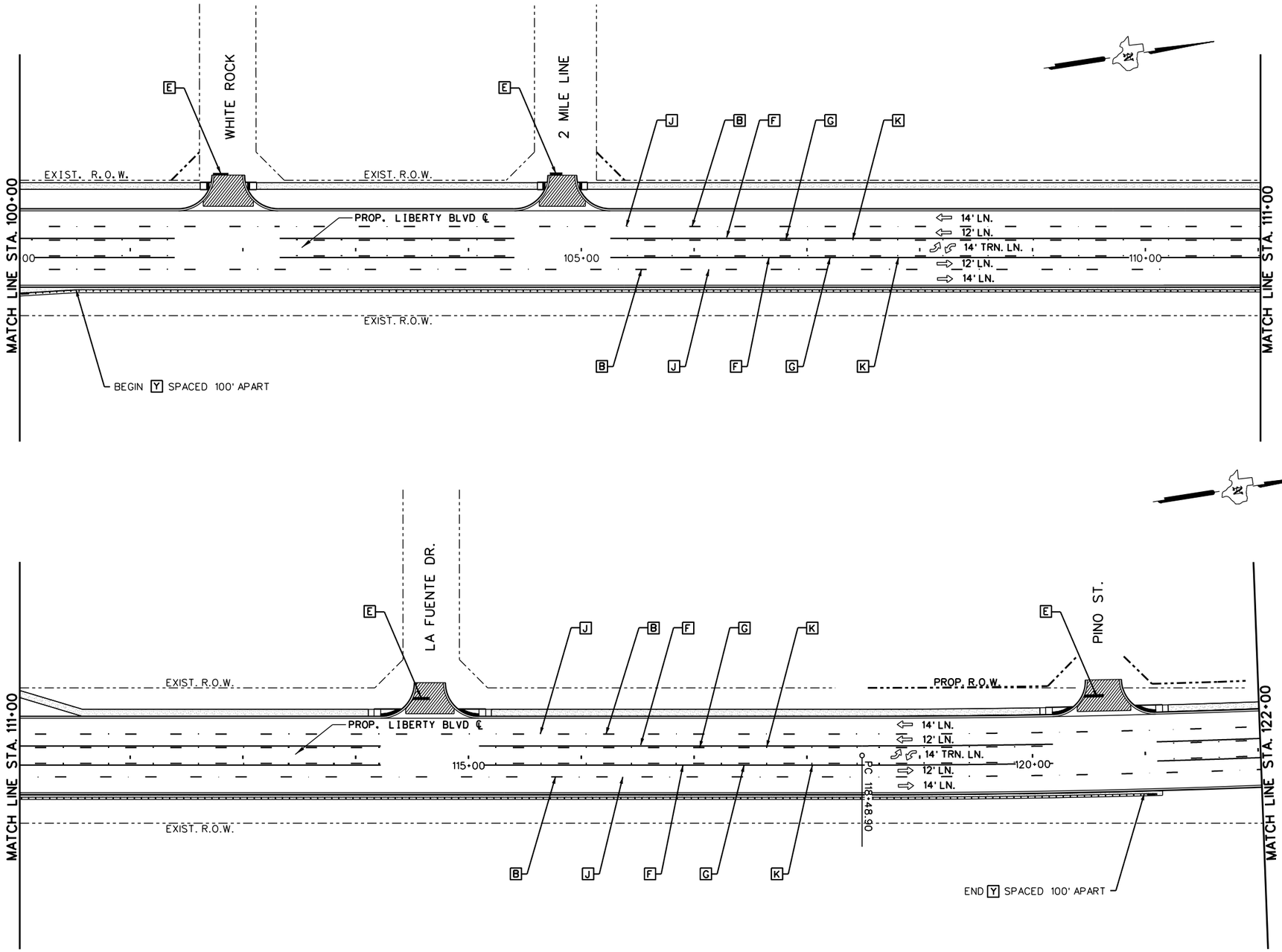
TYPE I-THERMOPLASTIC W/ RETROREFLECTIVITY REQUIREMENTS (ITEM 666)
- [A] 4" WHITE SOLID
- [B] 4" WHITE BROKEN
- [F] 4" YELLOW SOLID
- [G] 4" YELLOW BROKEN

TYPE I-THERMOPLASTIC (ITEM 666)
- [C] 8" WHITE SOLID
- [D] 12" WHITE SOLID
- [E] 24" WHITE SOLID
- [L] 24" YELLOW SOLID

PREFAB. PAVEMENT MARKERS TYPE B (ITEM 668)
- [H] SINGLE ARROW WHITE
- [I] WORD "ONLY" WHITE

REFLECTIVE PAVEMENT MARKERS (ITEM 672)
- [J] TYPE I-C REFLECTIVE CL B
- [K] TYPE II-AA REFLECTIVE CL B
- ← TRAFFIC FLOW

DELINEATOR AND OBJECT MARKERS (ITEM 658)
- [Y] (D-SW)SZ (BRF)GF2



STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL LICENSED ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
PAVEMENT MARKINGS LAYOUT

SCALE 1" = 100' SHEET 5 OF 6

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
						6	TEXAS				267
						STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
						PHR	HIDALGO	0921	02	194	LIBERTY

11/19/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3\\07 TRAFFIC\\04 Pavement Markings\Liberty_PM05.dgn

SHEET SUMMARY

STATION LIMITS	REFLECTORIZED PAVEMENT MARKINGS ITEM 666								PREFAB PAV MRKS ITEM 668		RAISED PAV MRKS ITEM 672	
	TY I(W) 4" (BRK) (100 MIL) (LF)	TY I(W) 4" (SLD) (100 MIL) (LF)	TY I(W) 8" (SLD) (100 MIL) (LF)	TY I(W) 12" (SLD) (100 MIL) (LF)	TY I(W) 24" (SLD) (100 MIL) (LF)	TY I(Y) 24" (SLD) (100 MIL) (LF)	TY I(Y) 4" (BRK) (100 MIL) (LF)	TY I(Y) 4" (SLD) (100 MIL) (LF)	TY C (W) (ARROW) (EA)	TY C (W) (WORD) (EA)	REFL PAV MRK TY I-C (EA)	REFL PAV MRK TY II-A-A (EA)
122+00 - 134+00	753	-	280	-	26	-	483	2068	2	2	39	72
133+00 - 144+00	84	2100	838	1354	359	-	143	3054	4	4	44	152
SHEET TOTAL	837	2100	1118	1354	385	-	626	5122	6	6	83	224

NOTES:

1. THE PAVEMENT SURFACE SHALL BE FREE OF DELETERIOUS MATERIAL BEFORE APPLICATION OF PERMANENT STRIPING AND PAVEMENT MARKERS. IF THE SURFACE NEEDS TO BE CLEANED, AS DETERMINED BY THE ENGINEER, THE CONTRACTOR SHALL PREPARE SURFACE IN ACCORDANCE WITH ITEM 678, "PAVEMENT SURFACE PREPARATION FOR MARKINGS", EXCEPT FOR "MEASUREMENT" AND "PAYMENT". THE PREPARATION OF PAVEMENT SURFACE SHALL BE SUBSIDIARY TO ITEM 666, 668 AND 672.
2. ALL PERMANENT PAVEMENT MARKINGS SHALL BE THERMOPLASTIC 100 MIL.

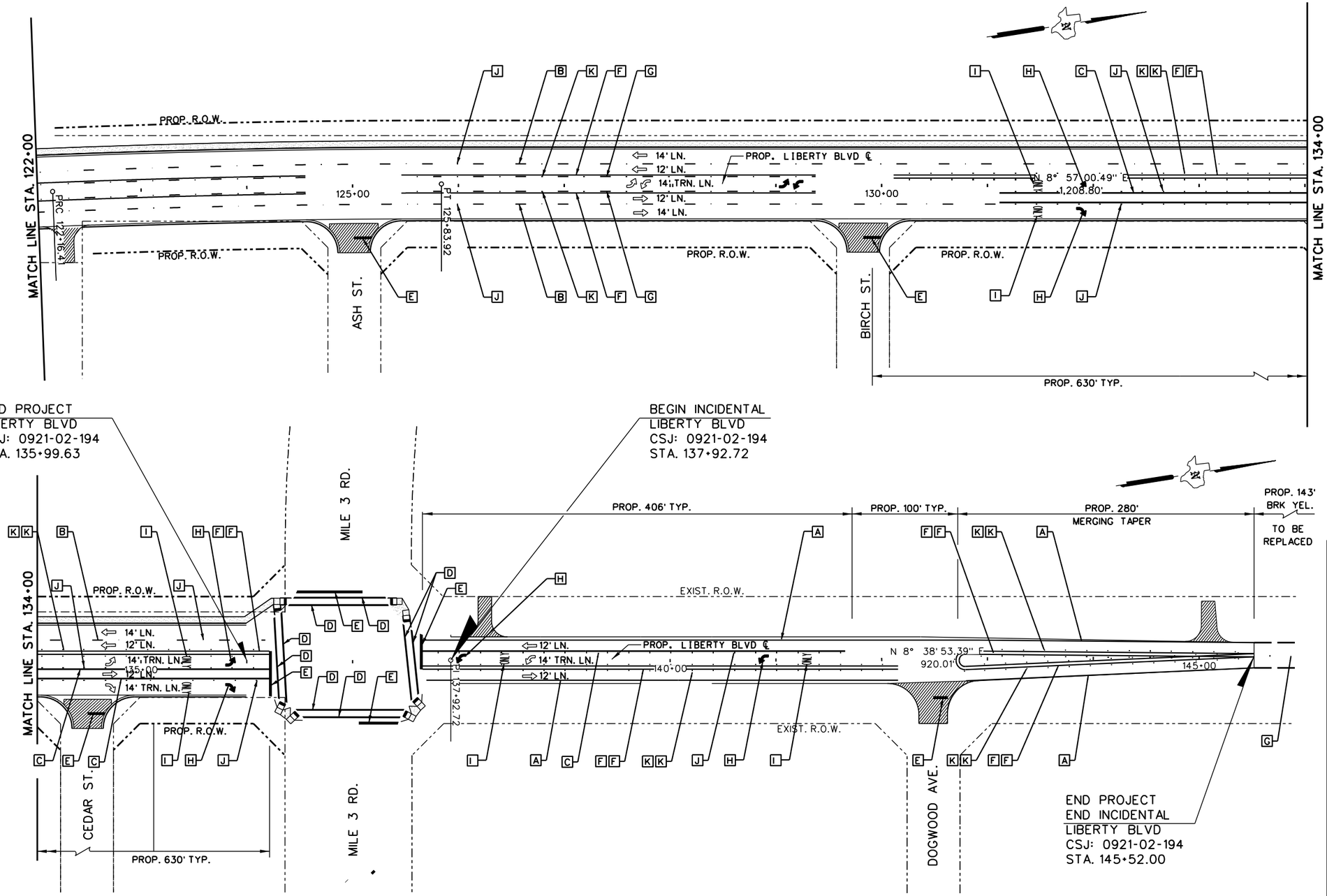
PAVEMENT MARKINGS LEGEND:

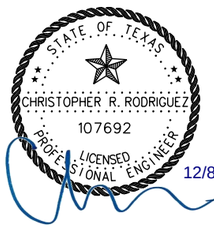
TYPE I-THERMOPLASTIC W/ RETROREFLECTIVITY REQUIREMENTS (ITEM 666)
- [A] 4" WHITE SOLID
- [B] 4" WHITE BROKEN
- [F] 4" YELLOW SOLID
- [G] 4" YELLOW BROKEN

TYPE I-THERMOPLASTIC (ITEM 666)
- [C] 8" WHITE SOLID
- [D] 12" WHITE SOLID
- [E] 24" WHITE SOLID
- [L] 24" YELLOW SOLID

PREFAB. PAVEMENT MARKERS TYPE B (ITEM 668)
- [H] SINGLE ARROW WHITE
- [I] WORD "ONLY" WHITE

REFLECTIVE PAVEMENT MARKERS (ITEM 672)
- [J] TYPE I-C REFLECTIVE CL B
- [K] TYPE II-AA REFLECTIVE CL B
- ⟵ TRAFFIC FLOW





THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

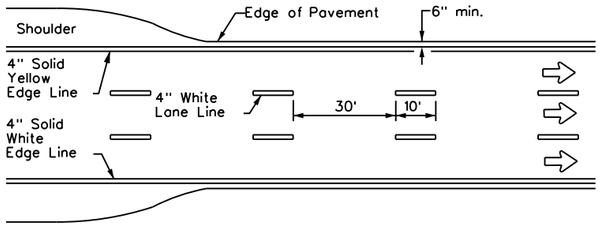
LIBERTY BLVD
PAVEMENT MARKINGS LAYOUT

SCALE 1" = 100' SHEET 6 OF 6

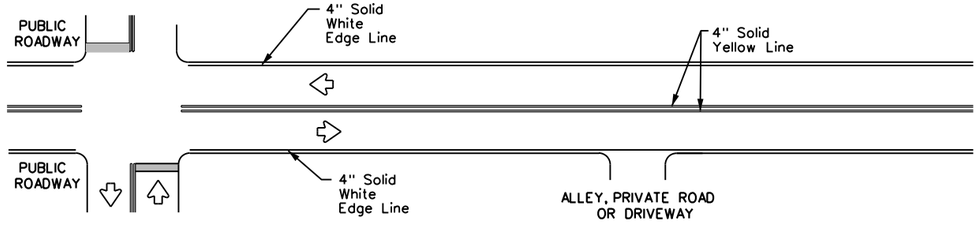
DN:	CK DN:	DW:	CK DW:	TR:	CK TR:	FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
						6	TEXAS				268
						STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
						PHR	HIDALGO	0921	02	194	LIBERTY

11/19/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\07 TRAFFIC\04 Pavement Markings\Liberty_PM06.dgn

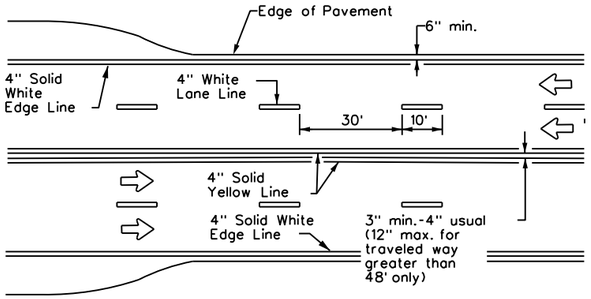
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



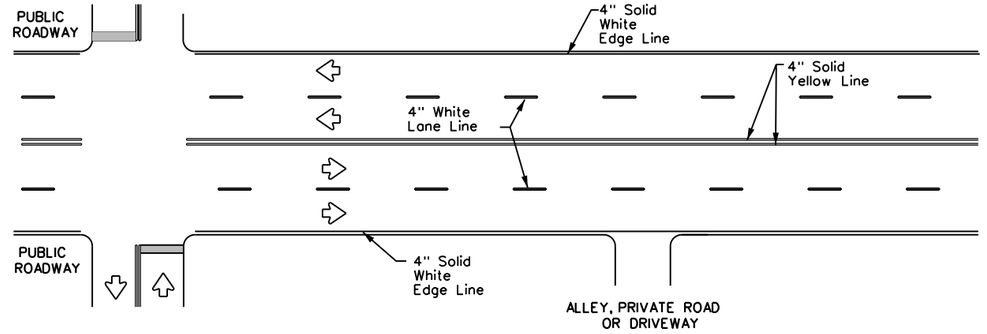
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



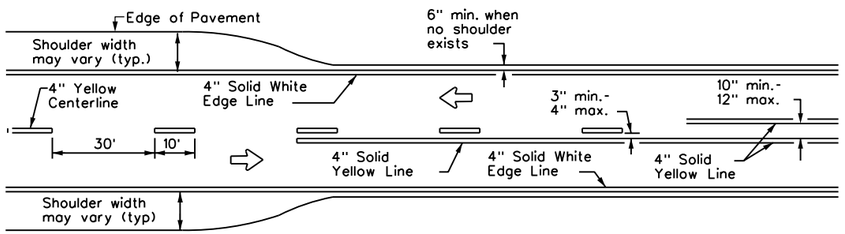
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



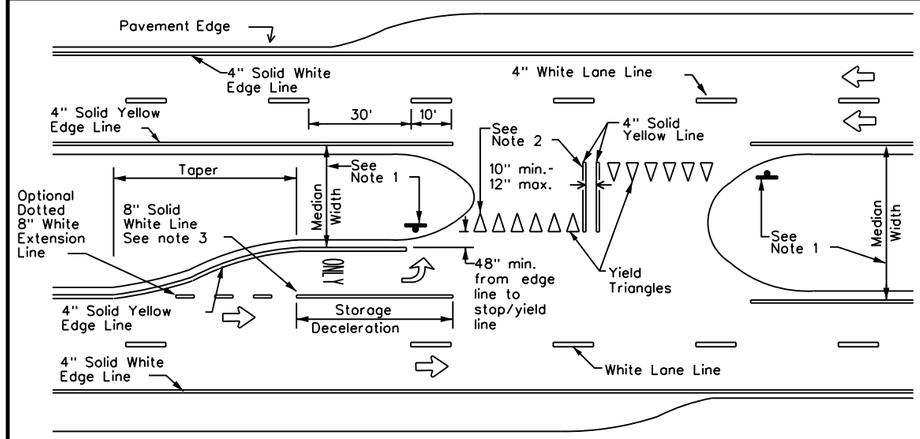
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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.

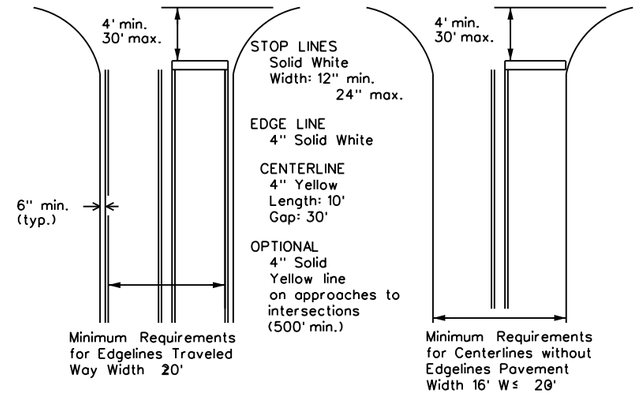
GENERAL NOTES

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

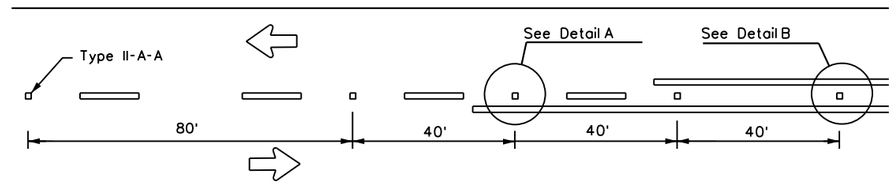
PM(1)-20

FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	1803	02	194	LIBERTY
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	PHR	HIDALGO		269

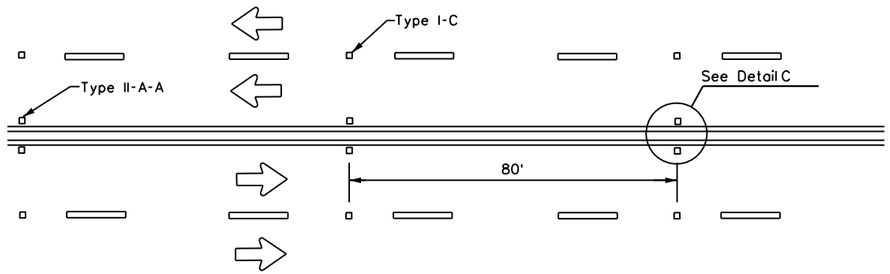
DATE:
FILE:

22A

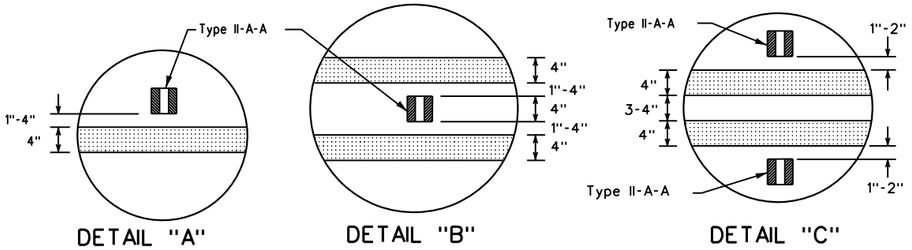
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



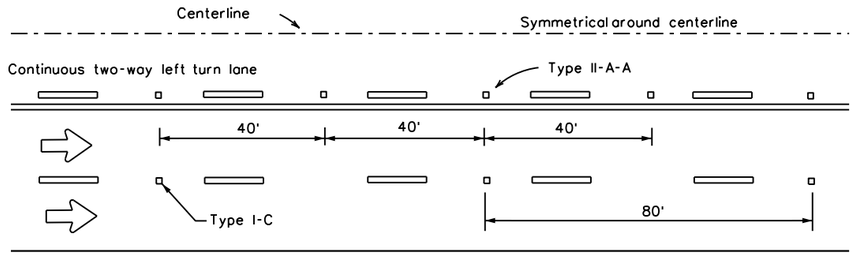
CENTERLINE FOR ALL TWO LANE ROADWAYS



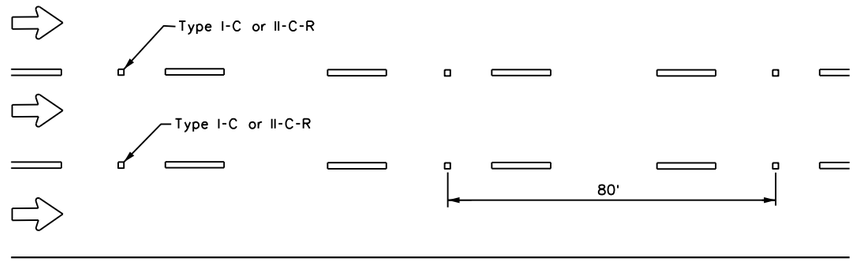
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



DETAIL "A" DETAIL "B" DETAIL "C"

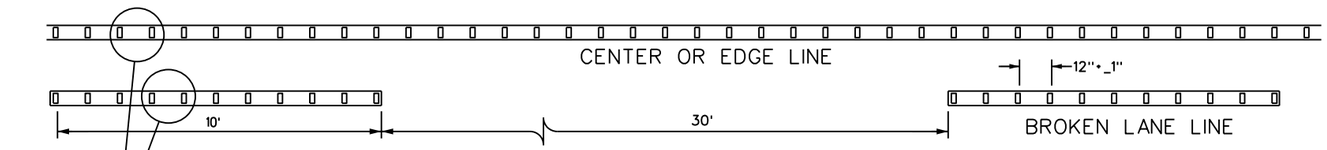


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



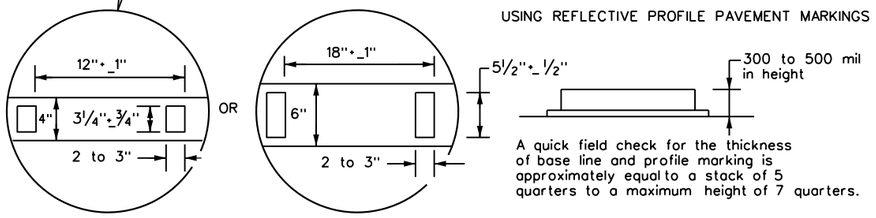
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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

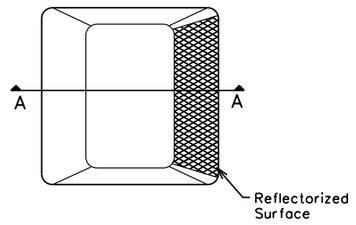
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

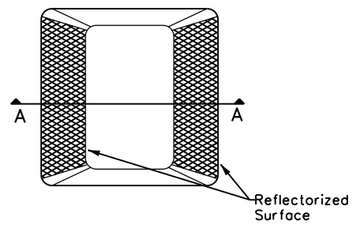
1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

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

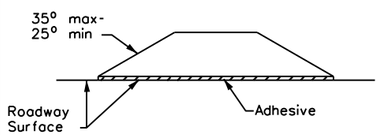
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



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

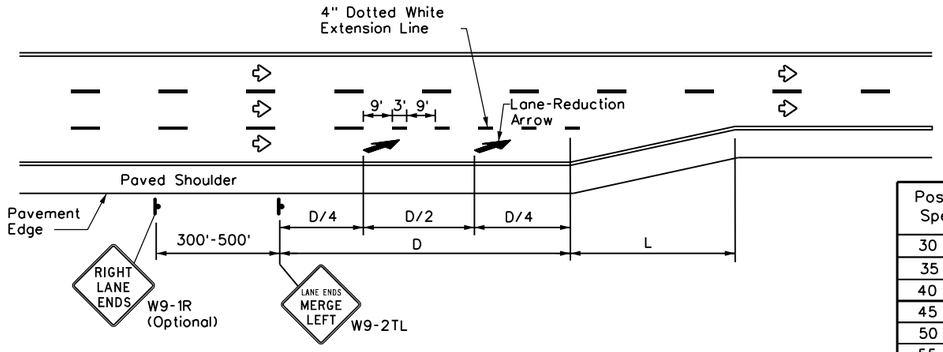
FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10	1803	02	194	LIBERTY
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	PHR	HIDALGO		270

22B

DISCLAIMER:
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:
FILE:

DISCLAIMER:
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.

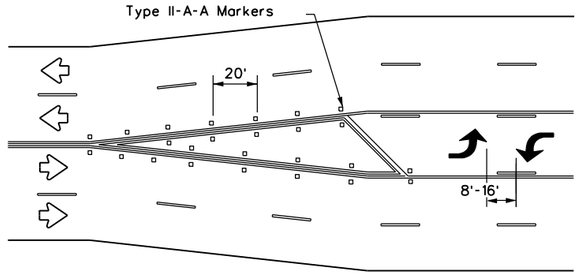


LANE REDUCTION

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.

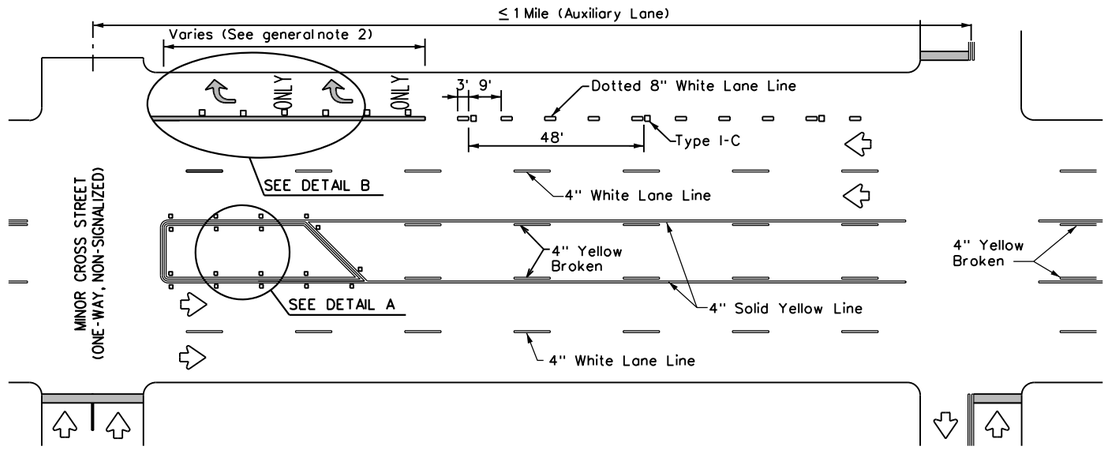
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

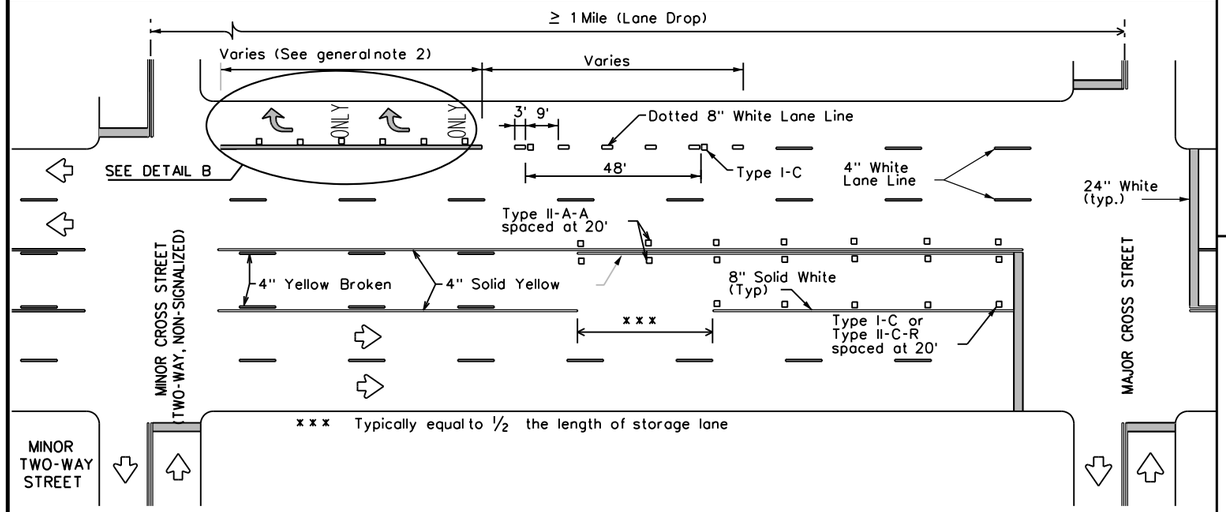
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn 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.

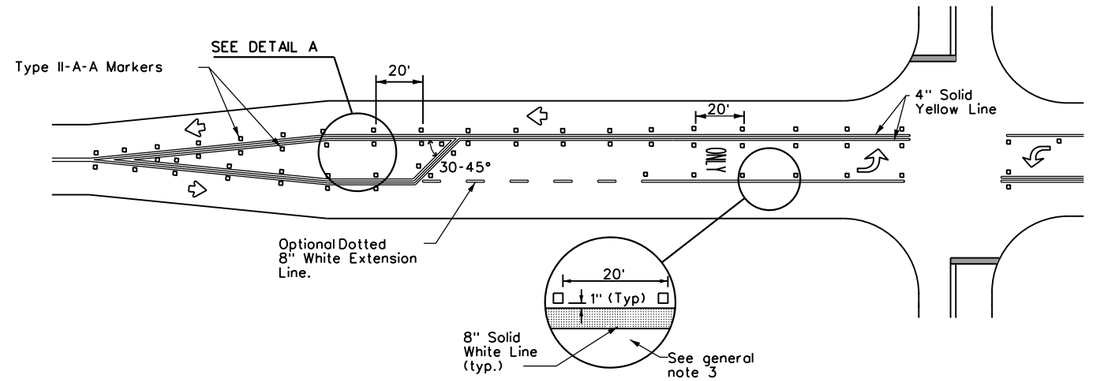


TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE

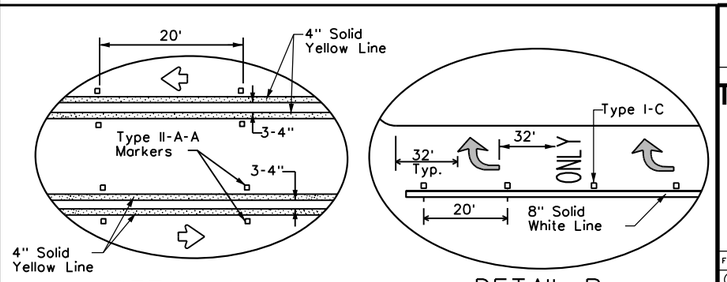


xxx Typically equal to ½ the length of storage lane

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

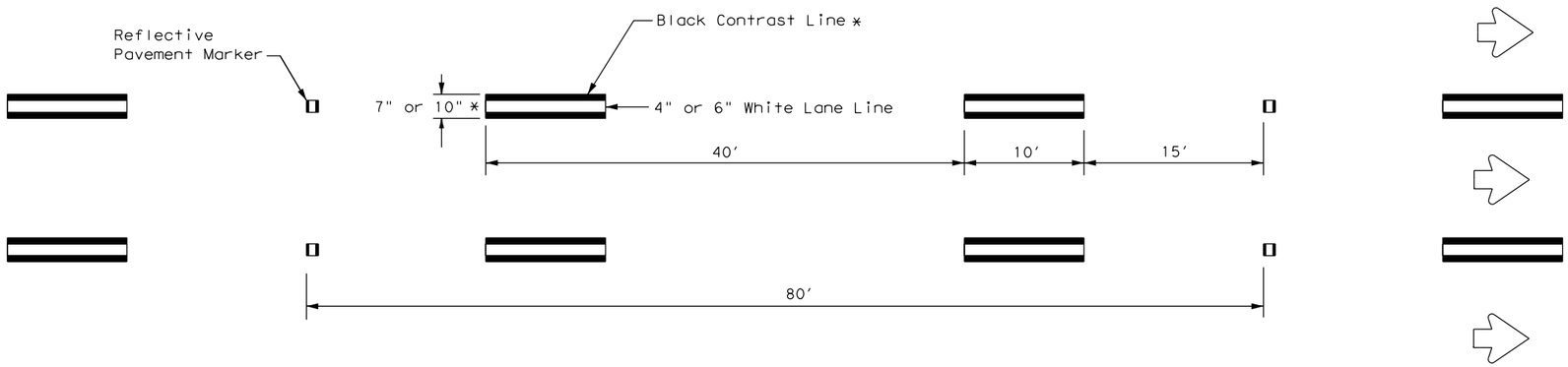
TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-20

FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	1803	02	194	LIBERTY
5-00 2-10	DIST	COUNTY		SHEET NO.
8-00 2-12	PHR	HIDALGO		271
3-03 6-20				

22C

DATE:
FILE:

DISCLAIMER:
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.



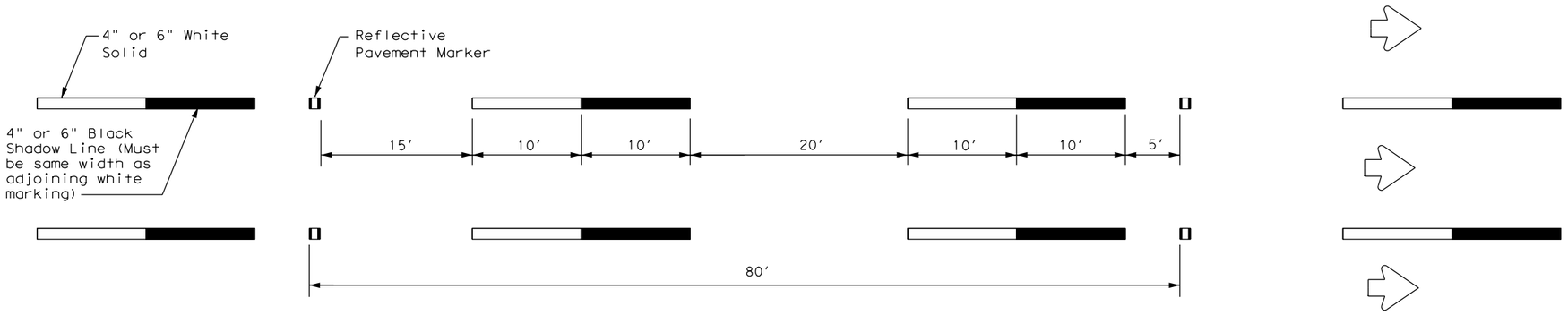
* See contrast line dimensions table for width of black line.

CONTRAST LANE LINE DESIGN

CONTRAST LINE DIMENSIONS		
White	Black (per side)	Total Width
4"	1.5"	7"
6"	2"	10"

GENERAL NOTES

1. Contrast and Shadow markings may only be used on concrete pavements.
2. Contrast and Shadow markings shall not be used on edge lines.
3. Contrast lane lines shall be permanent prefabricated pavement markings meeting DMS 8240.
4. Shadow lane line designs shall be a liquid markings system approved by TxDOT.
5. All raised reflective pavement markers placed in broken lines shall be placed in line with and midway between the white stripes.
6. See PM(2) for raised reflective pavement markings installation details.



SHADOW LANE LINE DESIGN

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.

Texas Department of Transportation

Traffic Operations Division Standard

CONTRAST AND SHADOW PAVEMENT MARKINGS

CPM(1)-14

FILE: CPM(1)14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	PHR	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		272

22N

DATE:
FILE:

During the planning phase of project development, the following Environmental Permits, Issues and Commitments have been developed during coordination with resource agencies, local governmental entities and the general public. Any change orders and/or deviations from the final design must be reported to the Engineer prior to the commencement of construction activities as additional environmental clearances may be required.

I. Clean Water Act, Section 402: Stormwater Pollution Prevention

Action Items Required : ☐ No Action Required

1. ☒ The contractor must implement the SW3P by installing Best Management Practices (BMPs) as indicated in the construction plans and maintained appropriately throughout construction. BMPs must be in place prior to the start of construction. The SW3P may need to be revised as necessary as construction progresses.
2. ☒ For all construction PSL's off the ROW, the contractor must certify compliance with all applicable laws, rules and regulations pertaining to the preservation of cultural resources, natural resources and the environment.
3. ☒ Based on the acreage of impact, select the appropriate box below:
   - ☐ This project will disturb less than 1 acre of soil and is not part of a larger common plan of development; therefore, a NOI and TPDES Site Notice are not required for this project.

   or
   - ☐ This project will disturb equal to or more than 1 acre of soil but less than 5 acres; therefore a NOI is not required but a TPDES Site Notice is required. The Construction Site Notice (CSN) is required to be posted at the construction site in a publicly accessible location for review by the public, TCEQ, EPA and other Inspectors.

   or
   - ☒ This project will disturb equal to or more than 5 acres of soil and will require a NOI and TPDES Site Notice. The NOI and Site Notice are required to be posted at the construction site in a publicly accessible location.
4. ☒ Need to address MS4 requirements (Cameron & Hidalgo Counties only) ☐ MS4 requirements not needed

II. Clean Water Act, Sections 401 and 404 Compliance

Action Items Rquired : ☐ No Action Required

1. ☒ Filling, dredging or excavating in any water bodies, rivers, creeks, streams, wetlands or wet areas is prohibited unless specified in the USACE permit and approved by the Engineer. The contractor shall adhere to all agreements, mitigation plans, and BMPs required by the NWP as regulated by the USACE.

   The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

   - ☒ No Permit Required
   - ☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)
   - ☐ Nationwide Permit 14 - PCN Required (1/10th to <1/2 acre, 1/3 in tidal waters)
   - ☐ Individual 404 Permit Required
   - ☐ Other Nationwide Permit Required: NWP* _____
2. ☒ The contractor is responsible for obtaining new or revised Section 404 permit(s) for Contractor initiated changes in construction methods that change Impacts To Waters Of The U.S., including wetlands. The Contractor will ensure that the water quality of the State will be maintained and not degraded.
3. ☒ Best Management Practices for applicable Section 401 General Conditions:

General Condition 12 - Categories I and II BMPs required

Category I (Erosion Control)

☒ Temporary Vegetation	☐ Interceptor Swale	☐ Mulch Filter Berms and/or Socks
☐ Blankets, Matting	☐ Diversion Dike	☐ Compost Filter Berms and/or Socks
☐ Mulch	☐ Erosion Control Compost	☐ Compost Blankets
☐ Sodding		

Category II (Sedimentation Control)

☒ Silt Fence	☐ Hay (Straw) Bale Dike	☒ Mulch Filter Berms and/or Socks
☐ Rock Berm	☐ Brush Berms	☒ Compost Filter Berms and/or Socks
☐ Triangular Filter Dike	☐ Sediment Basins	☐ Stone Outlet Sediment Traps
☐ Sand Bag Berm	☐ Erosion Control Compost	

General Condition 21 - Category III BMPs required

Category III (Post-Construction TSS Control)

☐ Vegetative Filter Strips	☐ Wet Basins	☐ Mulch Filter Berms and/or Socks
☐ Retention/Irrigation	☐ Grassy Swales	☐ Compost Filter Berms and/or Socks
☐ Extended Detention Basin	☒ Vegetation-Lined Ditches	☐ Sand Filter Systems
☐ Constructed Wetlands	☐ Erosion Control Compost	☐ Sedimentation Chambers

II. Clean Water Act, Sections 401 and 404 Compliance - Continued:

4. ☒ The Contractor's designated and qualified Contractor Responsible Person Environmental (CRPe) will monitor the project site daily to ensue compliance with SW3P and TPDES General Permit TXR 150000. Daily Monitoring Reports shall be provided to TxDOT within 48 hours, in accordance with Item 506.3.1.
5. ☐ Other Project Specific Actions:
   1.
   2.

III. Cultural Resources

Action Items Required : ☐ No Action Required

1. ☒ Refer to the 2014 TxDOT Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges, Item 7.7.1., 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.
2. ☐ Other Project Specific Actions:
   1.
   2.

IV. Vegetation Resources

Action Items Required : ☐ No Action Required

1. ☒ In accordance with the 2014 TxDOT Standard Specifications: Item 164 - Seeding For Erosion Control: provide and install temporary or permanent seeding for erosion control as shown on the plans or as directed by the Engineer for all seeding and replanting of right of way where possible. (Required for Urban Settings)
2. ☐ In accordance with Executive Order 13112 on invasive species and the Executive Memorandum on Beneficial Landscaping, native species of plants shall be used for all seeding and replanting of right of way where possible for rural roadways. (Required for Rural Settings)
3. ☒ Preserve vegetation where possible throughout the project and minimize clearing, grubbing and excavation within stream banks, bed and approach sections.
4. ☐ Other Project Specific Actions:
   1.
   2.

