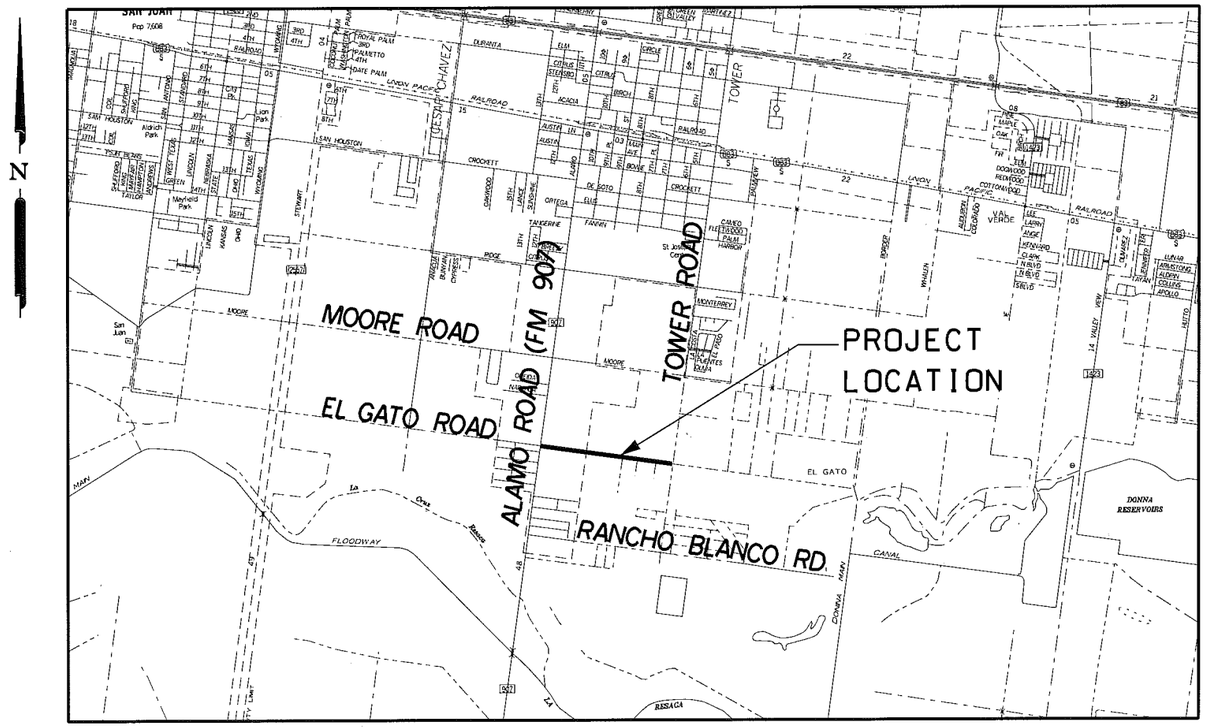
EL GATO ROAD IMPROVEMENTS 2010

NET LENGTH OF PROJECT = 3,898 FT = 0.74 MILES

LIMITS FROM: ALAMO RD. (FM 907)
TO: TOWER ROAD

RECONSTRUCTION OF AN URBAN OFF-SYSTEM, NON-FREEWAY ROAD:
CONSISTING OF GRADING, CURB & GUTTER, LIME TREATED SUBGRADE, FLEXIBLE BASE, ASPHALTIC CONCRETE PAVING, STORM SEWER STRUCTURES, WHEEL CHAIR RAMPS, SIGNING AND PAVEMENT MARKINGS.



DESIGN SPEED:
SPEED = 45 MPH

HIDALGO COUNTY OFFICIALS

COUNTY JUDGE	RENE A. RAMIREZ
COMMISSIONER PRECINCT NO. 1	A.C. CUELLAR, Jr.
COMMISSIONER PRECINCT NO. 2	HECTOR "TITO" PALACIOS
COMMISSIONER PRECINCT NO. 3	JOE M. FLORES
COMMISSIONER PRECINCT NO. 4	OSCAR L. GARZA, JR.

STATE OF TEXAS
RAMIRO GUTIERREZ
65948
REGISTERED
PROFESSIONAL ENGINEER
P.E.

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY RAMIRO GUTIERREZ, P.E. 65948
DATE: 9-28-10
ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE LAW.

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

SHEET NO.	DESCRIPTION
	GENERAL
1	TITLE SHEET
2	INDEX OF SHEETS
3	PROJECT LAYOUT
4	TYPICAL SECTIONS
5-6	ESTIMATE & QUANTITIES
7	EARTHWORK SUMMARIES
8-17	DESIGN CROSS SECTIONS
	TRAFFIC CONTROL PLAN
18	TRAFFIC CONTROL PLAN GENERAL NOTES
19	TRAFFIC CONTROL DETOUR PLAN
	STANDARDS
20-31	[S] BC (1) - 07 THRU (12) - 07
	ROADWAY DETAILS
32-38	PLAN AND PROFILE SHEETS
39	DRIVEWAY TABLES
	STANDARDS
40	[D] SIDEWALK AND WHEEL CHAIR RAMP DETAILS
41	[D] CURB & GUTTER DETAILS
42-44	[D] MAILBOX DETAIL
45	[D] DRIVEWAY DETAILS PRIVATE (RESIDENTIAL & COMMERCIAL)
46	[D] DRIVEWAY DETAILS PUBLIC (COUNTY ROAD - CITY STREETS)
47-49	[S] PED - 02
	DRAINAGE DETAILS
50-56	UTILITY AND DRAINAGE SHEETS
	STANDARDS
57	[D] INLET TY "F"
58	[D] TYPE "A" & TYPE "A1" MANHOLE (CONCRETE)
59	[D] TYPE "M" MANHOLE (CONCRETE)
60	[D] INLET AND MANHOLE CAPPING DETAIL

SHEET NO.	DESCRIPTION
	TRAFFIC ITEMS
61-62	SIGNING & PAVEMENT MARKING LAYOUT
	STANDARDS
63	[S] SMD (GEN) - 02
64-66	[S] SMD (SLIP-1) THRU (SLIP-3) - 02
67	[S] SMD TWT - 02
68	[S] SMD (FRP) - 02
69	[S] PM (1) - 03
70-71	[S] PM (2) - 00A & PM (3) - 00A
72	[S] PM (4) - 03
73	[S] W (1) - 95
	ENVIRONMENTAL ISSUES
74	SW3P
	STANDARDS
75	[S] EC (1) - 93
76	[S] EC (3) - 93

STATE OF TEXAS
RAMIRO GUTIERREZ
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LEGEND
[D] - DISTRICT STANDARD
[S] - STATE STANDARD

EL GATO ROAD
INDEX OF SHEETS

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.
DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	2

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SCALE 1"=200'

N

BENCHMARK #1
ALUMINUM DISK ON CONC.
STA. 5+62.65, 60.17' LT
N = 16582942.883
E = 1106475.755
EL. = 96.87

PROP. 52' B-B RDWY.
PROP. 100.0' R.O.W.

B

PROP. R.O.W. LINE

0+00 POT 0+00.00

5+00

10+00

15+00

20+00

25+00

PROP. R.O.W. LINE

BEGIN PROJECT
STA. 5+31.00
MATCH EXIST. PAV'T

A

PC 8+71.02

PRC 9+57.63

PT 10+44.23

ALAMO ROAD (FM 907)

P.S.J.A. I.S.D.
SCHOOL

SABAL LANE

SABAL P
V

EL GATO ROAD

C

D

PT 23+65.15

PRC 24+09.88

PT 24+54.60

BENCHMARK #2
ALUMINUM DISK ON CONC.
STA. 24+29.67, 45.97' LT
N = 16582656.631
E = 1108320.028
EL. = 95.81

MATCHLINE STA. 28+00

ALAMO CITY LIMITS
HIDALGO COUNTY LIMITS

STA. 18+20.60

A CURVE DATA

PISTATION	= 9+14.33
DELTA	= 1° 39' 14.56" (LT)
DEGREE OF CURVE	= 1° 54' 35.49"
TANGENT	= 43.31
LENGTH	= 86.61
RADIUS	= 3,000.00
PC STATION	= 8+71.02
PT STATION	= 9+57.63

B CURVE DATA

PISTATION	= 10+00.93
DELTA	= 1° 39' 14.56" (RT)
DEGREE OF CURVE	= 1° 54' 35.49"
TANGENT	= 43.31
LENGTH	= 86.61
RADIUS	= 3,000.00
PC STATION	= 9+57.63
PT STATION	= 10+44.23

C CURVE DATA

PISTATION	= 23+87.52
DELTA	= 1° 16' 52.32" (LT)
DEGREE OF CURVE	= 2° 51' 53.24"
TANGENT	= 22.36
LENGTH	= 44.72
RADIUS	= 2,000.00
PC STATION	= 23+65.15
PT STATION	= 24+09.88

D CURVE DATA

PISTATION	= 24+32.24
DELTA	= 1° 16' 52.32" (RT)
DEGREE OF CURVE	= 2° 51' 53.24"
TANGENT	= 22.36
LENGTH	= 44.72
RADIUS	= 2,000.00
PC STATION	= 24+09.88
PT STATION	= 24+54.60

ALMS SUBDIVISION PHASE I
L. 48, PG. 33, M.R.H.C.

ALAMO CITY LIMITS
HIDALGO COUNTY LIMITS

EXIST. 90.0' R.O.W.

PROP. 90' R.O.W.

BENCHMARK #3
ALUMINUM DISK ON CONC.
STA. 44+05.72, 54.19LT
N = 16582369.970
E = 1110275.779
EL. = 95.69

300' TRANSITION

STA. 39+77.80

STA. 42+77.80

PROP. R.O.W. LINE

30+00

35+00

40+00

45+00

EXIST. R.O.W. LINE

EXIST. R.O.W. LINE

MATCHLINE STA. 28+00

VILLAGE CIRCLE

ANDES DRIVE

GOLD DRIVE

EXIST. 80.0' R.O.W.

TOWER ROAD

POT 45+91.83

END PROJECT
STA. 44+29.70

SCALE 1"=200'

N

STATE OF TEXAS
RAMIRO GUTIERREZ
65948
REGISTERED
PROFESSIONAL ENGINEER

, P.E.

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DATE: 12-20-10
ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE LAW.

EL GATO ROAD
PROJECT LAYOUT

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.
DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	3

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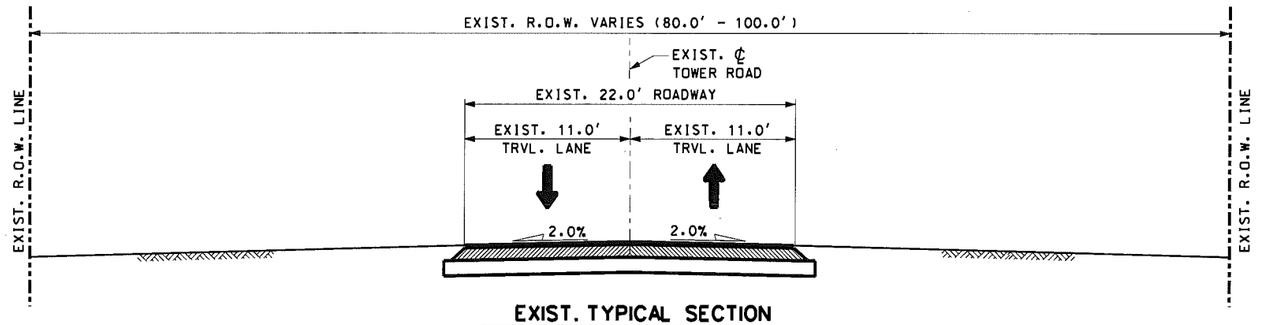
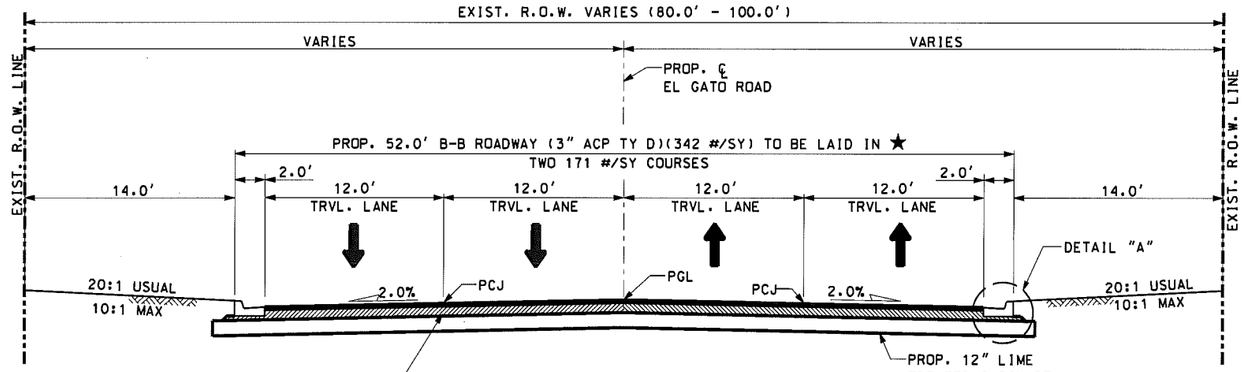
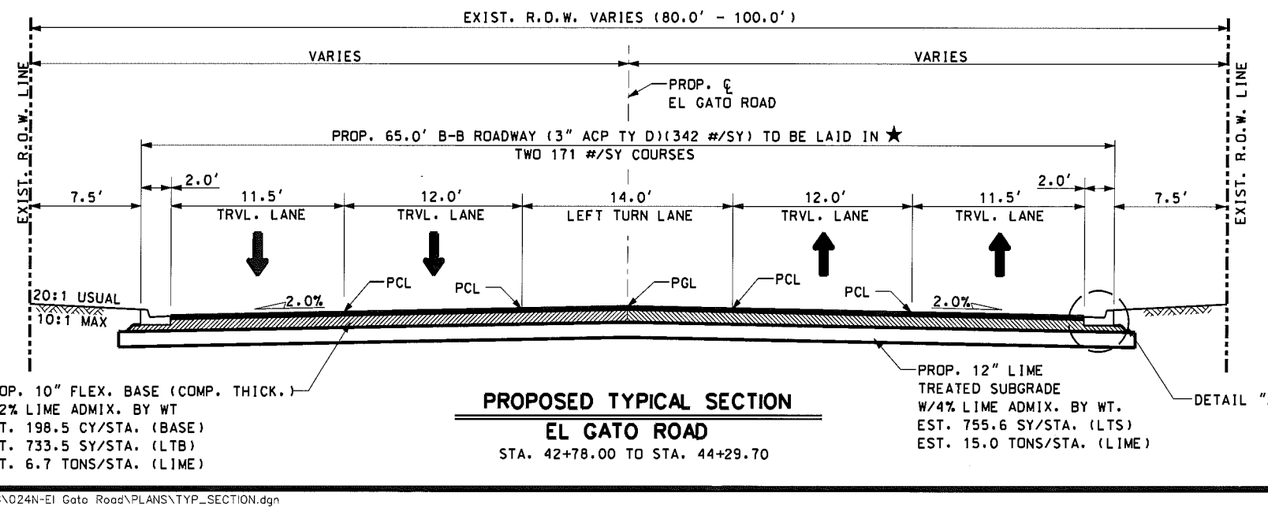


EXIST. TYPICAL SECTION
EL GATO ROAD
STA. 5+31.00 TO STA. 44+29.00



▩ PROP. 10" FLEX. BASE (COMP. THICK.) W/2% LIME ADMIX. BY WT
EST. 158.5 CY/STA. (BASE)
EST. 588.9 SY/STA. (LTB)
EST. 5.4 TONS/STA. (LIME)

PROPOSED TYPICAL SECTION
EL GATO ROAD
STA. 5+31.00 TO STA. 39+78.00



▩ PROP. 10" FLEX. BASE (COMP. THICK.) W/2% LIME ADMIX. BY WT
EST. 198.5 CY/STA. (BASE)
EST. 733.5 SY/STA. (LTB)
EST. 6.7 TONS/STA. (LIME)

PROPOSED TYPICAL SECTION
EL GATO ROAD
STA. 42+78.00 TO STA. 44+29.70

GENERAL NOTES

(1) PGL - PROFILE GRADE LINE
PCJ - PERMISSIBLE CONSTRUCTION JOINT

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

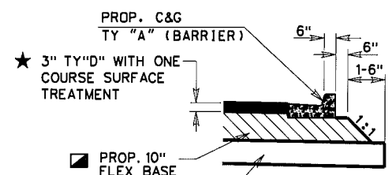
(3) ALL GRADING SHALL BE WITHIN R.O.W. LIMITS

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

(5) THE SUBGRADE SHALL BE SHAPED AND BLADED A MINIMUM DISTANCE OF 2.0' BEYOND THE EDGE OF THE PROPOSED BASE COURSE. THE COMPLETE BASE SHALL BE ROLLED BEFORE THE EARTH SHOULDER IS SHAPED, AND FINAL COMPACTION WILL BE DONE OVER BASE AND EDGE OF SHOULDER.

(6) THE 2% LIME SHOWN ON TYPICAL SECTIONS FOR ITEM 247 "FLEXBASE" IS SEPARATE FROM LIME WHICH MAY BE REQUIRED TO MEET P.I. AND TRIAXIAL REQUIREMENTS ADDED AT CONTRACTOR'S EXPENSE.

(7) 114 lbs/yd2 IS EQUIVALENT TO 1" IN DEPTH.



DETAIL "A"
N.T.S.

LEGEND

▩ FLEXIBLE BASE MATERIAL TO BE PURCHASED AND DELIVERED BY HIDALGO COUNTY.

★ ITEM TO BE CONSTRUCTED BY HIDALGO COUNTY FORCES.

LTB - LIME TREATED BASE MATERIAL
LTS - LIME TREATED SUBGRADE

4-LANE TO 5-LANE TRANSITION SECTIONS:

* STA. 39+78.00 TO STA. 42+78.00 (52' B-B TO 65' B-B)

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DATE: 5-25-11
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EL GATO ROAD
TYPICAL SECTIONS

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2568
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.
DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	4

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BASIS OF ESTIMATE (ROADWAY)

LOCATION STA.	ITEM 100 PREP. R.O.W.	ITEM 110 EXCAVATION (ROADWAY)	ITEM 132 EMBANK (FINAL) (DENS. CONT.) (TY "C")	ITEM 204 ⊛ SPRINK DUST CONTROL 4 MG/STA	SUBGRADE ITEM 260 LIME TRT (EXIST MATL) (12")	SUBGRADE ITEM 260 LIME (HYD, COM, OR QK (SLURRY) (4% BY WT.)	SUBGRADE ITEM 260 LIME SOFT SPOT (HYD, COM, OR QK (SLURRY)) 25 TON/MILE (TON)	⊛ PAVEMENT AREA	PRIME COAT ITEM 310 ASPH MAT'L. (MC-30) (0.3 GAL/SY)	ASPH.CONC. PAV. ITEM 340 ★ ACP (SURF) TY "D"
	(STA)	(CY)	(CY)	(MG)	(SY)	(TON)		(SY)	(GAL)	(SY)
CITY OF ALAMO	16.32	6,600.0	80.0	65.3	10,214.0	202	7.7	8,709	2,613	8,827
HIDALGO COUNTY	16.31	9,808.0	191.0	65.3	12,122.0	240	8.3	10,546	3,164	10,955
SCHOOL	6.35	2,209.0	47.0	25.4	1,973.0	39	3.0	1,628	488	1,693
TOTAL	38.98	18,717.0	318.0	156.0	24,309.0	481	19.0	20,883	6,265	21,475

BASIS OF ESTIMATE (ROADWAY)(CONTINUED)

LOCATION STA.	FLEXIBLE BASE ITEM 247 ◪ FLEX BASE (RD DEL) TY E GR 4	FLEXIBLE BASE ITEM 260 LIME TREAT. FOR BASE (8") (NEW)	FLEXIBLE BASE ITEM 260 LIME FOR BASE TY "A" SLURRY "B"OR"C" SLURRY 2% BY WT. NEW AND SALV.
	(CY)	(SY)	(TON)
CITY OF ALAMO	2,675	9,666	90
HIDALGO COUNTY	3,191	11,534	108
SCHOOL	516	1,867	18
TOTAL	6,382	23,067	216

⊛ FOR CONTRACTORS INFORMATION ONLY (NON-PAY)
EST. WT. OF NEW & SALVAGE FLEXIBLE BASE - 3375 lb/cy (COMPACTED DRY WT.)
EST. WT OF SUBGREADE - 2970 lb/cy

SUMMARY OF DRIVEWAYS & TURNOUTS

LOCATION STA.	ITEM 530 ACP DRWY. TY PRB-1 AREA (SY)	ITEM 530 BRICK PAVER DRIVEWAYS (CONC) (SY)	ITEM 530 ACP TURNOUT AREA (SY)
CITY OF ALAMO	81.0		78.0
HIDALGO COUNTY	719.0	18.7	195.6
SCHOOL	78.0	-	156.0
TOTAL	878.0	18.7	429.6

SUMMARY OF CONC. CURB & GUTTER, SIDEWALK & RAMPS

LOCATION STA.	ITEM 529-2012 CONC CURB & GUTTER (TY A) (BARRIER)	ITEM-529 VALLEY GUTTER 6' (TY A)	ITEM-531 CURB RAMPS (TY 9)	ITEM-531 5' CONC. SIDEWALK
	(LF)	(SY)	(EA)	(SY)
CITY OF ALAMO	3,316	150	2	50
HIDALGO COUNTY	3,798	340	6	164
SCHOOL	635	110	2	306
TOTAL	7,749	600	10	520

SUMMARY OF MAILBOXES (ITEM 560)

LOCATION STA.	ITEM 560 ★ MAILBOX INSTALLATION (SINGLE) (EA)
HIDALGO COUNTY	7
TOTAL	7

SUMMARY OF SMALL ROADSIGN SIGNS

LOCATION STA.	ITEM 644 INS SM RD SN SUP&M TY S80(1) SA(P)	ITEM 644 REMOVE SM RD SN SUP&AM	ITEM 8531 SOLAR POWERED CROSSWALK WARNING SIGN ASSEMBLY
	(EA)	(EA)	(EA)
CITY OF ALAMO	4	2	-
HIDALGO COUNTY	6	6	-
SCHOOL	5	-	2
TOTAL	15	8	2

LEGEND

◪ FLEXIBLE BASE MATERIAL TO BE PURCHASED AND DELIVERED BY HIDALGO COUNTY.

★ ITEM TO BE CONSTRUCTED BY HIDALGO COUNTY FORCES.

STATE OF TEXAS
RAMIRO GUTIERREZ
65948
LICENSED
PROFESSIONAL ENGINEER

P.E.

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY RAMIRO GUTIERREZ, P.E. 65948

DATE: 5-25-11

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EL GATO ROAD
ESTIMATE & QUANTITIES

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.

DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	5

SUMMARY OF PAVEMENT MARKINGS

STATION LIMITS	ITEM 666 REFL PAV MRKR TY I (W) 4" (BRK) (100 MIL) (LF)	ITEM 666 REFL PAV MRKR TY I (W) 8" (SLD) (100 MIL) (LF)	ITEM 666 REFL PAV MRKR TY I (W) 24" (SLD) (100 MIL) (LF)	ITEM 666 REFL PAV MRKR TY I (Y) 4" (SLD) (100 MIL) (LF)	ITEM 666 REFL PAV MRKR TY I (Y) 24" (SLD) (100 MIL) (LF)	ITEM 666 CROSSWALK 6' WIDE (24" SLD. WHITE) (100 MIL) (EA)
	EST.	EST.	EST.	EST.	EST.	EST.
CITY OF ALAMO	800	125	283	3,130	76	-
HIDALGO COUNTY	970	125	285	5,135	76	-
SCHOOL	160	-	-	635	-	4
TOTAL	1,930	250	568	8,900	152	4

(ITEM 668) SUMMARY OF PREFABRICATED PAVEMENT MARKINGS

TY B (WHITE) DESCRIPTION	UNIT	QUANTITY CITY OF ALAMO	QUANTITY HIDALGO COUNTY
ITEM 688-2074 PREFAB PAV MRK (W) (WORD)(100 MIL)	EA	2	2
ITEM 688-2064 PREFAB PAV MRK (W) (ARROW)(LEFT)(100 MIL)	EA	2	2
ITEM 688-2064 PREFAB PAV MRK (W) (ARROW)(RIGHT)(100 MIL)	EA	2	2

SUMMARY OF RAISED PAVEMENT MARKERS

STATION LIMITS	ITEM 672 REFL PAV MRKR TY I-C (EA)	ITEM 672 REFL PAV MRKR TY-II-A-A (EA)
	EST.	EST.
CITY OF ALAMO	80	78
HIDALGO COUNTY	97	128
SCHOOL	16	16
TOTAL	193	222

NOTE: PAVEMENT MARKERS TY I-C AND TY II-AA SHALL BE INSTALLED WITH THE CLEAR OR AMBER REFLECTIVE FACE TOWARDS THE DIRECTION OF TRAFFIC.

SUMMARY OF TEMPORARY EROSION SEDIMENTATION AND ENVIROMENTAL CONTROLS

LOCATION STA.	ITEM 164 CELL FIBER MULCH SEED (TEMP) (WARM) (SY)	ITEM 164 CELL FIBER MULCH SEED (TEMP) (COOL) (SY)	ITEM 164 CELL FIBER MULCH SEED (PERM.) (URBAN CLAY) (SY)	ITEM 166 ⊕ FERTILIZER ⊕ (TON)	ITEM 168 (#) VEGETATIVE ⊕ WATERING (MG)	ITEM 506 CONST. EXITS TY (II) (INSTALL) (SY)	ITEM 506 CONST. EXITS TY (II) (REMOVE) (SY)	ITEM 506 TEMPORARY (◉) SEDIMENT CONTROL FENCE (LF)
	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.
CITY OF ALAMO	2,915.0	2,915.0	5,830.0	0.056	182.0	84.0	84.0	288.0
HIDALGO COUNTY	2,855.0	2,855.0	5,710.0	0.062	199.0	84.0	84.0	902.0
SCHOOL	935.0	935.0	1,870.0	0.007	23.0	-	-	144.0
TOTAL	6,705.0	6,705.0	13,410.0	0.125	404.0	168.0	168.0	1,334.0

⊕ FOR CONTRACTORS INFORMATION ONLY. NO DIRECT PAYMENT. SUBSIDIARY TO THE VARIOUS BID ITEMS.

⊕ THE TONNAGE OF FERTILIZER IS BASED ON A RATE THAT WILL PROVIDE 100 LBS. OF NITROGEN PER ACRE AS IS BASED ON FERTILIZER CONTENT (N-P-K) OF 10-5-5.

◉ QUANTITY BASED ON 46 LF PER INLET AND ALONG DITCH LINE. (12 LF/3000 LF)

(#) VEGETATED WATERING IS BASED ON A RATE OF 6780 GAL/AC/FOR 24 CYCLES.

LEGEND

◪ FLEXIBLE BASE MATERIAL TO BE PURCHASED AND DELIVERED BY HIDALGO COUNTY.

★ ITEM TO BE CONSTRUCTED BY HIDALGO COUNTY FORCES.

STATE OF TEXAS — RAMIRO GUTIERREZ — 65948 — REGISTERED PROFESSIONAL ENGINEER — P.E.

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY RAMIRO GUTIERREZ, P.E. 65948

DATE: 5-25-11

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SUMMARY OF DRAINAGE STRUCTURES

LOCATION STA.	ITEM 400 ⊕ STRUCT. EXCAV. (CY)	ITEM 400 CUT & RESTORE PAV'T. (SY)	ITEM 402 TRENCH EXCAVATION PROTECTION (LF)	ITEM 464 RC PIPE (CL III) (18") (LF)	ITEM 464 RC PIPE (CL III) (24") (LF)	ITEM 464 RC PIPE (CL III) (30") (LF)	ITEM 464 RC PIPE (CL III) (36") (LF)	ITEM 464 RC PIPE (CL III) (48") (LF)	ITEM 465 INLET (COMPL) TY "F" (EA)	ITEM 465 INLET (COMPL) TY "A" (EA)	ITEM 465 MANH (COMPL) TY "A" (EA)	ITEM 465 MANH (COMPL) TY "M" (EA)	ITEM 465 INLET EXT. (EA)	ITEM 479 ADJ. ⊕ MANHOLE (SANITARY) (EA)	ITEM 496 REMV. ⊕ STR. PIPE (LF)	ITEM 496 REMV. ⊕ STR. (S.E.T.) (EA)	ITEM 496 REMV. ⊕ STR. (INLET) (EA)	ITEM 479 ADJUST INLET (CAP) (EA)	ITEM 432 CONC. RIPRAP 4 IN. CY
	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.
CITY OF ALAMO	-	50.1	1569.0	134.0	353.0	453.0	345.0	-	9	-	-	-	4	-	-	2	1	1	2.0
HIDALGO COUNTY	-	74.7	2091.0	237.0	805.0	364.0	-	1204.0	12	6	7	-	16	1	-	-	-	-	-
SCHOOL	-	-	635.0	-	-	-	486.0	-	2	-	1	-	1	-	-	-	-	-	-
TOTAL	-	124.80	4474.0	421.0	1520.0	817.0	981.0	1204.0	23	6	8	-	21	1		2	1	1	2.0

EL GATO ROAD
ESTIMATE & QUANTITIES

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.
DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	6

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Station	Material Name	End Areas (sq. ft.)	Unadjusted Volumes (cu. yd.)	Adjusted Volumes (cu. yd.)	Mult Factor	Mass Ordinate
6+00.00	DIRT					
	Excavation	170.1	0	0	1.00	
	Fill	0.0	0	0	1.00	0
6+50.00	DIRT					
	Excavation	165.8	311	311	1.00	
	Fill	0.0	0	0	1.00	311
7+50.00	DIRT					
	Excavation	155.3	595	595	1.00	
	Fill	0.0	0	0	1.00	906
8+50.00	DIRT					
	Excavation	125.6	520	520	1.00	
	Fill	2.1	4	4	1.00	1422
9+50.00	DIRT					
	Excavation	111.4	439	439	1.00	
	Fill	2.0	8	8	1.00	1853
10+50.00	DIRT					
	Excavation	101.1	394	394	1.00	
	Fill	4.0	11	11	1.00	2236
11+50.00	DIRT					
	Excavation	118.5	407	407	1.00	
	Fill	1.9	11	11	1.00	2632
12+50.00	DIRT					
	Excavation	116.4	435	435	1.00	
	Fill	1.3	6	6	1.00	3061
13+50.00	DIRT					
	Excavation	121.6	441	441	1.00	
	Fill	1.5	5	5	1.00	3497
14+50.00	DIRT					
	Excavation	126.4	459	459	1.00	
	Fill	0.3	3	3	1.00	3953
15+50.00	DIRT					
	Excavation	124.7	465	465	1.00	
	Fill	0.4	1	1	1.00	4417
16+50.00	DIRT					
	Excavation	125.0	462	462	1.00	
	Fill	0.7	2	2	1.00	4877
17+50.00	DIRT					
	Excavation	143.4	497	497	1.00	
	Fill	0.0	1	1	1.00	5373
18+50.00	DIRT					
	Excavation	162.6	567	567	1.00	
	Fill	0.0	0	0	1.00	5940
19+50.00	DIRT					
	Excavation	139.5	559	559	1.00	
	Fill	0.6	1	1	1.00	6498
20+50.00	DIRT					
	Excavation	122.7	485	485	1.00	
	Fill	3.2	7	7	1.00	6976
21+50.00	DIRT					
	Excavation	123.6	456	456	1.00	
	Fill	0.2	6	6	1.00	7426
22+50.00	DIRT					
	Excavation	113.2	439	439	1.00	
	Fill	0.9	2	2	1.00	7863
23+50.00	DIRT					
	Excavation	120.9	434	434	1.00	
	Fill	1.0	3	3	1.00	8294
24+50.00	DIRT					
	Excavation	133.8	472	472	1.00	
	Fill	21.8	42	42	1.00	8724
25+50.00	DIRT					
	Excavation	148.7	523	523	1.00	
	Fill	1.2	43	43	1.00	9204
26+50.00	DIRT					
	Excavation	156.8	566	566	1.00	
	Fill	0.0	2	2	1.00	9768
27+50.00	DIRT					
	Excavation	134.4	539	539	1.00	
	Fill	0.4	1	1	1.00	10306
28+50.00	DIRT					
	Excavation	158.1	542	542	1.00	
	Fill	0.0	1	1	1.00	10847
29+50.00	DIRT					
	Excavation	158.6	586	586	1.00	
	Fill	0.0	0	0	1.00	11433
30+50.00	DIRT					
	Excavation	165.4	600	600	1.00	
	Fill	0.0	0	0	1.00	12033
31+50.00	DIRT					
	Excavation	159.2	601	601	1.00	
	Fill	0.0	0	0	1.00	12634
32+50.00	DIRT					
	Excavation	124.9	526	526	1.00	
	Fill	2.2	4	4	1.00	13156
33+50.00	DIRT					
	Excavation	122.5	458	458	1.00	
	Fill	4.1	12	12	1.00	13602
34+50.00	DIRT					
	Excavation	108.7	428	428	1.00	
	Fill	8.0	22	22	1.00	14008
35+50.00	DIRT					
	Excavation	93.5	374	374	1.00	
	Fill	13.4	40	40	1.00	14342
36+50.00	DIRT					
	Excavation	115.7	387	387	1.00	
	Fill	2.5	29	29	1.00	14700
37+50.00	DIRT					
	Excavation	118.3	433	433	1.00	
	Fill	0.6	6	6	1.00	15127
38+50.00	DIRT					
	Excavation	142.1	482	482	1.00	
	Fill	0.0	1	1	1.00	15608
39+50.00	DIRT					
	Excavation	142.6	527	527	1.00	
	Fill	3.6	7	7	1.00	16128
40+50.00	DIRT					
	Excavation	156.8	555	555	1.00	
	Fill	4.3	15	15	1.00	16668
41+50.00	DIRT					
	Excavation	134.5	539	539	1.00	
	Fill	1.4	11	11	1.00	17196
42+50.00	DIRT					
	Excavation	129.9	490	490	1.00	
	Fill	1.5	5	5	1.00	17681
43+50.00	DIRT					
	Excavation	120.0	463	463	1.00	
	Fill	1.2	5	5	1.00	18139
44+00.00	DIRT					
	Excavation	161.5	261	261	1.00	
	Fill	0.0	1	1	1.00	18399

* GRAND SUMMARY TOTALS

Material Name		Unadjusted Volumes (cu. yd.)	Adjusted Volumes (cu. yd.)	Mult Factor
DIRT				
	Excavation	18717	18717	1.00
	Fill	318	318	1.00

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EL GATO ROAD
ESTIMATE & QUANTITIES

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

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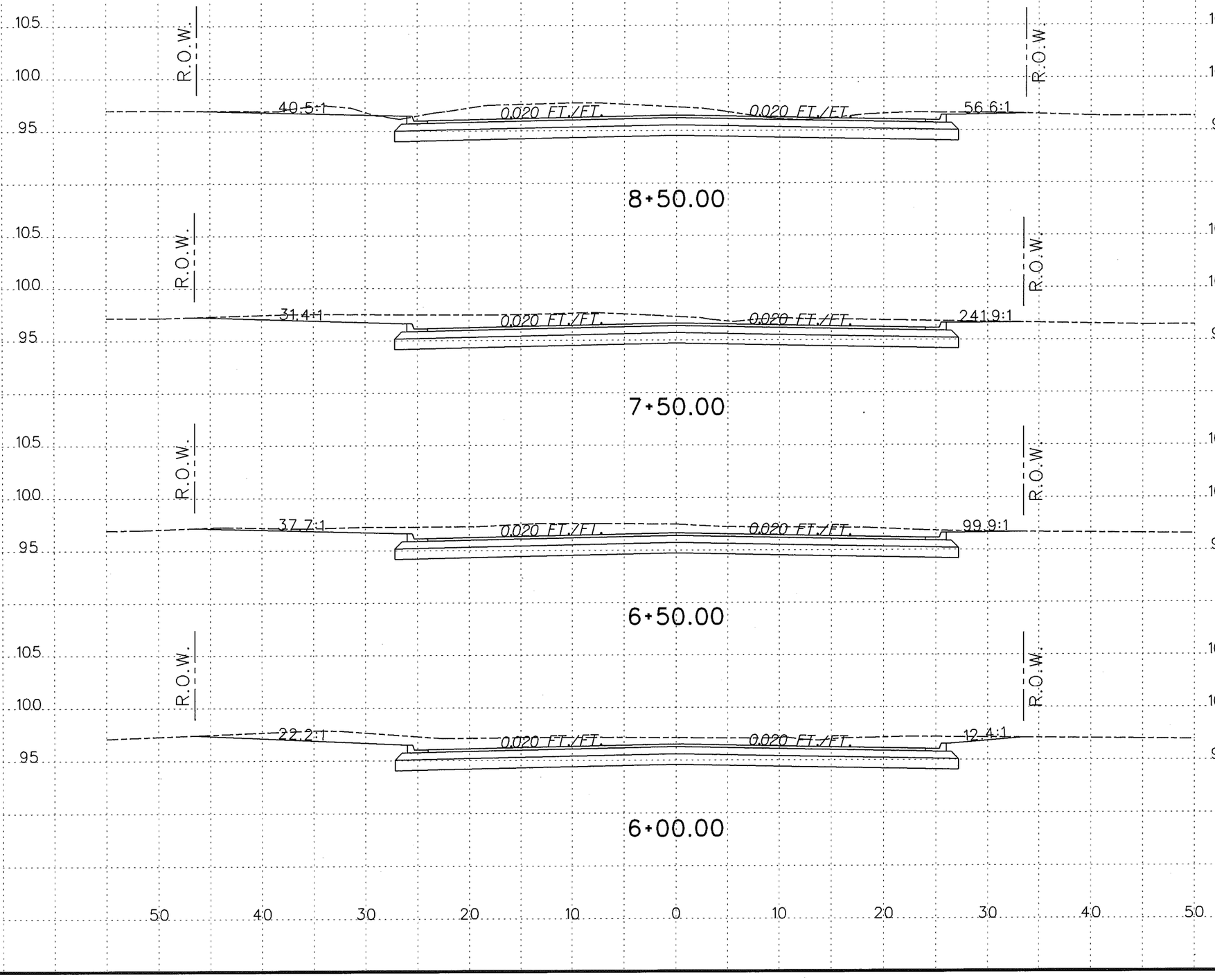

STATE OF TEXAS
RAMIRO GUTIERREZ
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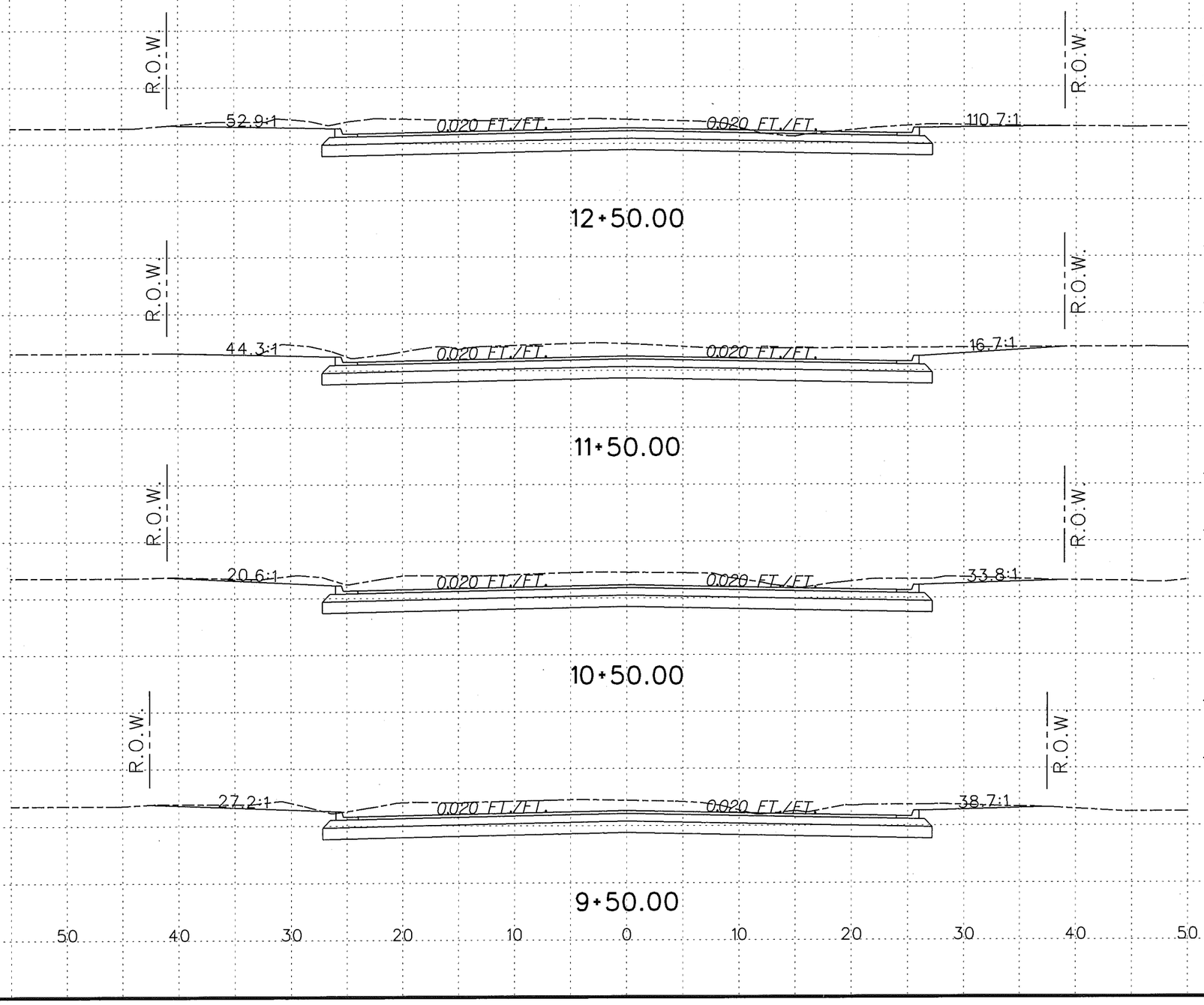

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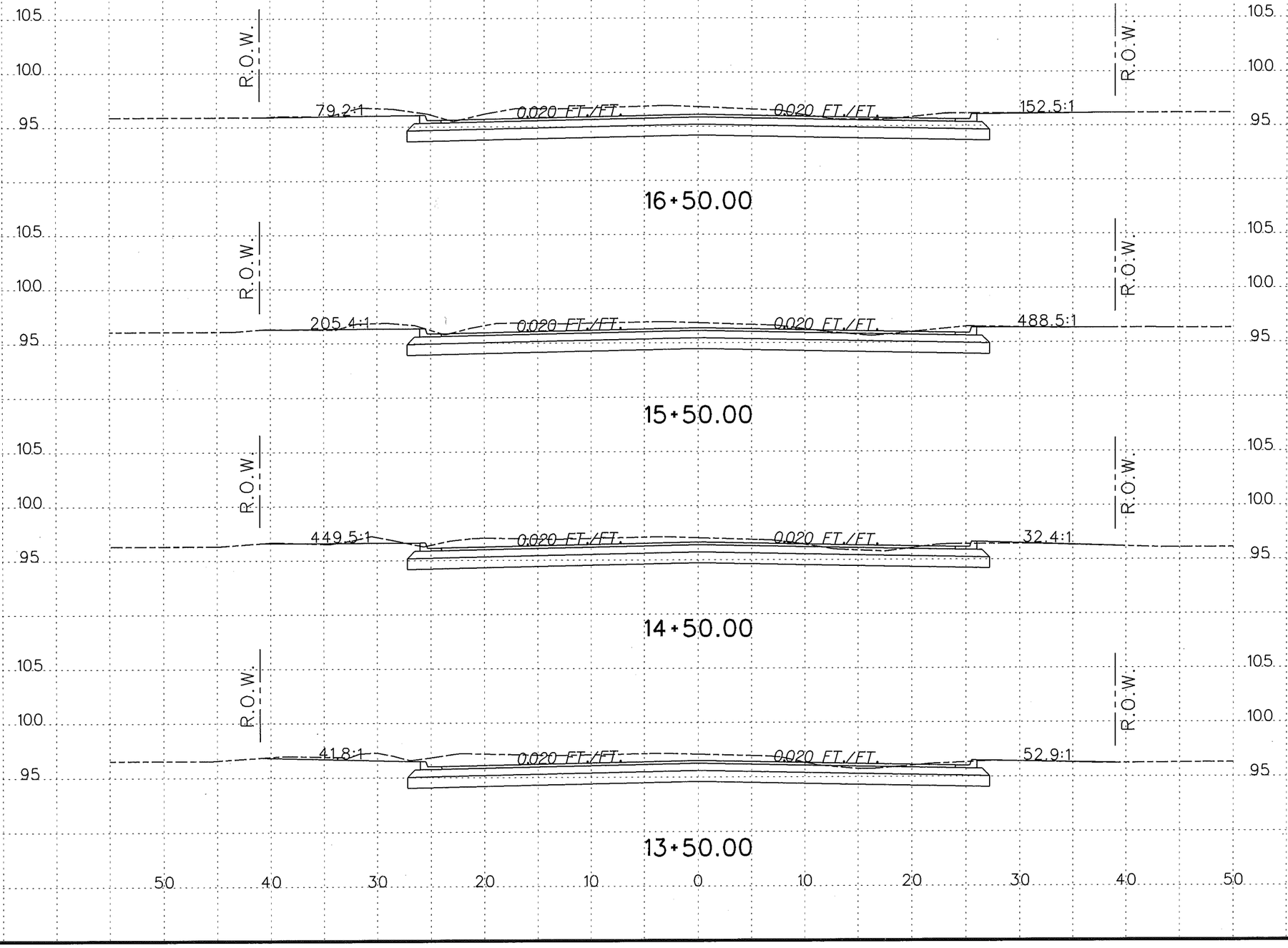

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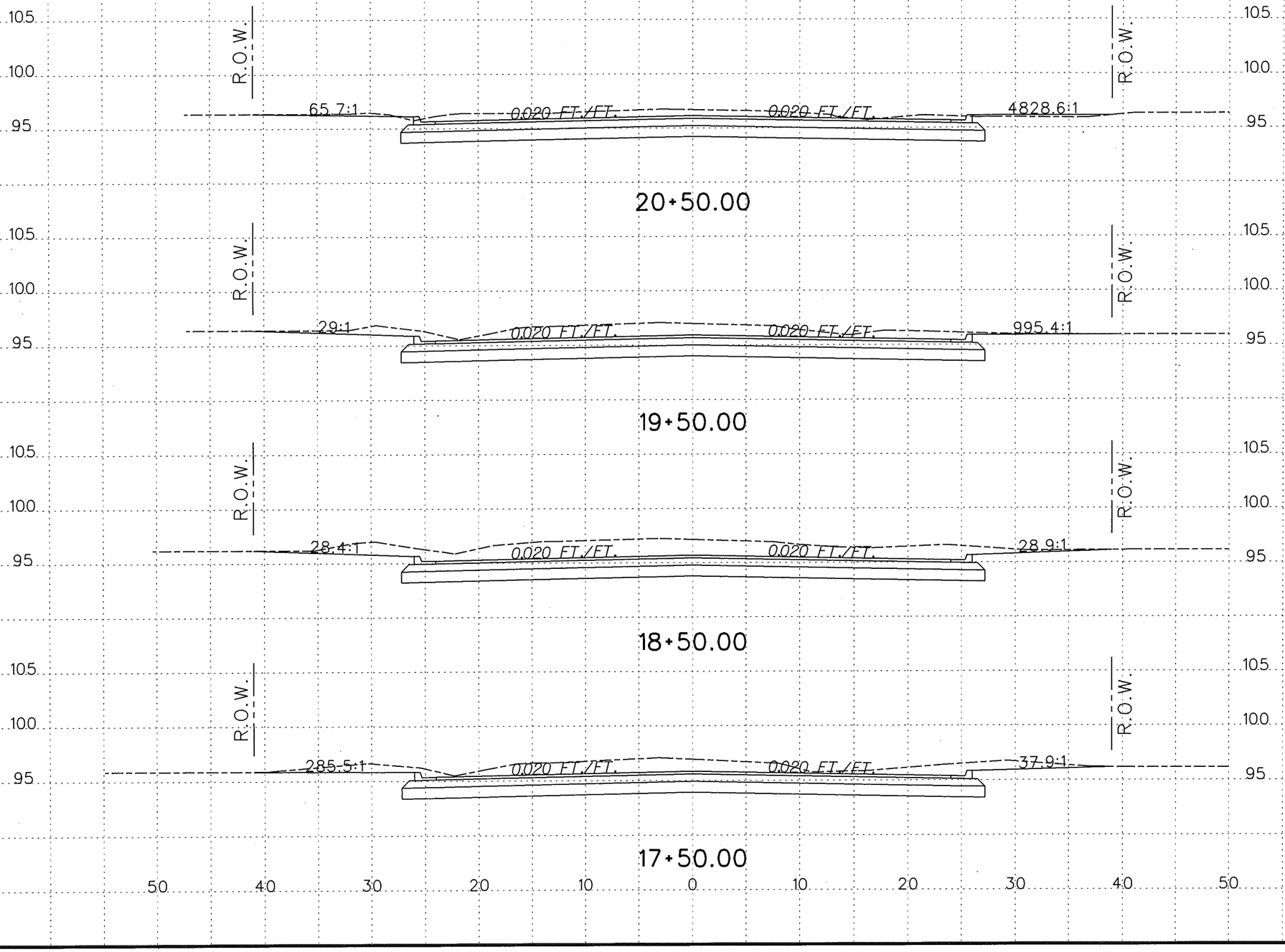

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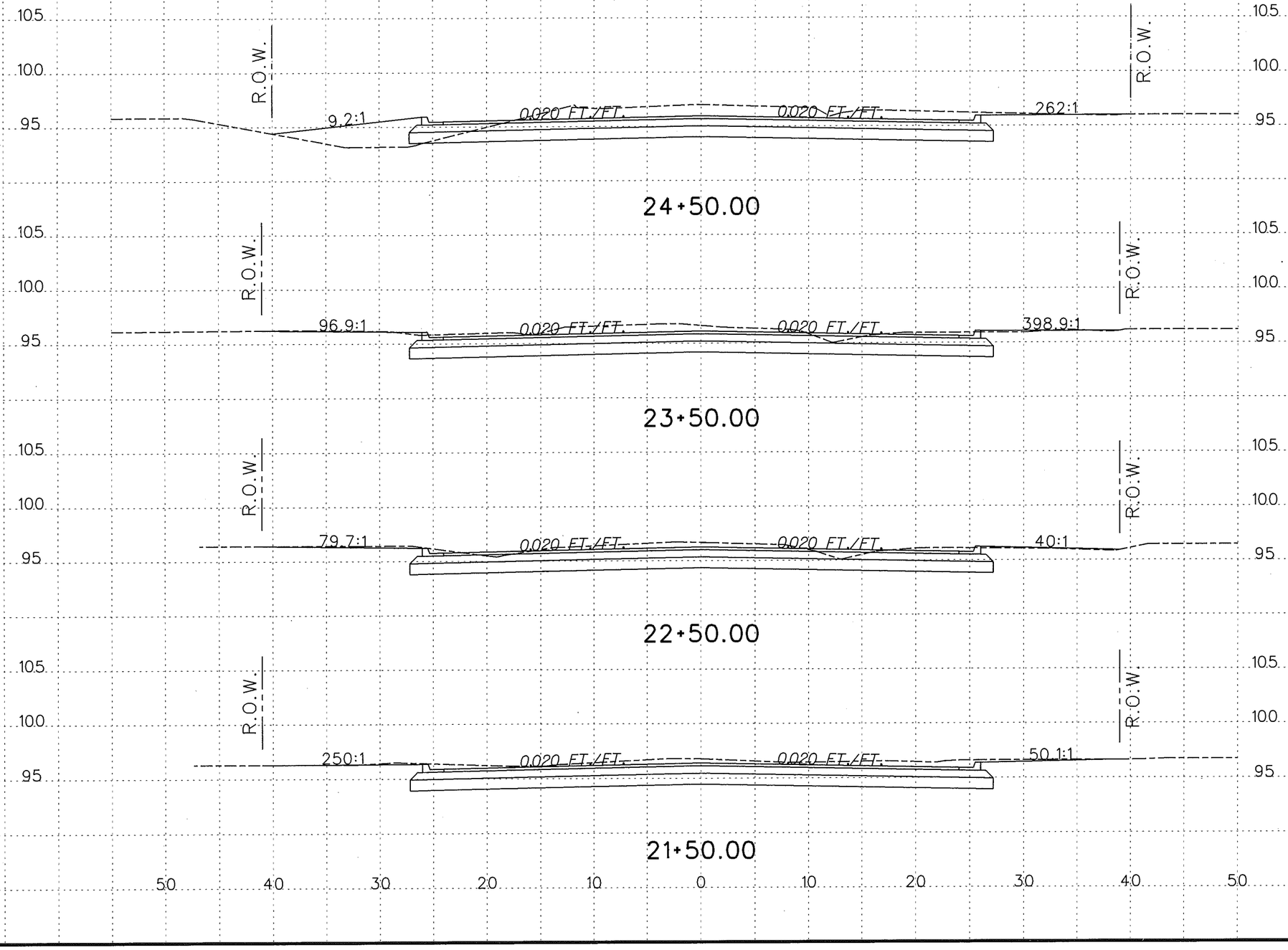

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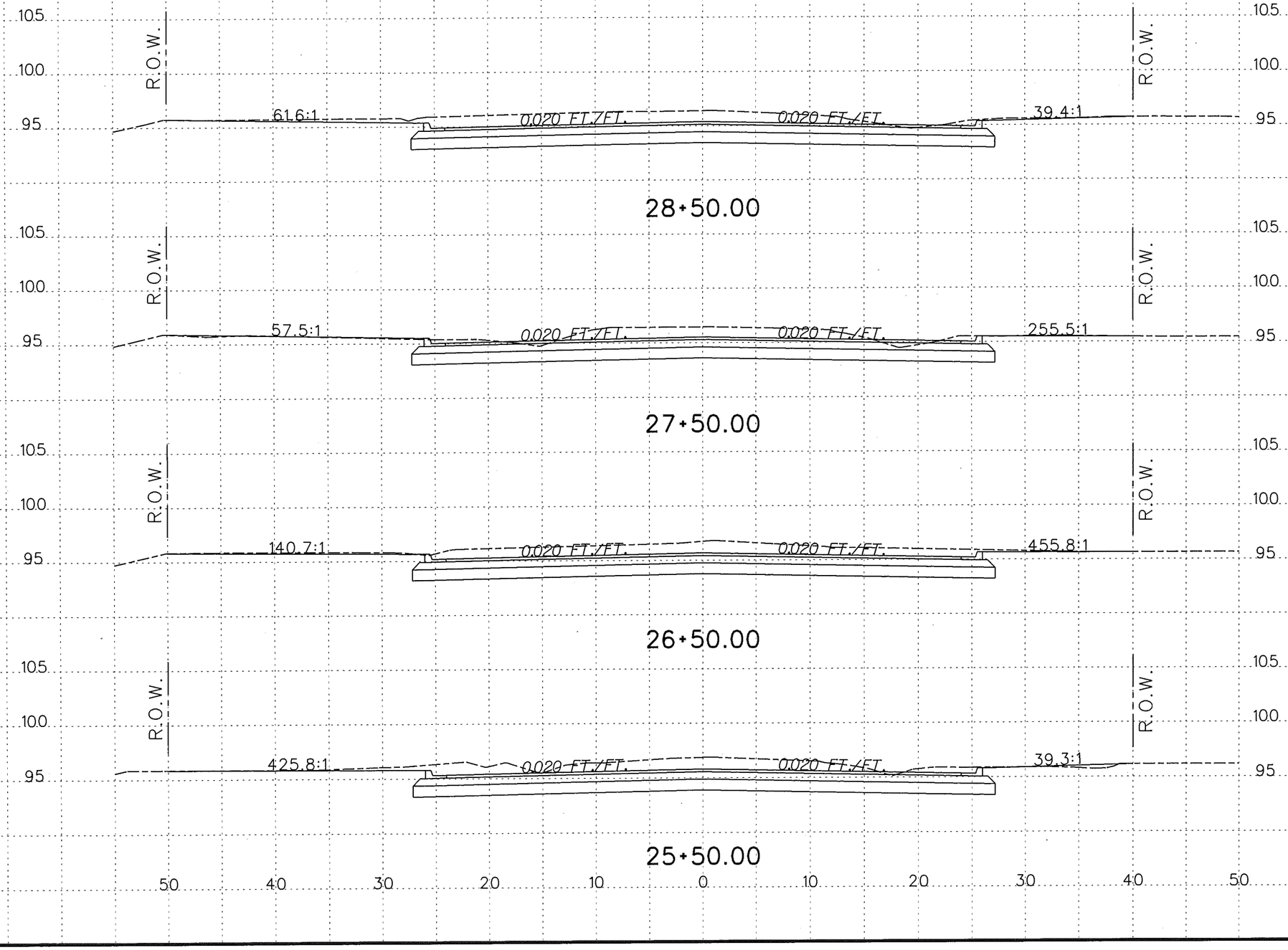

