FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6			1
STATE	STATE DIST.NO.	COUNTY	
TEXAS		HIDALGO	
CONT.	SECT.	JOB	HIGHWAY NO.
			SUNFLOWER

HIDALGO COUNTY
PRECINCT NO.4

PLANS OF PROPOSED ROADWAY IMPROVEMENT
HIDALGO COUNTY

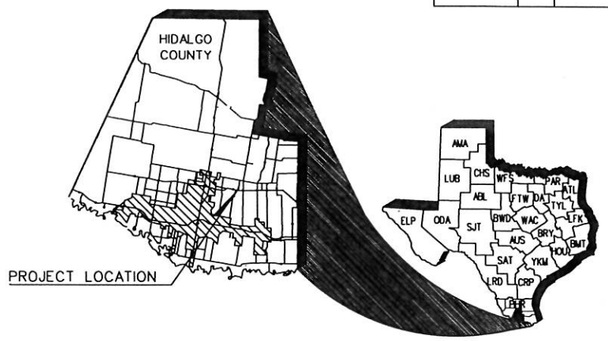
SUNFLOWER RD

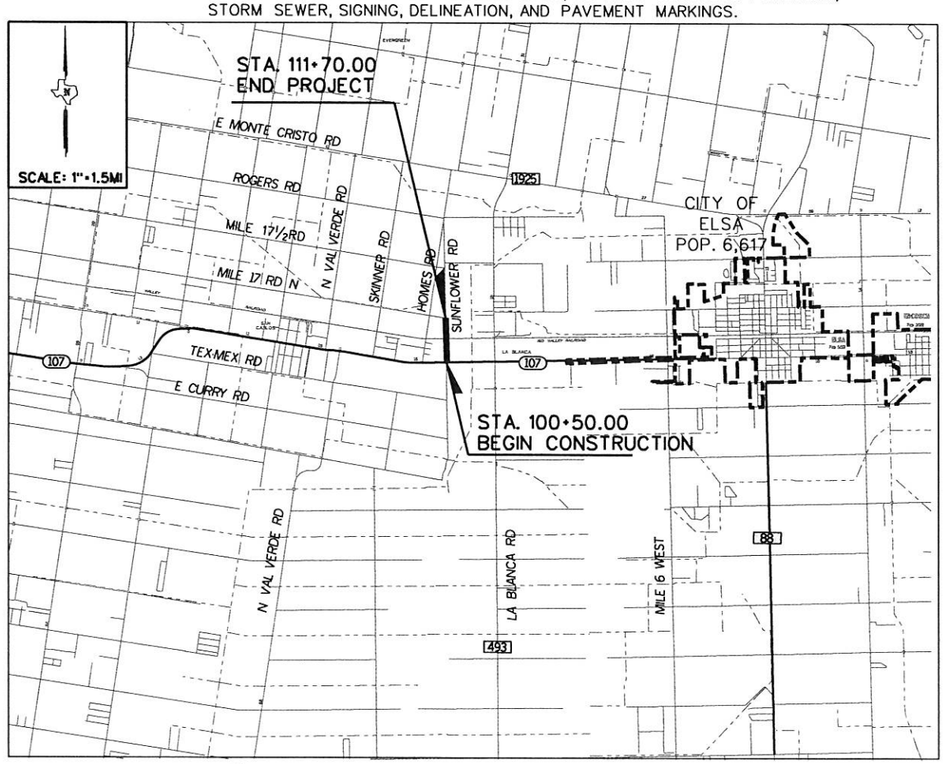
PROJECT LENGTH = 1,120 FT. = 0.212 MI.

NET LENGTH OF PROJECT = 1,120 FT. = 0.212 MI.

LIMITS: FROM SH 107 TO 0.2 MI. NORTH OF SH 107

TYPE: WIDENING OF A NON-FREEWAY FACILITY CONSISTING OF GRADING, COMPACTING SUBGRADE, LIME TREATED FLEXIBLE BASE, ASPHALT CONCRETE PAVEMENT, STORM SEWER, SIGNING, DELINEATION, AND PAVEMENT MARKINGS.





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INDEX DATA
SHEET ON PAGE 2

FINAL PLAN DATA :

FINAL CONTRACT PRICE: _____
CONTRACTORS NAME: _____
CONTRACTORS ADDRESS: _____
LETTING DATE: _____
DATE WORK BEGAN: _____
DATE WORK COMPLETED: _____
DATE OF ACCEPTANCE: _____

CHANGE ORDERS AND SUPPLEMENTAL AGREEMENTS:

ALL CONSTRUCTION WORK WAS PERFORMED IN ACCORDANCE WITH THE PLANS, SPECIFICATIONS AND CONTRACT. ALL PROPOSED CONSTRUCTION WAS COMPLETED UNLESS OTHERWISE NOTED.

HIDLAGO COUNTY PRECINCT NO.4 :

DATE:

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

SUNFLOWER RD PROJECT DATA

DESIGN SPEED: 30 MPH	FUNCTION CLASS: LOCAL RD
EXCEPTIONS: NONE	BRIDGE NONE
RAILROAD CROSSINGS: NONE	ADT N/A
EQUATIONS: NONE	

TDLR INSPECTION IS NOT REQUIRED

SOUTH TEXAS INFRASTRUCTURE GROUP

APPROVED FOR LETTING / DATE :

NAME, TITLE

P4

APPROVED FOR LETTING / DATE :

NAME, TITLE

SUNFLOWER ROAD

COUNTY HIDALGO
HWY. NO. SUNFLOWER
DATE ACCEPTED

PROJ. NO.
LETTING DATE

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1/27/2017

STANDARD SHEETS 13-27, 32-35, 43-49, 54-61, 64-66 & 68-69 HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

4/27/2017
DATE

STATE OF TEXAS
JULIO CESAR CERDA
90524
LICENSED PROFESSIONAL ENGINEER

GENERAL

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3	PROJECT LAYOUT
4	SURVEY CONTROL SHEETS
5	OMIT
6	TYPICAL SECTION
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TRAFFIC CONTROL PLAN

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34	[D] DRIVEWAY PROPFILE DETAILS
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69	[S] EC(3)-93

[D] - DENOTES DISTRICT STANDARD
[S] - DENOTES STATE STANDARD

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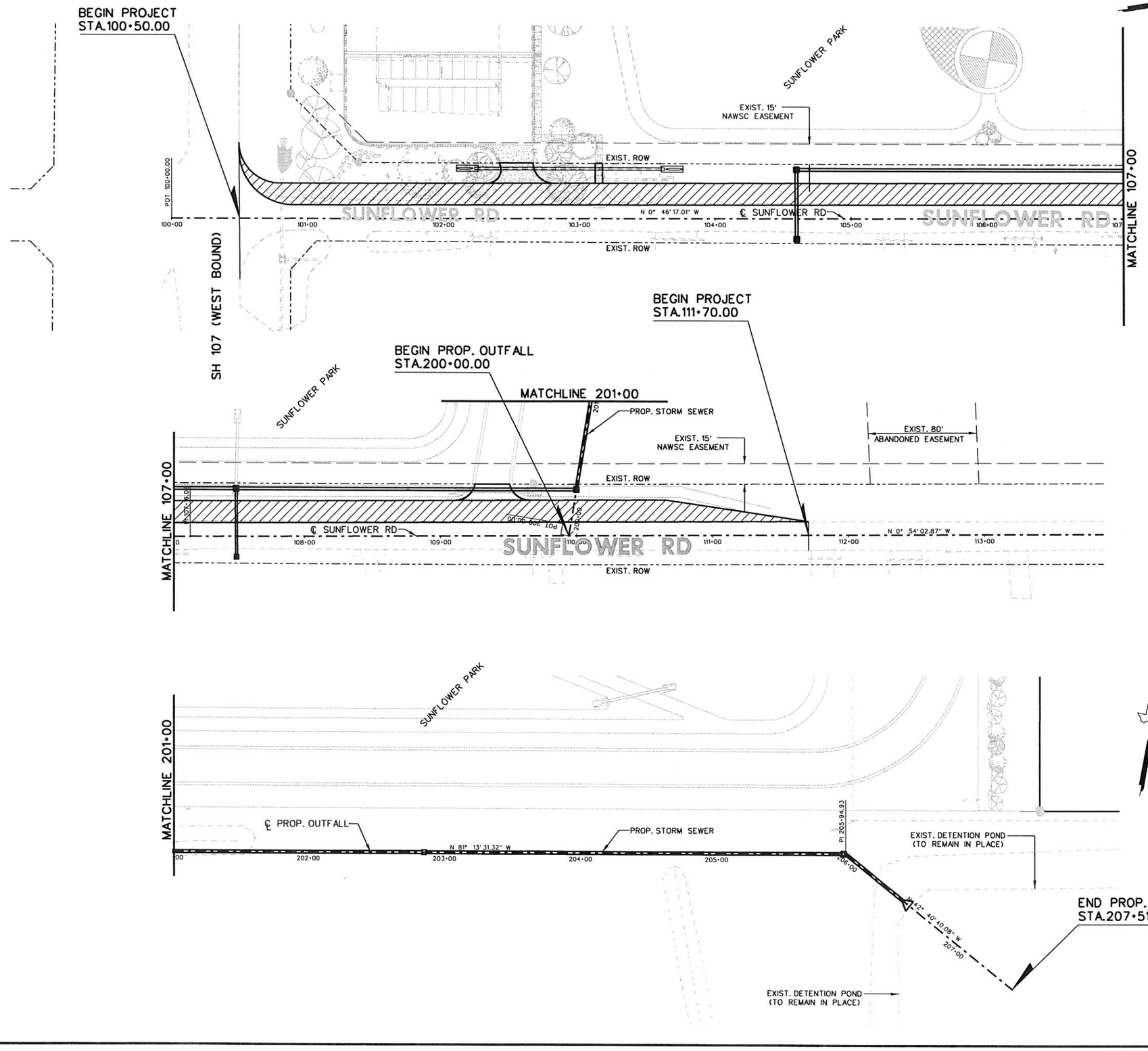
SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER ROAD
INDEX OF SHEETS

DRAWING:		FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK:		6	TEXAS					10th ST
ENGINEER:		STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK:		PHR	HIDALGO	0921	02	300		2
REVIEW:								
CK:								

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1/27/2017



LEGEND:

PROPOSED ROADWAY WIDENING

STATE OF TEXAS
JULIO CESAR CERDA
90524
LICENSED PROFESSIONAL ENGINEER

SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER ROAD PROJECT LAYOUT

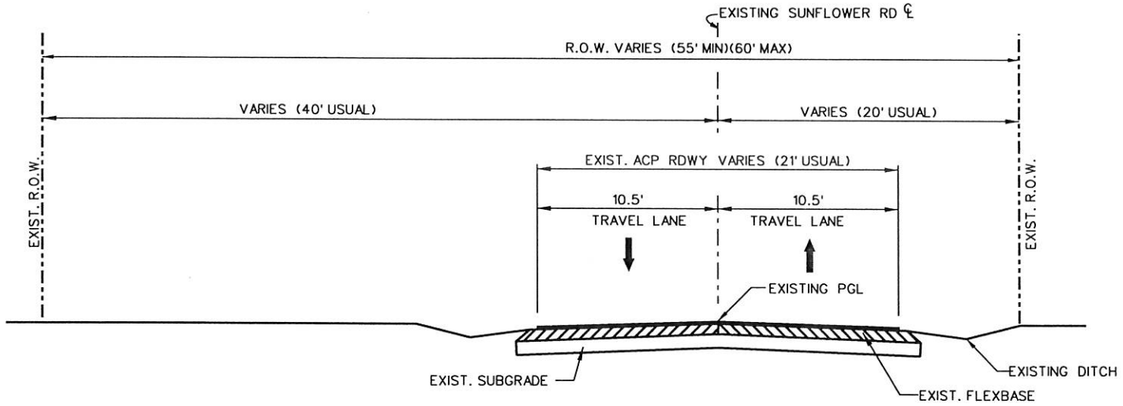
SCALE: 1" = 300'

SHEET 1 OF 1

DRAWING:	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK:	6	TEXAS					Sunf.
ENGINEER:	STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK:	PHR	HIDALGO	921	02			3
REVIEW:							
CK:							

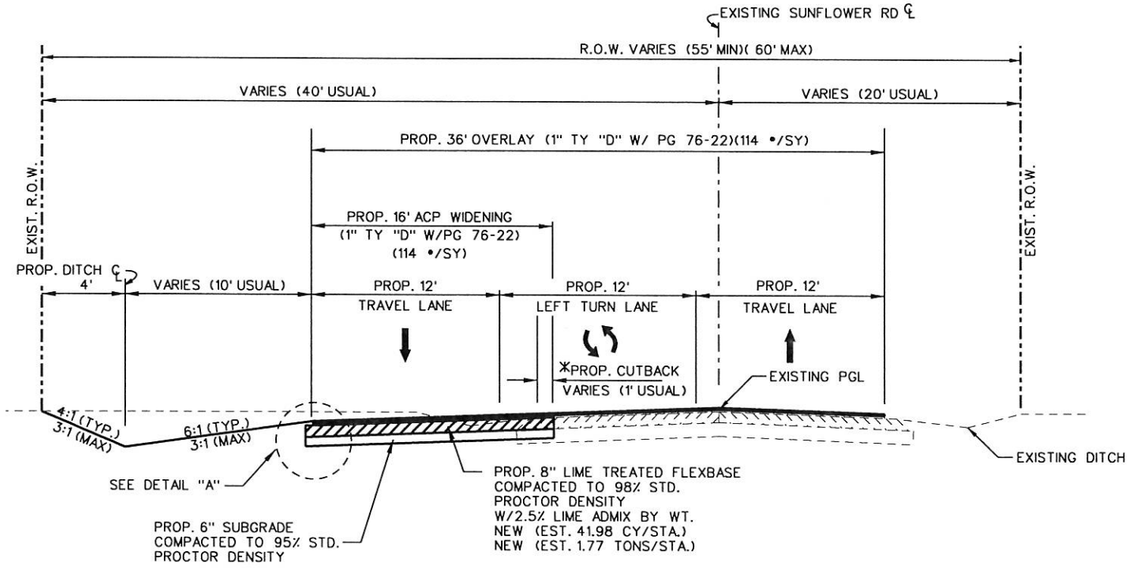
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1/27/2017



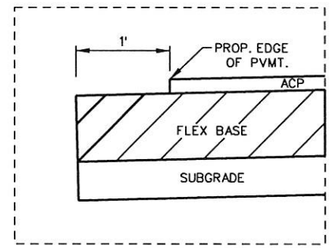
EXIST. SUNFLOWER RD. TYPICAL SECTION

STA. 100+50.00 TO STA. 111+70.00



PROP. SUNFLOWER RD. TYPICAL SECTION

STA. 100+50.00 TO STA. 111+70.00



DETAIL "A"
N.T.S.