Pharr District Contact No. 956-702-6100 Revised 01/30/2017

List of Abbreviations

BMP: Best Management Practice
CGP: Construction General Permit
CRPe: Contractor Responsible Person Environmental
DSHS: Texas Department of State Health Services
FEMA: Federal Emergency Management Agency
FHWA: Federal Highway Administration
MOA: Memorandum of Agreement
MOU: Memorandum of Understanding
MS4: Municipal Separate Stormwater Sewer System
MSAT: Mobile Source Air Toxic
MBTA: Migratory Bird Treaty Act
NOI: Notice of Intent
NOT: Notice of Termination
NWP: Nationwide Permit
PCN: Pre-Construction Notification
PSL: Project Specific Location
SPCC: Spill Prevention Control and Countermeasure
SW3P: Storm Water Pollution Prevention Plan
TCEQ: Texas Commission on Environmental Quality
THC: Texas Historical Commission
TPDES: Texas Pollutant Discharge Elimination System
TPWD: Texas Parks and Wildlife Department
TxDOT: Texas Department of Transportation
T&E: Threatened and Endangered Species
USACE: U.S. Army Corp of Engineers
USFWS: U.S. Fish and Wildlife Service

Texas Department of Transportation
© 2016
PHARR DISTRICT

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6			LIBERTY
STATE	DISTRICT	COUNTY	
TEXAS	PHR	HIDALGO	SHEET NO.
CONTROL	SECTION	JOB	
0921	02	194	273

Date Printed: X-X-XX

V. Federal Listed, and Proposed Threatened and Endangered Species, Critical Habitat, State Listed Species, Candidate Species and Migratory Birds

Action Items Required : ☐ No Action Required

1. ☒ Under the Migratory Bird Treaty Act (MBTA) of 1918, codified at 16 U.S.C. 703-712 and as enforced by the USFWS, the proposed construction work will not remove active nests from bridges, trees, ground and other structures during migratory bird nesting season, (February 1st. through October 1st.). If the Contractor needs to perform work within the right of way during nesting season, a qualified Biologist shall conduct a survey to determine if active nests are present. If present, the Contractor shall maintain a buffer zone around the nest(s) as directed by the Biologist. The buffer zone will be protected from clearing and disturbance until such time as the Biologist has determined that the nest(s) is no longer active. Prior to the nesting season, existing bridges and culverts should be treated against migratory bird nesting by utilizing Bird Exclusion Methods. Bird Exclusion Methods should be monitored and maintained throughout the nesting season. Refer to Standard Bird Exclusion Details.

2. ☒ There is the potential for the presence of state-listed species & species of greatest conservation need in the project area and state law prohibits the taking (incidental or otherwise) of state-listed species. Taking is defined as the collection, hooking, hunting, netting, shooting, or share by any means or devices. If any listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately.

3. ☒ Other Project Specific Actions:

   1. State rare, threatened, endangered or species of greatest conservation need that have the potential of occurring within the project area: Cactus Ferruginous Pygmy-Owl (Glaucidium brasilianum cactorum), Texas Botteri's Sparrow (Aimophila botterii texana), Western Burrowing Owl (Athene cunicularia hypugaea), Plains Spotted Skunk (Spilogale putorius interrupta), Black-Striped Snake (Coniophanes imperialis), Texas Indigo Snake (Drymarchon melanurus erebennus), Reticulate Collared Lizard (Crotaphytus reticulates), Texas Horned Lizard (Phrynosoma cornutum), Texas Tortoise (Gopherus berlandieri), Spot-Tailed Earless Lizard (Holbrookia lacerate), South Texas Siren (large form) (Siren sp.1), Black-Spotted Newt (Notophthalmus meridionalis), Mexican Treefrog (Smilisca baudinii), Sheep Frog (Hypopachus variolosus), White-Lipped Frog (Leptodactylus fragilis), and Mexican Mud-Plantain (Heteranthera mexicana).

VI. Hazardous Materials on Contamination Issues

Action Items Required : ☐ No Action Required

General (applies to all projects):

Comply with the Hazard Communication Act (HCA) 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 appropriate 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 HCA.

Maintain an adequate supply of on-site spill response materials as indicated in the MSDS. In the event of a spill, take immediate action to mitigate the spill as indicated in the MSDS and in accordance with safe work practices. Contact the TxDOT Pharr District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

- Dead or distressed vegetation (identified as not normal)
- Trash piles, drums, canisters, barrels, etc.
- Undesirable smells or odors
- Evidence of leaching or seepage of contaminant substances

Any other evidence indicating possible hazardous materials or contamination discovered on site.

1. ☒ If potentially hazardous material and/or contaminated media (i.e.: soil, groundwater, surface water, sediment, building materials) are unexpectedly encountered during construction, assure that such materials and contamination are handled according to applicable federal and state regulations, cease work in the immediate area and contact the Engineer immediately.

VI. Hazardous Materials on Contamination Issues - Continued:

2. Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

   ☐ Yes ☒ No

   If "No", then no further action required.
   If "Yes", then TxDOT is responsible for completing an asbestos assessment/inspection.

3. Are the results of the asbestos inspection positive (is asbestos present)?

   ☐ Yes ☐ No

   If "Yes", then TxDOT must retain a Texas Department of State Health Services (DSHS) licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled abatement activities and/or demolition.

   If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

4. ☐ The Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and an Asbestos Consultant in order to minimize construction delays and subsequent claims.

VII. Other Environmental Issues

Action Items Required : ☐ No Action Required

1. ☒ Noise

   Contractor shall make every reasonable effort to minimize construction noise through abatement measures such as work hour controls and proper maintenance of equipment mufflers.

2. ☒ Air

   Contractor shall practice common dust control techniques such as surface chemical treatment or watering of unpaved road surfaces and vehicle speed reduction shall be implemented to minimize and prevent airborne dust during construction.

   Contractor should minimize MSAT by utilizing measures to encourage use of EPA required cleaner diesel fuels, limits on idling, increase use of cleaner burning diesel engines, and other emission limitation techniques, as appropriate.

Pharr District Contact No. 956-702-6100 Revised 01/30/2017

List of Abbreviations

BMP: Best Management Practice
CGP: Construction General Permit
CRPe: Contractor Responsible Person Environmental
DSHS: Texas Department of State Health Services
FEMA: Federal Emergency Management Agency
FHWA: Federal Highway Administration
MOA: Memorandum of Agreement
MOU: Memorandum of Understanding
MS4: Municipal Separate Stormwater Sewer System
MSAT: Mobile Source Air Toxic
MBTA: Migratory Bird Treaty Act
NOI: Notice of Intent
NOT: Notice of Termination
NWP: Nationwide Permit
PCN: Pre-Construction Notification
PSL: Project Specific Location
SPCC: Spill Prevention Control and Countermeasure
SW3P: Storm Water Pollution Prevention Plan
TCEQ: Texas Commission on Environmental Quality
THC: Texas Historical Commission
TPDES: Texas Pollutant Discharge Elimination System
TPWD: Texas Parks and Wildlife Department
TxDOT: Texas Department of Transportation
T&E: Threatened and Endangered Species
USACE: U.S. Army Corp of Engineers
USFWS: U.S. Fish and Wildlife Service

© 2016

Texas Department of Transportation
PHARR DISTRICT

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6			LIBERTY
STATE	DISTRICT	COUNTY	
TEXAS	PHR	HIDALGO	SHEET NO.
CONTROL	SECTION	JOB	
0921	02	194	274

Date Printed: X-X-XX

TPWD BMPs

The Programmatic Agreement defines Best Management Practices (BMPs) to be implemented by Texas Department of Transportation (TxDOT) per §2.213 (Programmatic Agreements) of the 2017 Memorandum of Understanding (MOU) between TxDOT and Texas Parks and Wildlife Department (TPWD). These BMPs are measures that TxDOT and TPWD agree will result in avoidance and minimization of potential impacts to natural resources and in some cases apply to particular types of TxDOT projects.

The purpose of this section is to provide BMPs to minimize impacts to species or groups of species. Implementation of these BMPs by TxDOT eliminates the need for coordination under 2.206(1) of the MOU, except as noted.

Due diligence should be used to avoid killing or harming any wildlife species in the implementation of TxDOT projects.

☒ Bird BMPs (Required)

In addition to complying with the Migratory Bird Treaty Act (MBTA) perform the following BMPs:

- ☒ Prior to construction, perform daytime surveys for nests including under bridges and in culverts to determine if they are active before removal. Nests that are active should not be disturbed.
- ☒ Do not disturb, destroy, or remove active nests, including ground nesting birds, during the nesting season.
- ☒ Avoid the removal of unoccupied, inactive nests, as practicable.
- ☒ Prevent the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair.
- ☒ Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.

☐ Bald Eagle *(Haliaeetus leucocephalus)*

- ☐ Bird BMPs and Bald and Golden Eagle Protection Act compliance

☐ Reddish Egret *(Egretta rufescens)*
☐ White-faced Ibis *(Plegadis chihi)*

- ☐ Bird BMPs unless project is within 300 meters (984 feet) of a known colonial water bird rookery then coordinate with TPWD.

☐ Rookeries (Recommendations)

In general, nesting dates for herons and egrets range from early February to late August in Texas, depending on the species. Great Blue Herons (GBHE) are usually the first to nest. When GBHE get disrupted from the nest and abandon nesting, then the other species of herons and egrets may not attempt to nest at the colony that year. Breeding dates for rookery species are approximately as follows:

Species	Dates
Cattle Egret	Early April to late October
Little Blue Heron	Late March to late July
Snowy Egret	Late March to early August
Great Egret	Early March to early August
Black-crowned Night Heron	Early February to late July
Great Blue Heron	February to late August

☐ Rookeries (Recommendations) (Continued)

- ☐ Vegetation clearing in a primary buffer area of 300 meters (984 feet) from a heronry periphery should be avoided. Utilizing areas that have already been cleared within this buffer area may be acceptable depending on site-specific characteristics. Additionally, human foot-traffic or machinery use should not occur within this buffer area during the nesting season.
- ☐ Clearing activities or construction using heavy machinery in a secondary buffer area of 1,000 meters (3,281 feet) from the heronry periphery should be avoided during the breeding season (courting and nesting).

☐ Bat BMPs (Required)

To determine the appropriate BMP to avoid or minimize impacts to bats, review the habitat description for the species of interest on the TPWD Rare, Threatened, and Endangered Species of Texas by County List or other trusted resources. All bat surveys and other activities that include direct contact with bats shall comply with TPWD' recommended white-nose syndrome protocols located on the TPWD Wildlife Habitat Assessment Program website under "Project Design and Construction".

The following survey and exclusion protocols should be followed prior to commencement of construction activities. For the purposes of this document, structures are defined as bridges, culverts (concrete or metal), wells, and buildings.

- ☐ For activities that have the potential to impact structures, cliffs or caves, or trees; a qualified biologist will perform a habitat assessment and occupancy survey of the feature(s) with roost potential as early in the planning process as possible or within one year before project letting.
- ☐ For roosts where occupancy is strongly suspected but unconfirmed during the initial survey, revisit feature(s) at most four weeks prior to scheduled disturbance to confirm absence of bats.
- ☐ If bats are present or recent signs of occupation (i.e., piles of guano, distinct musky odor, or staining and rub marks at potential entry points) are observed, take appropriate measures to ensure that bats are not harmed, such as implementing non-lethal exclusion activities or timing or phasing of construction.
- ☐ Exclusion devices can be installed by a qualified individual between September 1 and March 31. Exclusion devices should be used for a minimum of seven days when minimum nighttime temperatures are above 50°F and minimum daytime temperatures are above 70°F. Prior to exclusion, ensure that alternate roosting habitat is available in the immediate area. If no suitable roosting habitat is available, installation of alternate roosts is recommended to replace the loss of an occupied roost. If alternate roost sites are not provided, bats may seek shelter in other inappropriate sites, such as buildings, in the surrounding area. See Additional Bat BMPs (Recommendations) for recommended acceptable methods for excluding bats from structures.
- ☐ If feature(s) used by bats are removed as a result of construction, replacement structures should incorporate bat-friendly design or artificial roosts should be constructed to replace these features, as practicable.
- ☐ Conversion of property containing cave or cliff features to transportation purposes should be avoided where feasible.

☐ Bat BMPs (Required)(Continued)

- ☐ Avoid unnecessary removal of dead fronds on native and ornamental palm trees in south Texas (Cameron, Hidalgo, Willacy, Kenedy, Brooks, Kleberg, Nueces, and San Patricio counties) from April 1st through October 31st. If removal of dead fronds is necessary at other times of the year, limit frond removal to extended warm periods (nighttime temperatures: 55°F for at least two consecutive nights), so bats can move away from the disturbance and find new roosts.
- ☐ Large hollow trees, snags (dead standing trees), and trees with shaggy bark should be surveyed for colonies and, if found, should not be disturbed until the bats are no longer occupying these features. Post-occupancy surveys should be conducted by a qualified biologist prior to tree removal from the landscape.
- ☐ Retain mature, large diameter hardwood forest species and native/ornamental palm trees where feasible.
- ☐ In all instances, avoid harm or death to bats. Bats should only be handled as a last resort and after communication with TPWD.

☐ Mexican Long-tongues Bat *(Choeronycteris mexicana)*

- ☐ Avoid unnecessary impacts to cacti and agave species.
- ☐ Bat BMPs.

☐ Additional Bat BMPs (Recommendations)

- ☐ Bat surveys of structures should include visual inspections of structural fissures (cracked or spalled concrete, damaged or split beams, split or damaged timber railings), crevices (expansion joints, space between parallel beams, spaces above supports piers), and alternative structures (drainage pipes, bolt cavities, open sections between support beams, swallow nests) for the presence of bats.
- ☐ Before excluding bats from any occupied structure, bat species, weather, temperature, season, and geographic location must be incorporated into any exclusion plans to avoid unnecessary harm or death to bats. Winter exclusion must entail a survey to confirm either, 1) bats are absent or 2) present but active (i.e. continuously active - not intermittently active due to arousals from hibernation).
- ☐ Avoid using materials that degrade quickly, like paper, steel wool or rags, to close holes.
- ☐ Avoid using products or making structural modifications that may block natural ventilation, like hanging plastic sheeting over an active roost entrance, thereby altering roost microclimate.
- ☐ Avoid using chemical and ultrasonic repellents.
- ☐ Avoid use of silicone, polyurethane or similar non-water-based caulk products.
- ☐ Avoid use of expandable foam products at occupied sites.
- ☐ Avoid the use of flexible netting attached with duct tape.

Pharr District Contact No. 956-702-6100

Revised 07/12/2017

List of Abbreviations

BMP: Best Management Practice
CGP: Construction General Permit
CRPe: Contractor Responsible Person Environmental
DSHS: Texas Department of State Health Services
FEMA: Federal Emergency Management Agency
FHWA: Federal Highway Administration
MOA: Memorandum of Agreement
MOU: Memorandum of Understanding
MS4: Municipal Separate Stormwater Sewer System
MSAT: Mobile Source Air Toxic
MBTA: Migratory Bird Treaty Act
NOI: Notice of Intent
NOT: Notice of Termination
NWP: Nationwide Permit
PCN: Pre-Construction Notification
PSL: Project Specific Location
SPCC: Spill Prevention Control and Countermeasure
SW3P: Storm Water Pollution Prevention Plan
TCEQ: Texas Commission on Environmental Quality
THC: Texas Historical Commission
TPDES: Texas Pollutant Discharge Elimination System
TPWD: Texas Parks and Wildlife Department
TxDOT: Texas Department of Transportation
T&E: Threatened and Endangered Species
USACE: U.S. Army Corp of Engineers
USFWS: U.S. Fish and Wildlife Service

© 2017

Texas Department of Transportation
PHARR DISTRICT

EPIC SHEET SUPPLEMENTALS

TPWD BMPs

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6			LIBERTY
STATE	DISTRICT	COUNTY	
TEXAS	PHR	HIDALGO	SHEET NO.
CONTROL	SECTION	JOB	
0921	02	194	275

Date Printed: X-X-XX

☐ Additional Bat BMPs (Recommendations) (Continued)

☐ In order to avoid entombing bats, exclusion activities should be only implemented by a qualified individual. A qualified individual or company should possess at least the following minimum qualifications:

- Experience in bat exclusion (the individual, not just the company).
- Proof of rabies pre-exposure vaccinations.
- Demonstrated knowledge of the relevant bat species, including maternity season date range and habitat requirements.
- Demonstrated knowledge of rabies and histoplasmosis in relation to bat roosts.

☐ Contact TPWD for additional resources and information to assist in executing successful bat exclusions that will avoid unnecessary harm or death in bats.

☐ Fossorial Mammal BMPs (Required)

☐ If black-tailed prairie dog (BTPD) burrows or pocket gopher mounds are to be excavated/directly impacted coordinate with TPWD WHAB.
☐ When a construction zone is adjacent to active BTPD burrows or pocket gopher mounds, erect barriers to discourage individuals moving through or into the construction area.
☐ When seeding or revegetation is planned in an area adjacent to BTPD burrows or pocket gopher mounds, a vegetative barrier should be considered in the planting to discourage dispersal into the ROW.

☐ Coues' Rice Rat *(Oryzomys couesi)*

☐ Minimize impacts to wetland, Resaca, oxbow lakes, and marsh habitats.
☐ Contractors will be advised of potential occurrence in the project area and to avoid harming the species if encountered.
☐ Water Quality BMPs.

☒ Plains Spotted Skunk *(Spilogale putorius interrupta)* or
☐ Swift Fox *(Vulpes velox)*

☒ Contractor will be advised of potential occurrence in the project area and to avoid harming the species if encountered and to avoid unnecessary impacts to dens.

☐ White nosed Coati *(Nasua narica)*
☐ Yellow nosed Cotton Rat *(Sigmodon ochrognathus)*

☐ Contractors will be advised of potential occurrence in the project area and to avoid harming the species if encountered.

☒ Terrestrial Reptile BMPs (Required)

☒ Apply hydro mulching and/or hydro seeding in areas for soil stabilization and/or revegetation of disturbed areas where feasible. If hydro mulching and/or hydro seeding are not feasible due to site conditions, utilize erosion control blankets or mats that contain no netting or contain loosely woven,natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable.
☒ For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1 :1) in areas left uncovered. Visually inspect excavation areas for trapped wildlife prior to backfilling.
☒ Inform contractors that if reptiles are found on project site allow species to safely leave the project area.
☒ Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter where feasible.
☒ Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.

☒ Texas Tortoise *(Gopherus berlandieri)*

☒ Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.
☒ Utility trenches should be covered overnight or visually inspected before filling to avoid burial of the species.
☒ Terrestrial Reptile BMPs.

☒ Texas Horned Lizard *(Phrynosoma cornutum)*

☒ Avoid harvester ant mounds in the selection of Project Specific Locations (PSLs) where feasible.
☒ Terrestrial Reptile BMPs.

☒ Additional Reptile BMPs (Recommendations)

☒ Due to increased activity (mating) of reptiles during the spring, construction activities like clearing or grading should attempt to be scheduled outside of the spring (April-May) season. Also, timing ground disturbing activities before October when reptiles become less active and may be using burrows in the project area is also encouraged.
☒ When designing roadways with curbs, consider using Type I or Type III curbs to provide a gentle slope to enable turtles and small animals to get out of roadways.
☒ If Texas Tortoises are present in a project area, they should be removed from the area. After removal of the tortoises, the area that will be disturbed during active construction and project specific locations should be fenced off to exclude tortoises and other reptiles. The exclusion fence should be constructed and maintained as follows:

a. The exclusion fence should be constructed with metal flashing or drift fence material.
b. Rolled erosion control mesh material should not be used.
c. The exclusion fence should be buried at least 6 inches deep and be at least 24 inches high.
d. The exclusion fence should be maintained for the life of the project and only removed after the construction is completed and the disturbed site has been revegetated.

☒ Amphibian and Aquatic Reptile BMPs (Required)

Unless absence of the species can be demonstrated, assume presence in suitable habitat and implement the following BMPs. Absence can only be demonstrated using TPWD-approved survey efforts (contact TPWD for minimum survey protocols for species and project site conditions).

☐ For projects within one mile of a known occupied location or observation of the species recorded from 1980 until the current year and suitable habitat is present, coordinate with TPWD.
☒ For new location roadway projects, coordinate with TPWD.
☒ For projects within existing right-of-way (ROW) when work is in water or will permanently impact a water feature and potential habitat exists for the target species complete the following:

a) Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.
b) Minimize impacts to wetland, temporary and permanent open water features, including depressions, and riverine habitats.
c) Maintain hydrologic regime and connections between wetlands and other aquatic features.

Pharr District Contact No. 956-702-6100

☒ Amphibian and Aquatic Reptile BMPs (Continued)

d) Use barrier fencing to direct animal movements away from construction activities and areas of potential wildlife-vehicle collisions in construction areas directly adjacent, or that may directly impact, potential habitat for the target species.
e) Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas where feasible. If hydromulching and/or hydroseeding are not feasible due to site conditions, using erosion control blankets or mats that contain no netting, or only contain loosely woven natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable.
f) Project specific locations (PSLs) proposed within state-owned ROW should be located in uplands away from aquatic features.
g) When work is directly adjacent to the water, minimize impacts to shoreline basking sites (e.g., downed trees, sand bars, exposed bedrock) and overwinter sites (e.g., brush and debris piles, crayfish burrows) where feasible.
h) Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter, which may be refugia for terrestrial amphibians, where feasible.
i) If gutters and curbs are part of the roadway design, where feasible install gutters that do not include the side box inlet and include sloped (i.e. mountable) curbs to allow small animals to leave roadway. If this modification to the entire curb system is not possible, install sections of sloped curb on either side of the storm water drain for several feet to allow small animals to leave the roadway. Priority areas for these design recommendations are those with nearby wetlands or other aquatic features.

☒ For projects that require acquisition of additional ROW and work within that new ROW is in water or will permanently impact a water feature, implement a) - i) above plus j) -l) below, where applicable:

j) For sections of roadway adjacent to wetlands or other aquatic features, install wildlife barriers that prevent climbing. Barriers should terminate at culvert openings in order to funnel animals under the road. The barriers should be of the same length as the adjacent feature or 80 feet long in each direction, or whichever is the lesser of the two.
k) For culvert extensions and culvert replacement/installation, incorporate measures to funnel animals toward culverts such as concrete wingwalls and barrier walls with overhangs.
l) When riprap or other bank stabilization devices are necessary, their placement should not impede the movement of terrestrial or aquatic wildlife through the water feature. Where feasible, biotechnical streambank stabilization methods using live native vegetation or a combination of vegetative and structural materials should be used.

Revised 07/12/2017

List of Abbreviations

BMP: Best Management Practice
CGP: Construction General Permit
CRPe: Contractor Responsible Person Environmental
DSHS: Texas Department of State Health Services
FEMA: Federal Emergency Management Agency
FHWA: Federal Highway Administration
MOA: Memorandum of Agreement
MOU: Memorandum of Understanding
MS4: Municipal Separate Stormwater Sewer System
MSAT: Mobile Source Air Toxic
MBTA: Migratory Bird Treaty Act
NOI: Notice of Intent
NOT: Notice of Termination
NWP: Nationwide Permit
PCN: Pre-Construction Notification
PSL: Project Specific Location
SPCC: Spill Prevention Control and Countermeasure
SW3P: Storm Water Pollution Prevention Plan
TCEQ: Texas Commission on Environmental Quality
THC: Texas Historical Commission
TPDES:Texas Pollutant Discharge Elimination System
TPWD: Texas Parks and Wildlife Department
TxDOT:Texas Department of Transportation
T&E: Threatened and Endangered Species
USACE:U.S. Army Corp of Engineers
USFWS:U.S. Fish and Wildlife Service

Texas Department of Transportation
© 2017
PHARR DISTRICT

EPIC SHEET SUPPLEMENTALS

TPWD BMPs

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6			LIBERTY
STATE	DISTRICT	COUNTY	
TEXAS	PHR	HIDALGO	SHEET NO.
CONTROL	SECTION	JOB	
0921	02	194	276

Date Printed: X-X-XX

☒ Sheep Frog *(Hypopachus variolosus)*

- ☒ Minimize disturbance to burrows or downed woody debris.
- ☒ Water Quality BMPs.
- ☒ Amphibian BMPs.

☒ South Texas Siren (Large Form) *(Siren sp 1)*

- ☒ Minimize impacts to warm, shallow waters with vegetative cover such as ponds and ditches.
- ☒ Water Quality BMPs.
- ☒ Amphibian BMPs.

☐ Freshwater Mussel BMPs (Required)

- ☐ When work is in the water; survey project footprints for state listed species where appropriate habitat exists.
- ☐ When work is in the water and mussels are discovered during surveys; relocate state listed and SGCN mussels under TPWD authorization and implement Water Quality BMPs.
- ☐ When work is adjacent to the water; Water Quality BMPs implemented as part of the SWPPP for a construction general permit or any conditions of the Section 401 water quality certification for the project will be implemented.

☐ Fish BMPs (Required)

- ☐ For projects within the range of a SGCN or State-Listed fish and work is adjacent to water: Use Water Quality BMPs. No TPWD Coordination required.
- ☐ For projects within the range of a SGCN or State-Listed fish, and work is in the water: TPWD coordination is required.

☒ Water Quality BMPs (Required)

In addition to BMPs required for a TCEQ Storm Water Pollution Prevention Plan and/or Section 401 water quality permit:

- ☒ Minimize the use of equipment in streams and riparian areas during construction. When possible, equipment access should be from banks, bridge decks, or barges.
- ☒ When temporary stream crossings are unavoidable, remove stream crossings once they are no longer needed and stabilize banks and soils around the crossing.

☐ Additional Water Quality BMPs (Recommendations)

- ☐ Wet-Bottomed detention ponds are recommended to benefit wildlife and downstream water quality. Consider potential wildlife-vehicle interactions when siting detention ponds.
- ☐ Rubbish found near bridges on TxDOT ROW should be removed and disposed of properly to minimize the risk of pollution. Rubbish does not include brush piles or snags.

☐ Aquatic Mitigation (Recommendations)

- ☐ In-kind compensatory mitigation should be considered for all unavoidable impacts to aquatic resources including, but not limited to streams, wetlands, oysters, seagrass and mudflats, regardless of their jurisdictional status.
- ☐ Compensatory mitigation plans should be developed in consultation with TPWD Transportation Conservation Coordinator.

☐ Stream Crossings (Recommendations)

- ☐ Use spanning bridges rather than culverts when feasible.
- ☐ If using a culvert, staggered culverts that concentrate low flows but provide conveyance of higher flows through staggered culverts placed at higher elevations is recommended.
- ☐ Bottomless culverts are recommended to allow for fish and other aquatic wildlife passage in the low flow channel. If bottomless culverts are not feasible, making a low flow channel for fish passage is recommended.
- ☐ Avoid placing riprap across stream channels and instead use alternative stabilization such as biotechnical stream bank stabilization methods including live native vegetation or a combination of vegetative and structural materials. When riprap or other bank stabilization devices are necessary, their placement should not impede the movement of aquatic and terrestrial wildlife underneath the bridge. In some instances, riprap may be buried, back-filled with topsoil and planted with native vegetation.
- ☐ Incorporate bat-friendly design into bridges and culverts.
- ☐ Design bridges for adequate vertical and horizontal clearances under the roadway to allow for terrestrial wildlife to safely pass under the road.
- ☐ A span wide enough to cross the stream and allow for dry ground and a natural surface path under the roadway is encouraged. For culverts, incorporation of an artificial ledge inside the culvert on one or both sides for use by terrestrial wildlife is recommended.
- ☐ Riparian buffer zones should remain undisturbed where possible.

☒ Vegetation BMPs (Recommendations)

- ☒ Minimize the amount of vegetation cleared. Removal of native vegetation, particularly mature native trees and shrubs should be avoided to the greatest extent practicable. Wherever practicable, impacted vegetation should be replaced with in-kind on-site replacement/restoration of native vegetation.
- ☒ To minimize adverse effects, activities should be planned to preserve mature trees, particularly acorn, nut or berry producing varieties. These types of vegetation have high value to wildlife as food and cover.
- ☒ It is strongly recommended that trees greater than 12 inches in diameter at breast height (dbh) that are removed be replaced. TPWD's experience indicates that for ecologically effective replacement, a ratio of three trees for every one (3:1) lost should be provided to the extent practicable either on-site or off-site. Trees less than 12 inches dbh should be replaced at a 1:1 ratio.
- ☒ Replacement trees should be of equal or better wildlife quality than those removed and be regionally adapted native species.
- ☒ When trees are planted, a maintenance plan that ensures at least an 85 percent survival rate after three (3) years should be developed for the replacement trees.
- ☒ The use of any non-native vegetation in landscaping and revegetation is discouraged. Locally adapted native species should be used.
- ☒ The use of seed mix that contains seeds from only locally adapted native species is recommended.
- ☒ Avoid vegetation clearing activities during the general bird nesting season, March through August, to minimize adverse impacts to birds.

☐ Invasive Species BMPs (Recommendations)

- ☐ For all work in waters listed in the distribution of Zebra mussels on http://texasinvasives .org/ as well as those waters specified in 31 TAC 57.972 and any TPWD emergency orders regarding prevention of the spread of Zebra mussels all machinery, equipment, or vehicles coming in contact with such waters should follow clean/drain/dry protocols to prevent the potential spread of invasive Zebra mussels.
- ☐ Care should be taken to avoid the spread of aquatic invasive plants (such as Giant Salvinia, Hydrilla, Hyacinth, Watermilfoil, Water Lettuce, and Alligatorweed) from infested water bodies into areas not currently infested. All machinery/equipment/vehicles coming in contact with waters containing aquatic invasive plant species should follow clean/drain/dry protocols to prevent the potential spread of invasive plants.
- ☐ Colonization by invasive plants should be actively prevented on disturbed sites in terrestrial habitats. Vegetation management should include removing invasive species as soon as practical while allowing the existing native plants to revegetate the disturbed areas. If using hay bales for sediment control, use locally grown weed-free hay to prevent the spread of invasive species. Leave the hay bales in place and allow them to break down, as this acts as mulch assisting in revegetation.

☐ Wildlife Crossings (Recommendations)

- ☐ Design roadways on new location to incorporate wildlife crossings, particularly in areas that bisect wildlife travel corridors or seasonal movement routes.
- ☐ Consider using cable median barrier instead of concrete traffic barrier when feasible to increase permeability for animals encountering barriers.

Pharr District Contact No. 956-702-6100

Revised 07/12/2017

List of Abbreviations

BMP: Best Management Practice
CGP: Construction General Permit
CRPe: Contractor Responsible Person Environmental
DSHS: Texas Department of State Health Services
FEMA: Federal Emergency Management Agency
FHWA: Federal Highway Administration
MOA: Memorandum of Agreement
MOU: Memorandum of Understanding
MS4: Municipal Separate Stormwater Sewer System
MSAT: Mobile Source Air Toxic
MBTA: Migratory Bird Treaty Act
NOI: Notice of Intent
NOT: Notice of Termination
NWP: Nationwide Permit
PCN: Pre-Construction Notification
PSL: Project Specific Location
SPCC: Spill Prevention Control and Countermeasure
SW3P: Storm Water Pollution Prevention Plan
TCEQ: Texas Commission on Environmental Quality
THC: Texas Historical Commission
TPDES: Texas Pollutant Discharge Elimination System
TPWD: Texas Parks and Wildlife Department
TxDOT: Texas Department of Transportation
T&E: Threatened and Endangered Species
USACE: U.S. Army Corp of Engineers
USFWS: U.S. Fish and Wildlife Service

Texas Department of Transportation
© 2017
PHARR DISTRICT

EPIC SHEET SUPPLEMENTALS

TPWD BMPs

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6			LIBERTY
STATE	DISTRICT	COUNTY	
TEXAS	PHR	HIDALGO	SHEET NO.
CONTROL	SECTION	JOB	
0921	02	194	277

Date Printed: X-X-XX

SITE DESCRIPTION

PROJECT LIMITS: *LIBERTY BLVD: FROM US 83 TO MILE 3 RD.*

PROJECT SITE MAPS:

- *Project Location Map: Title Sheet*
- *Drainage Patterns: Drainage Area Map*
- *Approx. Slopes Anticipated After Major Gradings and Areas of Soil Distrubance: Typ Sects Sheets*
- *Major Controls and Locations of Stabilization Practices: SW3P Layout Sheets*
- *Project Specific Locations: To be specified by Project Field Office and located in the Project SW3P File*
- *Surface Waters and Discharge Locations: U&D and Culvert Layout Sheets*

PROJECT DESCRIPTION: *Reconstruction and widening of a non-freeway facility consisting of grading, lime treated subgrade, flexible base, structures asphaltic concrete pavement, curb and gutter, drainage structure, storm sewer, signing, delineation, and pavement markings.*

MAJOR SOIL DISTURBING ACTIVITIES: *Soil disturbing activities will include preparing the right-of-way; excavation and embankment for the roadway; install irrigation structures, installation of proposed storm drain system, and inlets; placement of topsoil for establishment of both temporary and final planting and seeding.*

Disturbed areas on which construction activity has ceased (temporarily or permanently) shall be stabilized within 14 days unless activities are scheduled to resume and do whithin 21 days. Final seeding should be accomplished on all areas as soon as construction stage is complete.

TOTAL PROJECT AREA: *38.77 Acres*

TOTAL AREA TO BE DISTURBED: *38.77 Acres (100%)*

WEIGHTED RUNOFF COEFFICIENT:
Before Construction = 0.51
After Construction = 0.6

EXISTING CONDITION OF SOIL & VEGETATIVE *Existing soil conditions are:*
Brennan Fine Clay Loam; soil characteristics include very deep, well drained, moderate permeability. Used in farmland if irrigated.
Hidalgo Sandy Clay Loam; soil characteristics include very deep, well drained, moderate permeability. Used mostly as livestock grazing and wildlife habitat with a few areas farmed.
McAllen Fine Sandy Loam; soil characteristics include very deep, well drained, moderate permeability. Used in farmland ir irrigated.
Randado-Cuevitas complex; soil characteristics include very deep, well drained, medium permeability.

NAME OF RECEIVING WATERS:
All runoff drains into H.C.D.D. #1's drainage ditches that drain into the Main Floodwater Channel and ultimatley into the Laguna Madre. The Laguna Madre is approximately 5 miles south of Port Mansfield (Stream Segment No. 2491)

ENDANGERED SPECIES, DESIGNATED CRITICAL HABITAT AND HISTORICAL PROPERTY:
No designated critical habitat or historic properties have been found on the project site. State rare, threatened, or endangered species of greatest conservation need that have the potential of occurring within the project area: Cactus Ferruginous Pygmy-Owl (Glaucidium brasilianum cactorum), Texas Botteri's Sparrow (Almophila botterii texana), Western Burrowing Owl (Athene cunicularia hypugaea), Plains Spotted Skunk (Spilogale putorius interrupta), Black-Striped Snake (Coniophanes imperialis), Texas Indigo Snake (Drymarchon melanurus erebennus), Reticulate Collared Lizard (Crotaphytus reticulates), Texas Horned Lizard (Phrynosoma cornutum), Texas Tortoise (Gopherus berlandieri), Spot-Tailed Earless Lizard (Holbrookia lacerate), South Texas Siren (large form) (Siren sp.1), Black-Spotted Newt (Notophthalmus meridionalis), Mexican Treefrog (Smilisca baudinii), Sheep Frog (Hypopachus variolosus), White-Lipped Frog (Leptodactylus fragilis), and Mexican Mud-Plantain (Heteranthera mexicana).

The documentation satisfying TPDES Construction General Permit eligibility pertaining to the existence or of any protective action taken with regards to endangered species or designated critical habitat or historical property in this project area is contained in the project's Environmental Assessment and can be viewed under the State Open Records Act at the address shown below:

TEXAS DEPARTMENT OF TRANSPORTATION
PHARR DISTRICT HEADQUARTERS
ATTN: ENVIRONMENTAL COORDINATOR
600 W. INTERSTATE 2
PHARR, TX 78577
PHONE: 956-702-6100

EROSION AND SEDIMENT CONTROLS

SOIL STABILIZATION PRACTICES: (Select T = Temporary or P = Permanent, as applicable)

- T TEMPORARY SEEDING
- ___ MULCHING (Hay or Straw)
- ___ BUFFER ZONES
- ___ PLANTING
- P SEEDING
- ___ SODDING
- ___ OTHER: (Specify Practice)
- ___ PRESERVATION OF NATURAL RESOURCES
- ___ FLEXIBLE CHANNEL LINER
- ___ RIGID CHANNEL LINER
- ___ SOIL RETENTION BLANKET
- ___ COMPOST MANUFACTURED COMPOST
- T BIODEGRADABLE EROSION CONTROL SOCKS

STRUCTURAL PRACTICES: (Select T = Temporary or P = Permanent, as applicable)

- T SILT FENCES
- T BIODEGRADABLE EROSION CONTROL SOCKS
- ___ HAY BALES
- ___ ROCK FILTER DAMS
- ___ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- T DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- ___ DIVERSION DIKE AND SWALE COMBINATIONS
- ___ PIPE SLOPE DRAINS
- ___ PAVED FLUMES
- ___ ROCK BEDDING AT CONSTRUCTION EXIT
- T TIMBER MATTING AT CONSTRUCTION EXIT
- ___ CHANNEL LINERS
- ___ SEDIMENT TRAPS
- ___ SEDIMENT BASINS
- T STORM INLET SEDIMENT TRAP
- ___ STONE OUTLET STRUCTURES
- P CURBS AND GUTTERS
- P STORM SEWERS
- ___ VELOCITY CONTROL DEVICES
- ___ OTHER: (Specify Practice)

STORM WATER MANAGEMENT:
Storm water drainage will be provided by a combination of concrete curb and gutter with curb inlet openings, grate inlets, and a storm drain system outfalling into the H.C.D.D. No.1 receiving ditches.

STORM WATER MANAGEMENT ACTIVITIES: (Sequence of Construction)

The order of activities will be as follows:
1.- Install perimeter controls, clear R.O.W. where construction will take place, and make required utility adjustments
2. Install Proposed trunk lines/inlets, clean/regrade outfalls, install biodegradable erosion control logs along project, and install the culvert crossings.
3. Construct proposed roadway as shown on TCP.
4. Seed each section completed, with temp. seeding to right of way.
5. Once all construction activity is complete, permanent seeding on proposed areas shall be done according to plans or as instructed by the engineer.

NON-STORM WATER MANAGEMENT DISCHARGES:
Non-storm water discharges should be filtered, or held in retention basins, before being allowed to mix with storm water. These discharges consist of non-polluted ground water, spring water, foundation and/or footing drain water; and water used for dust control, pavement washing and vehicle wastewater containing no detergents.

OTHER REQUIREMENTS & PRACTICES

OTHER EROSION AND SEDIMENT CONTROLS:

MAINTENANCE: *All erosion and sediment controls will be maintained in good working order. If a repair is necessary, it will be done at the earliest date possible, but no later than 7 calendar days after the surrounding exposed ground has dried sufficiently to prevent further damage from heavy equipment. The areas adjacent to creeks and drainage ways shall have priority followed by devices protecting storm sewer inlets.*

INSPECTION: *An inspection will be performed by a TxDOT inspector every 14 calendar days as well as after every half inch or more of rain (as recorded on a non-freezing rain guage to be located at the Project Site). An inspection and Maintenance Report will be made per each inspection. Based on the inspection results, the controls shall be revised per the inspection report.*

WASTE MATERIALS: *All waste materials will be collected and stored in a securely lidded metal dumpster. The dumpster will meet all state and local solid waste management regulations. All trash and construction debris from the site will be deposited in the dumpster. The dumpster will be emptied as necessary or as required by local regulation and the trash will be hauled to a local dump. No construction waste material will be buried on site.*

HAZARDOUS WASTE (INCLUDING SPILL REPORTING): *At a minimum, any products in the following categories to be hazardous: Paints, Acids for cleaning masonry surfaces, Cleaning Solvents, Asphalt products, Chemical additives for soil stabilization, or Concrete curing compounds and additives. In the event of a spill which may be hazardous, the spill Coordinator should be contacted immediately. Emptying of excess concrete should not be allowed on site. Likewise, washout of concrete trucks should not be performed on site. These discharges are considered non-allowable non-storm water discharges. Concrete trucks should never be allowed to dump into storm drains or sanitary sewers.*

SANITARY WASTE: *All sanitary waste will be collected from the portable units as necessary or as required by local regulation by a licensed sanitary waste management contractor.*

OFFSITE VEHICLE TRACKING: *The Contractor shall be required, on a regular basis or as may be directed by the Engineer, to dampen haul roads for dust control, stabilize construction entrances and to remove excess dirt from the roadway.*

MANAGEMENT PRACTICES:
1. Disposal areas, stockpiles, and haul roads shall be constructed in a manner that will minimize and control the amount of sediment that may enter receiving waters. Disposal areas shall not be located in any wet land, water body or stream bed.
2. Construction staging areas and vehicle maintenance areas shall be constructed by the Contractor in a manner to minimize the runoff of pollutants.
3. All waterways shall be cleared, as soon as practical, of temporary embankment, temporary bridges, matting, false work, piling, or debris or other obstructions placed during construction operations that are not a part of the finished work.
4. This plan is a working document, and must be kept current in order to comply with EPA standards.

OTHER:
1. Construction materials stored on site to be provided by Project Field Office.
2. The project SW3P File located at the project field office shall contain the N.O.I., CGP Coverage Notice, EPA NPDES Form, Signature Authorization, Certification/Qualification Statements, Inspection Reports, Required Maps, and the NPDES Permit, Part II.