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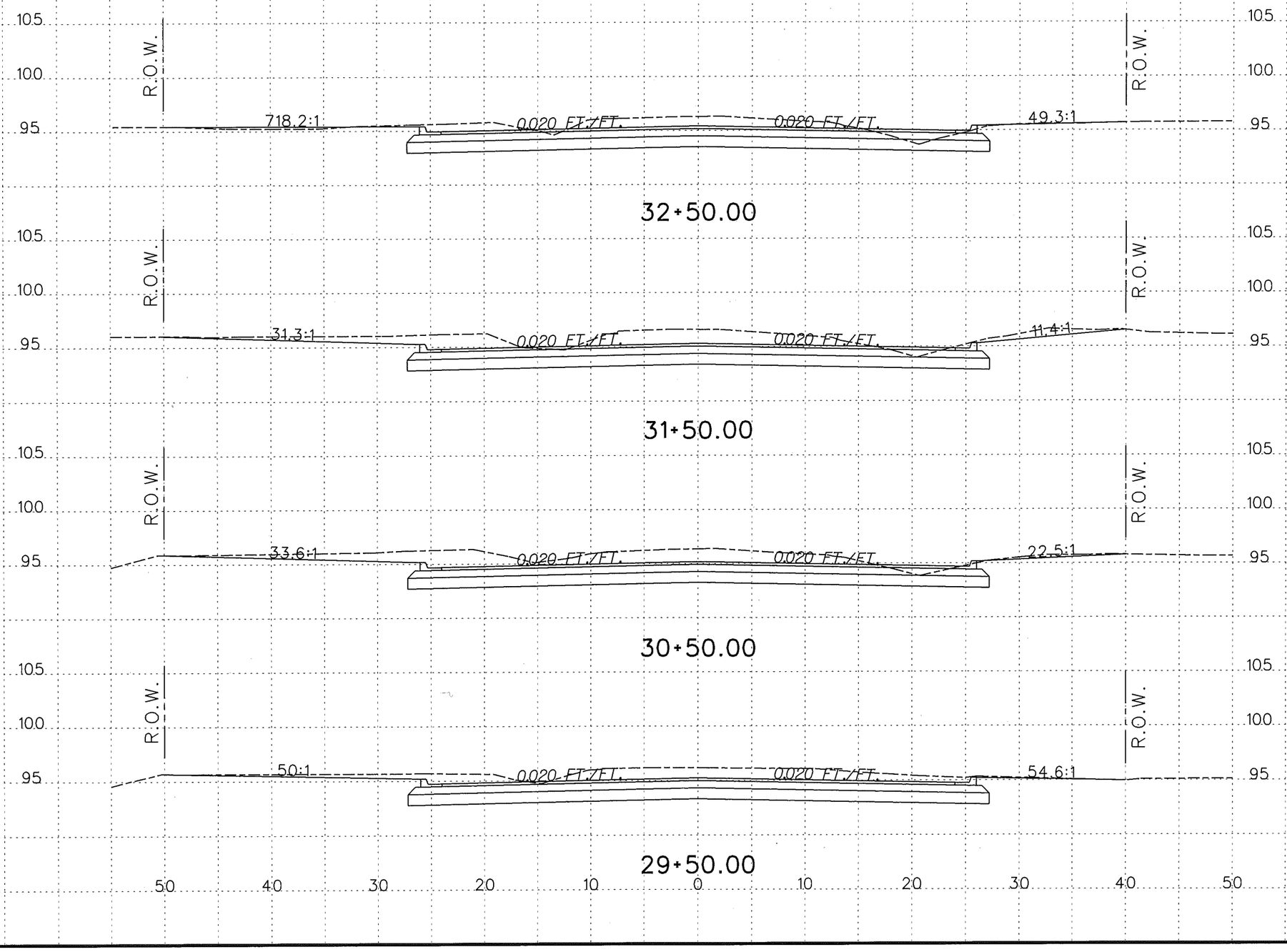

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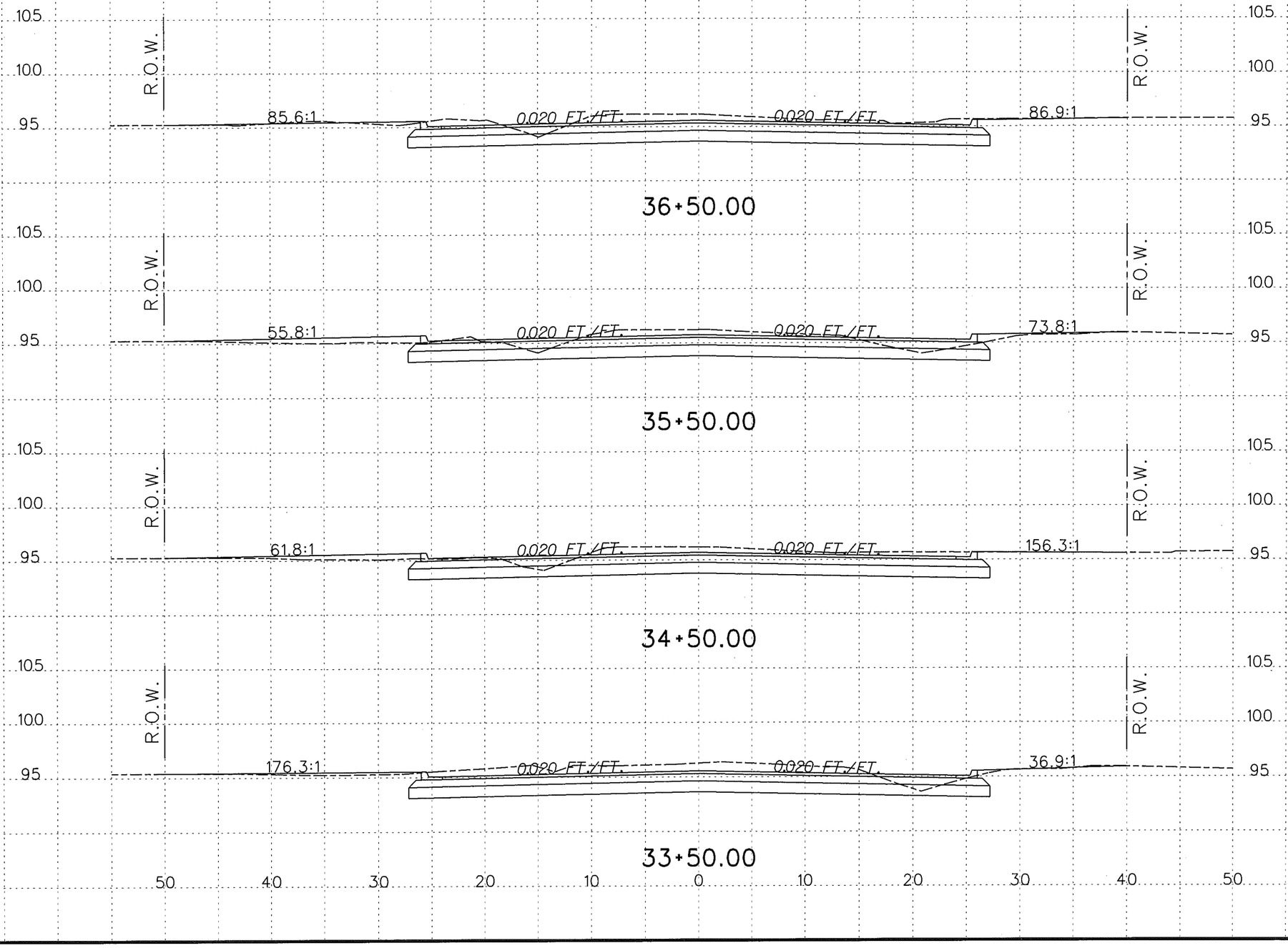

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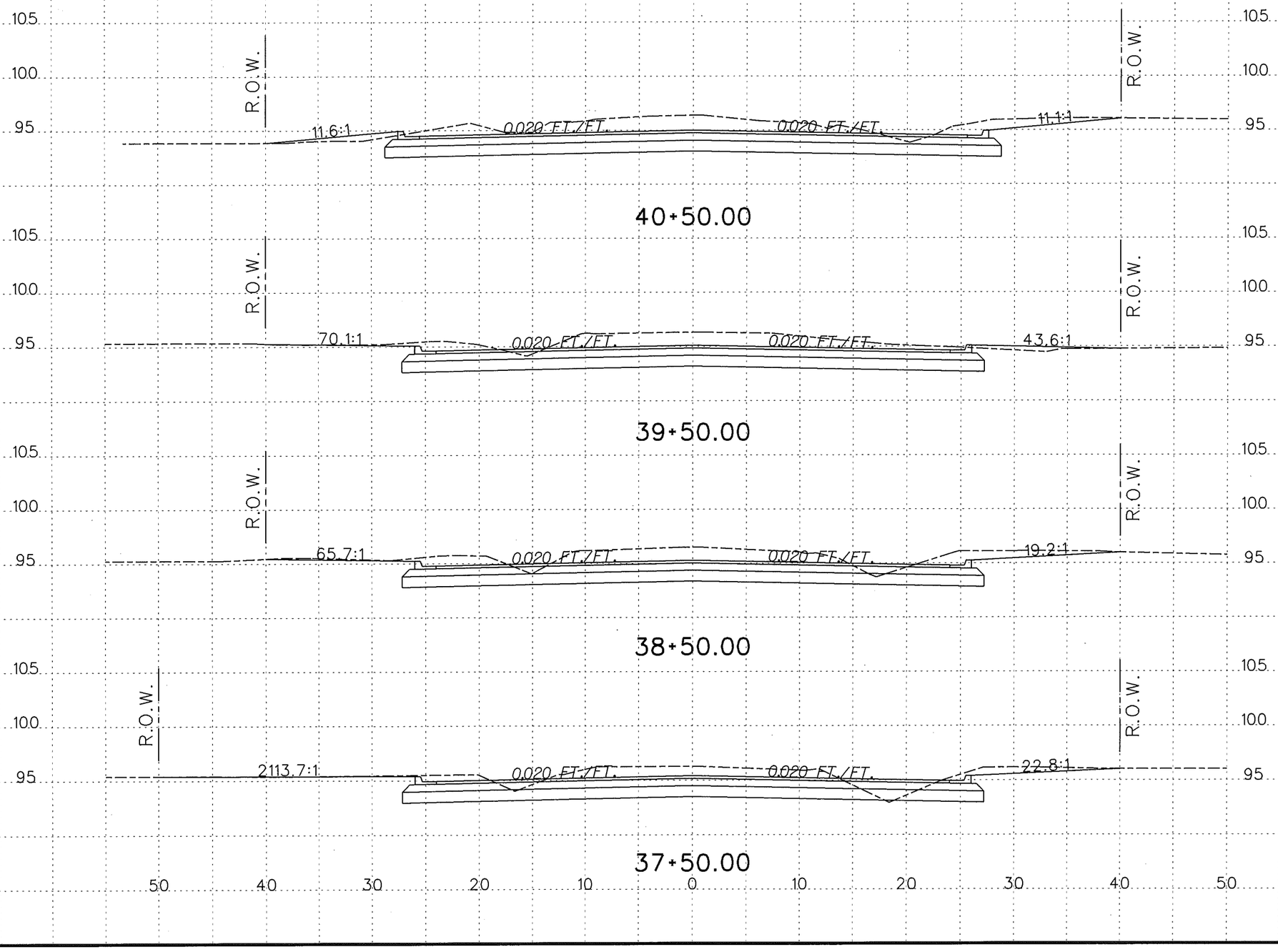

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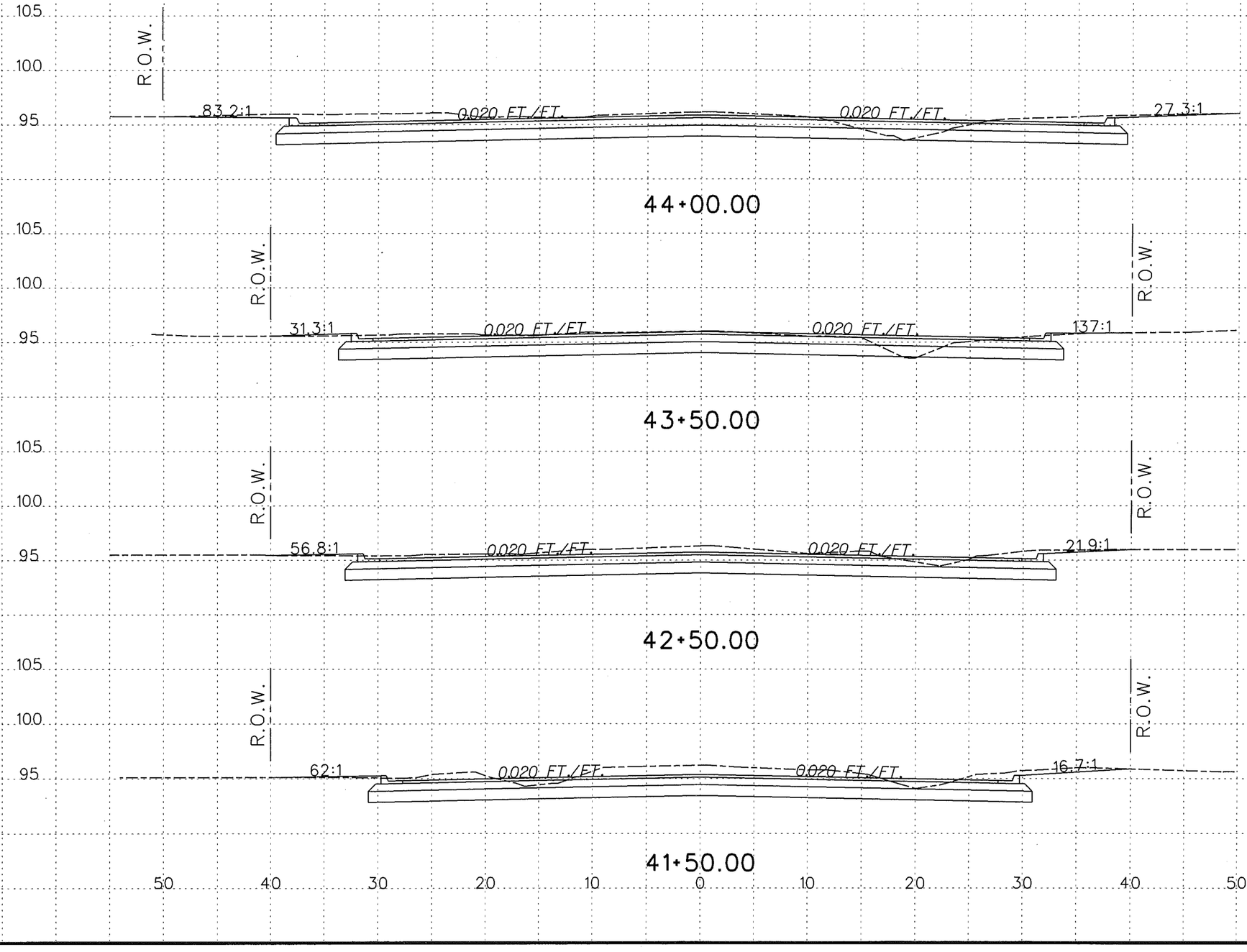

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STATE OF TEXAS
RAMIRO GUTIERREZ
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Ramiro Gutierrez, P.E.

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Professional Engineers & Land Surveyors
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(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.
	HIDALGO	
DRAWN BY:	CHECKED BY:	SHEET No.
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GENERAL NOTES:

1.) PROJECT BARRICADES & CONSTRUCTION WARNING SIGNS SHALL BE PROVIDED THRU OUT PROJECT WHICH COICIDE WITH THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS. AN ALTERNATE TRAFFIC CONTROL PLAN MAY BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

2.) THE WORKERS SHALL TAKE ALL OF THE PRECAUTIONS IN DEALING WITH EXISTING UTILITIES AND SERVICES.

3.) INGRESS AND EGRESS TO ALL PROPERTY OWNERS SHALL BE MAINTAINED DURING THE VARIOUS PHASES OF CONSTRUCTION. WORKERS SHALL COMMUNICATE WITH PROPERTY OWNERS AND KEEP THEM ADVISED AS TO THE ANTICIPATED CONSTRUCTION OPERATIONS.

4.) A MINIMUM SIX (6) INCH COMPACTED CALICHE SURFACE ROAD SHALL BE PROVIDED AT ALL TIMES FOR THE LOCAL TRAFFIC.

5.) EXCAVATED MATERIAL SHALL BE HANDLED IN SUCH A WAY THAT IT SHALL NOT BLOCK DRAINAGE.

6.) STOP SIGNS OF INTERSECTING STREETS SHALL BE ADJUSTED DURING THE VARIOUS CONSTRUCTION PHASES.

7.) MAIL BOXES SHALL BE ADJUSTED AND MAINTAINED DURING THE VARIOUS CONSTRUCTION PHASES.

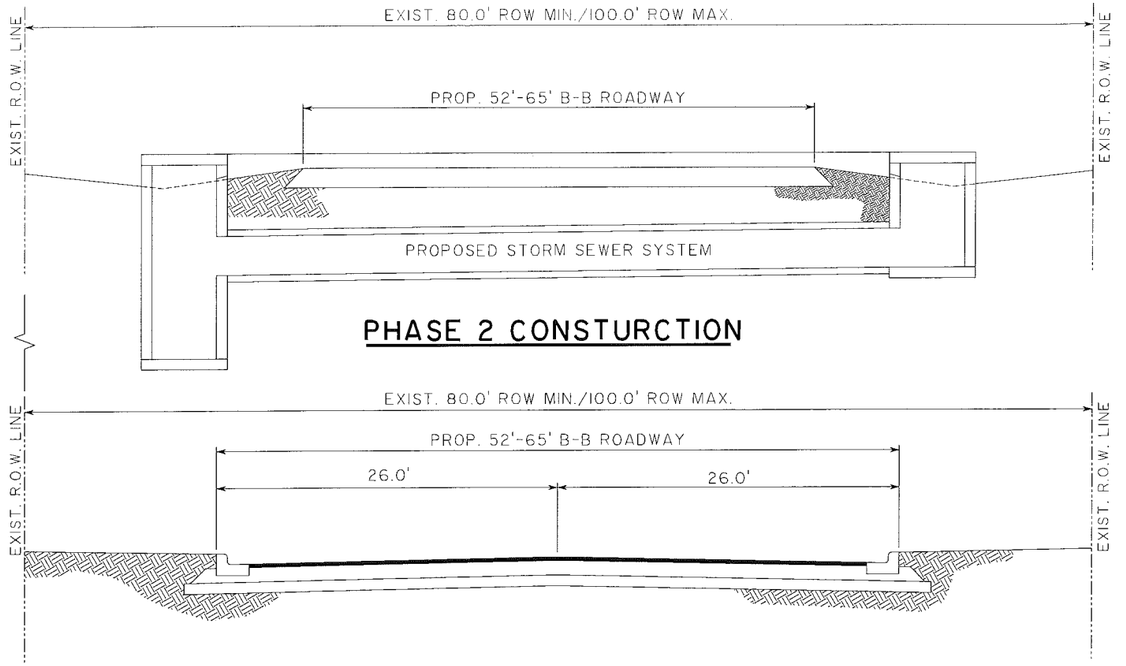
8.) THE CONSTRUCTION SEQUENCE MAY BE ADJUSTED TO ALLOW FOR THE EXCAVATION OF THE FULL ROADWAY WIDTH, HOWEVER, A MINIMUM 4" CALICHE BASE COURSE SHALL BE PLACED ON THE SUBGRADE PRIOR TO THE END OF THE WORKING DAY TO ALLOW FOR INGRESS AND EGRESS BY LOCAL TRAFFIC.

9.) ALL WORK TO ADJUST EXISTING SIGNS AND MAILBOXES DURING THE CONSTRUCTION SHALL NOT BE PAID FOR DIRECTLY BUT SHALL BE CONSIDERED SUBSIDIARY TO BID ITEM 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING.

SEQUENCE OF CONSTRUCTION:

PHASE PROJECT

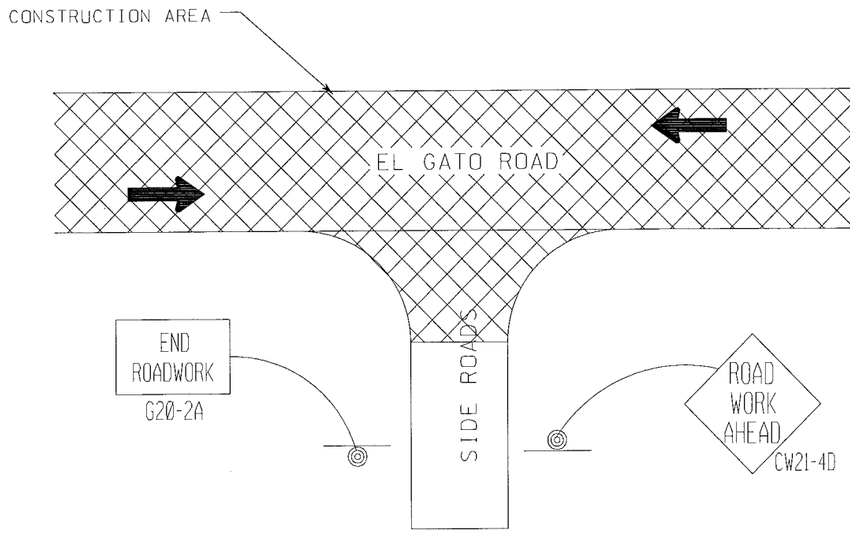
1.) INSTALL ALL NECESSARY TRAFFIC CONTROL DEVICES.
2.) INSTALL PROPOSED STORM SEWER SYSTEM.
3.) CONSTRUCT BASE COURSE ON ONE-HALF OF STREET AS SHOWN IN DETAIL.
4.) CONSTRUCT OTHER HALF OF BASE COURSE ON STREET AS SHOWN ON DETAIL.
5.) CONSTRUCT CURB & GUTTER.
6.) CONSTRUCT ASPHALTIC CONCRETE SURFACE.



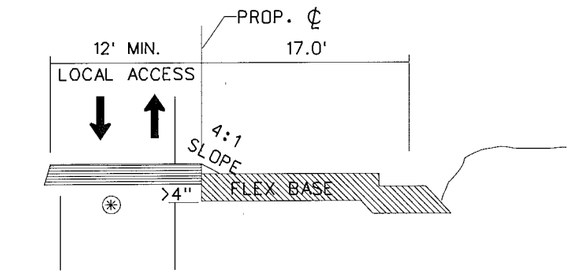
PHASE 2 CONSTURCTION

PHASE 5 & 6 CONSTURCTION

NOTE: SEE TYPICAL SECTIONS FOR PROPOSED MATERIALS

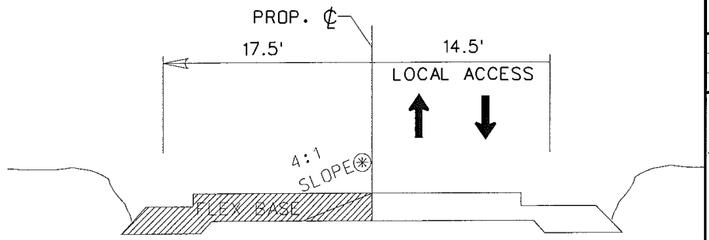


PROJECT BARRICADE DETAIL
SIDE ROADS
PHASE I

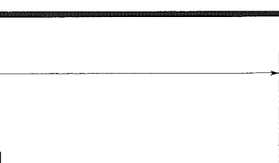


✱ IF DROP-OFF IS GREATER THAN 4" THEN CONTRACTOR SHALL PLACE 4:1 SLOPE AT THE END OF EACH WORKDAY.

PHASE 3



PHASE 4



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EL GATO ROAD
TRAFFIC CONTROL NOTES

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
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130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
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DESIGNED BY:	CHECKED BY:	18

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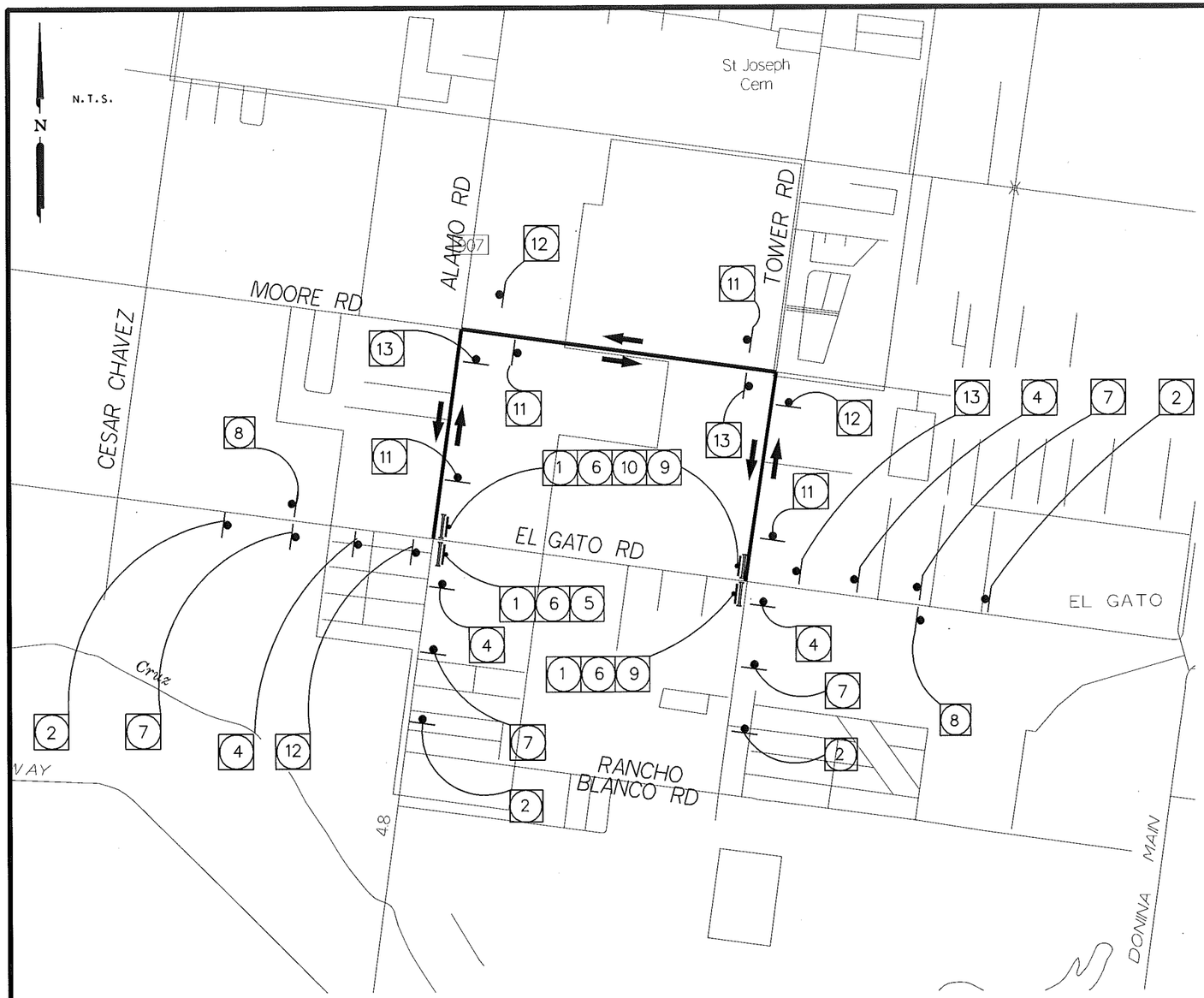

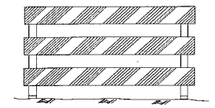

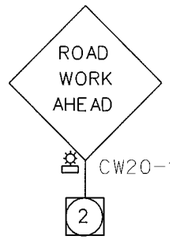

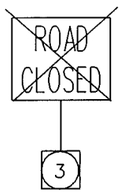

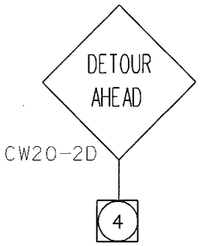

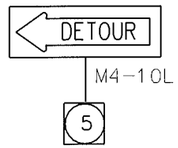

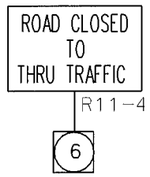

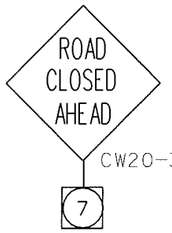

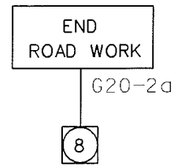

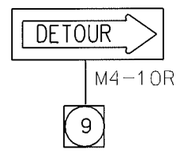

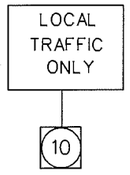

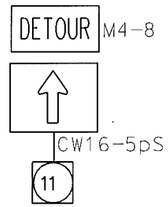

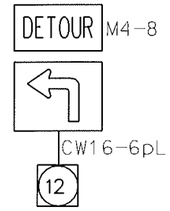

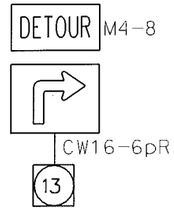

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY RAMIRO GUTIERREZ, P.E. 65948

DATE: 9-28-10

ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE LAW.

EL GATO ROAD
TRAFFIC CONTROL PLAN

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.

DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	19

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Barricade and Construction (BC) Standard Sheets General Notes:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets", the TxDOT "Roadway Design Manual" or engineering judgment.
6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
10. As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign 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.
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.
12. The Engineer has the final decision on the location of all traffic control devices.
13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

Worker Safety Apparel Notes:

1. Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel" 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.

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

Texas Department of Transportation
Traffic Operations Division - TE
Phone (512) 416-3134

WEB ADDRESSES FOR REFERENCED DOCUMENTS

Compliant Work Zone Traffic Control Devices List (CWZTCD)
http://www.txdot.gov/publications/traffic.htm

Texas Manual on Uniform Traffic Control Devices (TMUTCD)
http://www.txdot.gov/publications/traffic.htm

Standard Highway Sign Designs for Texas (SHSD)
http://www.txdot.gov/publications/traffic.htm

Traffic Engineering Standard Sheets
http://www.txdot.gov/business/disclaim.htm

Material Producer List
http://www.txdot.gov/business/producer-list.htm

Departmental Material Specifications (DMS)
http://www.txdot.gov/services/construction/material-specifications/

Roadway Design Manual
http://www.txdot.gov/services/general-services/manuals.htm

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

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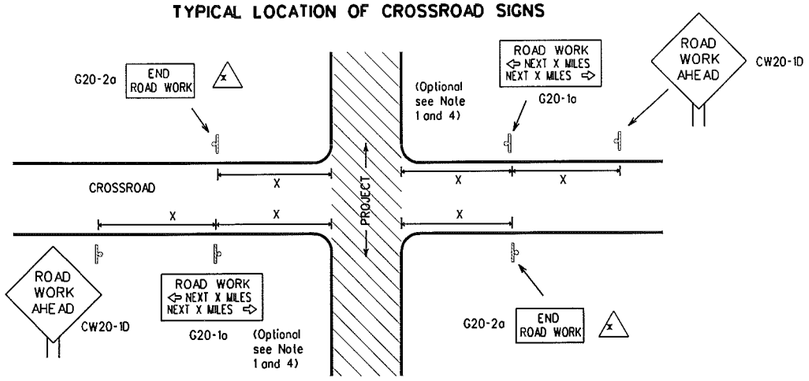
© TxDOT 11-4-D2	DW:- TxDOT	CK:- TxDOT	DW:- TxDOT	CK:- TxDOT

REVISIONS	STATE DISTRICT	FEDERAL REGION	PROJECT NUMBER	SHEET
4-03		6		20
9-07	COUNTY	CONTROL	SECTION	JOB / HIGHWAY

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

ACC:

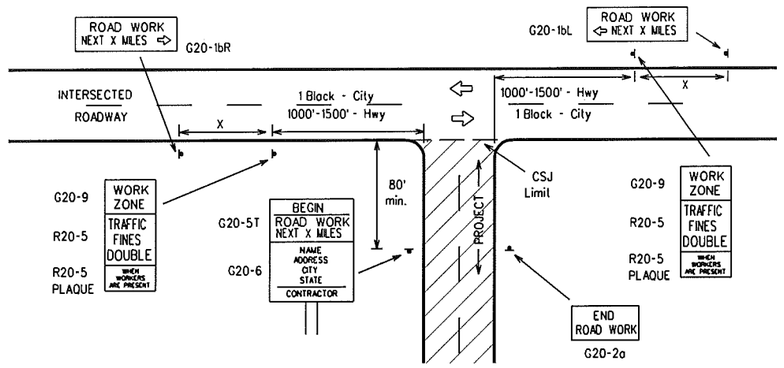
TYPICAL LOCATION OF CROSSROAD SIGNS



(x) May be mounted on back of CW20-1D sign with approval of engineer. (See note 2 below)

1. The typical minimum signing on a crossroad approach should be a CW20-1D ROAD WORK AHEAD sign and a G20-2a 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 (G20-2a) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume. This information shall be shown in the plans.
3. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
4. The G20-1a 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 G20-6 "Contractor Name" sign behind the Type III Barricades for the road closure (see BC(10) also). The G20-1bL and G20-1bR 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" Δ
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]

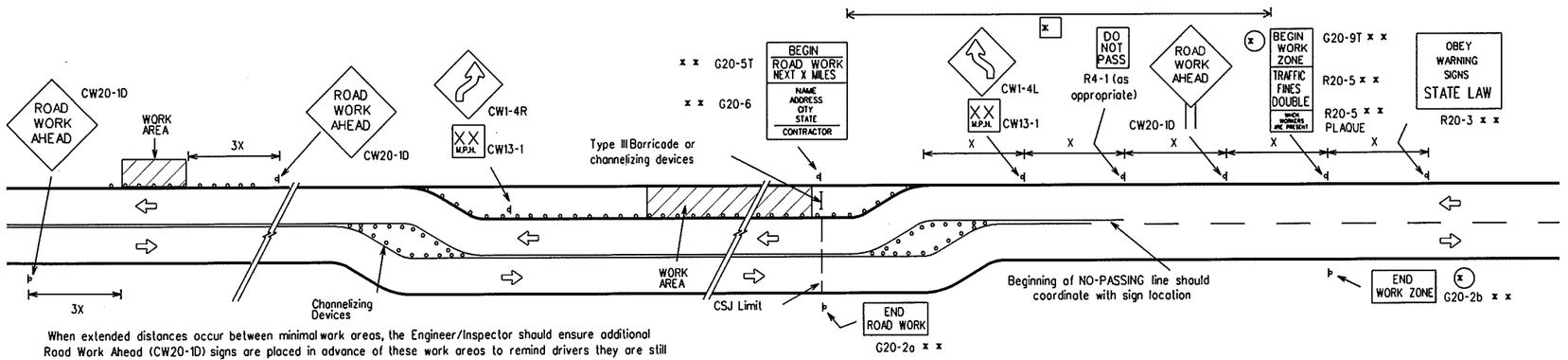
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

Δ 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 ½ mile or more advance warning.
4. 36" x 36" ROAD WORK AHEAD (CW20-1D) signs may be used on low volume crossroads at the discretion of the Engineer. See Note 2 under "Typical Location of Crossroad Signs".
5. Only diamond shaped warning sign sizes are indicated.
6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

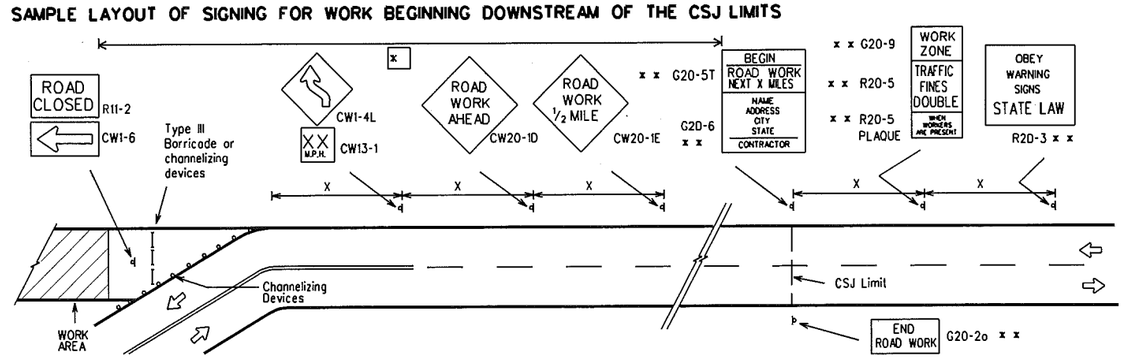
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



When extended distances occur between minimal work areas, 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 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.

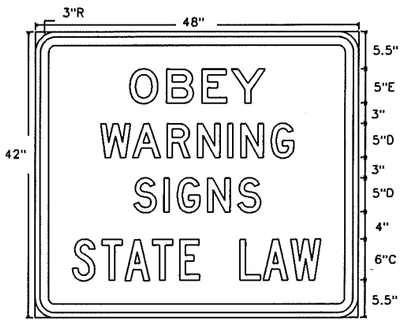
(x) The G20-9T and G20-2b shall be used when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a work zone where traffic fines may double if workers are present.

x x Required CSJ Limit signing. See Note 10 on BC(1).

(x) Area for placement of "ROAD WORK AHEAD" sign and other signs or devices as called for on the Traffic Control Plan.

LEGEND

- Sign
- O O Channelizing Devices
- Type III Barricade
- X See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.



R20-3
Legend/Border - Black
Background - White

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

BARRICADE AND CONSTRUCTION PROJECT LIMIT STANDARD

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©TxDOT 11-4-02	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS 9-07	STATE DISTRICT: 6	FEDERAL REGION	FEDERAL AID PROJECT	SHEET: 21
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY

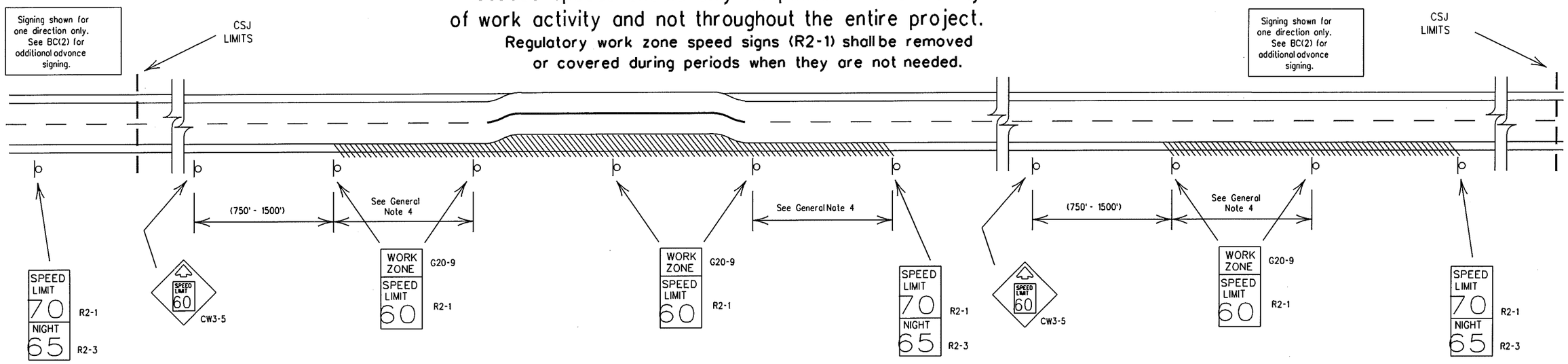
ACC: DISPLAYED 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

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 ony 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 should be included on the design of the traffic control plans when workers or equipment ore not behind concrete barrier, when work activity is within 15 feet of pavement edge or actually on the pavement.

Short Term Work Zone Speed Limit signs should be posted ond 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, errection and maintenance of the CW3-5 sign, G20-9 plaque and the R2-1 and R2-3 signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
7. Turning signs from view, loying signs over or down will not be allowed, unless otherwise noted.
8. Techniques that moy help reduce traffic speeds include but ore 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 ore for illustration only. Work Zone Speed Limits should only be posted as approved for each project.

ACC: → 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	

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT STANDARD

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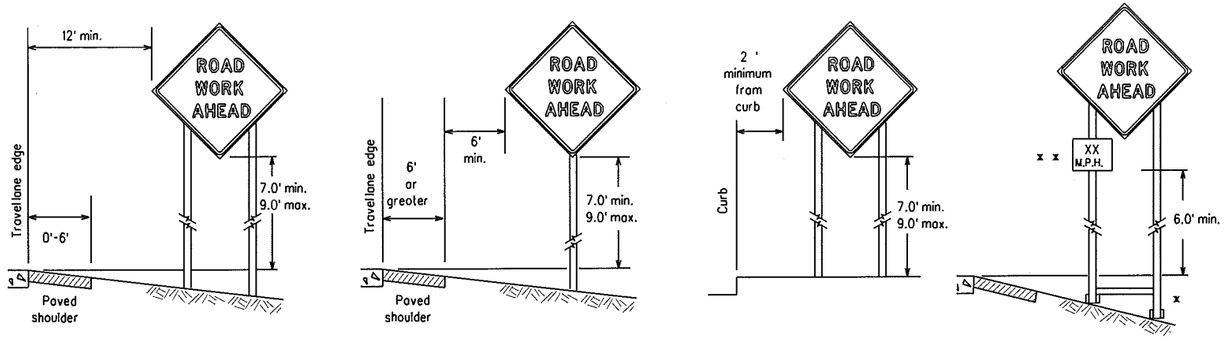
DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT

REVISIONS	STATE DISTRICT	FEDERAL PROJECT NO.	FEDERAL AID PROJECT	SHEET
9-07		6		22

COUNTY	CONTROL	SECTION	JOB	HIGHWAY

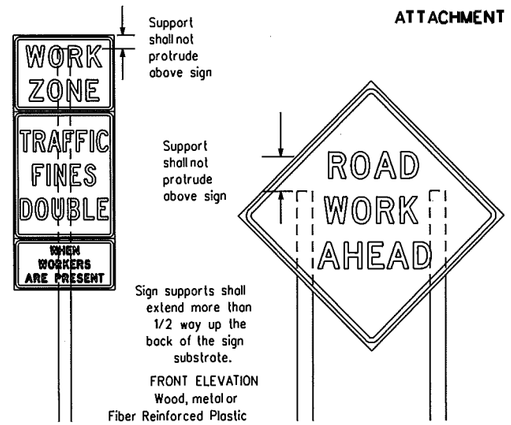
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



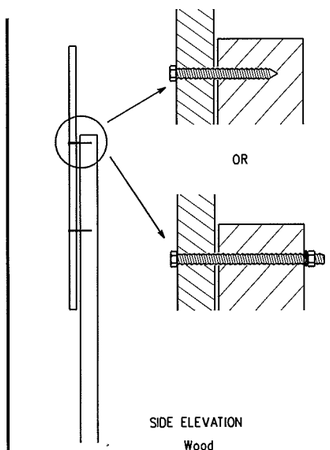
x When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS



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



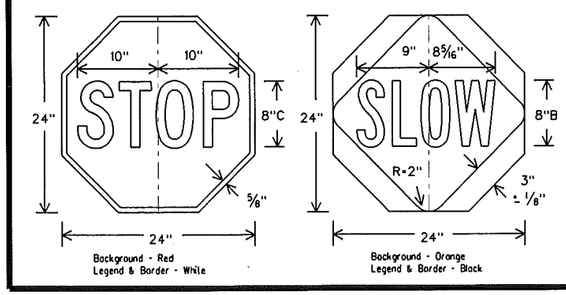
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

Nails will NOT be allowed.

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

STOP/SLOW PADDLES

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



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. 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. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
6. 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.
7. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD). The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
8. 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.
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 inch.
10. 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 Engineer may allow the use of smaller size construction warning signs on secondary roads or city streets where speeds are low if the sign size is listed as an option on the "Typical Construction Warning Sign Size and Spacing" chart shown on BC(2).
2. The Contractor shall furnish the sign sizes shown in plans, the BC Sheets, the TCP sheets 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 C (High Specific Intensity), shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type E (Fluorescent Prismatic), 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 type of sign support meets the crashworthiness standards regardless of the direction of impact. 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. These materials can damage the retroreflectivity of sheeting.
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 is recommended.
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.
6. Rubber (such as tire inner tubes) shall NOT be used for sandbags.
7. 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.
8. 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.
9. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES STANDARD

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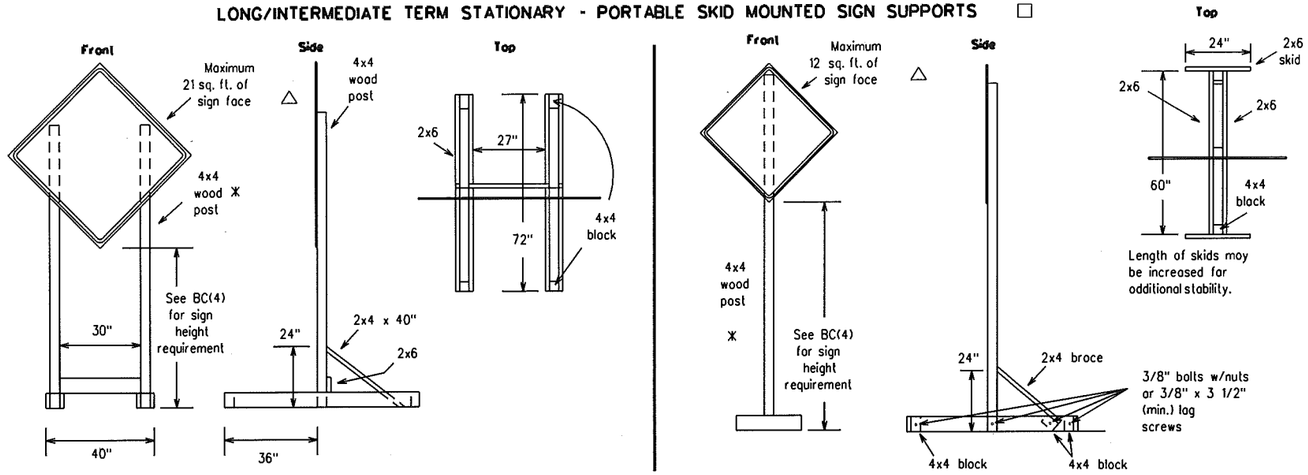
© TxDOT 11-4-02		DW: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS 9-07	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT		SHEET
		6			23
	COUNTY		CONTROL	SECTION	JOB	HIGHWAY

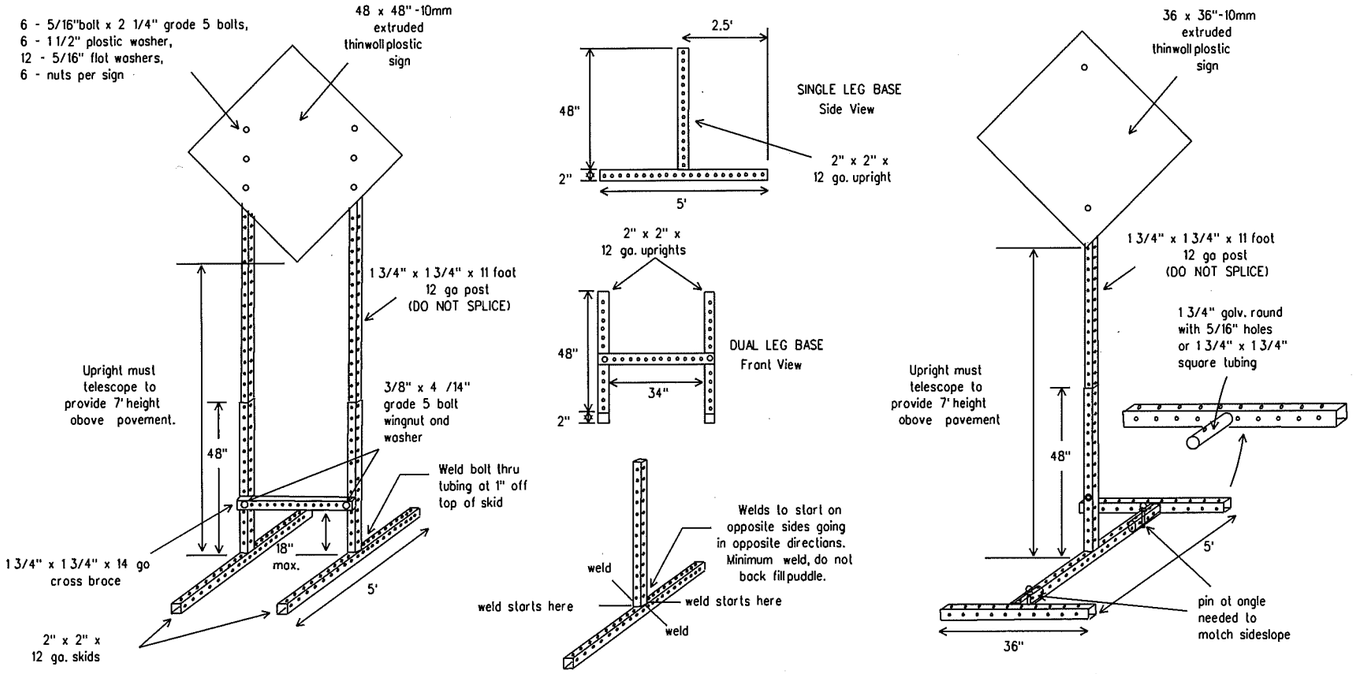
DISPLAYED																ACC:
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	
49	50	51	52	53	54	55	56	57	58	59	60	61	62	63		

SKID MOUNTED WOOD SIGN SUPPORTS

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

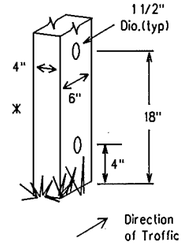


SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS



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)).



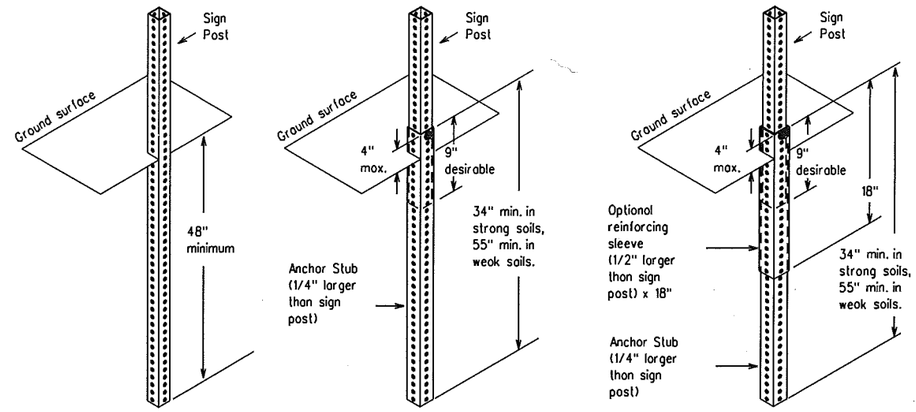
WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS

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

GROUND MOUNTED SIGN SUPPORTS

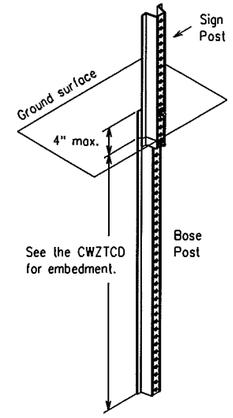
Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support. The maximum sign square footage shall adhere to the manufacturer's recommendation. Two post installations can be used for larger signs.

PERFORATED SQUARE METAL TUBING



WING CHANNEL

Lap-splice/base bolted onchor



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. More details of approved Long/Intermediate and Short Term supports can be found on the CWZTCD list. See BC(1) for website location.
3. No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
4. 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.

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT STANDARD

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© TxDOT 11-4-02	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS 9-07	STATE DISTRICT	FEDERAL ROAD	FEDERAL AID PROJECT	SHEET
		6		24
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY

ACC:

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		

ACC: 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	

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.
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 720 feet. 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	Abb.	Word or Phrase	Abb.
Access Road	ACCS RD	Major	MAJ
Air Quality	AIR QLTY	Miles	MI
Alternate	ALT	Miles Per Hour	MPH
Avenue	AVE	Minor	MNR
Best Route	BEST RTE	Monday	MON
Boulevard	BLVD	Normal	NORM
Bridge	BRDG	North	N
Connot	CANT	Northbound	(route) N
Center	CNTR	Parking	PKING
Construction Ahead	CONST AHEAD	Parking Lot	PRK LOT
Detour Route	DETOUR RTE	Road	RD
Do Not	DONT	Right Lane	RGT LN
East	E	Saturday	SAT
Eastbound	(route) E	Service Road	SERV RD
Emergency	EMER	Shoulder	SHLDR
Emergency Vehicle	EMER VEH	Slippery	SLIP
Entrance, Enter	ENT	South	S
Express Lanes	EXP LANE	Southbound	(route) S
Expressway	EXPWY	Speed	SPD
XXXX Feet	XXXX FT	Street	ST
Fog Ahead	FOG AHD	Sunday	SUN
Freeway	FRWY, FWY	Telephone	PHONE
Freeway Blocked	FWY BLKD	Temporary	TEMP
Friday	FRI	Thursday	THURS
Hazardous Driving	HAZ DRIVING	To	TO
Hazardous Material	HAZMAT	Downtown	DWNTN
High-Occupancy Vehicle	HOV	Traffic	TRAF
Highway	HWY	Travelers	TRVLRS
Hours	HR	Tuesday	TUES
Information	INFO	Time Minutes	TIME MIN
It Is	ITS	Upper Level	UPPR LVL
Junction	JCT	Vehicle	VEH
Left	LFT	Warning	WARN
Left Lane	LFT LN	Wednesday	WED
Lane Closed	LN CLSD	Weight Limit	WT LIMIT
Lower Level	LOWR LVL	West	W
Maintenance	MAINT	Westbound	(route) W
		Wet Pavement	WET PVMT
		Will Not	WONT

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

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

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 *

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

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

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 x	

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

x x See Application Guidelines Note 6.

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.

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 CW20-7a Flagger Symbol, 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 panel provided it meets the visibility, flash rate and dimming requirements on BC(7), for the same size arrow.

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS) STANDARD

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DW: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT

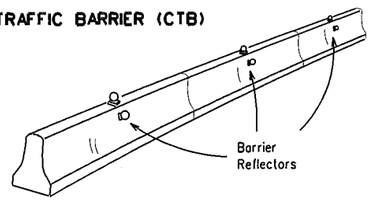
REVISIONS	STATE DISTRICT	FEDERAL PROJECT	SHEET
9-07	6		25

COUNTY	CONTROL	SECTION	JOB	HIGHWAY

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

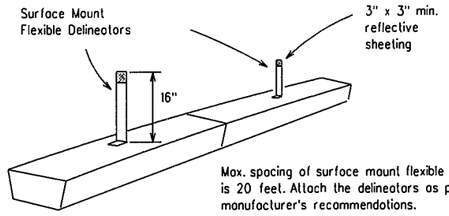
1. Barrier Reflectors shall be prequalified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors (Type C Delineators) can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 502.

CONCRETE TRAFFIC BARRIER (CTB)



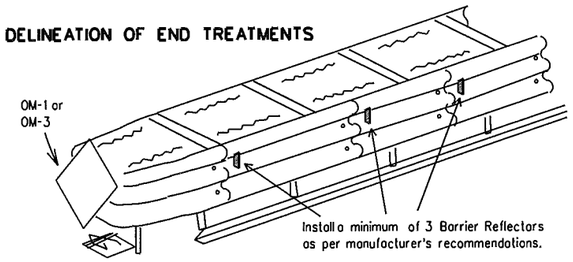
3. Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. 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. Yellow Barrier Reflectors shall be made with Type E Fluorescent Prismatic Yellow Retroreflective Sheeting. White reflectors shall be made with Type D White Prismatic sheeting.
7. Maximum spacing of Barrier Reflectors is forty (40) feet.
8. Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
9. Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
10. Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
11. Single slope barriers shall be delineated as shown on the above detail.

LOW PROFILE CONCRETE BARRIER (LPCB)



Max. spacing of surface mount flexible delineators is 20 feet. Attach the delineators as per manufacturer's recommendations.

DELINEATION OF END TREATMENTS



	APPROACHING TRAFFIC	
	BOTH SIDES	ONE SIDE
DELINEATION	OM-1	OM-3 or Vertical Panel

END TREATMENTS FOR CTB'S USED IN WORK ZONES

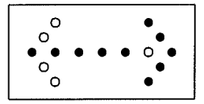
End treatments used on CTB's in work zones shall meet crashworthy standards as defined in the National Cooperative Highway Research Report 350. Refer to the CWZTCD List for approved end treatments and manufacturers.

TYPICAL FLASHING ARROW PANEL

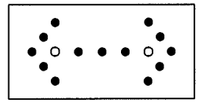
Arrow Panels may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

1. The Flashing Arrow Panel 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 Panels 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 Panel.
4. The Flashing Arrow Panel should be able to display the following symbols:

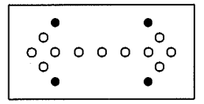
Flashing RIGHT (LEFT) ARROW



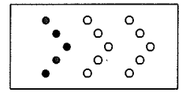
Flashing DOUBLE ARROW



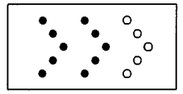
Flashing CAUTION

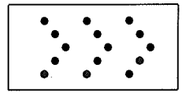


5. The "CAUTION" display consists of four corner lamps flashing simultaneously.
6. The straight line caution display is NOT ALLOWED.
7. The Flashing Arrow Panel shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 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.