GENERAL NOTES:

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

THE PROP. FLEXBASE SHALL BE NEW MATERIAL.

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

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

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

PGL - DENOTES PROFILE GRADE LINE

PCJ - DENOTES PERMISSIBLE CONSTRUCTION JOINT

A STATION IS EQUIVALENT TO 100 FT.

* THE PROP. CUTBACK OPERATIONS SHALL BE CONSIDERED SUBSIDIARY TO PERTINENT ITEMS.

STATE OF TEXAS
JULIO CESAR CERDA
90524
LICENSED
PROFESSIONAL ENGINEER

SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER ROAD TYPICAL SECTIONs

SHEET 1 OF 1

DRAWING:		FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK:		6	TEXAS					Sunf.
ENGINEER:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK:		PHR	HIDALGO	921	02			6
REVIEW:								
CK:								

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SUMMARY OF ROADWAY ITEMS

LOCATION	LENGTH (FT)	100 6002 PREPARING ROW (STA)	CUT 110 6001 EXCAVATION (ROADWAY) (CY)	FILL 132 6006 EMBANKMENT (FINAL) (DENS CONT) (TY C) (CY)	204 6003 SPRINK DUST CONTROL 8MG/STA (MG)	SUBGRADE 112 6003 SUBGRADE WIDENING (17' WIDTH) (SY)	FLEXIBLE BASE 247 6225 FLEX. BASE (RDWY DEL) TY"E" GR.4 (FINAL POS) (CY)	FLEXIBLE BASE ✱ 260 6043 LIME HYD,COM OR QK(SLRY) 2.5% BY WT. (TON)	FLEXIBLE BASE 260 6015 LIME TREAT (NEW BASE) (8") (SY)	PRIME COAT 310 INFO-ONLY AREA ⊕ (SY)	PRIME COAT 310 6009 ASHP MAT'L (MC-30) 0.2 GAL/SY (GAL)	ASPH. CONC. PAV. 341 INFO-ONLY AREA ⊕ (SY)	ASPH. CONC. PAV. 341 6047 D-GR HMA (QCQA) TY-D SAC-A PG 76-22 114 #/SY (TON)
		EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.
SUNFLOWER RD													
WIDENING	1120	11.2	624	71	90	2017	448	19	2017	1898	380	1898	109
OVERLAY	1120											4398	250
GRAND TOTAL		11.2	624	71	90	2017	448	19	2017	1898	380	6296	359

✱ PERCENT OF LIME MAY BE VARIED WHERE REQUIRED OR AS DIRECTED BY THE ENGINEER

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

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

SUMMARY OF PLAN AND PROFILE SHEET ITEMS (ITEM 104, 496, 530, & 531)

PLAN & PROFILE SHEET	104 6015 REMOV CONC (SIDEWALK) (SY)	104 6017 REMOV CONC (DRWY) (EA)	496 6004 REMOV STR (SET) (EA)	496 6007 REMOV STR (PIPE) (LF)	530 6004 DRIVEWAYS (CONC) (SY)	531 6001 CONC SIDEWALKS (4") (SY)
	EST.	EST.	EST.	EST.	EST.	EST.
SUNFLOWER RD						
P&P SHEETS						
1 OF 3	17	109	2	140	47	9
2 OF 3				20		
3 OF 3					44	
GRAND TOTAL	17	109	2	160	91	9

SUMMARY OF PROP. DRAINAGE STRUCTURES

SHEET NO.	ITEM 400 NON-PAY STRUCT EXCAV (CY)	ITEM 400 6006 CUT & RESTORING PAV (SY)	ITEM 400 6011 SAND BACKFILL (CY)	ITEM 402 6001 TRENCH EXCAVATION PROTECTION (LF)	ITEM 432 6001 RIRRAP (CONC) (4") (CY)	ITEM 464 6003 RC PIPE (CL III) (18") (LF)	ITEM 464 6038 RC PIPE (CL III) (18") (SPL) (LF)	ITEM 464 6039 RC PIPE (CL III) (24") (SPL) (LF)	ITEM 467 6363 SET (TY II)(18") (RCP)(6:1) (P) (EA)	ITEM 465 6070 INLET (COMPL) (PSL)(RC) (3'X3') (EA)	ITEM 465 6126 INLET (COMPL) (PSL)(FG) (3'X3') (3'X3') (EA)	ITEM 466 6005 HEADWALL (CH-FW-0) (24") (EA)
	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.
SUNFLOWER RD												
U&D SHEETS												
1 OF 5						140			2			
2 OF 5	474	22	249	629	12		47	582			4	
3 OF 5					3						1	
4 OF 5	590		223	554				554		1		
5 OF 5	72		24	59				59		1		1
GRAND TOTAL	1136	22	496	1242	15	140	47	1195	2	2	5	1

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SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER RD ESTIMATED QUANTITIES

SHEET 1 OF 2

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					7
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:			HIDALGO					SNFLWR
TR:								
CK TR:								

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1/27/2017

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

PAVEMENT MARKING SHEET	666 6036 REFL PAV MRK TY I (W) 8" (SLD) (100MIL) (LF)	666 6048 REFL PAV MRK TY I (W) 24" (SLD) (100MIL) (LF)	666 6120 REFL PAV MRK TY I (Y) 4" (BRK) (100MIL) (LF)	666 6126 REFL PAV MRK TY I (Y) 4" (SLD) (100MIL) (LF)	666 6141 REFL PAV MRK TY I (Y) 12" (SLD) (100MIL) (LF)	668 6019 PREFAB PAV MRK TY B (W) (ARROW) (EA)	668 6027 PREFAB PAV MRK TY B (W) (WORD) (EA)	672 6007 REFL PAV MRKR TY I-C (EA)	672 6009 REFL PAV MRKR TY II-A-A (EA)
	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.	EST.
SUNFLOWER RD									
SHEET 1 OF 2	120	30	260	1380		3	3	6	44
SHEET 2 OF 2			60	1056	100				48
GRAND TOTAL	120	30	320	2436	100	3	3	6	92

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

SW3P LAYOUT SHEET	164 6022 CELL FBR MLCH SEED (PERM)(RURAL) (SANDY) (ACRE)	166 6002 FERTILIZER ⊕ (TON)	168 6001 VEGETATIVE WATERING (MG)	506 6021 CONSTRUCTION EXIT (INSTALL) (TY 2) (SY)	506 6024 CONSTRUCTION EXIT (REMOVE) (SY)	506 6041 BIODEGRADABLE EROSION CNTRL LOGS (12" DIA) INSTALL (LF)	506 6043 BIODEGRADABLE EROSION CNTRL LOGS REMOVE (LF)
	EST.	EST.	EST.	EST.	EST.	EST.	EST.
SUNFLOWER RD							
SHEET 1 OF 1	0.36	180	55	156	156	145	145
GRAND TOTAL	0.36	180	55	156	156	145	145

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

SUMMARY OF INSTALL SMALL ROAD SIGNS

LOCATION	644 6027 INS SM RD SN SUP&AM TY S80 (1) SA (P) (EA)	644 6076 REMOVE SM RD SN SUP & AM (EA)
	EST.	EST.
SUNFLOWER RD		
GRAND TOTAL	7	2

SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER RD ESTIMATED QUANTITIES

SHEET 2 OF 2

DN:		FED. RD. DIV. NO.	STATE	PROJECT NO.				SHEET NO.
CK DN:		6	TEXAS					8
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		HIGHWAY NO.
CK DW:			HIDALGO					SNFLWR
TR:								
CK TR:								

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1/27/2017

Station	Material Name	End Areas (sq. ft.)	Unadjusted Volumes (cu. yd.)	Adjusted Volumes (cu. yd.)	Mult Factor	Mass Ordinate
100+50.00	DIRT					
	Excavation	119.1	0	0	1.00	
	Fill	0.0	0	0	1.00	0
101+00.00	DIRT					
	Excavation	35.3	143	143	1.00	
	Fill	4.0	4	4	1.00	139
101+50.00	DIRT					
	Excavation	12.5	44	44	1.00	
	Fill	2.8	6	6	1.00	177
102+00.00	DIRT					
	Excavation	13.4	24	24	1.00	
	Fill	0.8	3	3	1.00	198
102+50.00	DIRT					
	Excavation	30.4	41	41	1.00	
	Fill	0.0	1	1	1.00	238
103+00.00	DIRT					
	Excavation	21.7	48	48	1.00	
	Fill	0.0	0	0	1.00	286
103+50.00	DIRT					
	Excavation	12.0	31	31	1.00	
	Fill	0.0	0	0	1.00	317
104+00.00	DIRT					
	Excavation	11.5	22	22	1.00	
	Fill	0.6	1	1	1.00	338
104+50.00	DIRT					
	Excavation	6.1	16	16	1.00	
	Fill	2.6	3	3	1.00	351
105+00.00	DIRT					
	Excavation	10.2	15	15	1.00	
	Fill	0.7	3	3	1.00	363
105+50.00	DIRT					
	Excavation	6.1	15	15	1.00	
	Fill	1.9	2	2	1.00	376
106+00.00	DIRT					
	Excavation	13.1	18	18	1.00	
	Fill	0.5	2	2	1.00	392
106+50.00	DIRT					
	Excavation	10.5	22	22	1.00	
	Fill	2.2	3	3	1.00	411
107+00.00	DIRT					
	Excavation	14.4	23	23	1.00	
	Fill	0.6	3	3	1.00	431
107+50.00	DIRT					
	Excavation	9.6	22	22	1.00	
	Fill	2.0	2	2	1.00	451
108+00.00	DIRT					
	Excavation	10.9	19	19	1.00	
	Fill	0.9	3	3	1.00	467
108+50.00	DIRT					
	Excavation	6.6	16	16	1.00	
	Fill	4.3	5	5	1.00	478
109+00.00	DIRT					
	Excavation	11.4	17	17	1.00	
	Fill	0.3	4	4	1.00	491
109+50.00	DIRT					
	Excavation	8.5	18	18	1.00	
	Fill	0.6	1	1	1.00	508
110+00.00	DIRT					
	Excavation	21.1	27	27	1.00	
	Fill	0.0	1	1	1.00	534
110+50.00	DIRT					
	Excavation	2.9	22	22	1.00	
	Fill	7.7	7	7	1.00	549
111+00.00	DIRT					
	Excavation	6.0	8	8	1.00	
	Fill	4.5	11	11	1.00	546
111+50.00	DIRT					
	Excavation	4.7	10	10	1.00	
	Fill	1.0	5	5	1.00	551
111+70.00	DIRT					
	Excavation	4.3	3	3	1.00	
	Fill	0.4	1	1	1.00	553

* G R A N D S U M M A R Y T O T A L S

Material Name		Unadjusted Volumes (cu. yd.)	Adjusted Volumes (cu. yd.)	Mult Factor
DIRT				
	Excavation	624	624	1.00
	Fill	71	71	1.00

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1/27/2017

SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER ROAD
EARTHWORK QUANTITIES

DN:		DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CK DN:		CONT	SECT	JOB	HIGHWAY
DW:					SUNFLOWER
CK DW:		DIST	COUNTY		SHEET NO.
TR:		PHR	HIDALGO		9
CK TR:					

GENERAL NOTES:

Use the Texas Department of Transportation's "Standard Specifications for Construction And Maintenance of Highways, Streets, And Bridges" (November 2014) for item specifications information and requirements. The specification book shall read "Hidalgo County Precinct No. 2" in lieu of "The Texas Department of Transportation" and/or "The Department".

****

GENERAL REQUIREMENTS AND COVENANTS TO ITEMS 1 THRU 9

For all pits or quarries, comply with the "Texas Aggregate Quarry and Pit Safety Act."

Contact the 1-800 call services for locations of utilities before beginning any scarifying or excavating operations.

ITEM 100: Preparing Right of Way

Preparation of ROW will be done in accordance with the construction phasing shown on the Traffic Control Plans. Performance of this item will not be allowed outside of the project's current construction phase without prior approval by the County.

ITEM 132: Embankment

Embankment (DENS CONT) shall be Type C with a max. PI of 40. Material used as embankment material in the top two feet below the bottom of Flexible Base shall meet the following requirements based on preliminary tests and such other tests found necessary by the County.

1. The material shall be such as to produce a well-bonded embankment and shall have a minimum PI of 8 and a maximum PI of 30.

It is the Contractor's responsibility to advise the Engineer of the location of the source sufficiently in advance to avoid delay.

ITEM 164: Seeding for Erosion Control

During drill seeding operations, application methods shall be in accordance with the method shown in the Standard Specification Book.

SS-1 Tacking Agent shall be a ratio of 2:1, two (Emulsion) to one (water) and applied at a rate of 0.05 gallons per square yard. The SS-1 Tacking Agent required for Drill Seed operations, will not be paid for directly, but will be subsidiary to Item 164 "Drill Seeding." Watering shall not be use with the Drill Seed Method.

ITEM 247: Flexible Base

Flexible Base Type E will be composed of caliche (argillaceous Limestone, calcareous or calcareous clay particles) and may contain stone, conglomerate, gravel, sand or granular materials when these materials are in situ with the caliche.

Flexible Base (TY E GR 4) or (TY D GR 4) crushed concrete shall conform to the following requirements:

Retained on Sq. Sieve	Percent Retained
2"	0
½"	20-60
No. 4	40-75
No. 40	70-90
Max. PI:	15
Max. Wet Ball PI:	15
Wet Ball Mill Max Amount:	50
Min. Comp. Strength PSI:	150 at 15 PSI lateral pressure
Triaxial Test	Tex-117-E

The Wet Ball Test (Tex-116-E) shall be run and the Plasticity Index of the material passing the No. 40 sieve shall be determined (Wet Ball PI).