© 2014

Texas Department of Transportation

TxDOT STORM WATER POLLUTION PREVENTION PLAN (SW3P)

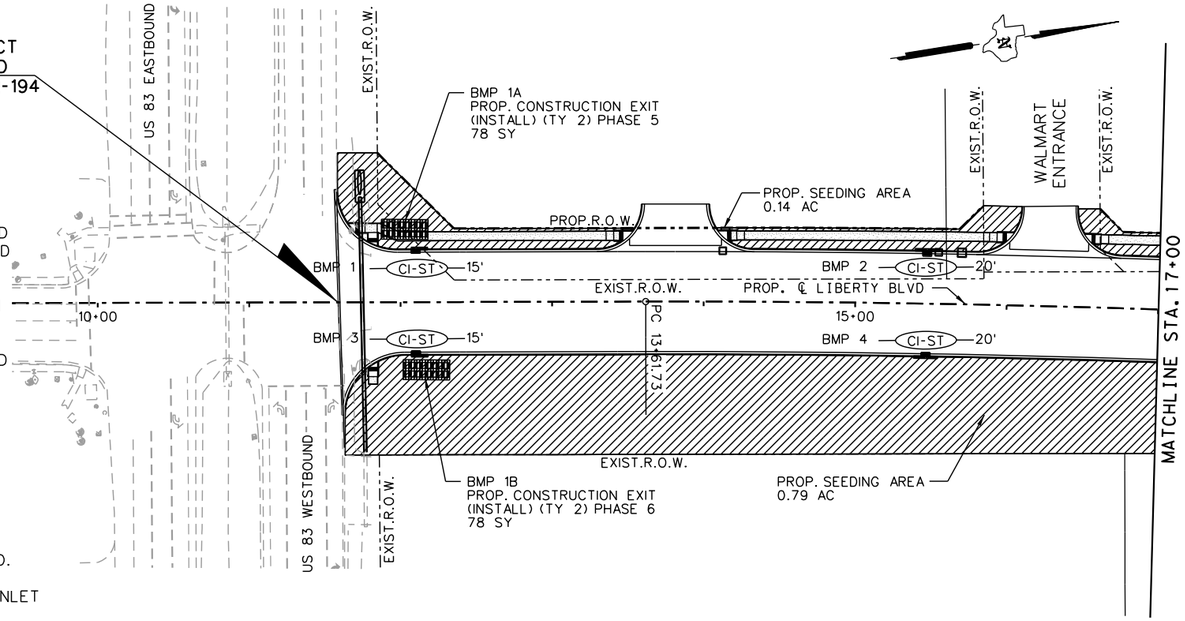
STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
08/04/2020

REV. 2-20-14 SW3P.DGN

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			278
STATE	DIST.	COUNTY	
TEXAS	PHARR	HIDALGO	
CONT.	SECT.	JOB	HIGHWAY NO.
0921	02	194	LIBERTY

8/4/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\08 ENVIRONMENTAL\01 SW3P\sw3p.dgn

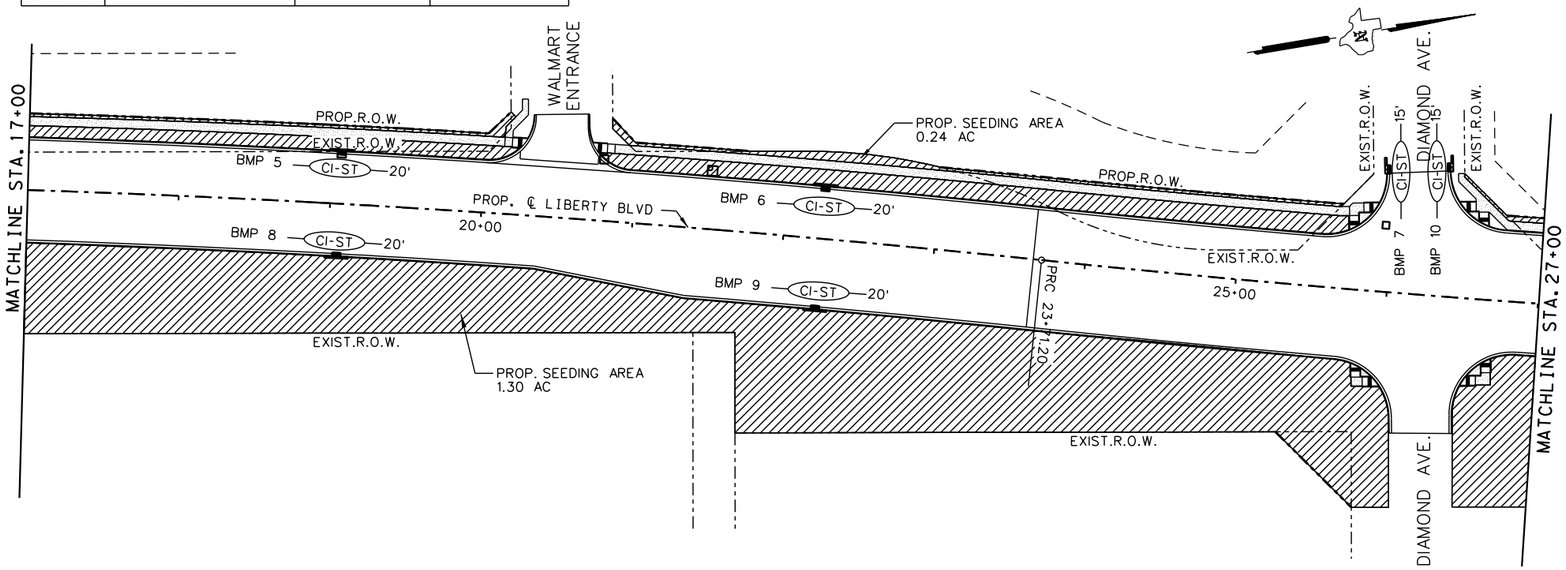
BEGIN PROJECT
LIBERTY BLVD
CSJ: 0921-02-194
STA. 11+60.00



NOTES:
1. EROSION CONTROL DEVICES MAY BE MODIFIED TO MEET FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER
2. DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITY HAS CEASED, TEMPORARILY OR PERMANENTLY, SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITIES ARE SCHEDULED TO RESUME, AND DO, WITHIN 21 DAYS.
3. FERTILIZER IS NON-PAY. SUBSIDIARY TO SEEDING (ITEM 164). APPLICATION RATE = 500 LBS/AC
4. VEGETATIVE WATERING APPLICATION RATE = 3394 GAL/AC @ 45 CYCLES
5. PERMANENT SEEDING TO BE DONE AFTER ALL ROADWAY CONSTRUCTION IS COMPLETED.
6. FRONT END LOADER WORK RATE = 0.5 HR/INLET

BMP ID	TCP PHASE INSTALL	DATE INSTALL	DATE REMOVE
BMP 1	5		
BMP 1A	5		
BMP 1B	6		
BMP 2	5		
BMP 3	6		
BMP 4	6		
BMP 5	5		
BMP 6	5		

BMP ID	TCP PHASE INSTALL	DATE INSTALL	DATE REMOVE
BMP 7	5		
BMP 8	6		
BMP 9	6		
BMP 10	5		



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
160	FURNISHING AND PLACING TOPSOIL	CY	
164	CELL FBR MLCH SEED (TEMP)(WARM)	AC	2.47
164	CELL FBR MLCH SEED (PERM)(RURAL)(SANDY)	AC	2.47
166	FERTILIZER ***NON-PAY***	TON	0.61
168	VEGETATIVE WATERING	MG	376
506	CONSTRUCTION EXITS (INSTALL)(TY 2)	SY	156
506	CONSTRUCTION EXITS (REMOVE)	SY	156
506	FRNT END LOADER WRK (ERSN & SEDM CONT)	HR	5
506	BIOGRD EROSN CONT LOGS (12" DIA) INSTALL	LF	180
506	BIOGRD EROSN CONT LOGS REMOVE	LF	180

LEGEND

- PROP. TEMPORARY/PERMANENT SEEDING AREA (TO FOLLOW TCP PHASING)
- PROP. SOIL RETENTION BLANKET (CL2)(TYF)
- PROP. CONSTRUCTION EXIT (TY 2)
- CI-ST XX' — PROP. CURB INLET SEDIMENT TRAP AND LENGTH
- DI-ST XX' — PROP. DROP INLET SEDIMENT TRAP AND LENGTH (LF)
- DL-ST XX' — PROP. DITCH LINE SEDIMENT TRAP (LOG) AND LENGTH (LF)
- RFD1 XX' — PROP. ROCK FILTER DAM (TYPE 1)
- SCF XX' — TEMP SEDIMENT CONTROL FENCE

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

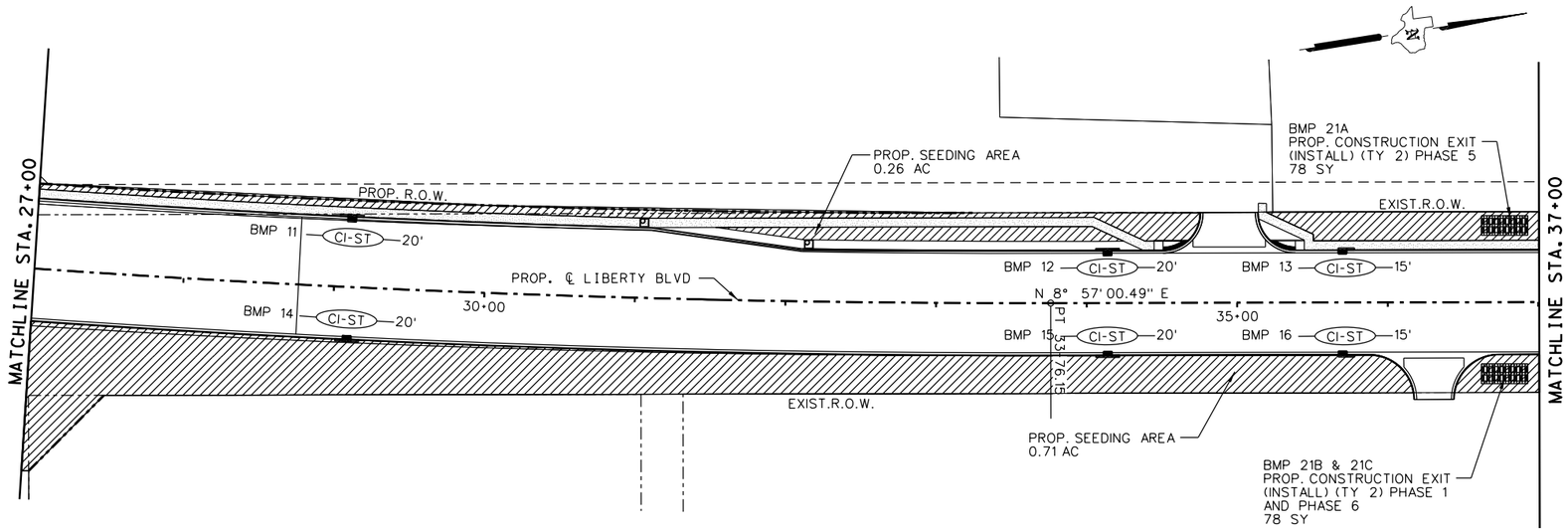
LIBERTY BLVD
SW3P LAYOUT
STA. 11+60 TO STA. 27+00

SCALE: 1" = 100'

SHEET 1 OF 7

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					279
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

11/20/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3\\08 ENVIRONMENTAL\\03 SW3P Layouts\Liberty SW3P01.dgn



BMP ID	TCP PHASE INSTALL	DATE INSTALL	DATE REMOVE
BMP 11	5		
BMP 12	5		
BMP 13	5		
BMP 14	6		
BMP 15	6		
BMP 16	6		
BMP 17	1		
BMP 18	1		
BMP 19	1		
BMP 20	1		
BMP 21	1		
BMP 21A	5		
BMP 21B	1		
BMP 21C	6		

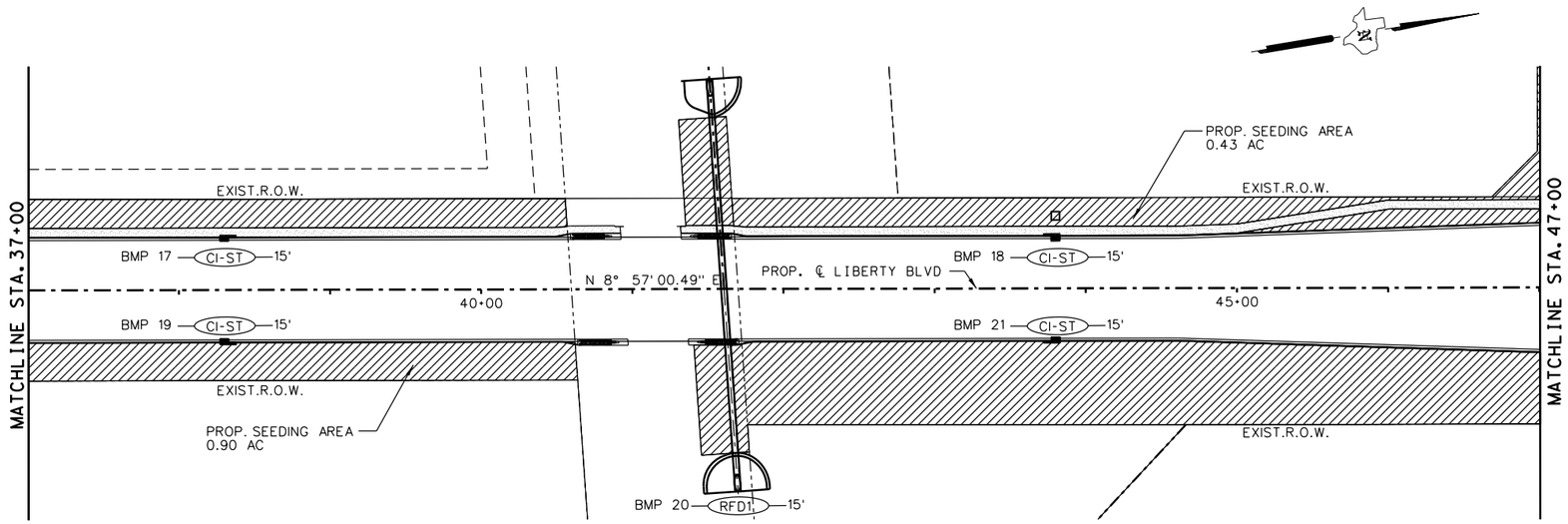
SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
160	FURNISHING AND PLACING TOPSOIL	CY	
164	CELL FBR MLCH SEED (TEMP)(WARM)	AC	2.30
164	CELL FBR MLCH SEED (PERM)(RURAL)(SANDY)	AC	2.30
166	FERTILIZER ***NON-PAY***	TON	0.55
168	VEGETATIVE WATERING	MG	335
506	CONSTRUCTION EXITS (INSTALL)(TY 2)	SY	234
506	CONSTRUCTION EXITS (REMOVE)	SY	234
506	FRNT END LOADER WRK (ERSN & SEDM CONT)	HR	5
506	BIOGRD EROSN CONT LOGS (12" DIA) INSTALL	LF	170
506	BIOGRD EROSN CONT LOGS REMOVE	LF	170
506	TEMPORARY SEDIMENT CONTROL FENCE	LF	
506	ROCK FILTER DAM (INSTALL)(TY 1)	LF	15
506	ROCK FILTER DAM (REMOVE)	LF	15

LEGEND

- PROP. TEMPORARY/PERMANENT SEEDING AREA (TO FOLLOW TCP PHASING)
- PROP. SOIL RETENTION BLANKET (CL2)(TYF)
- PROP. CONSTRUCTION EXIT (TY 2)
- CI-ST XX' — PROP. CURB INLET SEDIMENT TRAP AND LENGTH
- DI-ST XX' — PROP. DROP INLET SEDIMENT TRAP AND LENGTH (LF)
- DL-ST XX' — PROP. DITCH LINE SEDIMENT TRAP (LOG) AND LENGTH (LF)
- RFD1 XX' — PROP. ROCK FILTER DAM (TYPE 1)
- SCF XX' — TEMP SEDIMENT CONTROL FENCE

NOTES:
1. EROSION CONTROL DEVICES MAY BE MODIFIED TO MEET FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER
2. DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITY HAS CEASED, TEMPORARILY OR PERMANENTLY, SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITIES ARE SCHEDULED TO RESUME, AND DO, WITHIN 21 DAYS.
3. FERTILIZER IS NON-PAY. SUBSIDIARY TO SEEDING (ITEM 164). APPLICATION RATE = 500 LBS/AC
4. VEGETATIVE WATERING APPLICATION RATE = 3394 GAL/AC @ 45 CYCLES
5. PERMANENT SEEDING TO BE DONE AFTER ALL ROADWAY CONSTRUCTION IS COMPLETED.
6. FRONT END LOADER WORK RATE = 0.5 HR/INLET



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
PROFESSIONAL ENGINEER
LICENSED
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

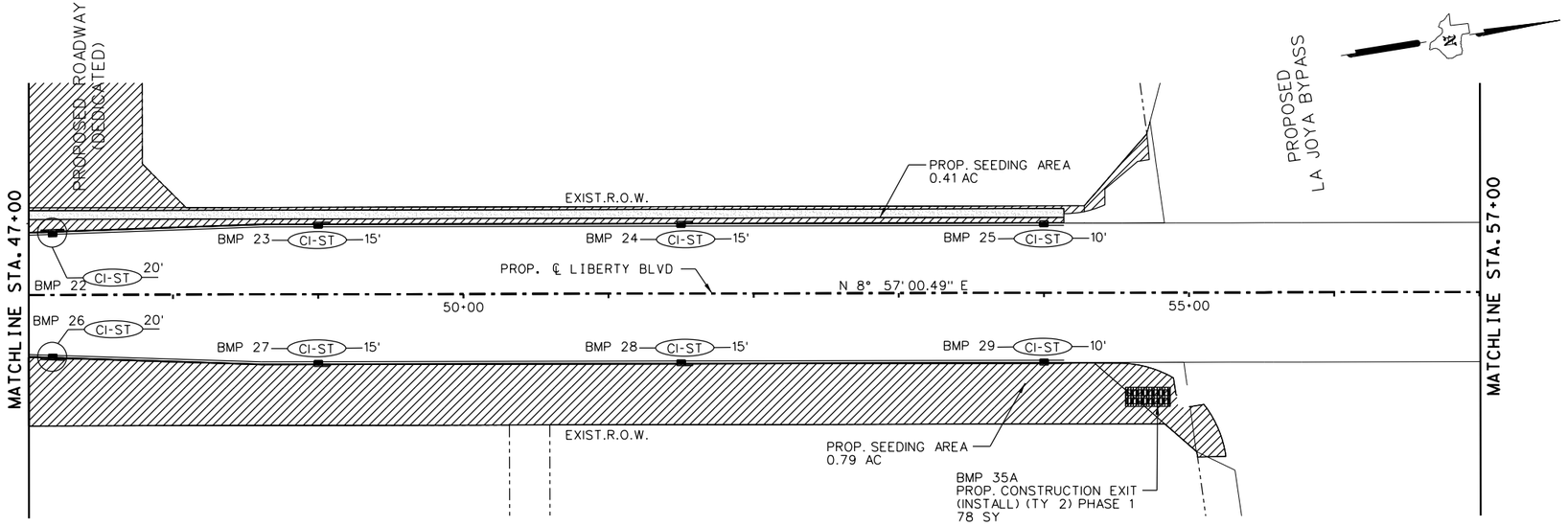
LIBERTY BLVD
SW3P LAYOUT
STA. 27+00 TO STA. 47+00

SCALE: 1" = 100'

SHEET 2 OF 7

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					280
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

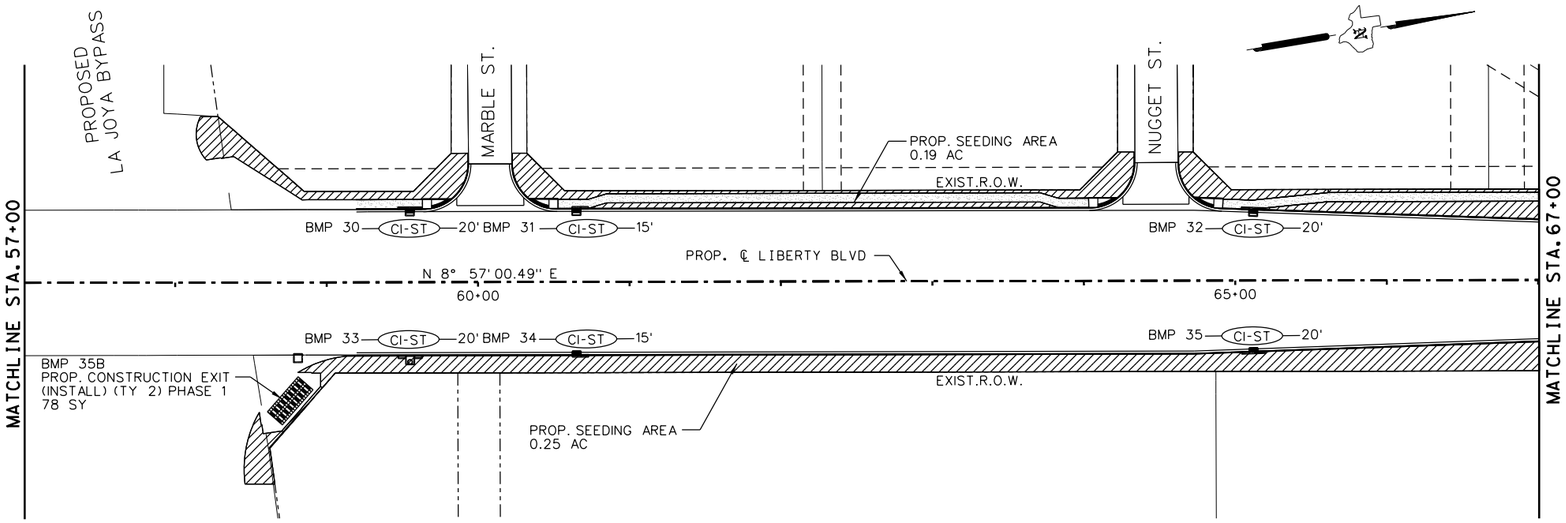
5/23/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\08 ENVIRONMENTAL\03 SW3P Layouts\Liberty SW3P02.dgn



BMP ID	TCP PHASE INSTALL	DATE INSTALL	DATE REMOVE
BMP 22	1		
BMP 23	1		
BMP 24	1		
BMP 25	1		
BMP 26	1		

BMP ID	TCP PHASE INSTALL	DATE INSTALL	DATE REMOVE
BMP 27	1		
BMP 28	1		
BMP 29	1		
BMP 30	1		
BMP 31	1		
BMP 32	1		
BMP 33	1		
BMP 34	1		
BMP 35	1		
BMP 35A	1		
BMP 35B	1		

NOTES:
1. EROSION CONTROL DEVICES MAY BE MODIFIED TO MEET FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER
2. DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITY HAS CEASED, TEMPORARILY OR PERMANENTLY, SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITIES ARE SCHEDULED TO RESUME, AND DO, WITHIN 21 DAYS.
3. FERTILIZER IS NON-PAY. SUBSIDIARY TO SEEDING (ITEM 164). APPLICATION RATE = 500 LBS/AC
4. VEGETATIVE WATERING APPLICATION RATE = 3394 GAL/AC @ 45 CYCLES
5. PERMANENT SEEDING TO BE DONE AFTER ALL ROADWAY CONSTRUCTION IS COMPLETED.
6. FRONT END LOADER WORK RATE = 0.5 HR/INLET



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
160	FURNISHING AND PLACING TOPSOIL	CY	
164	CELL FBR MLCH SEED (TEMP)(WARM)	AC	1.63
164	CELL FBR MLCH SEED (PERM)(RURAL)(SANDY)	AC	1.63
166	FERTILIZER ***NON-PAY***	TON	0.41
168	VEGETATIVE WATERING	MG	249
506	CONSTRUCTION EXITS (INSTALL)(TY 2)	SY	156
506	CONSTRUCTION EXITS (REMOVE)	SY	156
506	FRNT END LOADER WRK (ERSN & SEDM CONT)	HR	7
506	BIOGRD EROSN CONT LOGS (12" DIA) INSTALL	LF	230
506	BIOGRD EROSN CONT LOGS REMOVE	LF	230

LEGEND

- PROP. TEMPORARY/PERMANENT SEEDING AREA (TO FOLLOW TCP PHASING)
- PROP. SOIL RETENTION BLANKET (CL2)(TYF)
- PROP. CONSTRUCTION EXIT (TY 2)
- CI-ST XX' — PROP. CURB INLET SEDIMENT TRAP AND LENGTH
- DI-ST XX' — PROP. DROP INLET SEDIMENT TRAP AND LENGTH (LF)
- DL-ST XX' — PROP. DITCH LINE SEDIMENT TRAP (LOG) AND LENGTH (LF)
- RFD1 XX' — PROP. ROCK FILTER DAM (TYPE 1)
- SCF XX' — TEMP SEDIMENT CONTROL FENCE

STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

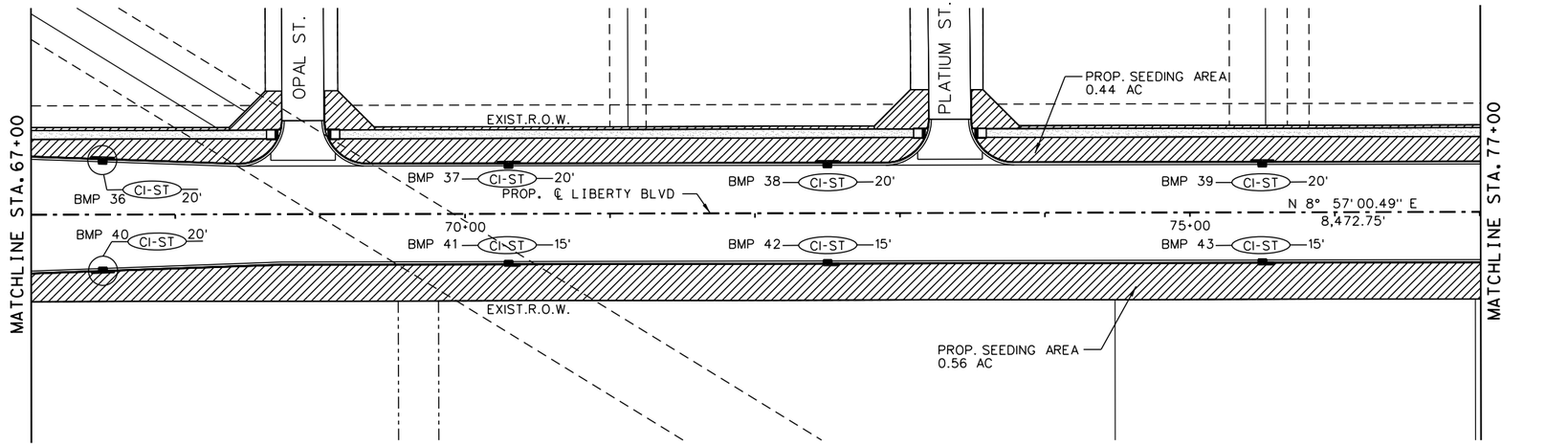
LIBERTY BLVD SW3P LAYOUT STA. 47+00 TO STA. 67+00

SCALE: 1" = 100'

SHEET 3 OF 7

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				281
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

5/23/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GD\08 ENVIRONMENTAL\03 SW3P Layouts\Liberty SW3P03.dgn



BMP ID	TCP PHASE INSTALL	DATE INSTALL	DATE REMOVE
BMP 36	1		
BMP 37	1		
BMP 38	1		
BMP 39	1		
BMP 40	1		
BMP 41	1		
BMP 42	1		
BMP 43	1		
BMP 44	1		
BMP 45	1		
BMP 46	1		
BMP 47	1		
BMP 48	1		
BMP 49	1		

NOTES:
1. EROSION CONTROL DEVICES MAY BE MODIFIED TO MEET FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER

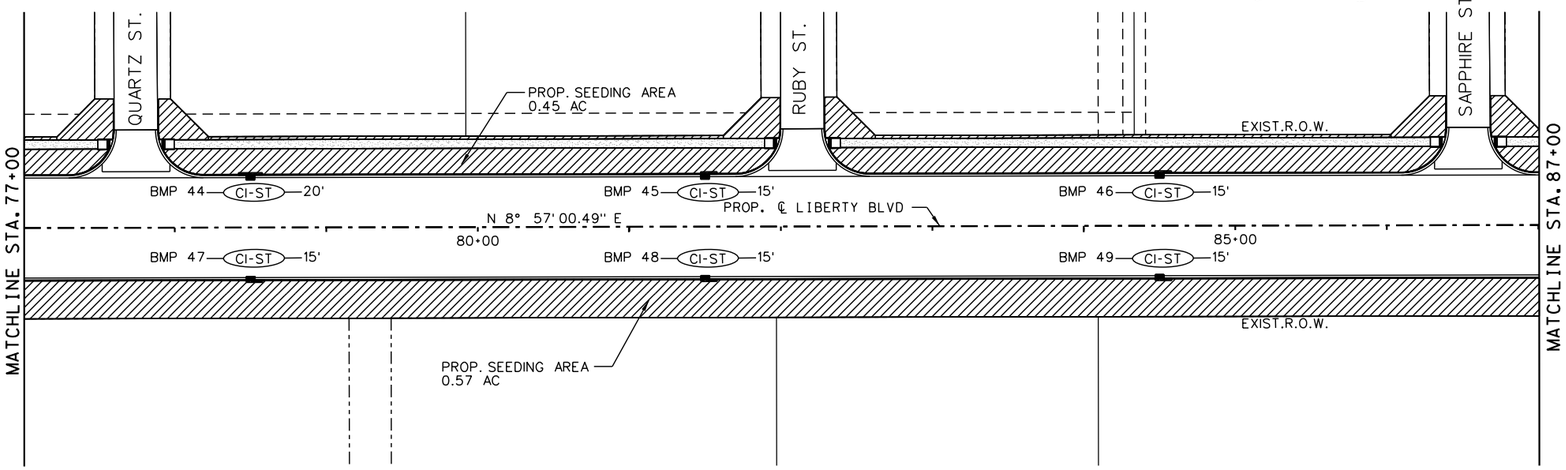
2. DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITY HAS CEASED, TEMPORARILY OR PERMANENTLY, SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITIES ARE SCHEDULED TO RESUME, AND DO, WITHIN 21 DAYS.

3. FERTILIZER IS NON-PAY. SUBSIDIARY TO SEEDING (ITEM 164). APPLICATION RATE = 500 LBS/AC

4. VEGETATIVE WATERING APPLICATION RATE = 3394 GAL/AC @ 45 CYCLES

5. PERMANENT SEEDING TO BE DONE AFTER ALL ROADWAY CONSTRUCTION IS COMPLETED.

6. FRONT END LOADER WORK RATE = 0.5 HR/INLET



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
160	FURNISHING AND PLACING TOPSOIL	CY	
164	CELL FBR MLCH SEED (TEMP)(WARM)	AC	2.02
164	CELL FBR MLCH SEED (PERM)(RURAL)(SANDY)	AC	2.02
166	FERTILIZER ***NON-PAY***	TON	0.51
168	VEGETATIVE WATERING	MG	309
506	CONSTRUCTION EXITS (INSTALL)(TY 2)	SY	
506	CONSTRUCTION EXITS (REMOVE)	SY	
506	FRNT END LOADER WRK (ERSN & SEDM CONT)	HR	7
506	BIOGRD EROSN CONT LOGS (12" DIA) INSTALL	LF	240
506	BIOGRD EROSN CONT LOGS REMOVE	LF	240
506	ROCK FILTER DAM (INSTALL)(TY 1)	LF	
506	ROCK FILTER DAM (REMOVE)	LF	

LEGEND

- PROP. TEMPORARY/PERMANENT SEEDING AREA (TO FOLLOW TCP PHASING)
- PROP. SOIL RETENTION BLANKET (CL2)(TYF)
- PROP. CONSTRUCTION EXIT (TY 2)
- CI-ST XX' — PROP. CURB INLET SEDIMENT TRAP AND LENGTH
- DI-ST XX' — PROP. DROP INLET SEDIMENT TRAP AND LENGTH (LF)
- DL-ST XX' — PROP. DITCH LINE SEDIMENT TRAP (LOG) AND LENGTH (LF)
- RFD1 XX' — PROP. ROCK FILTER DAM (TYPE 1)
- SCF XX' — TEMP SEDIMENT CONTROL FENCE

STATE OF TEXAS
CHRISTOPHER R. RODRIGUEZ
107692
LICENSED PROFESSIONAL ENGINEER
12/8/2020

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
SW3P LAYOUT
STA. 67+00 TO STA. 87+00

SCALE: 1" = 100'

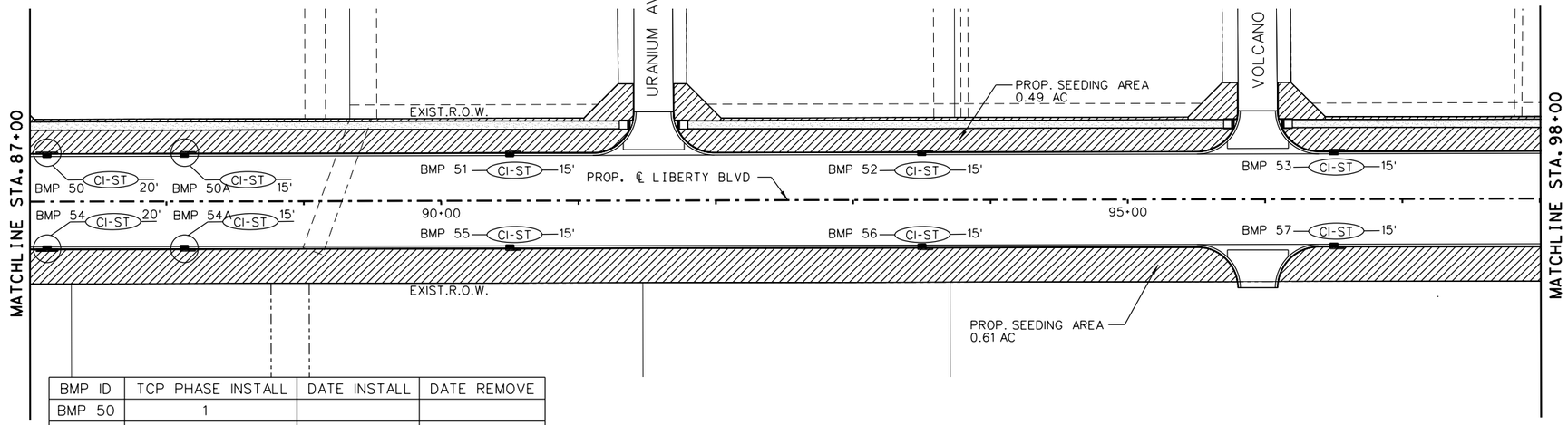
SHEET 4 OF 7

DN:	CK DN:	DW:	CK DW:	TR:	CK TR:

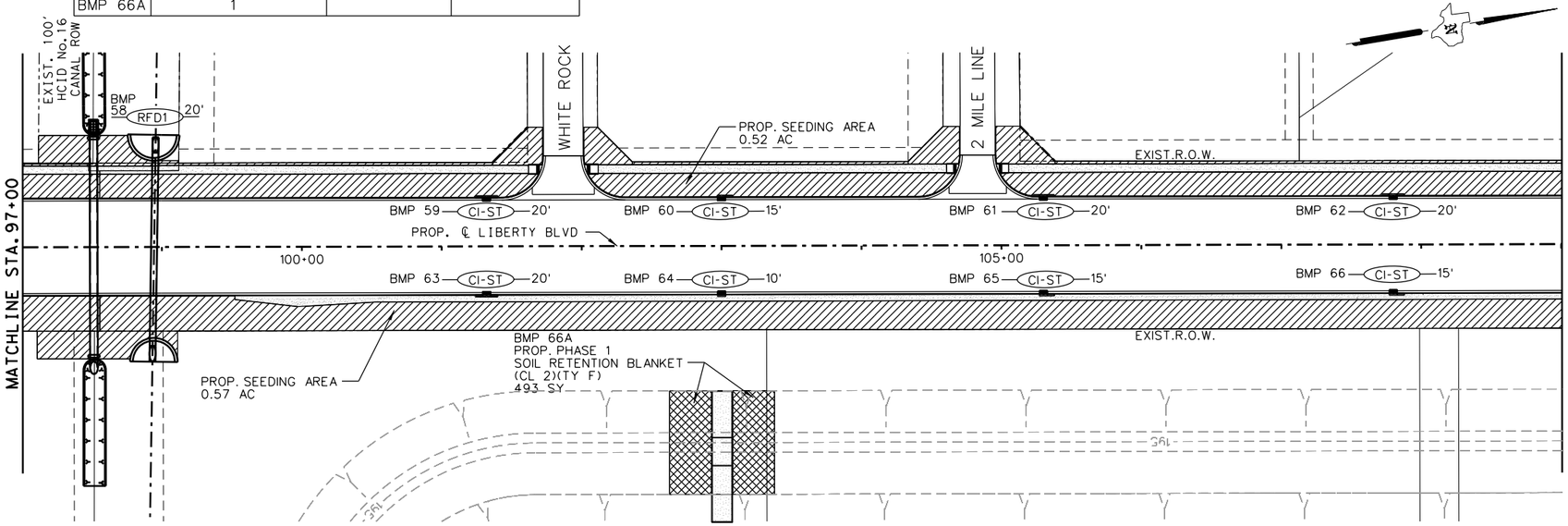
FED. RD. DIV. NO.	STATE	PROJECT NO.	SHEET NO.
6	TEXAS		282

STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
PHR	HIDALGO	0921	02	194	LIBERTY

11/20/2020 P:\Clients\Firms\L&G\Liberty Rd (US83 to Mile 3)\08 ENVIRONMENTAL\03 SW3P Layouts\Liberty SW3P04.dgn



BMP ID	TCP PHASE INSTALL	DATE INSTALL	DATE REMOVE
BMP 50	1		
BMP 50A	1		
BMP 51	1		
BMP 52	1		
BMP 53	1		
BMP 54	1		
BMP 54A	1		
BMP 55	1		
BMP 56	1		
BMP 57	1		
BMP 58	1		
BMP 59	1		
BMP 60	1		
BMP 61	1		
BMP 62	1		
BMP 63	1		
BMP 64	1		
BMP 65	1		
BMP 66	1		
BMP 66A	1		



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
160	FURNISHING AND PLACING TOPSOIL	CY	
164	CELL FBR MLCH SEED (TEMP)(WARM)	AC	2.19
164	CELL FBR MLCH SEED (PERM)(RURAL)(SANDY)	AC	2.19
166	FERTILIZER ***NON-PAY***	TON	0.54
168	VEGETATIVE WATERING	MG	329
169	SOIL RETENTION BLANKETS (CL2)(TYF)	SY	493
506	CONSTRUCTION EXITS (INSTALL)(TY 2)	SY	
506	CONSTRUCTION EXITS (REMOVE)	SY	
506	FRNT END LOADER WRK (ERSN & SEDM CONT)	HR	8
506	BIOGRD EROSN CONT LOGS (12" DIA) INSTALL	LF	295
506	BIOGRD EROSN CONT LOGS REMOVE	LF	295
506	ROCK FILTER DAM (INSTALL)(TY 1)	LF	20
506	ROCK FILTER DAM (REMOVE)	LF	20

LEGEND

- PROP. TEMPORARY/PERMANENT SEEDING AREA (TO FOLLOW TCP PHASING)
- PROP. SOIL RETENTION BLANKET (CL2)(TYF)
- PROP. CONSTRUCTION EXIT (TY 2)
- CI-ST XX' — PROP. CURB INLET SEDIMENT TRAP AND LENGTH
- DI-ST XX' — PROP. DROP INLET SEDIMENT TRAP AND LENGTH (LF)
- DL-ST XX' — PROP. DITCH LINE SEDIMENT TRAP (LOG) AND LENGTH (LF)
- RFD1 XX' — PROP. ROCK FILTER DAM (TYPE 1)
- SCF XX' — TEMP SEDIMENT CONTROL FENCE

NOTES:
1. EROSION CONTROL DEVICES MAY BE MODIFIED TO MEET FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER
2. DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITY HAS CEASED, TEMPORARILY OR PERMANENTLY, SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITIES ARE SCHEDULED TO RESUME, AND DO, WITHIN 21 DAYS.
3. FERTILIZER IS NON-PAY. SUBSIDIARY TO SEEDING (ITEM 164). APPLICATION RATE = 500 LBS/AC
4. VEGETATIVE WATERING APPLICATION RATE = 3394 GAL/AC @ 45 CYCLES
5. PERMANENT SEEDING TO BE DONE AFTER ALL ROADWAY CONSTRUCTION IS COMPLETED.
6. FRONT END LOADER WORK RATE = 0.5 HR/INLET

STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

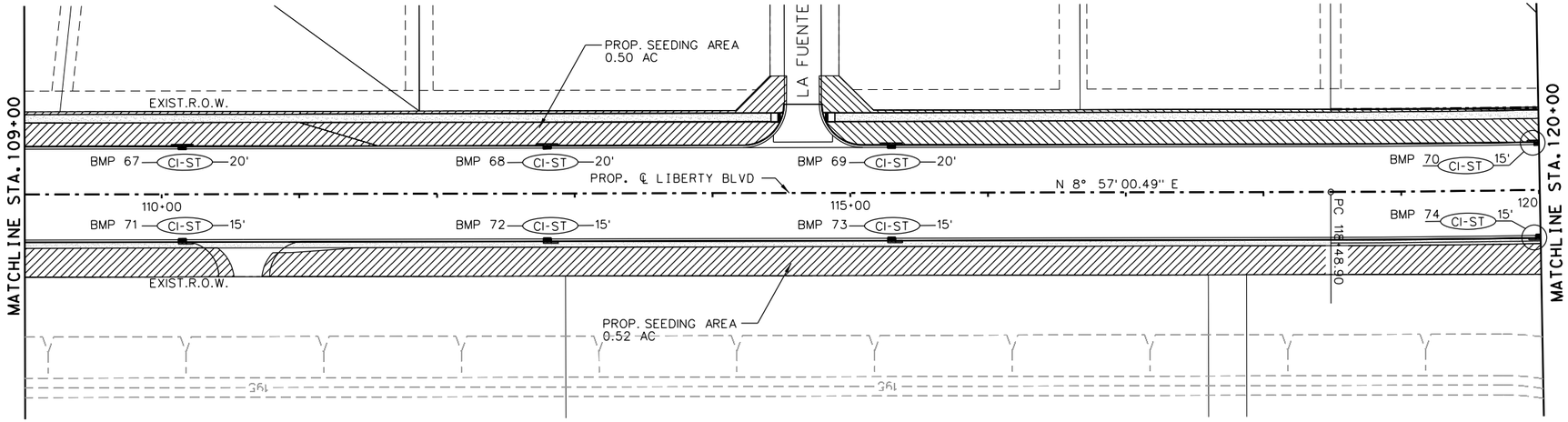
LIBERTY BLVD SW3P LAYOUT STA. 87+00 TO STA. 107+00

SCALE: 1" = 100'

SHEET 5 OF 7

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					283
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

5/23/2022 K:\Counties\HIDV\Liberty Rd (US83 to Mile 3)\GDJV\08 ENVIRONMENTAL\03 SW3P Layouts\Liberty SW3P05.dgn



BMP ID	TCP PHASE INSTALL	DATE INSTALL	DATE REMOVE
BMP 67	1		
BMP 68	1		
BMP 69	1		
BMP 70	1		
BMP 71	1		
BMP 72	1		
BMP 73	1		

BMP ID	TCP PHASE INSTALL	DATE INSTALL	DATE REMOVE
BMP 74	1		
BMP 75	1		
BMP 76	1		
BMP 77	4		
BMP 78	4		
BMP 79	4		
BMP 80	1		
BMP 81	1		
BMP 82	3		
BMP 83	3		
BMP 84	3		
BMP 84A	1		
BMP 84B	1		
BMP 84C	4		
BMP 84D	3		

NOTES:
1. EROSION CONTROL DEVICES MAY BE MODIFIED TO MEET FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER

2. DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITY HAS CEASED, TEMPORARILY OR PERMANENTLY, SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITIES ARE SCHEDULED TO RESUME, AND DO, WITHIN 21 DAYS.