Sequential Chevron





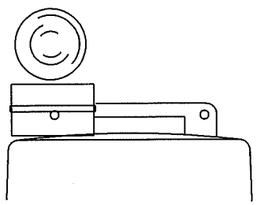
REQUIREMENTS

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

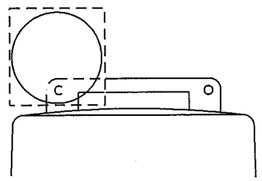
ATTENTION: Flashing Arrow Panels shall be equipped with automatic dimming devices.

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

11. The Flashing Arrow Panel shall be mounted on a vehicle, trailer or other suitable support.
12. A Flashing Arrow Panel SHALL NOT BE USED to laterally shift traffic.
13. A full matrix PCMS may be used to simulate a Flashing Arrow Panel 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 panels should be 7 feet from roadway to bottom of panel.



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



Warning reflector may be round or square. Must have a 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 E Sheeting (Fluorescent Prismatic) 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.

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 D (Non-fluorescent Prismatic).
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.

TRUCK-MOUNTED ATTENUATORS

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

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

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

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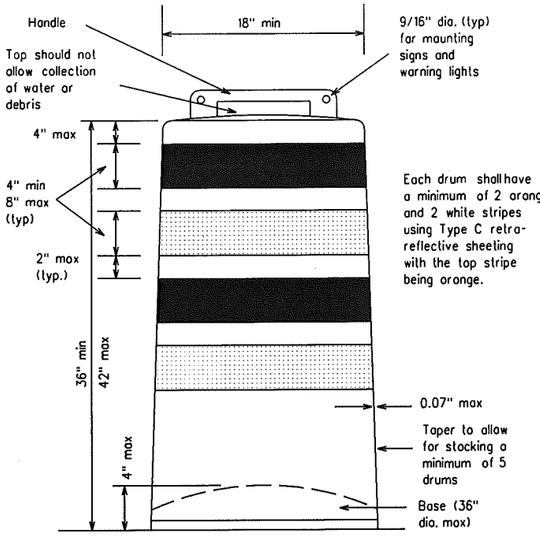
© TxDOT 11-4-02	DW: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS 9-07	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
		6		26
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY

ACC: 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



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

Prequalified plastic drums shall meet the following requirements:

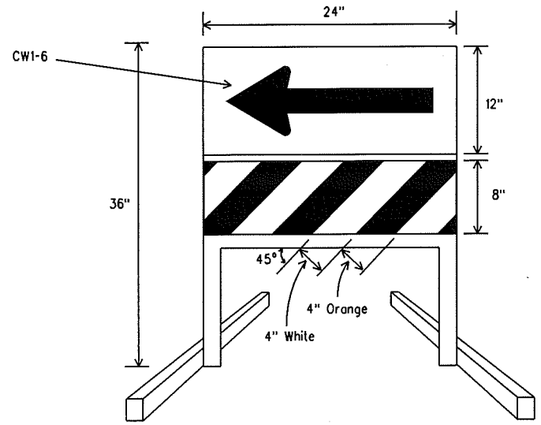
1. Plastic drums shall be a two-piece design: the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents 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 minimum unballasted weight of 7.7 lbs. and maximum unballasted weight of 11 lbs. The wall of the drum body shall be a minimum of 0.07 inch in thickness. Weight of any drum supplied shall not vary more than 0.5 lb. from that of the prequalified sample.
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, "Flat Surface Reflective Sheeting." High Specific Intensity (Type C) retroreflective 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.

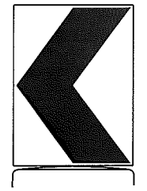
BALLAST

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. 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.
4. 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.
5. Ballast shall not be placed on top of drums.
6. Adhesives may be used to secure base of drums to pavement.

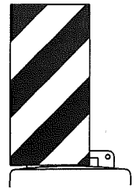


DIRECTION INDICATOR BARRICADE

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



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 E (Fluorescent Prismatic) 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 C (High Specific Intensity). 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.
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.

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES STANDARD

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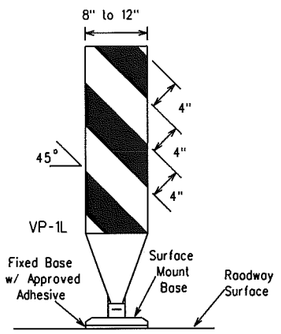
REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT		SHEET
4-03		6			27
9-07	COUNTY		CONTROL	SECTION	JOB / HIGHWAY

L DISPLAYED ACC:
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

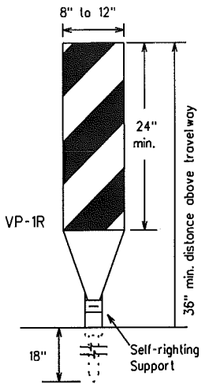
CHANNELIZING DEVICES

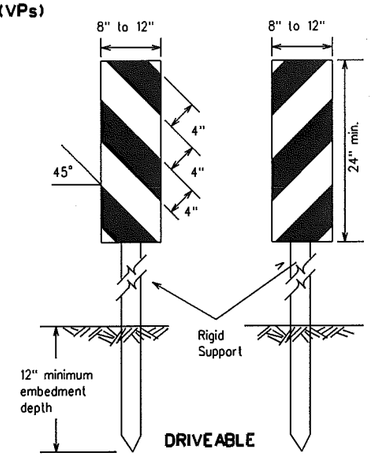
VERTICAL PANELS (VPs)



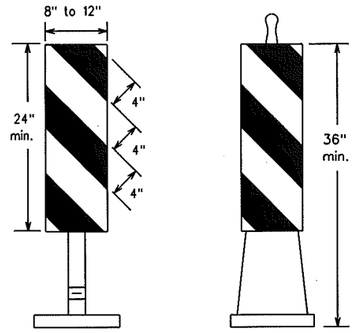
FIXED

(Rigid or self-righting)





DRIVEABLE

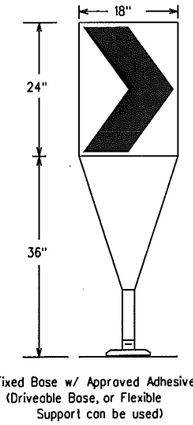


(Rigid or self-righting)

PORTABLE

1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of VP's for drop-offs.
3. VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
4. VP's used on expressways and freeways or other high speed roadways, shall have a minimum of 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 C (High Specific Intensity) conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of reflective material on the vertical panel is greater than 36 inches, a panel stripe of 6 inches shall be used.

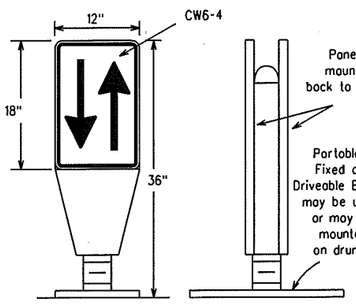
CHEVRONS



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

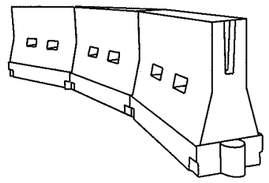
1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
4. To be effective, the chevron should be visible for at least 500 feet.
5. Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type E (Fluorescent Prismatic) conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall be black vinyl non-reflective decal sheeting meeting 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.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



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 simple tubular markers or VPs.
3. Spacing between the OTLD shall not exceed 500 feet. Tubular markers 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 E (Fluorescent Prismatic) conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall be black vinyl non-reflective decal sheeting meeting the requirements of DMS-8300.

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



LONGITUDINAL CHANNELIZING DEVICES

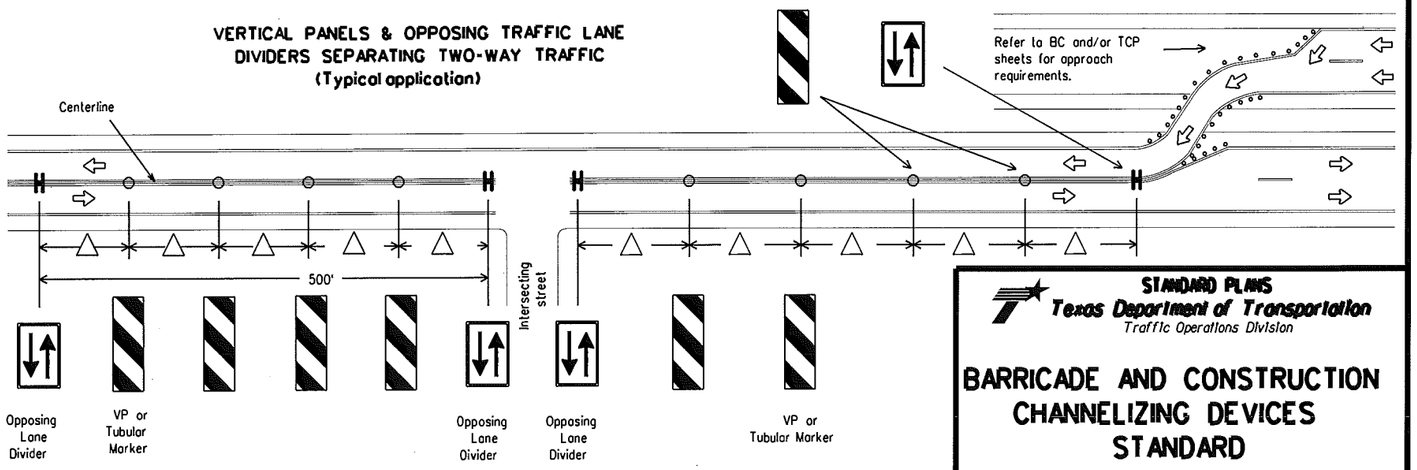
1. Longitudinal channelizing devices are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are designed to contain or redirect a vehicle on impact.
2. Longitudinal channelizing devices may be used instead of a line of cones or drums.
3. Longitudinal channelizing devices shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Longitudinal channelizing devices should not be used to provide positive protection for obstacles, pedestrians or workers.
5. Longitudinal channelizing devices shall be retroreflective, or supplemented with retroreflective delineation as required for temporary barriers on BC(7)-07.

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to 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 be not less than 32 inches in height.

VERTICAL PANELS & OPPOSING TRAFFIC LANE DIVIDERS SEPARATING TWO-WAY TRAFFIC (Typical application)



△ Spacing between the VP's or tubular markers shall not exceed 100 feet. On roadways with speeds less than 45 MPH, spacing between the tubular markers or VP's shall be as shown on the channelizing spacing table shown on this page. If the table shows spacing greater than 100 feet based on the roadway speed, then use a maximum of 100 feet spacing between the tubular markers or VP's. Every fifth channelizing device shall be on OTLD, except when the OLTD must be spaced closer to accomodate an intersection. Spacing between the OTLD shall not exceed 500 feet.

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 approximately 35 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.
8. Examples on this sheet are commonly used channelizing devices in work zones. For other devices, refer to the CWZTCD.

Posted Speed	Formula	Minimum Desirable Taper Lengths x x 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'-75'
35		205'	225'	245'	35'	70'-90'
40		265'	295'	320'	40'	80'-100'
45	L=WS	450'	495'	540'	45'	90'-110'
50		500'	550'	600'	50'	100'-125'
55		550'	605'	660'	55'	110'-140'
60		600'	660'	720'	60'	120'-150'
65		650'	715'	780'	65'	130'-165'
70		700'	770'	840'	70'	140'-175'
75		750'	825'	900'	75'	150'-185'
80		800'	880'	960'	80'	160'-195'

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

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES STANDARD

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REVISIONS 9-07	STATE DISTRICT	FEDERAL PROJECT		SHEET 28
	6			
	COUNTY	CONTROL	SECTION	JOB / HIGHWAY

ACC: DISPLAYED

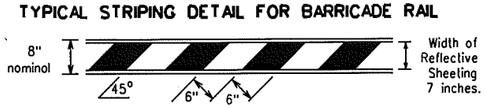
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	

TYPE III BARRICADES

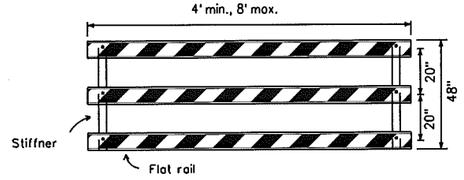
1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type III Barricades and a list of all materials used in the construction of Type III Baricades.
2. Type III Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending 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 C (High Specific Intensity) conforming to Departmental Material Specfication DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.

TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



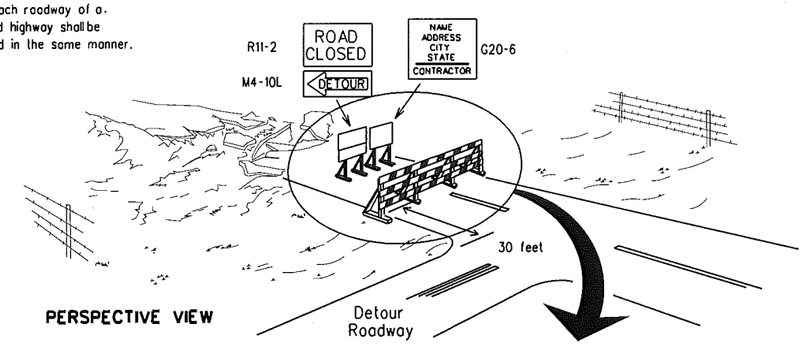
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



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

TYPE III BARRICADE (POST AND SKID) TYPICAL APPLICATION

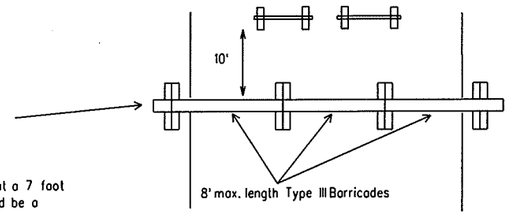
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

The three rails on Type III barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.

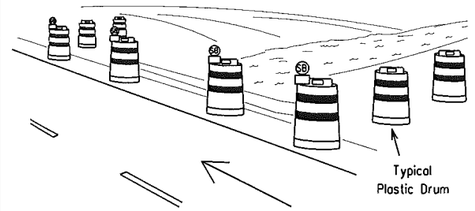
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

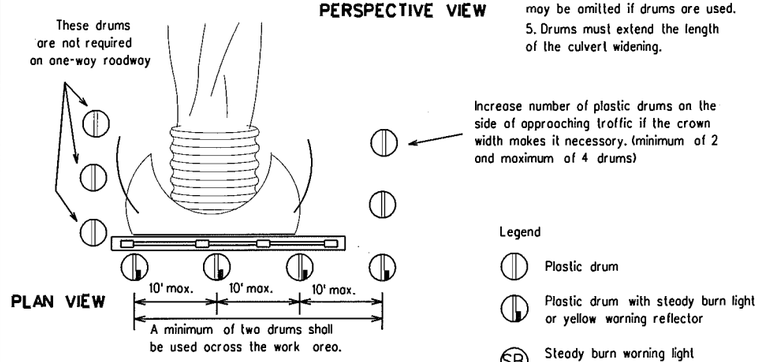
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type III Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



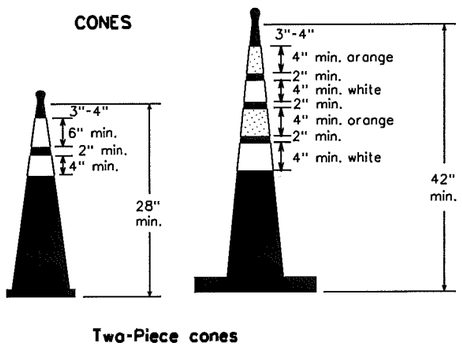
PERSPECTIVE VIEW

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.

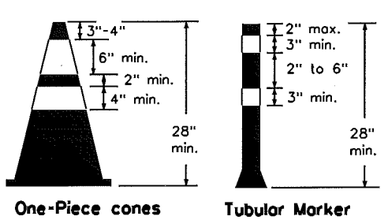


PLAN VIEW

CONES



Two-Piece cones



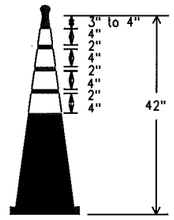
One-Piece cones Tubular Marker

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.

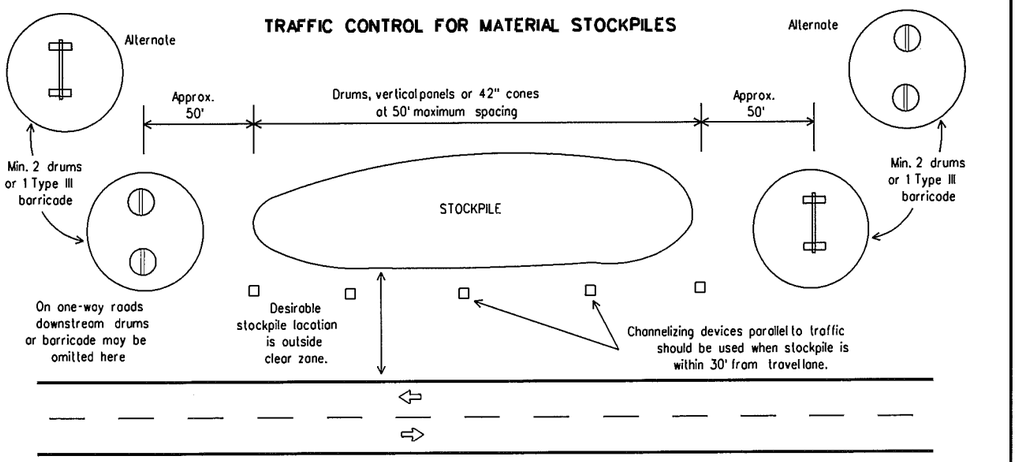
1. Traffic cones and tubular markers shall be a minimum of 28 inches in height when used either on freeways or at nighttime.
2. Cones or tubular markers shall be predominantly orange, fluorescent red-orange, or fluorescent yellow-orange. They should be kept clean and bright for maximum visibility.
3. Cones used only for daytime operations do not require the reflectorized bands.
4. Cones and tubular markers used for nighttime operations shall be reflectorized. Reflectorized material shall have a smooth, sealed outer surface that displays the same approximate color during the day and night. The reflectorized bands shall be retroreflective Type C (High Specific Intensity) conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
5. When used at night, appropriate personnel shall ensure that cones and tubular markers remain in their proper location and in an upright position.
6. Reflectorization of 28" cones shall consist of a minimum 6 inch band placed at least 3 inches but not more than 4 inches from the top, supplemented by a minimum 4 inch band spaced a minimum of 2 inches below the 6 inch band.
7. Reflectorization of 42" cones shall be provided by alternating 4 to 6" orange and white stripes with orange on top.
8. Reflectorization of tubular markers shall be a minimum of two 3 inch bands placed a maximum of 2 inches from the top with a maximum of 6 inches between bands.
9. One-piece cones or tubular markers are generally suitable for temporary usage (up to 8 hours) with other channelization devices such as vertical panels, drums or two-piece cones for long term usage. Care should be taken to ensure they remain in their proper location and in an upright position.
10. Cones or tubular markers used on each project shall be of the same size and shape.
11. The handle may be designed as a hook or other shape, fabricated from non-rigid materials similar to the cone material, and may extend up to a maximum of 8 inches above the top of cone. Length of the handle shall not be considered with regard to the overall height of the cone.

EDGELINE CHANNELIZER



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

TRAFFIC CONTROL FOR MATERIAL STOCKPILES



STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES STANDARD

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REVISIONS 9-07	STATE DISTRICT	FEDERAL PROJ#	FEDERAL AID PROJECT	SHEET
		6		29
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY

109A

ACC:
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

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.

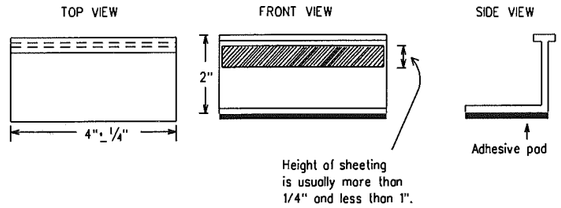
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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 two weeks, 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.
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
PREFABRICATED PAVEMENT MARKINGS-PERMANENT	DMS-8240
PREFABRICATED PAVEMENT MARKINGS-REMOVABLE	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).

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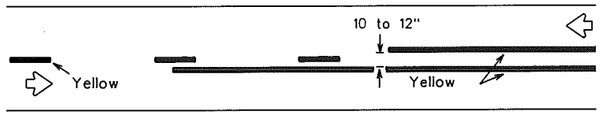
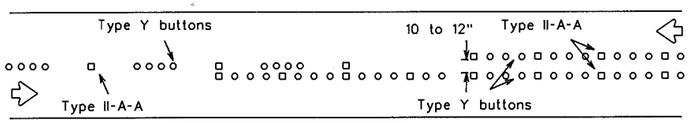
REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
2-98		6		30
1-02				
11-02	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
9-07					

PAVEMENT MARKING PATTERNS

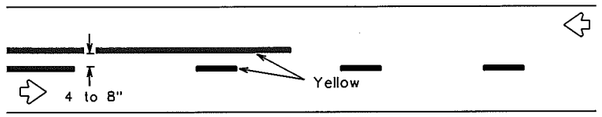
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



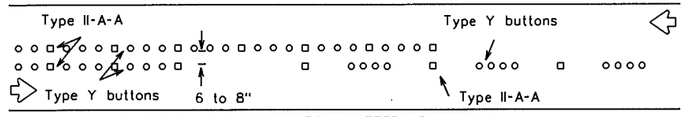
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



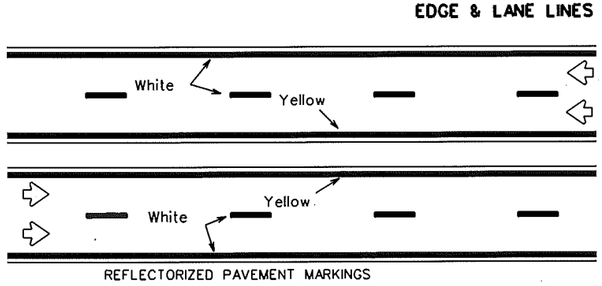
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



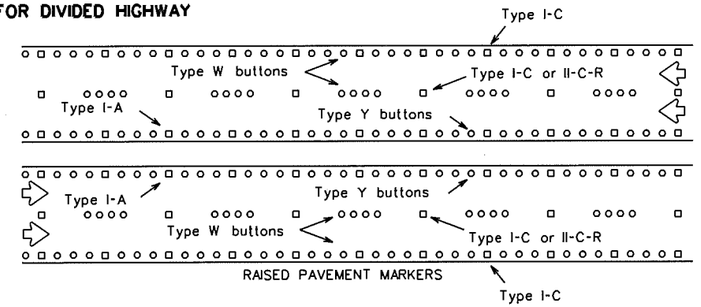
RAISED PAVEMENT MARKERS - PATTERN B

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.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



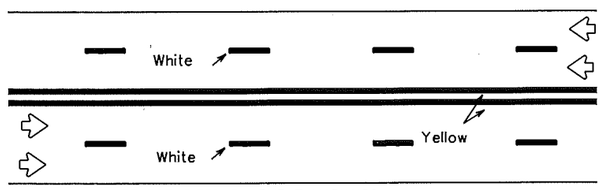
REFLECTORIZED PAVEMENT MARKINGS



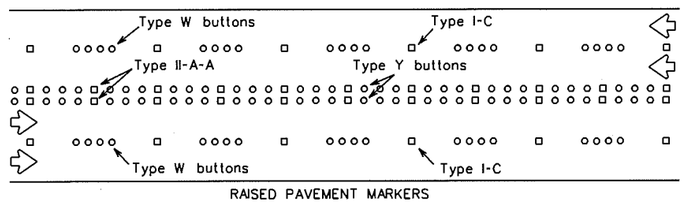
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



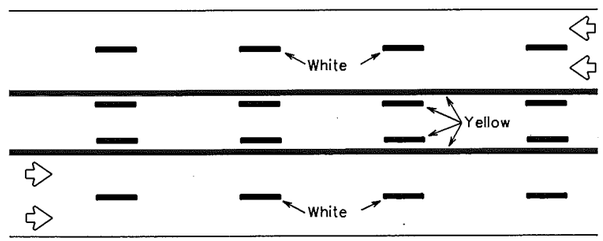
REFLECTORIZED PAVEMENT MARKINGS



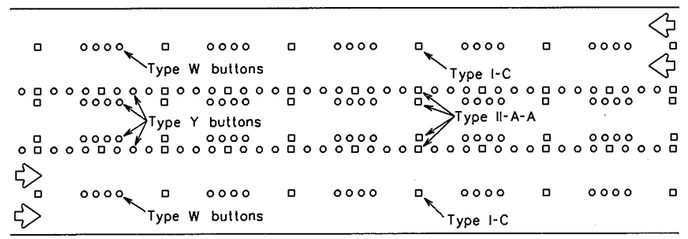
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE



REFLECTORIZED PAVEMENT MARKINGS



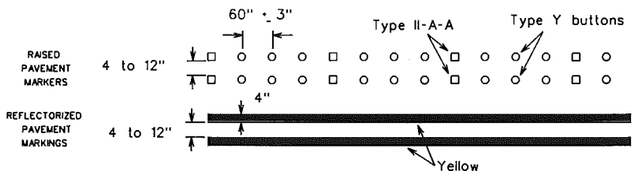
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

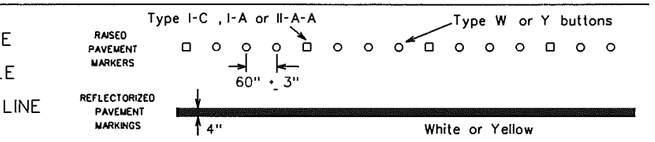
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

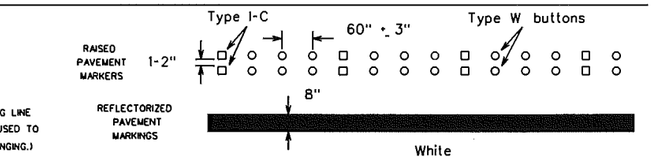


EDGE LINE OR SINGLE NO-PASSING LINE



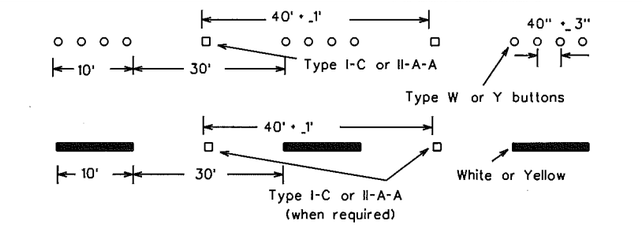
WIDE LINE

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



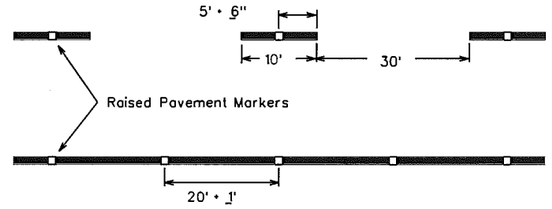
BROKEN LINE

(FOR CENTER LINE OR LANE 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."

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

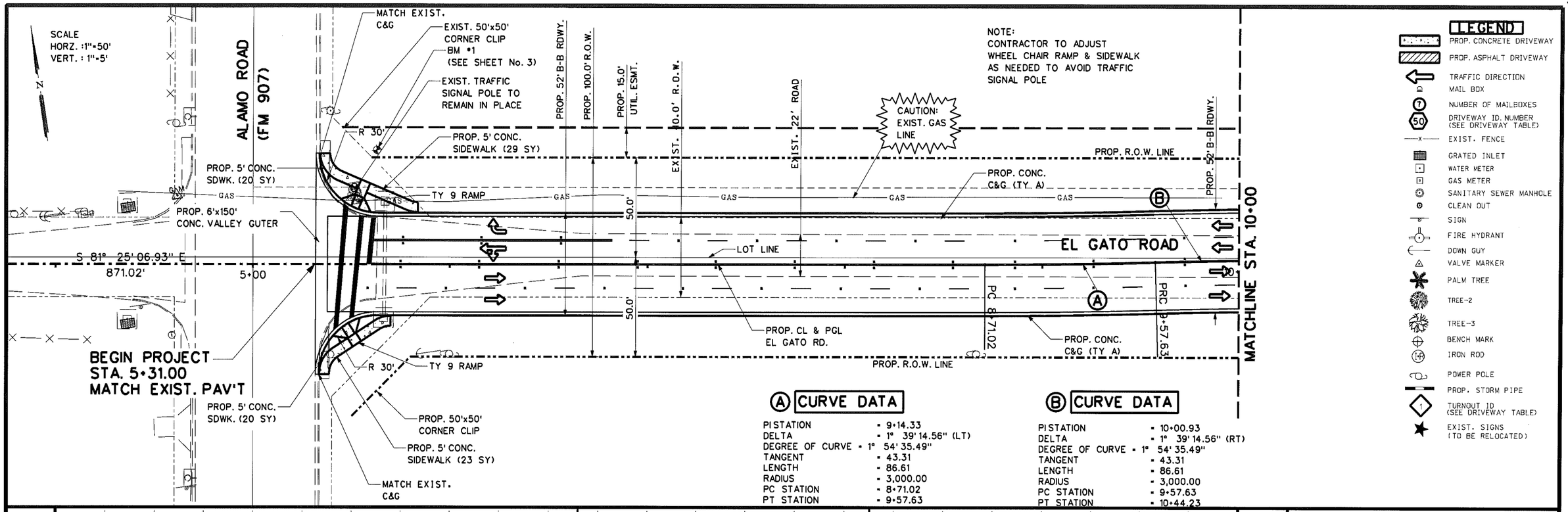
BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS STANDARD

12 of 12 BC(12)-07

©TxDOT February 1998	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS 1-97 2-98 11-02 9-07	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET 31
		6		
	COUNTY	CONTROL	SECTION	JOB / HIGHWAY

DISPLAYED / ACC:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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		



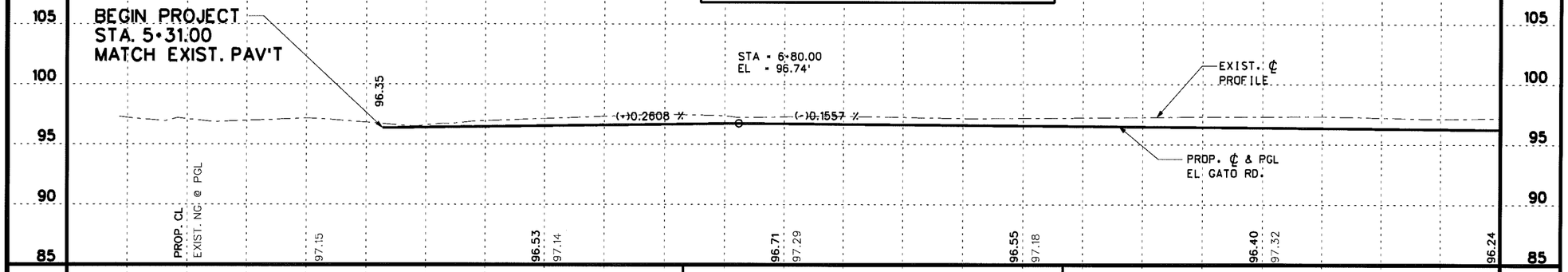
(A) CURVE DATA

PI STATION	= 9+14.33
DELTA	= 1° 39' 14.56" (LT)
DEGREE OF CURVE	= 1° 54' 35.49"
TANGENT	= 43.31
LENGTH	= 86.61
RADIUS	= 3,000.00
PC STATION	= 8+71.02
PT STATION	= 9+57.63

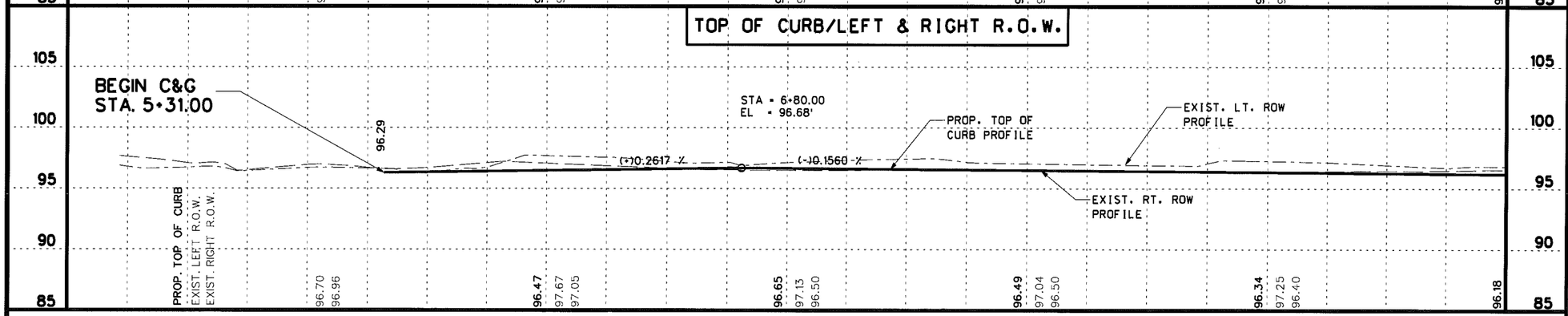
(B) CURVE DATA

PI STATION	= 10+00.93
DELTA	= 1° 39' 14.56" (RT)
DEGREE OF CURVE	= 1° 54' 35.49"
TANGENT	= 43.31
LENGTH	= 86.61
RADIUS	= 3,000.00
PC STATION	= 9+57.63
PT STATION	= 10+44.23

EXIST. & PROPOSED CENTERLINE



TOP OF CURB/LEFT & RIGHT R.O.W.



STATE OF TEXAS
RAMIRO GUTIERREZ
65948
REGISTERED PROFESSIONAL ENGINEER
P.E.

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY RAMIRO GUTIERREZ, P.E. 65948
DATE: 5-25-11

ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE LAW.

SHEET 1 OF 7

EL GATO ROAD
PLAN & PROFILE

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.
DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	32

F:\2008\ENG\024N-El Gato Road\p&p\pp1.dgn

SCALE
HORZ. :1"=50'
VERT. : 1"=5'

N

CAUTION: EXIST. GAS LINE

EXIST. 15' GAS ESM'T

PROP. 15.0' UTIL. ESMT.

EXIST. 40.0' R.O.W.

PROP. 100.0' R.O.W.

PROP. 52' B-B RDWY.

PROP. R.O.W. LINE

PROP. CL & PGL EL GATO RD.

PROP. CONC. C&G (TY A)

GAS

GAS

GAS

GAS

GAS

EL GATO ROAD

LOT LINE

MATCHLINE STA. 10+00

MATCHLINE STA. 16+00

00

15+00

PT 10+44.23

OHEC

OHEC

OHEC

51.0'

50.0'

49.0'

50.0'

PROP. CONC. C&G (TY A)

EXIST. 18"x23' RCP (*) TO BE REMOVED

PROP. R.O.W. LINE

1

LEGEND

- PROP. CONCRETE DRIVEWAY
- PROP. ASPHALT DRIVEWAY
- TRAFFIC DIRECTION
- MAIL BOX
- (7) NUMBER OF MAILBOXES
- (50) DRIVEWAY ID. NUMBER (SEE DRIVEWAY TABLE)
- —x— EXIST. FENCE
- GRATED INLET
- WATER METER
- GAS METER
- SANITARY SEWER MANHOLE
- CLEAN OUT
- SIGN
- FIRE HYDRANT
- DOWN GUY
- VALVE MARKER
- PALM TREE
- TREE-2
- TREE-3
- BENCH MARK
- IRON ROD
- POWER POLE
- PROP. STORM PIPE
- (1) TURNOUT ID (SEE DRIVEWAY TABLE)
- EXIST. SIGNS (TO BE RELOCATED)
- (*) SUBSIDIARY TO VARIOUS BID ITEMS

EXIST. & PROPOSED CENTERLINE

105 / 100 / 95 / 90 / 85

EXIST. ℄ PROFILE

STA = 14+50.00
EL = 96.65'

(+)0.1276 %

(-)0.2628 %

PROP. ℄ & PGL EL GATO RD.

(-)0.1557 %

(+)0.1276 %

STA = 10+58.00
EL = 96.15'

PROP. CL EXIST. NG @ PGL

97.19 | 96.20 97.26 | 96.33 97.31 | 96.46 97.09 | 96.59 97.08 | 96.52 96.96 | 96.26

TOP OF CURB/LEFT & RIGHT R.O.W.

105 / 100 / 95 / 90 / 85

EXIST. LT. ROW PROFILE

PROP. TOP OF CURB PROFILE

STA = 14+50.00
EL = 96.59'

(+)0.1276 %

(-)0.2628 %

EXIST. RT. ROW PROFILE

(-)0.1560 %

(+)0.1276 %

STA = 10+58.21
EL = 96.09'

PROP. TOP OF CURB
EXIST. LEFT R.O.W.
EXIST. RIGHT R.O.W.

96.84 96.57 | 96.14 96.80 96.79 | 96.27 96.78 96.76 | 96.40 96.75 96.32 | 96.53 96.86 96.17 | 96.46 96.53 96.29 | 96.20

10+00 | 11+00 | 12+00 | 13+00 | 14+00 | 15+00 | 16+

STATE OF TEXAS
RAMIRO GUTIERREZ
65948
REGISTERED
PROFESSIONAL ENGINEER

R. Gutierrez, P.E.

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DATE: 5-25-11

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SHEET 2 OF 7

EL GATO ROAD
PLAN & PROFILE

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.

DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	33

F:\2008\ENG\024N-El Gato Road\p&p\pp2.dgn

SCALE
HORZ. :1"=50'
VERT. : 1"=5'

N

MATCHLINE STA. 16+00

MATCHLINE STA. 22+00

PROP. 15.0' UTIL. ESMT.

EXIST. 40' R.O.W.

EXIST. 20' ROAD

CAUTION: EXIST. GAS LINE

CITY LIMITS

PROP. 5' CONC. SIDEWALK (114 SY)

TY 9 RAMP

PSJA ELEMENTARY SCHOOL

EXIST. FENCE TO BE REMOVED

PROP. 6'x110' CONC. VALLEY GUTTER

TY 9 RAMP

PROP. 5' CONC. SIDEWALK (72 SY)

PROP. R.O.W. LINE

PROP. CONC. C&G (TY A)

GAS

LOT LINE

PROP. 100.0' R.O.W.

51.0'

49.0'

50.0'

S 81° 25' 06.93" E

1,320.92'

EL GATO ROAD

20+00

PROP. CL & PGL EL GATO RD.

PROP. CONC. C&G (TY A)

EXIST. 24"x43.0' RCP TO BE REMOVED

PROP. R.O.W. LINE

PROP. RDWY.

12' T.L.

13.5' T.L.

6' VALLEY GUTTER

VARIES

6' CROSSWALK

2.0%

VARIES

1:12

VARIES

CROSSWALK TO MEET ADA CROSS-SLOPE REQUIREMENTS

SECTON A-A

LEGEND

- PROP. CONCRETE DRIVEWAY
- PROP. ASPHALT DRIVEWAY
- TRAFFIC DIRECTION
- MAIL BOX
- (7) NUMBER OF MAILBOXES
- (50) DRIVEWAY ID. NUMBER (SEE DRIVEWAY TABLE)
- EXIST. FENCE
- GRATED INLET
- WATER METER
- GAS METER
- SANITARY SEWER MANHOLE
- CLEAN OUT
- SIGN
- FIRE HYDRANT
- DOWN GUY
- VALVE MARKER
- PALM TREE
- TREE-2
- TREE-3
- BENCH MARK
- IRON ROD
- POWER POLE
- PROP. STORM PIPE
- (1) TURNOUT ID (SEE DRIVEWAY TABLE)
- EXIST. SIGNS (TO BE RELOCATED)
- (*) SUBSIDIARY TO VARIOUS BID ITEMS

EXIST. & PROPOSED CENTERLINE

105 / 100 / 95 / 90 / 85

PROP. ℄ & PGL EL GATO RD.

(-)0.2628 %

(+)0.2347 %

STA = 18+30.50
EL = 95.65'

EXIST. ℄ PROFILE

(+)0.2347 %

(-)0.2174

STA = 21+50.00
EL = 96.40'

PROP. CL EXIST. NG @ PGL	96.82	95.99	96.88	95.73	97.08	95.81	97.07	96.05	96.82	96.28	96.72	96.29

TOP OF CURB/LEFT & RIGHT R.O.W.

105 / 100 / 95 / 90 / 85

PROP. TOP OF CURB

(-)0.2628 %

(+)0.2347 %

STA = 18+30.50
EL = 95.59'

PROP. TOP OF CURB PROFILE

EXIST. LT. ROW PROFILE

EXIST. RT. ROW PROFILE

(+)0.2347 %

(-)0.2174

STA = 21+50.00
EL = 96.34'

EXIST. LEFT R.O.W. EXIST. RIGHT R.O.W.	96.20 96.26	95.93	95.91 96.17	95.67	95.95 96.15	95.75	96.03 96.06	95.99	96.11 96.14	96.22	96.20 96.34	96.23

+00 | 17+00 | 18+00 | 19+00 | 20+00 | 21+00 | 22

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SHEET 3 OF 7

EL GATO ROAD
PLAN & PROFILE

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.
DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	34

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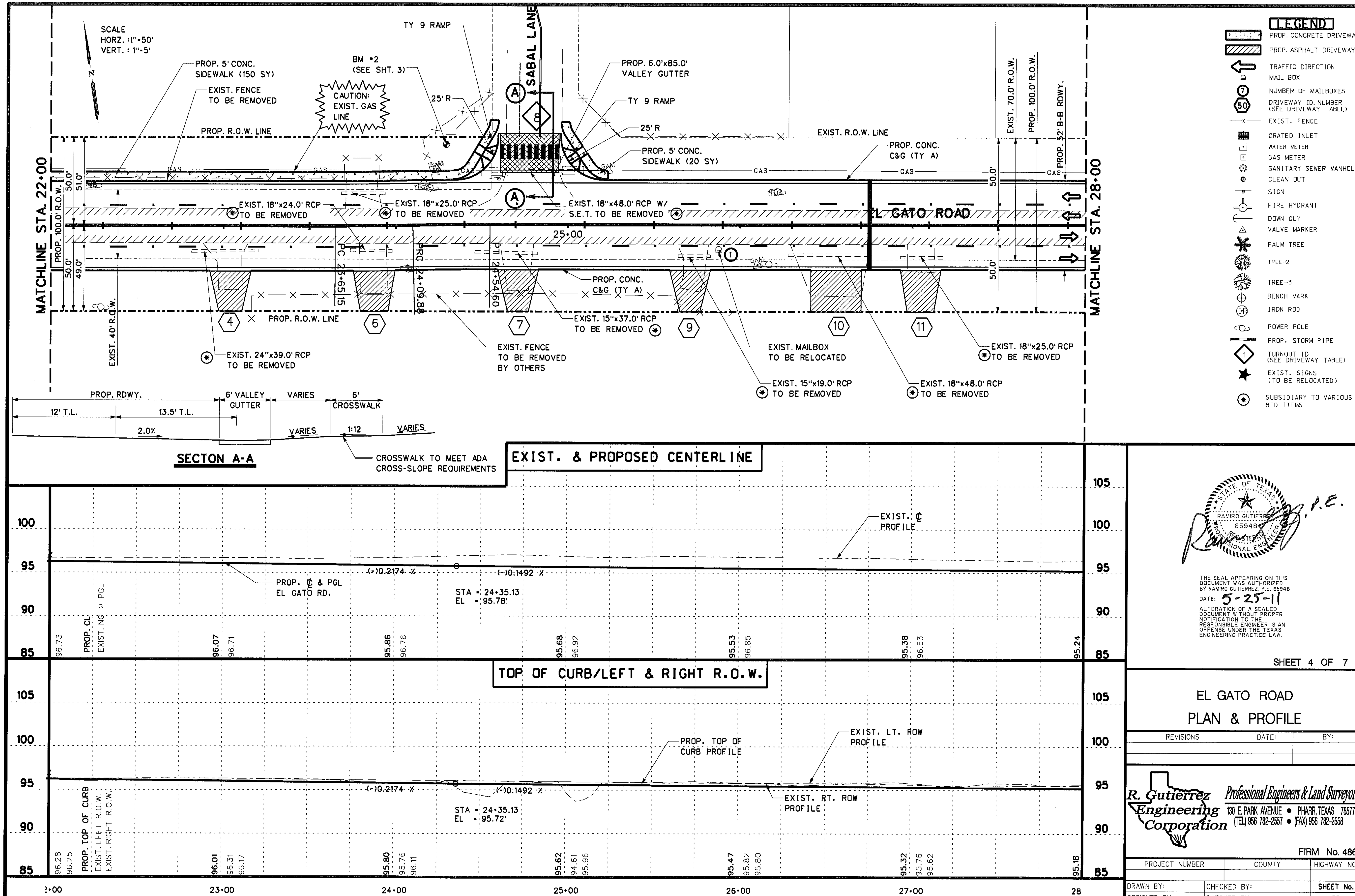

SCALE
HORZ. : 1"=50'
VERT. : 1"=5'
N
PROP. 5' CONC. SIDEWALK (150 SY)
EXIST. FENCE TO BE REMOVED
BM #2 (SEE SHT. 3)
CAUTION: EXIST. GAS LINE
TY 9 RAMP
25' R
SABAL LANE
PROP. 6.0'x85.0' VALLEY GUTTER
TY 9 RAMP
25' R
PROP. 5' CONC. SIDEWALK (20 SY)
PROP. R.O.W. LINE
EXIST. R.O.W. LINE
PROP. CONC. C&G (TY A)
EXIST. 70.0' R.O.W.
PROP. 100.0' R.O.W.
PROP. 52' B-B RDWY.
MATCHLINE STA. 22+00
MATCHLINE STA. 28+00
PROP. 100.0' R.O.W.
50.0'
51.0'
50.0'
49.0'
EXIST. 40' R.O.W.
EXIST. 18"x24.0' RCP TO BE REMOVED
EXIST. 18"x25.0' RCP TO BE REMOVED
EXIST. 18"x48.0' RCP W/ S.E.T. TO BE REMOVED
EL GATO ROAD
25+00
PC 23+65.15
PRC 24+09.88
PT 24+54.60
PROP. CONC. C&G (TY A)
PROP. R.O.W. LINE
EXIST. 24"x39.0' RCP TO BE REMOVED
EXIST. FENCE TO BE REMOVED BY OTHERS
EXIST. 15"x37.0' RCP TO BE REMOVED
EXIST. MAILBOX TO BE RELOCATED
EXIST. 15"x19.0' RCP TO BE REMOVED
EXIST. 18"x48.0' RCP TO BE REMOVED
EXIST. 18"x25.0' RCP TO BE REMOVED
GAS
4
6
7
9
10
11
1
A
8
PROP. RDWY.
12' T.L.
13.5' T.L.
2.0%
6' VALLEY GUTTER
VARIES
6' CROSSWALK
VARIES
1:12
VARIES
SECTON A-A
CROSSWALK TO MEET ADA CROSS-SLOPE REQUIREMENTS
LEGEND
PROP. CONCRETE DRIVEWAY
PROP. ASPHALT DRIVEWAY
TRAFFIC DIRECTION
MAIL BOX
NUMBER OF MAILBOXES
DRIVEWAY ID. NUMBER (SEE DRIVEWAY TABLE)
EXIST. FENCE
GRATED INLET
WATER METER
GAS METER
SANITARY SEWER MANHOLE
CLEAN OUT
SIGN
FIRE HYDRANT
DOWN GUY
VALVE MARKER
PALM TREE
TREE-2
TREE-3
BENCH MARK
IRON ROD
POWER POLE
PROP. STORM PIPE
TURNOUT ID (SEE DRIVEWAY TABLE)
EXIST. SIGNS (TO BE RELOCATED)
SUBSIDIARY TO VARIOUS BID ITEMS
EXIST. & PROPOSED CENTERLINE
105
100
95
90
85
EXIST. ℄ PROFILE
PROP. ℄ & PGL EL GATO RD.
(-)0.2174 %
(-)0.1492 %
STA = 24+35.13
EL = 95.78'
PROP. CL
EXIST. NG @ PGL
96.73
96.07
96.71
95.86
96.76
95.68
96.92
95.53
96.85
95.38
96.63
95.24
TOP OF CURB/LEFT & RIGHT R.O.W.
PROP. TOP OF CURB PROFILE
EXIST. LT. ROW PROFILE
EXIST. RT. ROW PROFILE
(-)0.2174 %
(-)0.1492 %
STA = 24+35.13
EL = 95.72'
PROP. TOP OF CURB
EXIST. LEFT R.O.W.
EXIST. RIGHT R.O.W.
96.28
96.25
96.01
96.31
96.17
95.80
95.76
96.11
95.62
94.61
95.96
95.47
95.82
95.80
95.32
95.76
95.62
95.18
22+00
23+00
24+00
25+00
26+00
27+00
28

STATE OF TEXAS
RAMIRO GUTIERREZ
65948
PROFESSIONAL ENGINEER

P.E.

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY RAMIRO GUTIERREZ, P.E. 65948
DATE: 5-25-11
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SHEET 4 OF 7

EL GATO ROAD
PLAN & PROFILE

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.

DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	35

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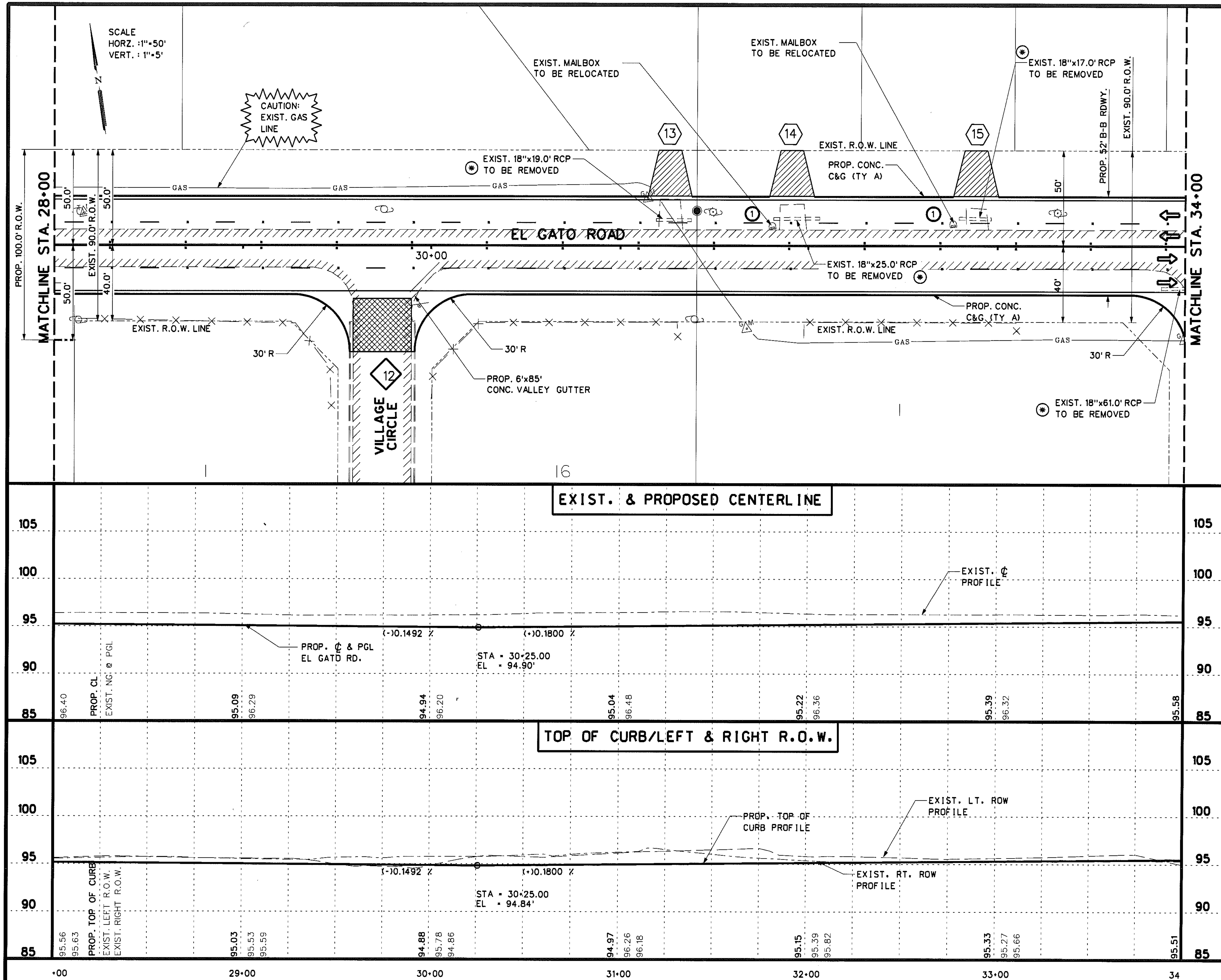

LEGEND

- PROP. CONCRETE DRIVEWAY
- PROP. ASPHALT DRIVEWAY
- TRAFFIC DIRECTION
- MAIL BOX
- NUMBER OF MAILBOXES
- DRIVEWAY ID. NUMBER (SEE DRIVEWAY TABLE)
- EXIST. FENCE
- GRATED INLET
- WATER METER
- GAS METER
- SANITARY SEWER MANHOLE
- CLEAN OUT
- SIGN
- FIRE HYDRANT
- DOWN GUY
- VALVE MARKER
- PALM TREE
- TREE-2
- TREE-3
- BENCH MARK
- IRON ROD
- POWER POLE
- PROP. STORM PIPE
- TURNOUT ID (SEE DRIVEWAY TABLE)
- EXIST. SIGNS (TO BE RELOCATED)
- SUBSIDIARY TO VARIOUS BID ITEMS

STATE OF TEXAS — RAMIRO GUTIERREZ — 65948 — REGISTERED PROFESSIONAL ENGINEER — P.E.

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SHEET 5 OF 7

EL GATO ROAD
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Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558

FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.

DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	36

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SCALE
HORZ. :1"=50'
VERT. : 1"=5'

N

EXIST. 15"x14.0' PVC TO BE REMOVED

EXIST. 24"x24.0' RCP TO BE REMOVED

EXIST. 18"x28.0' RCP TO BE REMOVED

EXIST. 18"x24.0' RCP TO BE REMOVED

EXIST. 18"x18.0' PVC TO BE REMOVED

EXIST. 18"x61.0' RCP TO BE REMOVED

300' TRANSITION (52' B-B TO 65' B-B)

EXIST. MAILBOX TO BE RELOCATED

EXIST. MAILBOX TO BE RELOCATED

EXIST. MAILBOX TO BE RELOCATED

EXIST. R.O.W. LINE

EXIST. 90' R.O.W.

50'

PROP. CONC. C&G (TY A)

PROP. 90.0' R.O.W.

PROP. 52' B-B RDWY.

50.0'

PROP. R.O.W. LINE

STA. 39+77.90

MATCHLINE STA. 34+00

MATCHLINE STA. 40+00

EL GATO ROAD

S 81° 25' 06.93" E

2,137.23'

35+00

EXIST. 60' R.O.W.

40'

40.0'

PROP. 6.0'x85.0' CONC. VALLEY GUTTER

PROP. CONC. C&G (TY A)

EXIST. R.O.W. LINE

GAS

30' R

PROP. 6.0'x85.0' CONC. VALLEY GUTTER

EXIST. 18"x17.0' RCP TO BE REMOVED

EXIST. 24"x25.0' RCP TO BE REMOVED

CAUTION: EXIST. GAS LINE

ANDES DRIVE

GOLD DRIVE

16 17 18 19 20 21 22 23 24

14

EXIST. & PROPOSED CENTERLINE

STA = 35+25.00
EL = 95.80'

(+)0.1800 %

(-)0.1605 %

EXIST. ℄ PROFILE

PROP. ℄ & PGL EL GATO RD.

PROP. CL. EXIST. NG @ PGL

96.24 95.75 96.21 95.68 96.24 95.52 96.17 95.36 96.46 95.20 96.39 95.04

TOP OF CURB/LEFT & RIGHT R.O.W.

STA = 35+25.00
EL = 95.74'

(+)0.1800 %

(-)0.1612 %

PROP. TOP OF CURB PROFILE

EXIST. LT. ROW PROFILE

EXIST. RT. ROW PROFILE

(-)0.1612 %

PROP. TOP OF CURB
EXIST. LEFT R.O.W.
EXIST. RIGHT R.O.W.

95.37 94.95 95.69 95.10 95.93 95.62 95.17 95.81 95.46 95.21 95.88 95.30 95.49 95.91 95.14 95.41 95.91 94.96

105 100 95 90 85

·+00 35+00 36+00 37+00 38+00 39+00 40

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LEGEND

- PROP. CONCRETE DRIVEWAY
- PROP. ASPHALT DRIVEWAY
- TRAFFIC DIRECTION
- MAIL BOX
- (7) NUMBER OF MAILBOXES
- (50) DRIVEWAY ID. NUMBER (SEE DRIVEWAY TABLE)
- —x— EXIST. FENCE
- GRATED INLET
- WATER METER
- GAS METER
- SANITARY SEWER MANHOLE
- CLEAN OUT
- SIGN
- FIRE HYDRANT
- DOWN GUY
- VALVE MARKER
- PALM TREE
- TREE-2
- TREE-3
- BENCH MARK
- IRON ROD
- POWER POLE
- PROP. STORM PIPE
- (1) TURNOUT ID (SEE DRIVEWAY TABLE)
- EXIST. SIGNS (TO BE RELOCATED)
- (*) SUBSIDIARY TO VARIOUS BID ITEMS

STATE OF TEXAS
RAMIRO GUTIERREZ
65948
REGISTERED PROFESSIONAL ENGINEER
P.E.