Two (2) percent lime (by weight) will be incorporated into the Flexible Base in the field at the County's expense in accordance with the provisions of Items 260.

The percent of density as determined by Compaction Ratio (Tex-113-E) for the new Flexible Base shall be a minimum of 98%.

The Contractor's attention is called to the fact that certain existing and/or proposed structures may be within the limits of the Flexible Base. It shall be the Contractor's responsibility to perform construction operations without damage to these structures.

For water added under Item 247, the sulfate content will not exceed 3000-ppm and the chloride content will not exceed 3000-ppm.

ITEM 260: Lime Treatment (Road Mixed)

The Contractor's attention is called to the fact that certain existing and/or proposed structures are within the limits of the lime-treated Subgrade. Unless otherwise directed by the County, these structures shall be installed before the final rolling of this Subgrade. It shall be the Contractor's responsibility to perform the proper lime treating operation without damage to these structures.

The slurry method of applying lime will be required, except when the lime is to be added to naturally wet materials as directed by the Engineer.

P4

SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER RD
GENERAL NOTES

DRAWING:		FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK:		6	TEXAS					SNFLWR
ENGINEER:		STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK:			HIDALGO					10A
REVIEW:								
CK:								

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1/27/2017

ITEM 341: Dense-Graded Hot-Mix Asphalt

The contractor shall exercise diligence in the application of "Tack Coat" by the use of flagging and rolling procedures to keep from spraying or splattering the traveling public with asphaltic material.

Blading (not to exceed more than 3-ft from the pavement edge) may also be necessary to clean dirt and grass from pavement edges and turnout areas as work under this bid Item. The cost of this blading will not be paid for directly, but shall be considered subsidiary to this bid Item.

This project will require the following minimum surface aggregate Classifications:

County	CSJ	Highway	Classification
Hidalgo	N/A	Sunflower Rd	A

RAP (recycled asphalt pavement) to be recycled will be stockpiled separately from other project sources and Contractor owned RAP. Each stockpile will be clearly marked by the Contractor indicating project source.

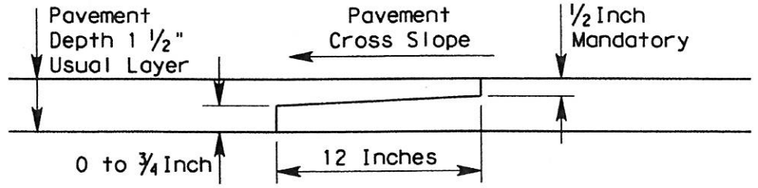
The Contractor shall exercise diligence during milling operations in order to avoid contamination. The RAP stockpiles are subjected to PI and decantation requirements as specified under this Item.

Recycled asphaltic pavement to be salvaged as shown in plans will be available for use as RAP in the hot-mix for this project.

All surplus RAP from this project will remain the property of the State.

Level-up will be placed before the surface course. An asphaltic concrete spreading and finishing machine and/or motor graders; when approved by the Engineer may be used to place the ACP level-up.

All unconfined longitudinal joints shall be constructed with a joint maker providing a maximum ½-inch vertical edge and a minimum 6:1 edge taper or as approved by the Engineer.



NOTCHED WEDGE JOINT

The engineer may allow for variances to the dimensions shown.

The Hamburg wheel Test requirement for PG 64 binder will be 5,000 passes @ 0.5 inch rut depth.

Target Lab Molded Density for this project shall be 97%.

ITEM 400: Excavation and Backfill for Structures

If the Contractor elects to cut pavement (existing/detour) for structural work beyond that required by the construction phasing shown in the plans and approved by the Engineer, it shall be restored at his expense and backfilled to its original condition or better in accordance with Item 400.

Unless shown otherwise in the plans, use a 1-ft depth for Item 400 Structural Excavation (Special for gravel bedding needed below drainage structures with unstable material.

ITEM 421: Hydraulic Cement Concrete

Submit to the County for approval the project locations for all Portland Cement concrete washout areas prior to starting any concrete work.

Use membrane curing, Type 2, for concrete curb, gutter and combined curb and gutter, concrete medians, directional islands and sidewalks.

ITEM 432: Riprap

Provide Class "A" concrete minimum for riprap aprons placed around all box culvert and pipe safety end treatments. Provide ¼-inch thick dummy joints at least every 15-ft for riprap aprons placed around box and pipe culverts.

Do not use fiber reinforced concrete RIPRAP on side slopes equal to or steeper than 6:1 unless approved by the engineer.

ITEM 464: Reinforced Concrete Pipe

Use tongue and groove pipe where the RCP extends into the lime treated subgrade. The 4-foot depth restriction for heavy equipment passage over pipe structures is voided. The Contractor will be responsible for any construction damage to these facilities.

Do not use mortar joints.

All reinforced concrete pipe shall include rubber gaskets unless shown otherwise on the plans or directed by the engineer.

ITEM 465: Junction Boxes, Manholes & Inlets

For TY PSL with RG, FG, or SFG lid inlets, provide Class B concrete riprap with (6"x6" W3xW3 (no. 6 gauge) welded wire fabric) for any side that is touching the natural ground. The riprap will

SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER RD
GENERAL NOTES

DRAWING:		FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK:		6	TEXAS					SNFLWR
ENGINEER:		STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK:			HIDALGO					10B
REVIEW:								
CK:								

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1/27/2017

ITEM 466: Headwalls and Wingwalls

Use pre-cast headwalls/wingwalls.

ITEM 471: Frames, Grates, Rings, and Covers

All grates will be tack welded to the frames in a manner satisfactory to the Engineer.

ITEM 502: Barricades, Signs, and Traffic Handling

Shadow vehicles equipped with Truck-Mounted Attenuators are required.

Replace/relocate all regulatory signs removed due to construction operations with the same sign on fixed support(s) immediately upon its removal. First obtain County approval before removing any regulatory roadway sign. Required flaggers are to be available to direct traffic during sign intermediate down time.

Relocate any Directional Sign Assemblies removed during construction operations immediately upon their removal.

These signs shall be relocated to a location in accordance with the Latest Version of the "Texas Manual on Uniform Traffic Control Devices". In no case will a sign be removed without a replacement sign and support(s) being readily available and a location established. Removal and relocation of these signs required for traffic control will not be paid for directly, but shall be considered subsidiary to Item 502.

From the beginning to the end of the project, all traffic control devices need to be in acceptable condition as per the Texas Quality Guidelines for Work Zone Traffic Control Devices.

ITEM 504: Field Office and Laboratory

For this project a field office will not be required at the project site.

ITEM 530: Intersections, Driveways, and Turnouts

Prime coat shall meet the requirements of Item 310.

Daily testing requirements for Hot Mix Asphaltic Concrete Pavements for drives, commercial entrances and/or turnouts may be waived by the County.

Public and private driveways need to have a smooth vertical transition tie-in between the propose driveway and the existing driveway. The contractor is to add a vertical taper if needed which will be subsidiary to Item 530.

ITEMS 636: Signs

Complete sign blanks and panels shall be handled and stored at the job site in such a manner that corners, edges and faces are not damaged. Finished sign blanks shall be stored in either a weathe proof warehouse or outside and off the ground in a vertical position. All paper, cardboard and chemically treated separators and packaging shall be removed prior to outside storage.

ITEM 644: Small Roadside Sign Assemblies

All signs shall be installed as shown in the plans and in accordance with the current edition of the "Texas Manual on Uniform Traffic Control Devices" and the "Sign Crew Field Book" (SCFB).

All signs shall be erected according to the locations shown on the signing layout sheets except that a sign may be shifted in order to secure a more desirable location. All sign locations will be staked as shown in the plans and as approved. It is the intent of the plans to erect all roadside traffic signs with the sign edge a minimum of 6 feet from the edge of the shoulder, or if none, 12 feet from the edge of the travel lane. In curb and gutter sections the sign edge shall be a minimum of 2 feet from the face of the curb.

For this project, aluminum type sign blanks as provided for under Item 636 will be required for all proposed signing installed under Item 644. Aluminum sign blanks less than 7.5 square feet shall be 0.08 inch thick, sign blanks 7.5 to 15 square feet shall be 0.100 inch thick and sign blanks greater than 15 square feet shall be 0.125 inch thick.

All excess excavation shall be spread uniformly inside the right of way as directed and shall be included in the price of these Items.

Sign types which design details are not shown on the plans shall conform with the latest edition of the Department's "Standard Highway Sign Design for Texas" Manual.

Signs shown to be removed shall include the complete sign installation and separate the sign post at the concrete foundation. The concrete foundation shall be disposed in accordance with this Bid Item. Except for concrete foundations, all removed sign panels, sign posts, and hardware shall remain then property of the Department. All removed sign installations shall be completely disassembled. All salvageable sections of sign panels shall be recycled by TxDOT. The removec sign material will be required to be hauled to the maintenance yard closest to the project. No sign shall be removed without prior approval.

ITEMS 662 and 666: Work Zone Pavement Markings and Retroreflectorized Pavement Marking

All permanent pavement markings and work zone pavement markings for this project under these Items shall be 0.100 inches (100 mil) thick thermoplastic.

P4

SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER RD
GENERAL NOTES

DRAWING:		FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK:		6	TEXAS					SNFLWR
ENGINEER:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK:			HIDALGO					10C
REVIEW:								
CK:								

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1/27/2017

GENERAL NOTES AND SPECIFICATIONS DATA:

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

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

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

DO NOT BLOCK DRAINAGE WHEN HANDLING & STOCKPILING EXCAVATED MATERIAL.

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

THE CONTRACTOR SHALL PROVIDE ALL WEATHER PASSAGE TO ALL LOCAL TRAFFIC.

TRAFFIC CONTROL DEVICES:

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

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

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

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

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

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

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

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

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

SAFETY:

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

SEQUENCE OF CONSTRUCTION:

1. INSTALL PROJECT LIMIT AND ADVANCE WARNING SIGNS AND INSTALL CROSSROAD BARRICADES/SIGNS, AS SHOWN ON THE TRAFFIC PLANS (TCP), IN ACCORDANCE WITH THE LATEST TXMUTCD AND/OR AS DIRECTED BY THE PROJECT ENGINEER. THESE SIGNS SHALL BE ERECTED AND PLACED PRIOR TO COMMENCING ANY PROPOSED ROADWAY CONSTRUCTION AND SHALL REMAIN IN PLACE FOR THE DURATION OF THE PROJECT AND UNTIL COMPLETION AND ACCEPTANCE OF THE PROJECT BY THE COUNTY.

2. CLOSE SUNFLOWER ROAD ALLOWING PASSAGE TO LOCAL TRAFFIC ONLY AND DETOUR ALL REMAINING TRAFFIC THROUGH EXISTING HOLMES ROAD AS SHOWN ON THE TCP DETOUR LAYOUT AND IN ACCORDANCE WITH THE LATEST TXMUTCD AND/OR AS DIRECTED BY THE ENGINEER.

3. BEGIN SUNFLOWER ROAD WIDENING CONSTRUCTION INCLUDING CLEAN, RESHAPE, GRADE ROAD SIDE DITCHES, AND INSTALL THE DRAINAGE STORM SEWER INLETS AND PIPES. ONE EXISTING TRAVEL LANE SHALL REMAIN OPEN AT ALL TIMES DURING CONSTRUCTION OPERATIONS FOR LOCAL TRAFFIC TO CONTINUE TO ACCESS. THE CONTRACTOR SHALL OPEN ALL EXISTING LANES DURING NON-CONSTRUCTION OPERATION HOURS TO ALLOW BI-DIRECTIONAL LOCAL TRAFFIC TO CONTINUE TO ACCESS.

4. PLACE FINAL ACP OVERALY THROUGH ENTIRE WIDTH OF ROADWAY AS SHOWN ON THE PROPOSED TYPICAL SECTIONS AND IN ACCORDANCE WITH THE TCP STANDARDS AND PROJECT SPECIFICATIONS.

5. INSTALL EROSION CONTROL LOGS AND/OR ANY OTHER REQUIRED EROSION / SEDIMENTATION CONTROL DEVICES AS SHOWN ON THE SW3P LAYOUTS AND STANDARDS.

6. INSTALL FINAL STRIPING AND SIGNING.

7. OPEN SUNFLOWER ROAD TO FULL TRAFFIC AND REMOVE ALL TCP BARRICADES, SIGNS, CHANNELIZING DEVICES, AND EROSION / SEDIMENTATION CONTROL DEVICES AFTER APPROVAL AND ACCEPTANCE OF THE PROJECT BY THE COUNTY.