3. FERTILIZER IS NON-PAY. SUBSIDIARY TO SEEDING (ITEM 164). APPLICATION RATE = 500 LBS/AC

4. VEGETATIVE WATERING APPLICATION RATE = 3394 GAL/AC @ 45 CYCLES

5. PERMANENT SEEDING TO BE DONE AFTER ALL ROADWAY CONSTRUCTION IS COMPLETED.

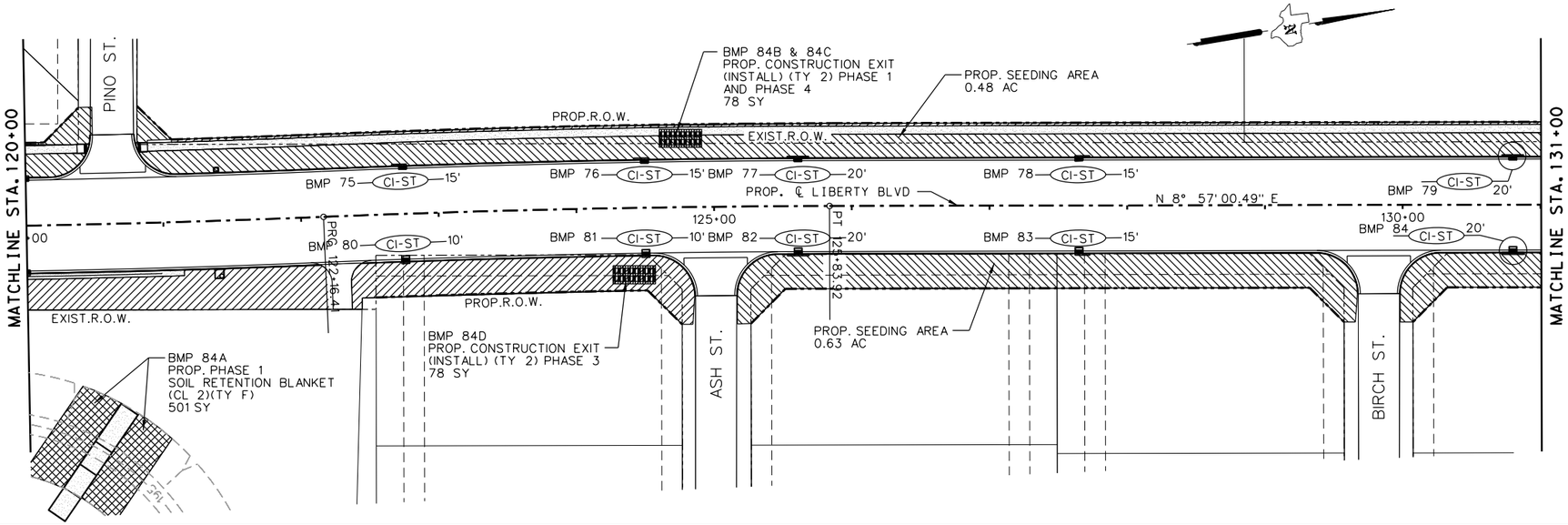
6. FRONT END LOADER WORK RATE = 0.5 HR/INLET

SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
160	FURNISHING AND PLACING TOPSOIL	CY	
164	CELL FBR MLCH SEED (TEMP)(WARM)	AC	2.12
164	CELL FBR MLCH SEED (PERM)(RURAL)(SANDY)	AC	2.12
166	FERTILIZER ***NON-PAY***	TON	0.53
168	VEGETATIVE WATERING	MG	324
169	SOIL RETENTION BLANKETS (CL2)(TYF)	SY	501
506	CONSTRUCTION EXITS (INSTALL)(TY 2)	SY	234
506	CONSTRUCTION EXITS (REMOVE)	SY	234
506	FRNT END LOADER WRK (ERSN & SEDM CONT)	HR	9
506	BIOGRD EROSN CONT LOGS (12" DIA) INSTALL	LF	295
506	BIOGRD EROSN CONT LOGS REMOVE	LF	295

LEGEND

- PROP. TEMPORARY/PERMANENT SEEDING AREA (TO FOLLOW TCP PHASING)
- PROP. SOIL RETENTION BLANKET (CL2)(TYF)
- PROP. CONSTRUCTION EXIT (TY 2)
- CI-ST XX' — PROP. CURB INLET SEDIMENT TRAP AND LENGTH
- DI-ST XX' — PROP. DROP INLET SEDIMENT TRAP AND LENGTH (LF)
- DL-ST XX' — PROP. DITCH LINE SEDIMENT TRAP (LOG) AND LENGTH (LF)
- RFD1 XX' — PROP. ROCK FILTER DAM (TYPE 1)
- SCF XX' — TEMP SEDIMENT CONTROL FENCE



STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

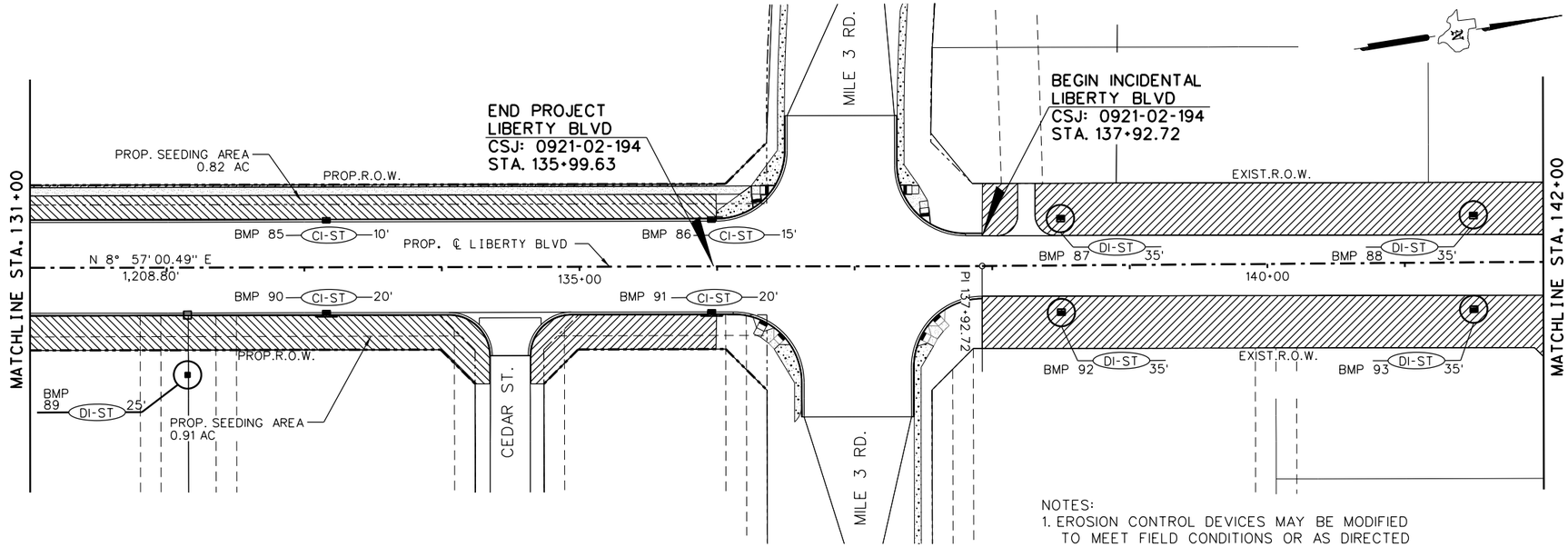
LIBERTY BLVD
SW3P LAYOUT
STA. 109+00 TO STA. 131+00

SCALE: 1" = 100'

SHEET 6 OF 7

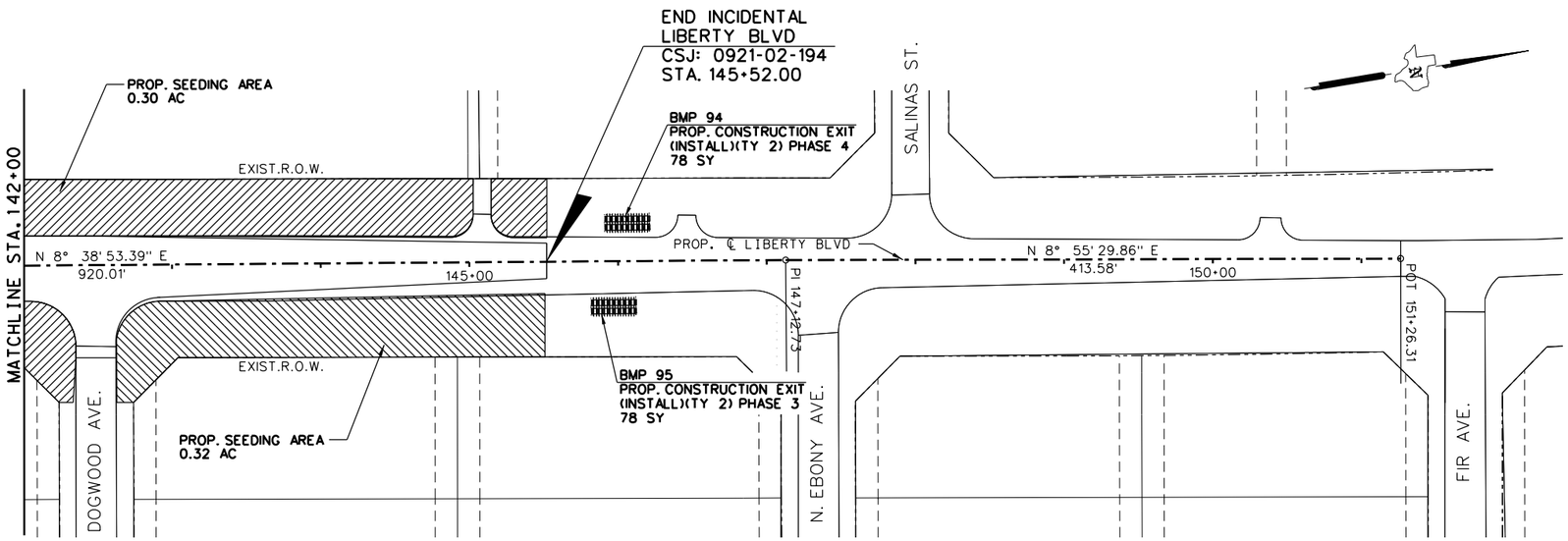
DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					284
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

5/23/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GDJ\08 ENVIRONMENTAL\03 SW3P Layouts\Liberty SW3P06.dgn



BMP ID	TCP PHASE INSTALL	DATE INSTALL	DATE REMOVE
BMP 85	4		
BMP 86	4		
BMP 87	4		
BMP 88	4		
BMP 89	3		
BMP 90	3		
BMP 91	3		
BMP 92	3		
BMP 93	3		
BMP 94	4		
BMP 95	3		

NOTES:
1. EROSION CONTROL DEVICES MAY BE MODIFIED TO MEET FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER
2. DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITY HAS CEASED, TEMPORARILY OR PERMANENTLY, SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITIES ARE SCHEDULED TO RESUME, AND DO, WITHIN 21 DAYS.
3. FERTILIZER IS NON-PAY. SUBSIDIARY TO SEEDING (ITEM 164). APPLICATION RATE = 500 LBS/AC
4. VEGETATIVE WATERING APPLICATION RATE = 3394 GAL/AC @ 45 CYCLES
5. PERMANENT SEEDING TO BE DONE AFTER ALL ROADWAY CONSTRUCTION IS COMPLETED.
6. FRONT END LOADER WORK RATE = 0.5 HR/INLET



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
160	FURNISHING AND PLACING TOPSOIL	CY	
164	CELL FBR MLCH SEED (TEMP)(WARM)	AC	2.34
164	CELL FBR MLCH SEED (PERM)(RURAL)(SANDY)	AC	2.34
166	FERTILIZER ***NON-PAY***	TON	0.59
168	VEGETATIVE WATERING	MG	358
506	CONSTRUCTION EXITS (INSTALL)(TY 2)	SY	156
506	CONSTRUCTION EXITS (REMOVE)	SY	156
506	FRNT END LOADER WRK (ERSN & SEDM CONT)	HR	4.5
506	BIOGRD EROSN CONT LOGS (12" DIA) INSTALL	LF	205
506	BIOGRD EROSN CONT LOGS REMOVE	LF	205

LEGEND

- PROP. TEMPORARY/PERMANENT SEEDING AREA (TO FOLLOW TCP PHASING)
- PROP. SOIL RETENTION BLANKET (CL2)(TYF)
- PROP. CONSTRUCTION EXIT (TY 2)
- CI-ST XX' — PROP. CURB INLET SEDIMENT TRAP AND LENGTH
- DI-ST XX' — PROP. DROP INLET SEDIMENT TRAP AND LENGTH (LF)
- DL-ST XX' — PROP. DITCH LINE SEDIMENT TRAP (LOG) AND LENGTH (LF)
- RFD1 XX' — PROP. ROCK FILTER DAM (TYPE 1)
- SCF XX' — TEMP SEDIMENT CONTROL FENCE

STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED
PROFESSIONAL ENGINEER
05/23/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

LIBERTY BLVD
SW3P LAYOUT
STA. 131+00 TO STA. 154+37

SCALE: 1" = 100'

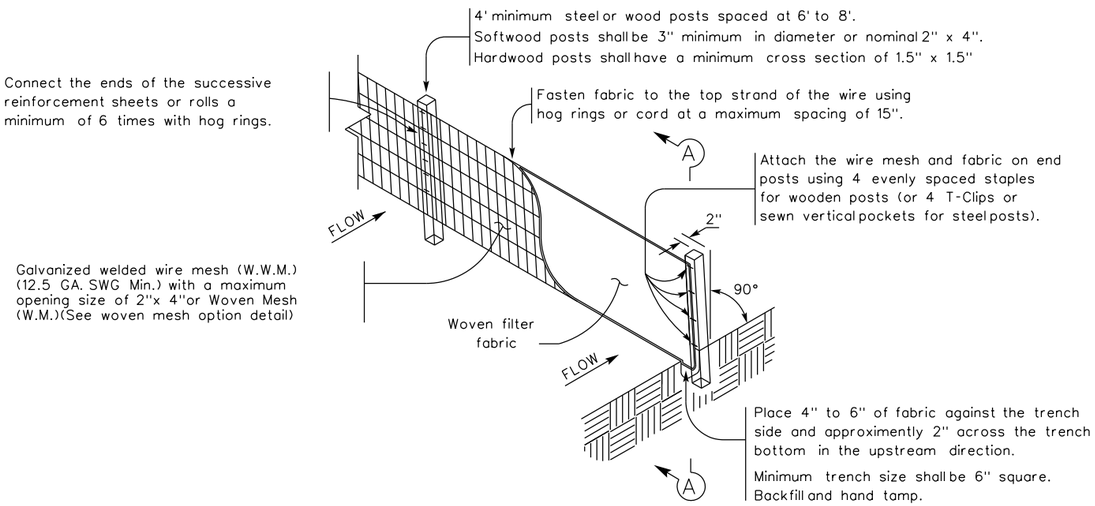
SHEET 7 OF 7

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				285
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

5/23/2022 K:\Counties\HID\Liberty Rd (US83 to Mile 3)\GD\08 ENVIRONMENTAL\03 SW3P Layouts\Liberty SW3P07.dgn

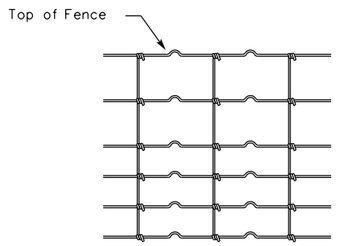
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

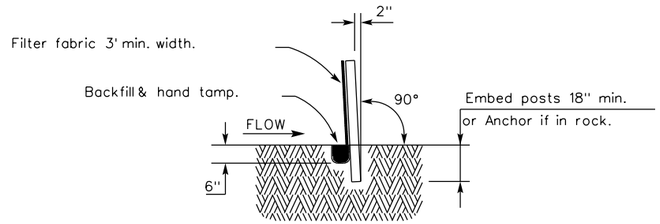
DATE
FILE



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.

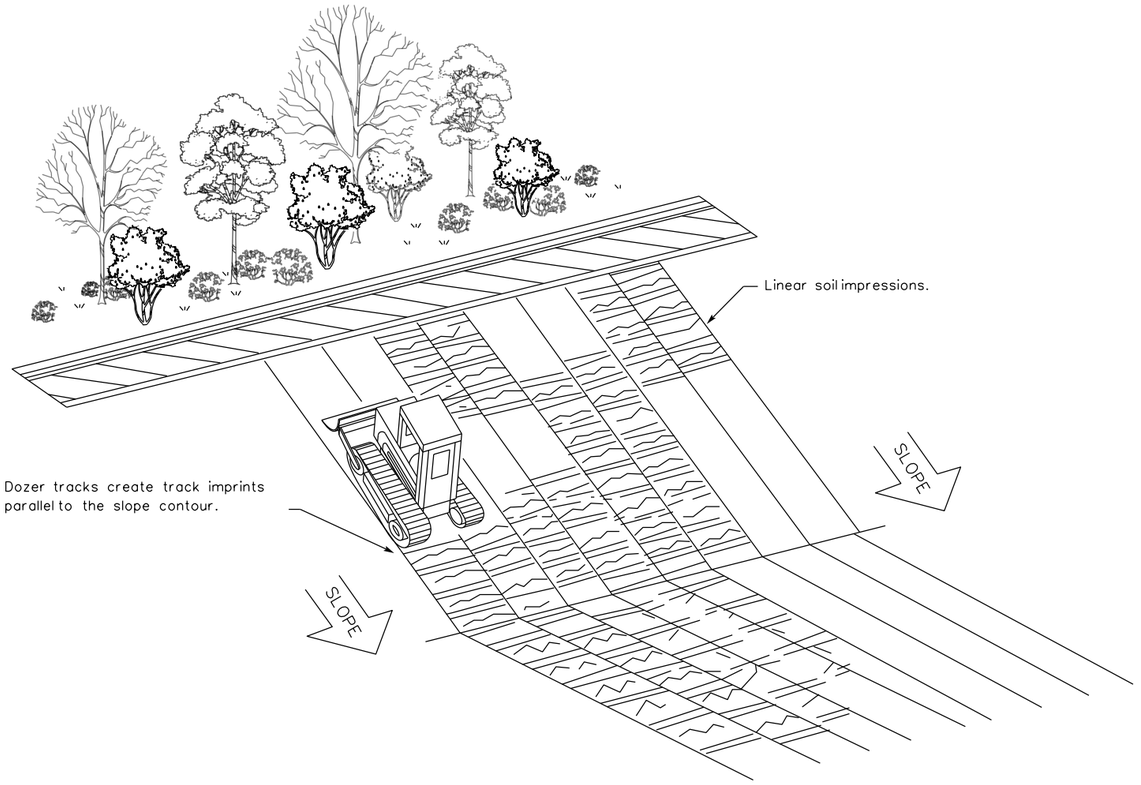
LEGEND

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

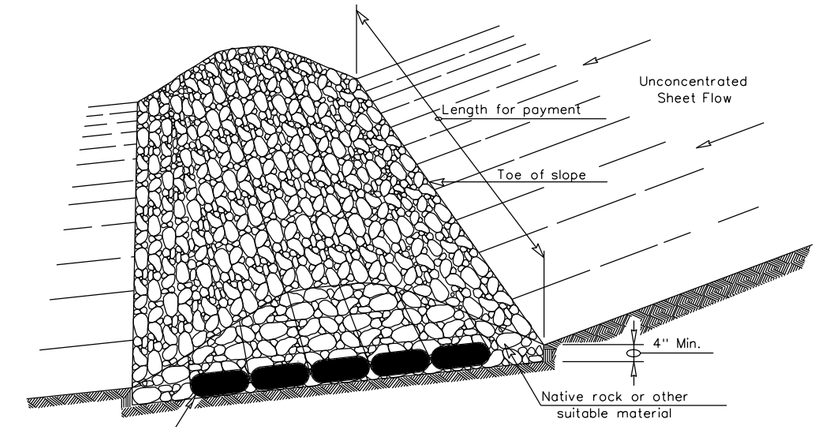
FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TXDOT		CK: TXDOT	DW: TXDOT		CK: TXDOT	
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0921	02	194		LIBERTY		
	DIST	COUNTY				SHEET NO.	
	PHR	HIDALGO				286	

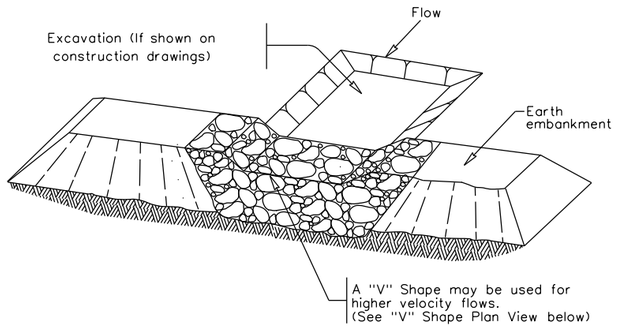
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:



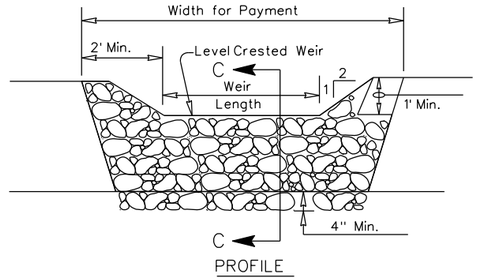
FILTER DAM AT TOE OF SLOPE

RFD1

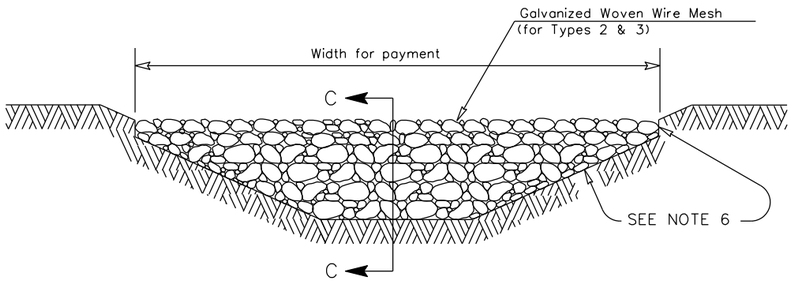


FILTER DAM AT SEDIMENT TRAP

RFD1 OR RFD2

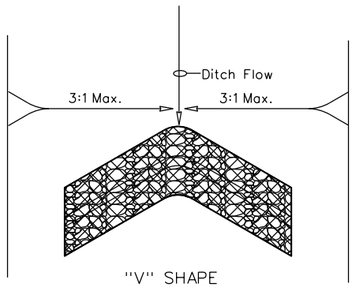


PROFILE



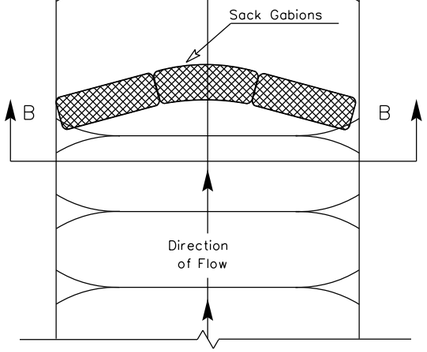
FILTER DAM AT CHANNEL SECTIONS

RFD1 OR RFD2 OR RFD3

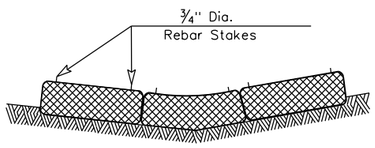


"V" SHAPE

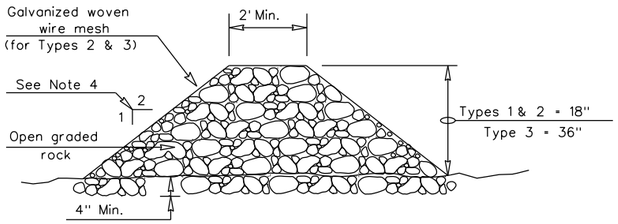
PLAN VIEW



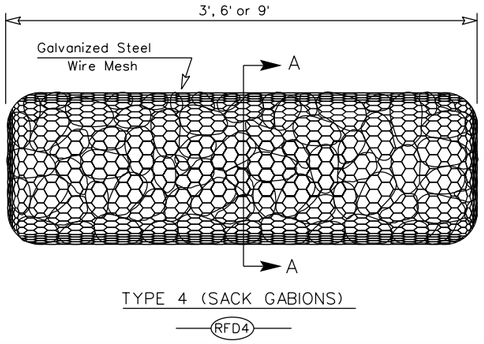
PLAN VIEW



SECTION B-B

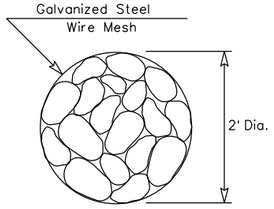


SECTION C-C



TYPE 4 (SACK GABIONS)

RFD4



SECTION A-A

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.

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 3/4" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 1/2" x 3 1/4"
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.

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

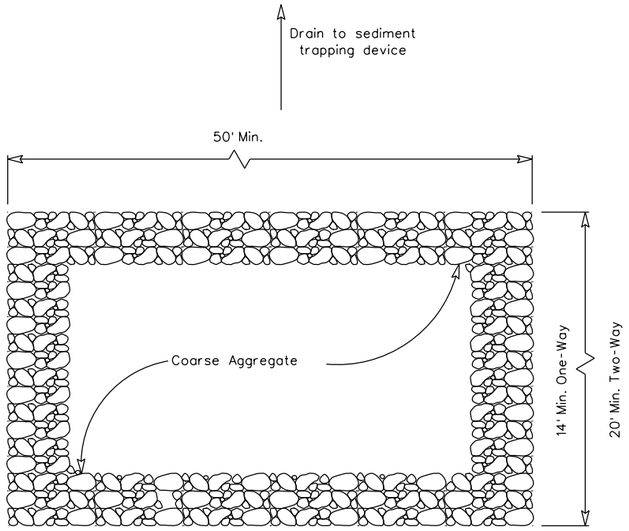
ROCK FILTER DAMS

EC(2)-16

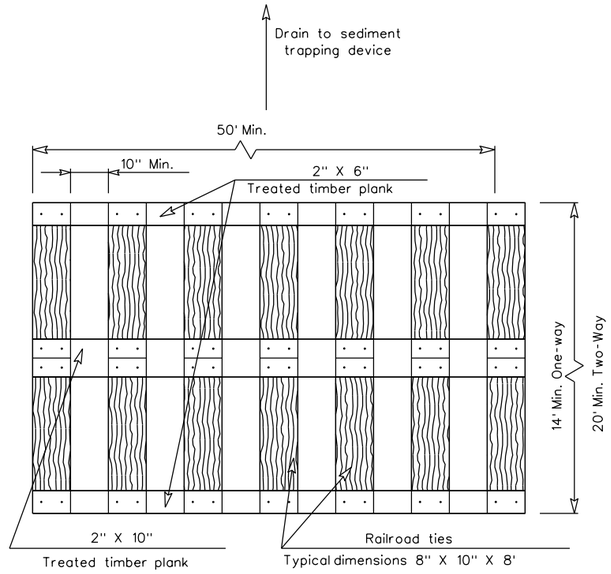
FILE: ec216	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		287

DISCLAIMER:
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.

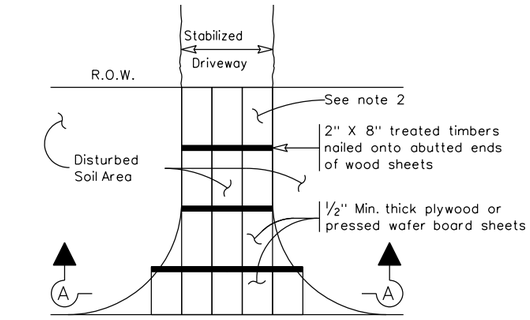
DATE:
FILE:



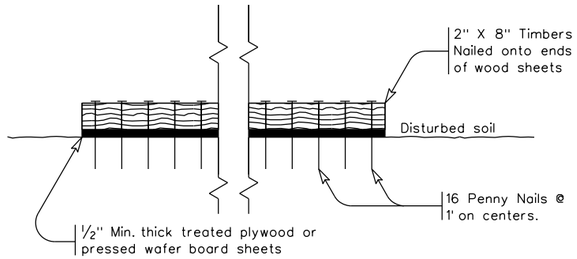
PLAN VIEW



PLAN VIEW



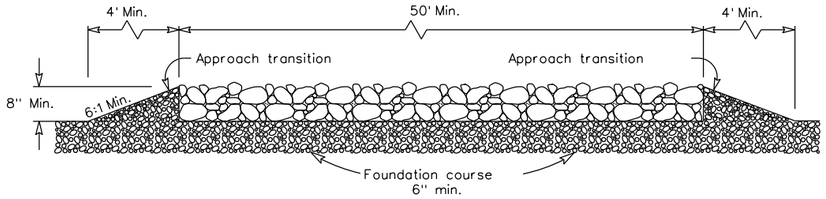
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

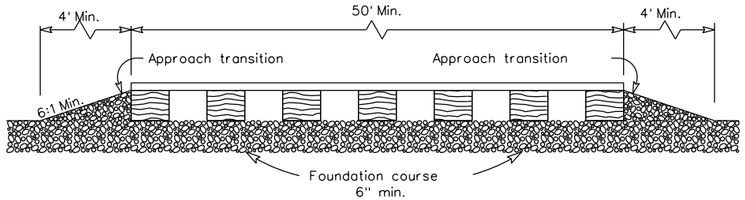
SHORT TERM



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

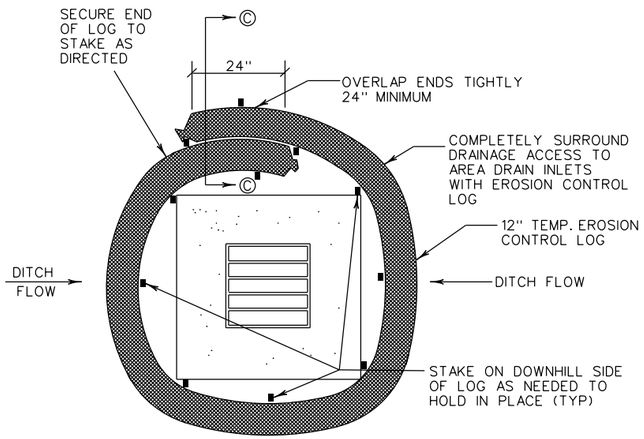
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT	
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0921	02	194	LIBERTY	
	DIST	COUNTY		SHEET NO.	
	PHR	HIDALGO		288	

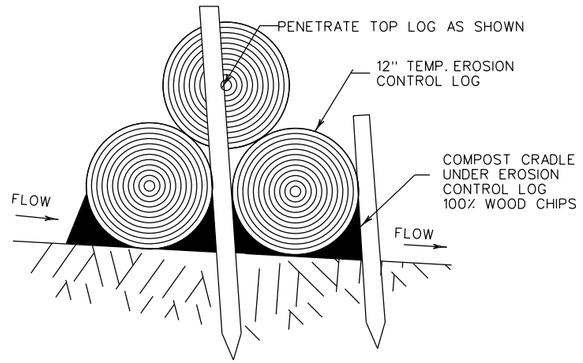
DISCLAIMER :
The use of this standard is governed by the Texas Engineering Practice Act. No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



DROP INLET SEDIMENT TRAP

NTS

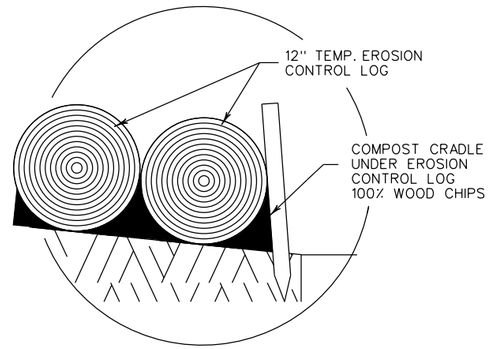
DI-ST



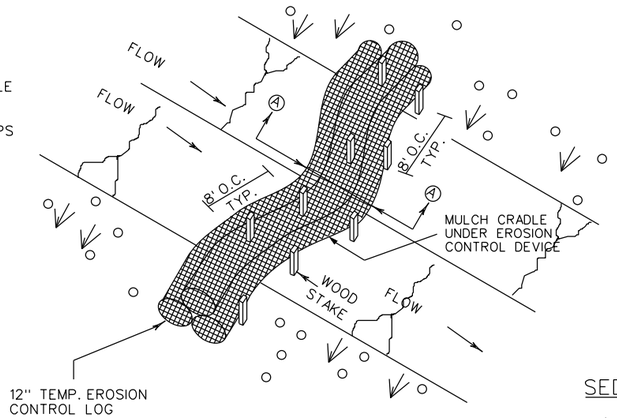
SECTION A-A

DITCH LINE SEDIMENT TRAP A-A

DL-ST



SECTION C-C



DITCH LINE SEDIMENT TRAP

DL-ST

PLANS SHEET LEGEND

DI-ST — DROP INLET SEDIMENT TRAP

DL-ST — DITCH LINE SEDIMENT TRAP

BOCI-ST — BACK OF CURB INLET SEDIMENT TRAP

ROW-ST — RIGHT OF WAY SEDIMENT TRAP

CI-ST — CURB INLET SEDIMENT TRAP

SEDIMENT BASIN & TRAP USAGE GUIDELINES

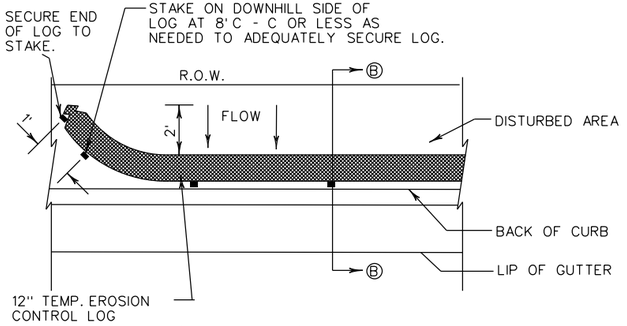
A sediment trap may be used to precipitate sediment out of runoff draining from an unstabilized area.

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).

Sediment traps should be placed in the following locations:

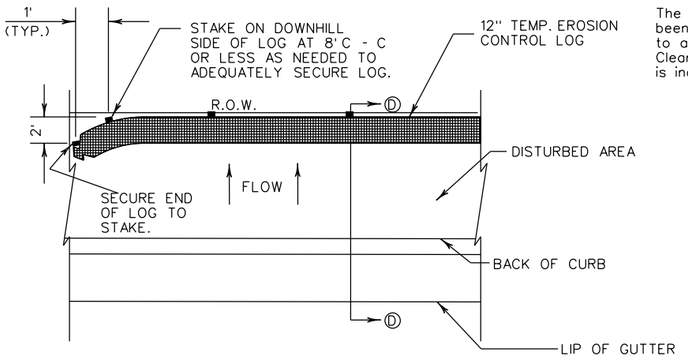
1. Immediately preceding drain inlets
2. Just before the drainage enters a water course
3. Just before the drainage leaves the right of way
4. Just before the drainage leaves the construction limits where drainage flows away from the project

The trap should be cleaned when the capacity has been reduced by 1/2 or the sediment has accumulated to a depth of 1', whichever is less.
Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for seperately.



PLAN VIEW

NTS

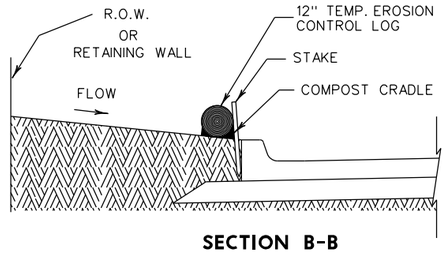


PLAN VIEW

NTS

GENERAL NOTES

1. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED. MAXIMUM LENGTH OF LOGS SHALL BE 30' FOR 12" DIAMETER LOGS.
2. 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.
3. STUFF LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE DENSITY THAT WILL HOLD SHAPE WITHOUT EXCESSIVE DEFORMATION.
4. STAKES SHALL BE 2" X 2" WOOD 4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG.
5. COMPOST CRADLE MATERIAL IS INCIDENTAL AND WILL NOT BE PAID FOR SEPARATELY.

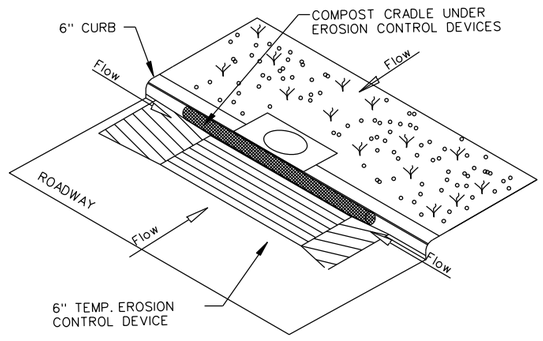


SECTION B-B

BACK OF CURB INLET SEDIMENT TRAP

NTS

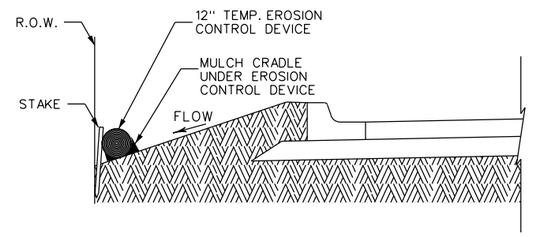
BOCI-ST



CURB INLET SEDIMENT TRAP

NTS

CI-ST



SECTION D-D

RIGHT-OF-WAY SEDIMENT TRAP

NTS

ROW-ST

LEVELS DISPLAYED

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	

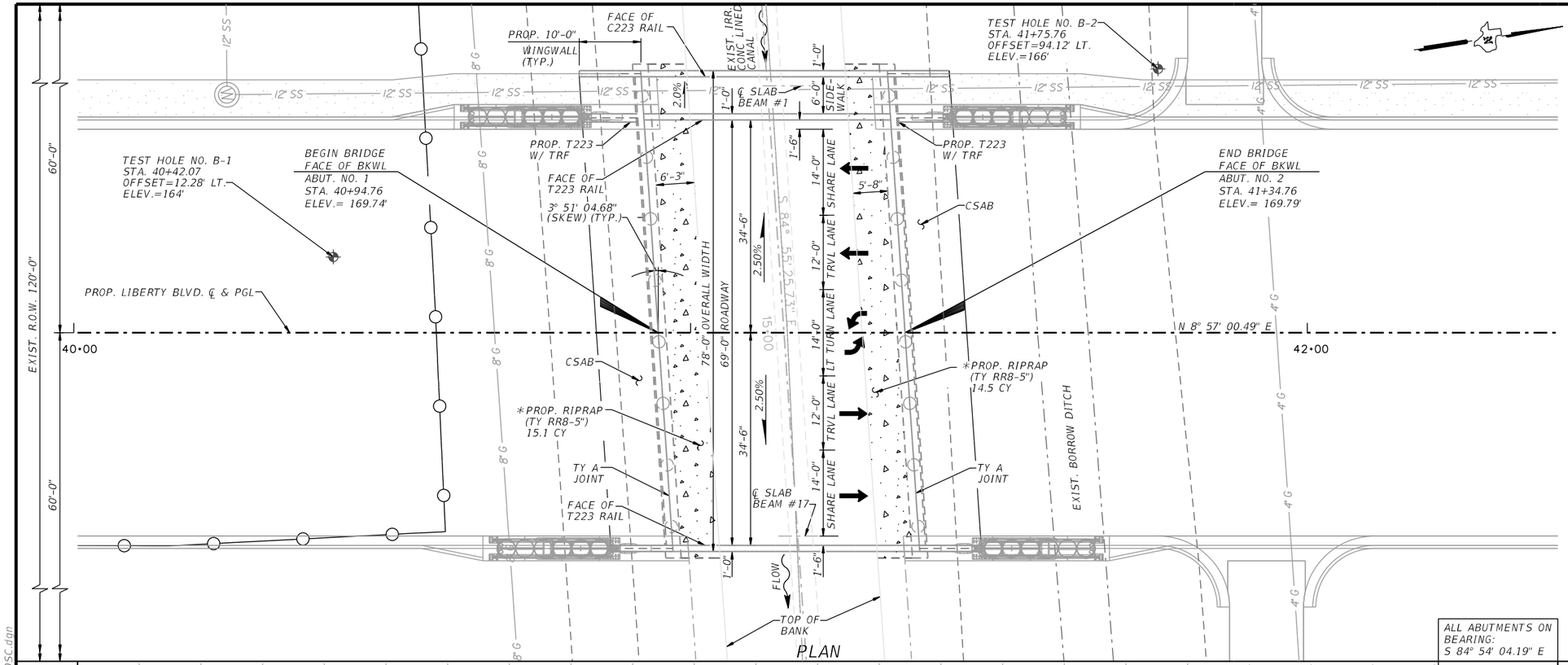
PHARR DISTRICT STANDARD

Texas Department of Transportation

© TxDOT 2017

TEMPORARY EROSION CONTROL LOGS
TECL-17 (PHR)

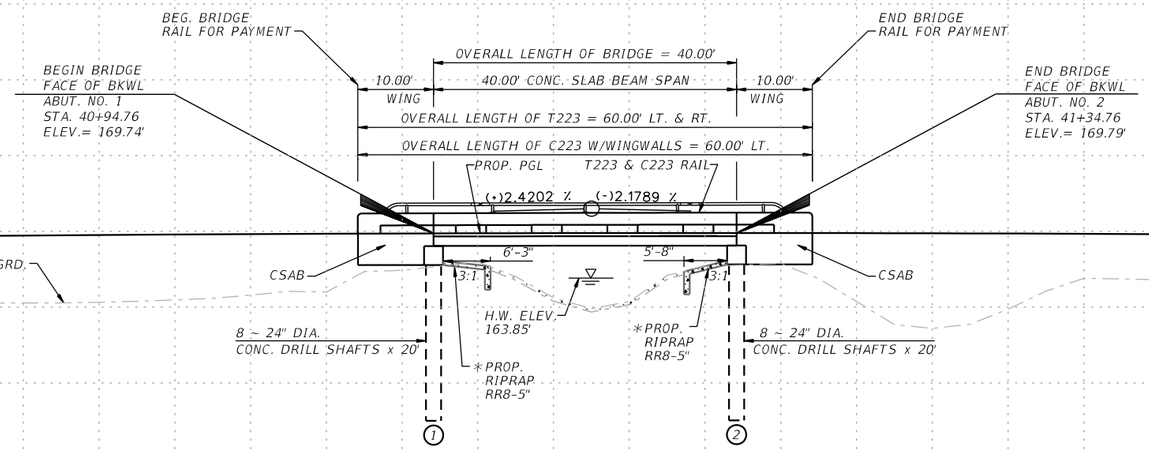
FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6			
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	PHARR	HIDALGO	289
CONTROL	SECTION	JOB	
0921	02	194	



ALL ABUTMENTS ON BEARING:
S 84° 54' 04.19" E

LIBERTY BLVD. PGL VERTICAL DATA

STA = 41+15.00
EL = 173.00'
ex = -3.22'
K = 122
L = 560.00'



* PROP. CONC. RIPRAP SHALL BE PLACED BETWEEN FACE OF PROPOSED ABUTMENT CAP AND TOP EDGE OF EXISTING CONC. LINED IRRIGATION CANAL SLOPE TO MATCH TIE-IN POINTS.