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EL GATO ROAD
PLAN & PROFILE

REVISIONS	DATE:	BY:

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Professional Engineers & Land Surveyors
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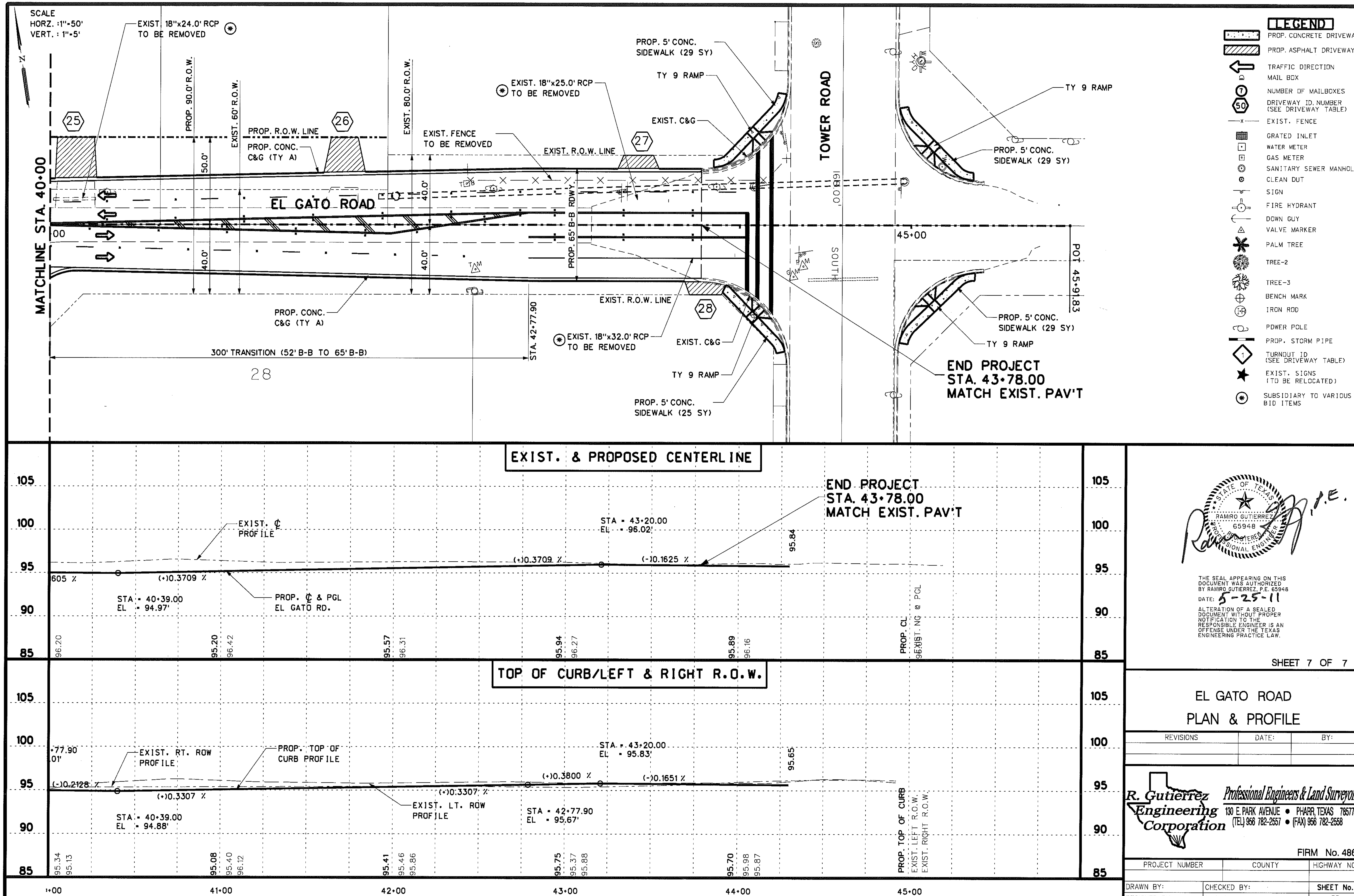
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.
DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	37



SCALE
HORZ. : 1"=50'
VERT. : 1"=5'
EXIST. 18"x24.0' RCP TO BE REMOVED
PROP. 90.0' R.O.W.
EXIST. 60' R.O.W.
EXIST. 80.0' R.O.W.
PROP. R.O.W. LINE
PROP. CONC. C&G (TY A)
EXIST. 18"x25.0' RCP TO BE REMOVED
EXIST. FENCE TO BE REMOVED
EXIST. R.O.W. LINE
PROP. 5' CONC. SIDEWALK (29 SY)
TY 9 RAMP
EXIST. C&G
TOWER ROAD
25
26
27
28
EL GATO ROAD
MATCHLINE STA. 40+00
50.0'
40.0'
PROP. 65' B-B RDWY.
SOUTH
45+00
POT 45+91.83
PROP. CONC. C&G (TY A)
300' TRANSITION (52' B-B TO 65' B-B)
STA. 42+77.90
EXIST. 18"x32.0' RCP TO BE REMOVED
PROP. 5' CONC. SIDEWALK (25 SY)
END PROJECT
STA. 43+78.00
MATCH EXIST. PAV'T
LEGEND
PROP. CONCRETE DRIVEWAY
PROP. ASPHALT DRIVEWAY
TRAFFIC DIRECTION
MAIL BOX
NUMBER OF MAILBOXES
DRIVEWAY ID. NUMBER (SEE DRIVEWAY TABLE)
EXIST. FENCE
GRATED INLET
WATER METER
GAS METER
SANITARY SEWER MANHOLE
CLEAN OUT
SIGN
FIRE HYDRANT
DOWN GUY
VALVE MARKER
PALM TREE
TREE-2
TREE-3
BENCH MARK
IRON ROD
POWER POLE
PROP. STORM PIPE
TURNOUT ID (SEE DRIVEWAY TABLE)
EXIST. SIGNS (TO BE RELOCATED)
SUBSIDIARY TO VARIOUS BID ITEMS
EXIST. & PROPOSED CENTERLINE
EXIST. ℄ PROFILE
STA = 43+20.00
EL = 96.02'
(+)0.3709 %
(-)0.1625 %
(+)0.3709 %
STA = 40+39.00
EL = 94.97'
PROP. ℄ & PGL EL GATO RD.
PROP. CL
EXIST. NG @ PGL
TOP OF CURB/LEFT & RIGHT R.O.W.
EXIST. RT. ROW PROFILE
PROP. TOP OF CURB PROFILE
STA = 43+20.00
EL = 95.83'
(+)0.3800 %
(-)0.1651 %
(-)0.2128 %
(+)0.3307 %
(+)0.3307 %
EXIST. LT. ROW PROFILE
STA = 40+39.00
EL = 94.88'
STA = 42+77.90
EL = 95.67'
PROP. TOP OF CURB
EXIST. LEFT R.O.W.
EXIST. RIGHT R.O.W.
105
100
95
90
85
41+00
42+00
43+00
44+00
45+00

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STATE OF TEXAS
RAMIRO GUTIERREZ
65946
REGISTERED PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY RAMIRO GUTIERREZ, P.E. 65946

DATE: 5-25-11

ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE LAW.

SHEET 7 OF 7

EL GATO ROAD PLAN & PROFILE

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558

FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.

DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	38

EL GATO ROAD DRIVEWAY TABLE

ID #	STATION	SIDE	EXIST. DRVWY WIDTH (FT)	PROP. WIDTH @ CURB & GUTTER (FT)	PROP. WIDTH @ R-O-W LINE (FT)	EXIST. DRVWY MATERIAL (FT)	ACP DRWY AREA (SY)			BRICK PAVER DRWY AREA (SY)	ITEM 496 REMOVE OLD * STR. PIPE (LF)			ITEM 496 REMOVE SMALL * STR. (EA)
							P-1	PRB-1	PB-1		15"	18"	24"	
1	11+39.20	RT	17.0	24.0	17.0	ASPHALT		52.0				23.0		
3	21+61.20	RT	12.0	24.0	12.0	ASPHALT		46.0					43.0	
4	23+04.10	RT	13.5	24.0	13.5	ASPHALT		48.0					38.0	
5	23+80.70	LT	18.5	24.0	18.5	ASPHALT						26.0		
6	23+87.70	RT	16.0	24.0	16.0	DIRT		52.0				24.0		
7	24+71.20	RT	12.0	24.0	12.0	ASPHALT		49.0			37.0			
9	25+70.90	RT	12.0	24.0	12.0	BRICK				47.0	19.0			
10	26+55.30	RT	29.0	29.0	29.0	DIRT		79.0				49.0		
11	27+04.60	RT	15.6	24.0	15.6	DIRT		53.0				25.0		
13	31+26.30	LT	10.6	24.0	12.0	CALICHE		32.0				19.0		
14	31+91.10	LT	13.0	24.0	13.0	CALICHE		49.3				25.0		
15	32+88.50	LT	10.7	24.0	12.0	CALICHE		32.0				17.0		
17	34+56.90	LT	10.0	24.0	12.0	CALICHE		32.0			14.0			
18	36+10.00	LT	11.5	24.0	12.0	CALICHE		32.0					24.0	
19	36+46.80	RT	11.3	24.0	12.0	CALICHE		19.3				17.0		
20	36+67.80	LT	11.6	24.0	12.0	CALICHE		32.0				28.0		
21	37+24.90	RT	16.0	24.0	16.0	ASPHALT		31.1					25.0	
22	37+37.96	LT	13.3	24.0	13.3	CALICHE		49.7				19.0		
23	38+91.90	LT	16.6	24.0	16.6	CALICHE		54.0				24.0		
25	40+14.90	LT	21.4	24.0	21.4	CALICHE		59.0				24.0		
26	41+70.90	LT	15.4	24.0	15.4	CALICHE		43.0				24.0		
27	43+41.50	LT	16.0	24.0	16.0	ASPHALT		16.7				24.0		
28	43+80.30	RT	16.7	24.0	16.7	ASPHALT		16.9				32.0		
						PROJECT TOTAL		878.0		47.0	70.0	400.0	130.0	

* FOR CONTRACTOR'S INFO. ONLY (NON-PAY).

EL GATO ROAD TURNOUT TABLE

ID #	STATION	EXIST. TURNOUT WIDTH	PROP. WIDTH	EXIST. TURNOUT MATERIAL	ASPHALT DRIVES ACP DRWY AREA (SY)				REMOVE * OLD STRUCTURE PIPE (LF)			ITEM 496 * REMOVE SMALL STR. (EA)
		(FT)	(FT)		P	PRB1	PBS1	PBS2	(12")	(18")	(24")	
2	20+47.94 LT	29.0	29.0	ASPHALT				78.0		48.0		2.0
8	24+80.10, LT.	29.0	29.0	ASPHALT	-	-	-	78.0		48.0		2.0
12	29+73.90, RT.	31.0	31.0	ASPHALT	-	-	-	96.6		-		
16	34+16.90, RT.	28.3	28.3	ASPHALT	-	-	-	88.0		61.0		
24	39+70.35, RT.	28.3	28.3	ASPHALT	-	-	-	89.0		61.0		
				PROJECT TOTAL	-	-	-	429.6		218.0		4.0

* FOR CONTRACTOR'S INFO. ONLY (NON-PAY).

STATE OF TEXAS
RAMIRO GUTIERREZ
65948
REGISTERED PROFESSIONAL ENGINEER
P.E.

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY RAMIRO GUTIERREZ, P.E. 65948
DATE: 12-20-10
ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE LAW.

EL GATO ROAD
DRIVEWAY TABLES

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.
DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	39

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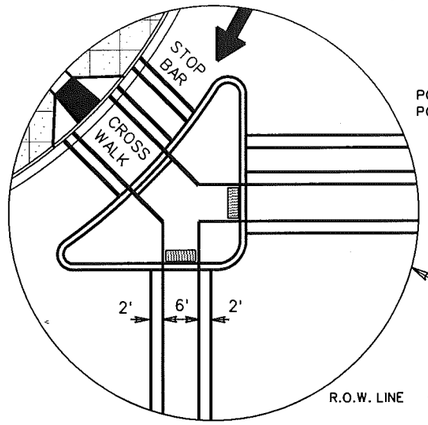
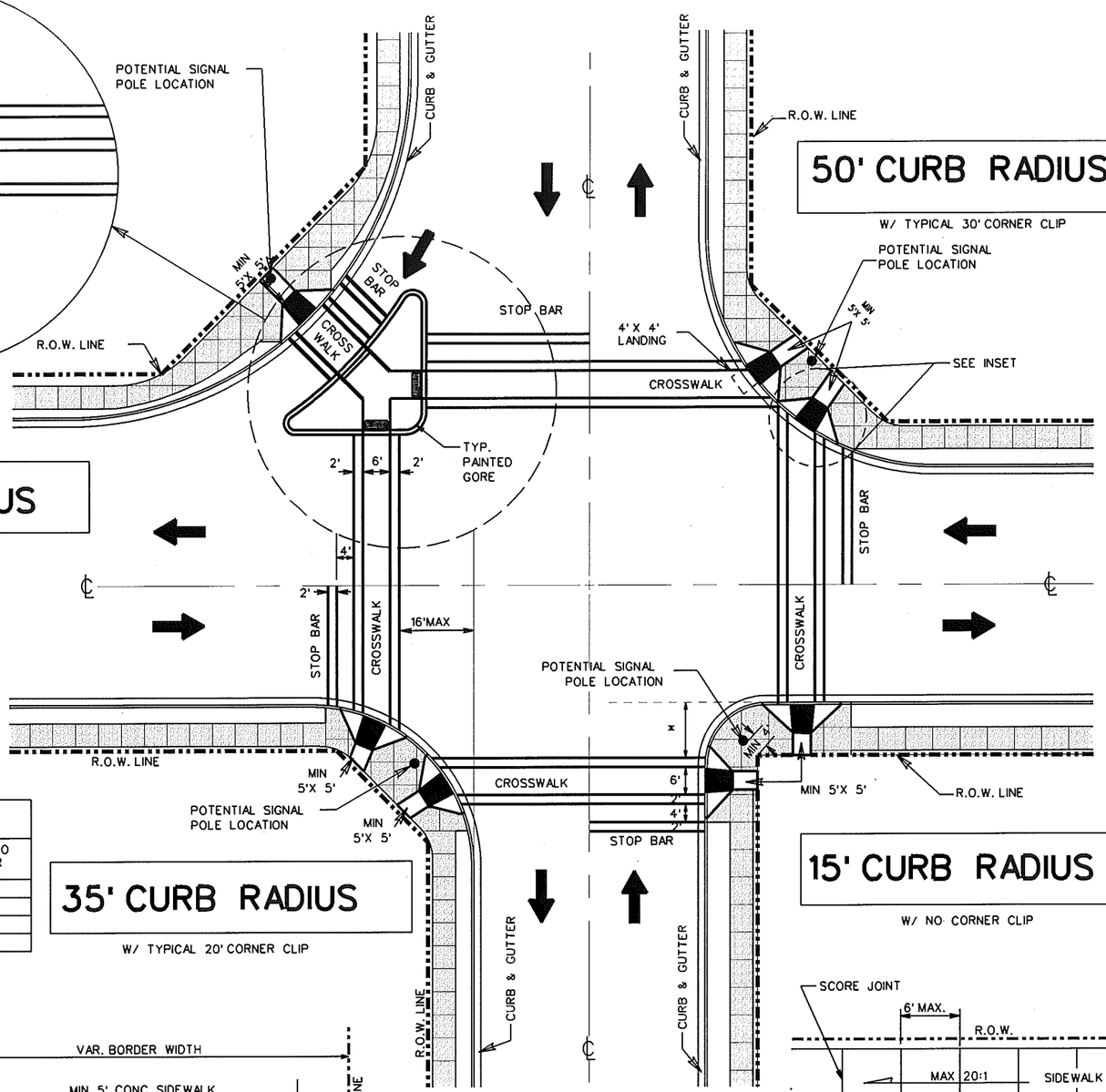




75' CURB RADIUS

W/ TYPICAL 45' CORNER CLIP

50' CURB RADIUS

W/ TYPICAL 30' CORNER CLIP

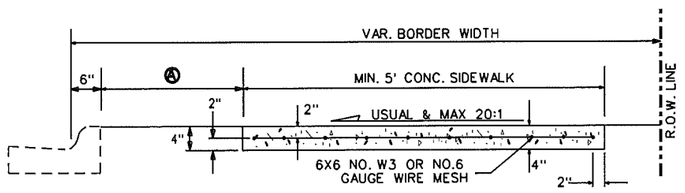
35' CURB RADIUS

W/ TYPICAL 20' CORNER CLIP

15' CURB RADIUS

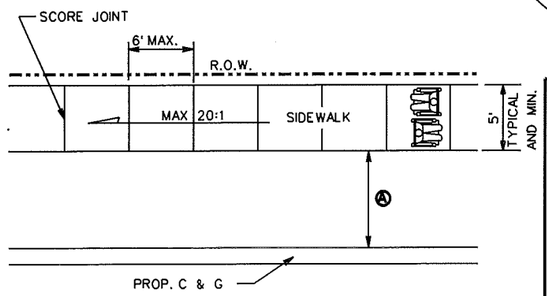
W/ NO CORNER CLIP

* FOR 90° INTERSECTION		
RADIUS	DISTANCE TO RAMP CONTROL	DISTANCE TO STOPBAR
5' R	7.5'	16'
10' R	12.5'	21'
15' R	17.5'	26'
>20' R	22.5'	30'



TYPICAL CONC. SIDEWALK

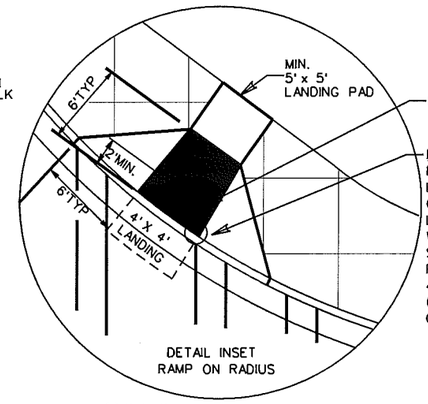
TYPICAL WHEEL CHAIR RAMP LOCATION



SCORE JOINTS 1/4" THICKNESS
EXPANSION JOINT EVERY 30'
JOINT IN CENTER OF SIDEWALK IF OVER 15' WIDE.

PLAN VIEW

MINIMUM 5' SIDEWALK



DETAIL INSET RAMP ON RADIUS

RAMP CONTROL: PLACE RAMP CORNER IN ALIGNMENT W/ CROSS WALK INSIDE LINE TO MAXIMIZE WHEELCHAIR TURNING SPACE. RAMPS SHALL HAVE MIN 4' MANEUVERING SPACE (AT CENTER) WITHIN CROSSWALK.

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

Ⓐ DESIRABLE 3' OR GREATER FOR HIGH SPEED TRAFFIC. FOR BORDER WIDTHS OF 8' OR LESS, PLACE SIDEWALK ADJACENT TO CURB.

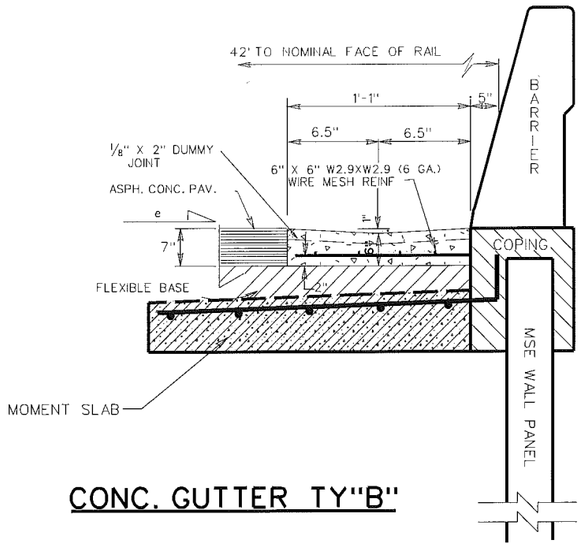
PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

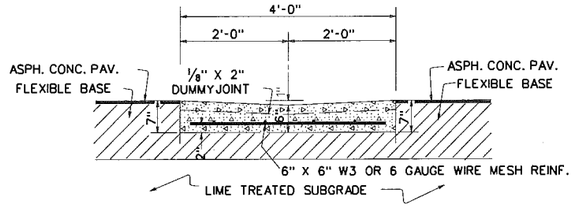
SIDEWALK & WHEELCHAIR RAMP DETAILS

SIDEWALK.DGN

REVISIONS	STATE DISTRICT	FEDERAL ROUTE	STATE PROJECT			SHEET
REV. 4/02						40
	COUNTY		CONTROL	SECTION	JOB	HIGHWAY

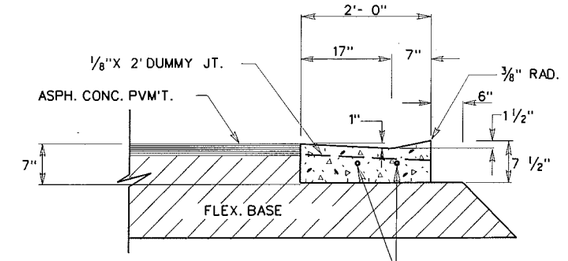


CONC. GUTTER TY"B"



4' CONC. VALLEY GUTTER (TY"A")

TO BE USED WHERE REQUIRED TO CARRY DRAINAGE WATER ACROSS SIDE STREETS



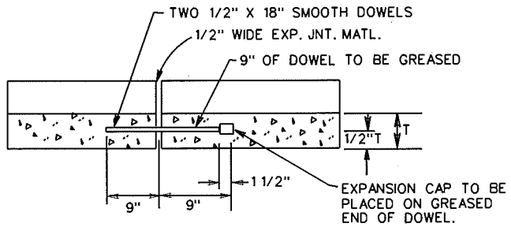
(TO BE USED ONLY ON COMMERCIAL ENTRANCES)
2-NO. 5 LONGITUDINAL REINF. BAR REINF. STEEL TO BE MADE PART OF ITEM "CONC. CURB & GUTTER." THE LENGTH OF REINFORCING STEEL WILL BE THE WIDTH OF THE PROP. COMMERCIAL ENTRANCE PLUS FOUR FEET.

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.

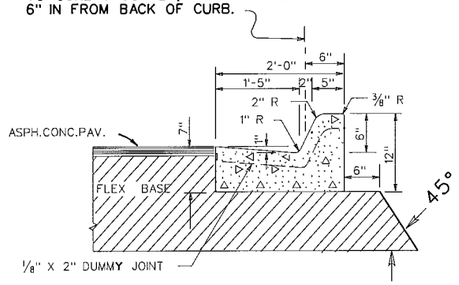


DETAIL EXPANSION JOINT

LONGITUDINAL SECTION THRU CURB AND/OR C&G. REINFORCING STEEL (WHEN USED) SHALL NOT CROSS EXPANSION JOINTS. STEEL SHALL BE TERMINATED 3" 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 ABUTMENTS AND/OR ANY OTHER LOCATIONS SPECIFIED BY THE ENGINEER. MAX. SPACING = 105'

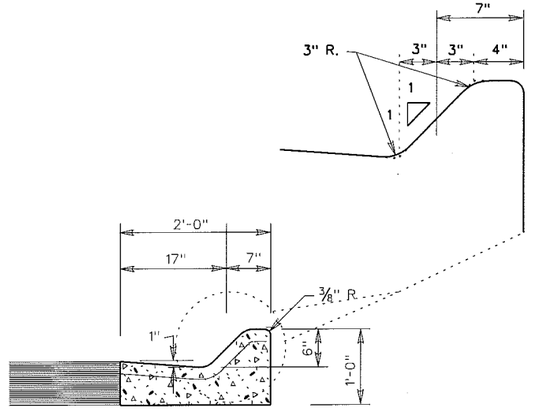
ALL HORIZONTAL DIMENSIONS AND RADII SHOWN ON PLANS, RELATING TO CURB & GUTTER, ARE TO A POINT 6" IN FROM BACK OF CURB.



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 ABUTMENTS AND/OR ANY OTHER LOCATIONS SPECIFIED BY THE ENGINEER. MAX. SPACING = 105'

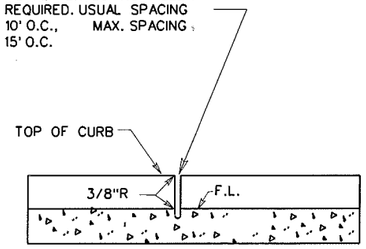


CONC. CURB & GUTTER TY. "B" (MOUNTABLE)

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 ABUTMENTS 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.

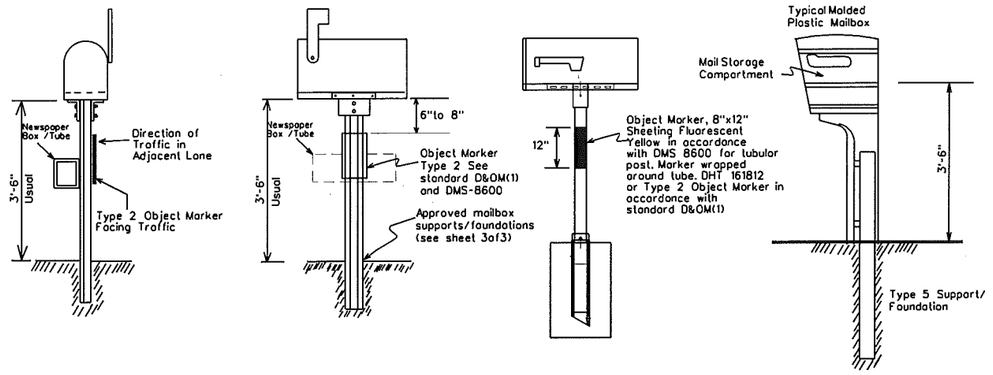
PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

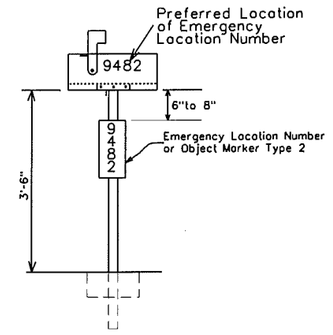
CURB & GUTTER DETAILS

C&G.DGN

REVISIONS	STATE DISTRICT	FEDERAL REGION	STATE PROJECT				SHEET
REV. 4/02							41
COUNTY			CONTROL	SECTION	JOB	HIGHWAY	



SINGLE AND DOUBLE MAILBOX MOUNT



Location Number shall be placed on a yellow, type A plate with class 1 flat surface reflective sheeting in accordance with DMS 8600. (Same type plate as used for the type 2 Object Marker) The color of numbers shall be black. (Max. sign size 6" by 15")

PLACEMENT OF EMERGENCY LOCATION NUMBER

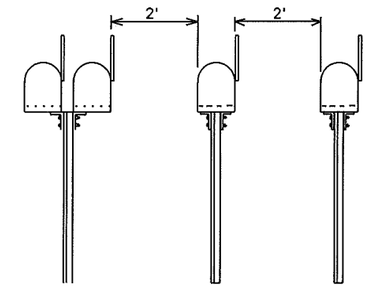
Mailboxes shall be made of light weight sheet metal or light weight plastic. Heavy steel, cast iron or decorative mailboxes shall not be used on the state highway system.

US Postal mailbox requirements are in Postal Bulletin No. 21907.

TYPICAL MAILBOX SIZE IN INCHES			
SIZE	LENGTH	WIDTH	HEIGHT
SMALL	19 ½	6	7
MEDIUM	22 ½	8	11 ½
LARGE	23 ½*	11 ½*	13 ½*

* Maximum allowed dimensions for mailbox

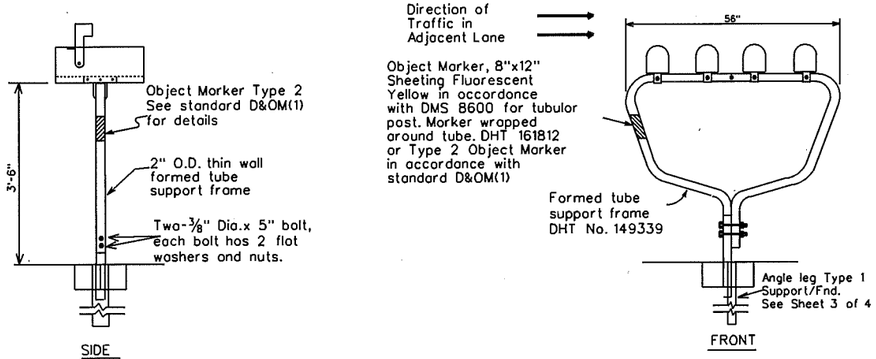
MAILBOX SIZES



2' Cleor Distance between single or double mounted installations. (Normally when 4 or more mailboxes are in one location they should be placed on a multiple support.)

SINGLE & DOUBLE MAILBOX PLACEMENT

Permissible Number of Mailboxes on Multiple Support:
All small & medium size - 5 Maximum
Combination variaus sizes - 4 Maximum with no more than 2 large size.
All large size - 3 Maximum



MULTIPLE MAILBOX MOUNT

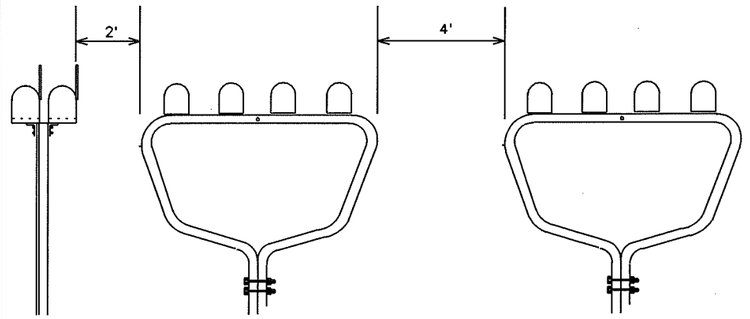
ONE PIECE MOLDED PLASTIC MAILBOXES

Molded Plastic Mailboxes shall be installed on 4"x4" treated timber posts only. Post may be set in concrete. The use of steel pipe or structural tubing in place of timber post is prohibited.

NEWSPAPER RECEPTACLE

A light weight receptacle for newspaper delivery may be attached to the post of single and double mailboxes if the receptacle:

a. Does not touch the mailbox.
b. Does not present a hazard to traffic or delivery of the mail.
c. Does not extend beyond the front of the mailbox.
c. Does not display advertising, except the publication title.



4' Clear Distance between multiple installations and 2' clearance between double or single installations and the multiple installation.

MULTIPLE MAILBOX PLACEMENT

INDEX OF MAILBOX DETAIL SHEETS

FILE: MB-05(1).dc

LEVELS DISPLAYED
1 2 3 ■ 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

Standard Plans

Texas Department of Transportation

Maintenance Division

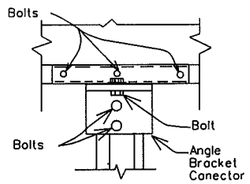
MAILBOX MOUNTING AND SPACING

MB-05(1)

Sheet 1 of 3

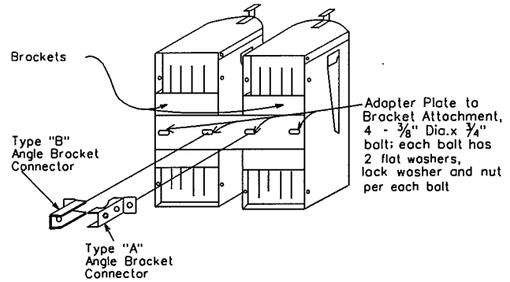
FILE: MB05(1).DGN	DN: LJB	CK: BS	DW:	CK: JG	NEG:	
©TxDOT JUNE 05	DIST	FED REG	FEDERAL AID PROJECT			SHEET
REVISIONS						42
02/02/05	COUNTY		CONTROL	SECT	JOB	HIGHWAY
06/08/05: Sheet & title block renumbered.						

MULTIPLE MAILBOX MOUNT



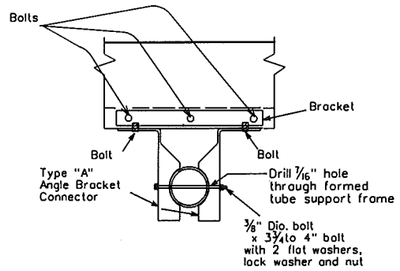
For bolt sizes see details below for "SMALL MAILBOX" and "MEDIUM AND LARGE MAILBOXES"

SINGLE MAILBOX CONNECTION

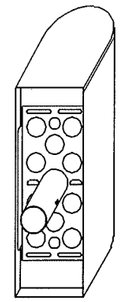


DOUBLE MAILBOX CONNECTION

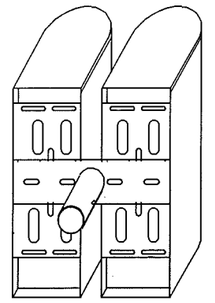
(Not permitted for Large Mailboxes)



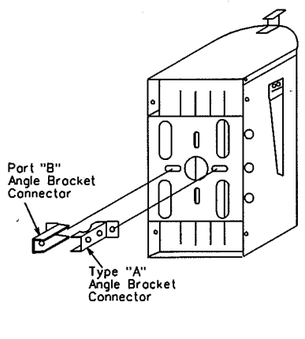
MULTIPLE MAILBOX CONNECTION



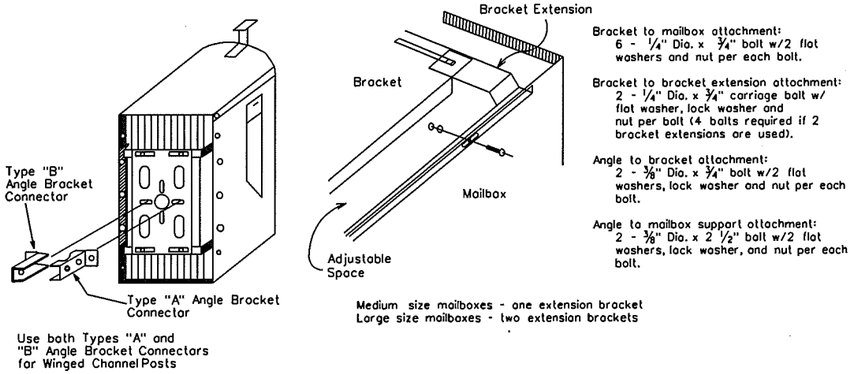
SINGLE MAILBOX BRACKET CONNECTION FOR FLEXIBLE POST



DOUBLE MAILBOX BRACLET CONNECTION WITH ADAPTER PLATE FOR FLEXIBLE POST



SMALL MAILBOX



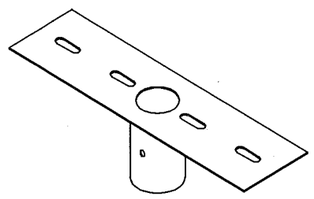
Use both Types "A" and "B" Angle Bracket Connectors for Winged Channel Posts

Medium size mailboxes - one extension bracket
Large size mailboxes - two extension brackets

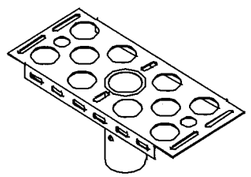
MEDIUM AND LARGE MAILBOXES

GENERAL NOTES

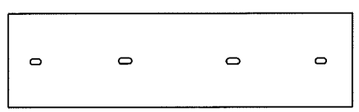
1. Connecting hardware detailed on this sheet is for the hardware that the Department stocks at the Regional Warehouses. This hardware is available to the contractor only when so stated elsewhere in the plans or specification.
2. Hardware for mounting mailboxes to the support/foundation furnished by industry may be used when shown on the Maintenance Divisions "Approved Products List." Only mailbox hardware that have been crash tested in accordance with NCHRP Report 350, will be on the approved list.
3. Hardware furnish by industry shall be erected in accordance with the manufacture's recommendation.
4. Bracket and bracket extension shall be constructed of 14 gauge galvanized steel sheet metal.
5. The angles brackets and adapter plates shall be constructed of 12 gauge galvanized steel sheet metal.
6. Items with evidence of damage to the galvonized coating or wet storage stains (white rust) will not be accepted.



ADAPTER PLATE CONNECTOR TO FLEXIBLE POST DHT 162323

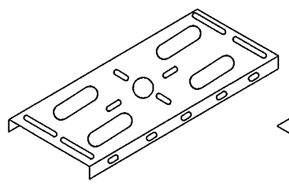


BRACKET FOR FLEXIBLE POST DHT 161443

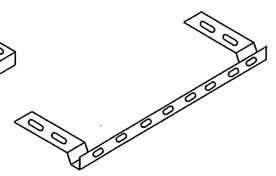


ADAPTER PLATE DHT #3789

Used for mounting two Mailboxes on the same post.

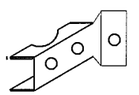


BRACKET DHT 148939

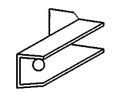


BRACKET EXTENSION DHT 148938

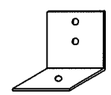
Used for extending 6" wide bracket to attach larger mailboxes.



TYPE "A" ANGLE BRACKET DHT 159489



TYPE "B" ANGLE BRACKET DHT 159490



ANGLE BRACKET FOR TEMPORARY MAILBOX DHT 2917

HARDWARE AT TXDOT REGIONAL WAREHOUSES

Brackets and adopter plate shown in this section may be available to the Contractor when stated elsewhere in plans or specifications.

FILE: MB-05-(1).c

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		

Standard Plans

Texas Department of Transportation

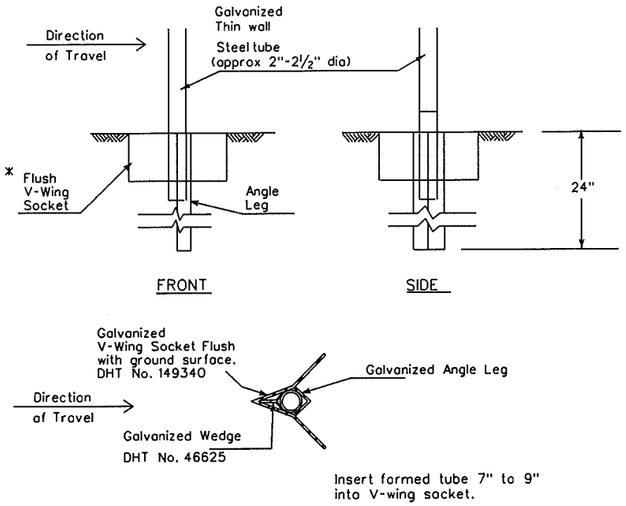
Maintenance Division

MAILBOX BRACKET CONNECTING DETAILS

MB-05(1)

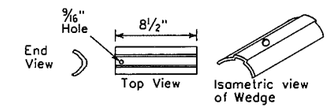
Sheet 2 of 3

FILE: MB05(1).DGN	DN: LJB	CK: BS	DW:	CK: JG	NEG:	
©TxDOT JUNE 05	DIST	FED REG	FEDERAL AID PROJECT			SHEET
REVISIONS 02/02/05 08/08/05:Sheet & title block renumbered.						43
	COUNTY			CONTROL	SECT	JOB	HIGHWAY



TYPE 1 SUPPORT/FOUNDATION

THIN WALL STEEL TUBE w/ V-LOC ANCHORAGE

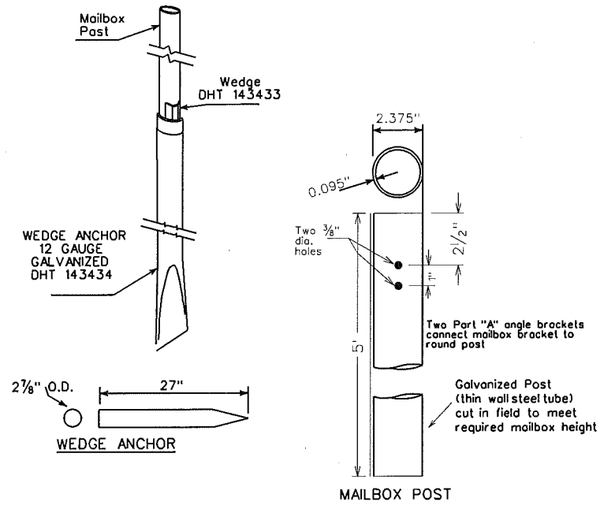


WEDGE 11 GUAGE GALVANIZED
DHT 143433

NOTES FOR TYPE 2 SUPPORT/FOUNDATION

A. Galvanize steel support foundation in accordance with Item 445 Galvanizing.

B. All dimensions may be varied to fit a 2 inch thin wall steel tube if approved by the Engineer.

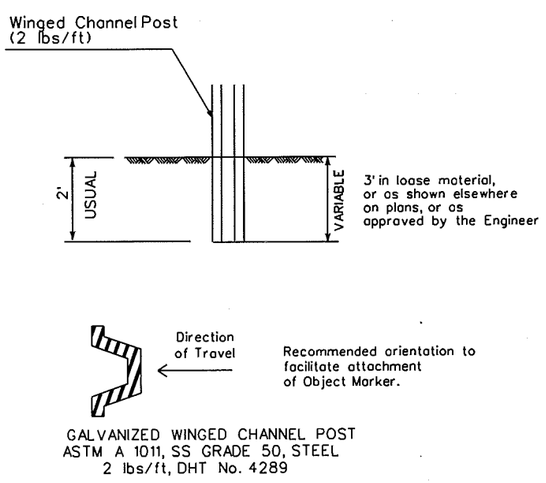


TYPE 2 SUPPORT/FOUNDATION

THIN WALL STEEL TUBE w/ WEDGE ANCHOR SYSTEM

GENERAL NOTES

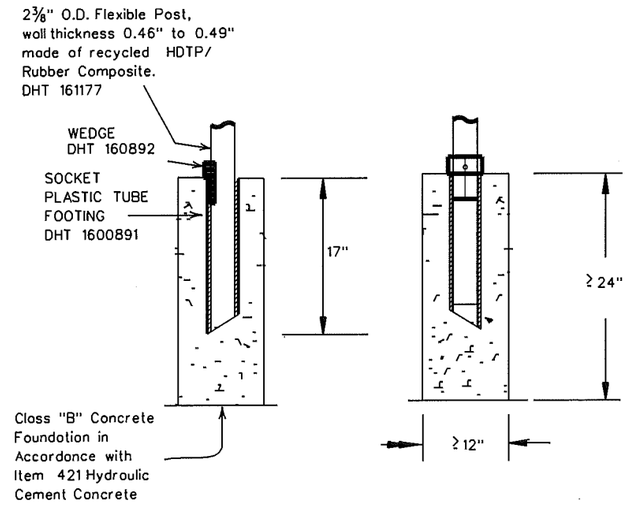
1. Erect post plum or vertical.
2. When galvanized part is required galvanize in accordance with Item 445.
3. Type 1, 2, 3 or 4 supports or foundation can be used for single or double mailboxes except for the single plastic or rubber mailbox. The Type 5 support/foundotion is use for the single molded plastic mailbox.
4. The Type 1 support/foundation can be used for a multiple mailbox mount.
5. Use a concrete footing as shown or when directed. Concrete footing will be required when soils do not hold the support/foundations in a stable condition.
6. Galvanized thin wall posts may be used for Ty 1, 2 & 4.
7. Galvanized thin wall post may be powder coated white DHT-162911.



GALVANIZED WINGED CHANNEL POST
ASTM A 1011, SS GRADE 50, STEEL
2 lbs/ft, DHT No. 4289

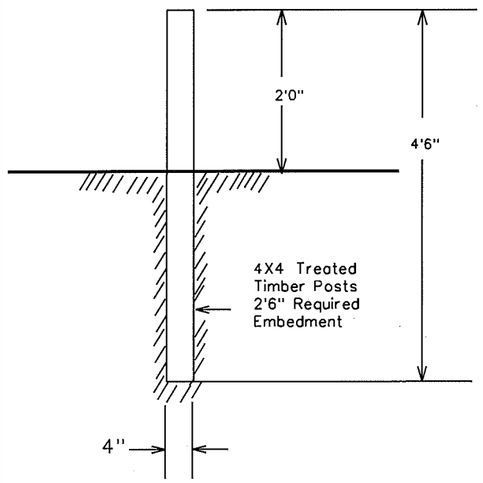
TYPE 3 SUPPORT/FOUNDATION

WINGED CHANNEL POST



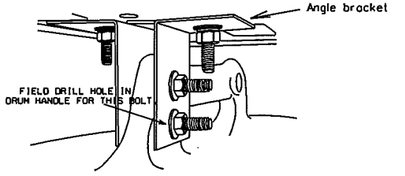
TYPE 4 SUPPORT/FOUNDATION

FOR FLEXIBLE POST



TYPE 5 SUPPORT/FOUNDATION

FOR ONE PIECE MOLDED PLASTIC MAILBOX



Placed on approved plastic drum as shown in the Compliant Work Zone Traffic Control Devices (CWZTCD).
Existing attachment hardware shall be used unless damaged. Damaged hardware shall be replaced.

TYPE 6 TEMPORARY MAILBOX SUPPORT

CONNECTION DETAIL

Standard Plans

Texas Department of Transportation

Maintenance Division

MAILBOX SUPPORT/ FOUNDATION

Sheet 3 of 3

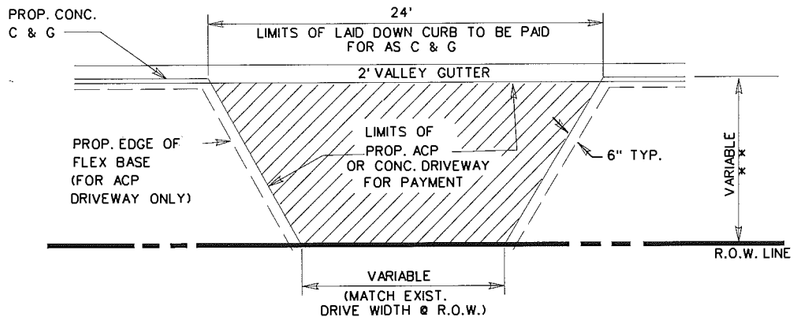
MB-05(1)

FILE: MB05(1).DGN	DN: LJB	CK: BS	DW:	CK: JG	NEG:
© TxDOT JUNE 05	DIST	FED REG	FEDERAL AID PROJECT		SHEET
REVISIONS					44
02/02/05	COUNTY		CONTROL	SECT	JOB	HIGHWAY
06/08/05: Added generalnote numbers 6 & 7. Sheet & title block renumbered.						

FILE: MB-05-(1).o

LEVELS DISPLAYED
1 2 3 ■ 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

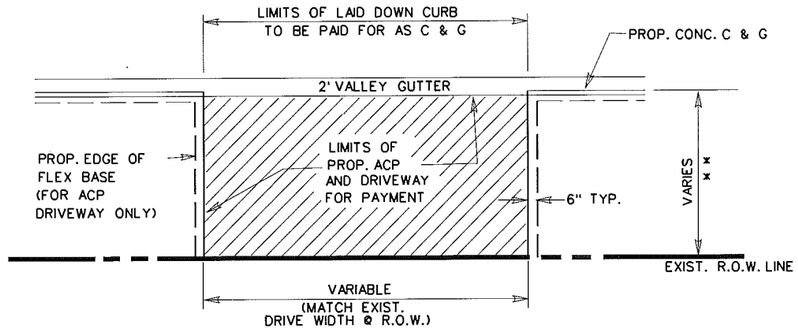
PRIVATE AND COMMERCIAL DRIVES WITH CURB & GUTTER



PLAN OF PRIVATE AND COMMERCIAL DRIVES

(W/DRIVEWAY WIDTH LESS THAN 24')

** SEE P&P SHEETS

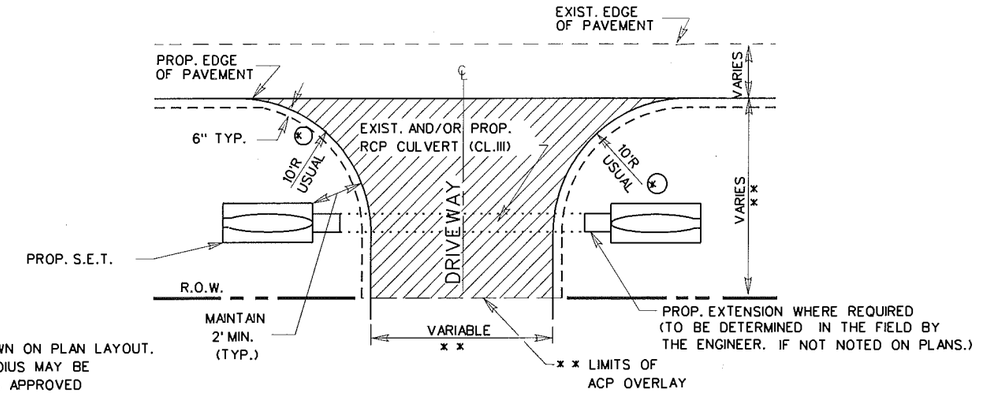


PLAN OF PRIVATE AND COMMERCIAL DRIVES

(W/DRIVEWAY WIDTH EQUAL TO OR GREATER THAN 24' @ R.O.W. LINE)

N.T.S.

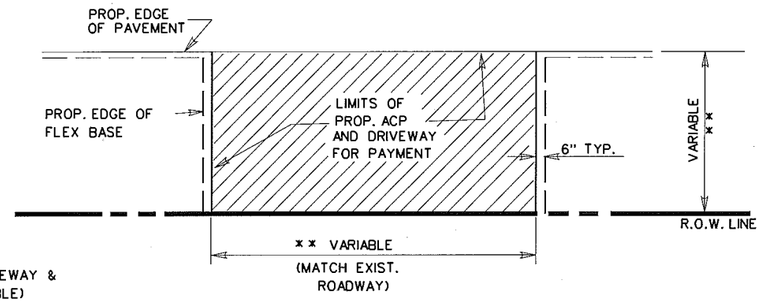
PRIVATE AND COMMERCIAL DRIVES WITHOUT CURB & GUTTER



(*) OR AS SHOWN ON PLAN LAYOUT. TURNING RADIUS MAY BE REDUCED AS APPROVED BY THE ENGINEER.

PLAN OF PRIVATE AND COMMERCIAL DRIVES

*W/DRIVEWAY WIDTH LESS THAN 24')

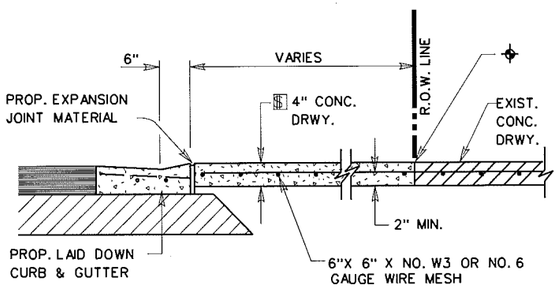


** FOR DETAILS SEE DRIVEWAY & TURNOUT DETAILS (TABLE)

PLAN OF PRIVATE AND COMMERCIAL DRIVES

(W/DRIVEWAY WIDTH EQUAL TO OR GREATER THAN 24' @ R.O.W. LINE)

N.T.S.



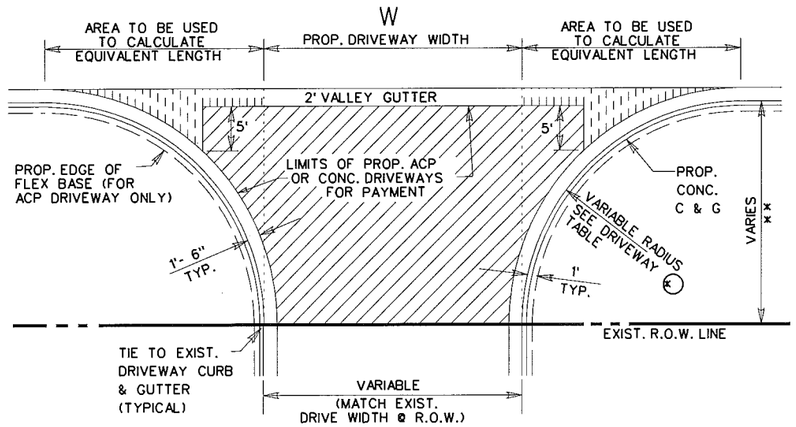
TYPICAL CONCRETE DRIVEWAY SECTION

⌖ CONC. SHALL BE SAW CUT TO THE LIMITS OF REMOVAL WHERE APPLICABLE.

[6] 6" FOR COMMERCIAL DRIVES

N.T.S.

PRIVATE AND COMMERCIAL DRIVES WITH CURB & GUTTER



PLAN OF PRIVATE AND COMMERCIAL DRIVES

SEE P&P SHEETS FOR LOCATIONS OF DRIVES

N.T.S.

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 PRB-1
EXIST. PAVED CALICHE AND /OR GRAVEL DRIVEWAYS TO BE SCARIFED AND RECONSTRUCTED WITH 3" NEW AND/OR SALVAGE FLEX. BASE TO MATCH THE PROPOSED WIDENED SECTION. THEN PRIMED AND SURFACED WITH 114#/SY ACP (TY "D")

TY PB-1
EXIST. UNPAVED PRIVATE OR COMMERCIAL DRIVEWAYS TO BE CONSTRUCTED AS SHOWN WITH 4" NEW AND/OR SALVAGE FLEX. BASE, PRIMED AND SURFACED WITH 114#/SY ACP.

TY P1
EXIST. PAVED DRIVEWAYS TO BE PAVED WITH 114#/SY ACP TY "D".

PHARR DISTRICT STANDARD

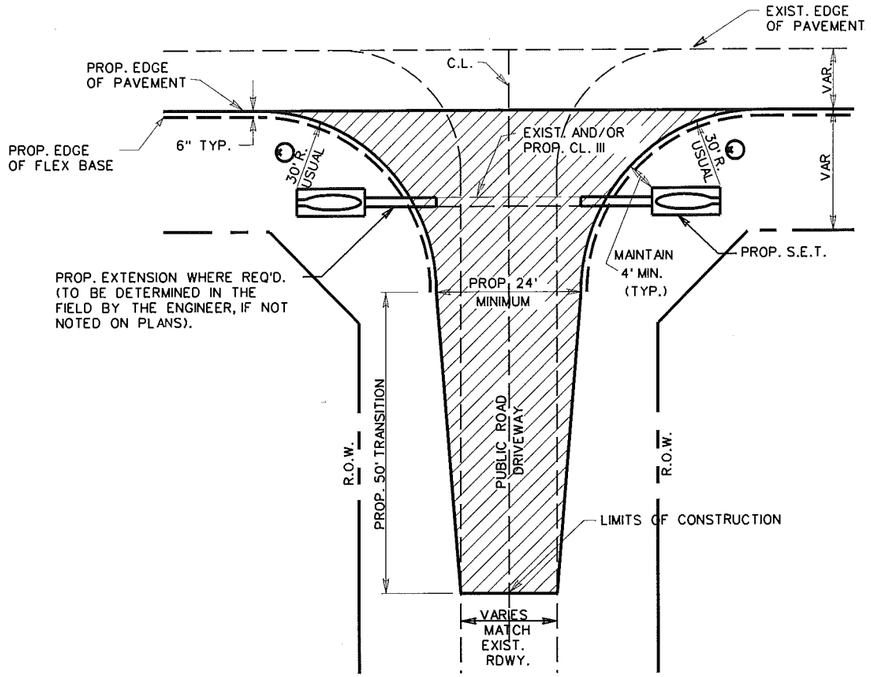
TEXAS DEPARTMENT OF TRANSPORTATION

DRIVEWAY DETAILS PRIVATE (RESIDENTIAL-COMMERCIAL)

DRIVEWAY2.DGN

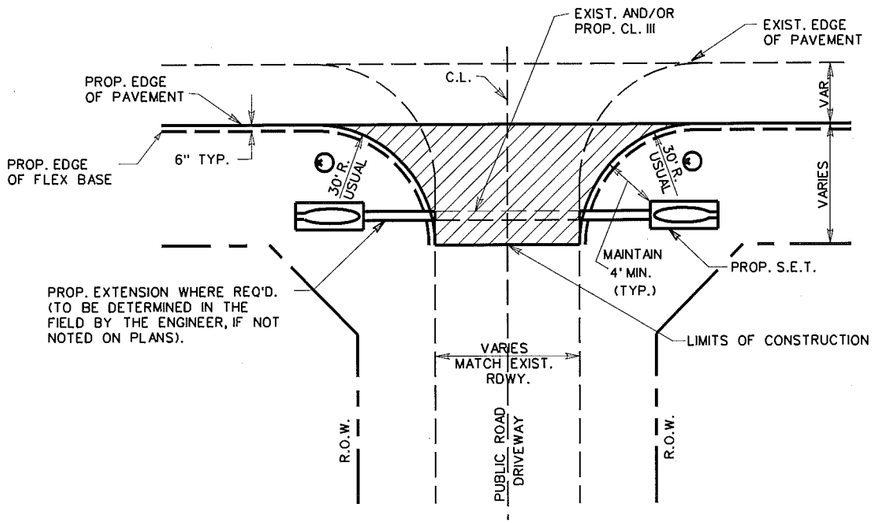
REVISIONS	STATE DISTRICT	FEDERAL REGION	STATE PROJECT				SHEET
REV. 4/05							45
	COUNTY		CONTROL	SECTION	JOB		HIGHWAY

AD-76-0



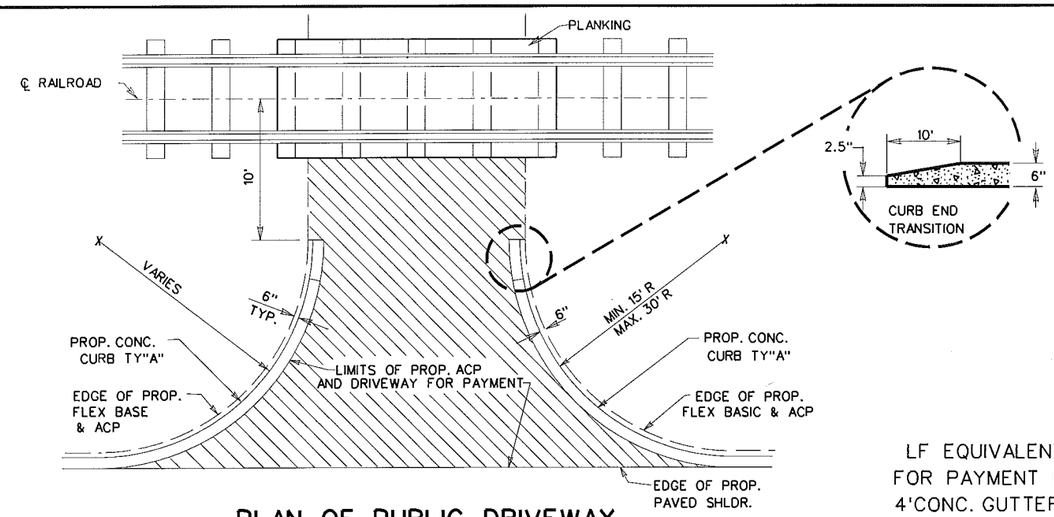
TYPICAL DETAIL

(WHEN EXIST. ROADWAY WIDTH LESS THAN 24'.)