STATE OF TEXAS
JULIO CESAR CERDA
90524
LICENSED PROFESSIONAL ENGINEER

P4

SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER RD
TRAFFIC CONTROL PLAN
GENERAL NOTES / SEQUENCE OF CONSTRUCTION

SHEET 1 OF 1

DRAWING:		DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CK:		CONT	SECT	JOB	HIGHWAY
ENGINEER:		921	02		Sunf.
CK:		DIST	COUNTY		SHEET NO.
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CK:					

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LEGEND	
▬	CONSTRUCTION PHASE
→	DIRECTION OF TRAFFIC FLOW
▬	TYPE 3 BARRICADE
▬	CONSTRUCTION SIGN
▲	SIGN SPACING - 120'
■	SIGN SPACING - 500'
★	SIGN SPACING - 320'

SKINNER RD

MILE 17 RD N

SUNFLOWER RD

R20-3 48X42 OBEY WARNING SIGNS STATE LAW

G20-10T STAY ALERT — TALK OR TEXT LATER

SPEED LIMIT 30 R2-1 36X48

ROAD WORK AHEAD CW20-4D 48X48

DETOUR AHEAD CW20-2D 48X48

M4-12T SUNFLOWER RD DETOUR M4-9L 30X24

G20-5T 48X18 BEGIN ROAD WORK NEXT 1 MILES — NAME ADDRESS CITY STATE CONTRACTOR

G20-6 48X30

G20-9TP 36x24 BEGIN WORK ZONE

R20-5T 36x36 TRAFFIC FINES DOUBLE

R20-5aTP PLAQUE 36x18 WHEN WORKERS ARE PRESENT

M4-12T SUNFLOWER RD DETOUR M4-9R 30X24

G20-2 48X24 END ROAD WORK

M4-8a 30X24 END DETOUR

M4-12T SUNFLOWER RD DETOUR M4-9L 30X24

DETOUR M4-10R 48X18

ROAD CLOSED TO THRU TRAFFIC R11-4

ROAD WORK NEXT 1 MILE G20-1bR 72X36

TY 3 BARRICADE

SUNFLOWER RD
STA. 111+70.00
END PROPJECT

RIO VALLEY RAILROAD

HERNANDEZ DR

HOLMES RD

107

TEX-MEX RD

1423

M4-12T SUNFLOWER RD DETOUR M4-9S 30X24

M4-10L 48X18

ROAD WORK NEXT 1 MILE G20-1bL 72X36

SUNFLOWER RD
STA. 100+50.00
BEG PROJECT

SPEED LIMIT 30 R2-1 36X48

STAY ALERT — TALK OR TEXT LATER G20-10T

OBEY WARNING SIGNS STATE LAW R20-3 48X42

STATE OF TEXAS
JULIO CESAR CERDA
90524
LICENSED PROFESSIONAL ENGINEER

SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER RD
TRAFFIC CONTROL PLAN
DETOUR LAYOUT

SHEET 1 OF 1

DN:		DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CK DN:	CONT	SECT	JOB		HIGHWAY
DW:	921	02			Sunf.
CK DW:	DIST		COUNTY		SHEET NO.
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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

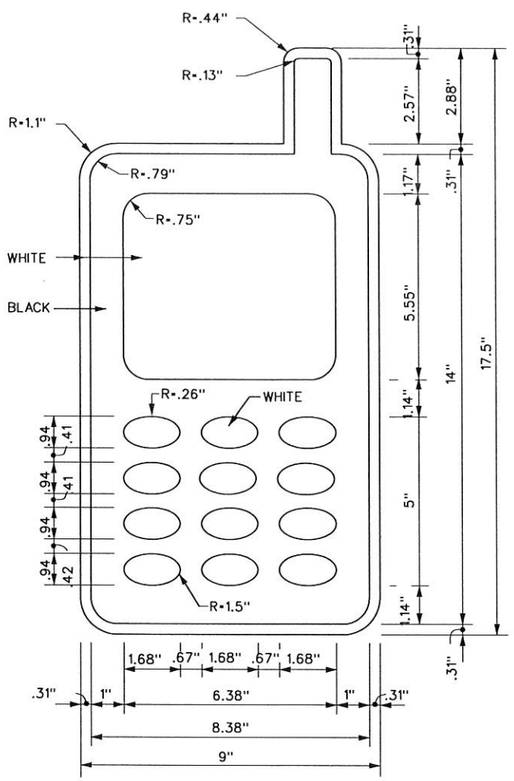
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.

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

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

WORKER SAFETY APPAREL NOTES:

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





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

SIGN DETAIL (G20-10T)

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

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

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

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

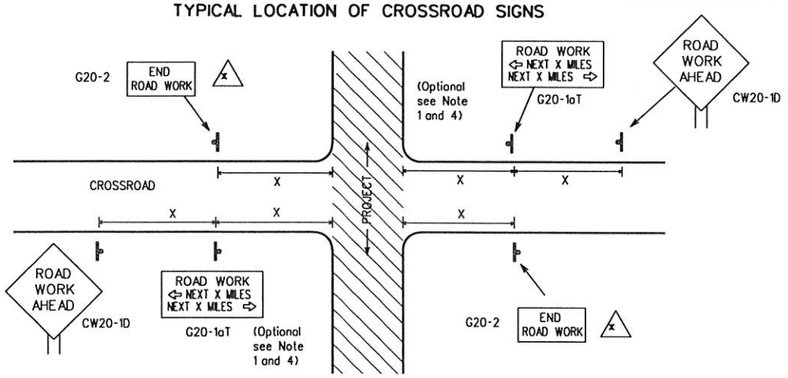
BC(1)-14

FILE: bc-14.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	921	02		Sunf.
4-03 5-10 8-14	DIST	COUNTY		SHEET NO.
9-07 7-13		HIDALGO		13

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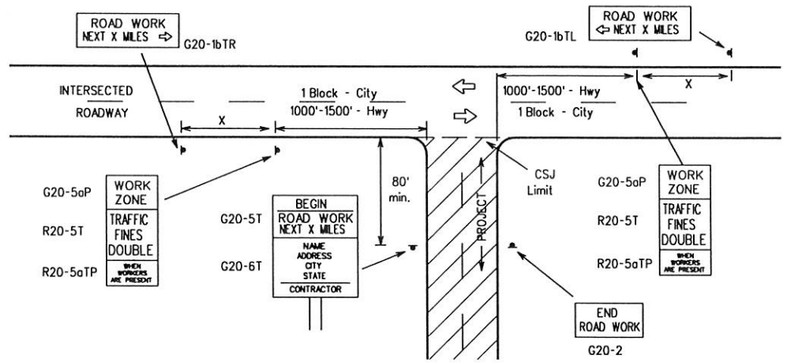
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

Posted Speed	Sign Spacing "X" 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]

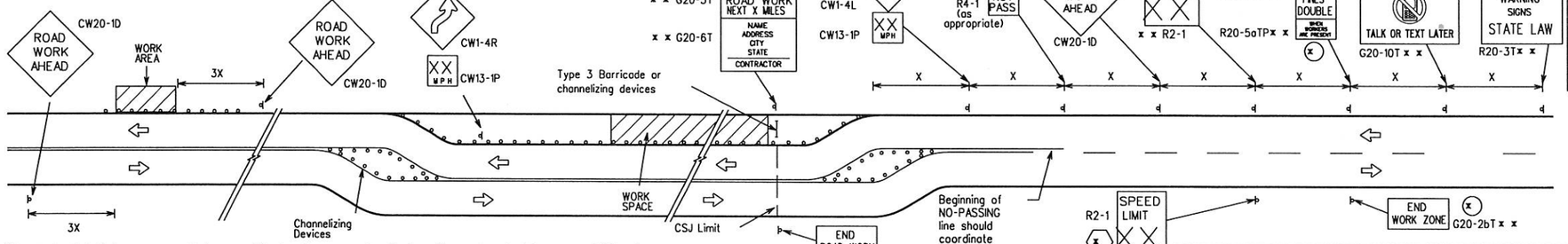
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

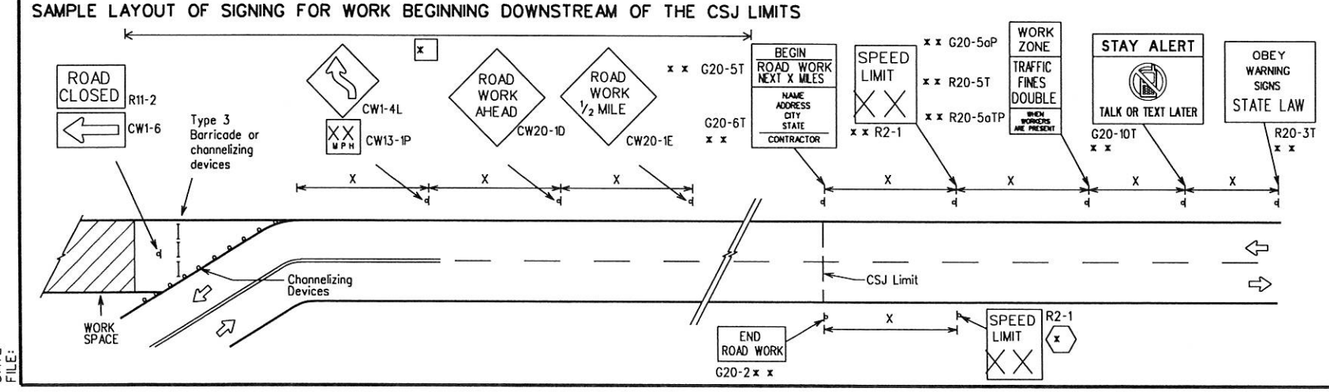
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

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



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

NOTES

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

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

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

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

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

LEGEND

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-14

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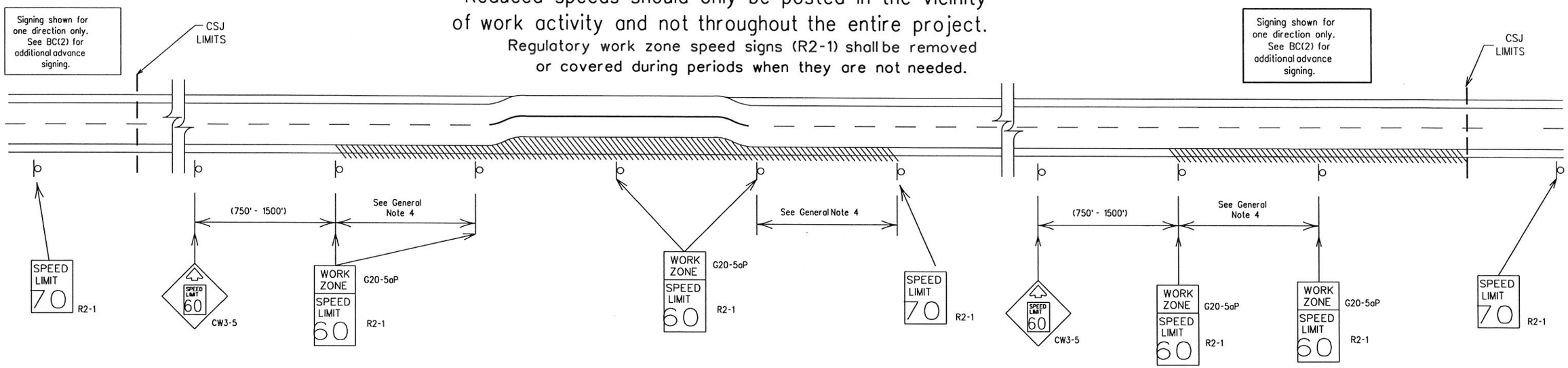
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

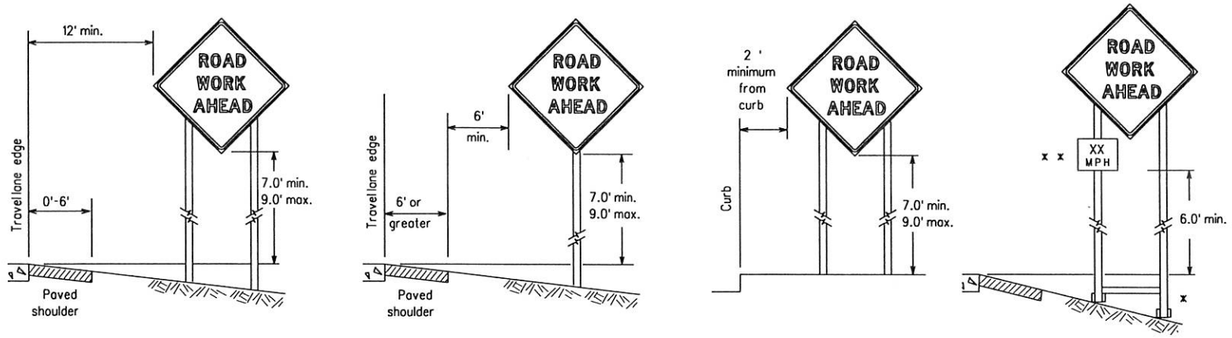
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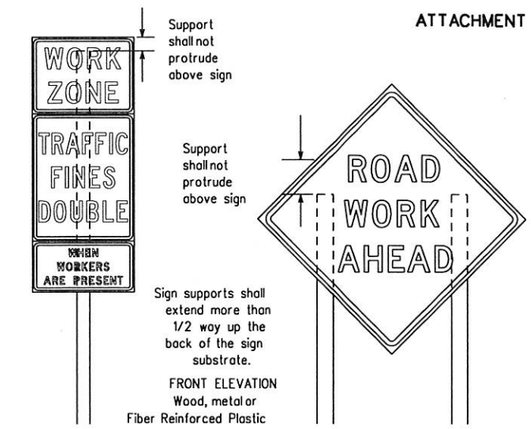
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



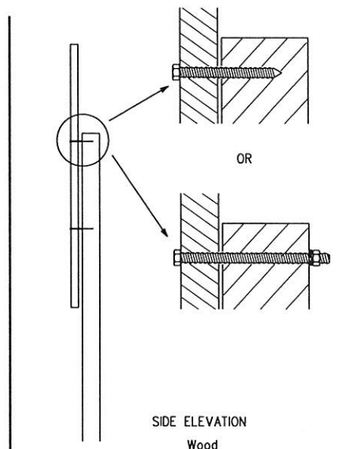
x When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS



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

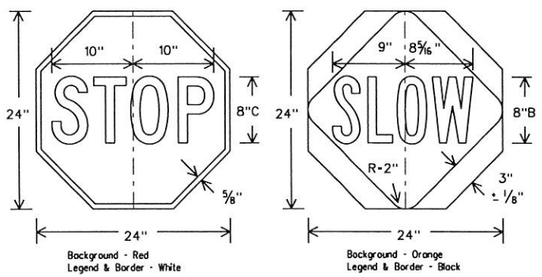


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

STOP/SLOW PADDLES

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



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation

Traffic Operations Division Standard

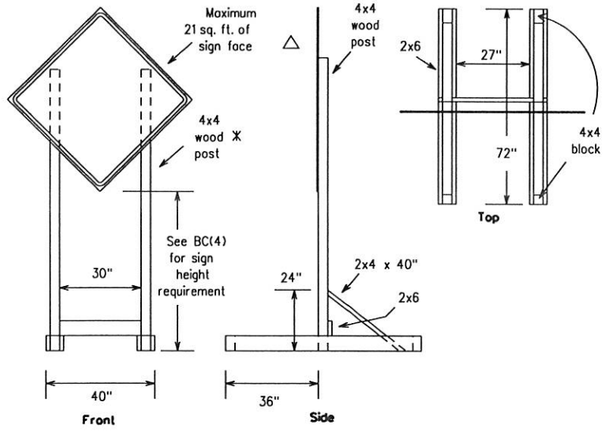
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