GENERAL NOTES:

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECFICATIONS, 8TH EDITION (2017) AND INTERIM REVISIONS.
2. TEST HOLES PROVIDED BY L&G ENGINEERING, FOR SOIL BORING INFORMATION SEE "TEST HOLE DATA SHEETS".
3. THE CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES TO FIELD VERIFY UTILITIES PRIOR TO CONSTRUCTION.
4. GIRDER END CONDITIONS: D = DOWEL IN OUTSIDE GIRDER ENDS

BENCH MARK DATA:

SEE HORIZONTAL & VERTICAL CONTROL SHEETS.

DESIGN DATA:

FUNC. CLASS: MAJOR COLLECTOR
ADT (2016): 6,900
ADT (2036): 10,300
DESIGN SPEED: 55 MPH
PROP. NBI:
DESIGN LOAD: HL93

HYDRAULIC DATA:

THERE ARE NO IMPACTS TO THE EXISTING HYDRAULICS OF THE CONTOLLED FLOW CANAL.

LEGEND:

TRAFFIC FLOW ARROW

TEST HOLE

HL93 LOADING

STATE OF TEXAS — JORGE A. MADRIGAL — 97243 — LICENSED PROFESSIONAL ENGINEER

6/2/2022

THE COUNTY OF HIDALGO — TEXAS

L&G Engineering

Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

BRIDGE LAYOUT

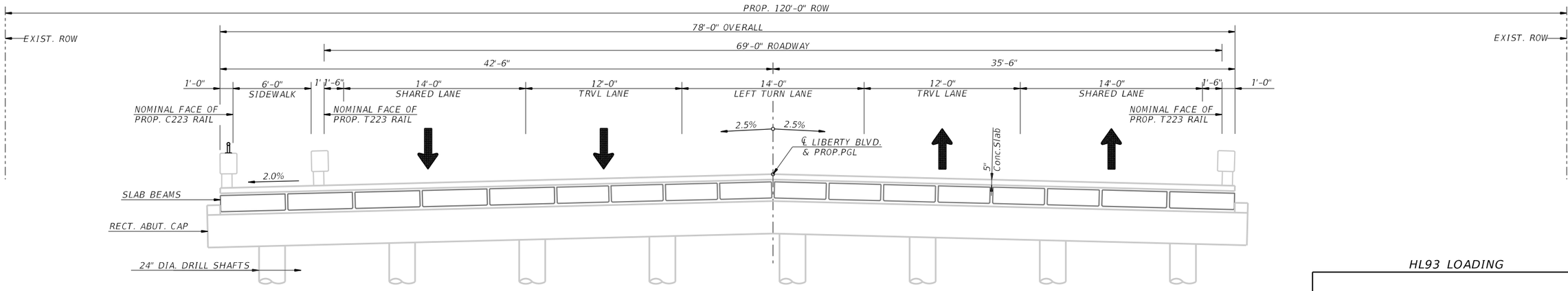
HCID#6 CANAL BRIDGE

SCALE:
HOR: 1"=20'
VER: 1"=20'

SHEET 1 OF 1

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					290
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

DATE: 6/2/2022 2:21:52 PM
FILE: K:\Counties\HID\Liberty Rd (US83 to Mile 3)\06 BRIDGES\Bridge Layouts\Liberty Blvd Bridge Layout 20SC.dgn



PROPOSED BRIDGE TYPICAL SECTION

HL93 LOADING

STATE OF TEXAS
JORGE A. MADRIGAL
97243
LICENSED PROFESSIONAL ENGINEER

6/2/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering

Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

BRIDGE TYPICAL

HCID#6 CANAL BRIDGE

SHEET 1 OF 1

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					291
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

DATE: 6/2/2022 2:24:02 PM
FILE: K:\Counties\HID\Liberty Rd (US83 to Mile 3)\06 BRIDGES\Bridge Typical Sections\Liberty Blvd Bridge Typical Working.dgn

DRILLING LOG

WinCore Version 3.1

County Hidalgo
Highway
CSJ

Hole B-01
Structure Bridge
Station
Offset

District Pharr
Date 4/20/2016
Grnd. Elev. 164.00 ft
GW Elev. 143.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test: Lateral Press. (psi)	Triaxial Test: Deviator Stress (psi)	Properties: MC	LL	PI	Wet Den. (pcf)	Additional Remarks
			CLAY, Sandy Lean Clay, Brown, w/ Traces of Calcareous Nodules, Stiff, Dry (CL)							
	5	19 (6) 23 (6)				11.7				-200 = 59.6%
	10	50 (4) 50 (2)				12.6	48	30		
149.	15	50 (3) 50 (2)				15.5	27	9		-200 = 57.4%
			SAND, Poorly Graded Sand w/ Silt, Brown, Very Dense, Dry to Moist (SP-SM)							
144.	20	50 (1) 50 (0)				37.2				
			GRAVEL, Poorly Graded Gravel w/ Silt and Sand, Gravel Sized 1/4" - 1/2" (Sub-Angular), Very Dense, Moist to Wet (GP-GM)							
	25	50 (1) 50 (0)				20.6				-200 = 6.1%
134.	30	43 (6) 50 (2)				6.4	0	0		
			CLAY, Sandy Fat Clay, Brown, Hard, Wet (CH)							
	35	42 (6) 50 (1)				53.6				-200 = 51.3%
	40	48 (6) 50 (0)				48	52	35		

Remarks: Sulfate Test Performed at 10 and 55 ft. Results Provided on Seperate Document. Boring Locate: 26°15'03.78"N, 98°26'21.36"W (WGS84) (From Field GPS). Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: B. Gonzalez **Logger: O. Garcia** **Organization: L&G Engineering Laboratory**

L:\Projects\Year 2016 Projects\L&G Engineering\G16005 - Liberty Rd Project (US 83 to Mile 3)\Borings\Liberty Rd_Bridge.CLG Prepared By: J.B.S. Reviewed By: D.A.S.

DRILLING LOG

WinCore Version 3.1

County Hidalgo
Highway
CSJ

Hole B-01
Structure Bridge
Station
Offset

District Pharr
Date 4/20/2016
Grnd. Elev. 164.00 ft
GW Elev. 143.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test: Lateral Press. (psi)	Triaxial Test: Deviator Stress (psi)	Properties: MC	LL	PI	Wet Den. (pcf)	Additional Remarks
			CLAY, Sandy Fat Clay, Brown, Hard, Wet (CH)							
119.	45	50 (3) 50 (0)				42				-200 = 55.4%
			CLAY, Lean Clay w/ Sand, Brown, Hard, Wet (CL)							
	50	38 (6) 44 (6)				37.9	44	26		
	55	24 (6) 38 (6)				32.8				-200 = 79.3%
	60	32 (6) 46 (6)				34.7	48	31		
99.	65	44 (6) 50 (1)				30.7				-200 = 78.1%
			CLAY, Fat Clay, Brown, Hard, Wet (CH)							
	70	50 (3) 50 (0)				21.3	58	40		
89.	75	50 (2) 50 (0)				25.4				-200 = 90.4%
	80									

Remarks: Sulfate Test Performed at 10 and 55 ft. Results Provided on Seperate Document. Boring Locate: 26°15'03.78"N, 98°26'21.36"W (WGS84) (From Field GPS). Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: B. Gonzalez **Logger: O. Garcia** **Organization: L&G Engineering Laboratory**

L:\Projects\Year 2016 Projects\L&G Engineering\G16005 - Liberty Rd Project (US 83 to Mile 3)\Borings\Liberty Rd_Bridge.CLG Prepared By: J.B.S. Reviewed By: D.A.S.

HL93 LOADING

STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER

THE COUNTY OF HIDALGO
TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

TEST HOLE DATA

HCID#6 CANAL BRIDGE

SHEET 1 OF 2

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					292
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

DATE: 6/2/2022 2:26:02 PM
FILE: K:\Counties\HID\Liberty Rd (US83 to Mile 3\06 BRIDGES\Soil Borings\Liberty Blvd Bridge Soil Boring.dgn

DRILLING LOG

WinCore Version 3.1

County Hidalgo
Highway
CSJ

Hole B-02
Structure Bridge
Station
Offset

District Pharr
Date 4/21/2016
Grnd. Elev. 166.00 ft
GW Elev. 148.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	LL	PI	Wet Den. (pcf)	Additional Remarks
			CLAY, Sandy Lean Clay, Dark Brown, Stiff, Dry (CL)							
161. 5		16 (6) 19 (6)				11.6	38	26		-200 = 57.8%
			CLAY, Sandy Fat Clay, Brown, Stiff to Hard, Dry (CH)							
10		31 (6) 48 (6)				13.9				
151. 15		48 (6) 50 (2)				17.6	56	38		-200 = 64.8%
			CLAY, Lean Clay w/ Sand, Brown, w/ Traces of Gravel Sized 1/4" (Sub-Angular) (Noted From 20' - 25'), Very Stiff to hard, Moist to Wet (CL)							
20		19 (6) 30 (6)				35.3				-200 = 72.9%
141. 25		38 (6) 50 (2)				25.2	26	10		
			GRAVEL, Poorly Graded Gravel, Sized 1/4" (Sub-Angular), Very Dense, Wet (GP)							
30		50 (2) 50 (0)				5.7				-200 = 1.2%
35		50 (4) 50 (0)				4.8				
126. 40		50 (1) 50 (0)				9.8				-200 = 4.8%

Remarks: Sulfate Test Performed at 15 and 65 ft. Results Provided on Seperate Document. Boring Locate: 26°15'05.22"N, 98°26'22.02"W (WGS84) (From Field GPS). Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: B. Gonzalez **Logger: O. Garcia** **Organization: L&G Engineering Laboratory**

L:\Projects\Year 2016 Projects\L&G Engineering\G16005 - Liberty Rd Project (US 83 to Mile 3)\Borings\Liberty Rd_Bridge.CLG Prepared By: J.B.S. Reviewed By: D.A.S.

DRILLING LOG

WinCore Version 3.1

County Hidalgo
Highway
CSJ

Hole B-02
Structure Bridge
Station
Offset

District Pharr
Date 4/21/2016
Grnd. Elev. 166.00 ft
GW Elev. 148.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	LL	PI	Wet Den. (pcf)	Additional Remarks
			SAND, Silty Sand, Brown, Dense, Wet (SM)							
45		32 (6) 46 (6)				26.8	0	0		
50		28 (6) 37 (6)				24.2				-200 = 13.9%
55		43 (6) 50 (0)				22.5				
60		39 (6) 46 (6)				22.7	0	0		-200 = 12.8%
65		36 (6) 49 (6)				30.1				
70		42 (6) 50 (1)				23.3				-200 = 19.4%
91. 75		46 (6) 50 (2)				23.5	0	0		
80										

Remarks: Sulfate Test Performed at 15 and 65 ft. Results Provided on Seperate Document. Boring Locate: 26°15'05.22"N, 98°26'22.02"W (WGS84) (From Field GPS). Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: B. Gonzalez **Logger: O. Garcia** **Organization: L&G Engineering Laboratory**

L:\Projects\Year 2016 Projects\L&G Engineering\G16005 - Liberty Rd Project (US 83 to Mile 3)\Borings\Liberty Rd_Bridge.CLG Prepared By: J.B.S. Reviewed By: D.A.S.

HL93 LOADING

STATE OF TEXAS
JORDAN B. SINCLAIR
127491
LICENSED PROFESSIONAL ENGINEER

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

TEST HOLE DATA

HCID#6 CANAL BRIDGE

SHEET 2 OF 2

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				293
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

DATE: 6/2/2022 2:36:02 PM
FILE: K:\Counties\HID\Liberty Rd (US83 to Mile 3)\06 BRIDGES\Soil Borings\Liberty Blvd Bridge Soil Boring2.dgn

SUMMARY OF ESTIMATED QUANTITIES

ITEM NO.	400	416	420	422	425	425	432	450	450	454
DESC CODE	6005	6002	6013	6007	6009	6010	6010	6006	6032	6021
BID ITEM DESCRIPTION / BRIDGE ELEMENT	CEMENT STABILIZED BACKFILL	DRILL SHAFT (24 IN)	CLASS "C" CONCRETE ABUTMENT	REINFORCED CONCRETE SLAB (SLAB BEAM)	PRESTRESSED CONCRETE SLAB BEAM (Tx4SB12)	PRESTRESSED CONCRETE SLAB BEAM (Tx5SB12)	RIPRAP (CONC) (CL B) (5 IN) (TY RR8)	RAIL (TY T223)	RAIL (TY C223)	(TY A JOINT)
	CY	LF	CY	SF	LF	LF	CY	LF	LF	LF
2 ~ ABUTMENTS	115.4	320	53.0							
1 ~ 40.00' PRESTR CONC SLAB BEAM SPAN				3,120	395.00	276.50		120	60	156
							29.6			
TOTAL	115.4	320	53.0	3,120	395.00	276.50	29.6	120	60	156

DATE: 6/2/2022 2:39:40 PM
FILE: K:\Counties\HID\Liberty Rd (US83 to Mile 3\06 BRIDGES\Quantities\E&Q Liberty Blvd .dgn

THE COUNTY OF HIDALGO TEXAS

L&G Engineering

Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

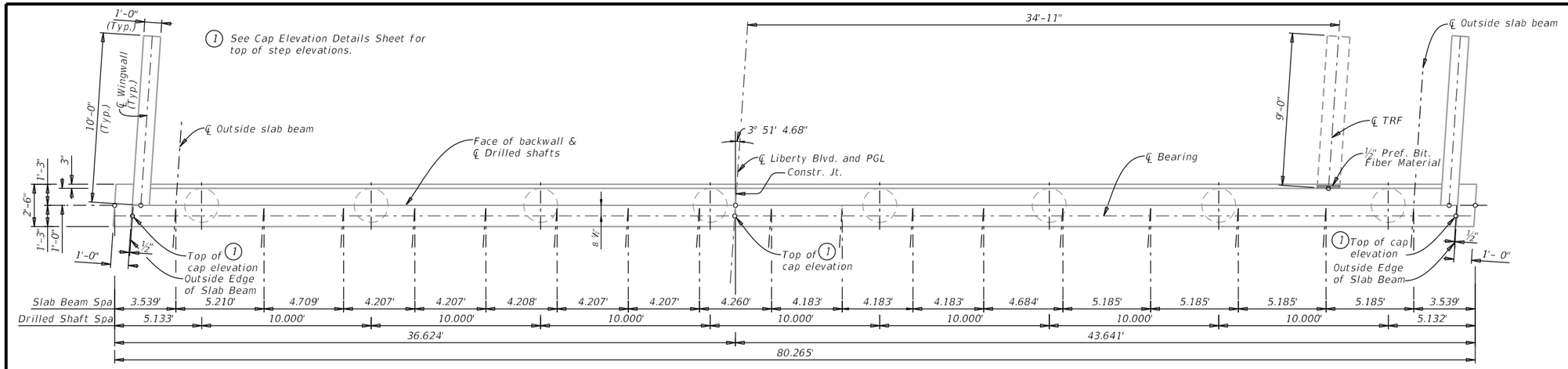
900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ESTIMATED QUANTITIES

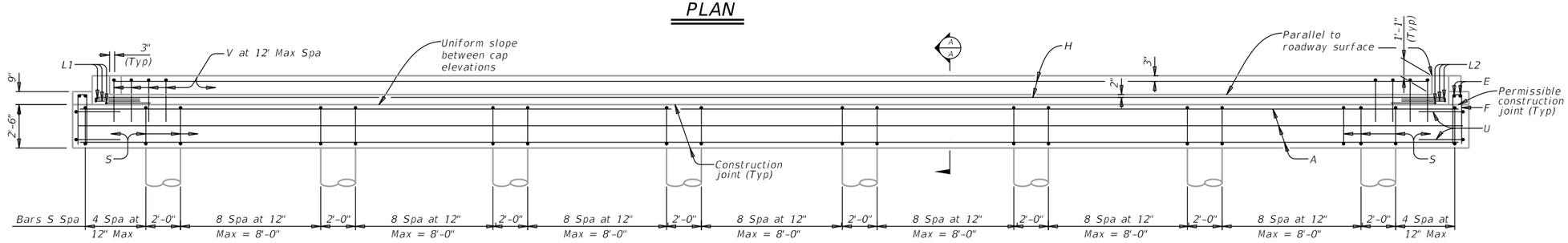
HCID#6 CANAL BRIDGE

SHEET 1 OF 1

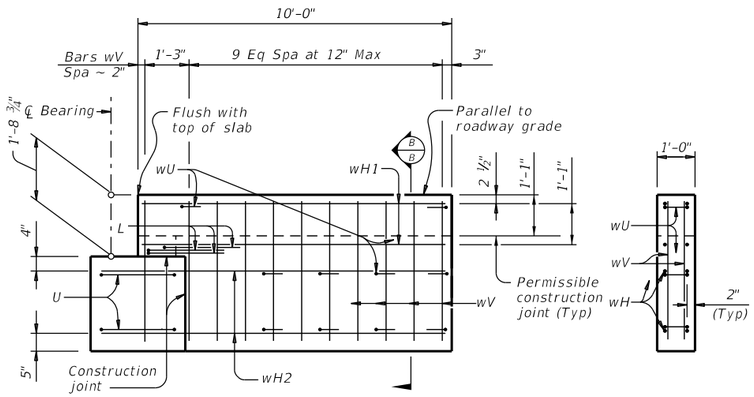
DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				294
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							



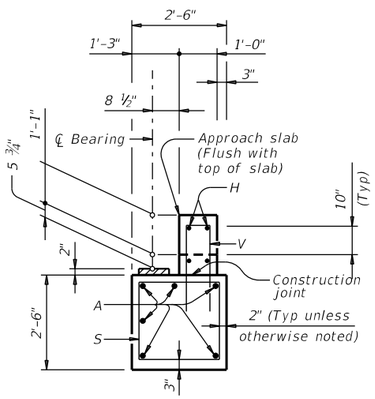
PLAN



ELEVATION

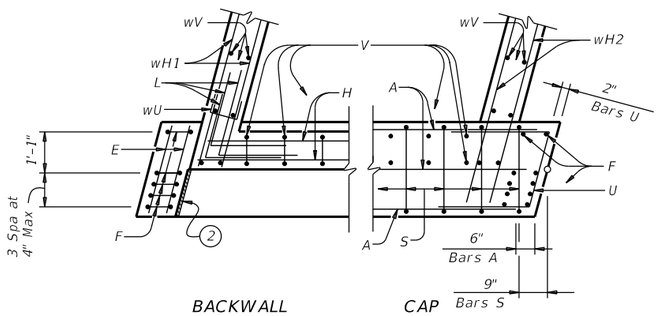


WINGWALL ELEVATION



SECTION B-B

SECTION A-A



BACKWALL CAP

CORNER DETAILS

(2) ½" preformed bituminous fiber material between slab beam and earwall. Bond to earwall with an approved adhesive. Cast inside face of earwall perpendicular to cap. (typ)

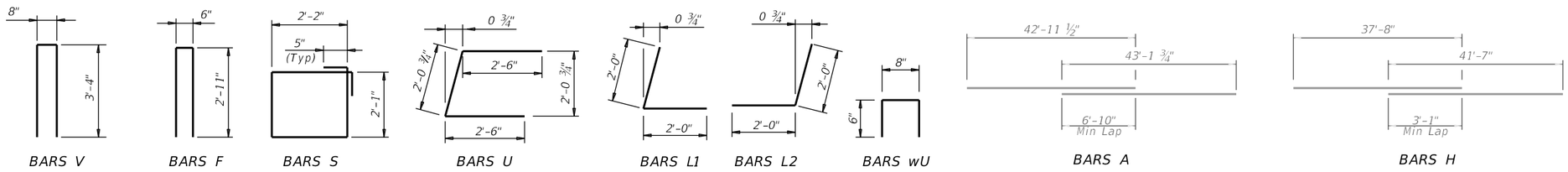


TABLE OF ESTIMATED QUANTITIES

Bar	No.	Size	Length	Weight
A	6	#11	86'-1 ¼"	2,745
E	4	#4	2'-3"	6
F	10	#4	6'-4"	43
H	2	#5	79'-3"	331
L1	3	#6	4'-0"	18
L2	3	#6	4'-0"	18
S	46	#4	9'-4"	455
U	4	#6	7'-1"	43
V	32	#5	7'-4"	589
wH1	8	#6	9'-8"	116
wH2	8	#6	10'-11"	131
wU	12	#4	1'-8"	22
wV	28	#5	3'-10"	176
Reinforcing Steel			Lb	4,693
Cl "C" Conc (Abut)			CY	26.5

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications, 8th Edition (2017)

See Foundation Detail standard sheet, FD, for all foundation details and notes.

See T223 and PR11 railing standards for rail anchorage details.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

Calculated Foundation Loads = 45 Tons/DS

MATERIAL NOTES:

Provide Grade 60 reinforcing steel
Provide Class C concrete (f'c =3600 psi)

HL93 LOADING

STATE OF TEXAS
JORGE A. MADRIGAL
97243
LICENSED PROFESSIONAL ENGINEER
6/2/2022

THE COUNTY OF HIDALGO TEXAS

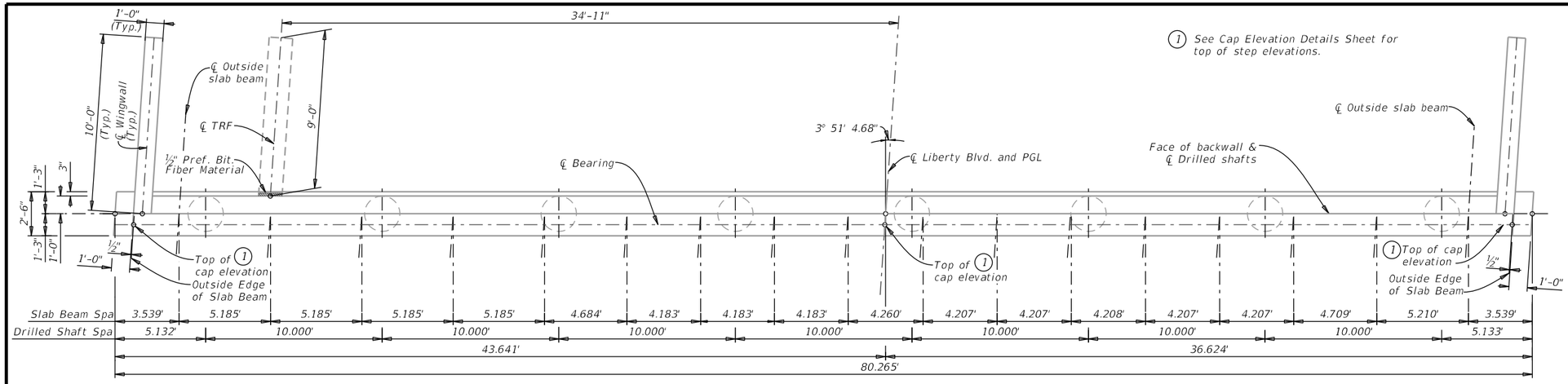
L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105
2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018
900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ABUTMENT NO. 1

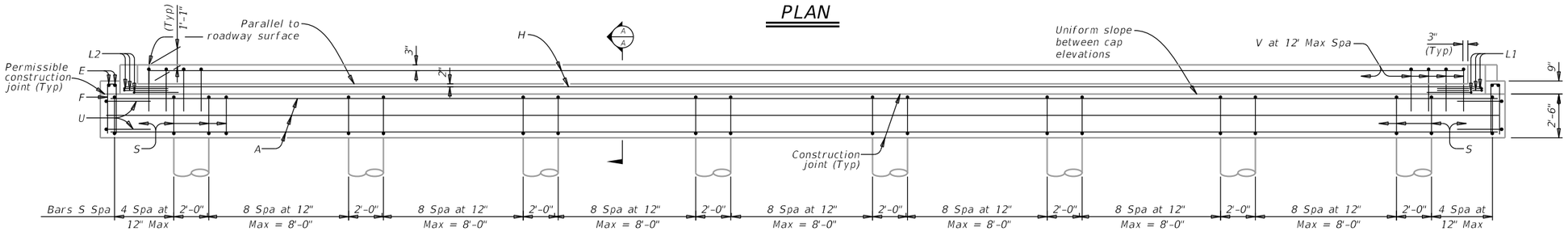
HCID#6 CANAL BRIDGE

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
CK DN:		6	TEXAS				295
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY
TR:							
CK TR:							

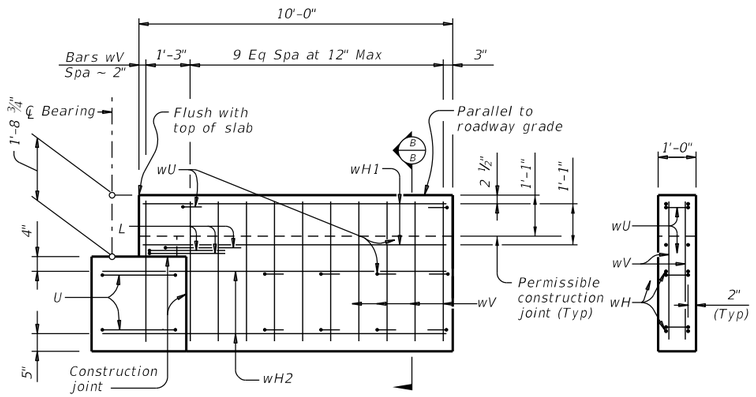
DATE: 6/2/2022 2:41:40 PM
FILE: K:\Counties\HID\Liberty Rd (US83 to Mile 3)\06 BRIDGES\Abutments\Abutment No1.dgn



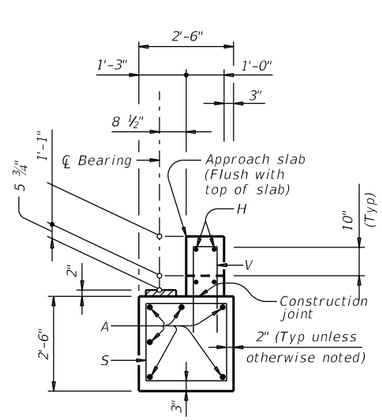
PLAN



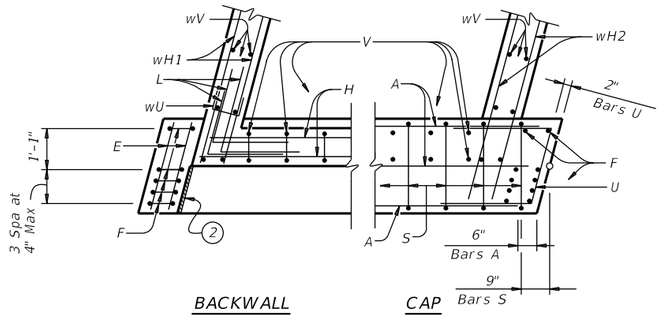
ELEVATION



WINGWALL ELEVATION



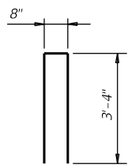
SECTION A-A



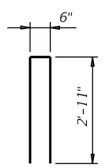
BACKWALL CAP

CORNER DETAILS

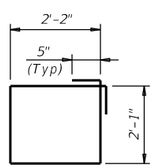
2 ½" preformed bituminous fiber material between slab beam andearwall. Bond to earwall with an approved adhesive. Cast inside face of earwall perpendicular to cap. (typ)



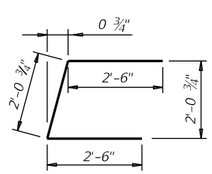
BARS V



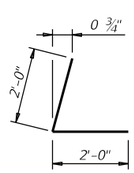
BARS F



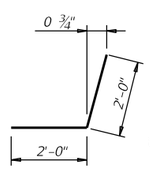
BARS S



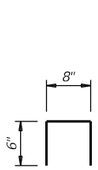
BARS U



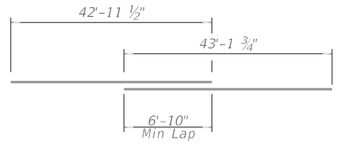
BARS L1



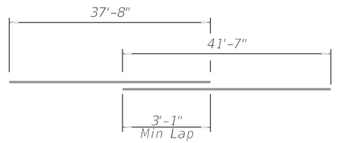
BARS L2



BARS wU



BARS A



BARS H

TABLE OF ESTIMATED QUANTITIES

Bar	No.	Size	Length	Weight
A	6	#11	86'-1 ¼"	2,745
E	4	#4	2'-3"	6
F	10	#4	6'-4"	43
H	2	#5	79'-3"	331
L1	3	#6	4'-0"	18
L2	3	#6	4'-0"	18
S	46	#4	9'-4"	455
U	4	#6	7'-1"	43
V	32	#5	7'-4"	589
wH1	8	#6	9'-8"	116
wH2	8	#6	10'-11"	131
wU	12	#4	1'-8"	22
wV	28	#5	3'-10"	176
Reinforcing Steel			Lb	4,693
Cl "C" Conc (Abut)			CY	26.5

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications, 8th Edition (2017)

See Foundation Detail standard sheet, FD, for all foundation details and notes.

See T223 and PR11 railing standards for rail anchorage details.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.

Calculated Foundation Loads = 45 Tons/DS

MATERIAL NOTES:

Provide Grade 60 reinforcing steel

Provide Class C concrete (f'c =3600 psi)

HL93 LOADING

STATE OF TEXAS
JORGE A. MADRIGAL
97243
LICENSED PROFESSIONAL ENGINEER
6/2/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

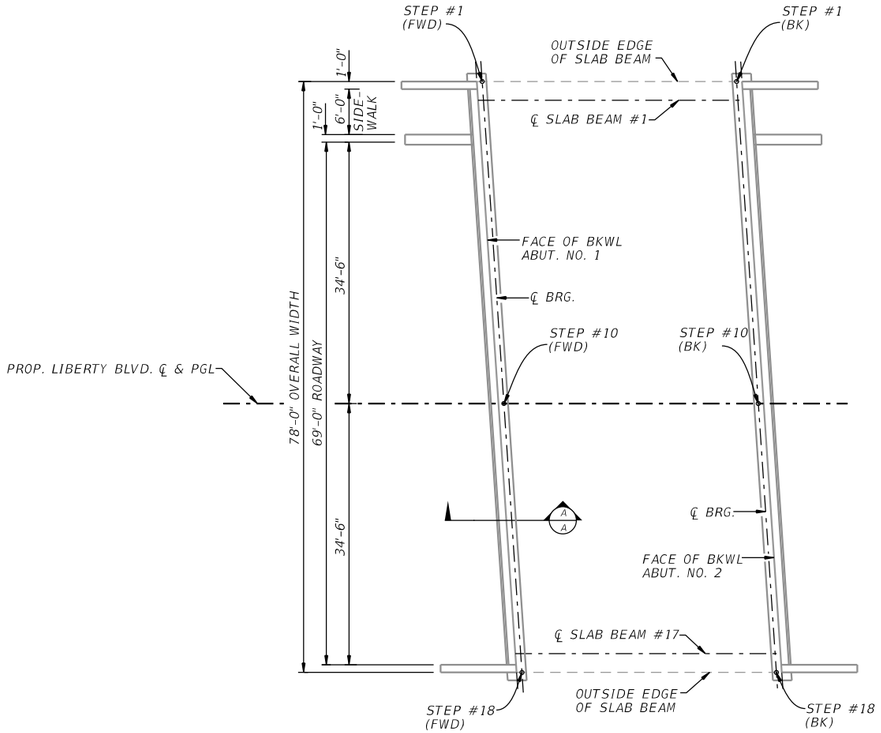
900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

ABUTMENT NO. 2

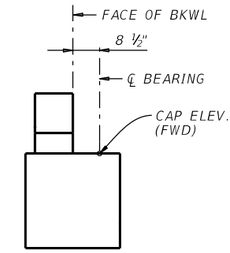
HCID#6 CANAL BRIDGE

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					296
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO	0921	02	194	LIBERTY	
TR:								
CK TR:								

DATE: 6/2/2022 2:43:41 PM
FILE: K:\Counties\HID\Liberty Rd (US83 to Mile 3)\06 BRIDGES\Abutments\Abutment No2.dgn

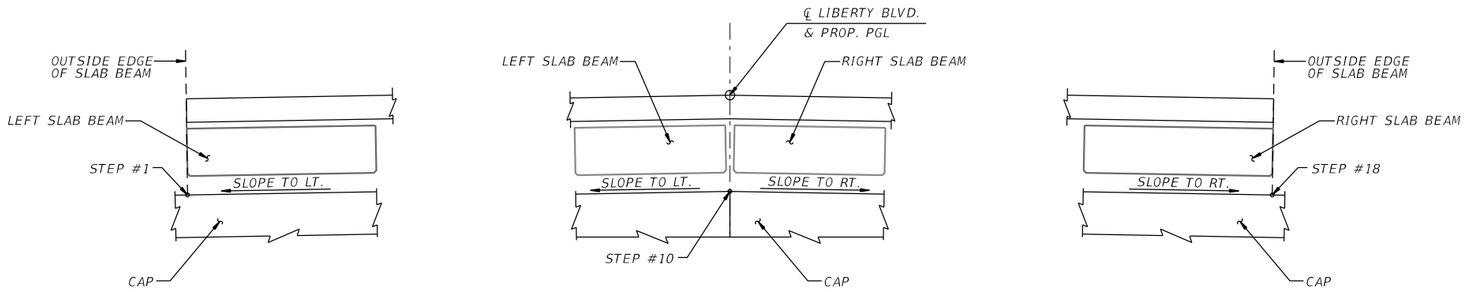


PLAN OF STEP LOCATIONS



SECTION A-A

CAP ELEVATIONS			
	STEP #1	STEP #10	STEP #18
ABUT. #1 (FWD)	166.916	167.947	167.067
ABUT. #2 (BK)	166.967	167.995	167.110



COMMON TRANSVERSE SECTIONS AT STEP LOCATIONS

HL93 LOADING

STATE OF TEXAS
JORGE A. MADRIGAL
97243
LICENSED PROFESSIONAL ENGINEER

6/2/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering

Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

CAP ELEVATION DETAILS

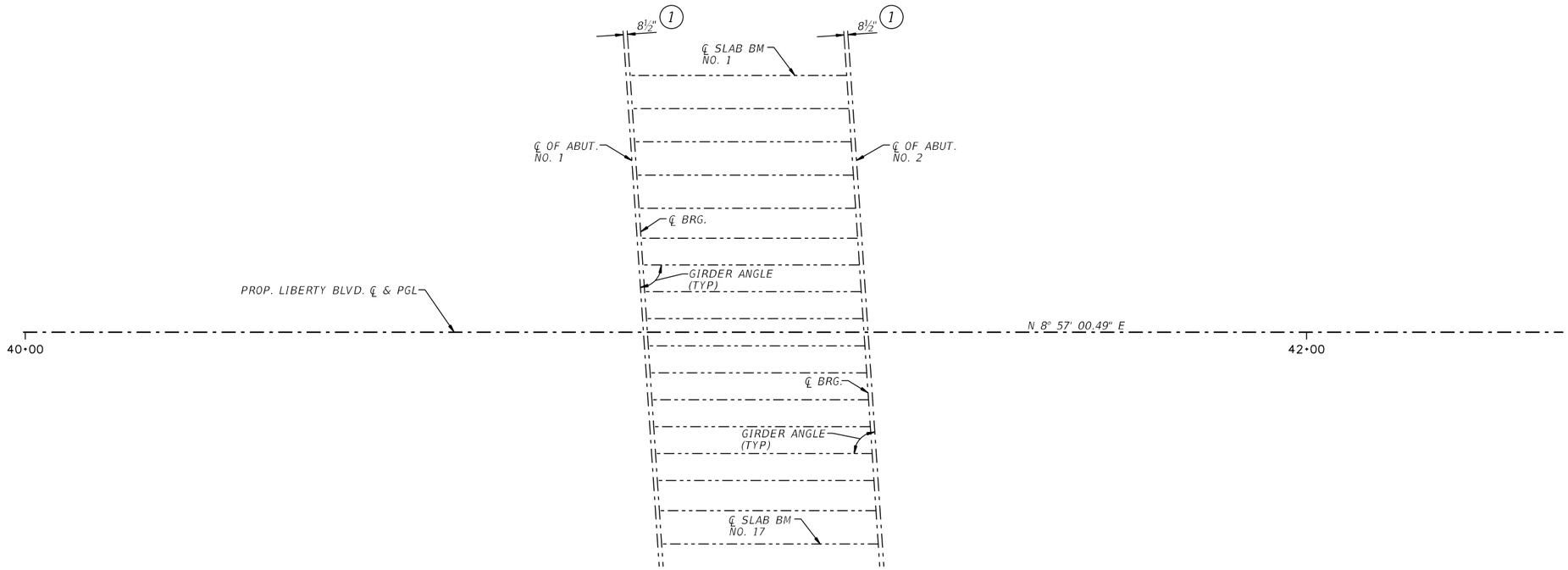
HCID#6 CANAL BRIDGE

SCALE:
HOR: 1"=20'

SHEET 1 OF 1

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					297
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:								
TR:		PHR	HIDALGO	0921	02	194		LIBERTY
CK TR:								

DATE: 6/2/2022 2:45:58 PM
FILE: K:\Counties\HID\Liberty Rd (US83 to Mile 3)\06 BRIDGES\Cap Elevation Detail\Cap Elevation Detail.dgn



FRAMING PLAN

(4SB12 & 5SB12 SLAB BEAMS)

BENT REPORT

BENT NO. 1 (S 84 54 4.19 E)

DISTANCE BETWEEN STATION LINE AND BEAM 1, 40.101 L

		BEAM	SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN	1	BEAM 1	0.000	86	8	55
		BEAM 2	5.185	86	8	55
		BEAM 3	5.185	86	8	55
		BEAM 4	5.185	86	8	55
		BEAM 5	5.185	86	8	55
		BEAM 6	4.684	86	8	55
		BEAM 7	4.183	86	8	55
		BEAM 8	4.183	86	8	55
		BEAM 9	4.183	86	8	55
		BEAM 10	4.260	86	8	55
		BEAM 11	4.207	86	8	55
		BEAM 12	4.207	86	8	55
		BEAM 13	4.208	86	8	55
		BEAM 14	4.207	86	8	55
		BEAM 15	4.207	86	8	55
		BEAM 16	4.709	86	8	55
		BEAM 17	5.210	86	8	55
		TOTAL	73.186			

BENT NO. 2 (S 84 54 4.19 E)

DISTANCE BETWEEN STATION LINE AND BEAM 1, 40.101 L

		BEAM	SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN	1	BEAM 1	0.000	86	8	55
		BEAM 2	5.185	86	8	55
		BEAM 3	5.185	86	8	55
		BEAM 4	5.185	86	8	55
		BEAM 5	5.185	86	8	55
		BEAM 6	4.684	86	8	55
		BEAM 7	4.183	86	8	55
		BEAM 8	4.183	86	8	55
		BEAM 9	4.183	86	8	55
		BEAM 10	4.260	86	8	55
		BEAM 11	4.207	86	8	55
		BEAM 12	4.207	86	8	55
		BEAM 13	4.208	86	8	55
		BEAM 14	4.207	86	8	55
		BEAM 15	4.207	86	8	55
		BEAM 16	4.709	86	8	55
		BEAM 17	5.210	86	8	55
		TOTAL	73.186			

BEAM REPORT

BEAM REPORT, SPAN 1

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM 1	40.000	38.580	39.50	0.0014
BEAM 2	40.000	38.580	39.50	0.0014
BEAM 3	40.000	38.580	39.50	0.0014
BEAM 4	40.000	38.580	39.50	0.0014
BEAM 5	40.000	38.580	39.50	0.0013
BEAM 6	40.000	38.580	39.50	0.0013
BEAM 7	40.000	38.580	39.50	0.0013
BEAM 8	40.000	38.580	39.50	0.0013
BEAM 9	40.000	38.580	39.50	0.0012
BEAM 10	40.000	38.580	39.50	0.0012
BEAM 11	40.000	38.580	39.50	0.0012
BEAM 12	40.000	38.580	39.50	0.0012
BEAM 13	40.000	38.580	39.50	0.0011
BEAM 14	40.000	38.580	39.50	0.0011
BEAM 15	40.000	38.580	39.50	0.0011
BEAM 16	40.000	38.580	39.50	0.0011
BEAM 17	40.000	38.580	39.50	0.0010

(1) See Slab Beam Elastomeric Bearing Details (PSBEB) standard sheet for orientation of dimension.