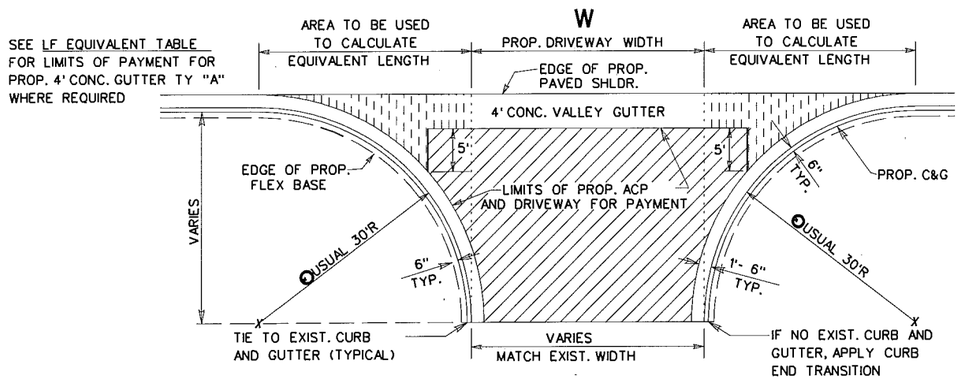


TYPICAL DETAIL

(WHEN EXIST. ROADWAY WIDTH EQUAL TO OR GREATER THAN 24'.)



PLAN OF PUBLIC DRIVEWAY ADJACENT TO R.R. CROSSING



PLAN OF PUBLIC DRIVEWAY

TY P

EXIST. PAVED DRIVEWAYS TO BE SURFACED W/171#/SY ACP.

TY PRB1

EXIST. PAVED, CALICHE AND/OR GRAVEL DRIVEWAYS TO BE SCARIFIED AND RECONTRUCTED WITH 4" NEW FLEX. BASE W/1% LIME TO MATCH THE PROPOSED WIDENED SECTION, THEN PRIMED AND SURFACED WITH 171#/SY ACP

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 ROADWAY.

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

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.

(E) 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.

PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

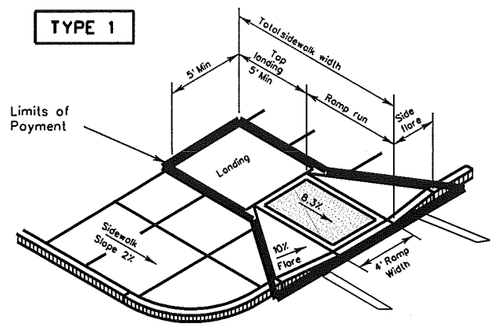
DRIVEWAY DETAILS PUBLIC (COUNTY ROAD-CITY STREET)

DRIVEWAY3.DGN

REVISIONS	STATE DISTRICT	FEDERAL REGION	STATE PROJECT			SHEET
REV. 4/05						46
	COUNTY		CONTROL	SECTION	JOB	HIGHWAY

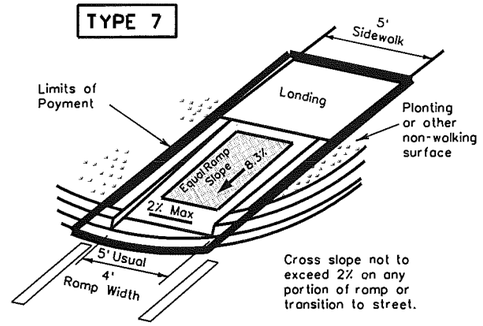
LEVELS DISPLAYED

TYPE 1



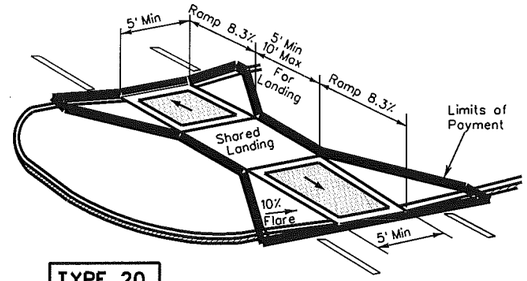
PERPENDICULAR CURB RAMP

TYPE 7

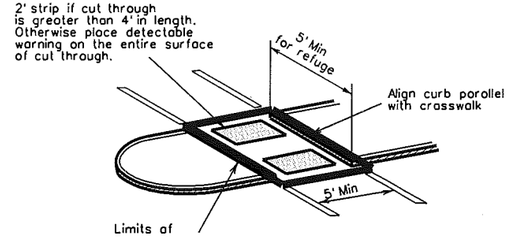


Cross slope not to exceed 2% on any portion of ramp or transition to street.

DIRECTIONAL RAMP WITHIN RADIUS



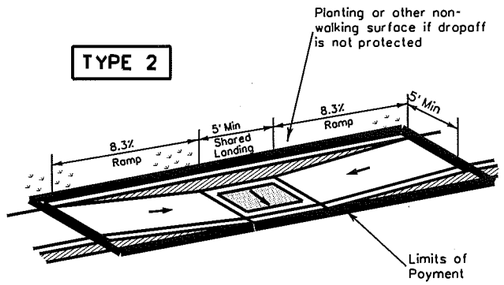
TYPE 20



TYPE 21

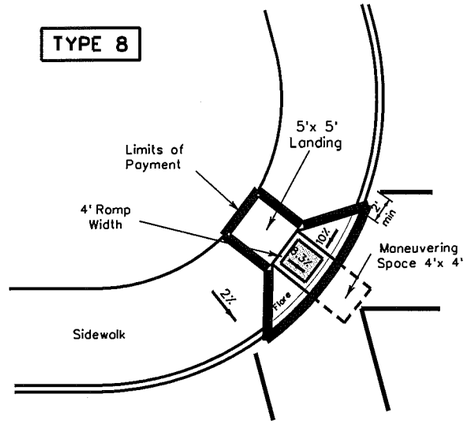
CURB RAMPS AT MEDIAN ISLANDS

TYPE 2



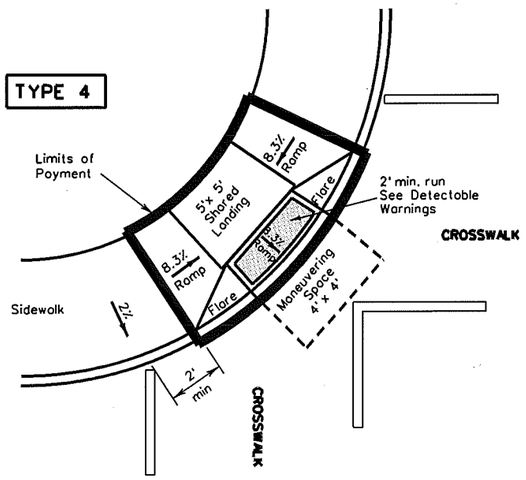
PARALLEL CURB RAMP

TYPE 8



DIAGONAL CURB RAMP (FLARED SIDES)

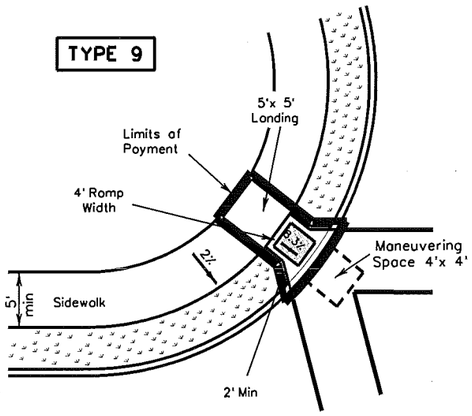
TYPE 4



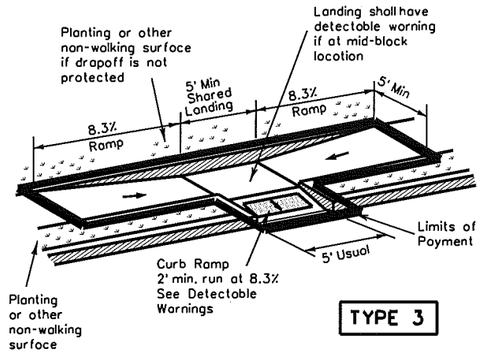
DIAGONAL COMBINATION CURB RAMP

Perpendicular to the Tangent of the Curb Radius and Contained in Crosswalk

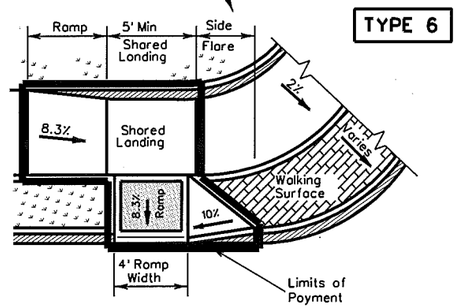
TYPE 9



DIAGONAL CURB RAMP (RETURNED CURB)

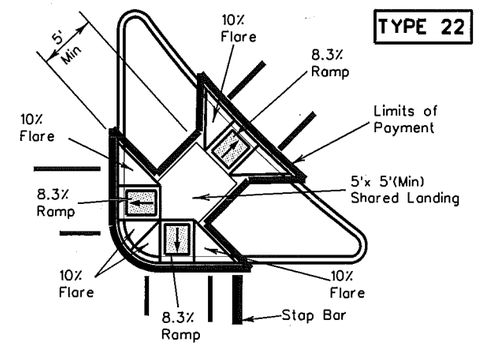


TYPE 3



TYPE 6

COMBINATION CURB RAMPS



TYPE 22

COMBINATION ISLAND RAMPS

General Notes

All slopes are maximum allowable. The least possible slope that will still drain properly should be used. Ramp length or grade of approach sidewalks may be adjusted as directed by the Engineer.

The minimum sidewalk width is 5'. Where a 5' sidewalk can not be provided due to site constraints, a minimum 3' sidewalk with 5'x 5' passing areas at intervals not to exceed 200 ft is required.

Landings shall be 5'x 5' minimum with a maximum 2% slope in any direction.

Maneuvering 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 travelpath.

Maximum allowable cross slope on sidewalk and ramp surfaces is 2%.

Curb ramps with returned curbs may be used only where pedestrians would not normally walk across the ramp. Otherwise, flared sides shall be provided.

All concrete surfaces shall receive a light broom finish unless noted otherwise in the plans.

Ramp textures must consist of truncated domed surfaces. Textures are required to be detectable underfoot. Surfaces that would allow water to accumulate are prohibited.

Additional information on curb ramp location, design, light reflective value and texture may be found in the current edition of the Texas Accessibility Standards (TAS) prepared and administered by the Texas Department of Licensing and Regulation (TDLR).

Raised medians separate opposing directions of traffic and provide a refuge area for pedestrians unable to cross the entire roadway in the allotted signal phase. To serve as a refuge area, the median should be a minimum of 5' wide. Medians should be designed to provide accessible passage over or through them.

Small channelization islands, which can not provide a minimum 5'x 5' landing at the top of ramps, shall be cut through level with the surface of the street.

Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, ramps shall be aligned with theoretical crosswalks, or as directed by the Engineer.

Existing features that comply with TAS may remain in place unless otherwise shown on the plans.

Handrails are not required on curb ramps. Curb ramps shall be provided wherever an accessible route crosses (penetrates) a curb.

Shaded areas indicate locations of detectable warnings. (Color / light reflective value and texture contrast)

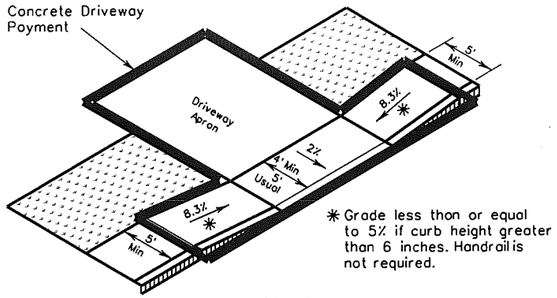
Curb ramps and landings shall be constructed and paid for in accordance with Item, "Curb ramp and Landing". Street curb transitions and curb bevels will be paid for in accordance with Item, "Concrete Curb, Gutter and Combined Curb and Gutter".

Texas Department of Transportation
Design Division (Roadway)

PEDESTRIAN FACILITIES
CURB RAMPS
PED-02

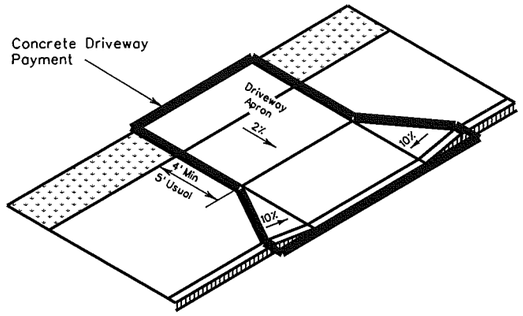
SHEET 1 OF 3

FILE: ped02.dgn	DN: MAM	CK: MAM	DW: BGD	CK:
©TxDOT March 2002	DIST	FED REG	FEDERAL AID PROJECT	SHEET 47
REVISIONS	COUNTY	CONTROL	SECT	JOB	HIGHWAY

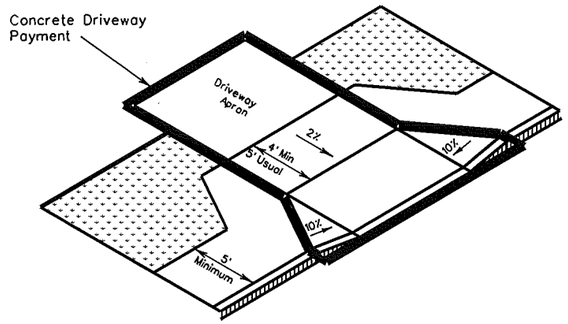


* Grade less than or equal to 5% if curb height greater than 6 inches. Handrail is not required.

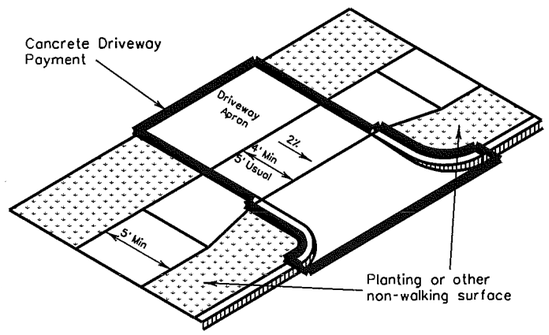
Ramp sidewalk



Wide sidewalk

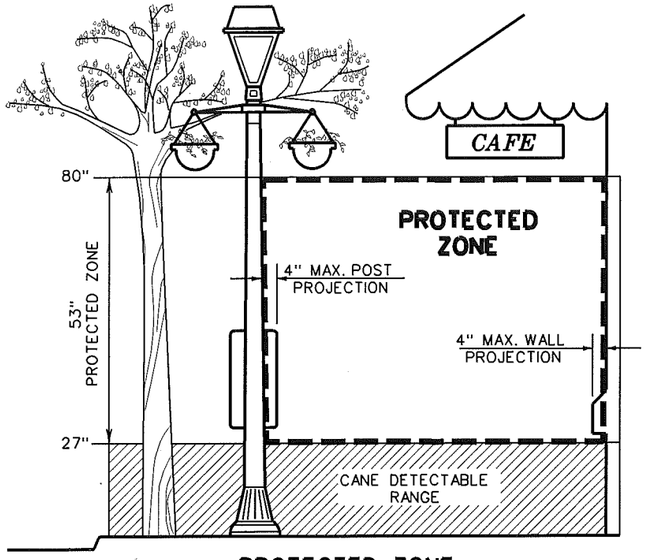


Apron offset sidewalk



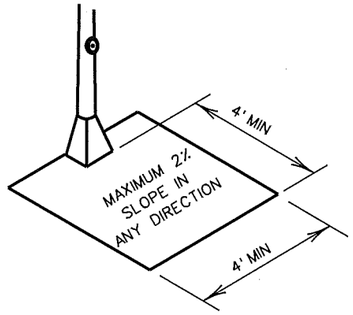
Setback sidewalk

SIDEWALK TREATMENT AT DRIVEWAYS

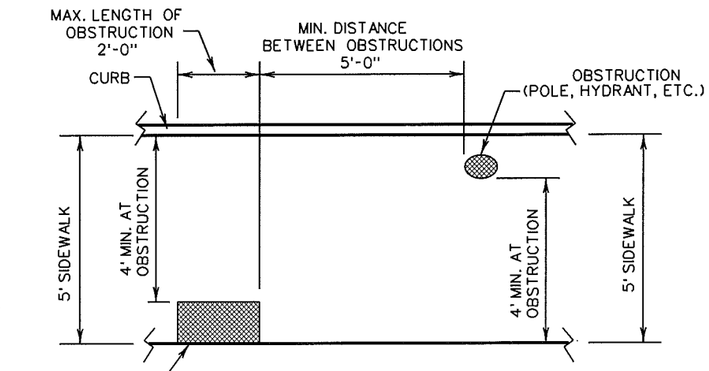


PROTECTED ZONE

In pedestrian circulation area, maximum 4" projection for post or wall mounted objects between 27"and 80" above the surface.



CLEAR GROUND SPACE AT PEDESTRIAN PUSH BUTTON



PLAN VIEW
PLACEMENT OF STREET FIXTURES

(ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' x 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.)

General Notes

All slopes are maximum allowable. The least possible slope that will still drain properly should be used.

Traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items shall be placed so not to obstruct the accessible route.

Usual sidewalk cross slope equals 1.5%. The maximum allowable sidewalk cross slope equals 2%.

Street grades and cross slopes shall be as shown elsewhere in the plans.

Existing features that comply with TAS may remain in place unless otherwise shown on the plans.

Changes in level greater than 1/4 inch are not permitted.

Any part of the accessible route with a slope greater than 1:20 (5%) shall be considered a ramp. If a ramp has a rise greater than 6 inches or a horizontal projection greater than 72 inches, then it shall have handrails on both sides, with the following exceptions:

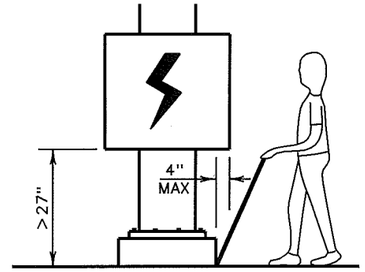
At ramp sidewalks shown at for left.

Handrails are not required on curb ramps. Curb ramps shall be provided wherever an accessible route crosses (penetrates) a curb.

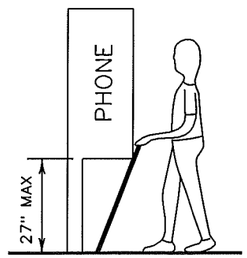
The least possible grade should be used to maximize accessibility. Where structurally impractical to achieve TAS compliance, the running slope of sidewalks and crosswalks, within the public right of way, may follow the grade of the parallel roadway without invoking Texas Accessibility Standards (TAS) variances for landings or handrails. Where a continuous grade greater than 5% must be provided, handrails may be desirable on one or both sides of the sidewalk to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions.

Parabolic crowns may require adjustment in crosswalk areas to limit the crosswalk grade to 5%.

Driveways and turnouts shall be constructed and paid for in accordance with Item, "Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".



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"

LEVELS DISPLAYED

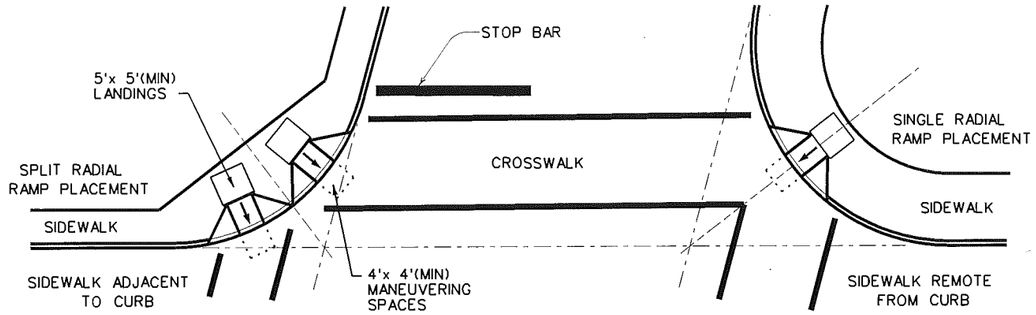
Texas Department of Transportation
Design Division (Roadway)

PEDESTRIAN FACILITIES
SIDEWALKS

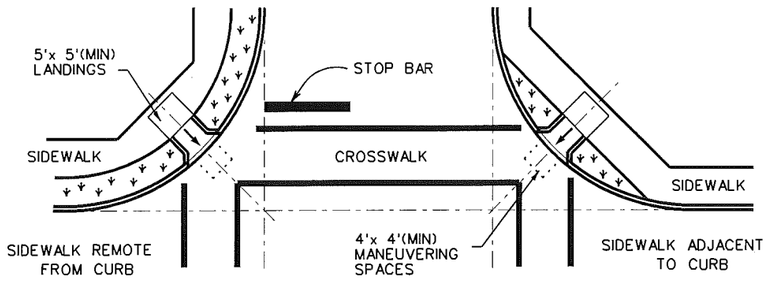
PED-02

SHEET 2 OF 3

FILE: ped02.dgn	DN: MAM	CK: MAM	DW: BGD	CK:	
©TxDOT March 2002	DIST	FED REG	FEDERAL AID PROJECT		SHEET
REVISIONS					48
	COUNTY		CONTROL	SECT	JOB	HIGHWAY



SKEWED INTERSECTION WITH "LARGE" RADIUS



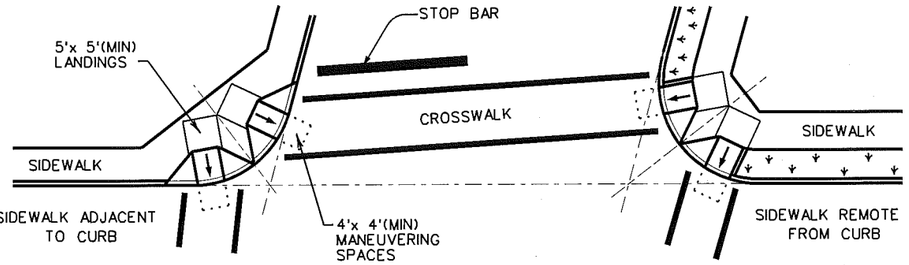
NORMAL INTERSECTION WITH "LARGE" RADIUS

General Notes

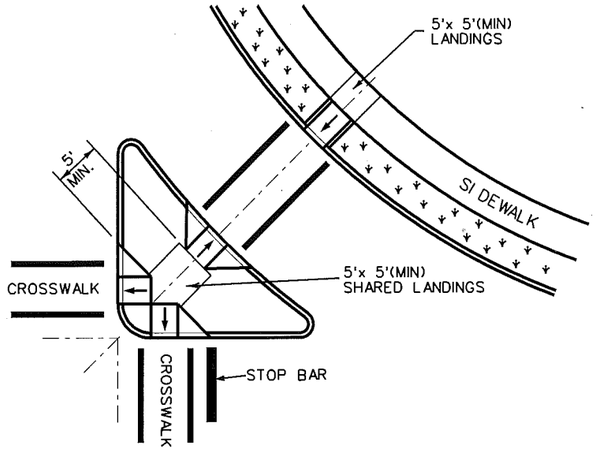
Street grades and cross slopes shall be as shown elsewhere in the plans.

Ramps are shown here without detectable warnings for simplicity. Detectable warnings are required at the locations shown on the PED Standard (Sheet 1 of 3) and in accordance with the details shown below.

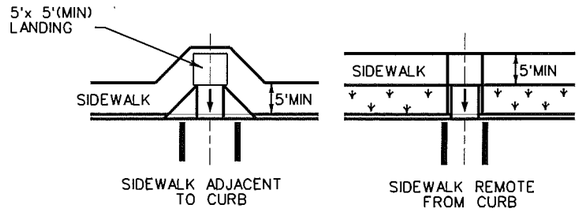
Small channelization islands, which can not provide a minimum 5' x 5' landing at the top of ramps, shall be cut through level with the surface of the street.



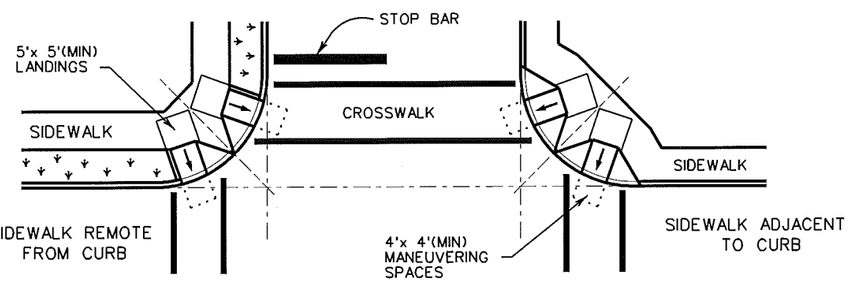
SKEWED INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



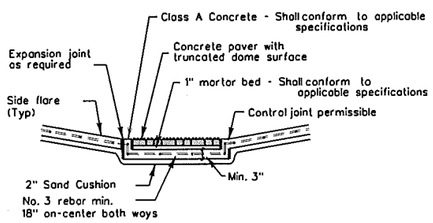
MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS



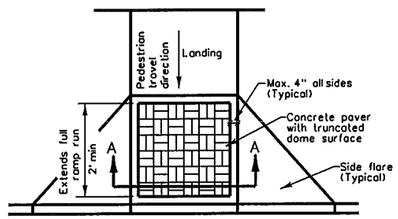
NORMAL INTERSECTION WITH "SMALL" RADIUS

TYPICAL CROSSING LAYOUTS

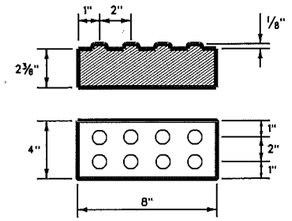
SEE SHEET 1 OF 3 FOR DETAILS AND DIMENSIONS



Section A-A



TYPE A
Truncated Dome Pattern Curb Ramp



Concrete paver with truncated dome surface

DETECTABLE WARNINGS

General Notes

Concrete paver units shall meet all requirements of ASTM C-936, C-33, and shall be laid in a two by two unit basket weave pattern, unless shown otherwise in the plans.

Domes shall be aligned in the direction of pedestrian travel.

Concrete paver units shall have a truncated dome top surface for detectable warning to pedestrians.

Concrete paver unit color for the ramp shall be a contrasting color that provides a light reflective value that significantly contrasts with the adjacent surfaces. The color of the concrete paver units shall be shown elsewhere in the plans. (Adjacent surfaces include side flares).

Concrete paver units shall be saw cut only and any cut unit shall not be less than 25 percent of a full unit.

Texas Department of Transportation
Design Division (Roadway)

PEDESTRIAN FACILITIES
INTERSECTION LAYOUTS AND DETECTABLE WARNINGS
PED-02

SHEET 3 OF 3

FILE: ped02.dgn	DN: MAM	CK: MAM	DW: BGD	CK:
©TxDOT March 2002	DIST	FED REG	FEDERAL AID PROJECT	# SHEET
REVISIONS				49
	COUNTY		CONTROL SECT	JOB HIGHWAY

LEVELS DISPLAYED

SCALE
HORZ. :1"=50'
VERT. : 1"=5'

EXIST. POWER POLE TO REMAIN
EXIST. TRAFFIC SIGNAL POLE TO REMAIN
SEE DETAIL "A"
EXIST GRATE INLET TO BE CAPPED★
PROP. 8" WATERLINE (BY OTHERS)
EXIST. WATER LINE ~~TO BE ADJUSTED BY~~ OTHERS (CITY OF ALAMO)
CAUTION: EXIST. GAS LINE IN AREA
PROP. 15' UTIL. ESMT.
EXIST. 15' GAS ESMT.
PROP. 52'B-B RDWY.
PROP. 100.0' R.O.W.
PROP. R.O.W. LINE
ALAMO ROAD (FM 907)
EL GATO ROAD
MATCHLINE STA. 10+00
S 81° 25' 06.93" E
871.02'
5+00
M.H.W.S.C. WATER SPOT LOCATION TOP WL = 92.65
EXIST GRATE INLET★ TO BE CAPPED
EXIST. OVERHEAD POWER LINE (AEP)
EXIST. WATER LINE (M.H.W.S.C.) (TO REMAIN)
EXIST. SANITARY SEWER LINE (CITY OF ALAMO)
EXIST. POWER POLE TO BE RELOCATED BY OTHERS
PC 8+71.02
PRC 9+57.65
50.0'
A1 ★
A2 ★
BEGIN PROJECT
STA. 5+31.00
MATCH EXIST. PAV'T

STR. I.D.	DESCRIPTION	STA./OFFSET	TOP OF STR. ELEV.	PROP. FL. OF STR.	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
★ A1	TY "F" INLET	STA. 5+66.90, 25.50' LT	96.00	91.83	91.83	91.83	-	-
★ A2	TY "F" INLET	STA. 5+66.80, 25.50' RT.	96.00	91.87	91.87	-	-	-

LEGEND

- DOWN GUY
- SANITARY SEWER MANHOLE
- EXIST. STANDPIPES
- TEL MARKER
- FIRE HYDRANT
- POWER POLE
- POWER POLE W/LIGHT
- WATER VALVE
- MONITOR WELL
- STRUCTURE TO BE RELOCATED BY CONTRACTOR
- EXIST. POWER POLES TO BE ADJUSTED BY OTHERS
- SS — SAN. SEWER LINE
- W — WATER LINE
- OHEC — OVERHEAD ELEC./CABLE
- U/G Tel — UNDERGROUND TEL.
- GAS — GAS LINE
- FM — FORCE MAIN

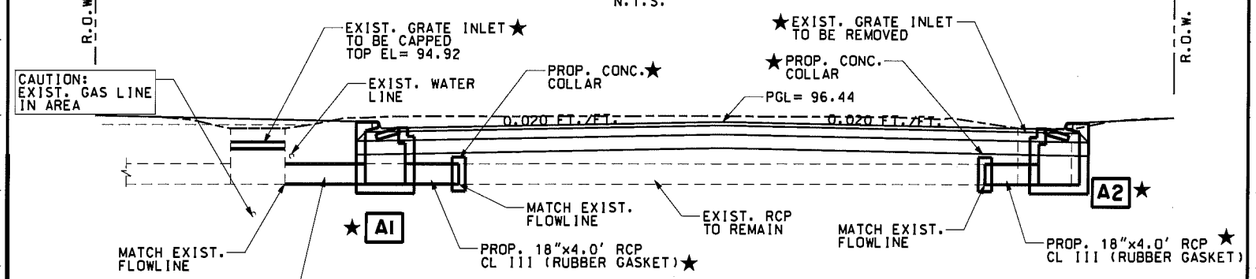
★ ITEM TO BE CONSTRUCTED BY HIDALGO COUNTY FORCES.

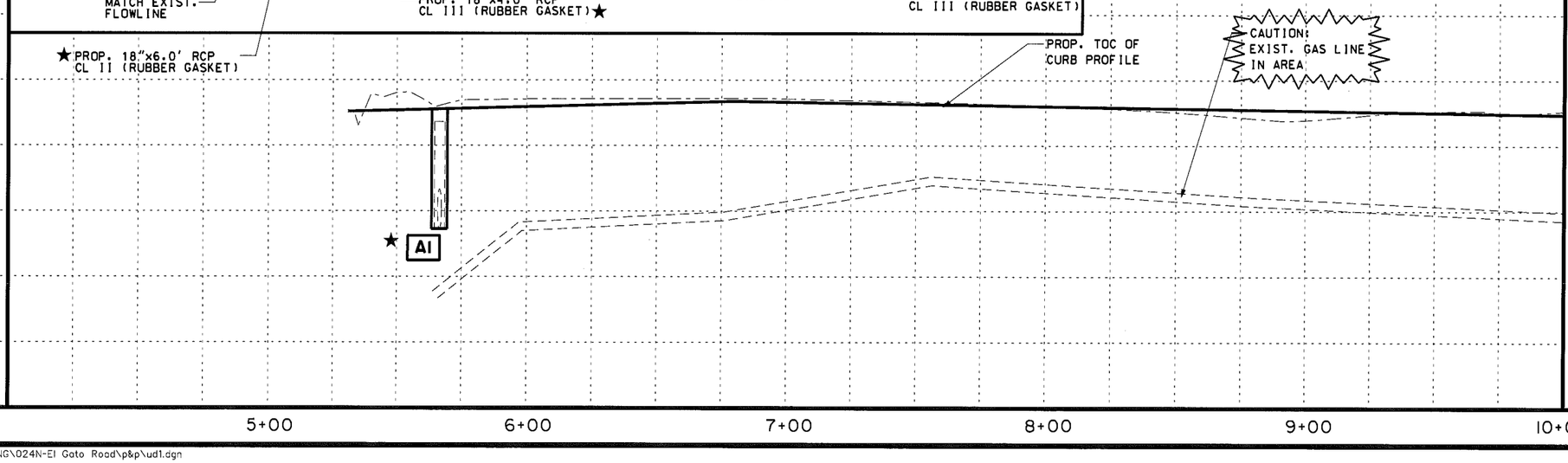
NOTES:

1.) MAILBOXES TO BE ADJUSTED AS NEEDED.
2.) ADJUST SAN. SEWER MANHOLES AS NEEDED AND CONSTRUCT A 4' DIA. X 6" CONC.COLLAR.
3.) ADJUST WATER VALVE AS NEEDED.
4.) CONTRACTOR SHALL VERIFY ALL UTILITIES:HORIZONTAL AND VERTICAL INFORMATION IN THE FIELD PRIOR TO CONSTRUCTION.

STA. 5+66.90 - DETAIL "A"

N.T.S.





THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY RAMIRO GUTIERREZ, P.E. 65948
DATE: 5-25-11

ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE LAW.

SHEET 1 OF 7

EL GATO ROAD
UTILITY & DRAINGE

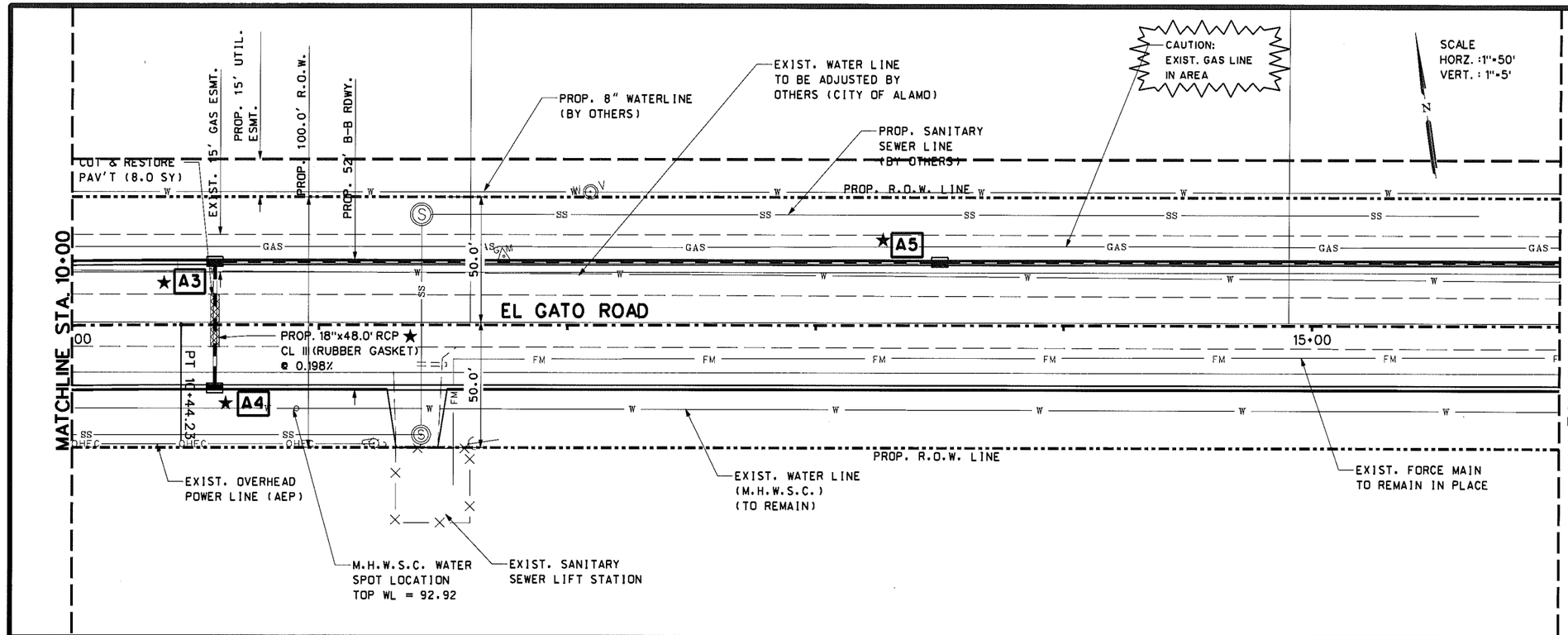
REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.

DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	50

F:\2008\ENG\024N-El Gato Road\p&p\ud1.dgn



LEGEND

- DOWN GUY
- SANITARY SEWER MANHOLE
- EXIST. STANDPIPES
- TEL MARKER
- FIRE HYDRANT
- POWER POLE
- POWER POLE W/LIGHT
- WATER VALVE
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- STRUCTURE TO BE RELOCATED BY CONTRACTOR
- EXIST. POWER POLES TO BE ADJUSTED BY OTHERS
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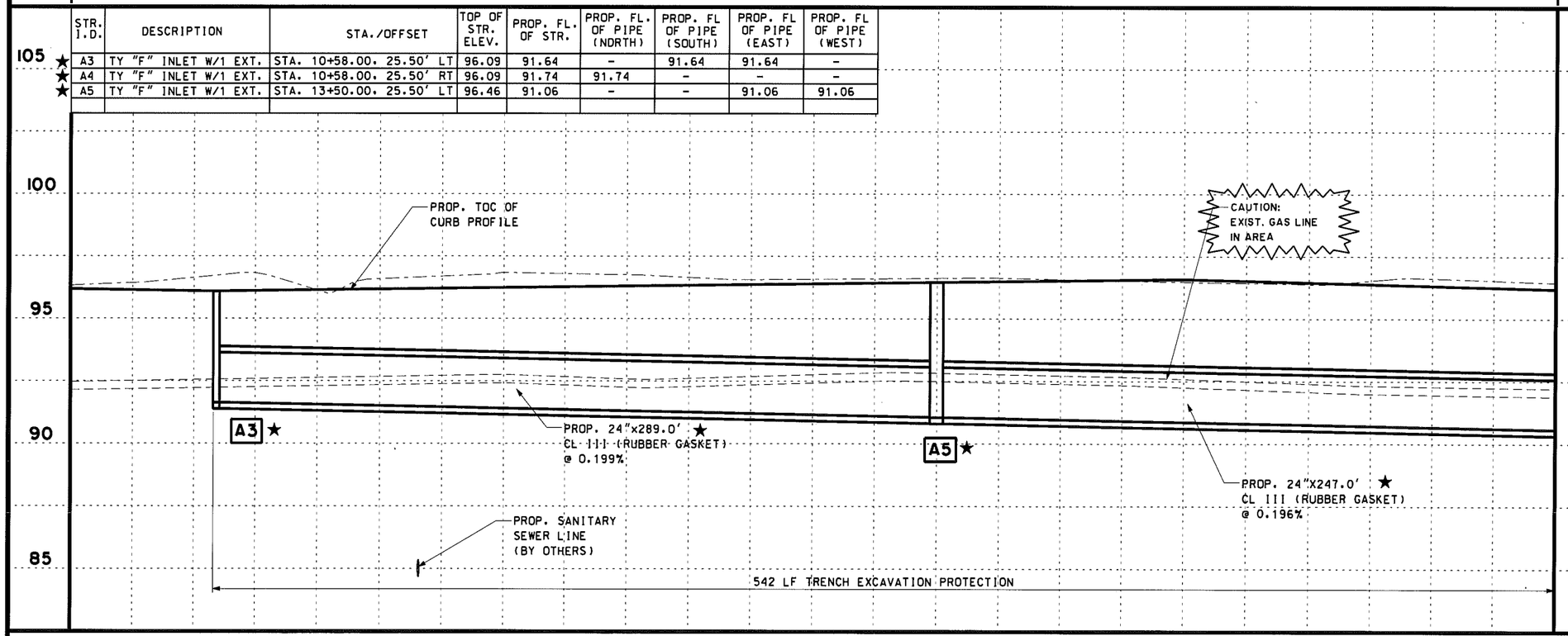
- GAS — GAS LINE
- FM — FORCE MAIN

★ ITEM TO BE CONSTRUCTED BY HIDALGO COUNTY FORCES.

NOTES:

1.) MAILBOXES TO BE ADJUSTED AS NEEDED.
2.) ADJUST SAN. SEWER MANHOLES AS NEEDED AND CONSTRUCT A 4' DIA. X 6" CONC.COLLAR.
3.) ADJUST WATER VALVE AS NEEDED.
4.) CONTRACTOR SHALL VERIFY ALL UTILITIES:HORIZONTAL AND VERTICAL INFORMATION IN THE FIELD PRIOR TO CONSTRUCTION.

	STR. I.D.	DESCRIPTION	STA./OFFSET	TOP OF STR. ELEV.	PROP. FL. OF STR.	PROP. FL. OF PIPE (NORTH)	PROP. FL OF PIPE (SOUTH)	PROP. FL OF PIPE (EAST)	PROP. FL OF PIPE (WEST)
★	A3	TY "F" INLET W/1 EXT.	STA. 10+58.00, 25.50' LT	96.09	91.64	-	91.64	91.64	-
★	A4	TY "F" INLET W/1 EXT.	STA. 10+58.00, 25.50' RT	96.09	91.74	91.74	-	-	-
★	A5	TY "F" INLET W/1 EXT.	STA. 13+50.00, 25.50' LT	96.46	91.06	-	-	91.06	91.06



RAMIRO GUTIERREZ 65948 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY RAMIRO GUTIERREZ, P.E. 65948
DATE: 5-25-11

ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE LAW.

SHEET 2 OF 7

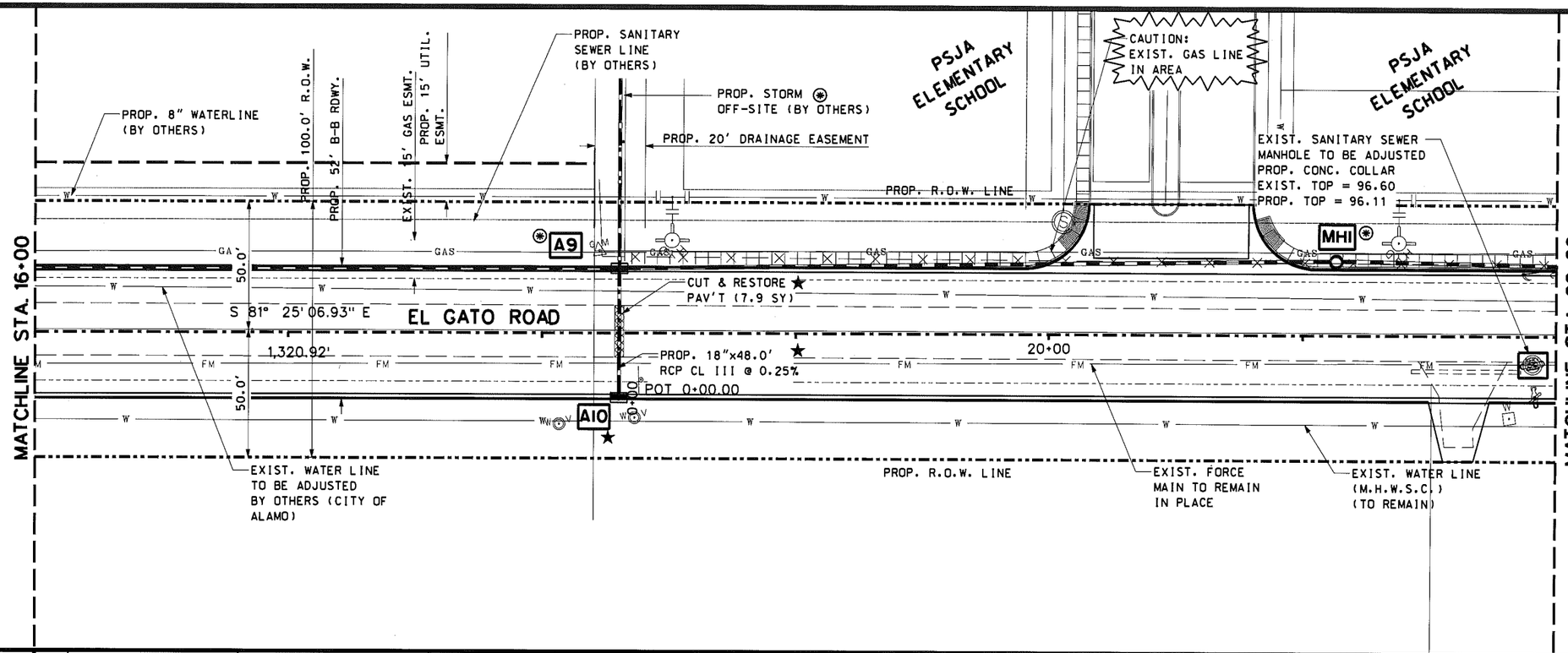
EL GATO ROAD
UTILITY & DRAINGE

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.
DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	51

F:\2008\ENG\024N-El Gato Road\p&p\ud2.dgn



SCALE
HORZ. :1"=50'
VERT. : 1"=5'

LEGEND

- DOWN GUY
- SANITARY SEWER MANHOLE
- EXIST. STANDPIPES
- TEL MARKER
- FIRE HYORANT
- POWER POLE
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- WATER VALVE
- MONITOR WELL
- STRUCTURE TO BE RELOCATED BY CONTRACTOR
- EXIST. POWER POLES TO BE ADJUSTED BY OTHERS
- SS — SAN. SEWER LINE
- W — WATER LINE
- OHEC — OVERHEAD ELEC./CABLE
- U/G Tel — UNDERGROUND TEL.
- GAS — GAS LINE
- FM — FORCE MAIN
- BY OTHERS

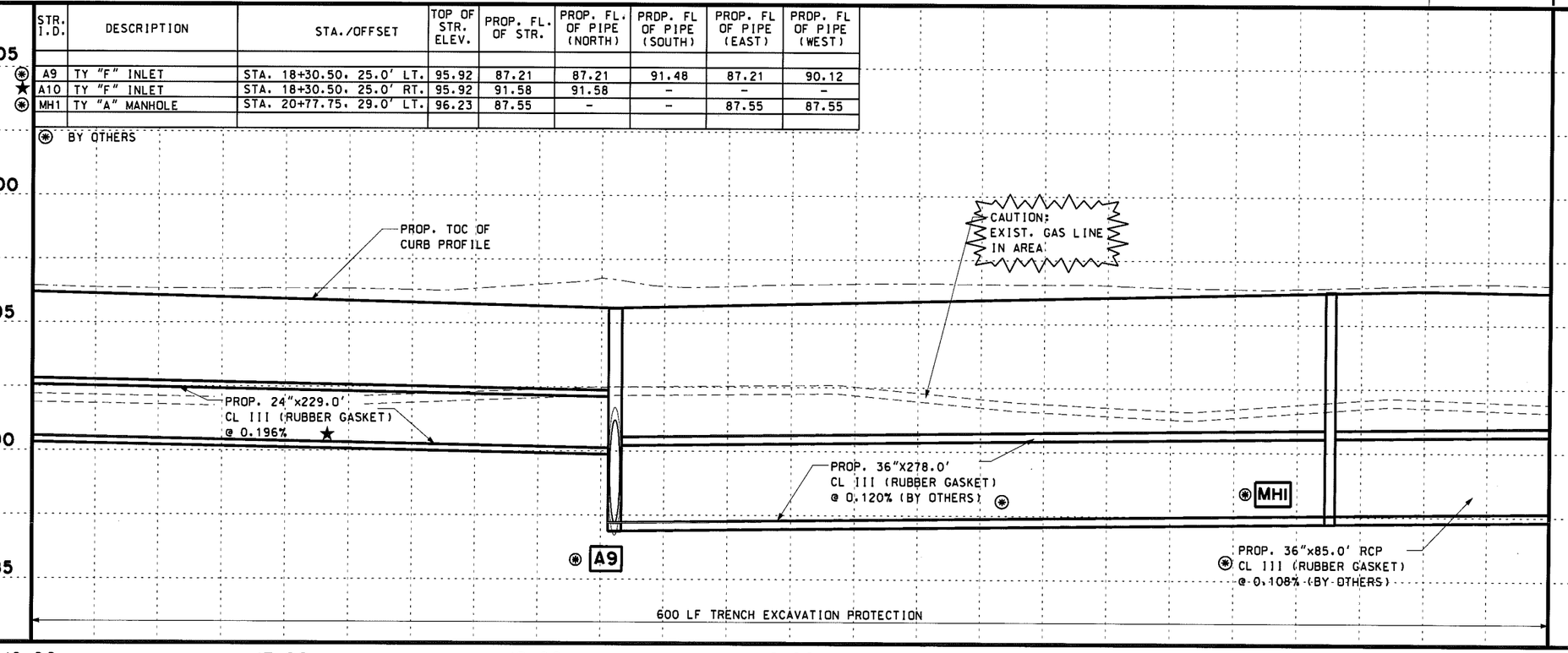
★ ITEM TO BE CONSTRUCTED BY HIDALGO COUNTY FORCES.

NOTES:

1.) MAILBOXES TO BE ADJUSTED AS NEEDED.
2.) ADJUST SAN. SEWER MANHOLES AS NEEDED AND CONSTRUCT A 4' DIA. X 6" CONC.COLLAR.
3.) ADJUST WATER VALVE AS NEEDED.
4.) CONTRACTOR SHALL VERIFY ALL UTILITIES:HDRIZONTAL AND VERTICAL INFORMATION IN THEFIELD PRIOR TO CONSTRUCTION.

STR. I.D.	DESCRIPTION	STA./OFFSET	TOP OF STR. ELEV.	PROP. FL. OF STR.	PROP. FL. OF PIPE (NORTH)	PROP. FL OF PIPE (SOUTH)	PROP. FL OF PIPE (EAST)	PROP. FL OF PIPE (WEST)
⊛ A9	TY "F" INLET	STA. 18+30.50, 25.0' LT.	95.92	87.21	87.21	91.48	87.21	90.12
★ A10	TY "F" INLET	STA. 18+30.50, 25.0' RT.	95.92	91.58	91.58	-	-	-
⊛ MH1	TY "A" MANHOLE	STA. 20+77.75, 29.0' LT.	96.23	87.55	-	-	87.55	87.55

⊛ BY OTHERS



STATE OF TEXAS
RAMIRO GUTIERREZ
65948
REGISTERED PROFESSIONAL ENGINEER
Ramiro Gutierrez, P.E.

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY RAMIRO GUTIERREZ, P.E. 65948
DATE: 5-25-11

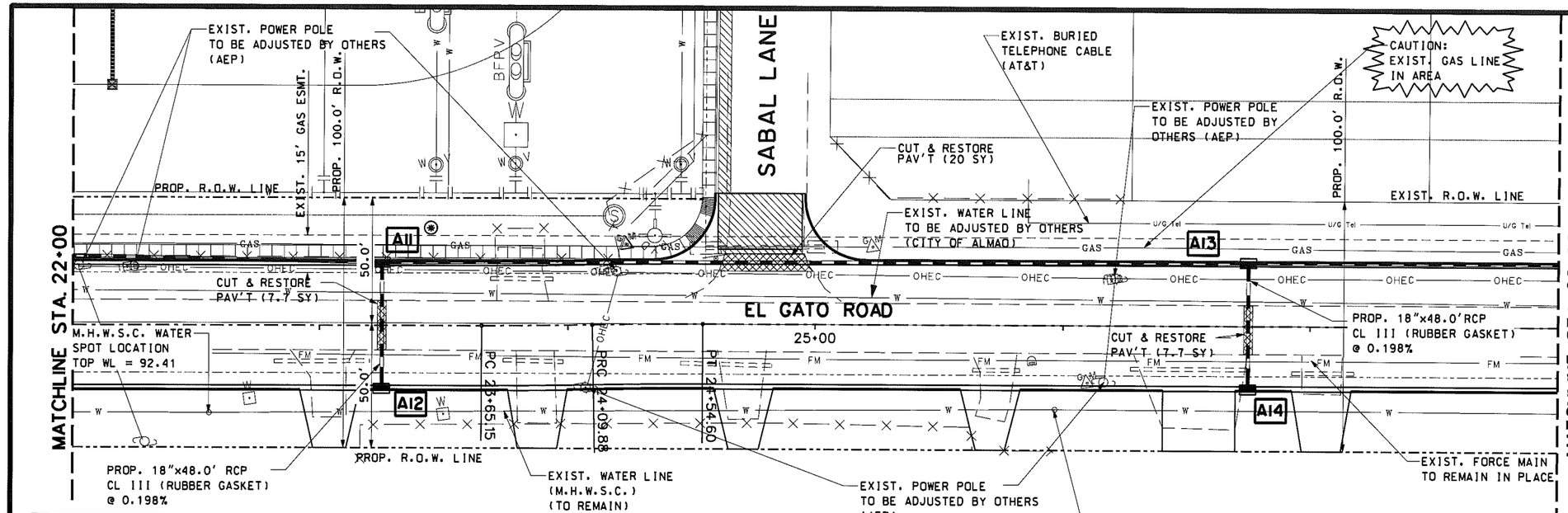
EL GATO ROAD
UTILITY & DRAINGE

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.
DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	52

F:\2008\ENG\024N-El Gato Road\p&p\ud3.dgn



STR. I.D.	DESCRIPTION	STA./OFFSET	TOP OF STR. ELEV.	PROP. FL. OF STR.	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL OF PIPE (EAST)	PROP. FL OF PIPE (WEST)
(*) A11	TY "F" INLET W/1 EXT.	STA. 23+25.00, 25.50' LT.	96.06	87.78	-	91.62	87.78	87.78
A12	TY "F" INLET W/1 EXT.	STA. 23+25.00, 25.50' RT.	96.06	91.72	91.72	-	-	-
A13	TY "F" INLET W/1 EXT.	STA. 26+75.00, 25.50' LT.	95.50	88.30	-	91.06	88.30	88.30
A14	TY "F" INLET W/1 EXT.	STA. 26+75.00, 25.50' RT.	95.50	91.16	91.16	-	-	-

(*) BY OTHERS

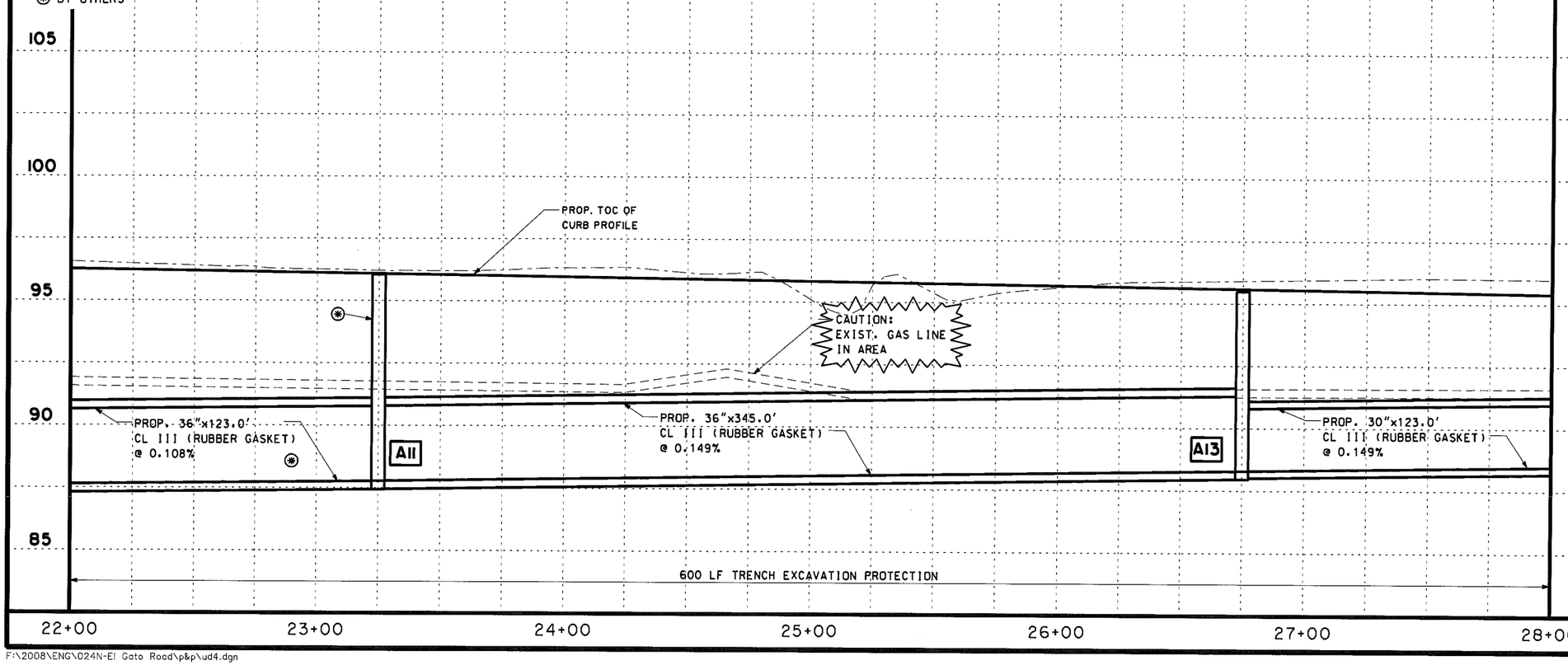
NOTES:

1.) MAILBOXES TO BE ADJUSTED AS NEEDED.
2.) ADJUST SAN. SEWER MANHOLES AS NEEDED AND CONSTRUCT A 4' DIA. X 6" CONC.COLLAR.
3.) ADJUST WATER VALVE AS NEEDED.
4.) CONTRACTOR SHALL VERIFY ALL UTILITIES:HORIZONTAL AND VERTICAL INFORMATION IN THEFIELD PRIOR TO CONSTRUCTION.