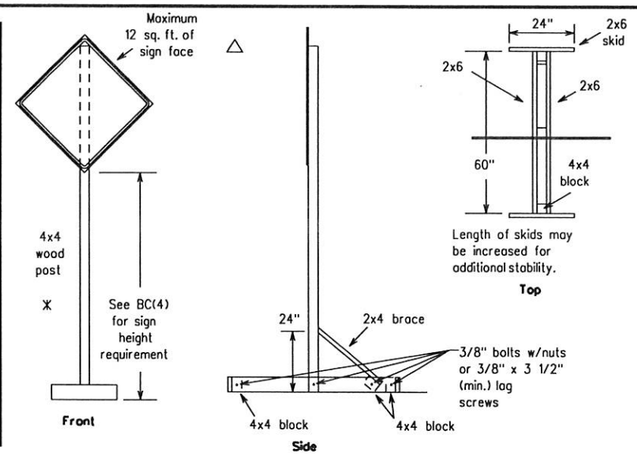
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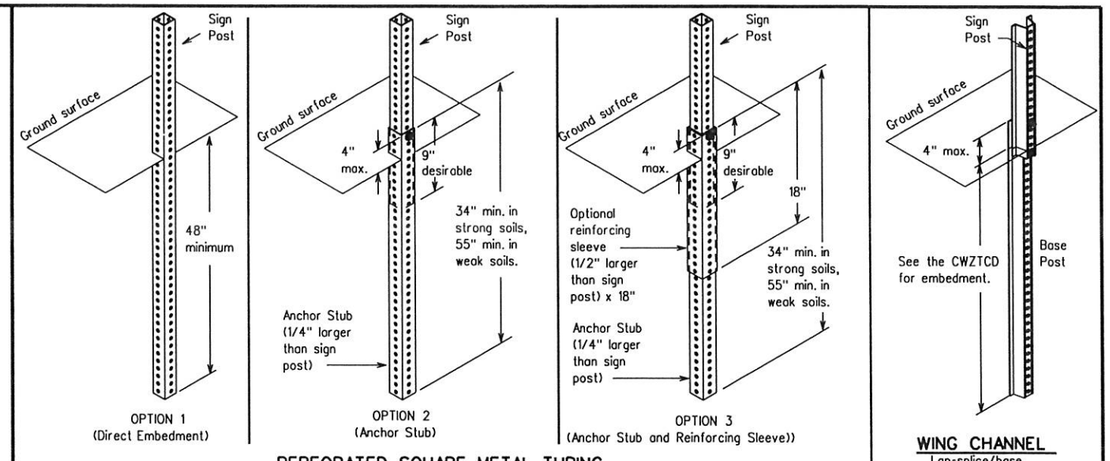
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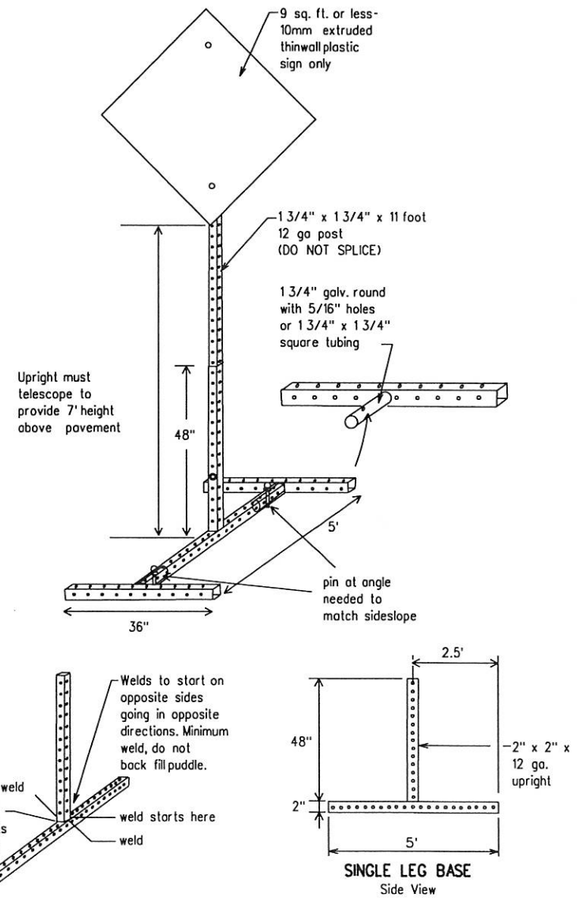
SKID MOUNTED WOOD SIGN SUPPORTS

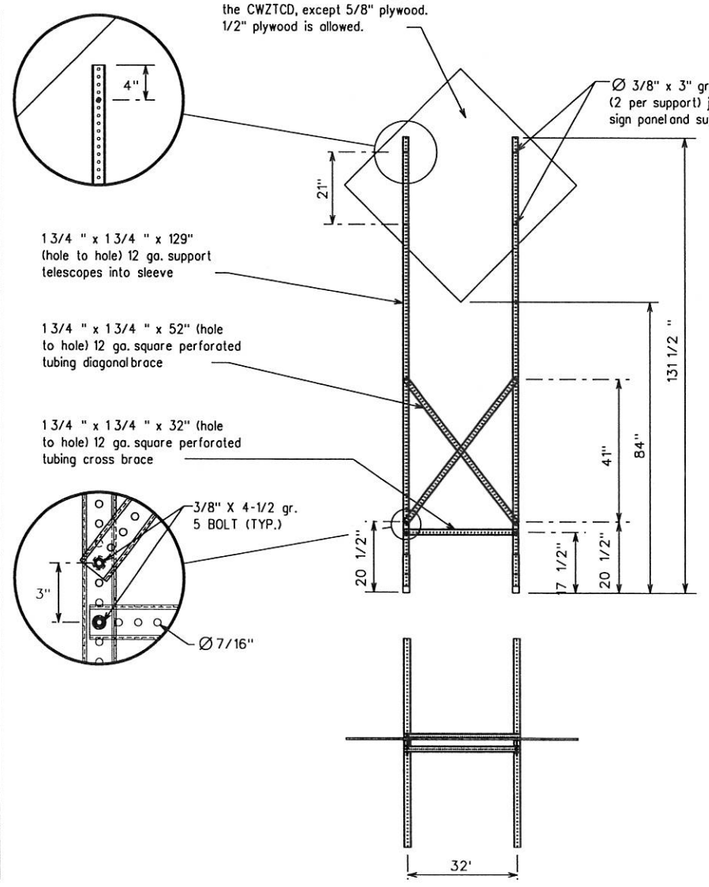
LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □

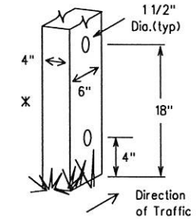


GROUND MOUNTED SIGN SUPPORTS

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

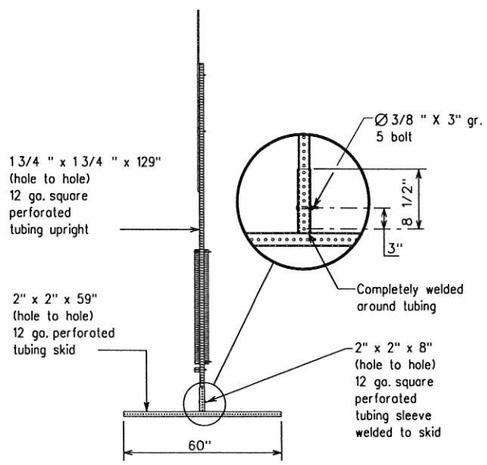






Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS



WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-14

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SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

- 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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-14

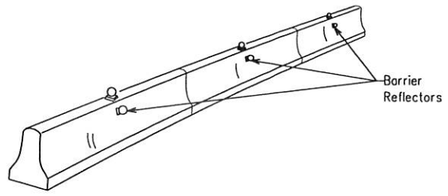
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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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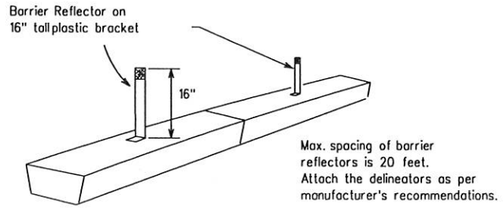
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1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.

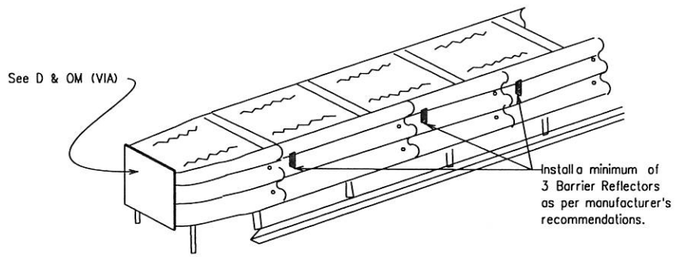


CONCRETE TRAFFIC BARRIER (CTB)

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



LOW PROFILE CONCRETE BARRIER (LPCB)

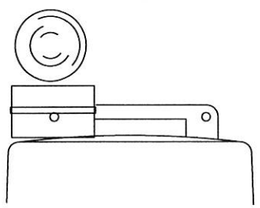


DELINEATION OF END TREATMENTS

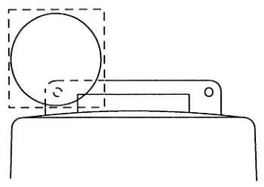
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

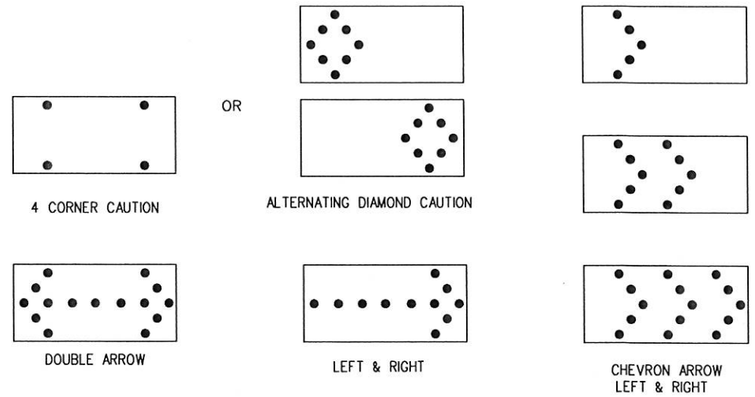
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

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

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

FLASHING ARROW BOARDS

SHEET 7 OF 10

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Operations Division Standard

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

BC(7)-14

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

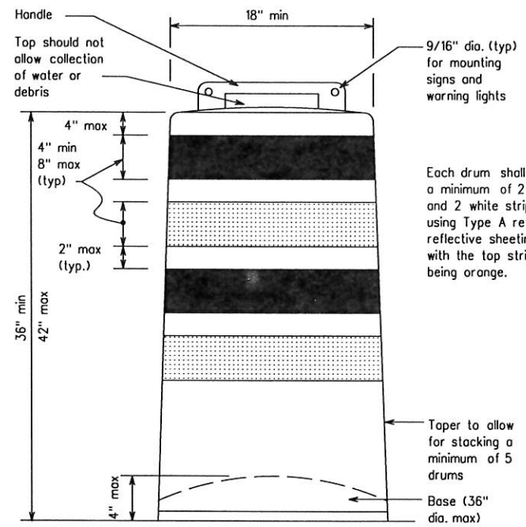
1. Plastic drums shall be a two-piece design: the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

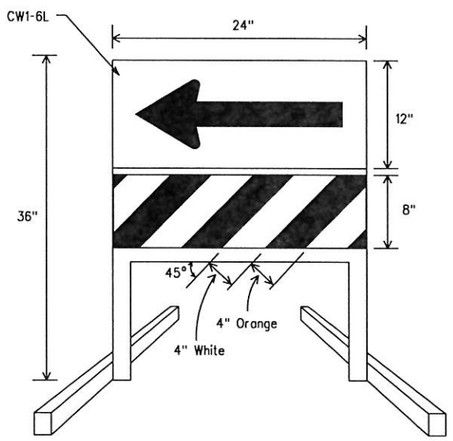
RETROREFLECTIVE SHEETING

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

BALLAST

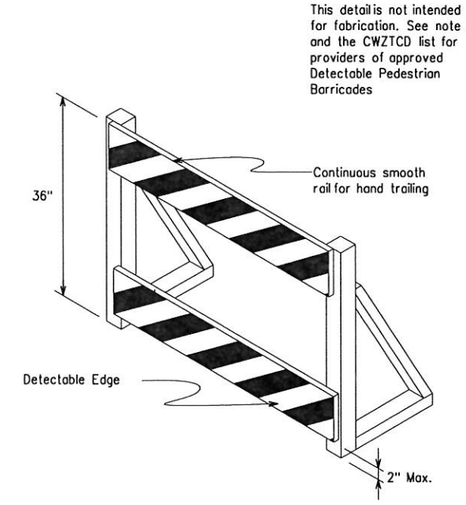
1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other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





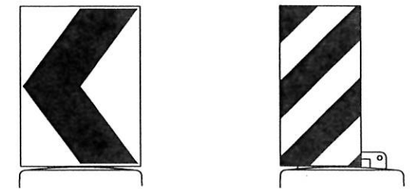
DIRECTION INDICATOR BARRICADE

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



DETECTABLE PEDESTRIAN BARRICADES

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



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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation

Traffic Operations Division Standard

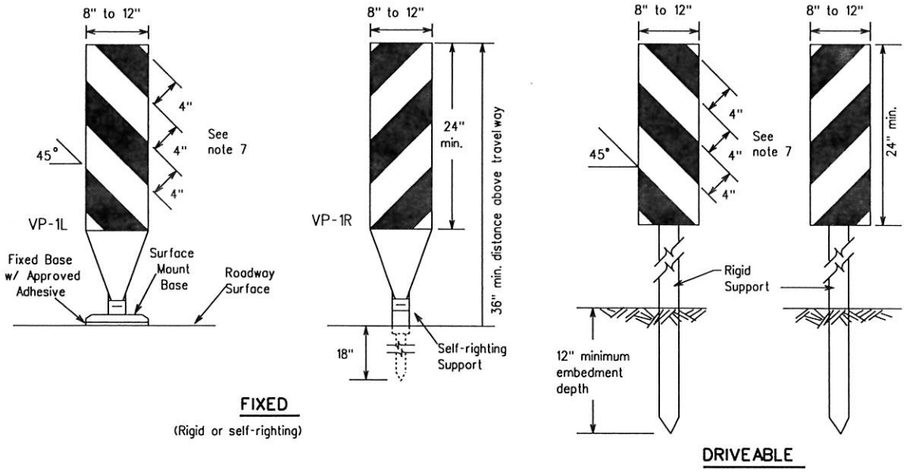
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-14