(2) Beam lengths shown are bottom beam lengths with adjustments made for beam slope.

HL93 LOADING

STATE OF TEXAS
JORGE A. MADRIGAL
97243
LICENSED PROFESSIONAL ENGINEER
6/2/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering

Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 585-1909
Fax : (956) 585-1927

FRAMING PLAN

HCID#6 CANAL BRIDGE

SHEET 1 OF 1

SCALE: 1"=20'

DW:

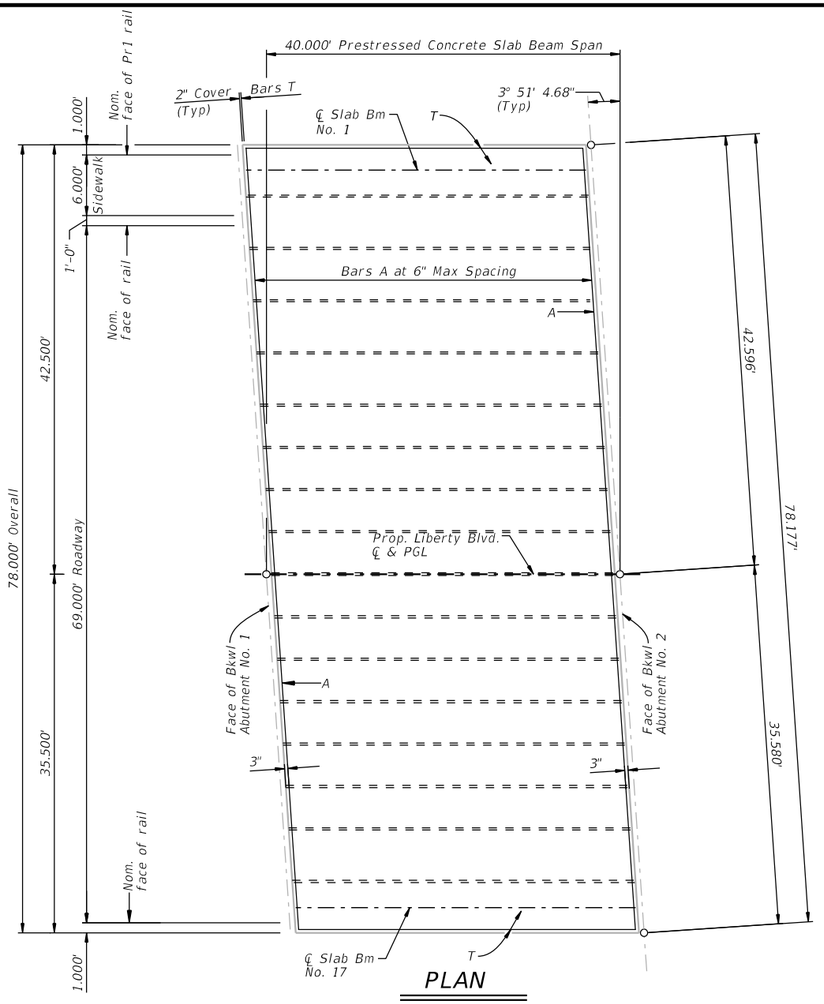
CK DW:

TR:

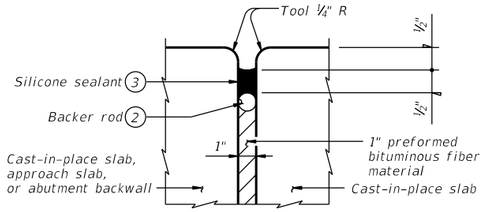
CK TR:

FED. RD. DIV. NO.	STATE	PROJECT NO.			SHEET NO.
6	TEXAS				298
STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
PHR	HIDALGO	0921	02	194	LIBERTY

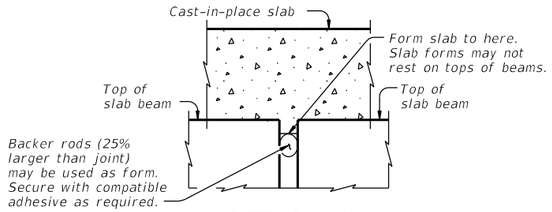
DATE: 6/2/2022 2:48:27 PM
FILE: K:\Counties\HID\Liberty Rd (US83 to Mile 3)\06 BRIDGES\Framing Plan\Liberty Blvd Framing Plan.dgn



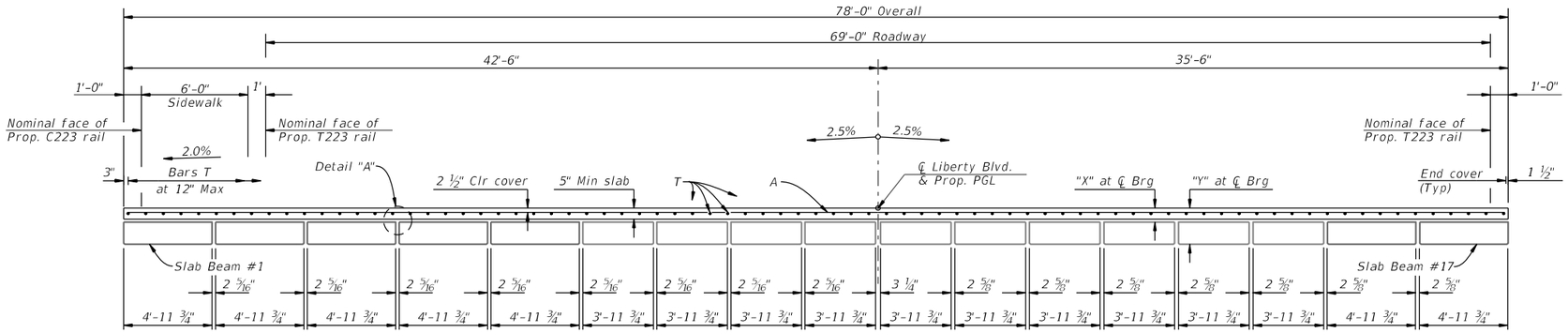
PLAN



TYPE A JOINT DETAIL



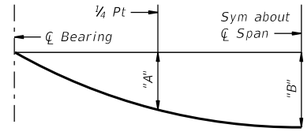
DETAIL "A"



TYPICAL TRANSVERSE SECTION

TABLE OF SECTION DEPTHS			
Span No.	Girder No.	"X" at ℄ Brg.	"Y" at ℄ Brg.
1	All	7 ½"	1'-7 ½"

BAR TABLE	
BAR	SIZE
A	#5
T	#4



DEAD LOAD DEFLECTION DIAGRAM

NOTE: Deflections shown are due to concrete slab only (E_c = 5000 ksi). Calculated deflections shown are theoretical and actual dimensions may vary. Adjust based on field verification.

Span No.	Beam Type	"A"	"B"
		Ft	Ft
1	4SB12	0.0221	0.031
1	5SB12	0.0228	0.032

TABLE OF ESTIMATED QUANTITIES				
SPAN No.	REINF CONCRETE SLAB (SLAB BEAM)	PRESTR CONC SLAB BEAM		TOTAL REINF STEEL (1)
		4SB12 ABUT TO ABUT	4SB15 ABUT TO ABUT	
Ft	SF	LF	LF	Lb
40	3,120	395.00	276.50	8,736

(1) Reinforcing steel weight is calculated using an approximate factor of 2.8 Lbs/SF.

(2) 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.

(3) 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.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications, 8th Edition (2017) and Current Interims.

See applicable rail details for rail anchorage in slab.

Cover dimensions are clear dimensions, unless noted otherwise.

MATERIAL NOTES:

Provide Class S concrete (f'c = 4,000 psi).

Provide Grade 60 reinforcing steel.

Provide bar laps, where required, as follows:
Uncoated ~ #4 = 1'-7"

Deformed welded wire reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars A or T unless noted otherwise.

HL93 LOADING

STATE OF TEXAS
JORGE A. MADRIGAL
97243
LICENSED PROFESSIONAL ENGINEER
6/2/2022

THE COUNTY OF HIDALGO TEXAS

L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105
2100 W. Expressway 83
Mercedes, TX. 78570
Phone : (956) 565-9813
Fax : (956) 565-9018
900 S. Stewart Rd., Ste. 10
Mission, TX. 78572
Phone : (956) 583-1909
Fax : (956) 585-1927

40.00' PRESTRESSED CONC. SLAB BEAM SPAN

HCID#6 CANAL BRIDGE

SHEET 1 OF 1

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					299
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:		PHR	HIDALGO	0921	02	194		LIBERTY
TR:								
CK TR:								

DATE: 6/2/2022 2:49:49 PM
FILE: K:\Counties\HID\Liberty Rd (US83 to Mile 3)\06 BRIDGES\Slab Bm Unit\Slab Bm Unit1.dgn

DISCLAIMER:
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:
FILE:

DESIGNED BEAMS (STRAIGHT STRANDS)

STRUCTURE	SPAN NO.	BEAM NO.	BEAM TYPE	PRESTRESSING STRANDS: NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	PRESTRESSING STRANDS: SIZE (in)	PRESTRESSING STRANDS: STRGTH fpu (ksi)	PRESTRESSING STRANDS: "e" ℄ (in)	PRESTRESSING STRANDS: "e" END (in)	PRESTRESSING STRANDS: TOT NO. DEB	DEBONDED STRANDS PER ROW: DIST FROM BOTTOM (in)	DEBONDED STRANDS PER ROW: NO. OF STRANDS: TOTAL	DEBONDED STRANDS PER ROW: NO. OF STRANDS: DE-BONDED	DEBONDED STRANDS PER ROW: NUMBER OF STRANDS DEBONDED TO (ft from end): 3	6	9	12	15	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)
HC1D#6 CANAL BRIDGE	1	1	5SB12		18	0.6	270	3.50	3.50	0	0.00	0	0	0	0	0	0	0	4.000	5.000
	1	2	5SB12		18	0.6	270	3.50	3.50	0	0.00	0	0	0	0	0	0	0	4.000	5.000
	1	3	5SB12		18	0.6	270	3.50	3.50	0	0.00	0	0	0	0	0	0	0	4.000	5.000
	1	4	5SB12		16	0.6	270	3.50	3.50	0	0.00	0	0	0	0	0	0	0	4.000	5.000
	1	5	5SB12		16	0.6	270	3.50	3.50	0	0.00	0	0	0	0	0	0	0	4.000	5.000
	1	6	4SB12		14	0.6	270	3.50	3.50	0	0.00	0	0	0	0	0	0	0	4.000	5.000
	1	7	4SB12		14	0.6	270	3.50	3.50	0	0.00	0	0	0	0	0	0	0	4.000	5.000
	1	8	4SB12		14	0.6	270	3.50	3.50	0	0.00	0	0	0	0	0	0	0	4.000	5.000
	1	9	4SB12		14	0.6	270	3.50	3.50	0	0.00	0	0	0	0	0	0	0	4.000	5.000
	1	10	4SB12		14	0.6	270	3.50	3.50	0	0.00	0	0	0	0	0	0	0	4.000	5.000
	1	11	4SB12		14	0.6	270	3.50	3.50	0	0.00	0	0	0	0	0	0	0	4.000	5.000
	1	12	4SB12		14	0.6	270	3.50	3.50	0	0.00	0	0	0	0	0	0	0	4.000	5.000
	1	13	4SB12		14	0.6	270	3.50	3.50	0	0.00	0	0	0	0	0	0	0	4.000	5.000
	1	14	4SB12		14	0.6	270	3.50	3.50	0	0.00	0	0	0	0	0	0	0	4.000	5.000
	1	15	4SB12		14	0.6	270	3.50	3.50	0	0.00	0	0	0	0	0	0	0	4.000	5.000
	1	16	5SB12		16	0.6	270	3.50	3.50	0	0.00	0	0	0	0	0	0	0	4.000	5.000
	1	17	5SB12		18	0.6	270	3.50	3.50	0	0.00	0	0	0	0	0	0	0	4.000	5.000

OPTIONAL DESIGN

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) Moment	LIVE LOAD DISTRIBUTION FACTOR (2) Shear
2.237	-2.837	827	0.431	0.431
2.236	-2.841	829	0.431	0.431
2.236	-2.841	829	0.431	0.431
2.161	-2.654	772	0.431	0.431
2.137	-2.606	747	0.410	0.410
2.197	-2.729	648	0.370	0.370
2.167	-2.669	623	0.349	0.349
2.167	-2.669	623	0.349	0.349
2.172	-2.681	628	0.352	0.352
2.174	-2.685	629	0.353	0.353
2.171	-2.677	626	0.351	0.351
2.171	-2.677	626	0.351	0.351
2.171	-2.677	626	0.351	0.351
2.171	-2.677	626	0.351	0.351
2.245	-2.851	679	0.372	0.372
2.176	-2.704	778	0.412	0.412
2.201	-2.747	801	0.433	0.433

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF BEAM

(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.

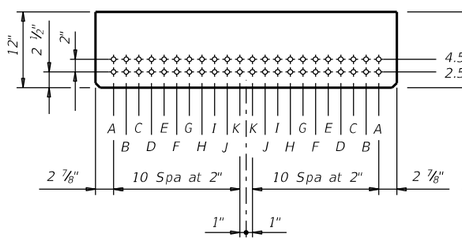
DESIGN NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
Prestress losses for the designed beams have been calculated for a relative humidity of percent. Optional designs must likewise conform.

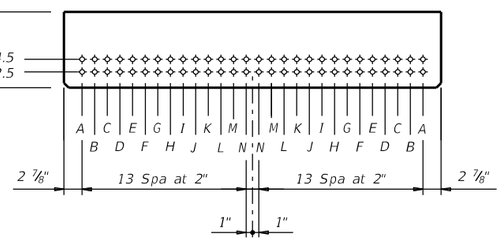
FABRICATION NOTES:

Provide Class H concrete.
Provide Grade 60 reinforcing steel.
Use low relaxation strands, each pretensioned to 75 percent of fpu.
Full-length debonded strands are not permitted in positions "A" and "B".
Strand debonding must comply with Item 424.4.2.2.2.4.
When shown on this sheet, the Fabricator has the option of furnishing either the designed beam or an approved optional beam design. All optional design submittals and shop drawings must be signed, sealed and dated by a Professional Engineer registered in the State of Texas.
Locate strands for the designed beam 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". Place strands within a row as follows:
1) Locate a strand in each "A" position.
2) Place strand symmetrically about vertical centerline of beam.
3) Space strands as equally as possible across the entire width.
Do not debond strands in position "A". Distribute debonded strands symmetrically about the vertical centerline. Increase debonded lengths working outward, with debonding staggered in each row.

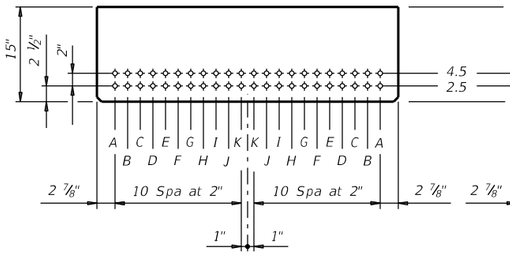
HL93 LOADING



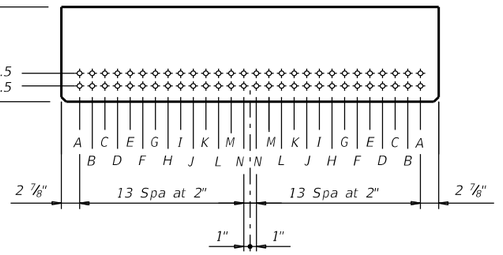
TxDOT 4SB12 SLAB BEAM



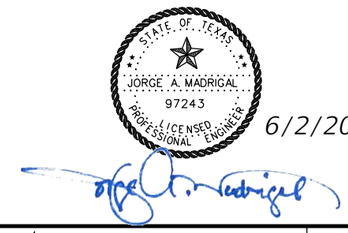
TxDOT 5SB12 SLAB BEAM



TxDOT 4SB15 SLAB BEAM



TxDOT 5SB15 SLAB BEAM



Texas Department of Transportation

Bridge Division Standard

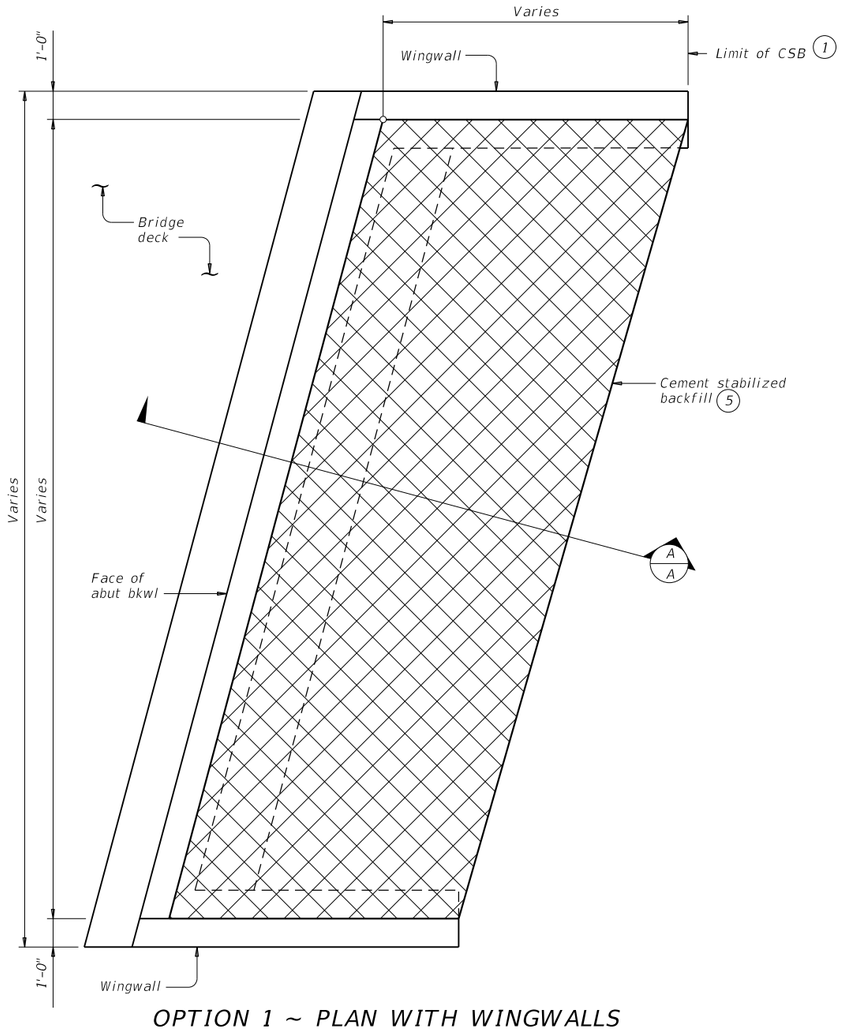
PRESTRESSED CONCRETE SLAB BEAMS (NON-STANDARD SPANS)

PSBND

FILE: psbsts05-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		300

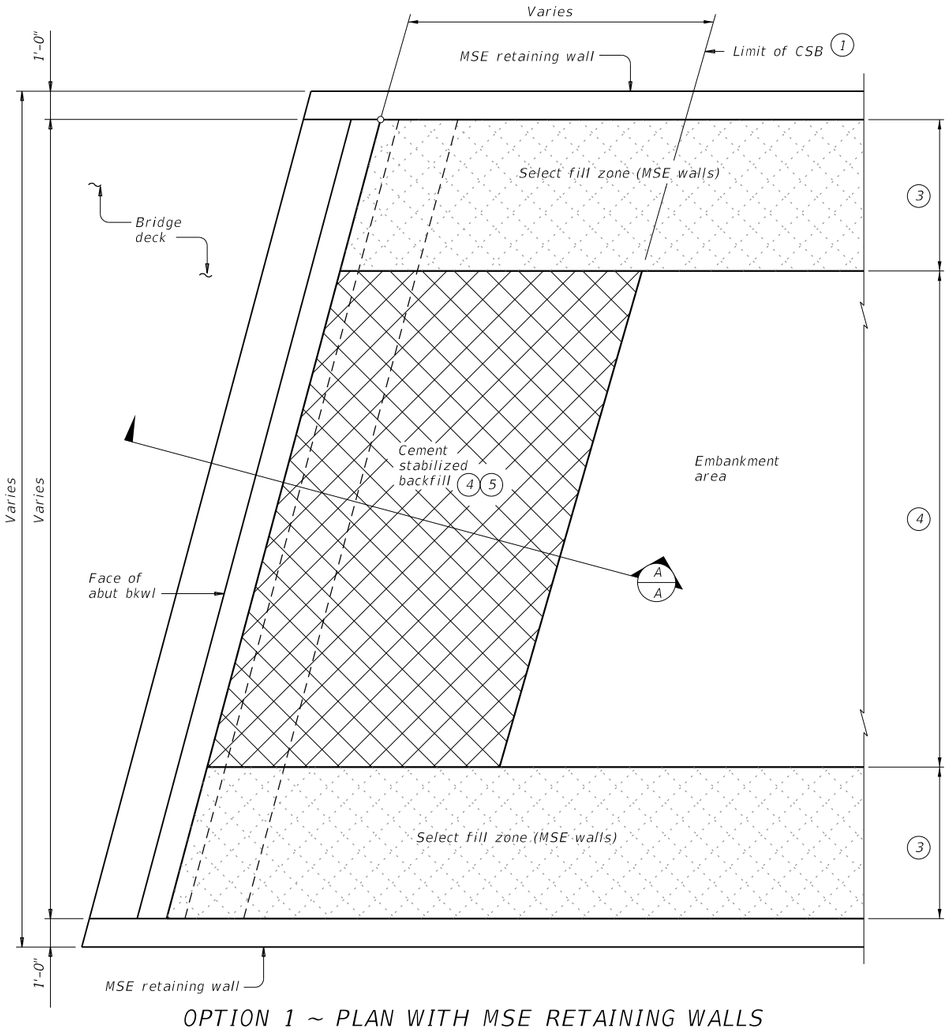
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

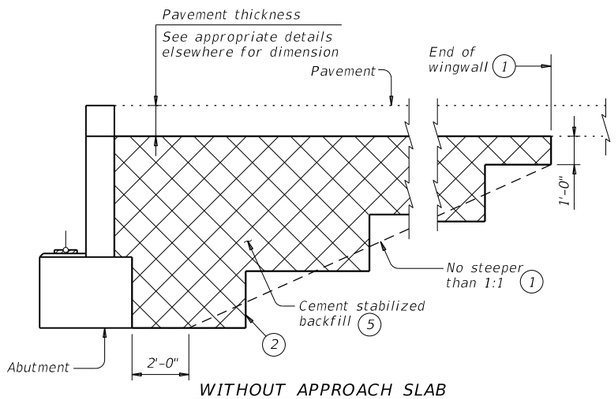


OPTION 1 ~ PLAN WITH WINGWALLS

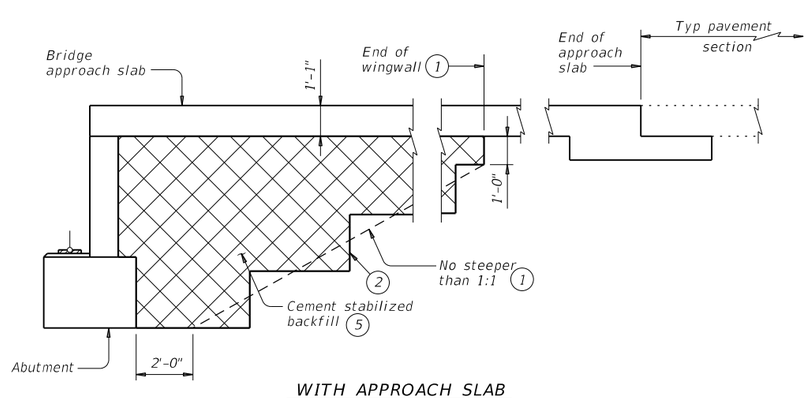
Cast-in-place retaining walls similar.



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.

Texas Department of Transportation

Bridge Division Standard

CEMENT STABILIZED ABUTMENT BACKFILL

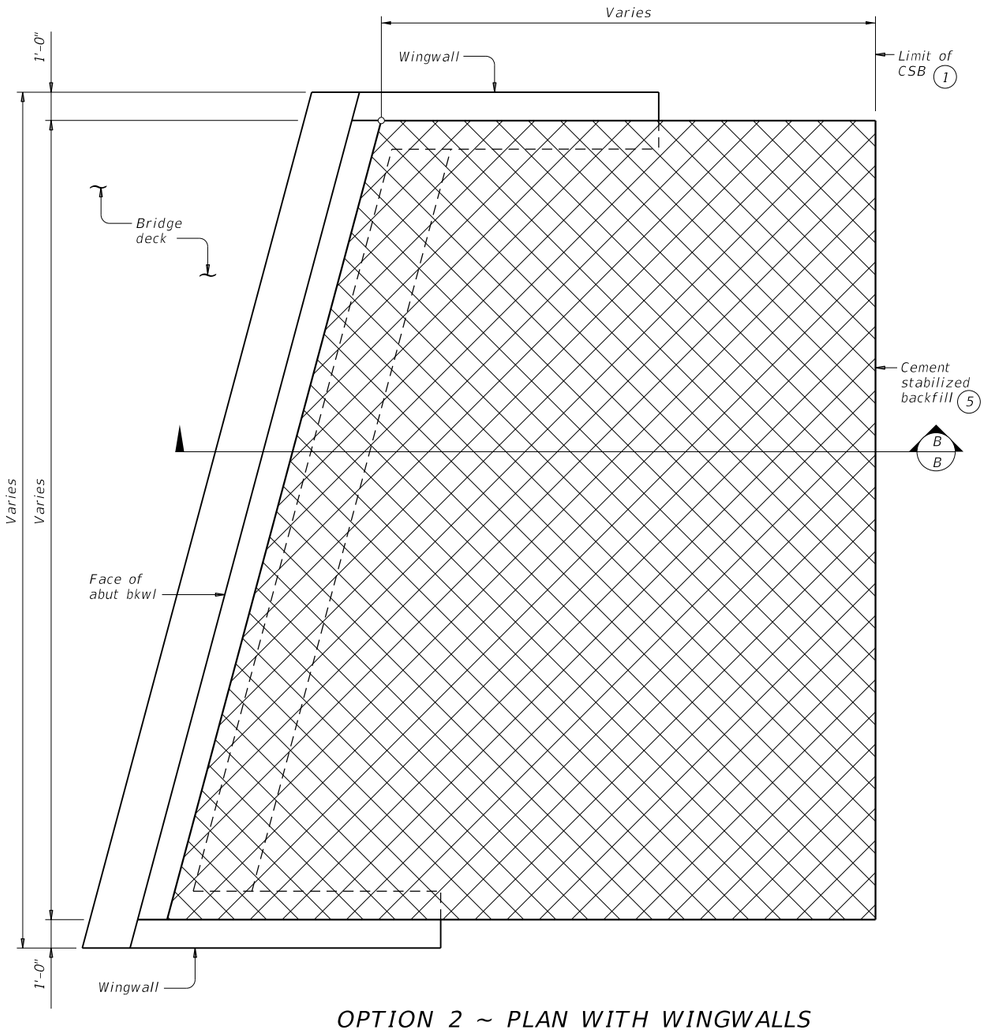
BRIDGE ABUTMENT

CSAB

FILE: csabste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
02-20: Added Option 2.	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		301

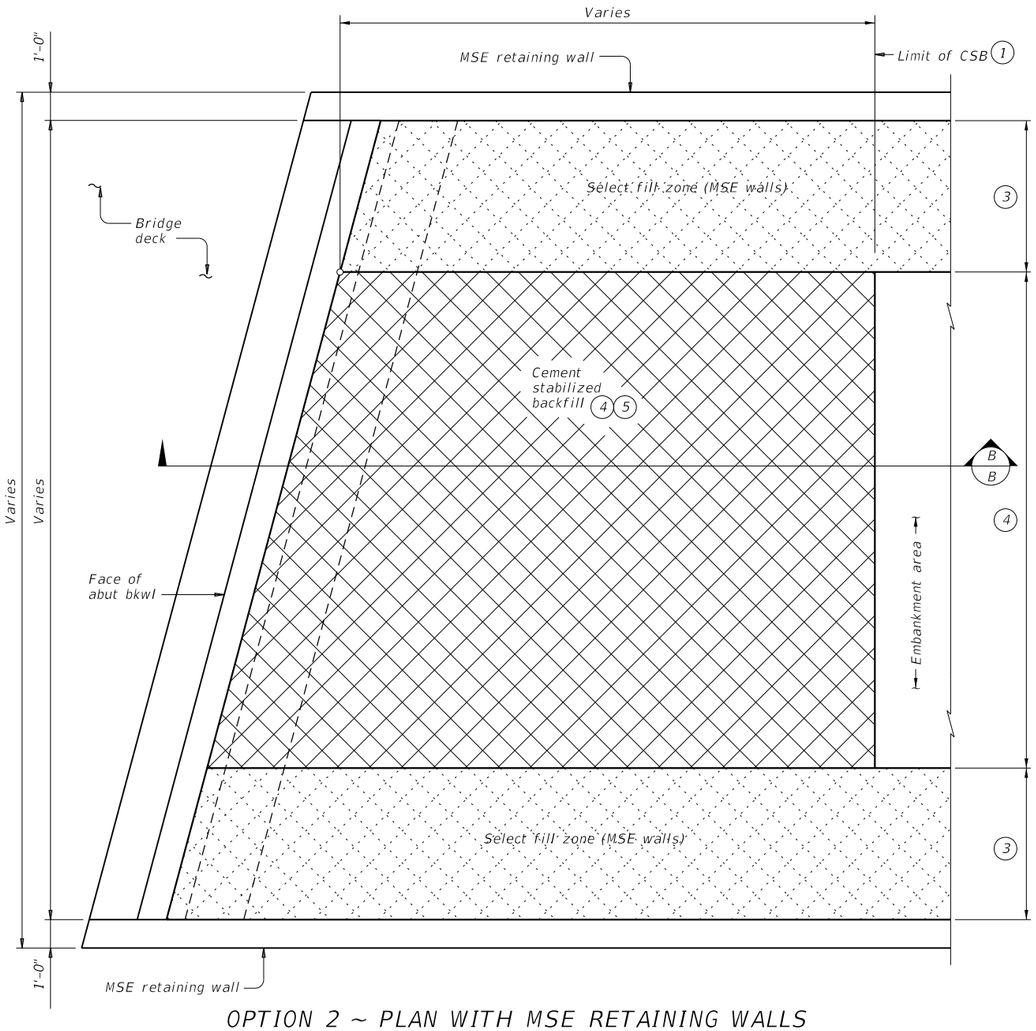
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:



OPTION 2 ~ PLAN WITH WINGWALLS

Cast-in-place retaining walls similar.



OPTION 2 ~ PLAN WITH MSE RETAINING WALLS

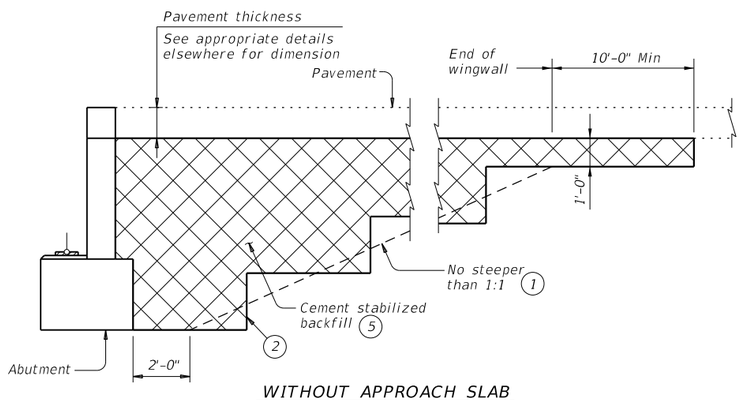
(1) *Usual limit of Cement Stabilized Backfill is at end of wingwall. Extend CSB limits as required to maintain a slope no steeper than 1:1 at bottom of backfill.*

(2) *Bench backfill as shown with 12" (approximate) bench depths.*

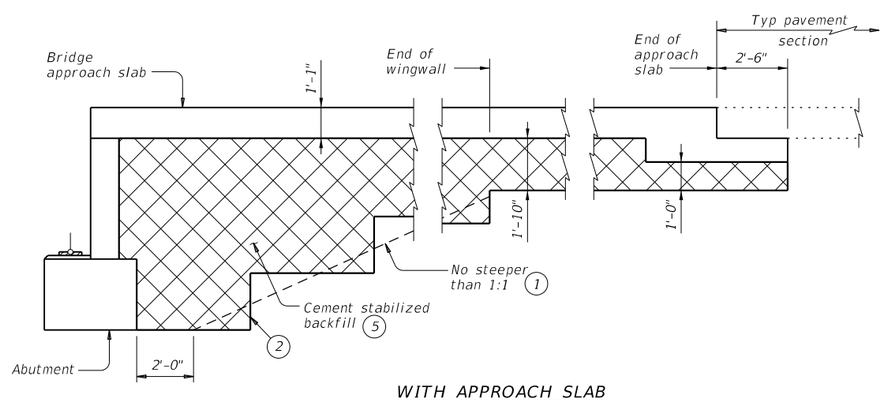
(3) *Where MSE retaining walls are present, adjust CSB limits to accommodate the select fill zone. See retaining wall details for additional information.*

(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).



WITHOUT APPROACH SLAB



WITH APPROACH SLAB

(Showing BAS-C, BAS-A similar.)

SECTION B-B

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

CEMENT STABILIZED ABUTMENT BACKFILL

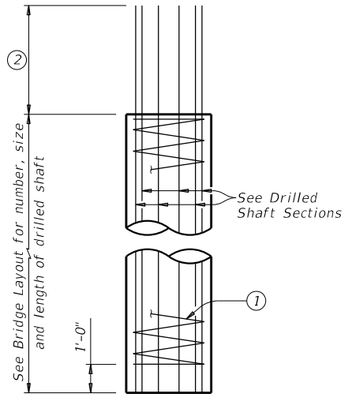
BRIDGE ABUTMENT

CSAB

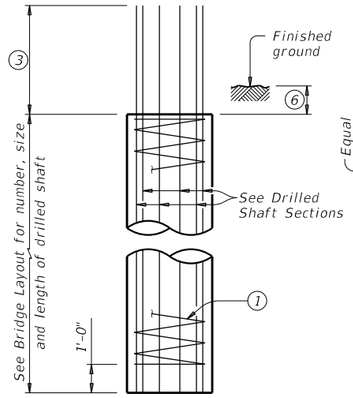
FILE: csabste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
02-20: Added Option 2.	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		302

DISCLAIMER:
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.

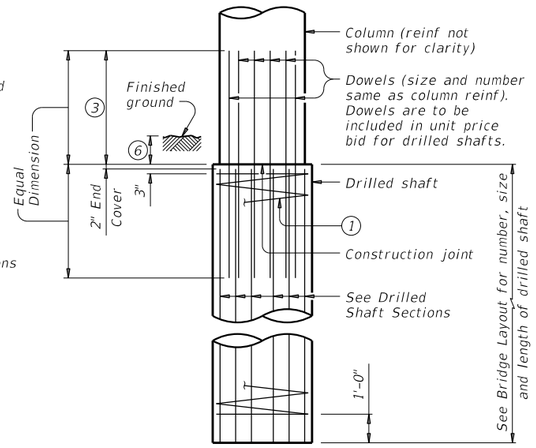
DATE:
FILE:



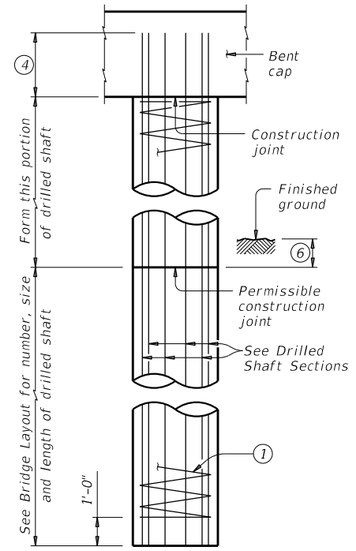
ABUTMENTS, WINGWALLS AND MULTI-DRILLED SHAFT FOOTINGS



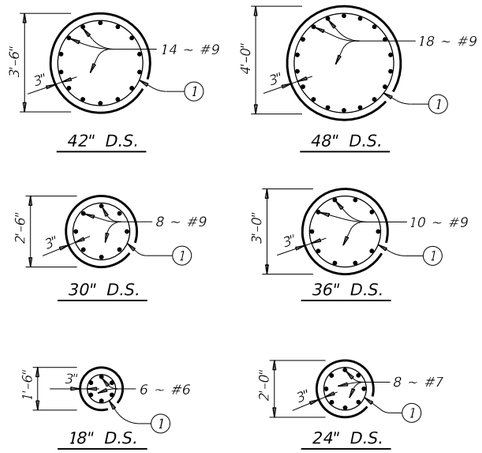
INTERIOR BENTS DRILLED SHAFT DIA EQUAL TO COLUMN DIA



INTERIOR BENTS DRILLED SHAFT DIA GREATER THAN COLUMN DIA



OPTIONAL INTERIOR BENT DRILLED SHAFT DETAIL (5)

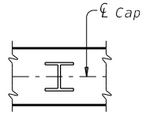


DRILLED SHAFT SECTIONS

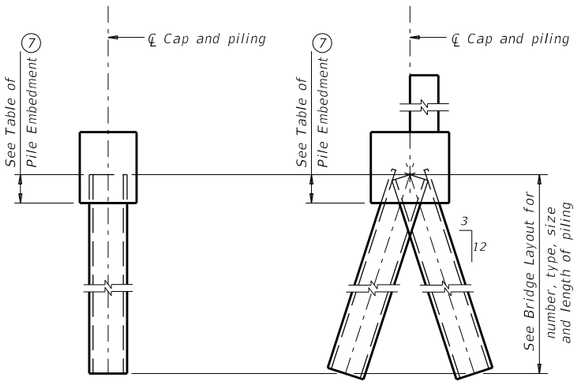
DRILLED SHAFT DETAILS

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.



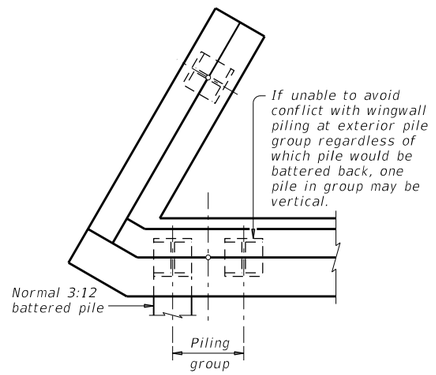
ORIENTATION OF STEEL H-PILING



VERTICAL PILE BATTERED PILE

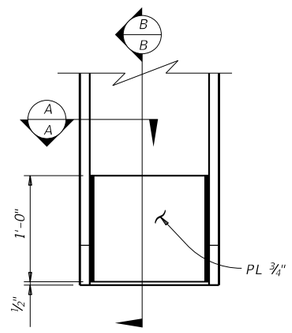
PILING DETAILS

(Concrete or steel H)

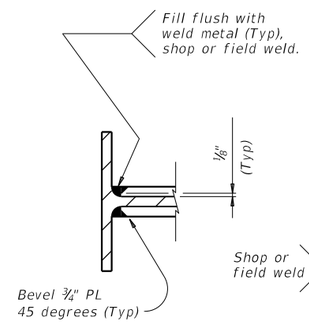


DETAIL "A"

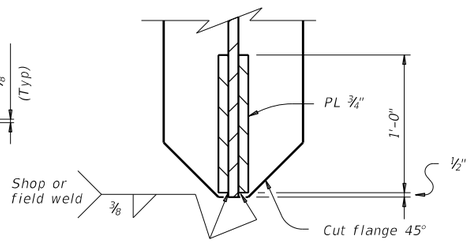
(Showing plan view of a 30° skewed abutment)



ELEVATION



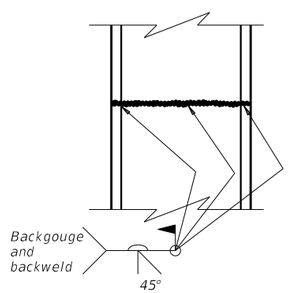
SECTION A-A

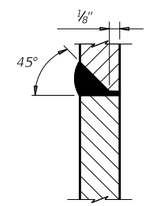


SECTION B-B

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.