SCALE
HORZ. :1"=50'
VERT. : 1"=5'

LEGEND

- DOWN GUY
- SANITARY SEWER MANHOLE
- EXIST. STANDPIPES
- TEL MARKER
- FIRE HYDRANT
- POWER POLE
- POWER POLE W/LIGHT
- WATER VALVE
- MONITOR WELL
- STRUCTURE TO BE RELOCATED BY CONTRACTOR
- EXIST. POWER POLES TO BE ADJUSTED BY OTHERS
- SS — SAN. SEWER LINE
- W — WATER LINE
- OHEC — OVERHEAD ELEC./CABLE
- U/G Tel — UNDERGROUND TEL.
- GAS — GAS LINE
- FM — FORCE MAIN
- (*) BY OTHERS



STATE OF TEXAS
RAMIRO GUTIERREZ
65948
LICENSED PROFESSIONAL ENGINEER
P.E.

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DATE: 5-25-11
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SHEET 4 OF 7

EL GATO ROAD
UTILITY & DRAINGE

REVISIONS	DATE:	BY:

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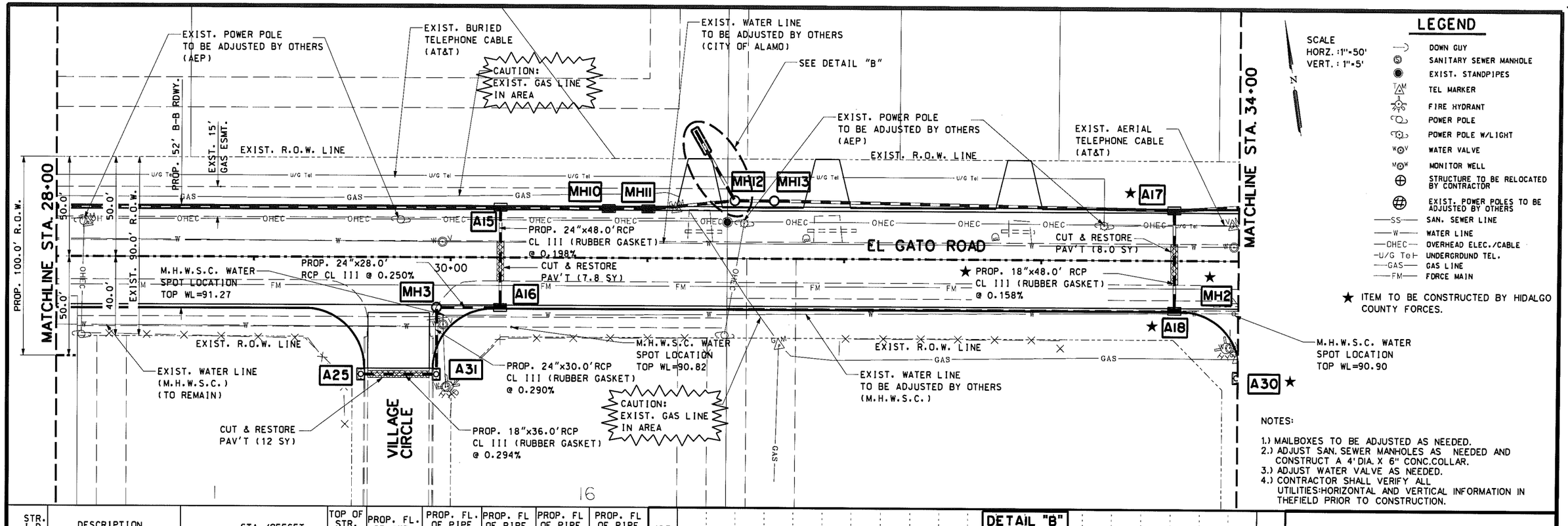
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

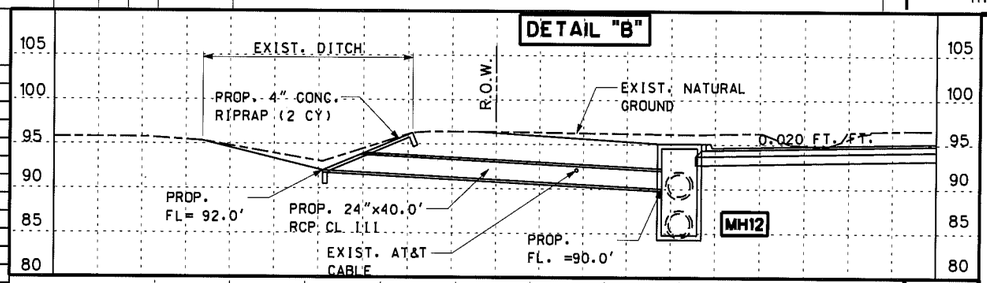
PROJECT NUMBER	COUNTY	HIGHWAY NO.

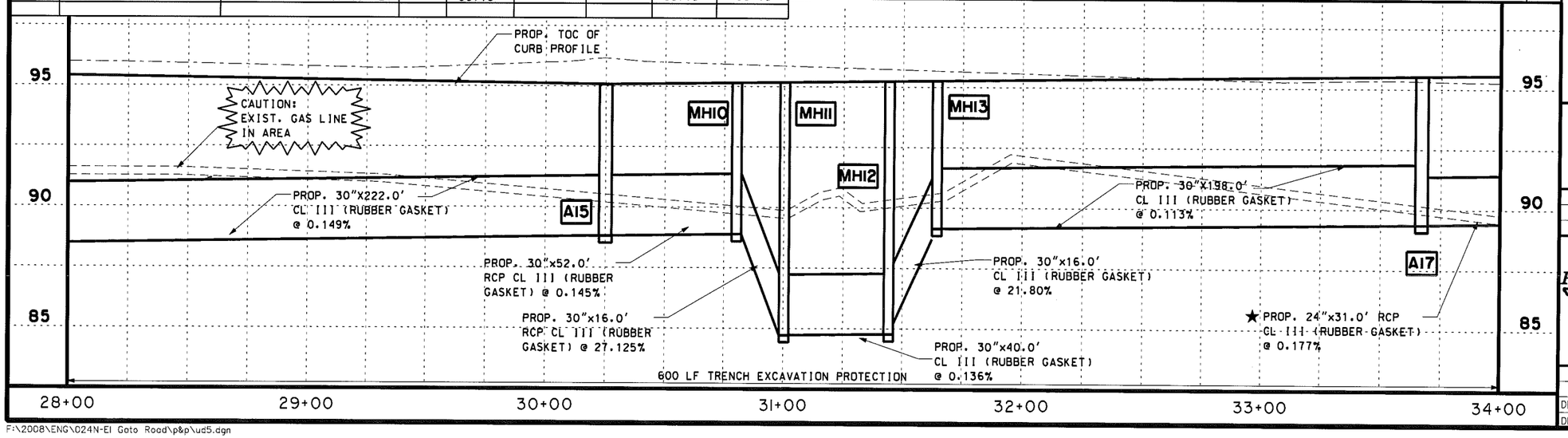
DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	53

F:\2008\ENG\024N-El Gato Road\p&p\ud4.dgn



STR. I.D.	DESCRIPTION	STA./OFFSET	TOP OF STR. ELEV.	PROP. FL. OF STR.	PROP. FL. OF PIPE (NORTH)	PROP. FL OF PIPE (SOUTH)	PROP. FL OF PIPE (EAST)	PROP. FL OF PIPE (WEST)
A15	TY "F" INLET	STA. 30.25.00. 25.50' LT.	94.94	88.82	-	89.90	88.82	88.82
A16	TY "F" INLET	STA. 30.25.00. 25.50' RT.	94.94	90.00	90.00	-	-	90.00
★ A17	TY "F" INLET W/1 EXT.	STA. 33+67.00. 25.50' LT.	95.38	89.38	-	89.38	89.90	89.38
★ A18	TY "F" INLET W/1 EXT.	STA. 33+67.00. 25.50' RT.	95.38	89.46	89.46	-	89.46	-
A25	TY "F" INLET W/1 EXT.	STA. 29+55.0. 59.00' RT.	95.10	90.72	-	-	90.72	-
★ A30	TY "A" INLET W/1 EXT.	STA. 34+01.40. 59.00' RT.	94.74	89.72	-	-	89.72	-
A31	TY "A" INLET W/1 EXT.	STA. 29+93.00. 59.00' RT.	95.10	90.18	90.18	-	-	90.62
MH3	PROP. TY "A" MANHOLE	STA. 29+93.00. 25.30' RT.	94.97	90.08	-	90.08	90.08	-
MH10	TY "F" INLET	STA. 30+80.40. 25.50' LT.	95.02	88.90	-	-	88.90	88.90
MH11	TY "F" INLET	STA. 31+00.40. 25.50' LT.	95.06	84.73	-	-	84.73	84.73
MH12	PROP. TY "A" MANHOLE	STA. 31+44.40. 29.00' LT.	95.13	84.79	90.00	-	84.79	84.79
MH13	PROP. TY "A" MANHOLE	STA. 31+64.40. 29.00' LT.	95.17	89.15	-	-	89.15	89.15





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SHEET 5 OF 7

EL GATO ROAD
UTILITY & DRAINGE

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2567 • (FAX) 956 782-2558
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.
DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	54

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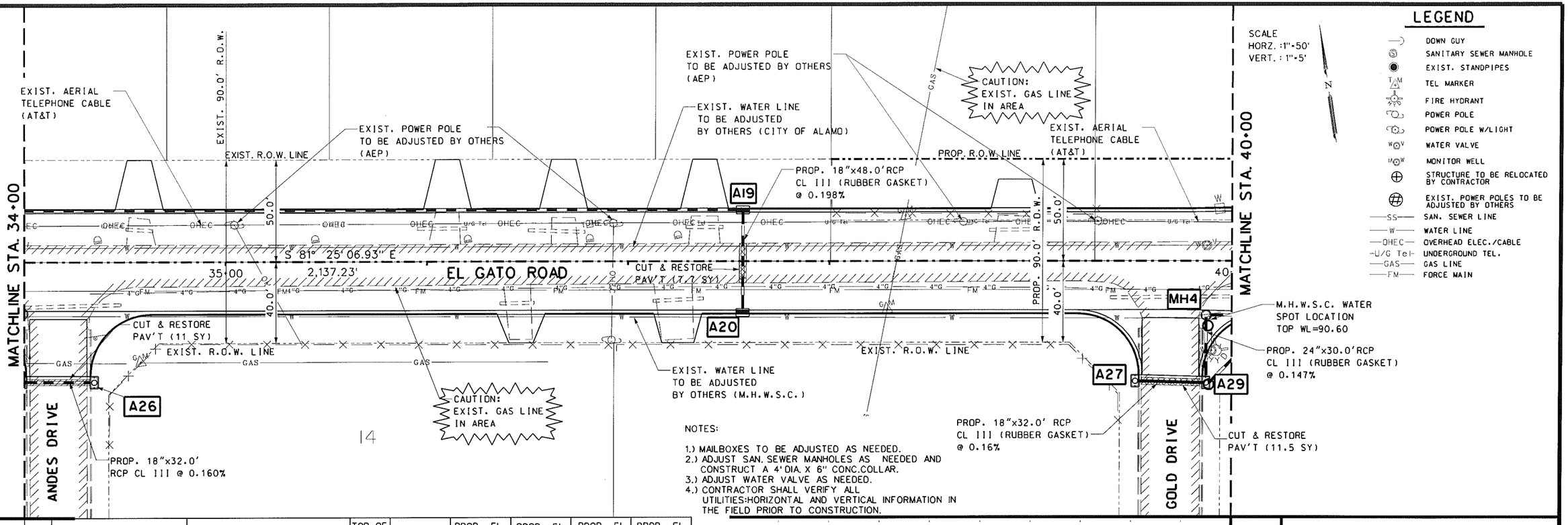

SCALE
HORZ. :1"=50'
VERT. : 1"=5'

LEGEND

- DOWN GUY
- SANITARY SEWER MANHOLE
- EXIST. STANDPIPES
- TEL MARKER
- FIRE HYDRANT
- POWER POLE
- POWER POLE W/LIGHT
- WATER VALVE
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- STRUCTURE TO BE RELOCATED BY CONTRACTOR
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NOTES:

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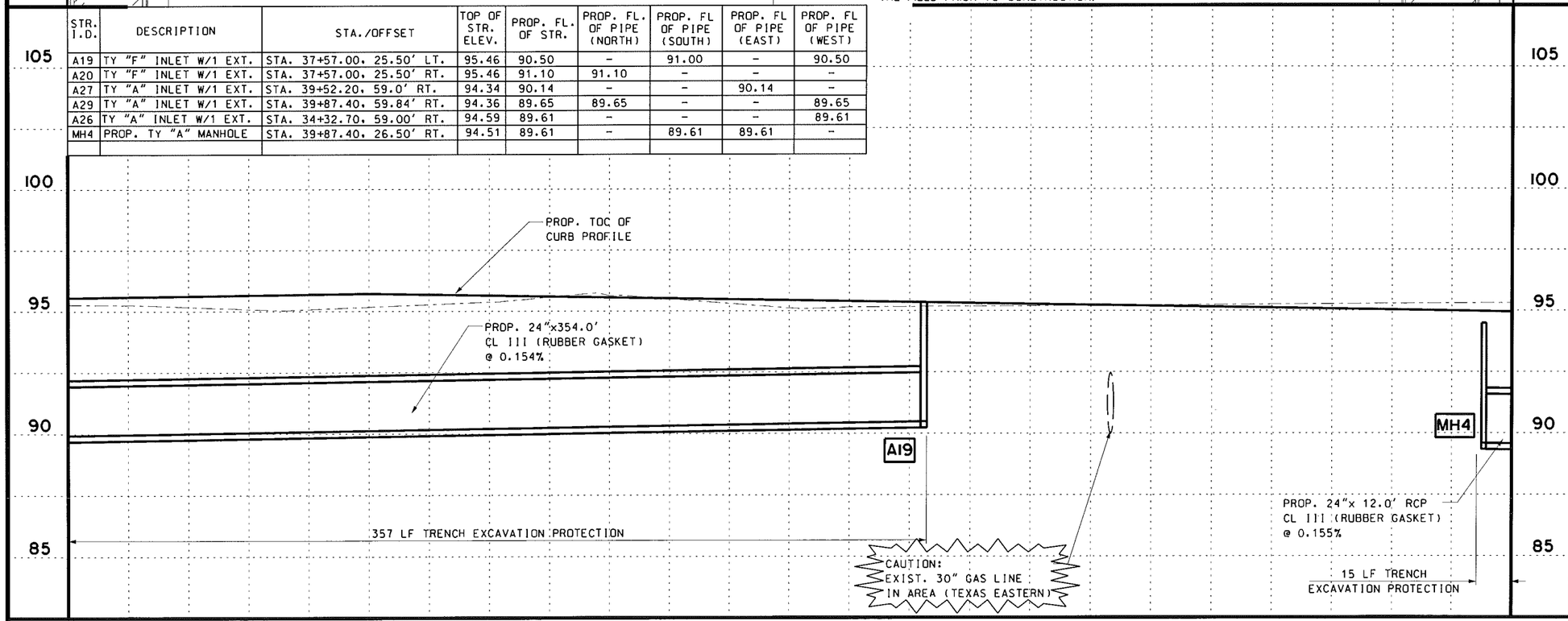
STR. I.D.	DESCRIPTION	STA./OFFSET	TOP OF STR. ELEV.	PROP. FL. OF STR.	PROP. FL. OF PIPE (NORTH)	PROP. FL OF PIPE (SOUTH)	PROP. FL OF PIPE (EAST)	PROP. FL OF PIPE (WEST)
A19	TY "F" INLET W/1 EXT.	STA. 37+57.00, 25.50' LT.	95.46	90.50	-	91.00	-	90.50
A20	TY "F" INLET W/1 EXT.	STA. 37+57.00, 25.50' RT.	95.46	91.10	91.10	-	-	-
A27	TY "A" INLET W/1 EXT.	STA. 39+52.20, 59.0' RT.	94.34	90.14	-	-	90.14	-
A29	TY "A" INLET W/1 EXT.	STA. 39+87.40, 59.84' RT.	94.36	89.65	89.65	-	-	89.65
A26	TY "A" INLET W/1 EXT.	STA. 34+32.70, 59.00' RT.	94.59	89.61	-	-	-	89.61
MH4	PROP. TY "A" MANHOLE	STA. 39+87.40, 26.50' RT.	94.51	89.61	-	89.61	89.61	-



STATE OF TEXAS — RAMIRO GUTIERREZ — 65948 — REGISTERED PROFESSIONAL ENGINEER — P.E.

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EL GATO ROAD
UTILITY & DRAINGE

REVISIONS	DATE:	BY:

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Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
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PROJECT NUMBER	COUNTY	HIGHWAY NO.
DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	55

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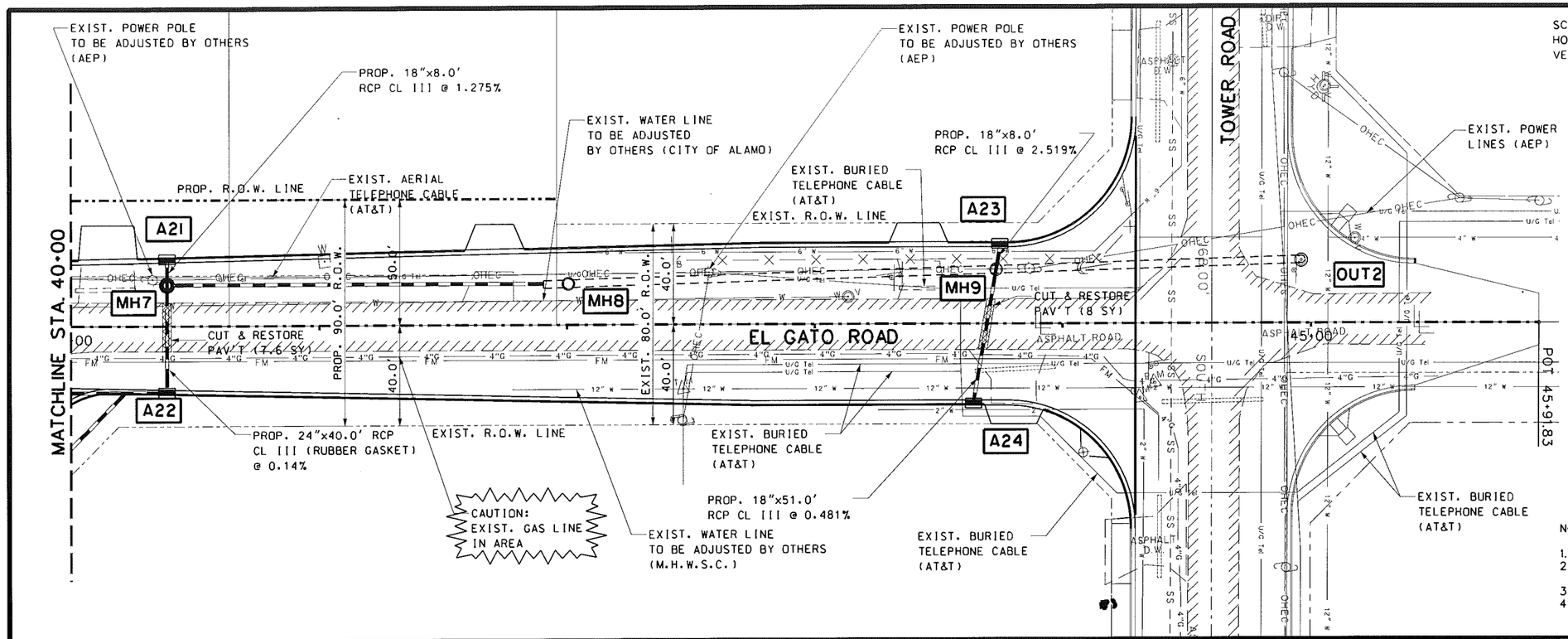

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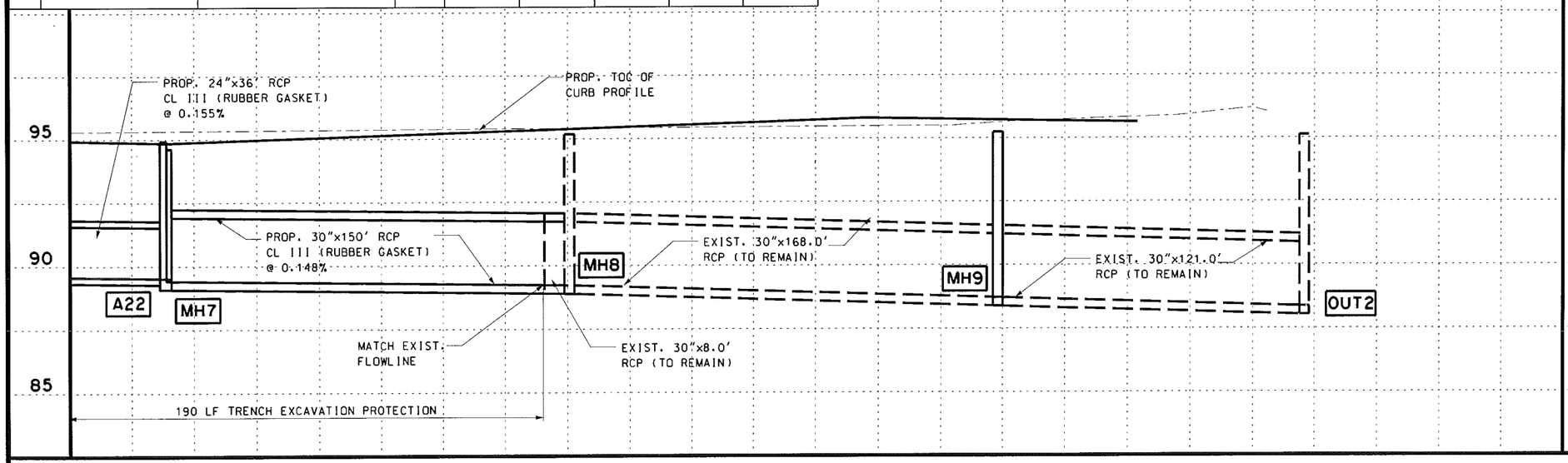
A21	TY "F" INLET W/1 EXT.	STA. 40+38.90, 26.80' LT.	94.95	90.55	-	90.55	-	-
A22	TY "F" INLET W/1 EXT.	STA. 40+38.90, 26.80' RT.	94.95	89.54	89.54	-	-	89.54
A23	TY "F" INLET W/1 EXT.	STA. 43+74.50, 32.0' LT.	95.50	91.10	-	91.10	-	-
A24	TY "F" INLET W/1 EXT.	STA. 43+64.00, 32.0' RT.	95.50	91.10	91.10	-	-	-
MH7	PROP. TY "A" MANHOLE	STA. 40+38.90, 16.40' LT.	94.64	89.44	90.50	89.44	89.44	-
MH8	EXIST. MANHOLE	STA. 42+00.65, 16.40' LT.	95.20	89.25	-	-	89.25	89.25
MH9	PROP. TY "A" MANHOLE	STA. 43+73.06, 21.55' LT.	95.25	88.74	88.91	88.91	88.74	88.74
OUT2	EXIST. MANHOLE	STA. 44+95.90,24.95' LT.	95.67	88.38	-	-	-	88.38



STATE OF TEXAS
RAMIRO GUTIERREZ
65948
REGISTERED PROFESSIONAL ENGINEER
, P.E.

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SHEET 7 OF 7

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UTILITY & DRAINGE

REVISIONS	DATE:	BY:

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(TEL) 956 782-2557 • (FAX) 956 782-2558
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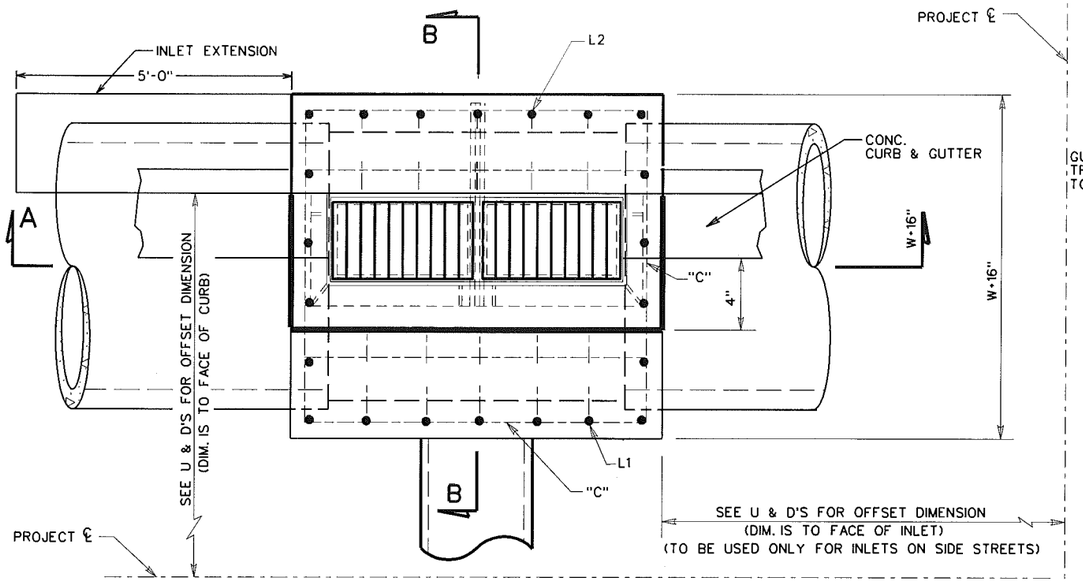
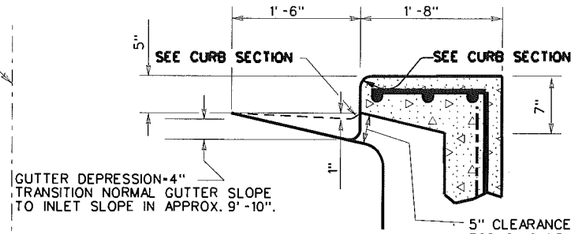
PROJECT NUMBER	COUNTY	HIGHWAY NO.
DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	56

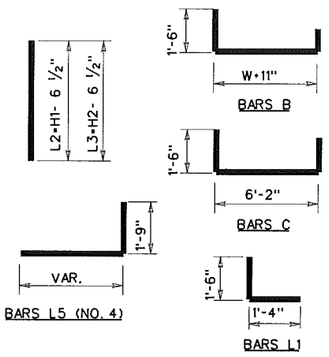
F:\2008\ENG\024N-El Gato Road\p&p\ud7.dgn



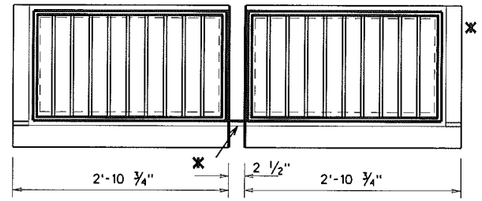
PLAN VIEW



CURB SECTION DETAIL



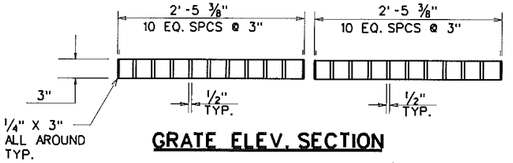
REINFORCING STEEL DETAILS



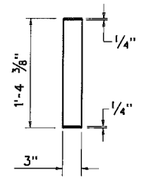
FRAMES AND GRATE TOP VIEW

TO BE SUBSIDIARY TO INLET ITEM

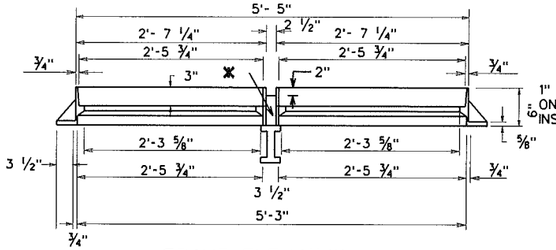
CONTRACTOR IS TO LEAVE THE GAP OPEN UNTIL THE FINAL LIFT OF HOT MIX IS LAID FOR DRAINAGE. THEN THE CONTRACTOR IS TO FILL IN THE GAP WITH EPOXY & MORTAR AS PER ITEM 421. THE MORTAR IS SUBSIDIARY TO ITEM 465. PROVIDE A 4" X 2 1/2"X 3/4" STEEL SPACER PLATE TO BE WELDED TO THE BOTTOM FRONT OF ONE OF THE FRAMES.



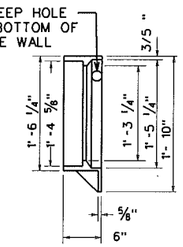
GRATE ELEV. SECTION



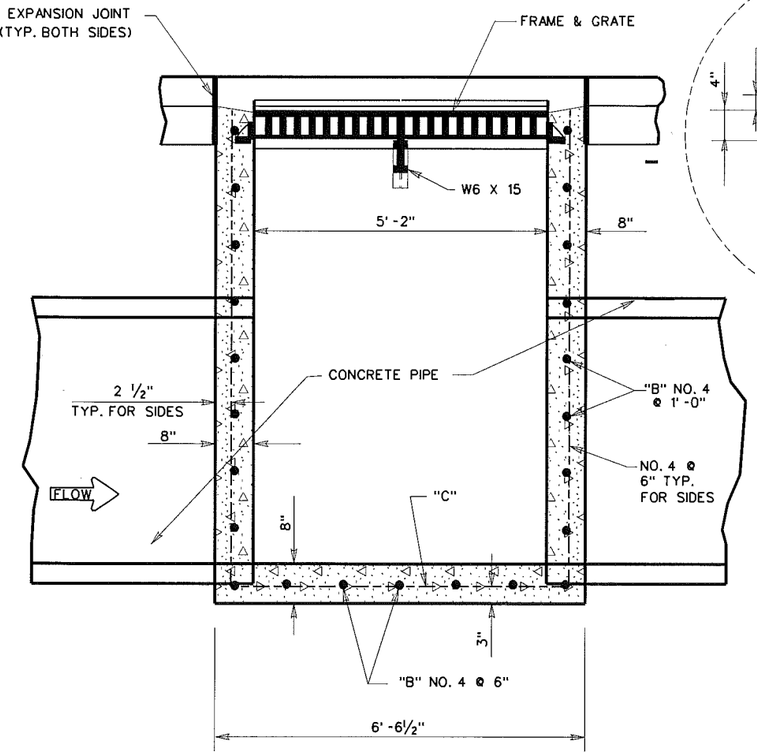
GRATE SECTION



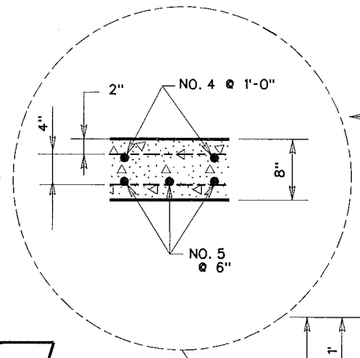
FRAME ELEVATION

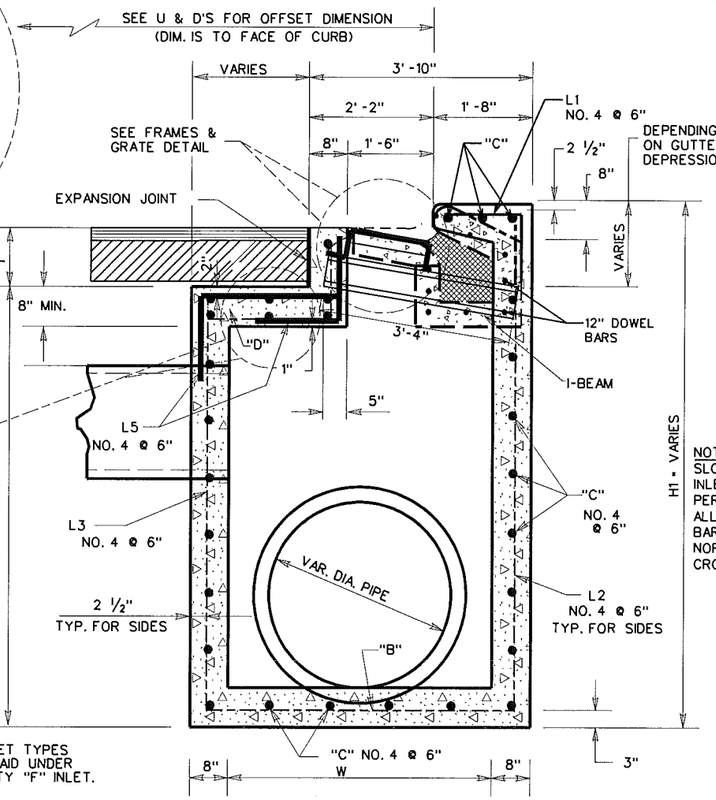


FRAME SECTION



SECTION A-A

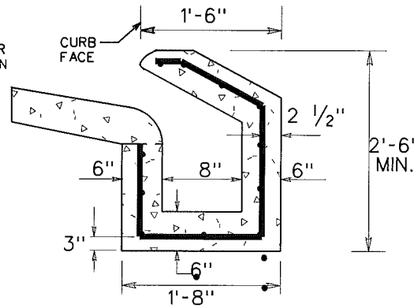




SECTION B-B

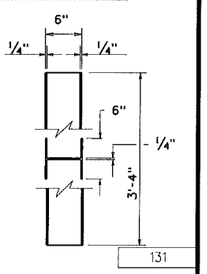
	INLET TYPE	W	MAX PIPE SIZE ALLOW (DIA.)
*	F	3'-0"	24"
*	F-1	4'-0"	36"
*	F-2	5'-0"	48"
*	F-3	6'-0"	60"

* ALL 4 INLET TYPES WILL BE PAID UNDER BID ITEM TY "F" INLET.



INLET EXTENSION

NOTE:
SLOPE BOTTOM OF INLET EXTENSION 1/2" PER FT. TOWARD INLET. ALL STEEL TO BE NO. 4 BARS ON 12" SPACING NORMAL TO THE CROSS SECTION.



131

I-BEAM DETAILS
W 6 X 15

NOTE: ALL REINFORCEMENT BARS SHALL BE GRADE 60.

PHARR DISTRICT STANDARD

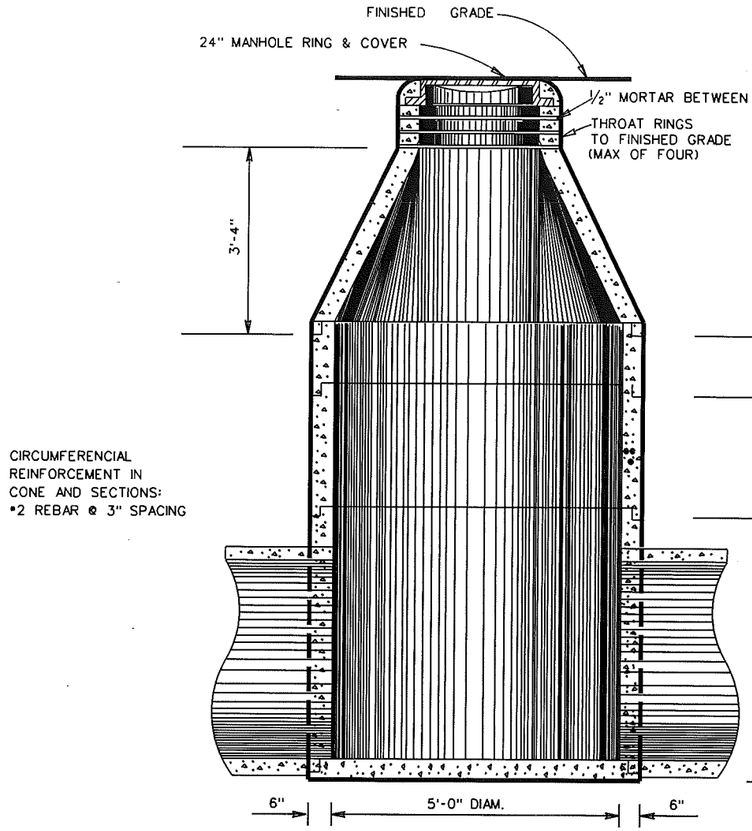
Texas Department of Transportation

TY "F" INLET DETAILS

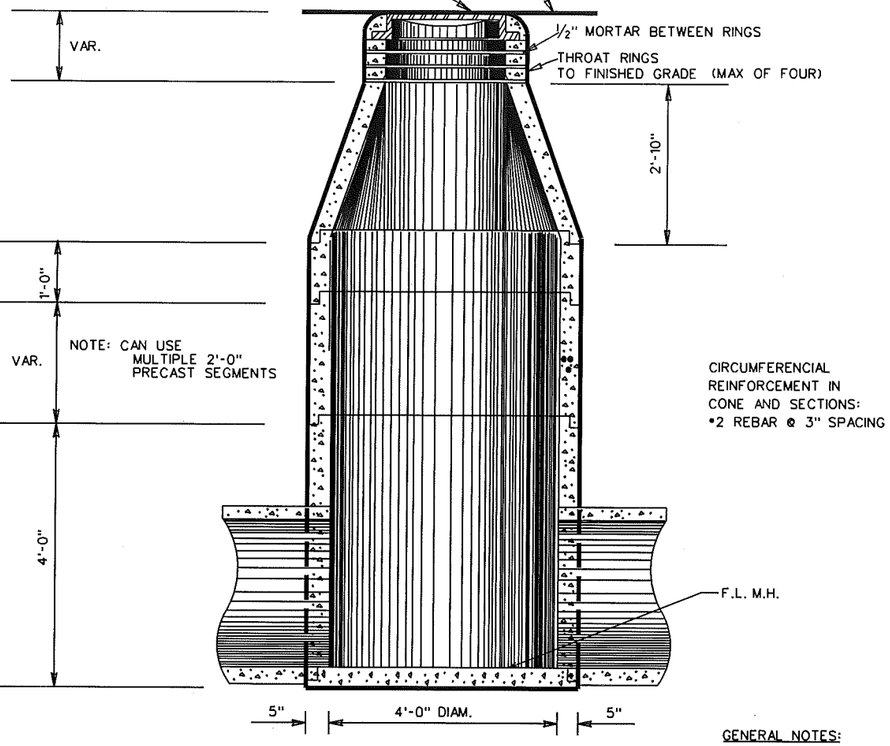
INLETF.DGN

REVISIONS	STATE DISTRICT	FEDERAL ROUTE	STATE PROJECT			SHEET
REV. 5/05						57
	COUNTY		CONTROL	SECTION	JOB	HIGHWAY

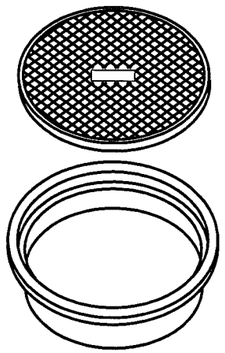
N.T.S.

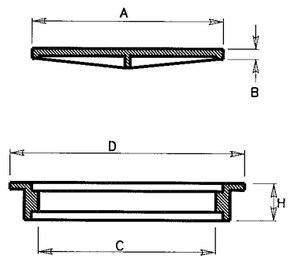


TY "A1"



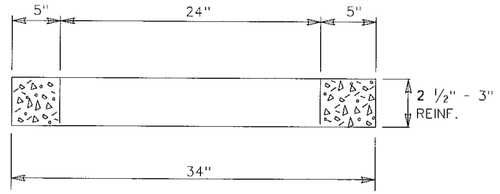
TY "A"

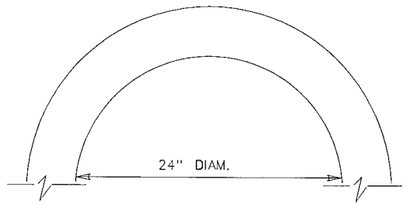




LID			RING		
"A"	"B"	WEIGHT	"C"	"D"	"H"
2'-2"	1"	174 lbs. (min)	2'-0"	2'-7½"	5"

RING & COVER DETAILS
(FOR MANHOLE TY "A" AND "A1")
(SUBSIDIARY)





REINF. CONC. THROAT RING

GENERAL NOTES:

FOR MANHOLES LOCATED WITHIN PAVED PORTIONS OF THE ROADWAY, THE COVER SHALL BE OF A TYPE THAT CAN BE BOLTED TO THE RING.

RINGS AND COVERS OF SLIGHTLY DIFFERENT DIMENSIONS BUT APPROXIMATELY THE SAME WEIGHT MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.

CONCRETE STRENGTH: 4,000 P.S.I. MIN.

THE CONTRACTOR MAY WITH THE APPROVAL OF THE ENGINEER FURNISH MANHOLES OF EQUIVALENT STRUCTURAL DESIGN.

ALTERNATE DESIGN DRAWINGS BEARING THE SEAL OF A REGISTERED ENGINEER WILL BE ACCEPTABLE FOR PRECAST CONSTRUCTION OF MANHOLES.

PHARR DISTRICT STANDARD

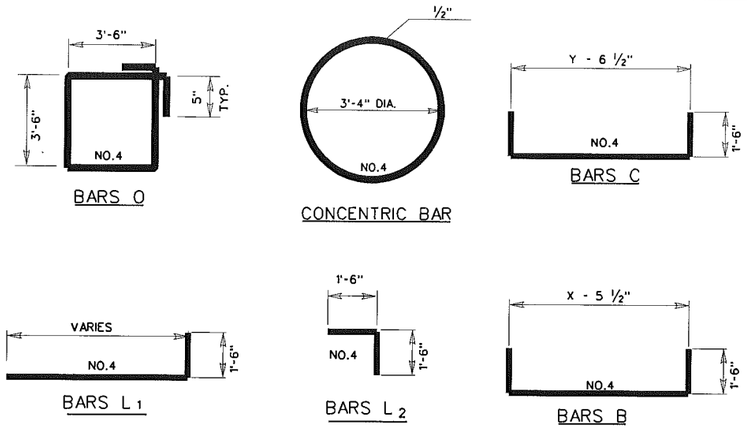
TEXAS DEPARTMENT OF TRANSPORTATION

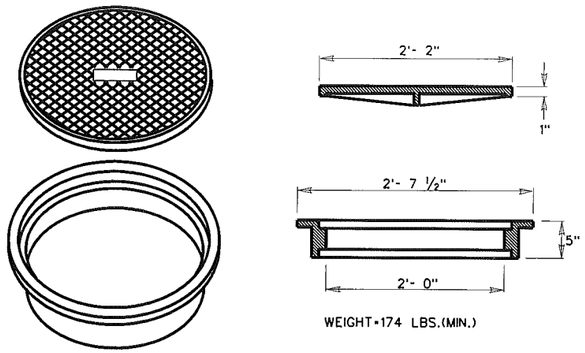
TYPE "A" & TYPE "A1" MANHOLE (COMPLETE)

MANHOLE1.DGN

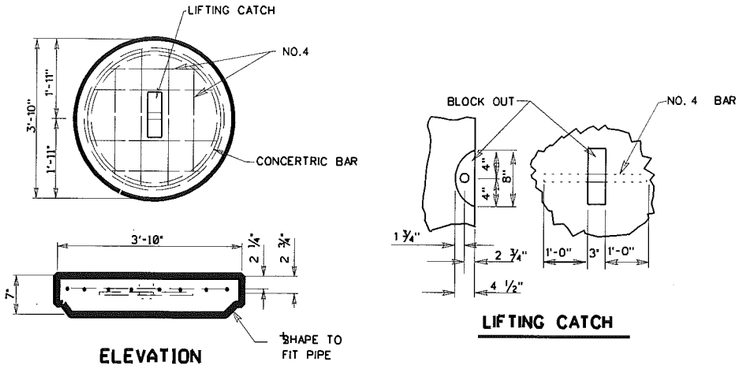
REVISIONS	STATE DISTRICT	FEDERAL REGION	STATE PROJECT				SHEET
REV. 4/02							58
	COUNTY		CONTROL	SECTION	JOB		HIGHWAY

N.T.S.

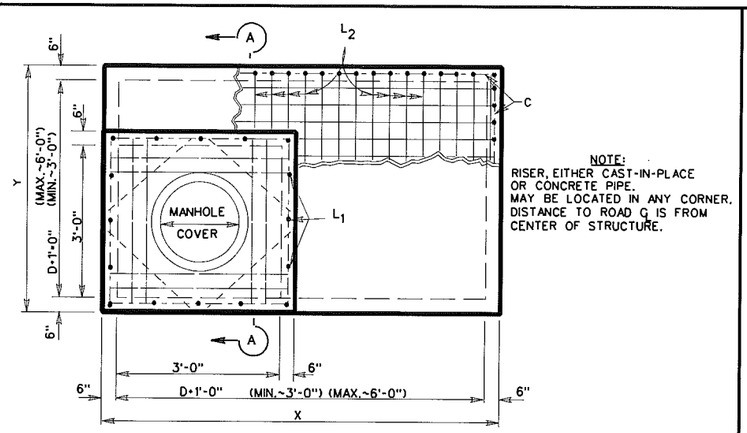




RING & COVER DETAILS (STEEL)
(SUBSIDIARY)

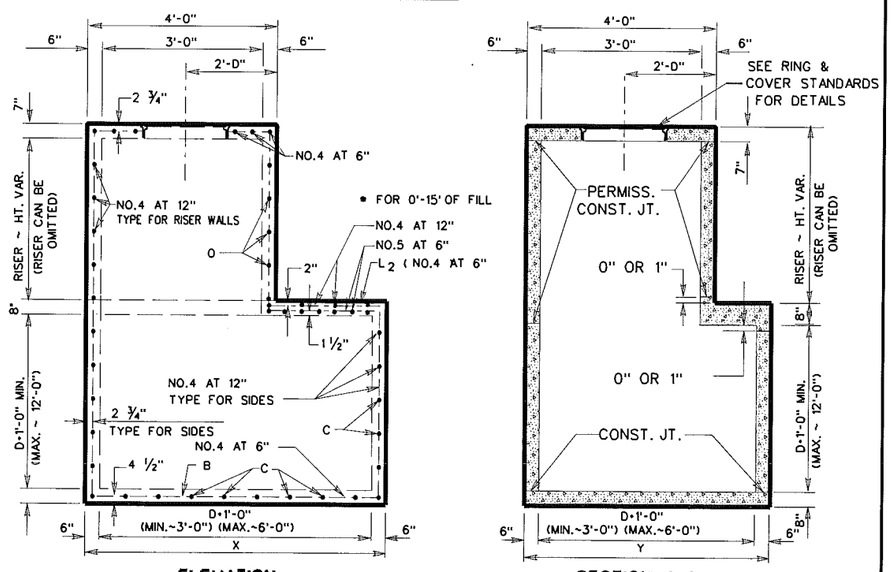


CONCRETE PIPE RISER COVER
OPTIONAL PRECAST CONCRETE LIFT-OFF COVER
(SUBSIDIARY)

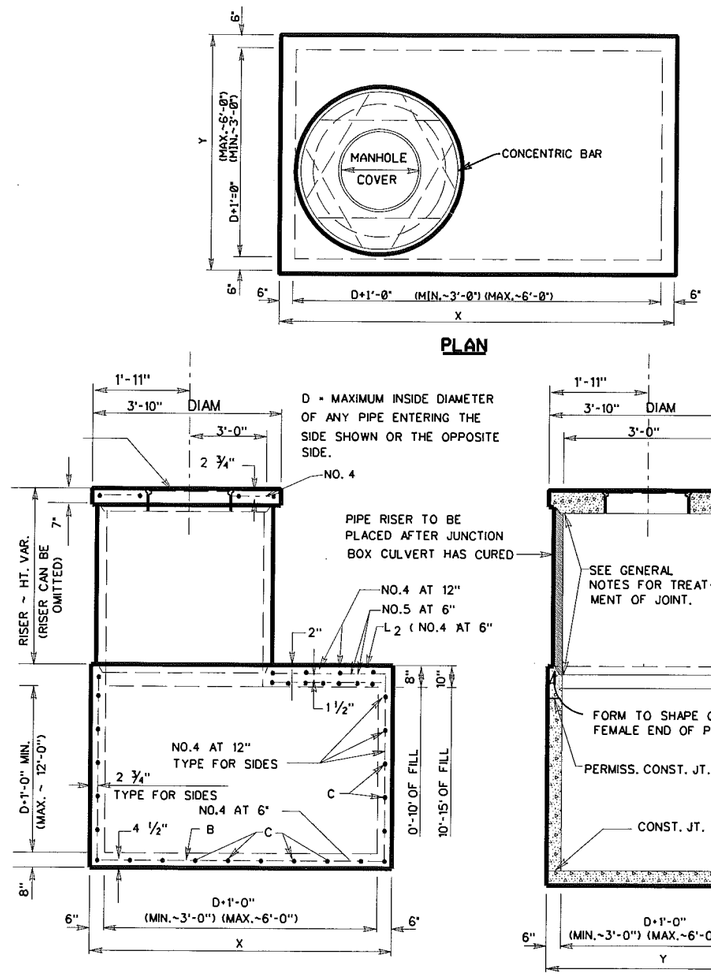


NOTE:
RISER, EITHER CAST-IN-PLACE OR CONCRETE PIPE. MAY BE LOCATED IN ANY CORNER. DISTANCE TO ROAD G IS FROM CENTER OF STRUCTURE.

PLAN



MANHOLE WITH CAST-IN-PLACE RISER



OPTIONAL MANHOLE WITH PIPE RISER

GENERAL NOTES

UNLESS OTHERWISE SHOWN IN THE PLANS, PAYMENT WILL BE MADE FOR EACH MANHOLE OF THE TYPE M.
EXPOSED EDGES SHALL BE CHAMFERED 3/4".
ALTERNATE DESIGN DRAWINGS BEARING THE SEAL OF A REGISTERED PROFESSIONAL ENGINEER WILL BE ACCEPTABLE FOR PRECAST CONSTRUCTION OF MANHOLES

SHOP DRAWINGS WILL NOT BE REQUIRED.

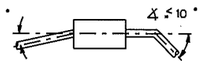
ALL MANHOLES LOCATED ON PAVED SURFACES WILL BE CONSTRUCTED WITH A COVER OF THE TYPE THAT WILL ENABLE IT TO BE BOLTED TO THE RING.

THE CONTRACTOR MAY WITH THE APPROVAL OF THE ENGINEER FURNISH MANHOLES OF EQUIVALENT STRUCTURAL DESIGN.

IN AREAS OF CONFLICT BETWEEN REINFORCING STEEL, BLOCK-OUTS PIPES, ANCHOR BOLTS OR OTHER REINFORCING STEEL, THE REINFORCEMENT SHALL BE BENT OR ADJUSTED TO CLEAR AS DIRECTED BY THE ENGINEER.

THE RISER MAY BE CONSTRUCTED OF REINFORCED CONCRETE AS SHOWN OR OF REINFORCED CONCRETE PIPE, CLASS III, IN ACCORDANCE WITH ASTM DESIGNATION C-76. IF PIPE IS USED, JOINTS SHALL CONFORM TO THE ITEM "REINFORCED CONCRETE PIPE CULVERTS". PRECAST CONCRETE LIFT OFF COVER MAY BE SUBSTITUTED FOR "RING AND COVER".

CONNECTING PIPES SHOULD WITHIN 10 DEG. OF NORMAL TO INLET GRATE IF NECESSARY. PIPE ELBOW OR CURBED APPROACH ALIGNMENT SHOULD BE USED TO STAY WITHIN THIS LIMIT.



PIPES MAY ENTER ALL WALLS. THE MAXIMUM LEGTH OF PIPE THAT CAN BE ACCOMODATED IS 60". MORE THAN ONE PIPE MAY ENTER A SIDE SUBJECT TO THE MAXIMUM BOX DIMENSIONS SHOWN. THE CLEAR DISTANCE BETWEEN ADJACEMENT PIPES SHOULD BE 9" MINIMUM.

PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

TYPE "M" MANHOLE (JUNCTION BOX WITH ACCESS)

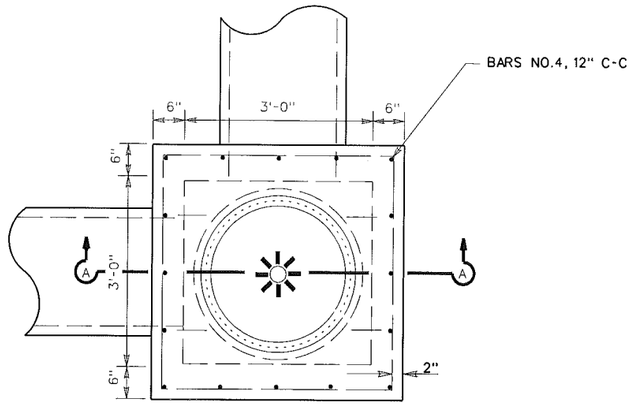
REV. 10/04

MANHOLE2.DGN

FED.RD. DIV.NO.	PROJECT NO.		FILE NO.			SHEET NO.
6						59
STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	21					

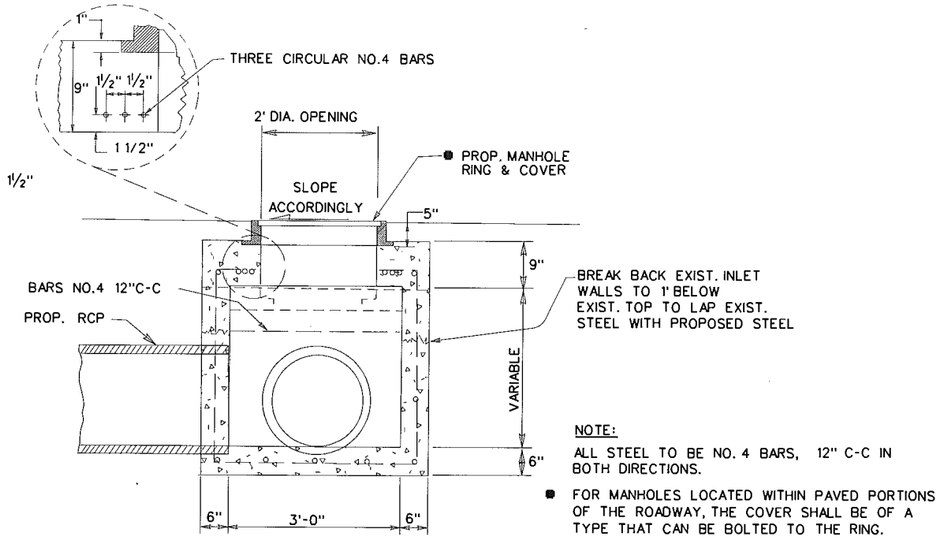
N.T.S.

AD-76-0



PLAN VIEW

(TO BE PAID UNDER ITEM 479 "ADJUST INLET (JCT BOX)"

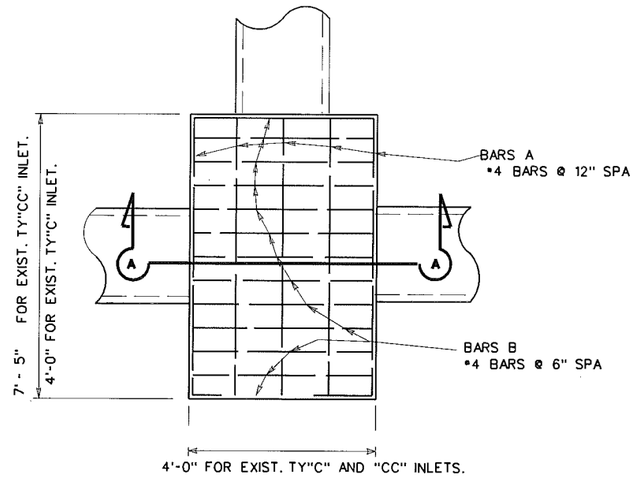


NOTE:

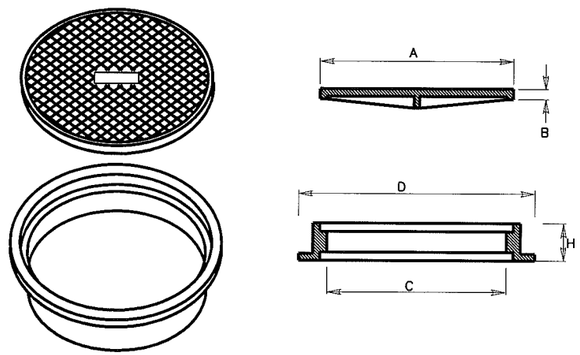
ALL STEEL TO BE NO. 4 BARS, 12" C-C IN BOTH DIRECTIONS.