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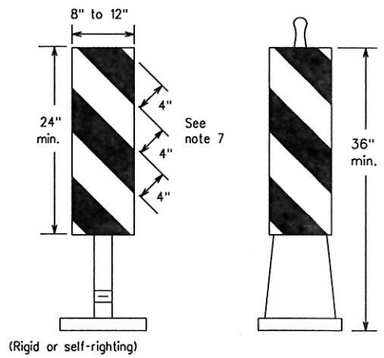
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FIXED

(Rigid or self-righting)

DRIVEABLE

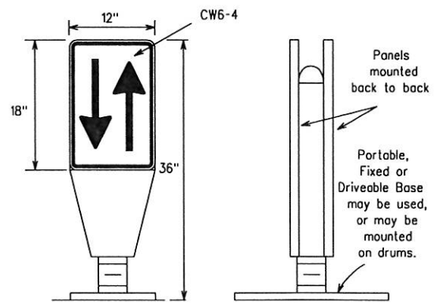


(Rigid or self-righting)

PORTABLE

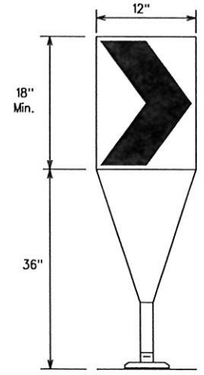
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



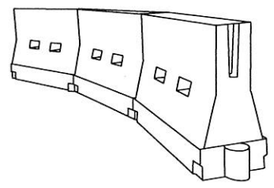
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-14

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7-13		HIDALGO		21

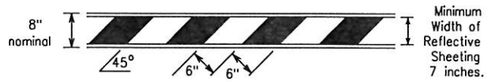
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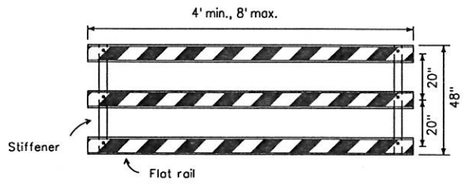
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



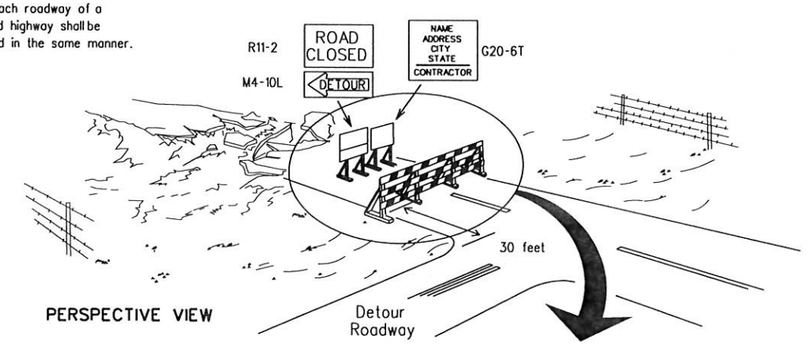
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

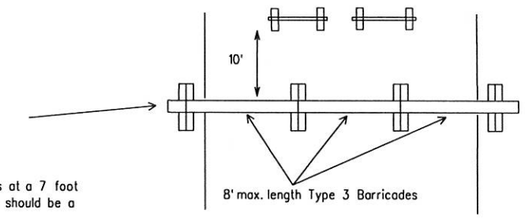
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.

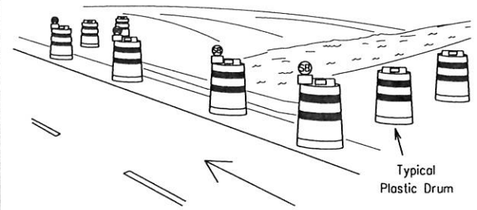
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

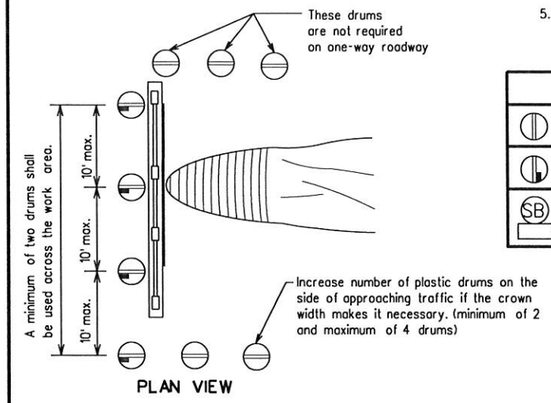
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

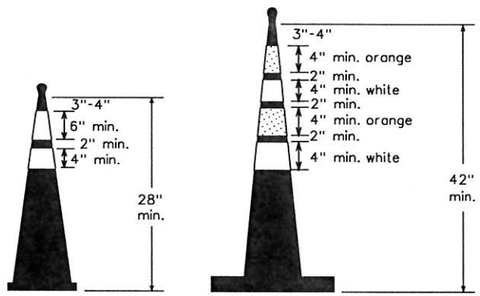
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



PLAN VIEW

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

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones

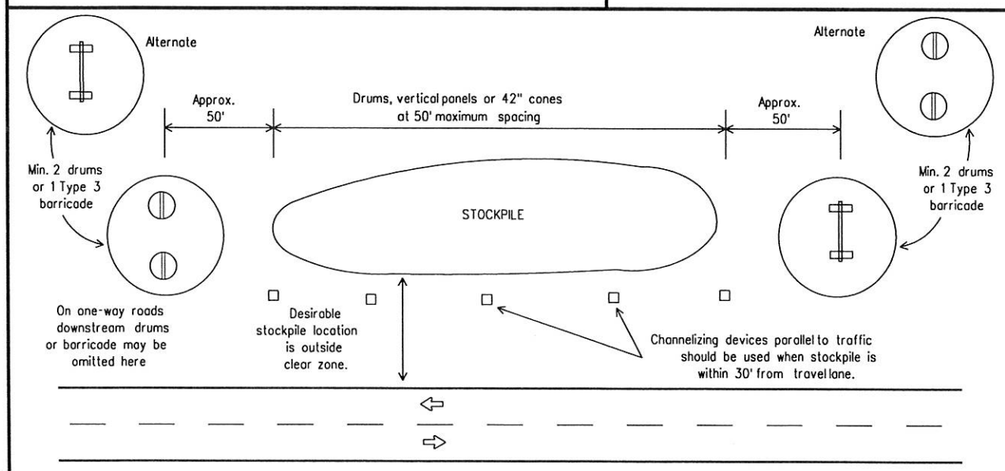
One-Piece cones

Tubular Marker

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

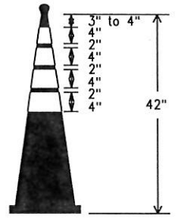
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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



EDGELINE CHANNELIZER

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

Texas Department of Transportation

Traffic Operations Division Standard

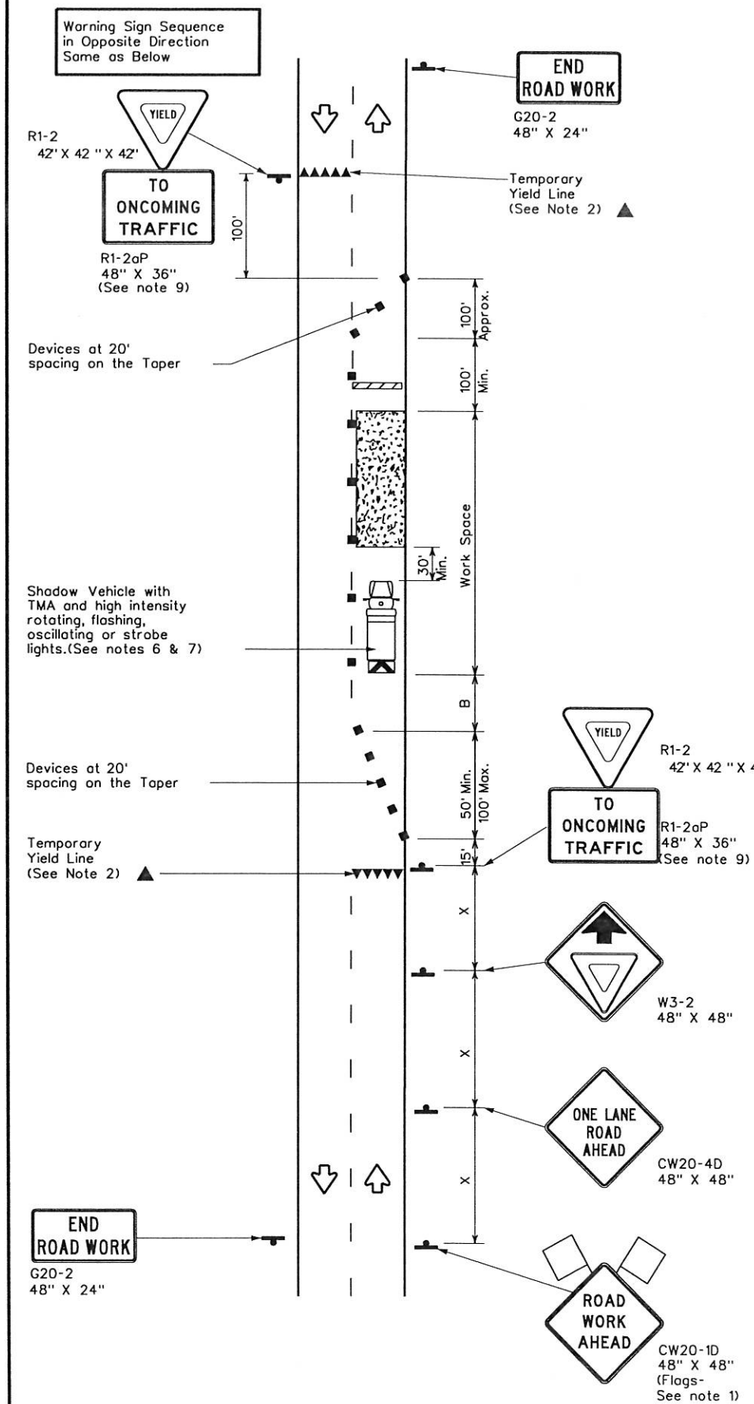
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-14

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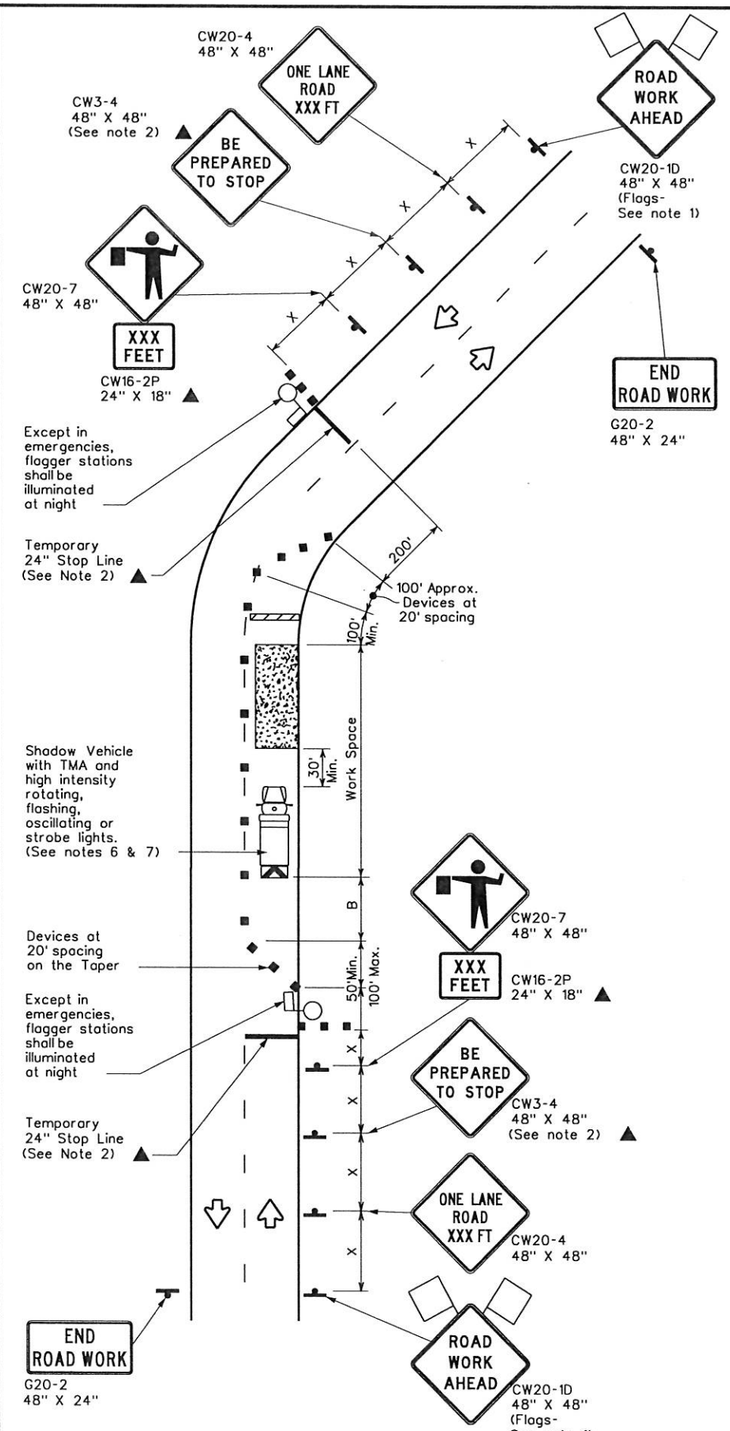
TCP (2-2a)