Texas Department of Transportation

Bridge Division Standard

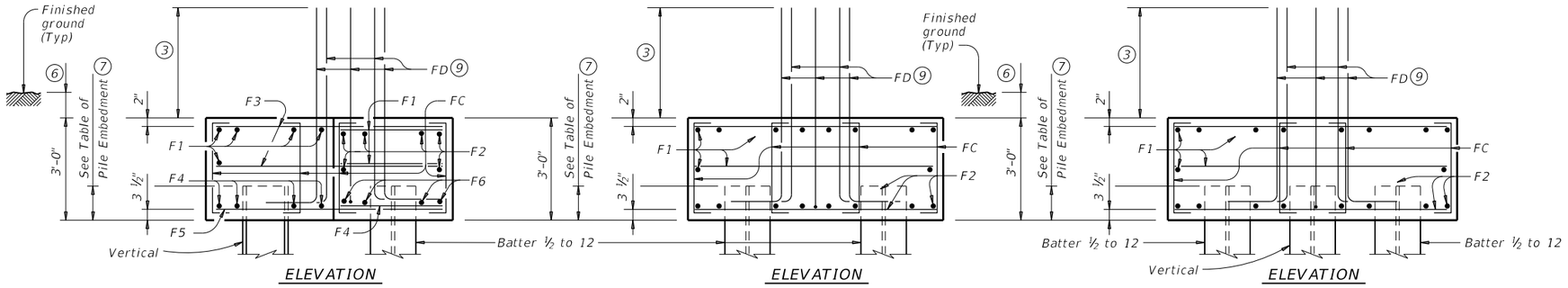
COMMON FOUNDATION DETAILS

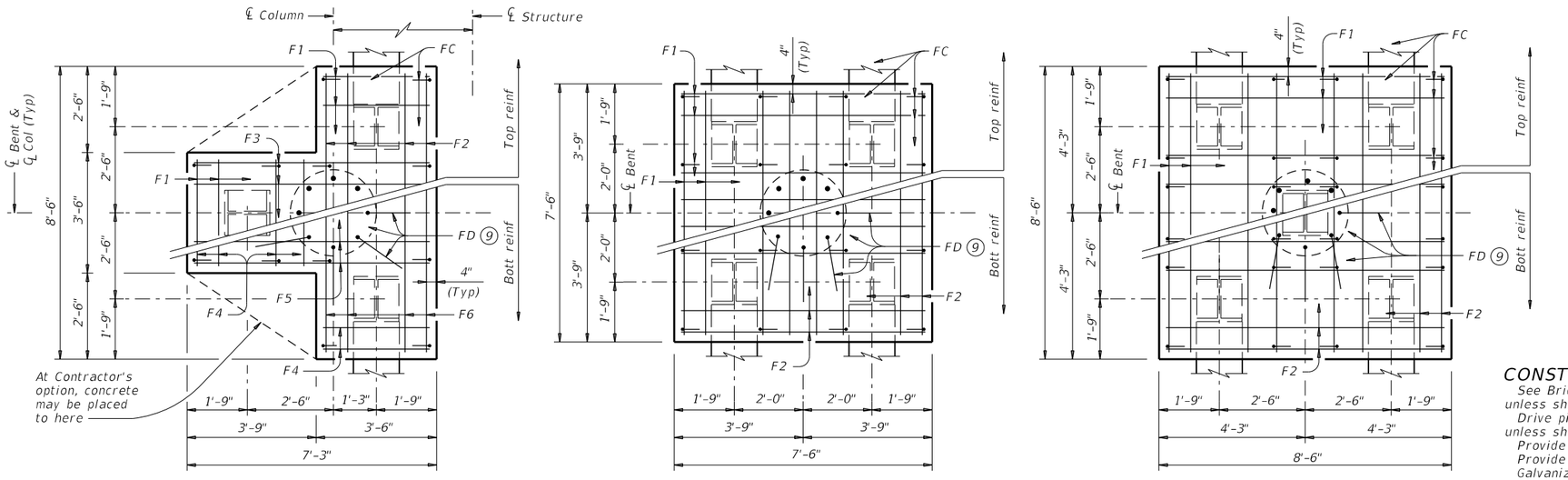
FD

FILE: fdstde01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
01-20: Added #11 bars to the FD bars.	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		303

DISCLAIMER:
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:
FILE:





THREE PILE FOOTING (8)

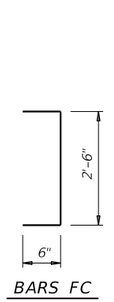
For 36" Dia and smaller columns.

FOUR PILE FOOTING (8)

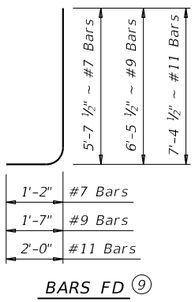
For 42" Dia and smaller columns.

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

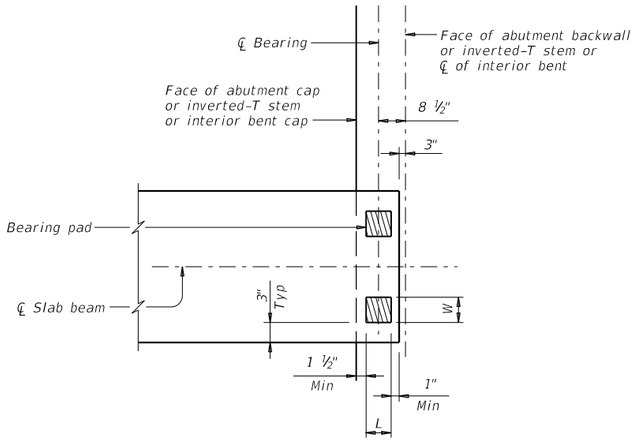
COMMON FOUNDATION DETAILS

FD

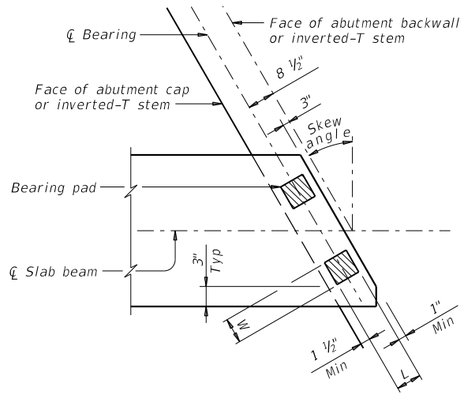
FILE: fdstde01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
01-20: Added #11 bars to the FD bars.	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		304

DISCLAIMER:
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.

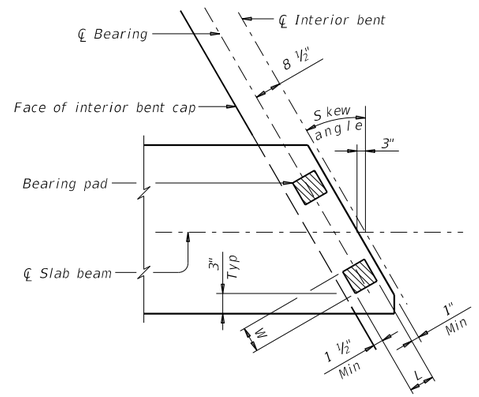
DATE:
FILE:



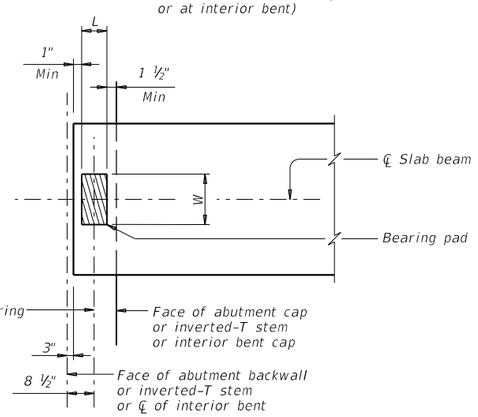
TWO-PAD DETAIL PLAN
(At abutment or inverted-T cap or at interior bent)



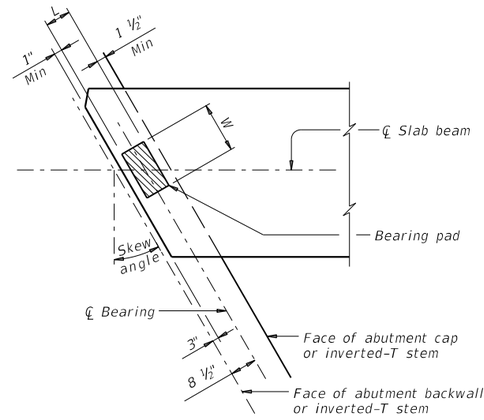
TWO-PAD DETAIL SKEW PLAN
(At abutment or inverted-T cap)



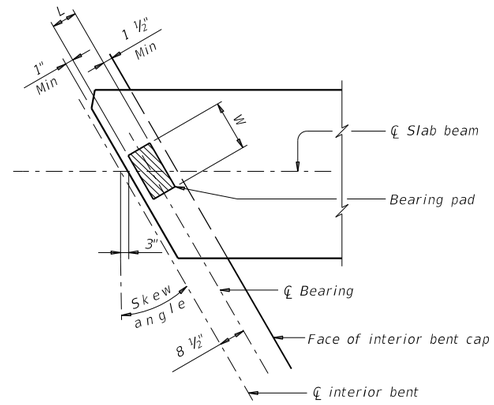
TWO-PAD DETAIL SKEW PLAN
(At interior bent)



ONE-PAD DETAIL PLAN
(At abutment or inverted-T cap or at interior bent)



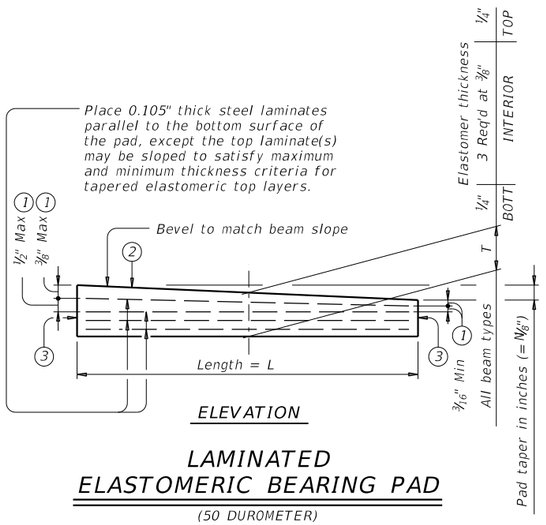
ONE-PAD DETAIL SKEW PLAN
(At abutment or inverted-T cap)



ONE-PAD DETAIL SKEW PLAN
(At interior bent)

ELASTOMERIC BEARING PAD PLACEMENT AND BEAM END DIAGRAMS

Place one bearing pad at forward station beam end.
Place two bearing pads at back station beam end.



ELEVATION

LAMINATED ELASTOMERIC BEARING PAD

(50 DUROMETER)

(1) Maximum and minimum layer thicknesses shown are for elastomer only, on tapered layers.

(2) 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 beam slope by more than $\left(\frac{0.0625"}{Length}\right)$ IN/IN.

(3) Locate permanent mark here.

TABLE OF BEARING PAD DIMENSIONS (ALL PRESTR CONC SLAB BM TYPES)

One-Pad (Ty SB1-"N") (2)			Two-Pad (Ty SB2-"N") (2)		
W	L	T	W	L	T
14"	7"	2"	7"	7"	2"

Pad sizes shown are applicable for the following conditions:

(1) All one, two and three span units where the minimum span length is not less than 25' and the maximum span is not more than 50'.
(2) Skews less than or equal to 30°.

GENERAL NOTES:

These details accommodate skew angles up to 30°.

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 must be included in unit price bid for "Prestressed Concrete Slab Beams".

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

ELASTOMERIC BEARING AND BEAM END DETAILS

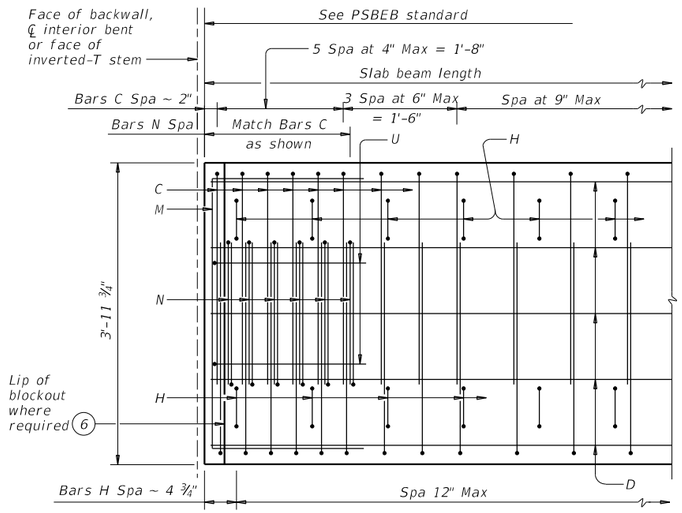
PRESTR CONCRETE SLAB BEAM

PSBEB

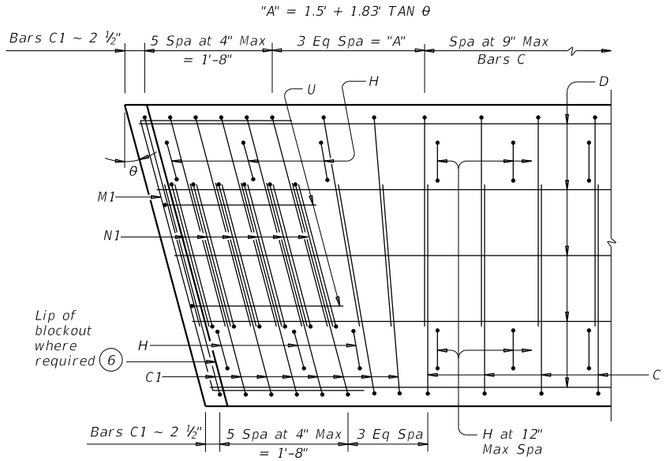
FILE: psbste06-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		305

DISCLAIMER:
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:
FILE:

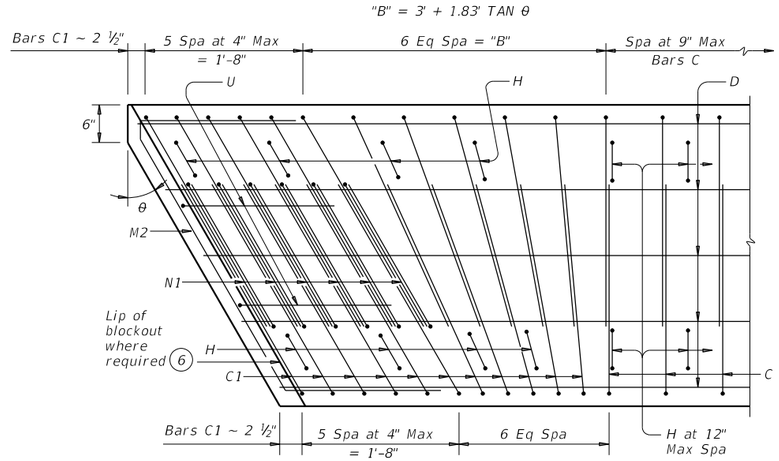


PART PLAN



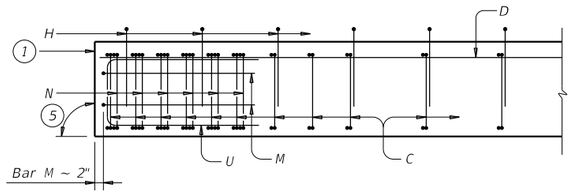
PART SKEW PLAN

(Showing θ over 0° to 15° Skew)

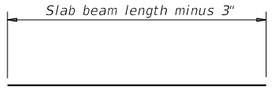


PART SKEW PLAN

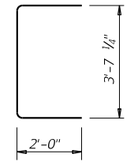
(Showing θ over 15° to 30° Skew)



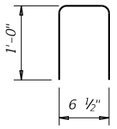
ELEVATION



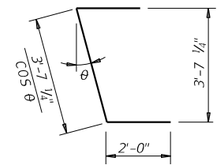
BARS D(#6)



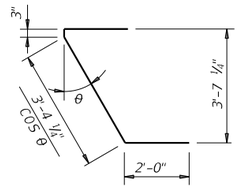
BARS M(#4)



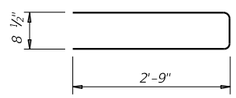
BARS H(#4)



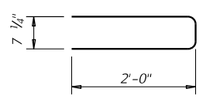
BARS M1(#4)



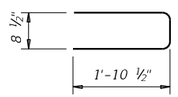
BARS M2(#4)



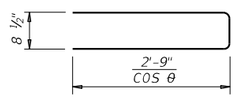
BARS C(#4)



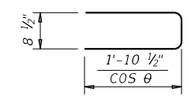
BARS U(#5)



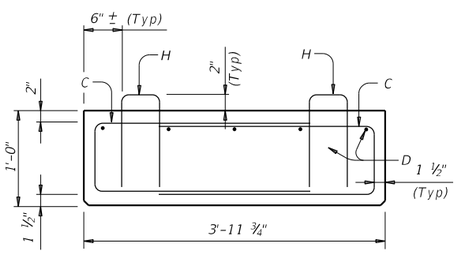
BARS N(#4)



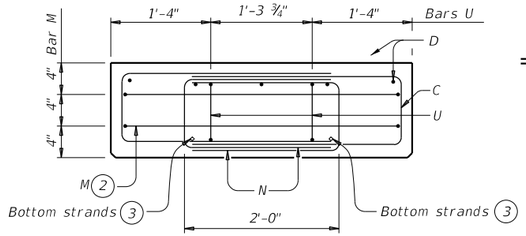
BARS C1(#4)



BARS N1(#4)

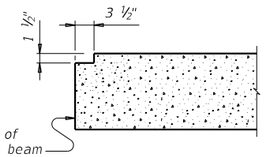


SECTION



END MAT REINFORCING

Bars H not shown for clarity.



ELEVATION OF BLOCKOUT 6

BEAM PROPERTIES		
Area	in^2	573.0
Y top	in	6.00
Y bott	in	6.00
I	in^4	6,876
Weight 4	lb/ft	597

1. See End Mat Reinforcing detail.
2. Adjust bars M vertically to avoid strands.
3. See sheet PSBND or PSBSD for strand locations.
4. Assumes 150 pcf weight density of concrete.
5. 90° at conventional interior bents. End of beam must be vertical at abutment backwall and inverted-T stem.
6. Blockout required at armor joint (AJ) and sealed expansion joint (SEJ) locations to accommodate joint anchorage.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

Provide Class H concrete. Provide Class H (HPC) if shown elsewhere in the plans.

Provide Grade 60 reinforcing steel.

An equal area of welded wire reinforcement (WWR) (ASTM 1064) may be substituted for bars C and D if approved by the Engineer.

These details can be used for any skew angle up to a maximum of 30 degrees.

Chamfer all exposed corners ¾" or round to a ¾" radius.

Details are drawn showing right forward skew. See Bridge Layout for actual direction.

Cover dimensions are clear dimensions, unless noted otherwise.

Reinforcing bar dimensions shown are out-to-out of bar.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE SLAB BEAM DETAILS

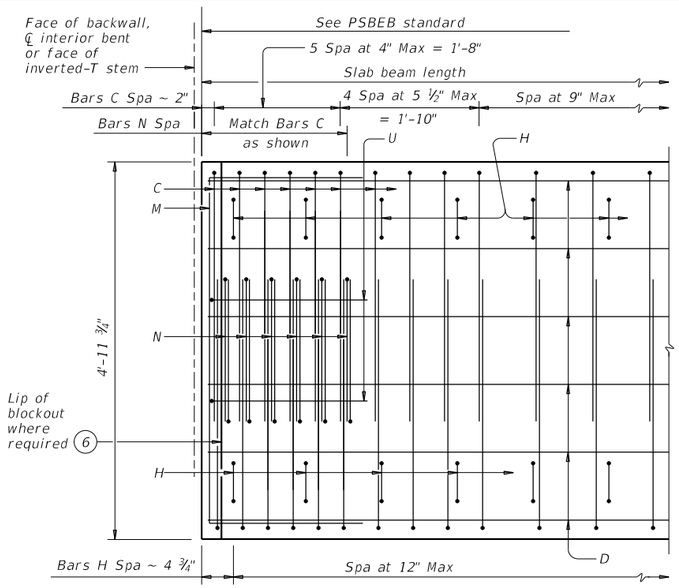
(TYPE 4SB12)

PSB-4SB12

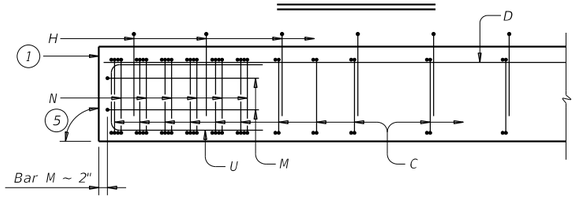
FILE: psbsts01-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		306

DISCLAIMER:
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.

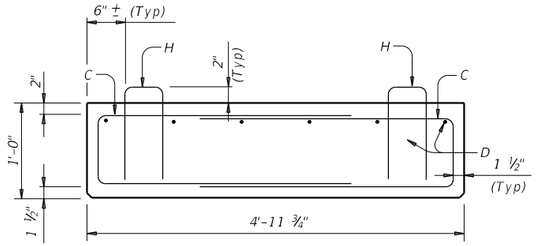
DATE:
FILE:



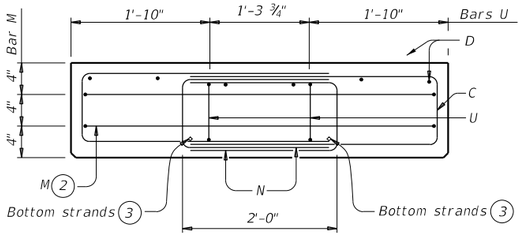
PART PLAN



ELEVATION

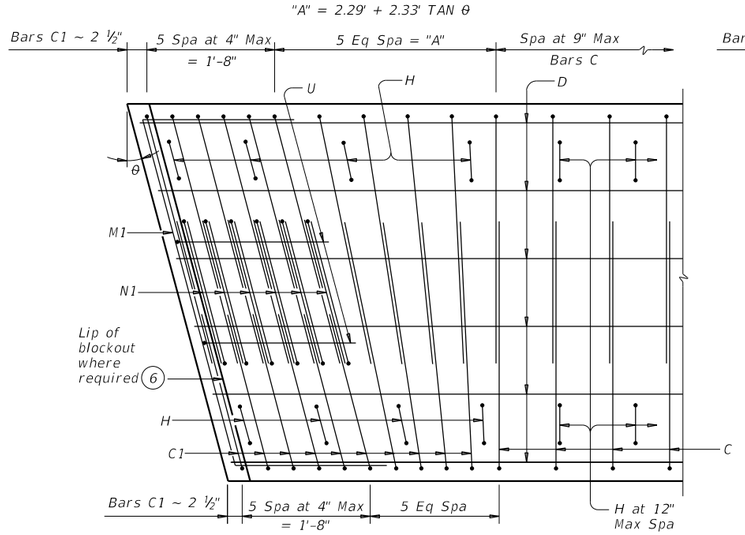


SECTION



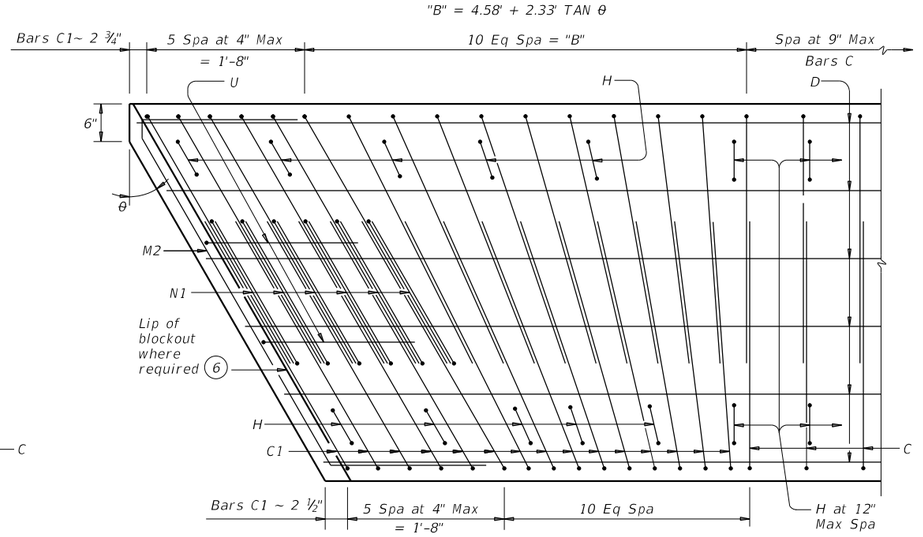
END MAT REINFORCING

Bars H not shown for clarity.



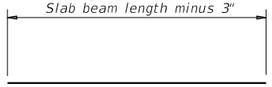
PART SKEW PLAN

(Showing θ over 0° to 15° Skew)

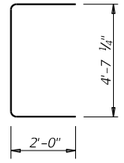


PART SKEW PLAN

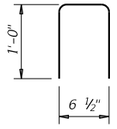
(Showing θ over 15° to 30° Skew)



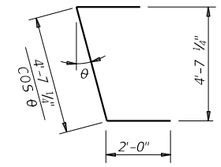
BARS D(#6)



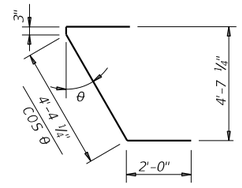
BARS M(#4)



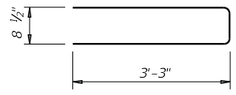
BARS H(#4)



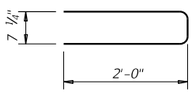
BARS M1(#4)



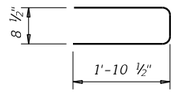
BARS M2(#4)



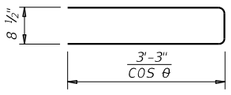
BARS C(#4)



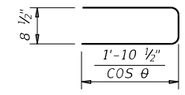
BARS U(#5)



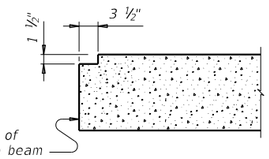
BARS N(#4)



BARS C1(#4)



BARS N1(#4)



ELEVATION OF BLOCKOUT (6)

BEAM PROPERTIES		
Area	in^2	717.0
Y top	in	6.00
Y bott	in	6.00
I	in^4	8,604
Weight (4)	lb/ft	747

(1) See End Mat Reinforcing detail.

(2) Adjust bars M vertically to avoid strands.

(3) See sheet PSBND or PSBSD for strand locations.

(4) Assumes 150 pcf weight density of concrete.

(5) 90° at conventional interior bents. End of beam must be vertical at abutment backwall and inverted-T stem.

(6) Blockout required at armor joint (AJ) and sealed expansion joint (SEJ) locations to accommodate joint anchorage.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

Provide Class H concrete. Provide Class H (HPC) if shown elsewhere in the plans.

Provide Grade 60 reinforcing steel.

An equal area of welded wire reinforcement (WWR) (ASTM 1064) may be substituted for bars C and D if approved by the Engineer.

These details can be used for any skew angle up to a maximum of 30 degrees.

Chamfer all exposed corners ¾" or round to a ¾" radius.

Details are drawn showing right forward skew. See Bridge Layout for actual direction.

Cover dimensions are clear dimensions, unless noted otherwise.

Reinforcing bar dimensions shown are out-to-out of bar.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE SLAB BEAM DETAILS

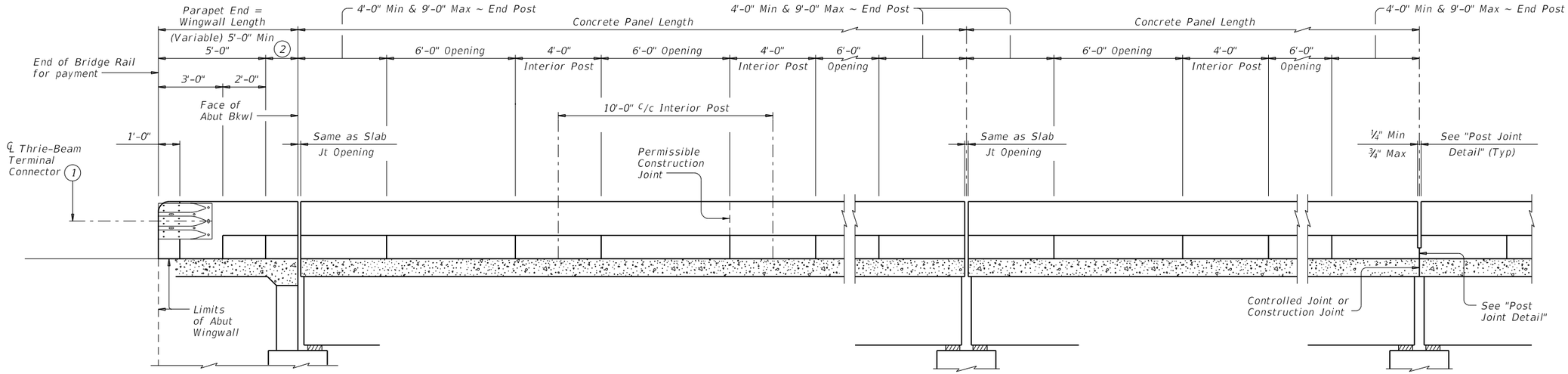
(TYPE 5SB12)

PSB-5SB12

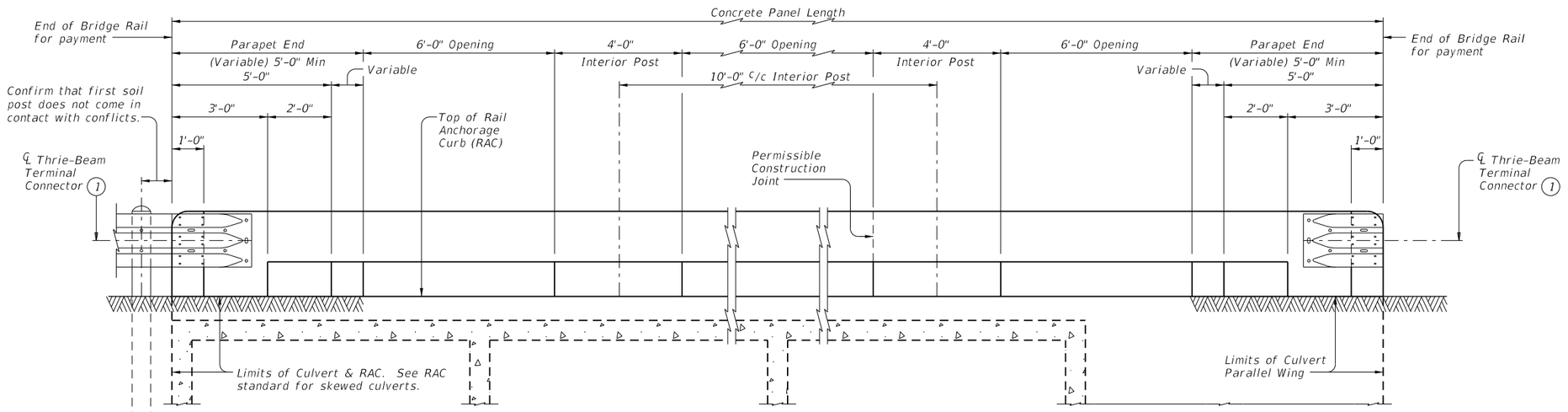
FILE: psbsts03-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2017 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		307

DISCLAIMER:
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:
FILE:



ROADWAY ELEVATION OF RAIL ON BRIDGE



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)*

Texas Department of Transportation

Bridge Division Standard

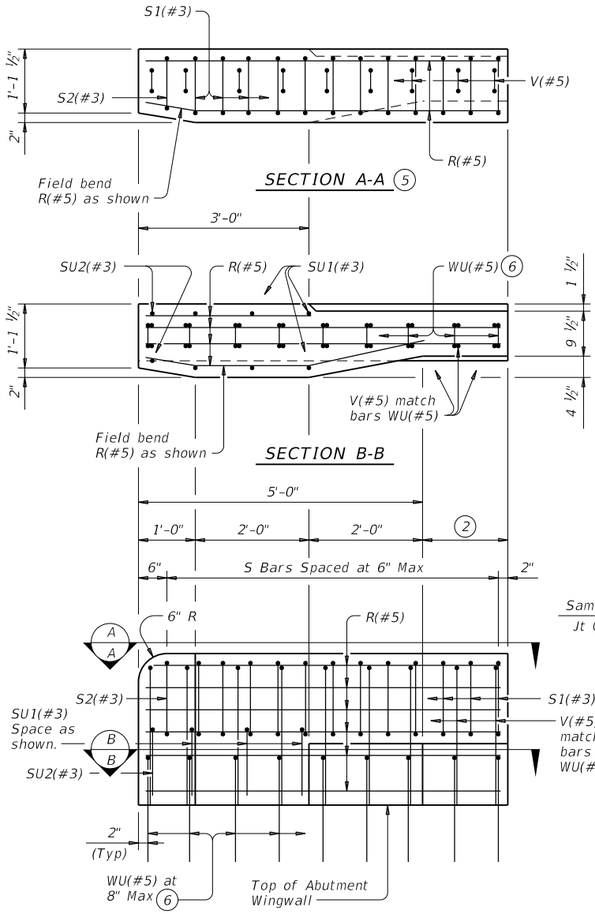
TRAFFIC RAIL

TYPE T223

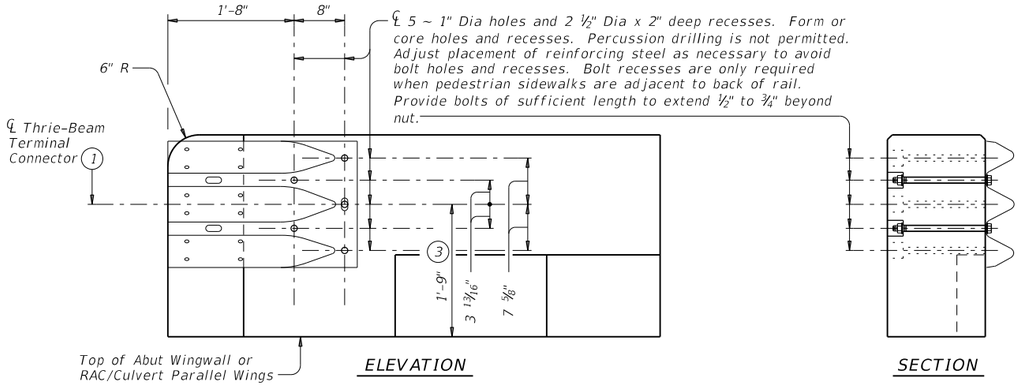
FILE: rlstd005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		308

DISCLAIMER:
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.

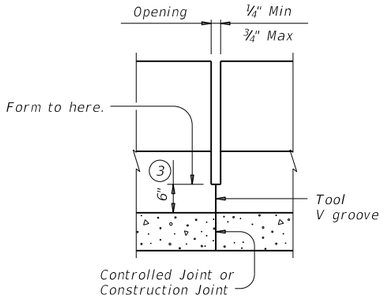
DATE:
FILE:



PARAPET END AT ABUT WINGWALL (6)

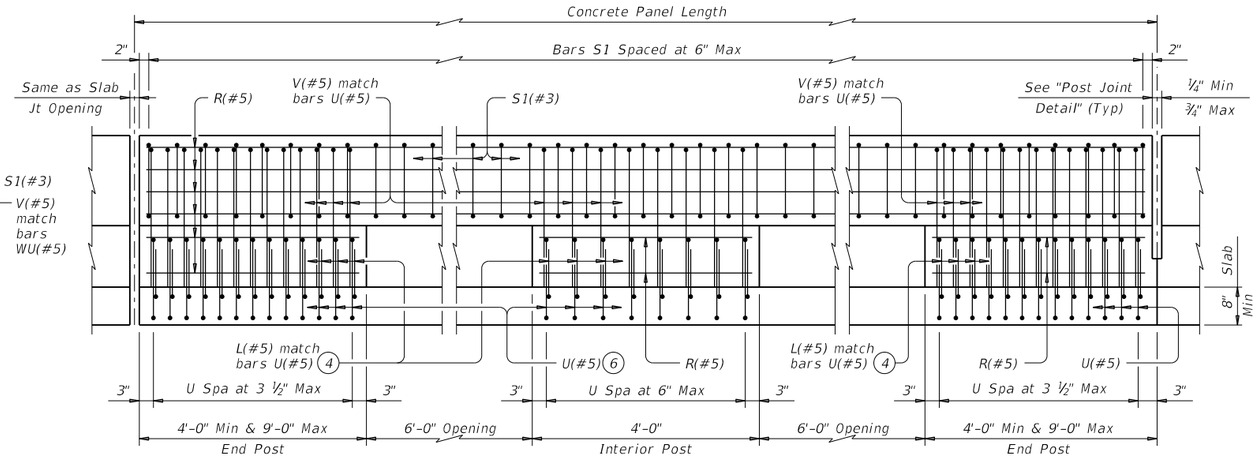


TERMINAL CONNECTION DETAILS



POST JOINT DETAIL

Provide at all interior bents without slab expansion joints.



AT SLAB EXPANSION JOINTS

AT 4' INTERIOR POST

AT BENTS WITHOUT SLAB EXPANSION JOINTS

ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

Showing rail on slab. Rail on box culvert similar.

(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) Increase 2" for structures with overlay.

(4) 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.

(5) Bars SU1(#3), SU2(#3) and WU(#5) not shown for clarity.

(6) Substitute Bars U(#5) for Bars WU(#5) when parapet end is located on achorage curb over culvert top slab. Use Bars WU(#5) in culvert parallel wings.

Texas Department of Transportation

Bridge Division Standard

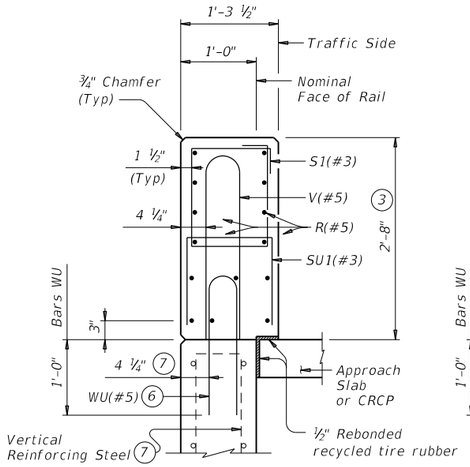
TRAFFIC RAIL

TYPE T223

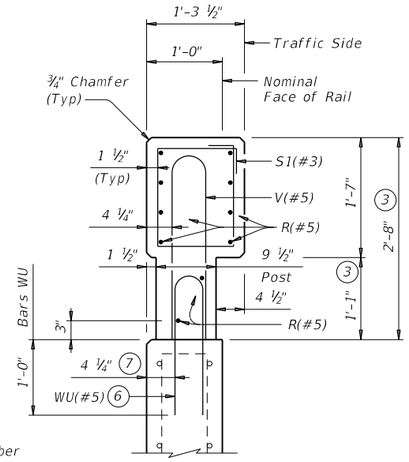
FILE: rlstd005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		309

DISCLAIMER:
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.

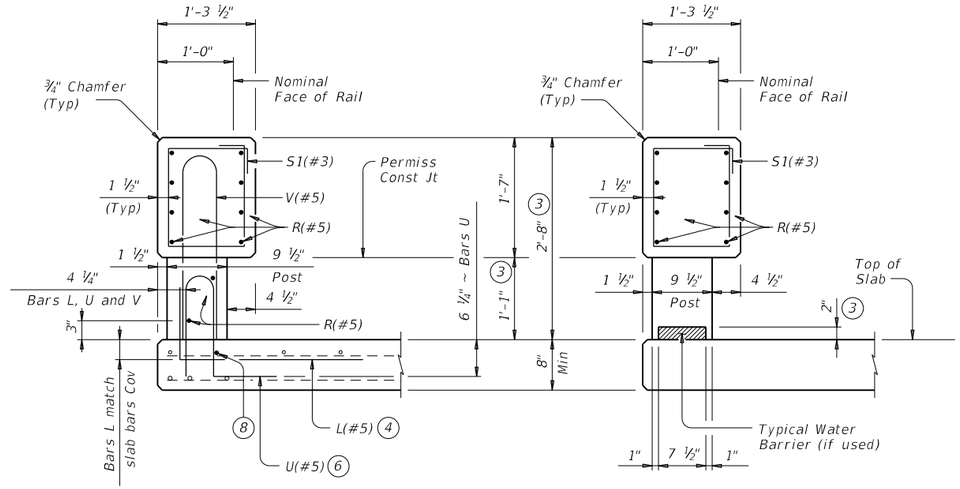
DATE:
FILE:



SECTION C-C
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS



SECTION D-D
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS

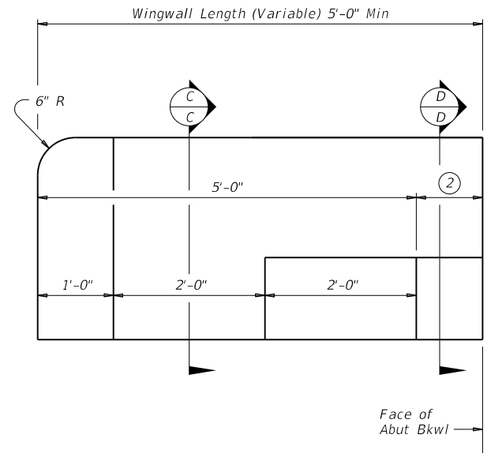


AT POST
ON BRIDGE SLAB

AT OPENING
ON BRIDGE SLAB

SECTIONS THRU RAIL

Sections on box culverts similar.



ELEVATION AT ABUTMENT WINGWALL

Box culvert parallel wings or rail anchorage curb similar.

(2) *Wingwall Length minus 5'-0" (Varies)*

(3) *Increase 2" for structures with overlay.*

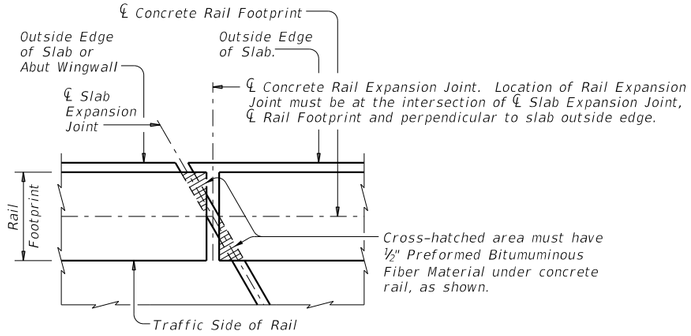
(4) *Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.*

(6) *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.*

(7) *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.*

(8) *Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.*

(9) *At the Contractor's option, Bars V may be replaced by extending Bars U to 2'-5 ¼" above the roadway surface without overlay.*



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

GENERAL NOTES:

Face of rail and parapet must be vertical transversely unless otherwise shown in the plans or approved by the Engineer.

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.

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.

Deformed Welded Wire Reinforcing (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U, V, and WU unless noted otherwise. Provide the same laps as required for reinforcing bars.

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.

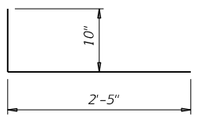
Do not use this railing on bridges with expansion joints providing more than 5" movement.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

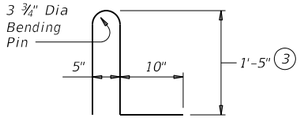
Shop drawings are not required for this rail.

Average weight of railing with no overlay is 358 plf.

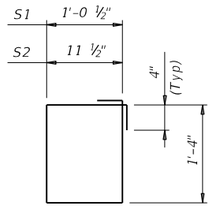
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.