● FOR MANHOLES LOCATED WITHIN PAVED PORTIONS OF THE ROADWAY, THE COVER SHALL BE OF A TYPE THAT CAN BE BOLTED TO THE RING.

SECTION A-A
ADJUST INLET (JUNCT. BOX)



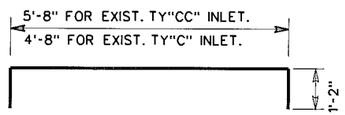
PLAN



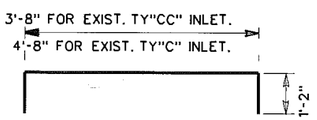
LID			RING		
"A"	"B"	WEIGHT	"C"	"D"	"H"
2'-2"	1"	174 lbs. (min)	2'-0"	2'-7½"	5"

RING & COVER DETAILS
(FOR MANHOLE TY "A" AND "A1")
(NON-PAY)

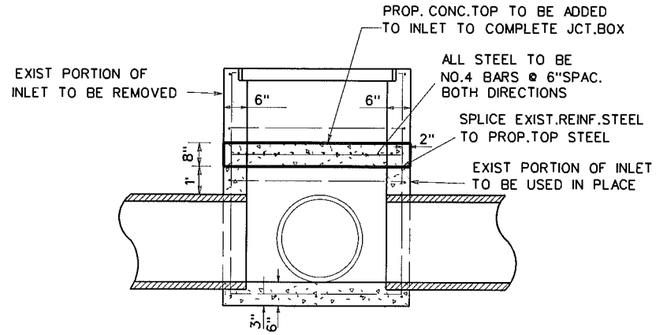
NOTES: RINGS AND COVERS OF SLIGHTLY DIFFERENT DIMENSIONS BUT APPROXIMATELY THE SAME WEIGHT MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



BARS A



BARS B



EXIST TY "C" OR TY "CC" INLET TO BE CONVERTED TO JCT. BOX

SECTION A-A
ADJ. INLET (CAP)

PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

INLET AND MANHOLE CAPPING DETAIL

REV. 4/02

CAPDET.DGN

ED.RD. DIV.NO.	FILE NO.	PROJECT NO.				SHEET NO.
6						60
STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	21					

24" SOLID WHITE STOP BAR & CROSSWALK SEE TYPICAL CROSSWALK STOPLINE DETAIL (TYP.)

ALAMO RD. (FM 907)
EL GATO ROAD
STOP
R1-1
1

W3-1A
2
4

2-4" SOLID YELLOW STRIPE & PVT. MKR. TY II-AA

8" SLD. WHITE W/ TY 1-C MARKERS @ 20' C-C

PROP. R.O.W. LINE

ALAMO ROAD (FM 907)

5+00

10+00

15+00

MATCHLINE STA. 18+50.00

PROP. R.O.W. LINE

PC 8+71.02

PRC 9+57.63

PT 10+44.23

PREFABRICATED WORDS & ARROWS (TYP.)

4" BROKEN WHITE STRIPE & PVT. MKR. TY 1-C

S1-1
4
AHEAD

SPEED LIMIT 30
3
R2-1

LEGEND

△ SIGNS TO BE REMOVED (ITEM 649)

○ SIGNS TO BE INSTALLED (ITEM 644)

SCHOOL S4-3
SPEED LIMIT 20 R2-1
WHEN FLASHING S4-4
CELL PHONE USE PROHIBITED UP TO $200 FINE
5

24" SOLID WHITE STOPLINE

SABAL LANE
EL GATO ROAD
STOP
R1-1
10
2

PROP. CROSSWALK STIPING (24" SLD. WHITE)(64 LF)

4" BROKEN WHITE STRIPE & PVT. MKR. TY 1-C

PROP. R.O.W. LINE

SABAL LANE

PROP. CROSSWALK STIPING (24" SLD. WHITE)(36 LF)

SCHOOL S4-3
SPEED LIMIT 20 R2-1
WHEN FLASHING S4-4
CELL PHONE USE PROHIBITED UP TO $200 FINE
11

EXIST. R.O.W. LINE

MATCHLINE STA. 18+50.00

20+00

25+00

30+00

MATCHLINE STA. 30+50.00

7

6

PROP. R.O.W. LINE

8

PC 23+65.15

PRC 24+09.88

PT 24+54.60

EXIST. R.O.W. LINE

24" SLD. WHITE (SCHOOL ZONE)

PROP. CROSSWALK STIPING (24" SLD. WHITE)(60 LF)

S1-1

9

S1-1

2-4" SOLID YELLOW STRIPE & PVT. MKR. TY II-AA

24" SLD. WHITE (SCHOOL ZONE)

PROP. CROSSWALK STIPING (24" SLD. WHITE)(60 LF)

24" SOLID WHITE STOPLINE

12

3

VILLAGE CIRCLE
EL GATO ROAD
STOP
R1-1

VILLAGE CIRCLE

STATE OF TEXAS
RAMIRO GUTIERREZ
65948
REGISTERED PROFESSIONAL ENGINEER
, P.E.

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY RAMIRO GUTIERREZ, P.E. 65948

DATE: 12-20-10

ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE LAW.

SHEET 1 OF 2

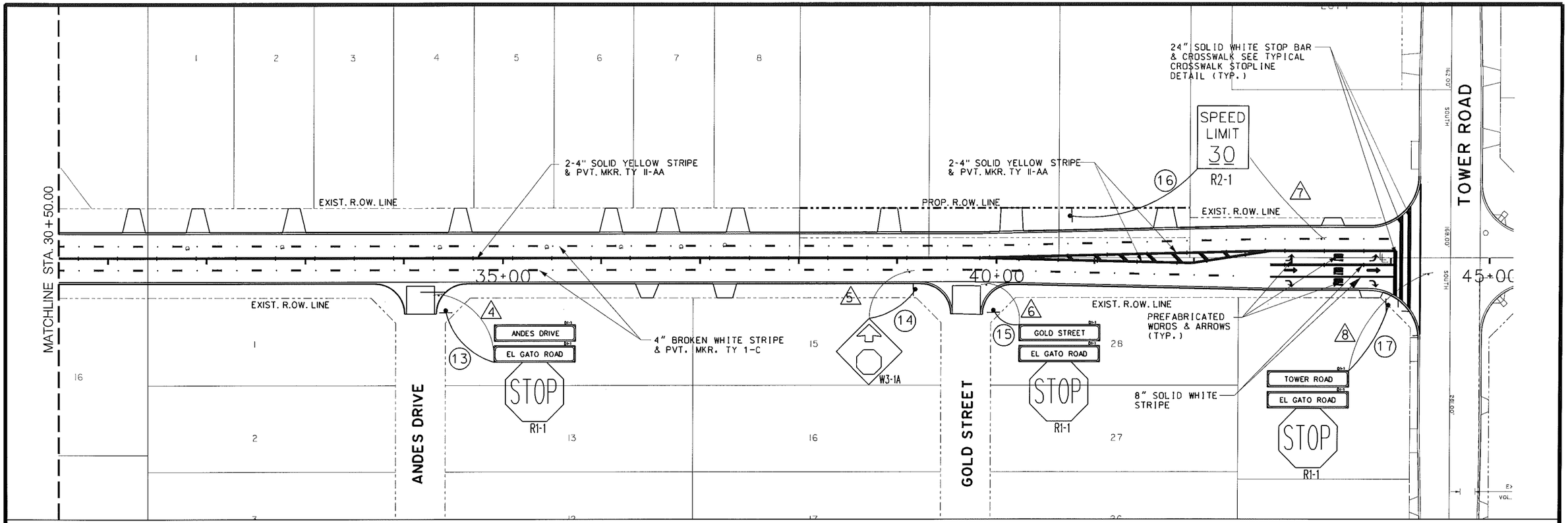
EL GATO ROAD
SIGNING & PAVEMENT MARKING LAYOUT

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
139 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.
DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	61

F:\2008\ENG\024N-El Gato Road\PLANS\SIGNING&STRIPING.dgn



LEGEND

△ SIGNS TO BE REMOVED (ITEM 649)

○ SIGNS TO BE INSTALLED (ITEM 644)

STATE OF TEXAS
RAMIRO GUTIERREZ
65948
LICENSED PROFESSIONAL ENGINEER
P.E.

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY RAMIRO GUTIERREZ, P.E. 65948

DATE: 12-20-10

ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE LAW.

SHEET 2 OF 2

EL GATO ROAD
SIGNING & PAVEMENT MARKING LAYOUT

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.
DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	62

F:\2008\ENG\024N-El Gato Road\PLANS\SIGNING&STRIPING2.dgn

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to SMD(SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to SMD(SLIP-3))

Number of Posts (1 or 2)

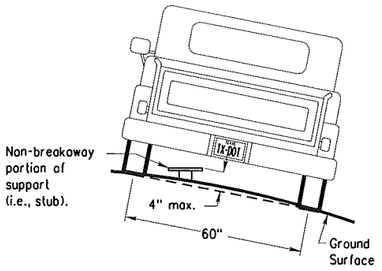
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and SMD(TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and SMD(TWT))
WA = Wedge Anchor - (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to SMD(SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to SMD(SLIP-3))

Sign Mounting Designation

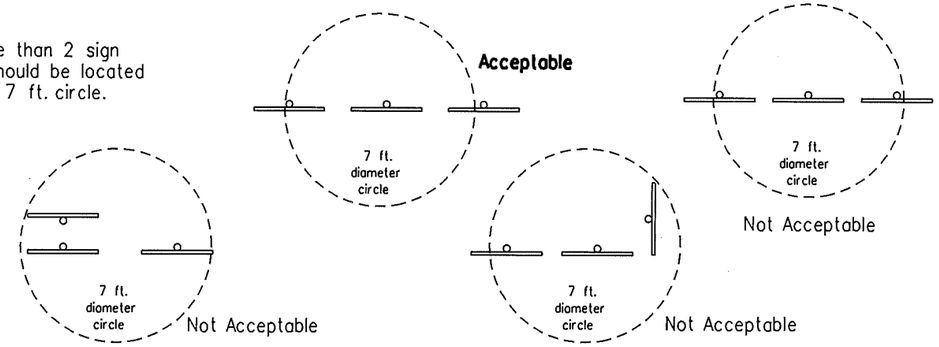
P = Prefab. "Plain" (see SMD(SLIP-1) to (3), SMD(TWT), SMD(FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (3), SMD(TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (3), SMD(TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (3))
EXAL = Extruded Aluminum sign panels (see SMD(SLIP-3))

REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



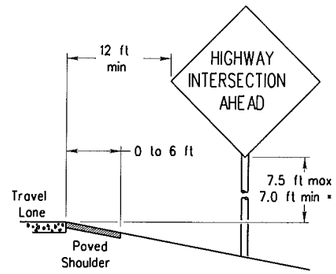
To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

No more than 2 sign posts should be located within a 7 ft. circle.



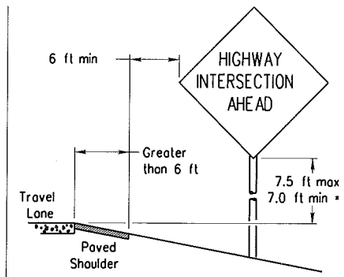
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

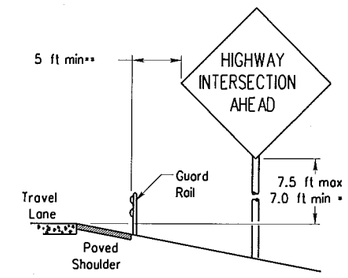
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



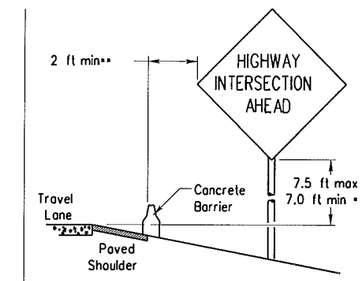
GREATER THAN 6 FT. WIDE

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.

BEHIND BARRIER



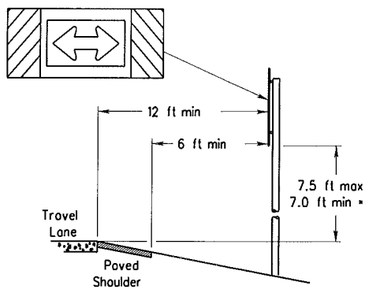
BEHIND GUARDRAIL



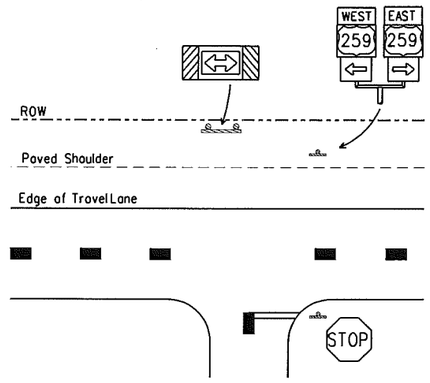
BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

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.



* 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.

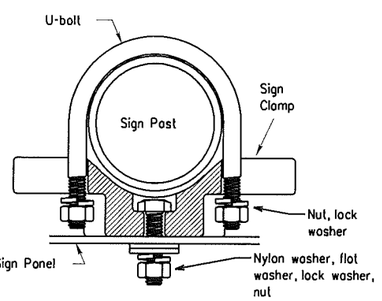
The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Texas Universal Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
ftp://ftp.dot.state.tx.us/pub/txdot-info/cmd/cserve/standard/traffic/slip.pdf

TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

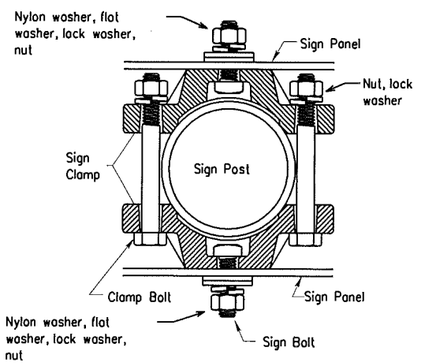


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum and 1 3/4 inch for plywood signs.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

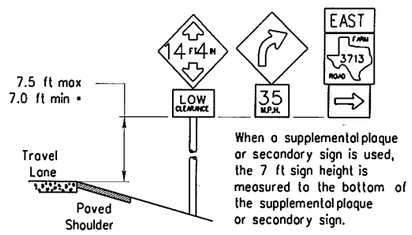
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



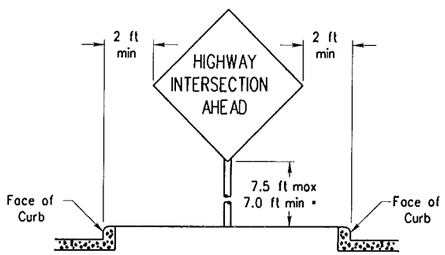
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



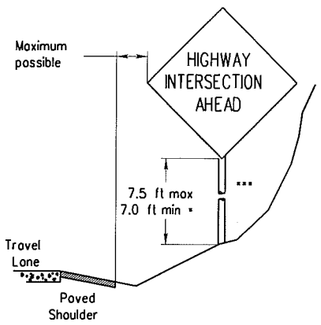
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

MEDIANS



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.

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-02

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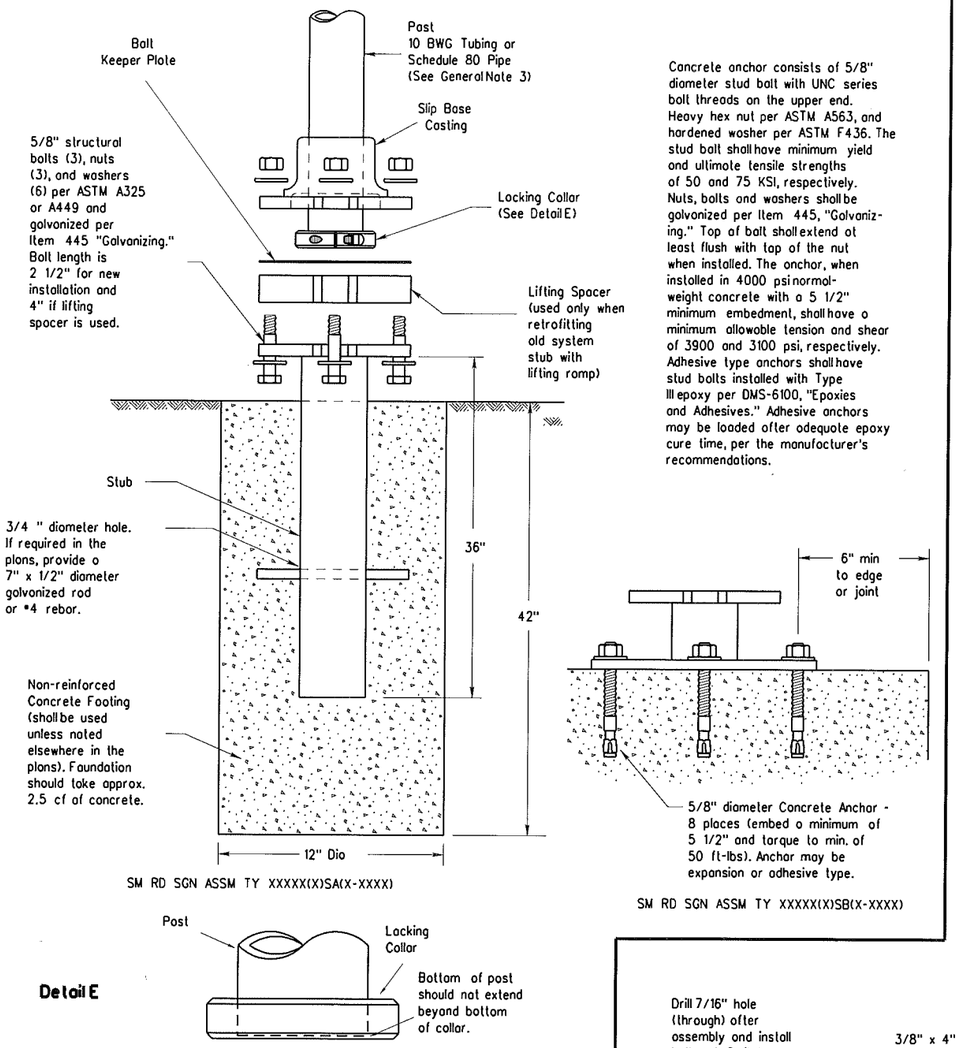
REVISIONS	STATE DISTRICT	FEDERAL PROJECT	FEDERAL AID PROJECT	SHEET
				63
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
	HIDALGO				

5. 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	

ACC:

Texas Universal Triangular Slipbase System



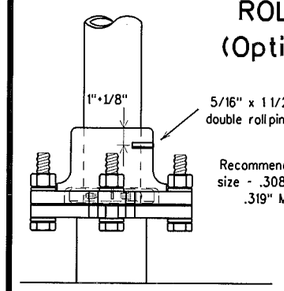
SM RD SGN ASSM TY XXXXX(X)SA(X-XXXX)

Concrete onchor consists of 5/8" diameter stud bolt with UNC series bolt threods on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimole tensile strengths of 50 and 75 KSI, respectively. Nuts, bolts ond washers shall be galvonized per Item 445, "Galvanizing." Top of bolt shall extend ot least flush with top of the nut when installed. The onchor, when installed in 4000 psi normol-weight concrete with o 5 1/2" minimum embedment, shall have o minimum allowoble tension and shear of 3900 and 3100 psi, respectively. Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded ofter odequote epoxy cure time, per the manufocturer's recommendations.

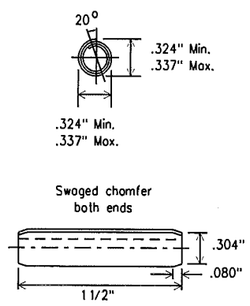
SM RD SGN ASSM TY XXXXX(X)SB(X-XXXX)

Detail E

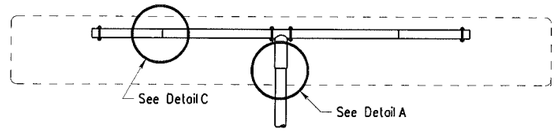
ROLL PIN (Optional)

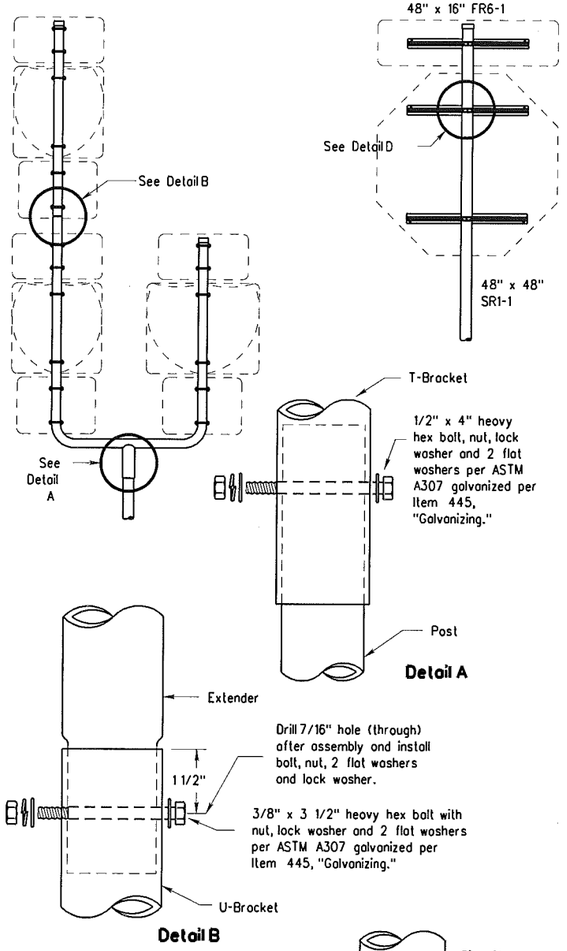


If shown in plons, the Engineer moy require the roll pin to be installed to reduce possible sign rototion.



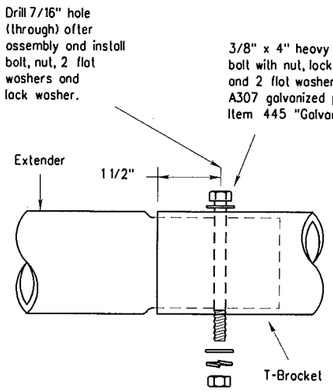
DOUBLE ROLL PIN DETAIL





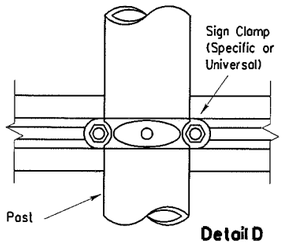
Detail A

Detail B

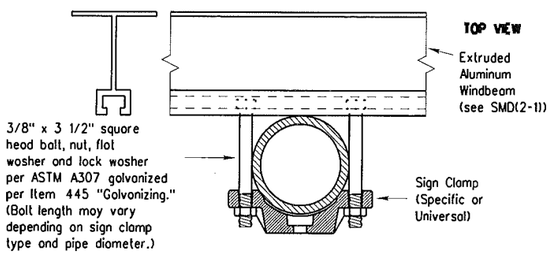


Detail C

Splices shall only be allowed behind the sign substrate.



Detail D



GENERAL NOTES:

1. Finished components, except posts (10 BWG Tubing ond Schedule 80 Pipe) and clamps, shall be permanently morked to indicate manufacturer. Method, design, ond location of marking ore subject to approvol of the TxDOT Troffic Standards Engineer.
2. Except for posts (10 BWG Tubing and Schedule 80 Pipe), clamps, nuts ond bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the TxDOT Traffic Standards Engineer, or the Traffic Operations Division website. The website address is: http://www.dot.state.tx.us/insdtdot/orgchart/trf/trfeng/
3. 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 ond 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"
   - Galvonization per ASTM A123
4. See the Traffic Operations Division website for detailed drowings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: ftp://ftp.dot.state.tx.us/pub/txdot-info/cmd/cserve/standard/traffic/slip.pdf
5. 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. Thoroughly wet and mix concrete in a container. Place concrete into hole until it is approximately flush with the ground.
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. The upper value assures that an impacting vehicle should not snag on the footing. The lower value provides clearance for assembly.
4. Plumb the stub by using a torpedo level on the slip plate. Allow concrete adequate time to set.

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.
3. Slide the slipbase casting onto the lower end of the sign support.
4. Drive a chisel or a flat-blade screwdriver into the cut on the locking collar to slightly pry the collar open. Slide the collar onto the end of the pipe so the edge of the pipe is between the face of the locking collar and the end of the edge bevel. A dead-blow hammer may be useful in positioning the collar correctly. Remove the tool used to pry the collar open. Torque the allen bolt to 60 foot-pounds (720 inch-pounds). DO NOT OVERTIGHTEN.
5. Place and align bolt keeper plate on slip plate and lift assembled sign and support into position.
6. Place one washer on each bolt and insert them through keeper plate and the notches on the slip plate and casting. After inserting each bolt, place one washer and a nut on the bolt and hand-tighten all three.
7. The breakaway features of this system will work when all three bolts are tightened between 40 to 80 foot-pounds (480 to 960 inch-pounds). The Engineer shall determine the appropriate bolt torque for each project. Tighten all bolts by working around the support in approximately 10 foot-pound increments to assure a balanced tension in the bolts. All three bolts shall be torqued the same. DO NOT OVERTIGHTEN.

ACC:																
S 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	

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-02

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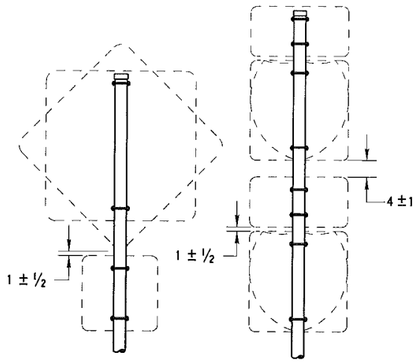
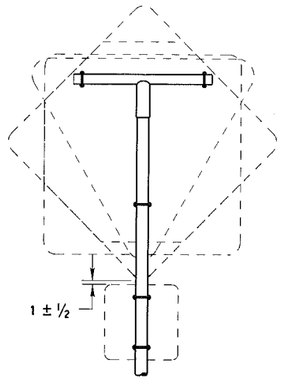
REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT			SHEET
						64
	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
	HIDALGO					



SM RD SGN ASSM TY XXXXX(1)XX(P)



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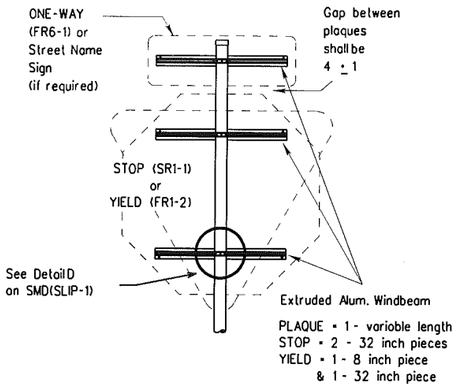
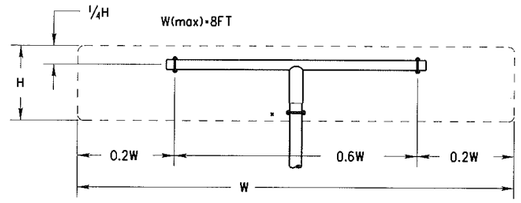
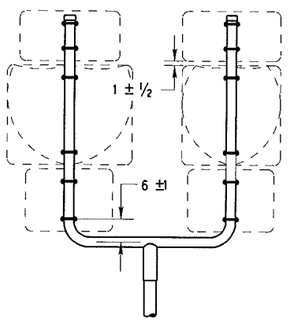


SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 13)



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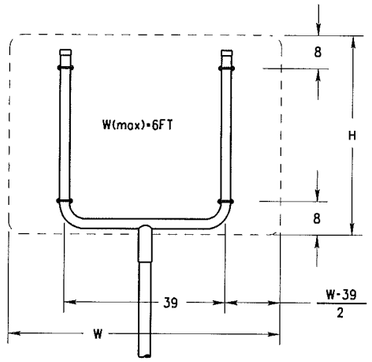

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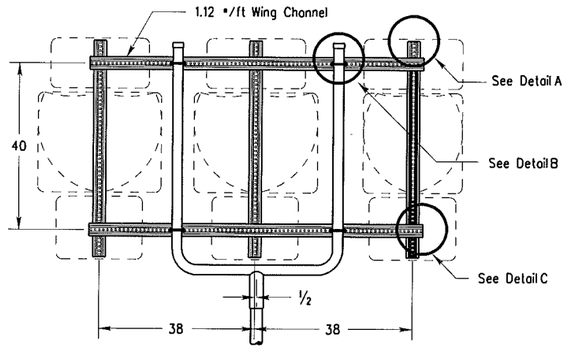
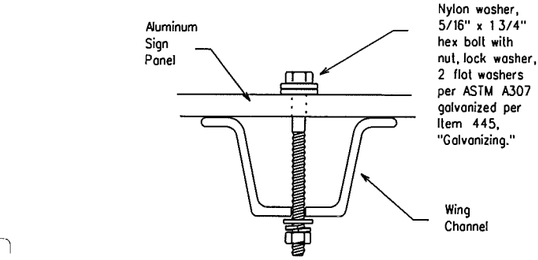
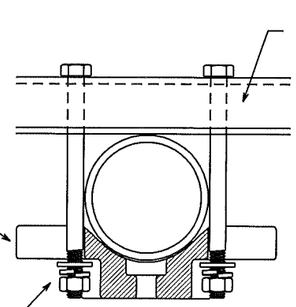


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 12)



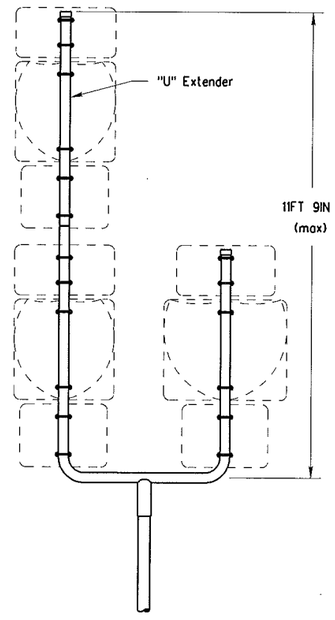
Top View

Detail A

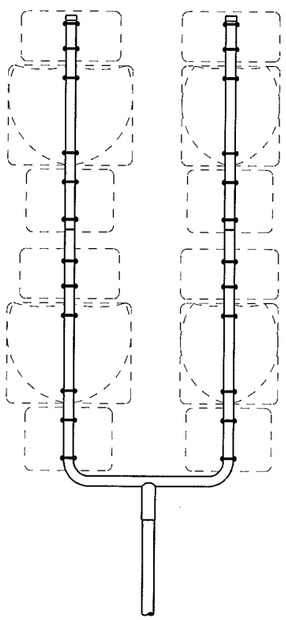


Top View

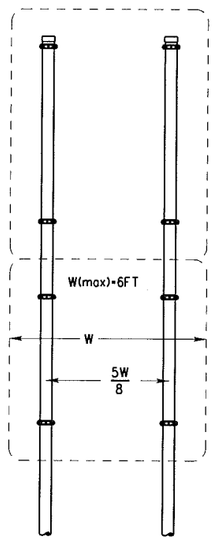
Detail B



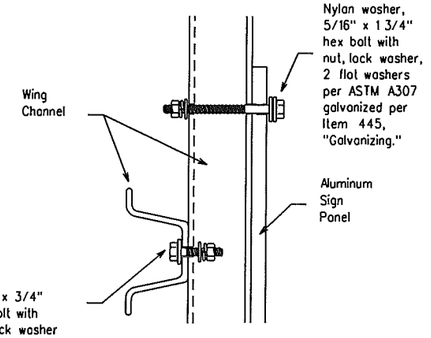
SM RD SGN ASSM TY S80(1)XX(U-1EXT)



SM RD SGN ASSM TY S80(1)XX(U-2EXT)



SM RD SGN ASSYM TY XXXXX(2)XX(P)



Side View

Detail C

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. Plywood signs shall conform to Departmental Material Specification DMS-7100 and shall be 5/8 inches thick.
6. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
7. For horizontal rectangular signs, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
8. 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.
9. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
10. Excess pipe, winged 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."
11. The Engineer may allow the use of an expanded foam foundation. A list of approved suppliers of expanding foam may be obtained from the Traffic Operations Division (TRF) or from the TRF website. The website address is: http://www.dot.state.tx.us/insdtdot/orgchart/trf/trfeng/
12. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
13. 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.

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (SR1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (FR1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (FR6-1)	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 (SS1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (SS2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-02

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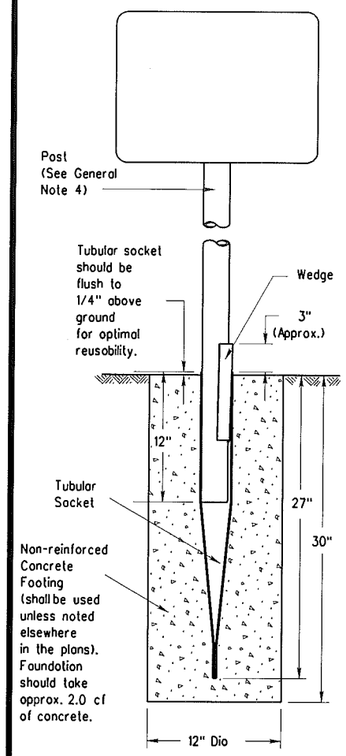
REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
				65
COUNTY		CONTROL	SECTION	JOB	HIGHWAY
HIDALGO					

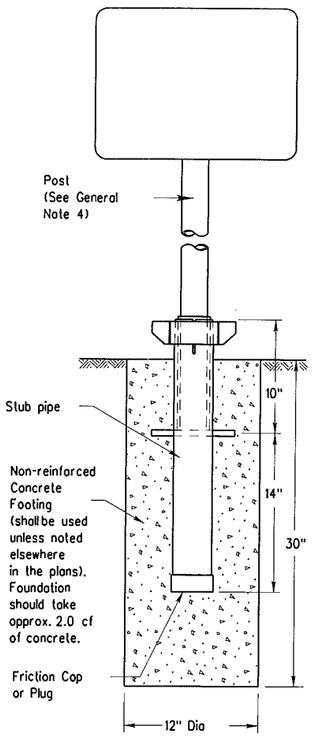
# DISPLAYED	ACC:
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63	

Wedge Anchor System

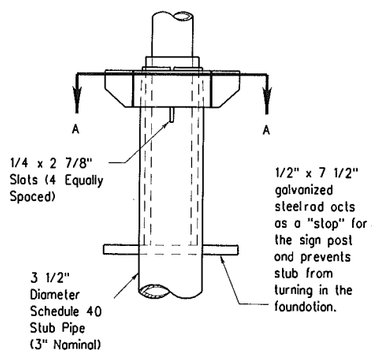


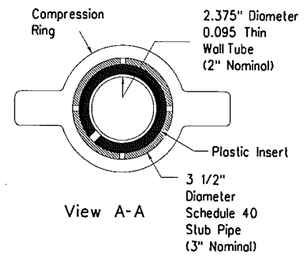
SM RD SGN ASSM TY TWT(X)WA(P)

Universal Anchor System with Thin-Walled Tubing Post

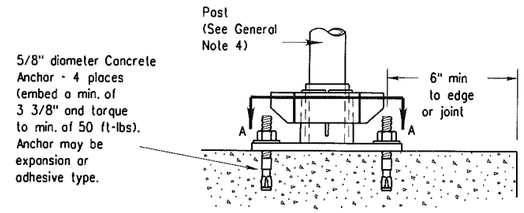


SM RD SGN ASSM TY TWT(X)UA(P)

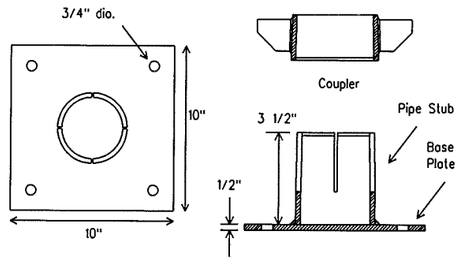




Plastic insert must be used when using the TWT with either the Universal Anchor System or the Bolt Down Universal Anchor System. The insert should be approx. 10" long and cover the tubing from just above the top of the stub pipe to the bottom of the sign post when using the Universal Anchor System. The insert should be cut to approx. 4 1/2" when used with the Bolt Down Universal Anchor System.



Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. 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.



SM RD SGN ASSM TY TWT(X)UB(P)

GENERAL NOTES:

1. The Wedge Anchor System and the Universal Anchor System with thin wall tubing post may be used to support up to 10 square feet of sign area.
2. The tubular socket, wedge and prefabricated T-bracket shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to the approval of the TxDOT Traffic Standards Engineer.
3. Except for posts (13 BWG Tubing), clamps, nuts and bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the TxDOT Traffic Standards Engineer, or the Traffic Operations Division website. The website address is: http://www.dot.state.tx.us/insdtdot/orgchart/trf/trfeng
4. Material used as post with this system shall conform to the following specifications:
   13 BWG Tubing (2.375" outside diameter)
   - 0.095" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing
   - 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
     - 18% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of .083" to .099"
   - Outside diameter (uncoated) shall be within the range of 2.369" to 2.381"
   - Galvanization per ASTM 123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
5. Sign blanks shall be the sizes and shapes shown on the plans. Unless otherwise shown, no panel on multipanel plywood signs shall have a dimension less than 18 inches. Plywood signs 4 feet by 8 feet or smaller in either dimension shall be of one piece construction.
6. Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
7. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
8. See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is: ftp://ftp.dot.state.tx.us/pub/txdot-info/cmd/cserve/standard/traffic/slip.pdf

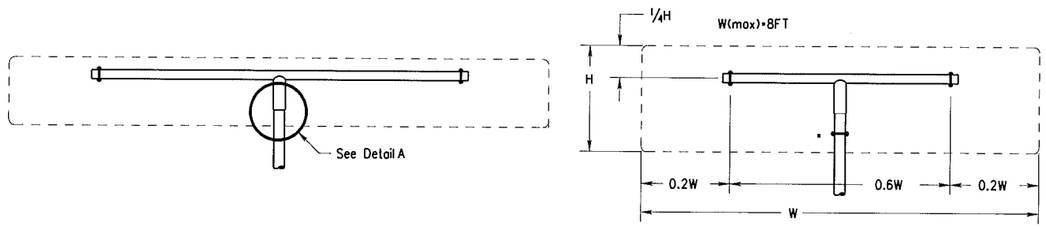
WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. Thoroughly wet and mix concrete in a container. Place concrete into hole until it is approximately flush with the ground.
3. Insert tubular socket into concrete until top of socket is approximately 1/4 " above the concrete footing.
4. Plumb the socket and allow concrete adequate time to set.
5. Attach the sign to the sign post.
6. Insert the sign post into socket and align sign face with roadway.
7. Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

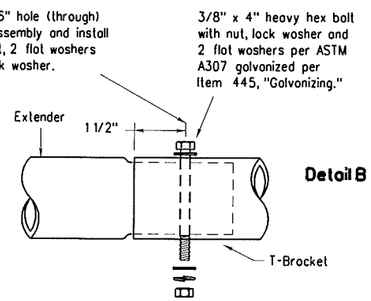
UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. Insert base post in hole to depths shown and backfill hole with concrete.
3. Level and plumb the base post using a torpedo level and allow concrete adequate time to set. The bottom of the slots provided in the stub pipe shall remain above the top of the concrete foundation.
4. Attach the sign to the sign post.
5. Install plastic insert around bottom of post.
6. Insert sign post into base post. Lower until the post comes to rest on steel rod.
7. Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
8. Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.

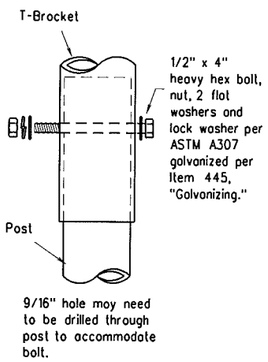
Sign Installation Using a Prefabricated T-Bracket for Thin-Wall Tubing Post



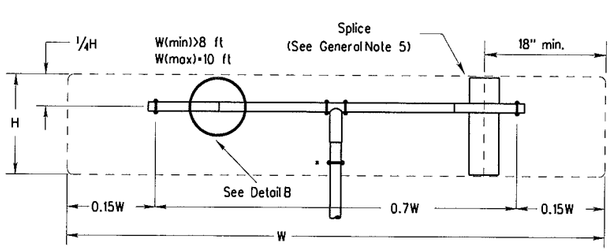
SM RD SGN ASSM TY TWT(X)XX(T)
(* - See General Note 6)



Detail B

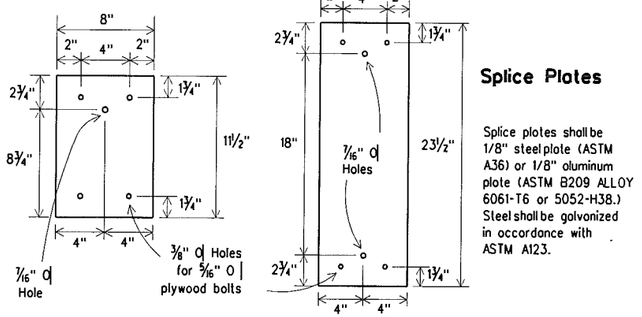


Detail A



SM RD SGN ASSM TY TWT(X)XX(T-2EXT)
(* - See General Note 6)

For horizontal rectangular signs, T-brockets may be used for signs up to 24" in height. Square footage of signs may not exceed 10 sf on this system.



Splice Plates

Splice plates shall be 1/8" steel plate (ASTM A36) or 1/8" aluminum plate (ASTM B209 ALLOY 6061-T6 or 5052-H38.) Steel shall be galvonized in accordance with ASTM A123.

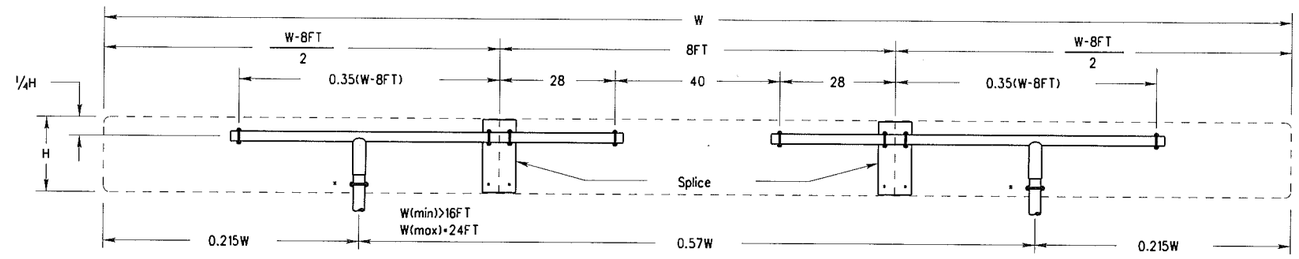
LS DISPLAYED																ACC:
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	
49	50	51	52	53	54	55	56	57	58	59	60	61	62	63		

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

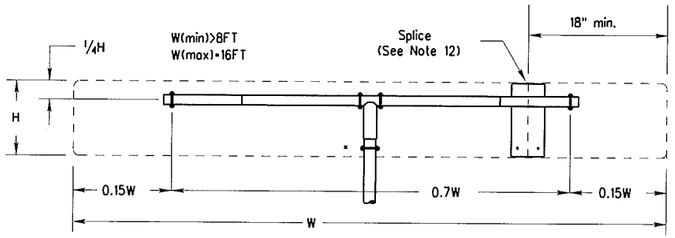
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST

SMD(TWT)-02

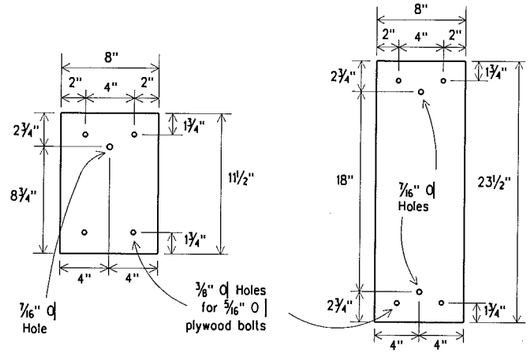
©TxDOT July 2002			DN: BAS	CK: GRB	DW: FDN	CK: CAL
REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT			SHEET
						66
	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
	HIDALGO					



SM RD SGN ASSM TY XXXXX(2)XX(T-2EXT)
(* - See Note 13)

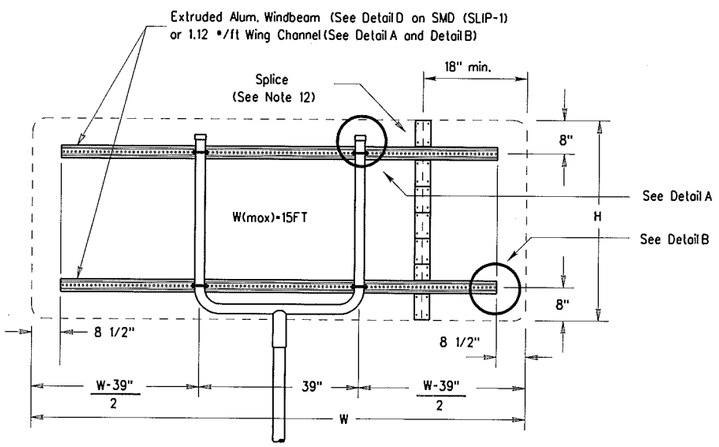


SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 13)

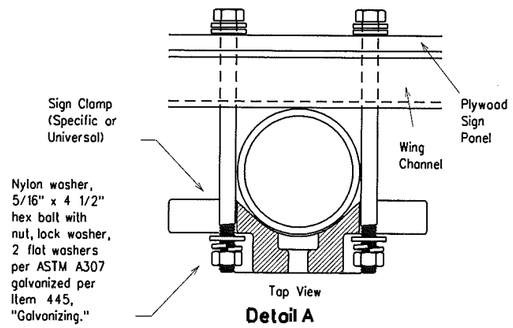


Splice Plates

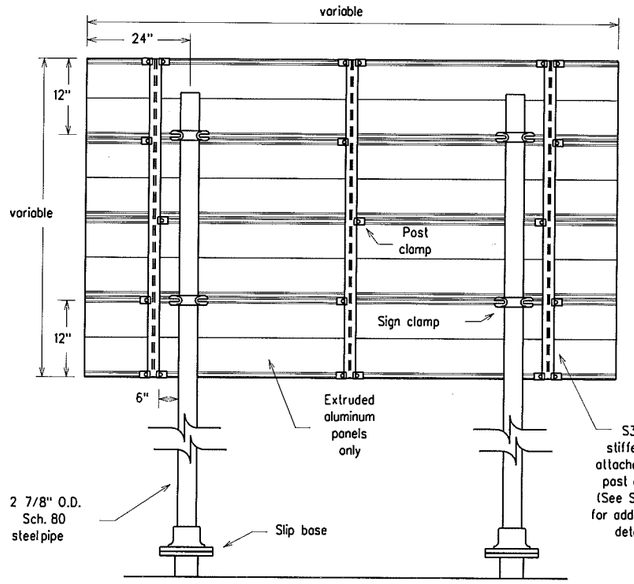
Splice plates shall be 1/8 " steel plate (ASTM A36) or 1/8 " aluminum plate (ASTM B209 ALLOY 6061-T6 or 5052-H38). Steel shall be galvonized in accordance with ASTM A123.



SM RD SGN ASSM TY XXXXX(1)XX(U-XX)

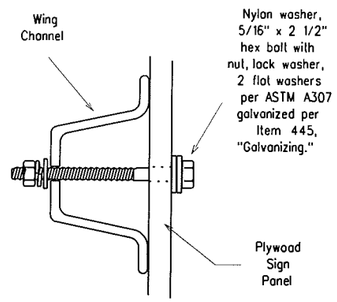


Detail A



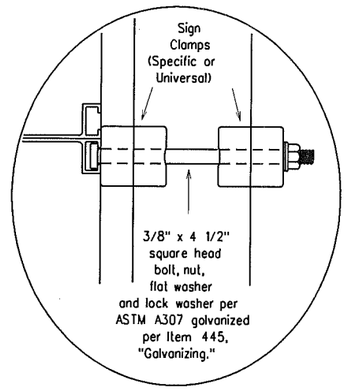
Typical Extruded Aluminum Sign Mount

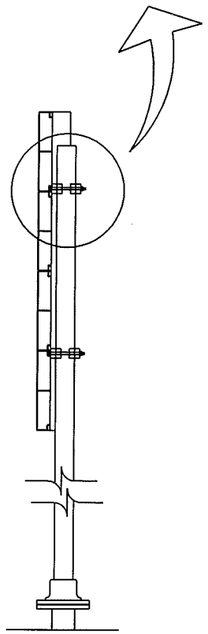
SM RD SGN ASSM TY S80(2)XX(P-EXAL)



Side View

Detail B





GENERAL NOTES:

1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Plywood signs shall conform to Departmental Material Specification DMS-7100 and shall be 5/8 inches thick.
6. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
7. For horizontal rectangular signs, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
8. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except thraugh the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
9. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
10. Excess pipe, winged 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."
11. The Engineer may allow the use of an expanded foam foundation. A list of approved suppliers of expanding foam may be obtained from the Traffic Operations Division (TRF) or from the TRF website. The website address is: http://www.dot.state.tx.us/insdtdot/orgchart/trf/trfeng/
12. Sign blanks shall be the sizes and shapes shown on the plans. Unless otherwise shown, no panel on multi-panel plywood signs shall have a dimension less than 18 inches. Plywood signs 4 feet by 8 feet or smaller in either dimension shall be of one piece construction.
13. 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.

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (SR1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (FR1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (FR6-1)	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 (SS1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (SS2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-02

©TxDOT July 2002	DN: BAS	CK: GRB	DW: FDN	CK: CAL
REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
			ENG05.015b	67
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
	HIDALGO				TOWER RD.

FILES DISPLAYED	ACC:
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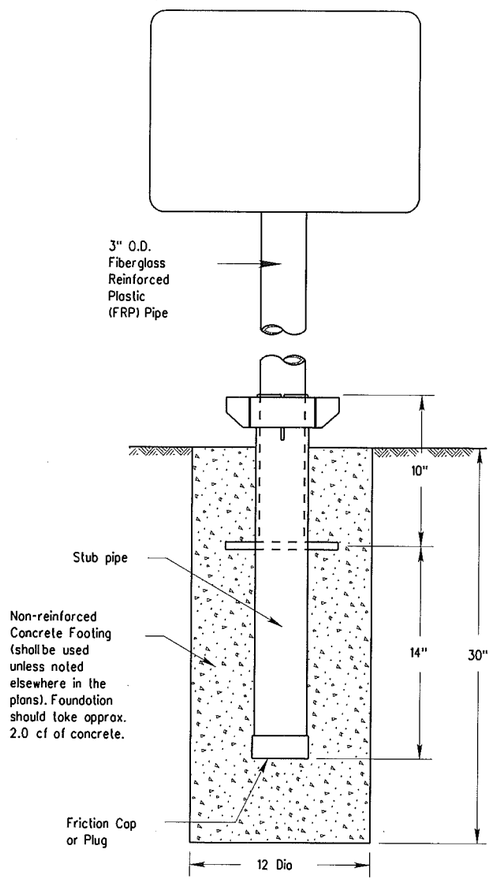
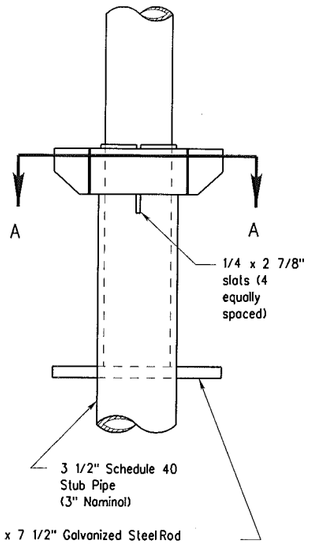
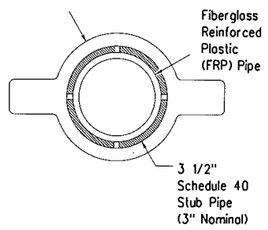
Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post



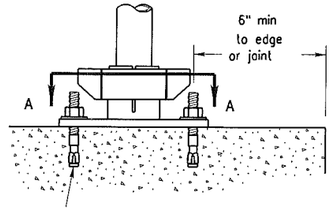


1/2 x 7 1/2" Galvanized Steel Rod Acts as a "stop" for the sign post and prevents stub from turning in the foundation.



View A-A

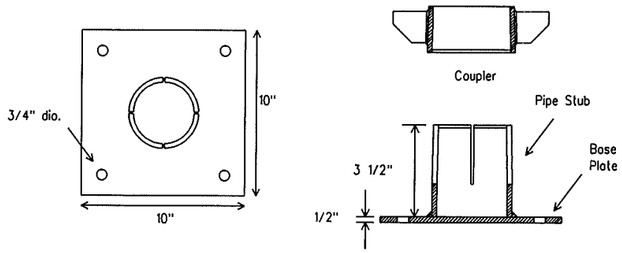
SM RD SGN ASSM TY FRP(X)UA(P)



5/8" diameter Concrete Anchor - 4 places (embed a min. of 3 3/8" and torque to min. of 50 ft-lbs). Anchor may be expansion or adhesive type.

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. 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.