2-LANE ROADWAY WITHOUT PAVED SHOULDERS

ONE LANE TWO-WAY

CONTROL WITH YIELD SIGNS

(Less than 2000 ADT - See Note 9)



TCP (2-2b)

2-LANE ROADWAY WITHOUT PAVED SHOULDERS

ONE LANE TWO-WAY

CONTROL WITH FLAGGERS

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

* Conventional Roads Only

** Taper lengths have been rounded off.

L-Length of Taper(FT) W-Width of Offset(FT) S-Posted Speed(MPH)

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-2a)

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

TCP (2-2b)

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

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(2-2)-12

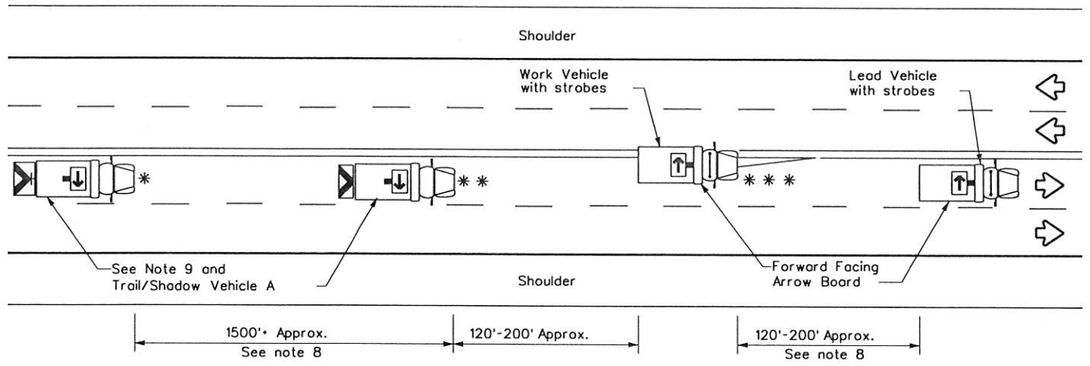
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1-97				
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3-03	PHR	HIDALGO		23

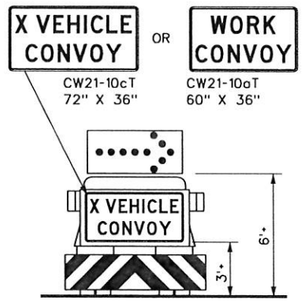
DATE:
FILE:

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TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

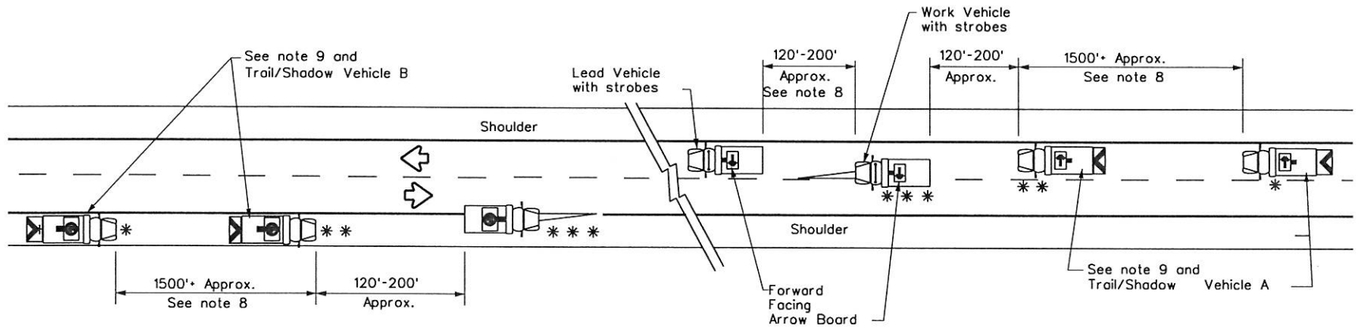
with RIGHT Directional display Flashing Arrow Board

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

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

GENERAL NOTES

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

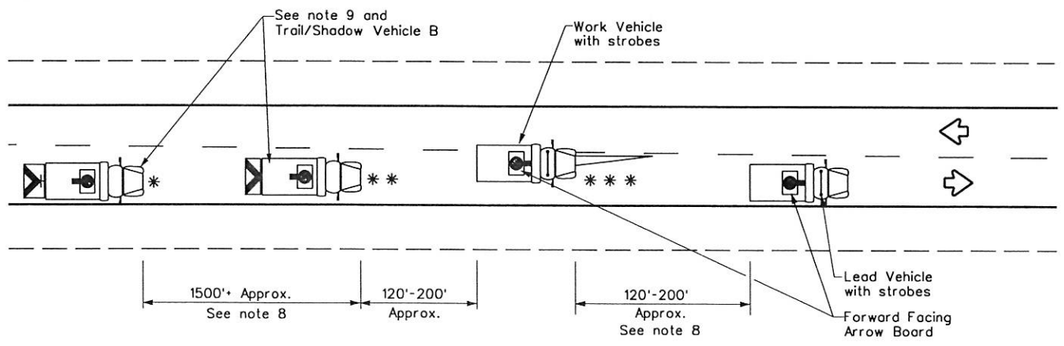


WORK ON SHOULDER

WORK ON TRAVEL LANE

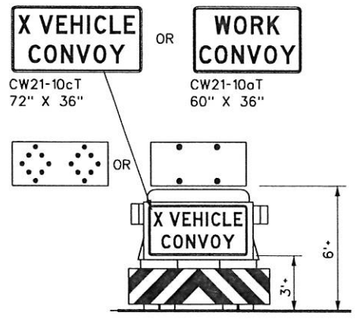
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



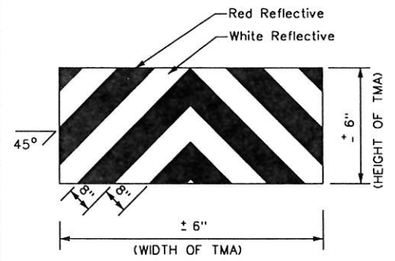
TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in CAUTION display



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

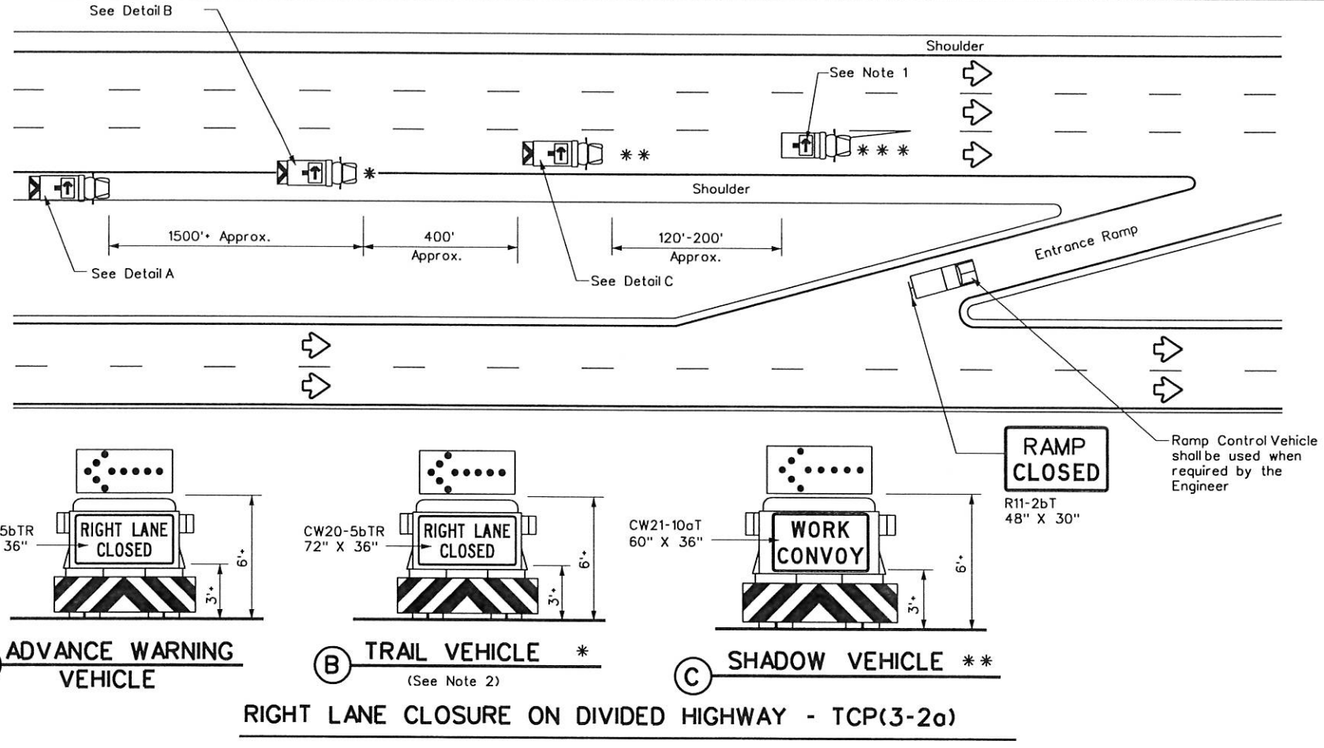
TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

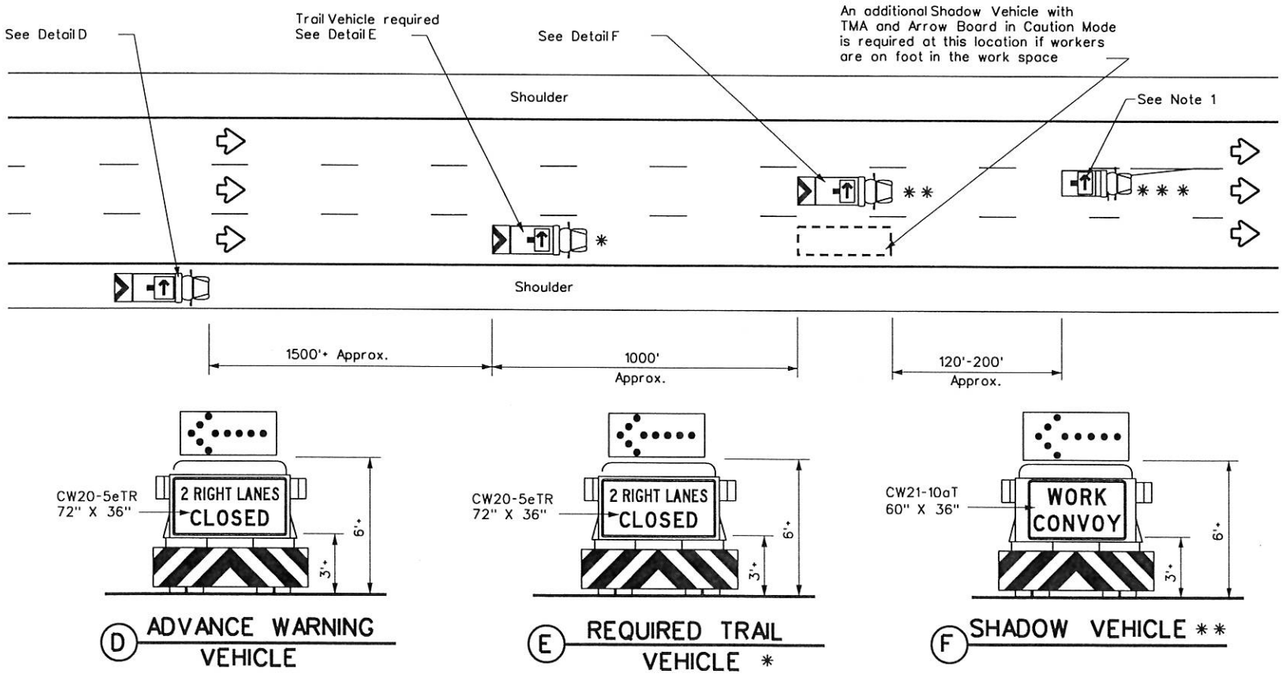
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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	921	02		Sunf.
2-94 4-98 8-95 7-13 1-97	DIST	COUNTY		SHEET NO.
		HIDALGO		24

DATE:
FILE:

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RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

DATE:
FILE:

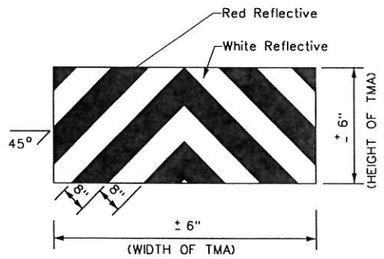
LEGEND

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

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

GENERAL NOTES

1. ADVANCE WARNING, TRAIL and SHADOW vehicles shall be equipped with Type B or Type C flashing arrow boards as per the Barricade and Construction (BC) standards. Arrow boards on WORK vehicles will be optional based on the type of work being performed. The arrow boards shall be operated from inside the vehicle.
2. For TCP(3-2a) the Engineer will determine if the TRAIL VEHICLE is required based on prevailing roadway conditions, traffic volume, and sight distance restrictions. All other vehicles shown for both TCP(3-2a) and TCP(3-2b) are required.
3. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
4. The use of truck mounted attenuators (TMA) on the ADVANCE WARNING, SHADOW, and TRAIL vehicles are required.
5. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DMS 8300, Type A.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE may vary according to terrain, work activity and other factors.
9. Standard 48" X 48" diamond shaped warning signs with the same message as those shown may be used where adequate mounting space exists.
10. The signs shown should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or a truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board, must be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
12. The principles on this sheet may be used to close lanes from the left side of the roadway considering the number of lanes, shoulder width, sight distance, and ramp frequency.
13. Signs and flashing arrow board modes shall be appropriately altered when implementing left lane closures or interior closures which close the left lanes.
14. The Advance Warning Vehicle may straddle the edgeline when shoulder width makes it necessary.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