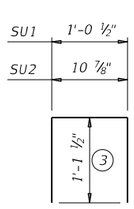
BARS L (#5)



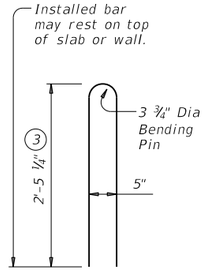
BARS U (#5) (9)



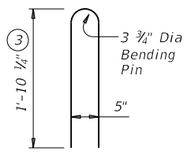
BARS S (#3)



BARS SU (#3)



BARS V (#5) (9)



BARS WU (#5)

SHEET 3 OF 3

Texas Department of Transportation

Bridge Division Standard

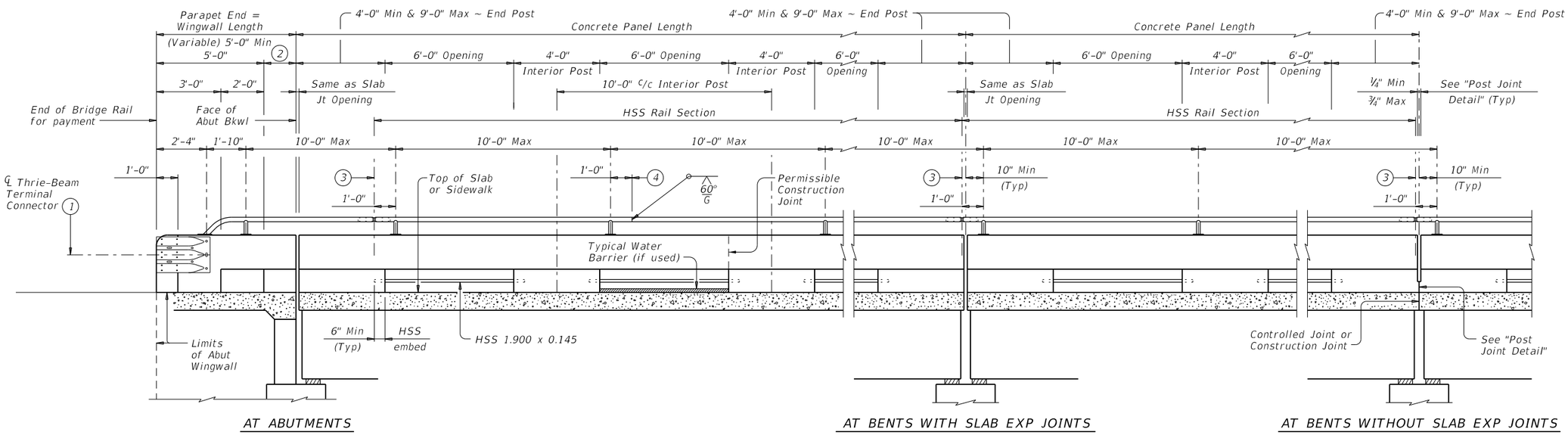
TRAFFIC RAIL

TYPE T223

FILE: rlstd005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		310

DISCLAIMER:
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:
FILE:



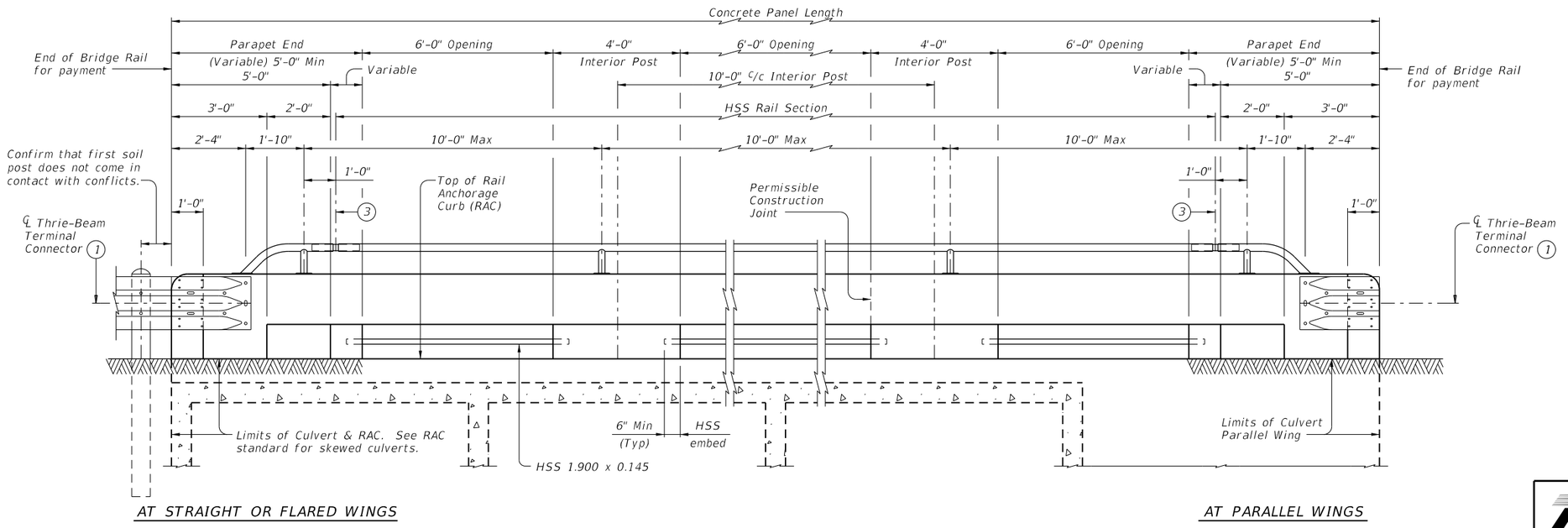
AT ABUTMENTS

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.

SHEET 1 OF 4

Texas Department of Transportation

Bridge Division Standard

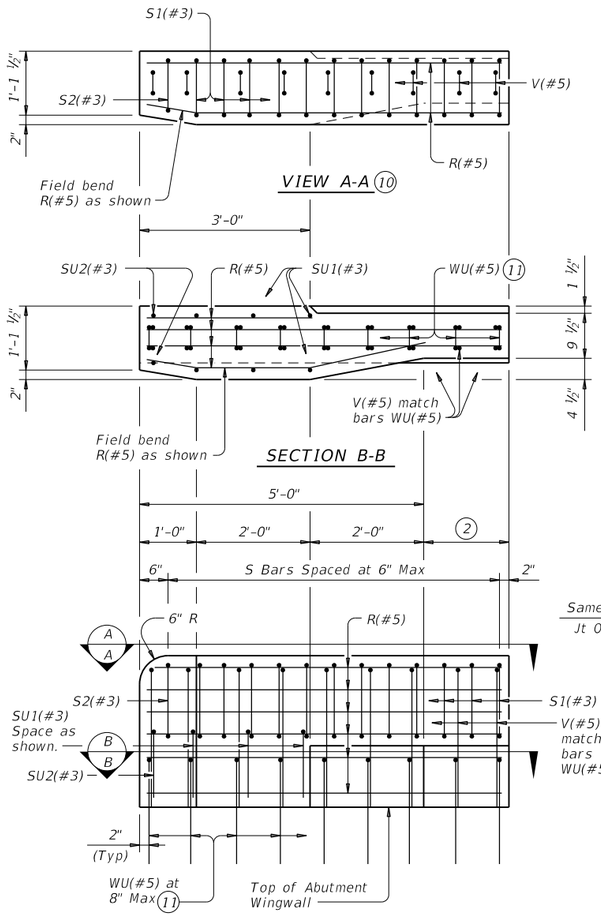
COMBINATION RAIL

TYPE C223

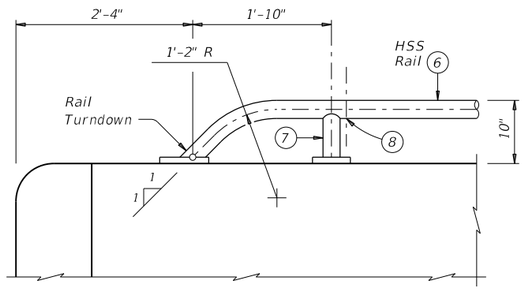
FILE: rlstd019-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		311

DISCLAIMER:
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:
FILE:

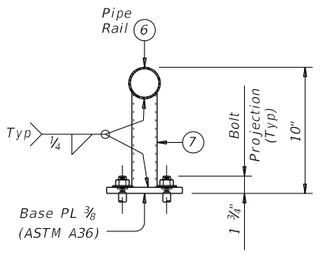


PARAPET END AT ABUT WINGWALL (11)

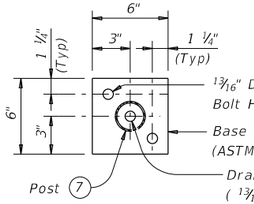


Note that at least two anchor points (as shown) are required for the Bridge Rail on the Abutment Wingwall. Longer Wingwalls may require more than two Rail anchorages.

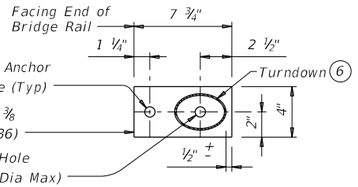
HSS RAIL TERMINAL DETAIL



TRANSVERSE SECTION

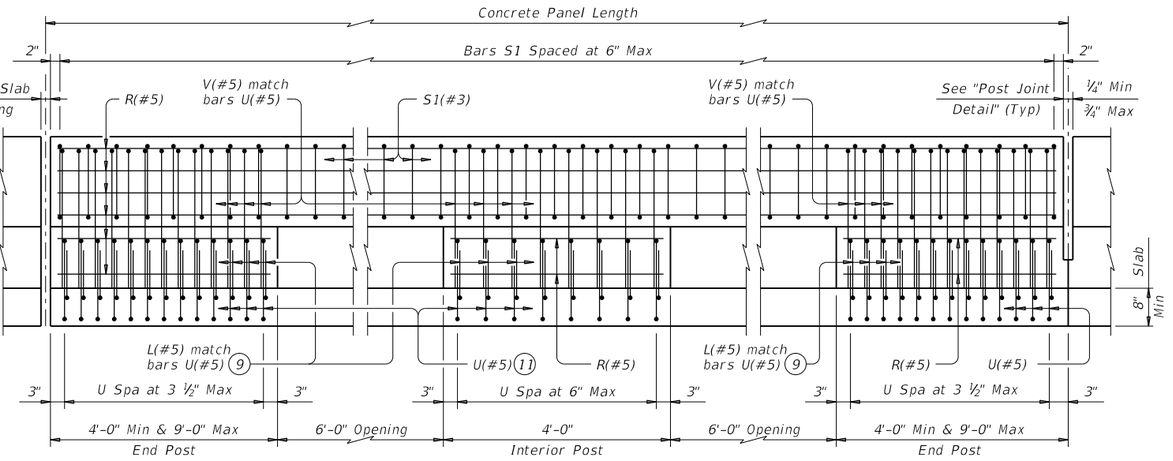


POST BASE PLATE PLAN



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.

(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

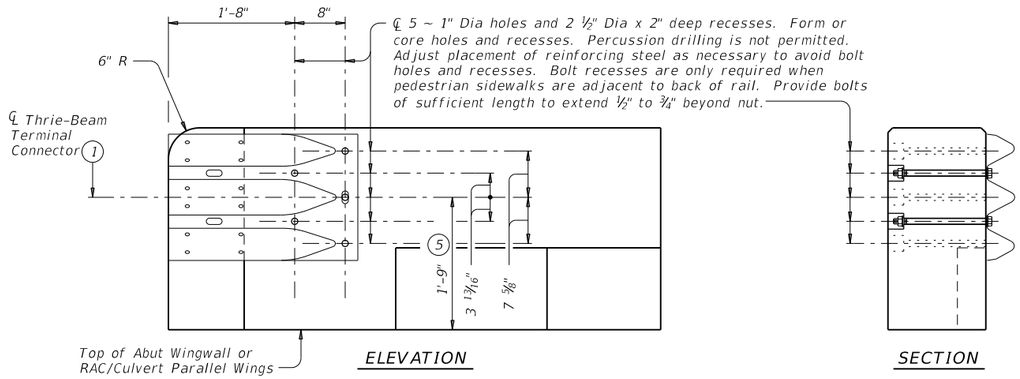
(7) HSS 2.375 x 0.154

(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.

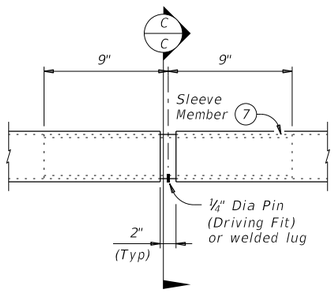
(10) Bars SU1(#3), SU2(#3) and WU(#5) not shown for clarity.

(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.

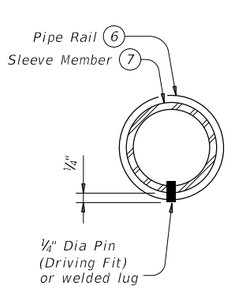


ELEVATION

SECTION



AT SPLICE OR EXP JTS



SECTION C-C

TERMINAL CONNECTION DETAILS

PIPE SPLICE DETAILS

Texas Department of Transportation

Bridge Division Standard

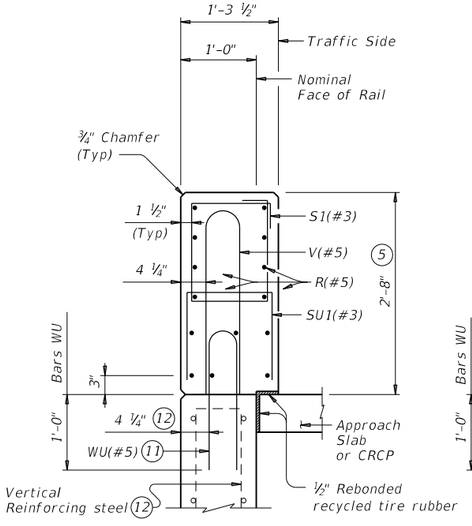
COMBINATION RAIL

TYPE C223

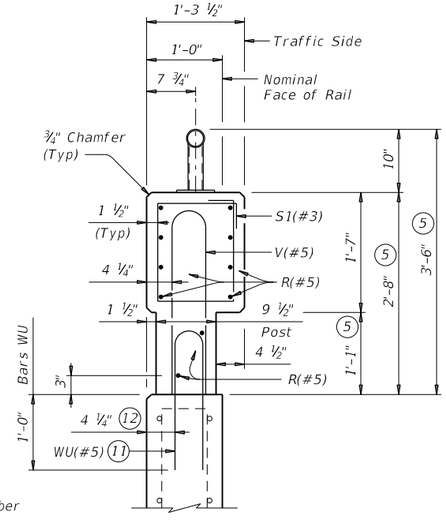
FILE: rlstd019-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		312

DISCLAIMER:
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.

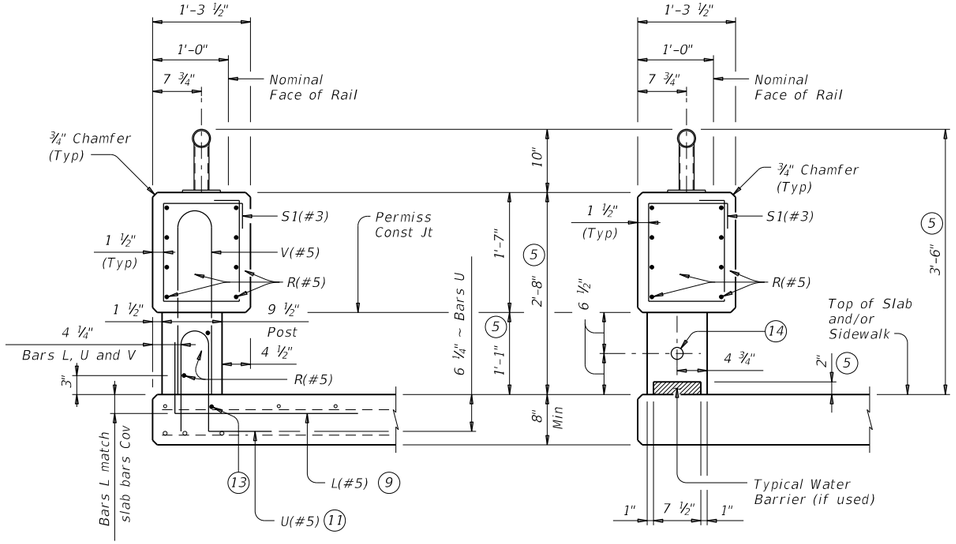
DATE:
FILE:



SECTION D-D
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS

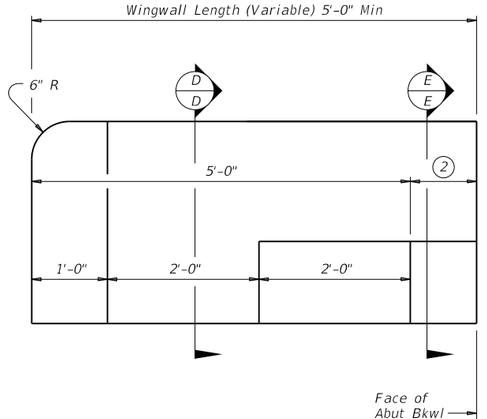


SECTION E-E
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS



AT POST
ON BRIDGE SLAB

AT OPENING
ON BRIDGE SLAB

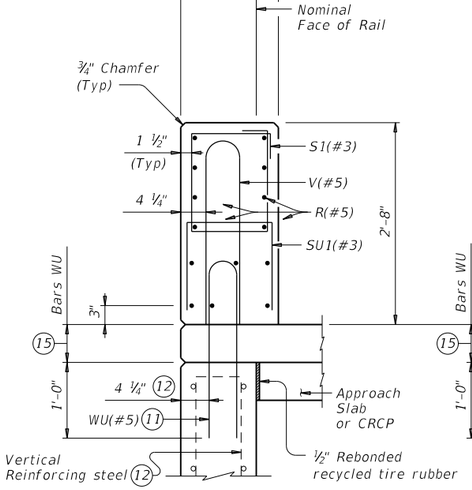


ELEVATION AT
ABUTMENT WINGWALL

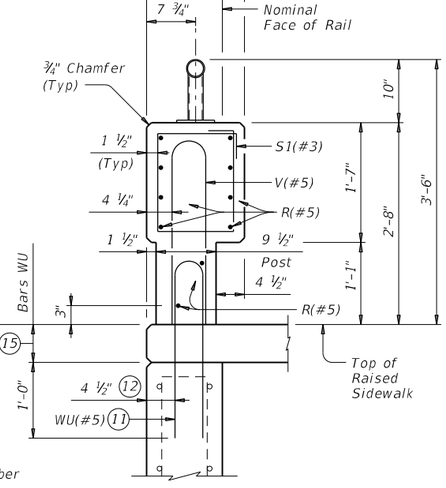
Box culvert parallel wings or rail anchorage curb similar.
HSS rail not shown for clarity.

SECTIONS THRU RAIL WITHOUT RAISED SIDEWALK

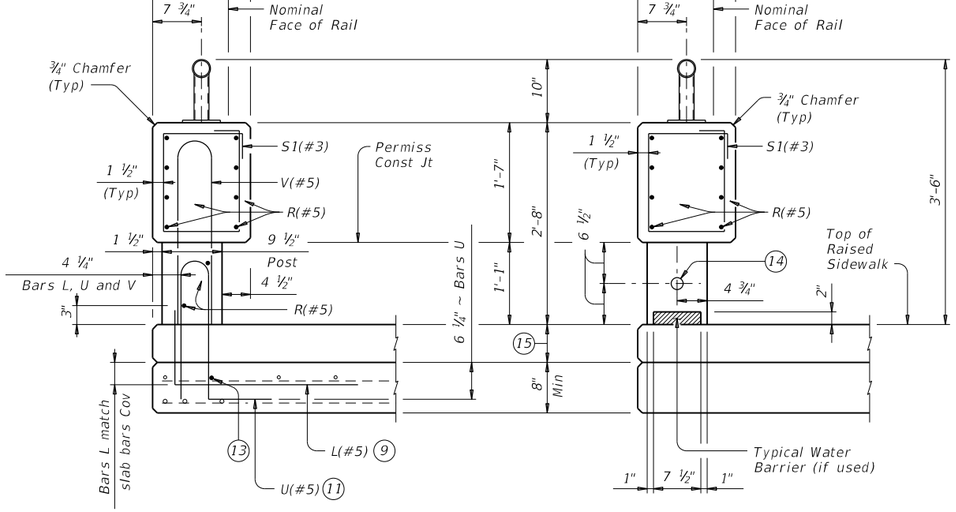
Sections on box culvert similar.



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.

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.

Texas Department of Transportation

Bridge Division Standard

COMBINATION RAIL

TYPE C223

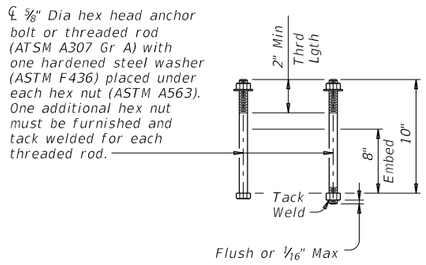
FILE: rlstd019-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		313

DISCLAIMER:
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.

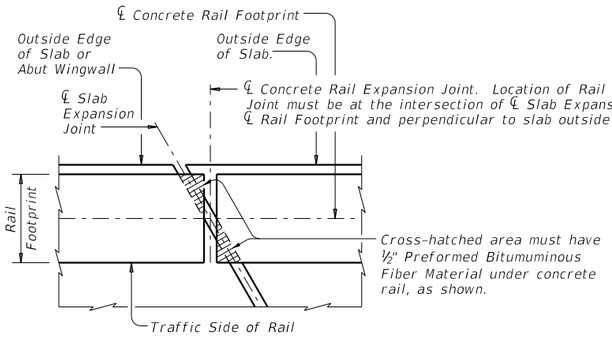
DATE:
FILE:

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.

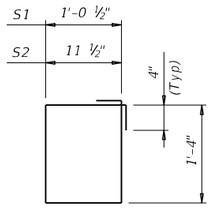
Rail anchorage details shown on this standard may require modification for select structure types.

See appropriate details elsewhere in plans for these modifications.

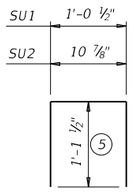
Submit erection drawings showing panel lengths, HSS rail post spacing, and anchor bolt setting to the Engineer for approval.

Average weight of railing with no overlay:
370 plf total
358 plf (Conc)
12 plf (Steel)

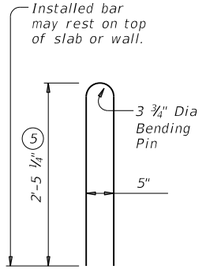
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



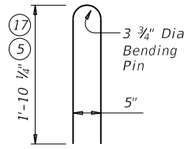
BARS S (#3)



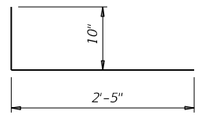
BARS SU (#3)



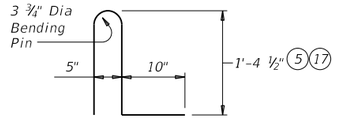
BARS V (#5) (18)



BARS WU (#5)



BARS L (#5)



BARS U (#5) (18)

SHEET 4 OF 4

Texas Department of Transportation | Bridge Division Standard

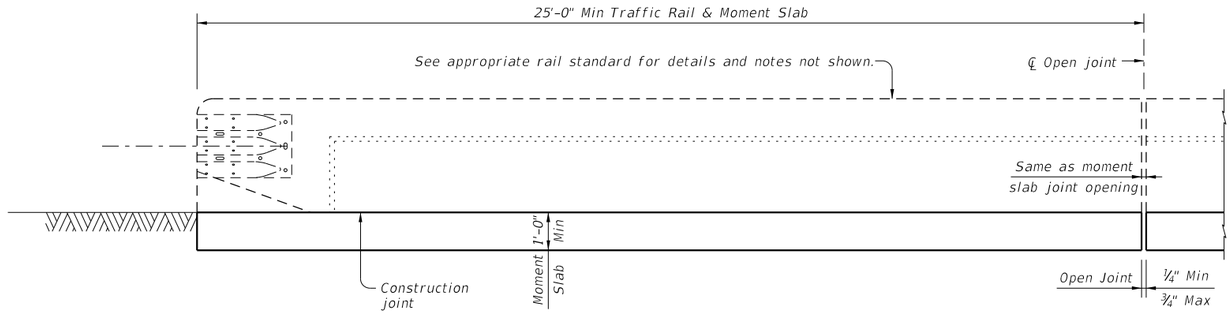
COMBINATION RAIL

TYPE C223

FILE: rlstd019-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		314

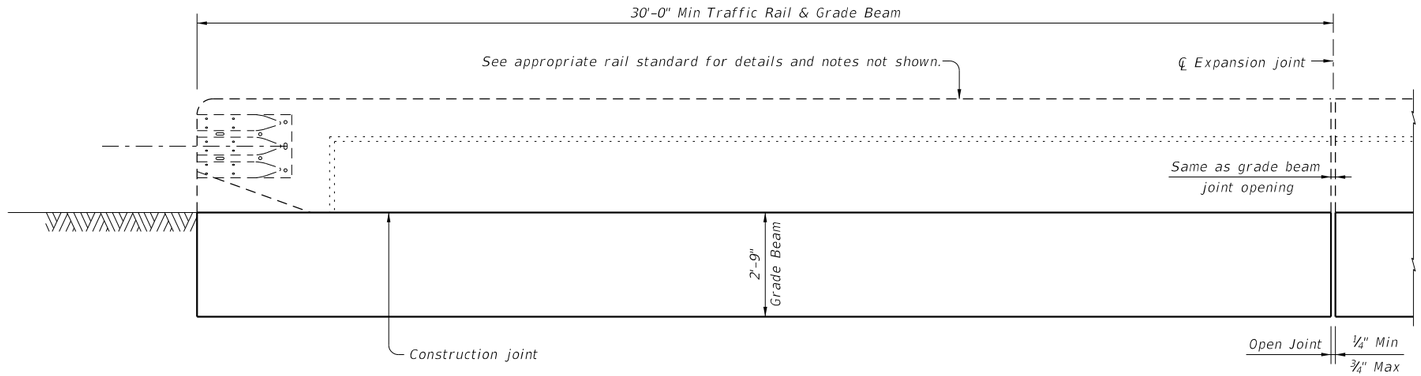
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:



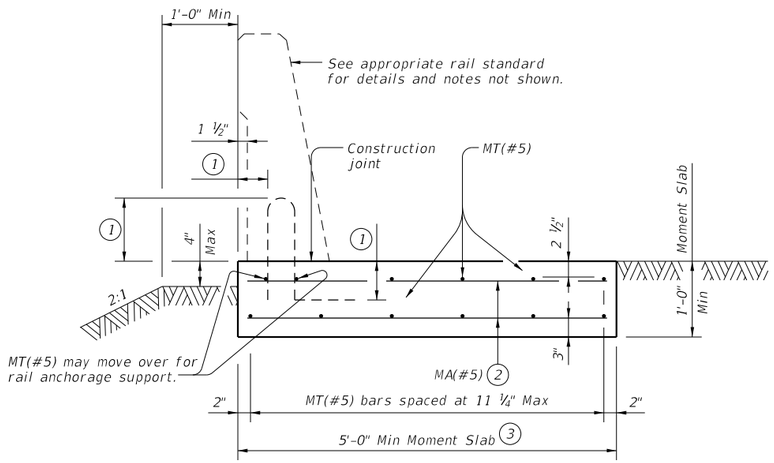
ROADWAY ELEVATION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)

(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)



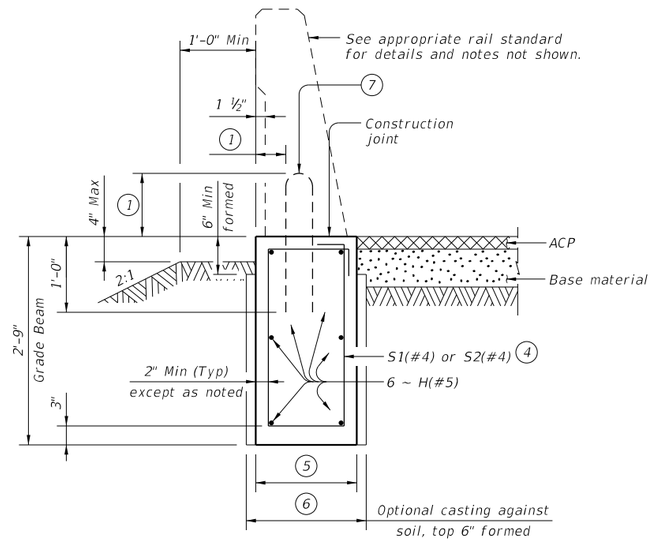
ROADWAY ELEVATION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)

(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)



SECTION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)

(Showing SSTR rail other rails are similar.)



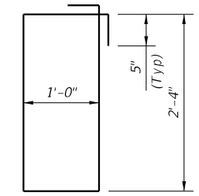
SECTION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)

(Showing SSTR rail other rails are similar.)

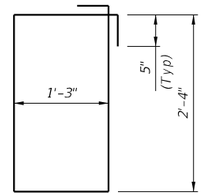
1. See applicable bridge rail standard.
2. MA(#5) space longitudinally along moment slab at 12" Max. (Spaced 2 ½" longitudinally from outside edge of moment slab).
3. Approximate moment slab concrete = 0.19 CY/LF and reinforcement = 22.4 LB/LF.
4. S1(#4) or S2(#4) spaced longitudinally along grade beam at 8" Max. (Spaced 2 ½" longitudinally from outside edge of grade beam).
5. Use bar S1(#4) with 1'-4" grade beam width and bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS. Approximate grade beam concrete = 0.14 CY/LF and reinforcement = 13.8 LB/LF.

   Use bar S2(#4) with 1'-7" grade beam width and bridge rail types: T66 and C66. Approximate grade beam concrete = 0.16 CY/LF and reinforcement = 14.2 LB/LF.
6. 1'-6" for bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS.

   1'-9" bridge rail types: T66 and C66.
7. Modify reinforcing on standard bridge rail anchorage if necessary by extending rail anchorage 12" Min, vertically into traffic rail



BARS S1(#4)



BARS S2(#4)

CONSTRUCTION NOTES:

Align moment slab (TRF-MS) or grade beam (TRF-GB) open joints with rail open joints maintaining no less than minimum rail length. Provide moment slab (TRF-MS) or grade beam (TRF-GB) with open joints at no greater than 100' spacing unless otherwise shown on the plans or approved by the Engineer.

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 required elsewhere.

Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for bars S1(#4), S2(#4) and H(#5) unless noted otherwise. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:

Uncoated or galvanized ~ #5 = 2'-4"
Epoxy coated ~ #5 = 3'-6"

GENERAL NOTES:

Use of these details will result in a moment slab (TRF-MS) or grade beam (TRF-GB) foundation that is acceptable for traffic rails which are MASH TL-2, TL-3, or TL-4 compliant.

See elsewhere in the plans for selected options between moment slab (TRF-MS) and/or grade beam (TRF-GB).

The foundation design resistance is based on the current AASHTO bridge railing requirements with the assumption of fair to good soil support conditions. Poor soil conditions will require suitably deeper and/or wider foundations.

See appropriate rail standard for details and notes not shown.

This detail is intended for use as a guide to unusual railing anchorage situations but may be included in the plans, modified as necessary to apply to specific installations required on the project.

Payment for moment slab (TRF-MS) and/or grade beam (TRF-GB) will be by Class "C" concrete or Class "C" (HPC) concrete for rail foundations.

The associated bridge railing will be paid for by the linear foot which includes the concrete and reinforcement.

Excavation will be subsidiary to other Items.

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

TRAFFIC RAIL FOUNDATIONS

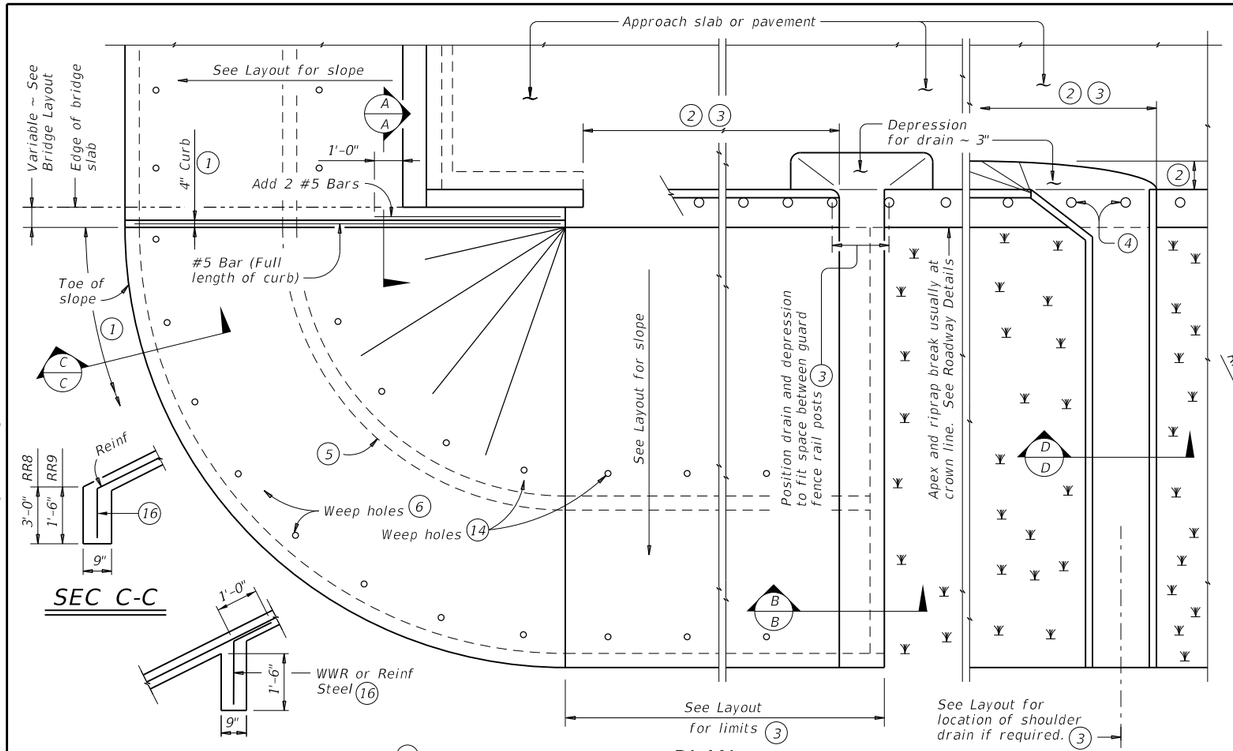
FOR MASH TL-2, TL-3 & TL-4 BRIDGE RAILS

TRF

FILE: rlstd027-20.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02	194	LIBERTY
07-20: Added moment slab with rail foundation lengths.	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		315

DISCLAIMER:
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.

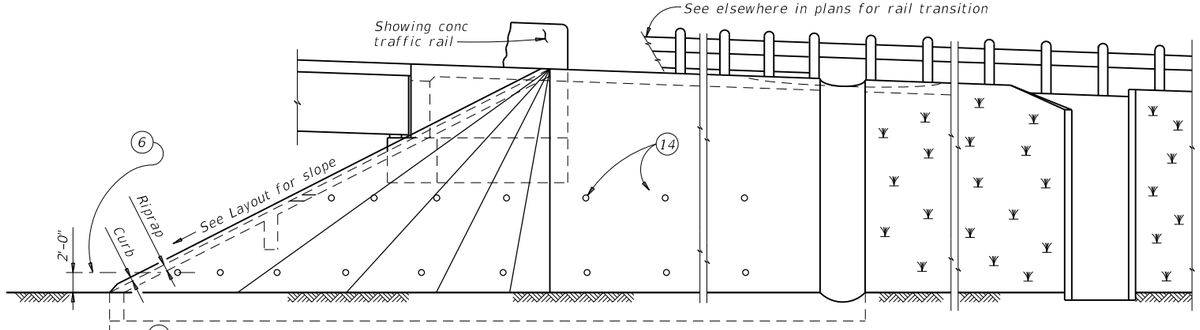
DATE:
FILE:



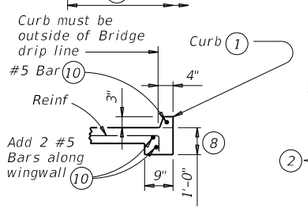
PLAN

SEC C-C

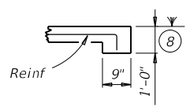
INTERMEDIATE TOEWALL (5)



ELEVATION

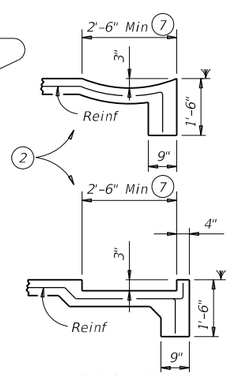


SEC A-A



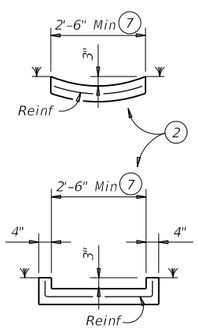
SEC B-B

(No drain)



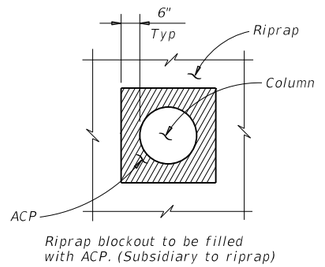
SEC B-B

(Shoulder drain integral with riprap)



SEC D-D

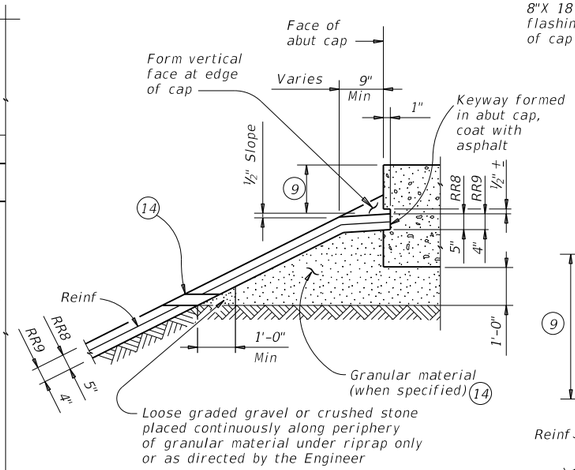
(Shoulder drain)



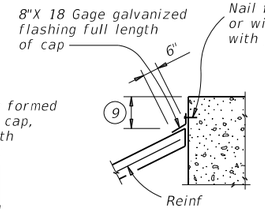
Riprap blockout to be filled with ACP. (Subsidiary to riprap)

RIPRAP DETAIL AT COLUMNS

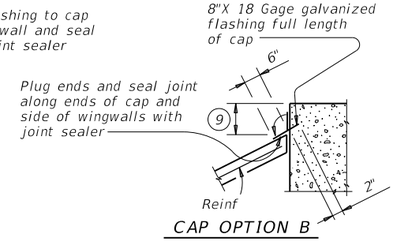
(As directed by the Engineer)



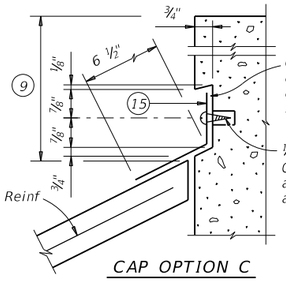
SHOWING KEYWAY OPTION



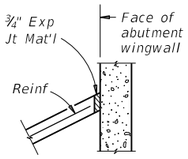
CAP OPTION A



CAP OPTION B

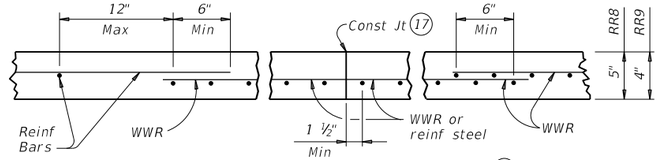


CAP OPTION C



SECT THRU RIPRAP AT WINGWALL (12)

SECTIONS THRU RIPRAP AT CAP (11)



REINFORCEMENT DETAILS (13)

See General Notes for optional synthetic fiber reinforcement.

1. When riprap is shown extended around header on layout, extend slab and toewall as shown and eliminate 4" curb.
2. Limits and configuration of drains and depressions are as shown elsewhere in plans or as directed by the Engineer.
3. Location of shoulder drain must consider limitations imposed by rail transition. Do not locate shoulder drains at expansion joints between approach slab and concrete pavement.
4. See details elsewhere in plans for installation of guard fence posts through concrete riprap.
5. Provide intermediate toewall only when designated elsewhere in the plans or included in the specifications.
6. Provide lower level of 2" Dia weep holes at 10' c-c backed by 1 CF packet of gravel and galvanized hardware cloth at all locations unless directed by the Engineer to eliminate.
7. Use wider or other drain configurations if shown elsewhere in plans or if directed by the Engineer.
8. Wall extension may be reduced or modified if approved by the Engineer. Increase wall extension to 1'-6" whenever the optional intermediate toewall is called for in the plans.
9. Top of cap to top of riprap dimension varies as directed by the Engineer. Should be 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.
10. #5 bars shown are required even when synthetic fiber reinforcing option is selected.
11. Provide sealing option for joint between the face of cap and riprap as designated by the Engineer or as shown elsewhere on plans.
12. Flashing (shown in Cap Option A) may be used at wingwall in addition to Exp Jt Mat'l if shown on plans or directed by the Engineer.
13. Provide #3 reinforcing bars at 18" Spa c-c. Provide 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.
14. If granular material is specified, provide upper level of 2" Dia weep holes at 10' c-c backed by galvanized hardware cloth.
15. 8" x 18 Gage Galv Sheet Metal
16. Provide WWR or #3 bars, with 1'-0" extension into slope.
17. 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 reinforcing fiber is utilized.

FOR CONTRACTOR'S INFORMATION ONLY:
5" of RR8 = 0.015 CY/SF
4" of RR9 = 0.012 CY/SF
#3 Reinf at 18" c-c = 0.501 Lbs/SF
6x6-D3xD3 = 0.408 Lbs/SF

GENERAL NOTES:

Provide Class "B" concrete (f'c = 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.

Install construction joints or grooved joints extending the full slant slope height at intervals of approximately 20 feet unless otherwise directed by the Engineer.

Hardware cloth, loose grade stone behind weep holes, flashing, or other sealing material are subsidiary to the bid item "Riprap".

See Layout for limits of riprap.

RR8 is to be used on stream crossings.

RR9 is to be used on other embankments.

Texas Department of Transportation

Bridge Division Standard

CONCRETE RIPRAP AND SHOULDER DRAINS
EMBANKMENTS AT BRIDGE ENDS (TYPES RR8 & RR9)

CRR

FILE: crrstde1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS			194	LIBERTY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		316