BOLT-DOWN DETAILS



SM RD SGN ASSM TY FRP(X)UB(P)

GENERAL NOTES:

1. FRP sign supports for a single type sign support may be used for signs up to and including 16 square feet. Dual post installation may be used for signs up to and including 32 square feet.
2. All nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing."
3. See the Traffic Operations Division website for detailed drawings of sign clamps. The website address is: http://www.dot.state.tx.us/insdtdot/orgchart/trf/trfeng/

FRP POST REQUIREMENTS

1. Materials shall conform to the requirements of Department Material Specification DMS-4410 and will be furnished in a yellow or gray color as specified elsewhere in the plans.
2. Thickness of FRP sign support is 0.125" + 0.031", - 0.0".
3. FRP sign supports are prequalified by the Traffic Operations Division. Prequalification procedures are obtained by writing:
   Texas Department of Transportation
   Traffic Operations Division
   125 East 11th Street
   Austin, Texas 78701-2483

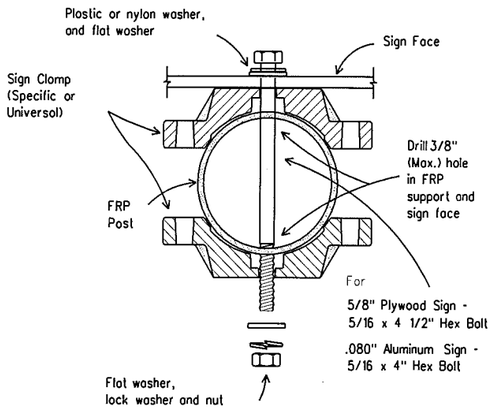
UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. Insert base post in foundation hole to depths shown and fill hole with concrete. Cut base post from bottom and ensure a minimum of 18" embedment if installed in solid rock.
3. Level and plumb the base post with coupler using a torpedo level and let concrete harden. Bottom of base post slots shall be above the concrete footing.
4. Attach sign to FRP post.
5. Insert sign post into base post. Lower until the post comes to rest on the steel rod.
6. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
7. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

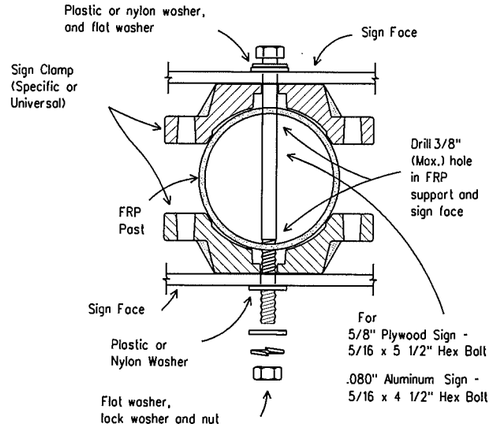
BOLT DOWN SIGN SUPPORT

1. Position base plate with coupler on existing concrete.
2. Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
3. Attach sign to FRP post.
4. Insert bottom of sign post into pipe stub.
5. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
6. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

Typical Sign Mounting Detail for FRP Support with Single Sign



Typical Sign Mounting Detail for FRP Support with Back-to-Back Signs



STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS UNIVERSAL ANCHOR SYSTEM WITH FRP POST

SMD(FRP)-02

©TxDOT July 2002	DN: BAS	CK: GRB	DW: FDN	CK: CAL
REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
				68
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
	HIDALGO				

FILE:	DN:	CK:	DW:	CK:

ACC:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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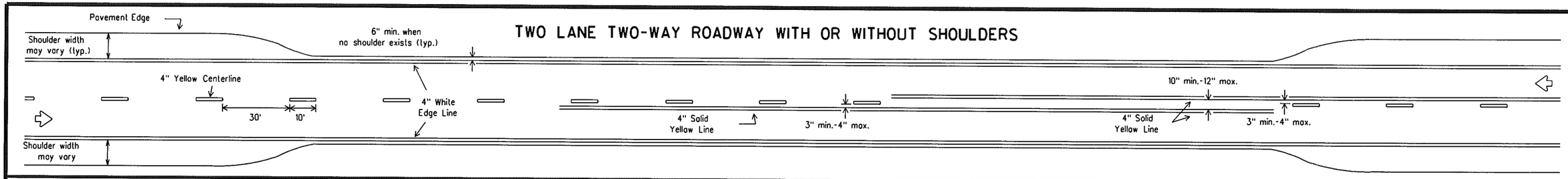
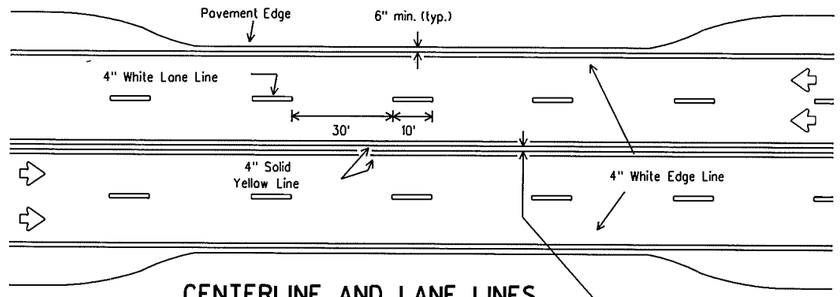
33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	

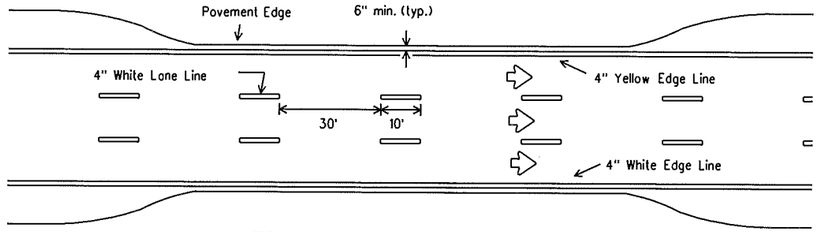
DISPLAYED

TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

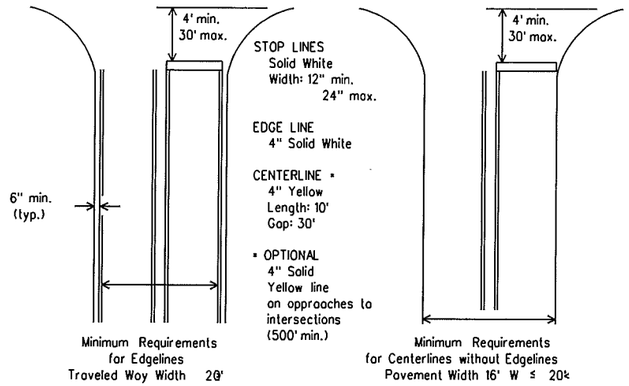




CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



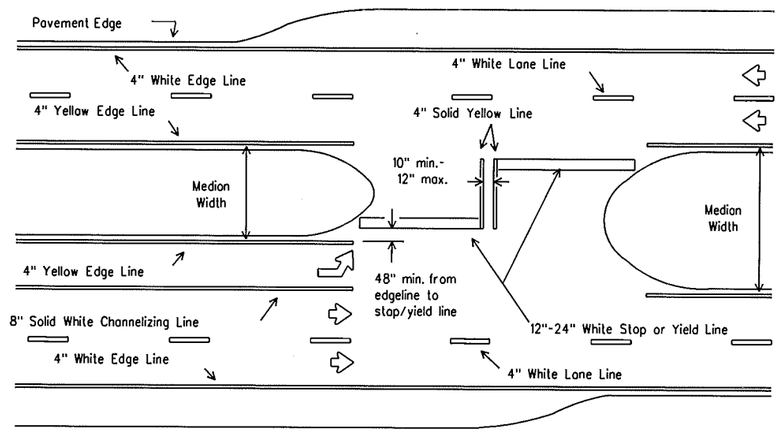
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

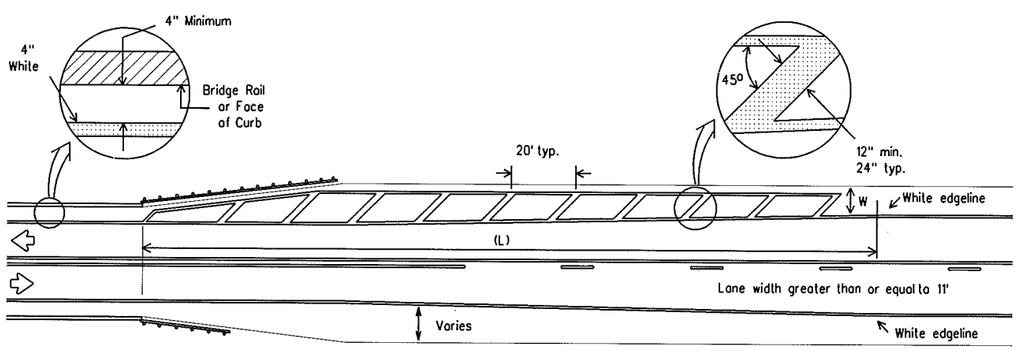
Based on Traveled Way and Pavement Widths for Undivided Highways

FOUR LANE DIVIDED ROADWAY INTERSECTIONS



All medians shall be field measured to determine the location of necessary striping. Stop/Yield bars and centerlines shall be placed when the median width is greater than 30 ft. The median width is defined as the area between two roadways of a divided highway measured from edge of traveled way to edge of traveled way. The median excludes turn lanes. The median width might be different between intersections, interchanges and at opposite approaches of the same intersection. The narrow median width will be the controlling width to determine if markings are required.

ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT



NOTES:

1. No-passing zone on bridge approach is optional but if used, it shall be a minimum 500 feet long.
2. For crosshatching length (L) see Table 1.
3. The width of the offset (W) and the required crosshatching width is the full shoulder width in advance of the bridge.
4. The crosshatching should be required if the shoulder width in advance of the bridge is 4 foot or wider and any reduction in shoulder width across the bridge occurs.
5. For guard fence details, refer elsewhere in the plans.

TABLE 1 - TYPICAL LENGTH (L)

Posted Speed x	Formula
30, 35, 40	$L = \frac{WS^2}{60}$
45, 50, 55, 60, 65, 70	L = WS

x 85th Percentile Speed may be used on roads where traffic speeds normally exceed the posted speed limit. Crosshatching length should be rounded up to nearest 5 foot increment.

L = Length of Crosshatching (FT.) W = Width of Offset (FT.) S = Posted Speed (MPH)

EXAMPLES:

An 8 foot shoulder in advance of a bridge reduces to 4 feet on a 70 MPH roadway. The length of the cross-hatching should be:

L = 8 x 70 = 560 ft.

A 4 foot shoulder in advance of a bridge reduces to 2 feet on a 40 MPH roadway. The length of the cross-hatching should be:

L = 4(40) ? 60 = 106.67 ft. rounded to 110 ft.

GENERAL NOTES:

Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should typically be placed a minimum of 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.

The traveled way includes only that portion of the roadway used for vehicular travel and not the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to inside of edgeline of a two lane roadway.

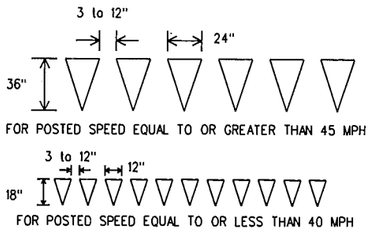
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.

SPECIFICATION REFERENCE TABLE

MATERIAL SPECIFICATIONS

PAVEMENT MARKERS (REFLECT.)	DMS-4200
EPOXY	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130

YIELD LINES



STANDARD PLANS

Texas Department of Transportation

Traffic Operations Division

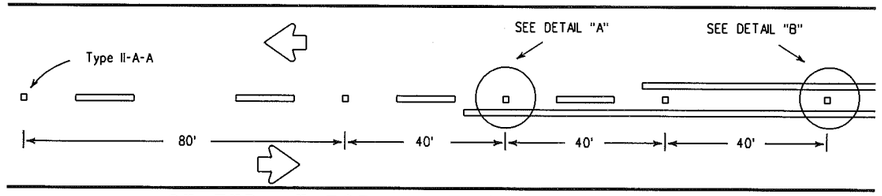
traffic

TYPICAL STANDARD PAVEMENT MARKINGS

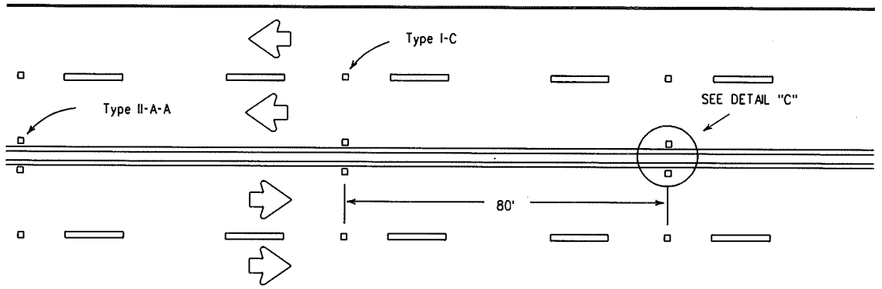
PM(1)-03

©TxDOT November 1978	DN: BAS	CK: GRB	DW: FDN	CK: CAL	FED. RD. DIV. NO.
REVISIONS 8-95 5-00 8-00 3-03	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT		SHEET 69
	COUNTY		CONTROL	SECTION	JOB / HIGHWAY

REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

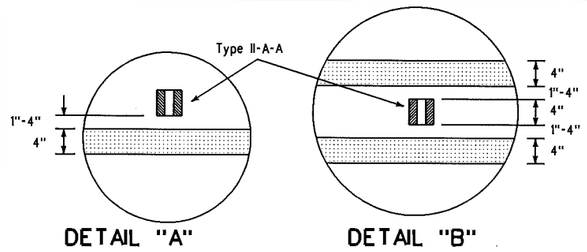


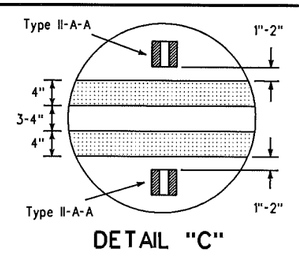
CENTERLINE FOR ALL TWO LANE ROADWAYS

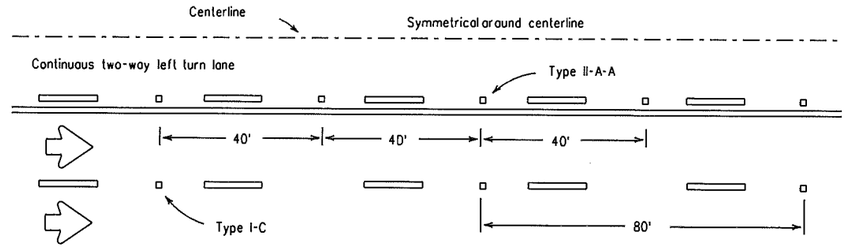


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS

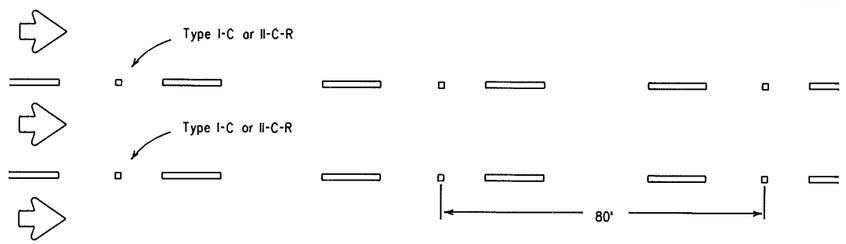
Raised pavement marker Type I-C, clear face toward normal traffic, shall be placed on 80-foot centers.







CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

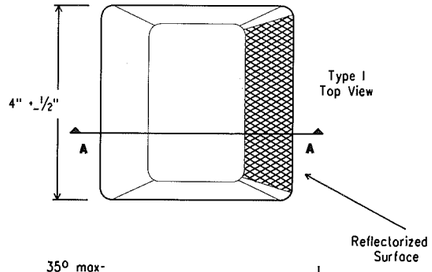
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

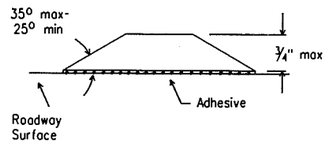
As required by the Engineer or shown elsewhere in the plans, Type II-C-R or Type I-C markers may be placed on 40-foot centers for the below listed conditions:

1. horizontal curves,
2. continuously illuminated sections,
3. high volume roadways
4. or roadways where safety concerns exist.

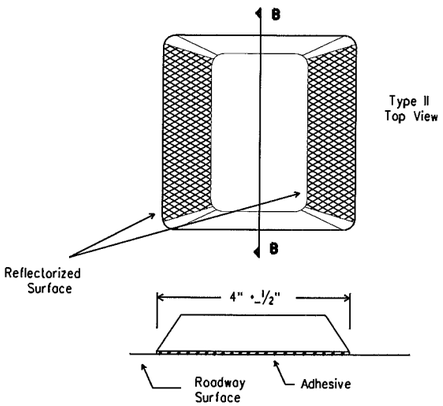
RAISED PAVEMENT MARKERS

(REFLECTORIZED)

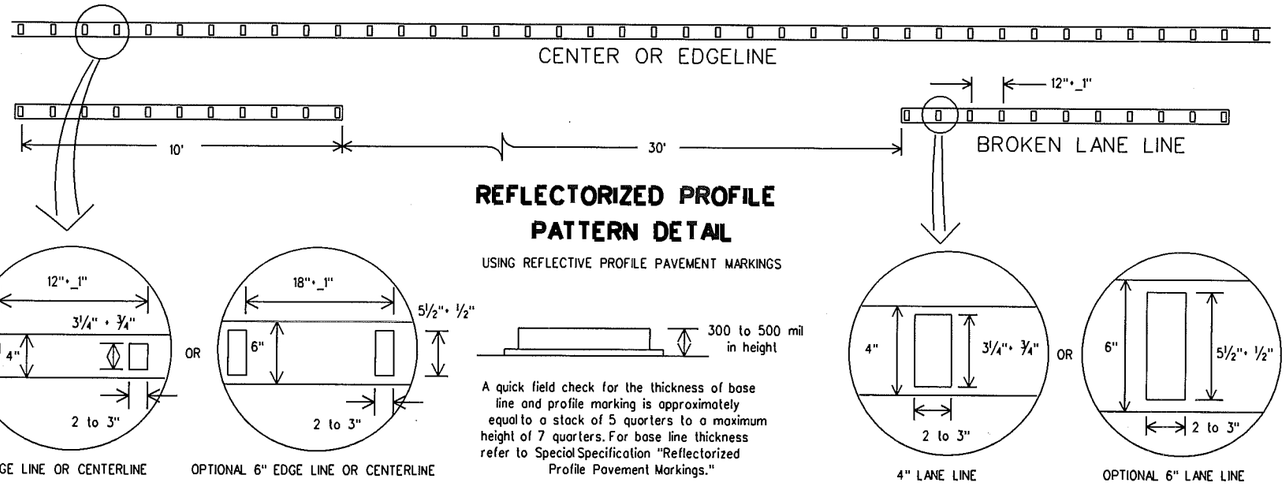




SECTION A



SECTION B



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

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. For base line thickness refer to Special Specification "Reflectorized Profile Pavement Markings."

GENERAL NOTES:

All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.

On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.

SPECIFICATION REFERENCE TABLE

MATERIAL SPECIFICATIONS

PAVEMENT MARKERS (REFLECT.)	DMS-4200
EPOXY	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130

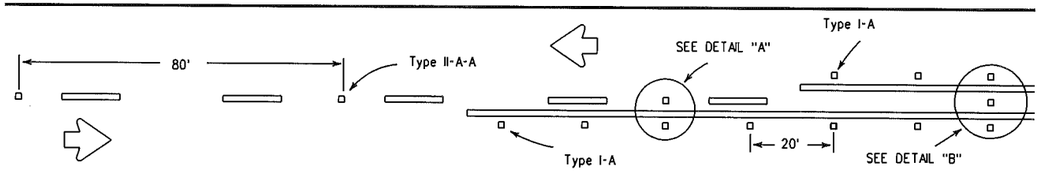
STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

POSITION GUIDANCE USING RAISED MARKERS REFLECTORIZED PROFILE MARKINGS

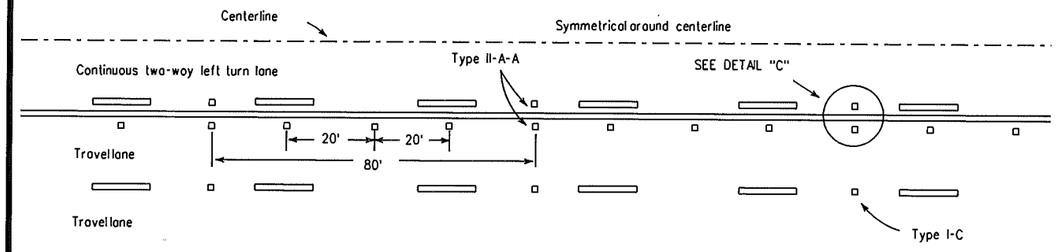
PM(2)-00A

©TxDOT April 1977	DES: BAS	CK: GRB	DW: FDN	CK: CAL
REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
10-86				70
4-92				
5-00	COUNTY	CONTROL	SECTION	JOB
8-00				

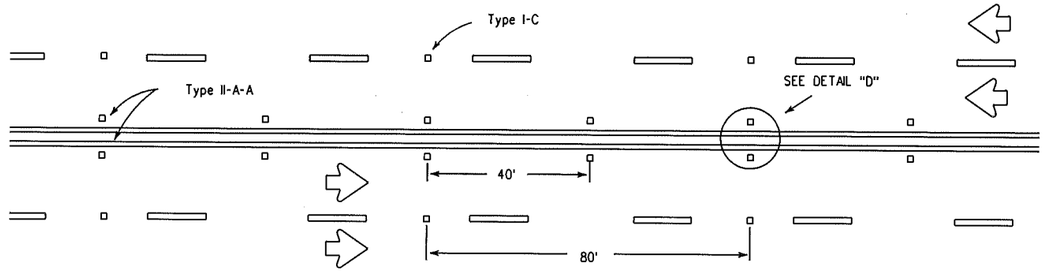
REFLECTIVE RAISED PAVEMENT MARKERS USED TO SUPPLEMENT STANDARD PAVEMENT MARKINGS



CENTERLINE & NO-PASSING LINES FOR 2 LANE TWO-WAY HWYS 24 FT. OR WIDER

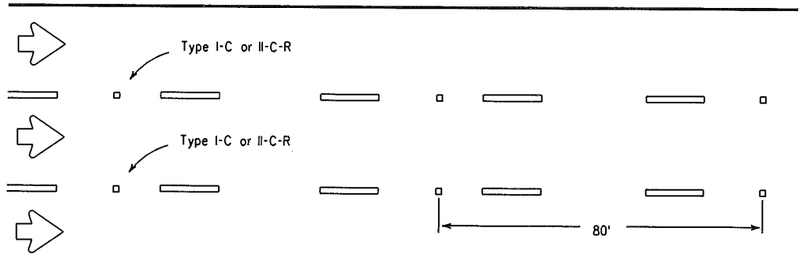


CENTERLINES & LANE LINES FOR TWO-WAY LEFT TURN LANE



CENTERLINE & LANE LINES FOR 4 LANE TWO-WAY HIGHWAYS

Raised pavement marker Type I-C, clear face toward normal traffic, shall be placed on 80-foot centers.

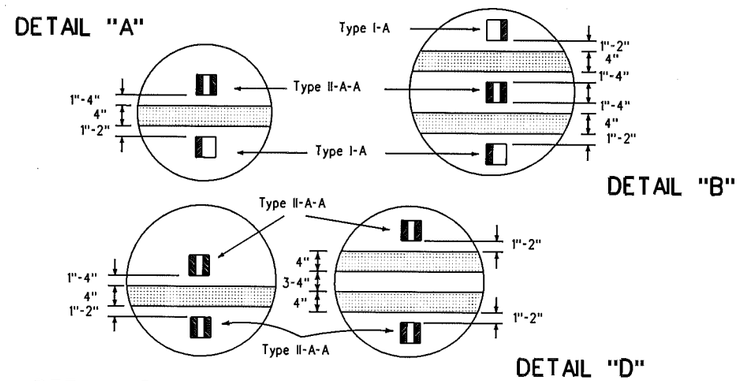


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

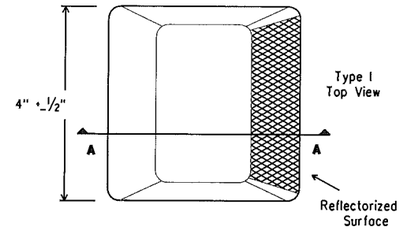
As required by the Engineer or shown elsewhere in the plans, Type II-C-R or Type I-C markers may be placed on 40-foot centers for the below listed conditions:

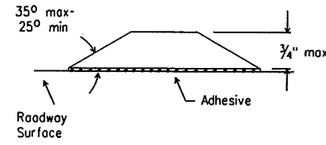
1. horizontal curves,
2. continuously illuminated sections,
3. high volume roadways
4. or roadways where safety concerns exist.



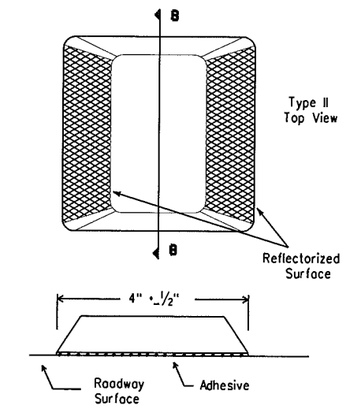
RAISED PAVEMENT MARKERS

(REFLECTORIZED)

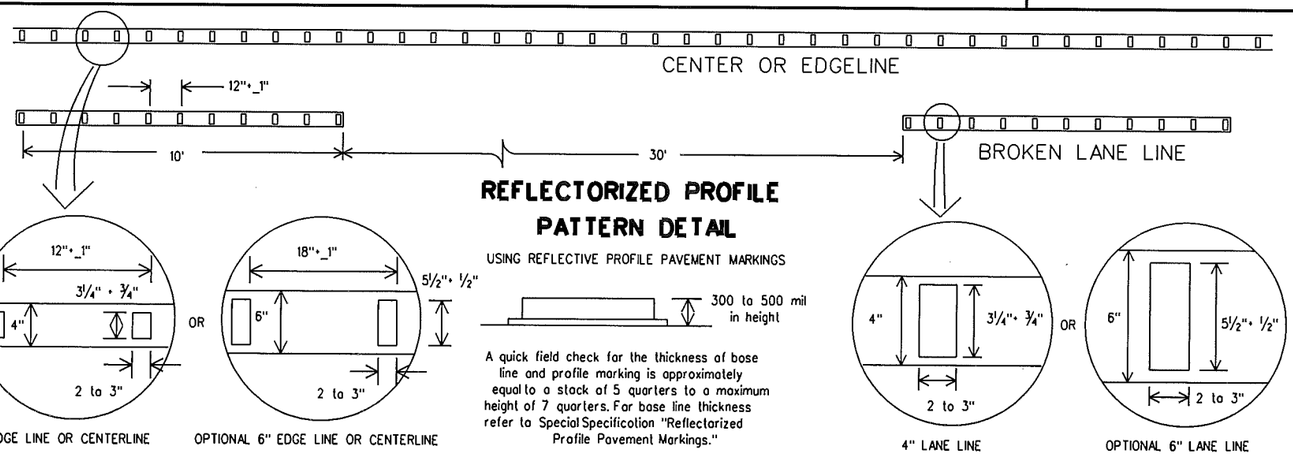




SECTION A



SECTION B



4" EDGE LINE OR CENTERLINE

OPTIONAL 6" EDGE LINE OR CENTERLINE

4" LANE LINE

OPTIONAL 6" LANE LINE

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

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. For base line thickness refer to Special Specification "Reflectorized Profile Pavement Markings."

GENERAL NOTES:

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On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.

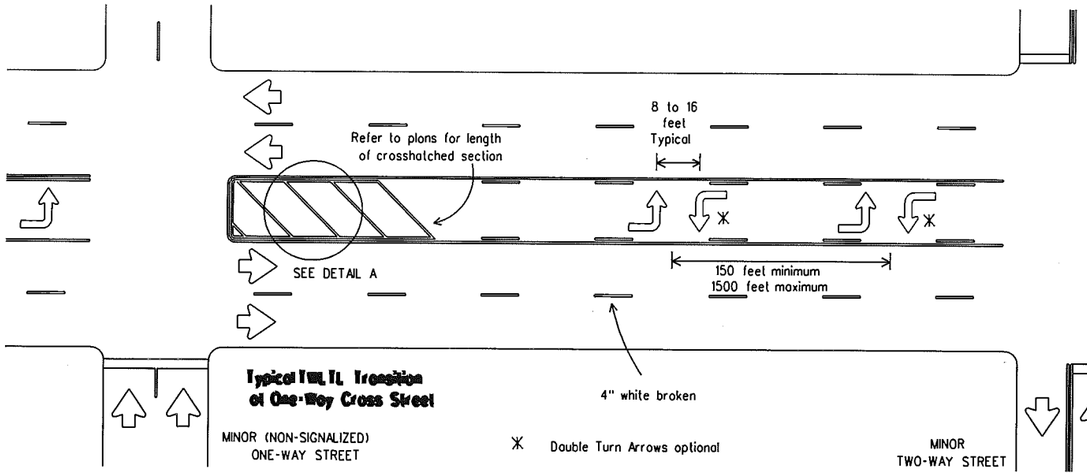
SPECIFICATION REFERENCE TABLE

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECT.)	DMS-4200
EPOXY	DMS-6100
BITUMINOUS ADHESIVE FOR PAVE. MKS.	DMS-6130

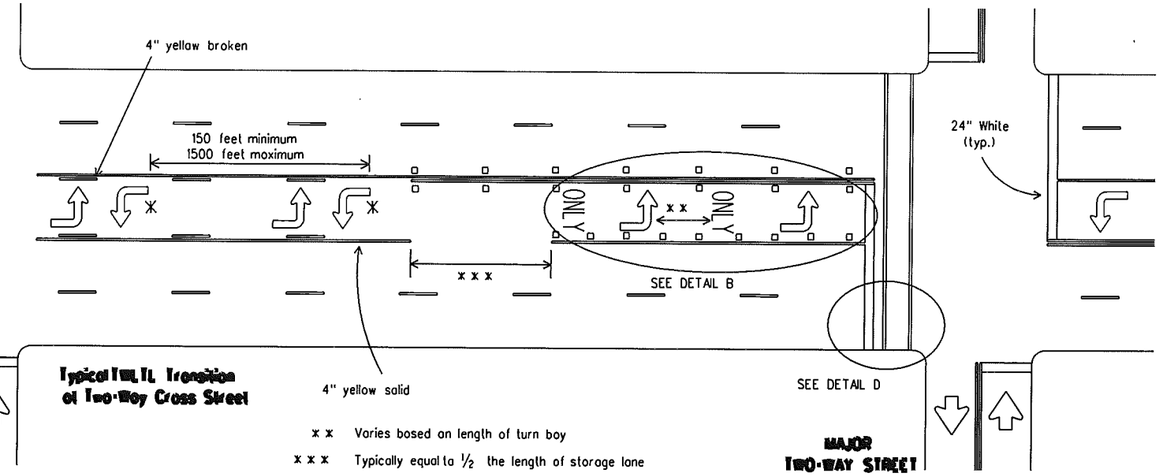
STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

SUPPLEMENTAL MARKINGS USING RAISED PAVEMENT MARKERS
REFLECTORIZED PROFILE MARKINGS
PM(3)-00A

© TxDOT April 1977	DW: BAS	CK: GRB	DW: FDN	CK: CAL	FED. NO.
REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT		SHEET
10-86					71
4-92					
5-00	COUNTY		CONTROL	SECTION	JOB
8-00					HIGHWAY



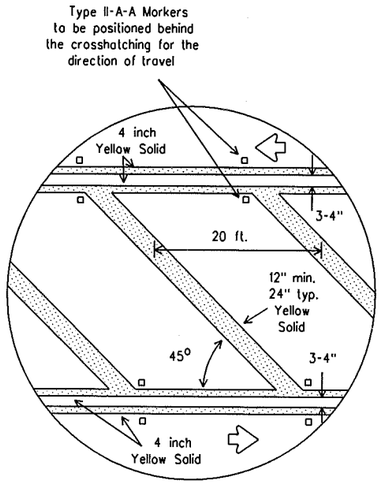
Typical TWLTL Transition at One-Way Cross Street



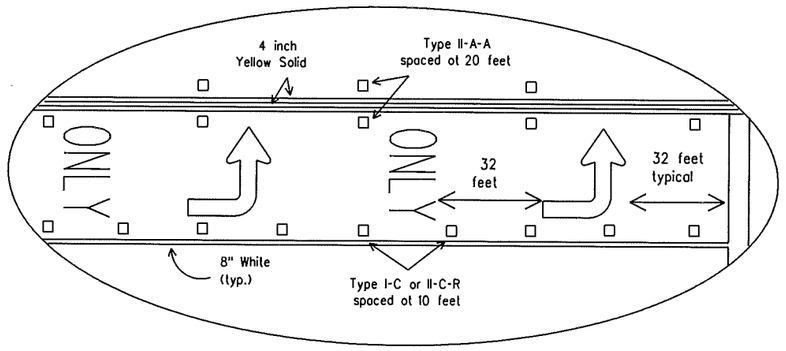
Typical TWLTL Transition at Two-Way Cross Street

xx Varies based on length of turn bay

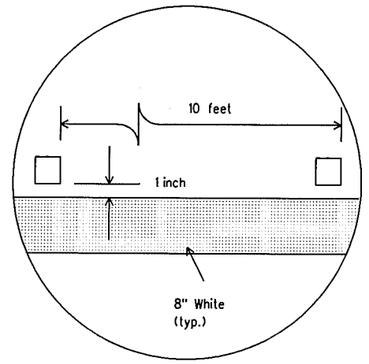
xxx Typically equal to ½ the length of storage lane



DETAIL A

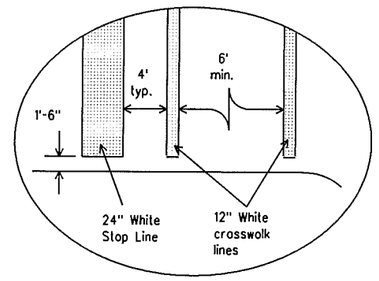


DETAIL B



DETAIL C

Raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Raised pavement marker Type II-C-R with divided highways and raised medians.



DETAIL D

Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

GENERAL NOTES

Refer elsewhere in plans for additional RPM placement and details.

Details for words and arrows as shown on other sheets.

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.

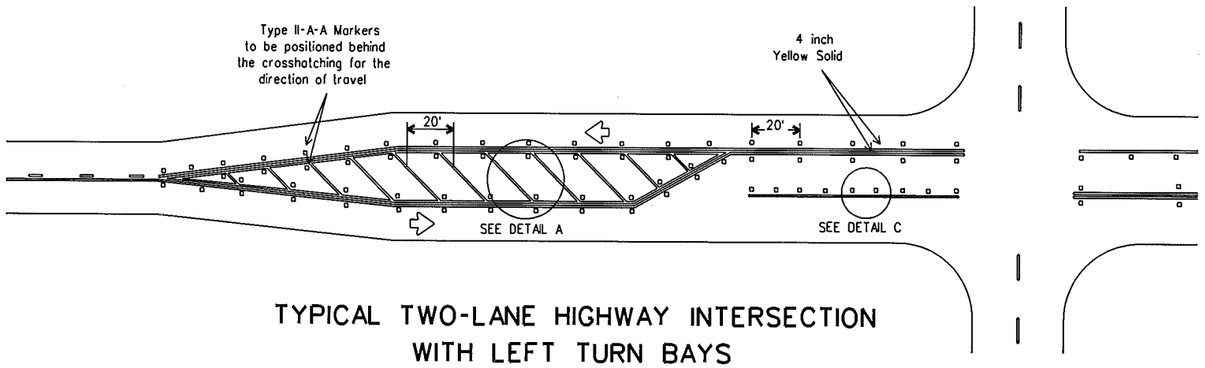
For a left turn bay, two sets of words and arrows shall be used if the length of the bay is equal to or greater than 180 feet. The bottom of the first ONLY shall be placed at the beginning of the turn bay lane line as shown above.

Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used.

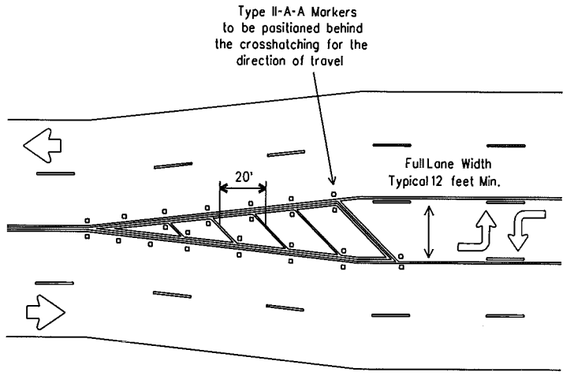
SPECIFICATION REFERENCE TABLE

MATERIAL SPECIFICATIONS

PAVEMENT MARKERS (REFLECT.)	DMS-4200
EPOXY	DMS-6100
BITUMINOUS ADHESIVE FOR PAVE. MKS.	DMS-6130



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

STANDARD PLANS

Texas Department of Transportation

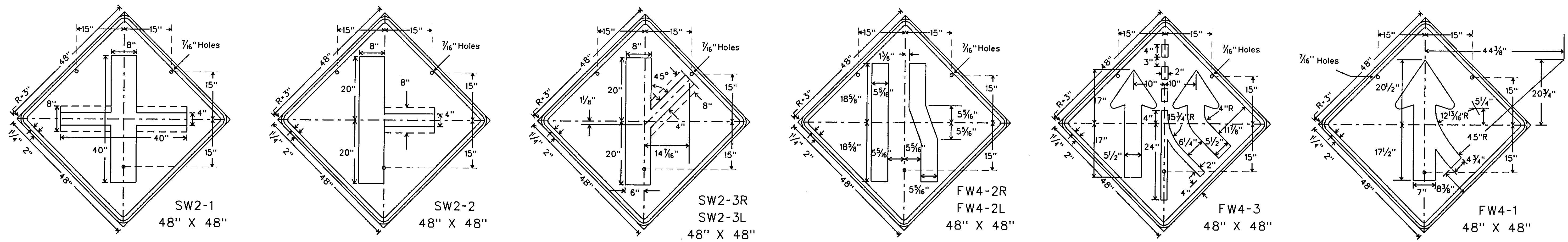
Traffic Operations Division

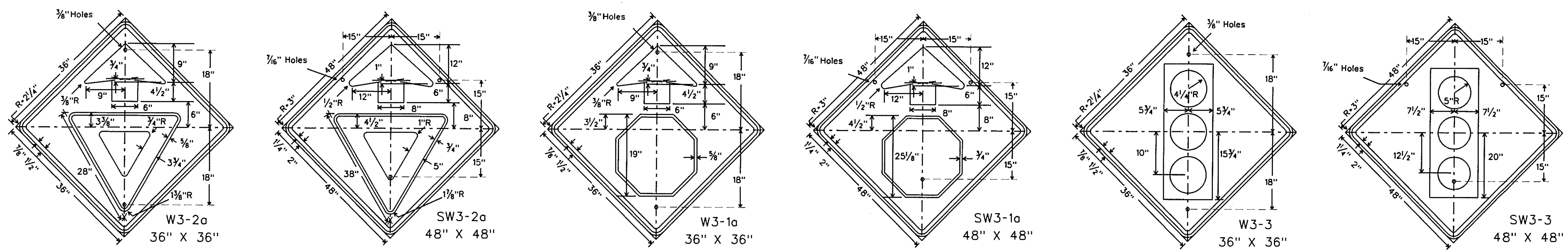
PAVEMENT MARKINGS FOR TWO-WAY LEFT TURN LANES DIVIDED HIGHWAYS AND RURAL LEFT TURN BAYS

PM(4)-03

DN: BAS	CK: GRB	DW: FDN	CK: CAL	REG. NO.:

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT			SHEET
5-00						72
8-00						
3-03	COUNTY		CONTROL	SECTION	JOB	HIGHWAY





Border and Arrow - Black
Symbol - Red Border Band on White Background (Refl)
Background - Yellow Reflective

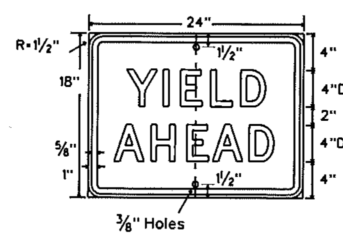
Border and Arrow - Black
Symbol - Red Border Band on White Background (Refl)
Background - Yellow Reflective

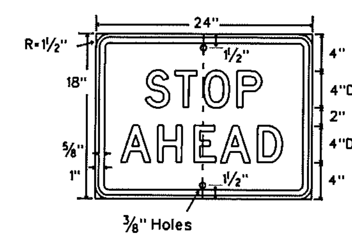
Border and Arrow - Black
Symbol - White Border on Red Background (Refl)
Background - Yellow Reflective

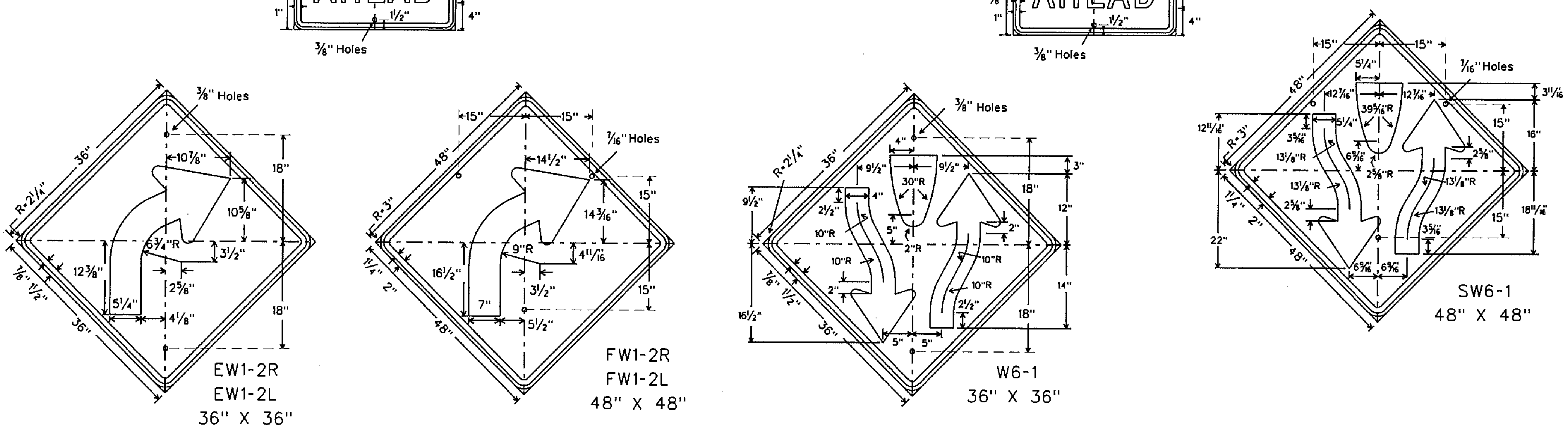
Border and Arrow - Black
Symbol - White Border on Red Background (Refl)
Background - Yellow Reflective

Symbol and Border - Black
Top Circle - Red Reflective
Bottom Circle - Green Reflective
Background - Yellow Reflective

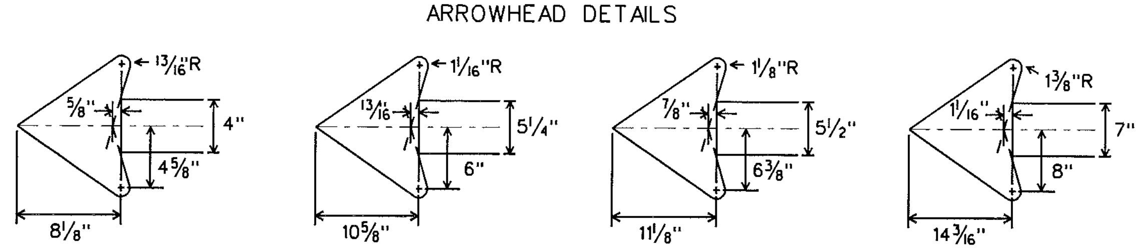
Symbol and Border - Black
Top Circle - Red Reflective
Bottom Circle - Green Reflective
Background - Yellow Reflective







ARROWHEAD DETAILS



SPECIFICATION REFERENCE TABLE	
MATERIALS AND TESTS DIVISION SPECIFICATIONS	
PLYWOOD SIGN BLANKS	D-9-7100
REFLECTIVE SHEETING, TYPE C (HIGH SPECIFIC INTENSITY)	D-9-8300
VINYL NON-REFLECTIVE DECAL SHEETING	D-9-8320

GENERAL NOTES:

The alphabets and lateral spacing between letters and numerals shall conform with the Texas "Manual on Uniform Traffic Control Devices for Streets and Highways", latest edition, and any approved changes thereto. Lateral spacing of text shall provide a balanced appearance. All materials shall conform to Department Specifications.

Legend (except where noted), shall be applied by screening process of black and/or transparent colored ink, cut-out black vinyl non-reflective decal sheeting and/or reflective sheeting or combination thereof. Background shall be yellow reflective sheeting (Type C).

Sign blanks shall be one piece 5/8 inch thick plywood (Type A), unless otherwise noted elsewhere in the plans.

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

WARNING SIGNS

W(1)-95

 DN:- LR | CK:- | DW:- DN | CK:- | NEG NO.:

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
1-85 7-90 8-95				73
	COUNTY	CONTROL	SECTION / JOB	HIGHWAY

SITE DESCRIPTION

PROJECT LIMITS: FROM: FM 907 (ALAMO ROAD)
TO: TOWER ROAD

PROJECT DESCRIPTION: Construction of a non-freeway facility consisting of: Grading, curb & gutter, lime treat. subgrade, flexible base asph. conc. pav't, wheel chair ramps, signing, traffic signals and storm sewer.

MAJOR SOIL DISTURBING ACTIVITIES: preparing the right-of-way
Embankment
Excavation
Grading Inlet/storm drains
erosion & sediment controls

TOTAL PROJECT AREA: 7.61 ACRES

TOTAL AREA TO BE DISTURBED: 7.61 ACRES

WEIGHTED RUNOFF COEFFICIENT (AFTER CONSTRUCTION): 0.50

EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER: Existing soil condition is Hidalgo Assoc: Level to convex soil, well drained, and calcareous soil.

NAME OF RECEIVING WATERS: A county drain ditches will receive all 7.61 acres. Ultimately the runoff will flow into the Laguna Madre, approximately 8.05 km south of Port Mansfield. The Laguna Madre is located within Stream Segment NO. 2491.

EROSION AND SEDIMENT CONTROLS

SOIL STABILIZATION PRACTICES:

- [x] TEMPORARY SEEDING
- [x] PERMANENT PLANTING, SODDING, OR SEEDING
- [ ] MULCHING
- [ ] SOIL RETENTION BLANKET
- [ ] BUFFER ZONES
- [x] PRESERVATION OF NATURAL RESOURCES

OTHER: Disturbed areas on which construction activity has ceased (temporarily or permanently) shall be stabilized within 14 days unless activities are scheduled to resume within 21 days.

STRUCTURAL PRACTICES:

- [x] SILT FENCES
- [x] HAY BALES
- [ ] ROCK BERMS
- [ ] DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- [ ] DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- [ ] DIVERSION DIKE AND SWALE COMBINATIONS
- [ ] PIPE SLOPE DRAINS
- [ ] PAVED FLUMES
- [ ] ROCK BEDDING AT CONSTRUCTION EXIT
- [x] TIMBER MATTING AT CONSTRUCTION EXIT
- [ ] CHANNEL LINERS
- [ ] SEDIMENT TRAPS
- [ ] SEDIMENT BASINS
- [ ] STORM INLET SEDIMENT TRAP
- [ ] STONE OUTLET STRUCTURES
- [x] CURBS AND GUTTERS
- [x] STORM SEWERS
- [ ] VELOCITY CONTROL DEVICES

OTHER:

NARRATIVE - SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT) ACTIVITIES:

The order of activities will be as follows:

1. Install controls for ingress and egress into the project site.

2. Install sediment control fences around culverts and other locations as shown. on the plans or as directed by the engineer.

3. Seed entire disturbed area from back of curb to the right of way.

4. When all construction activity is complete and the site is stabilized and approved by the Project Engineer, remove all temporary erosion controls and stabilize any areas disturbed by their removal.

STORM WATER MANAGEMENT: Storm water drainage will be provided by conc. curb & gutter, curbs, curb openings and a storm ditch system.

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.

INSPECTION: An inspection will be performed by a County Inspector every week as well as after every half inch or more of rain (as recorded on a non-freezing rain gauge 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 dumpster meeting all state and local city solid waste management regulations. All trash and construction debris from the site will be deposited as necessary, or as required by local regulations, at 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. Wash water and concrete will not be allowed to enter any storm drain or waterway. Likewise, washout of concrete trucks shall not be performed onsite without a system of containment these discharges are considered non-allowable non-storm water discharges. Concrete trucks shall not 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:

- [x] HAUL ROADS DAMPENED FOR DUST CONTROL
- [ ] LOADED HAUL TRUCKS TO BE COVERED WITH TARPAULIN
- [x] EXCESS DIRT ON ROAD REMOVED DAILY
- [x] STABILIZED CONSTRUCTION ENTRANCE

OTHER:

REMARKS: 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 wetland, waterbody or streambed.
Construction staging areas and vehicle maintenance areas shall be constructed by the Contractor in a manner to minimize the runoff of pollutants.

STATE OF TEXAS
RAMIRO GUTIERREZ
65948
REGISTERED PROFESSIONAL ENGINEER
P.E.

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY RAMIRO GUTIERREZ, P.E. 65948
DATE: 9-28-10

ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE LAW.

EL GATO ROAD
STORM WATER POLLUTION PREVENTION PLAN (SW3P)

REVISIONS	DATE:	BY:

R. Gutierrez Engineering Corporation
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78577
(TEL) 956 782-2557 • (FAX) 956 782-2558
FIRM No. 486

PROJECT NUMBER	COUNTY	HIGHWAY NO.
DRAWN BY:	CHECKED BY:	SHEET No.
DESIGNED BY:	CHECKED BY:	74

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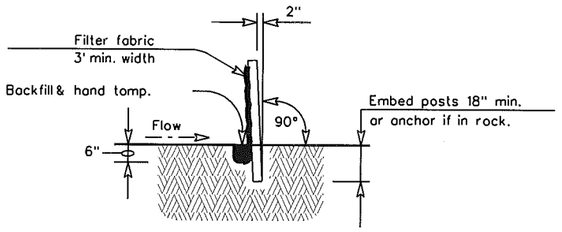


SECTION A-A

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.

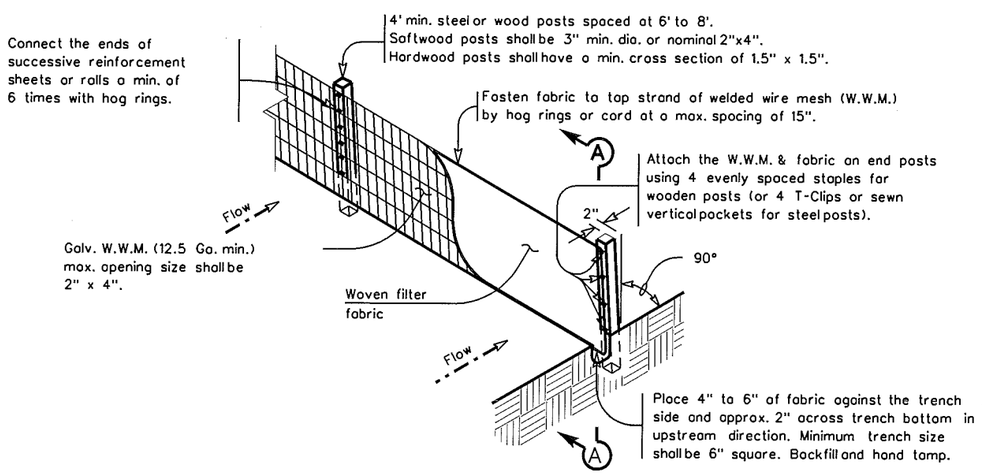
Sediment control fence should be sized to filter a max. flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

PLAN SHEET LEGEND

Sediment Control Fence —— SCF ——

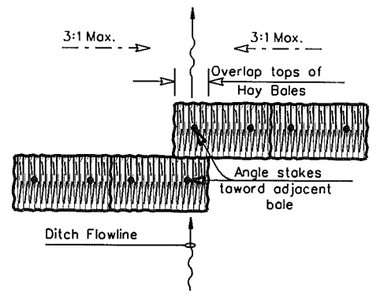
GENERAL NOTES

1. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

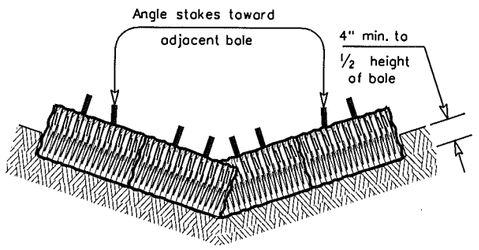


TEMPORARY SEDIMENT CONTROL FENCE

—— SCF ——



PLAN VIEW



PROFILE VIEW

PLANS SHEET LEGEND

Baled Hay —— BH ——

BALED HAY USAGE GUIDELINES

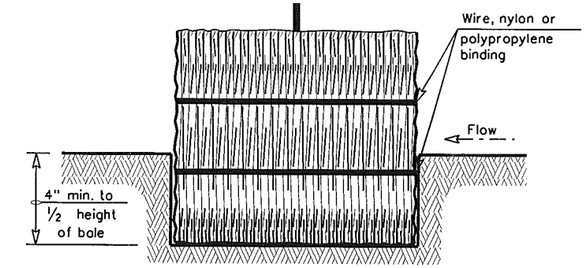
A Baled Hay installation may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A two year storm frequency may be used to calculate the flow thru rate to be filtered. The installation should be sized to filter a maximum flow thru rate of 5 GPM/FT^2 of cross sectional area. Baled hay may be used at the following locations:

1. Where the runoff approaching the baled hay flows over disturbed soil for less than 100'. If the slope of the disturbed soil exceeds 10%, the length of slope upstream the baled hay should be less than 50'.
2. Where the installation will be required for less than 3 months.
3. Where the contributing drainage area is less than ½ acre.

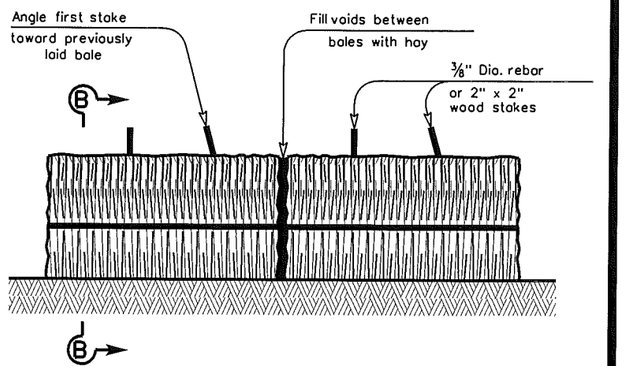
For Baled Hay installations in small ditches, the additional following considerations apply:

1. The ditch sideslopes should be graded as flat as possible to maximize the drainage flowrate thru the hay.
2. The ditch should be graded large enough to contain the overtopping drainage when sediment has filled to the top of the baled hay.

Bales should be replaced usually every 2 months or more often during wet weather when loss of structural integrity is accelerated.



SECTION B-B



BALED HAY FOR EROSION CONTROL

—— BH ——

GENERAL NOTES

1. Hay bales shall be a minimum of 30" in length and weigh a minimum of 50 Lbs.
2. Hay bales shall be bound by either wire or nylon or polypropylene string. The bales shall be composed entirely of vegetable matter.
3. Hay bales shall be embedded in the soil a minimum of 4" and where possible ½ the height of the bale.
4. Hay bales shall be placed in a row with ends tightly abutting the adjacent bales. The bales shall be placed with bindings parallel to the ground.
5. Hay bales shall be securely anchored in place with ⅜" Dia. rebar or 2" x 2" wood stakes, driven through the bales. The first stake shall be angled towards the previously laid bale to force the bales together.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

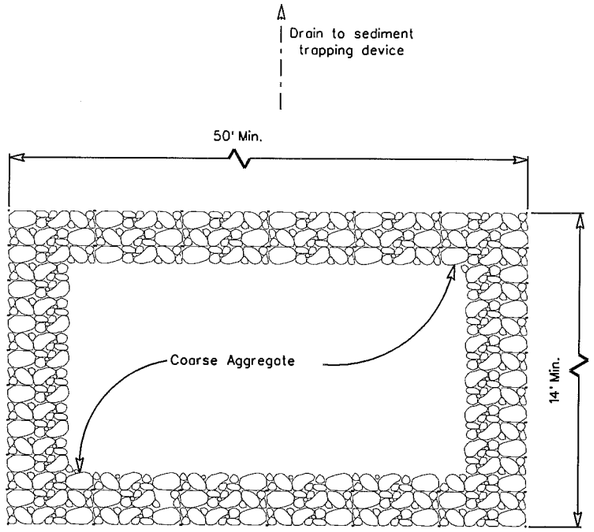
TEXAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

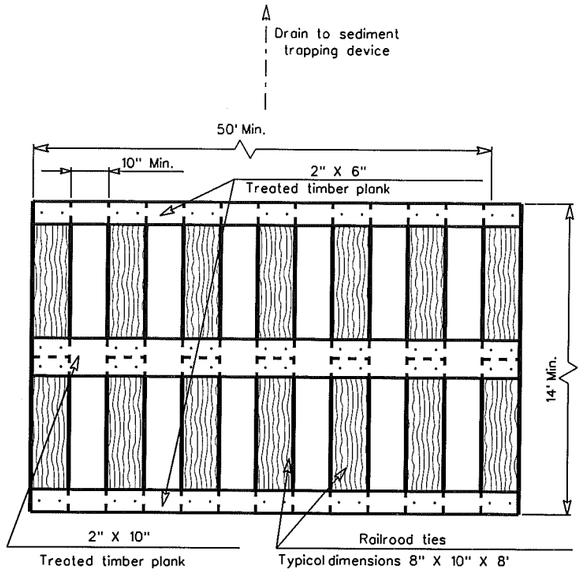
FENCE & BALED HAY

EC(1)-93

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT				SHEET
							75
	COUNTY		CONTROL	SECTION	JOB		HIGHWAY



PLAN



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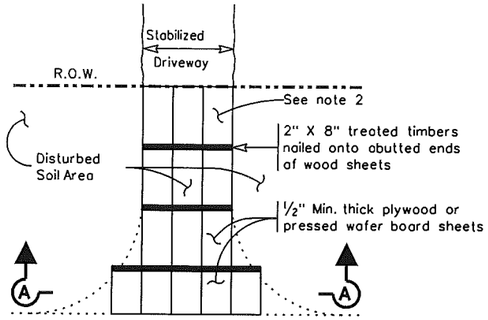
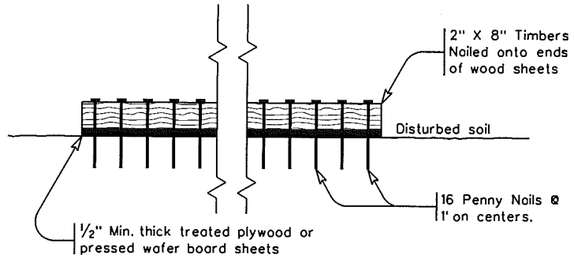
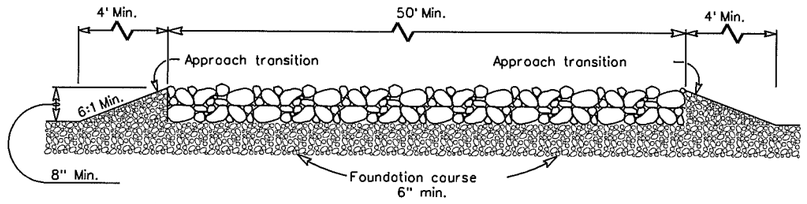


PLAN



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

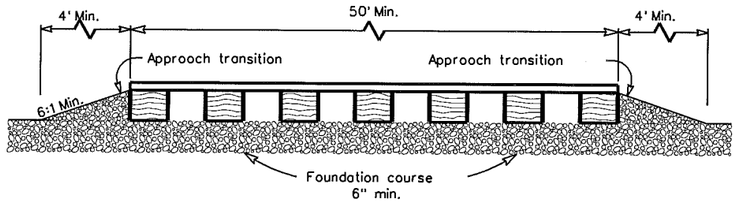


PROFILE

CONSTRUCTION EXIT (TYPE 1)

GENERAL NOTES

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse oggregote 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 material as approved by the Engineer.
5. The construction exit shall be graded to allow droinage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.



PROFILE

CONSTRUCTION EXIT (TYPE 2)

GENERAL NOTES

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less thon 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.

GENERAL NOTES

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 herean are suggestions only and may be modified by the Engineer.

TEXAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-93

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT			SHEET
						76
COUNTY			CONTROL	SECTION	JOB	HIGHWAY

HIGHWAY DESIGN DIVISION (D-8)