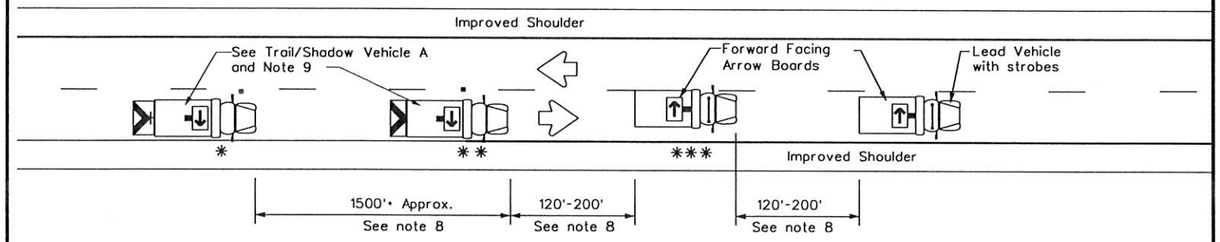
TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	DIST	COUNTY		SHEET NO. 25

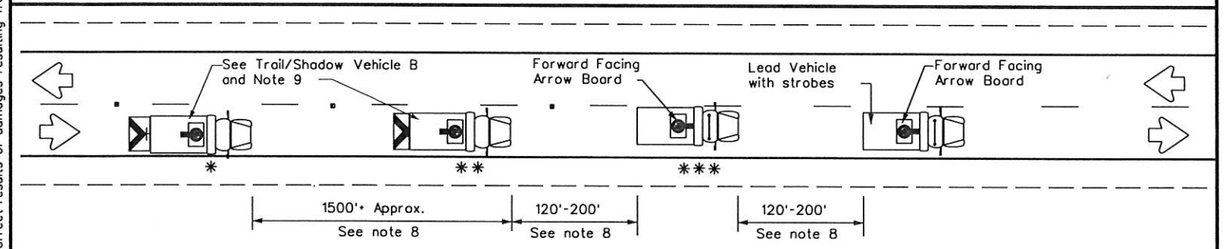
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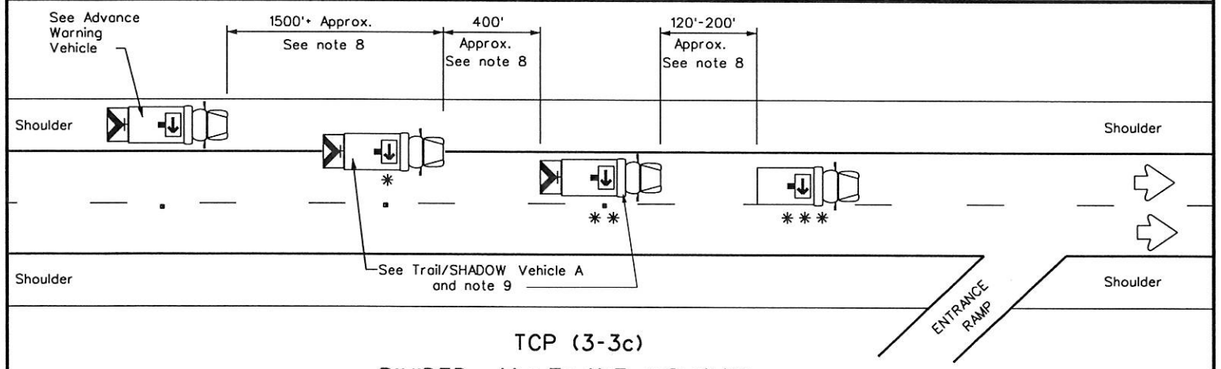
TCP (3-3a)

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



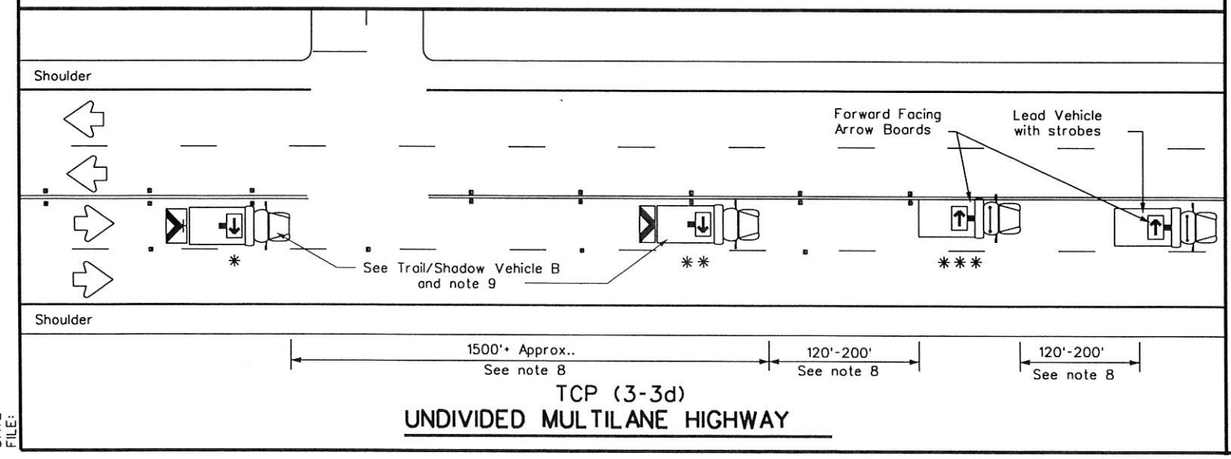
TCP (3-3b)

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



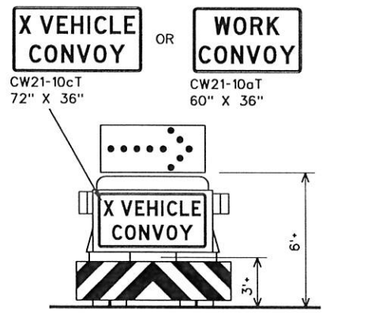
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



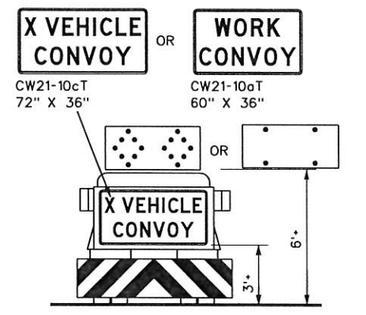
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



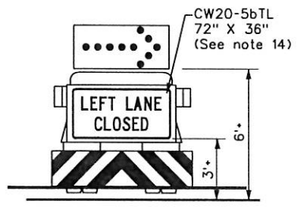
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

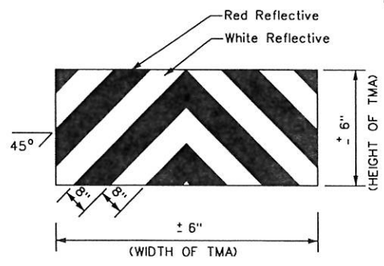


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL

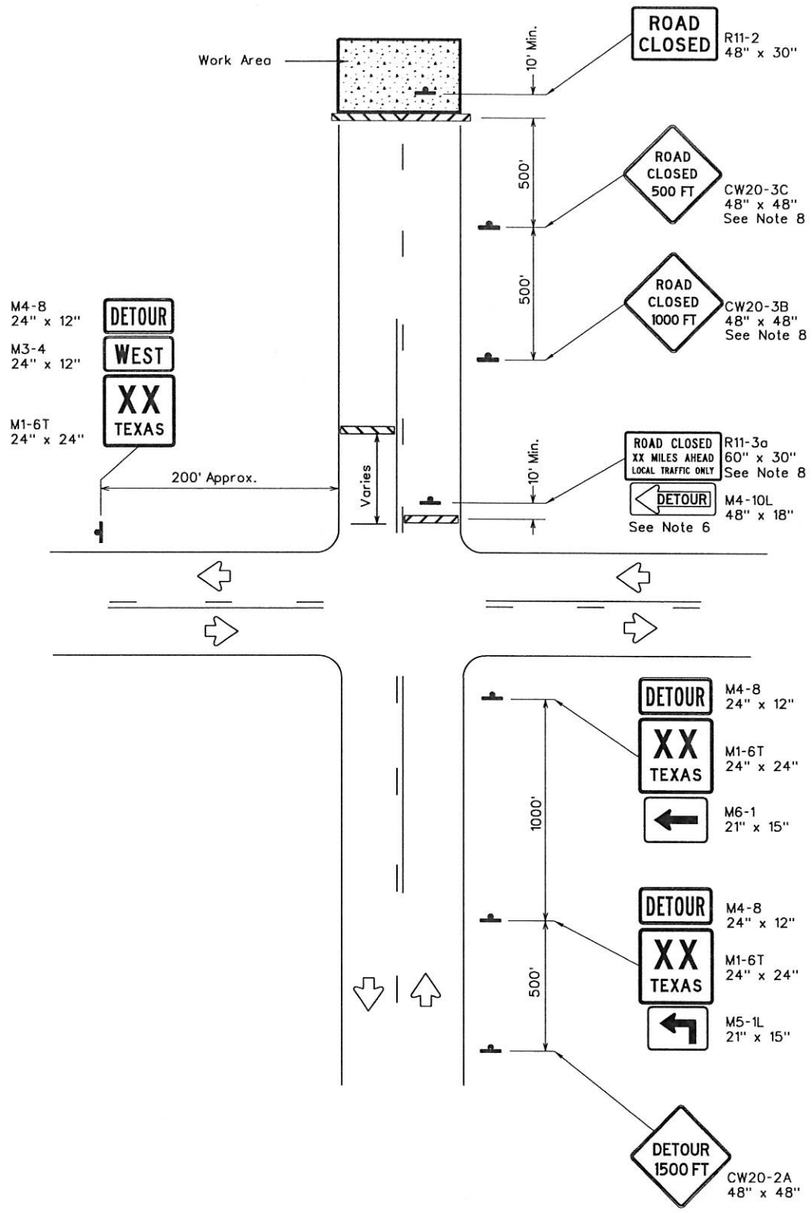
TCP(3-3)-14

FILE: tcp3-3.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS				
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13				26
1-97 7-14				

DATE:
FILE:

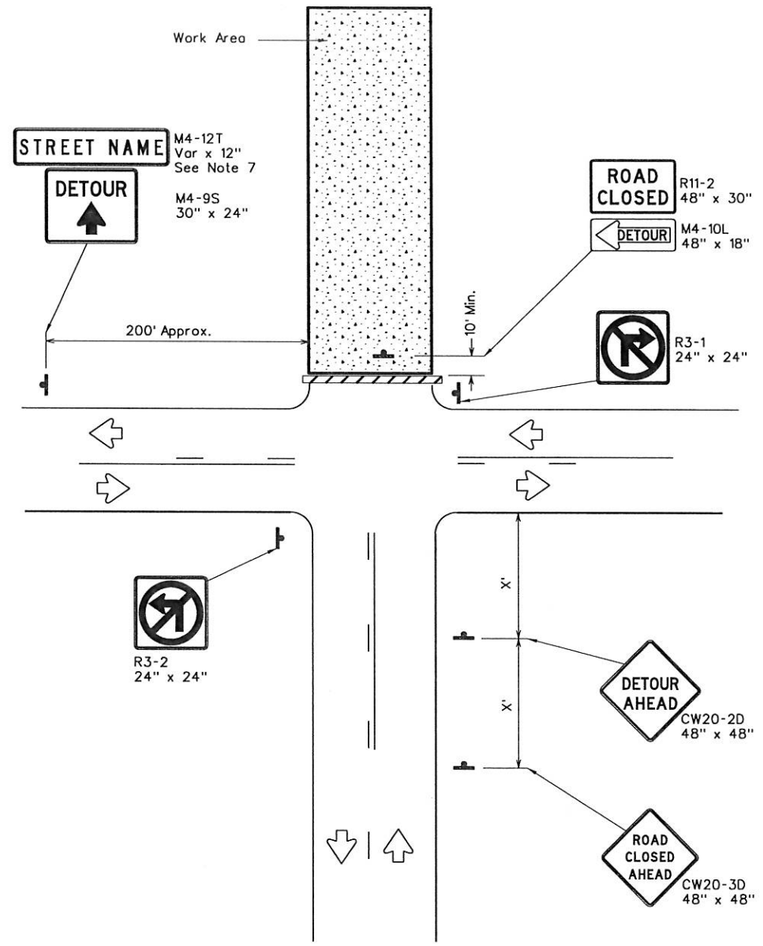
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DATE:
FILE:



ROAD CLOSURE BEYOND THE INTERSECTION

Signing for a Numbered Route with an Off-Site Detour



ROAD CLOSURE AT THE INTERSECTION

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

LEGEND	
	Type 3 Barricade
	Sign

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

* Conventional Roads Only

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE ROAD CLOSURE DETAILS

WZ(RCD)-13

FILE: wzrcd-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS				
1-97 4-98 7-13	DIST	COUNTY		SHEET NO.
2-98 3-03				27

113

SUNFLOWER ROAD ALIGNMENT

<* 1 Describe Chain EXCL

Chain EXCL contains:
EXCL1 EXCL2 EXCL3

Beginning chain EXCL description

Point EXCL1 X 1,133,150.45 Y 16,632,714.02 Sta 100+00.00

Course from EXCL1 to EXCL2 N 0° 46' 17.01" W Dist 716.08

Point EXCL2 X 1,133,140.81 Y 16,633,430.04 Sta 107+16.08

Course from EXCL2 to EXCL3 N 0° 54' 02.87" W Dist 1,071.61

Point EXCL3 X 1,133,123.96 Y 16,634,501.51 Sta 117+87.69

Ending chain EXCL description

STORM SEWER OUTFALL ALIGNMENT

Beginning chain STORMPCL description

Point STORM1 X 1,133,136.43 Y 16,633,708.18 Sta 200+00.00

Course from STORM1 to STORM2 N 81° 13' 31.32" W Dist 594.93

Point STORM2 X 1,132,548.46 Y 16,633,798.94 Sta 205+94.93

Course from STORM2 to STORM3 N 42° 40' 40.08" W Dist 156.39

Point STORM3 X 1,132,442.45 Y 16,633,913.91 Sta 207+51.32

Ending chain STORMPCL description

STATE OF TEXAS
JULIO CESAR CERDA
90524
LICENSED PROFESSIONAL ENGINEER

SOUTH TEXAS INFRASTRUCTURE GROUP

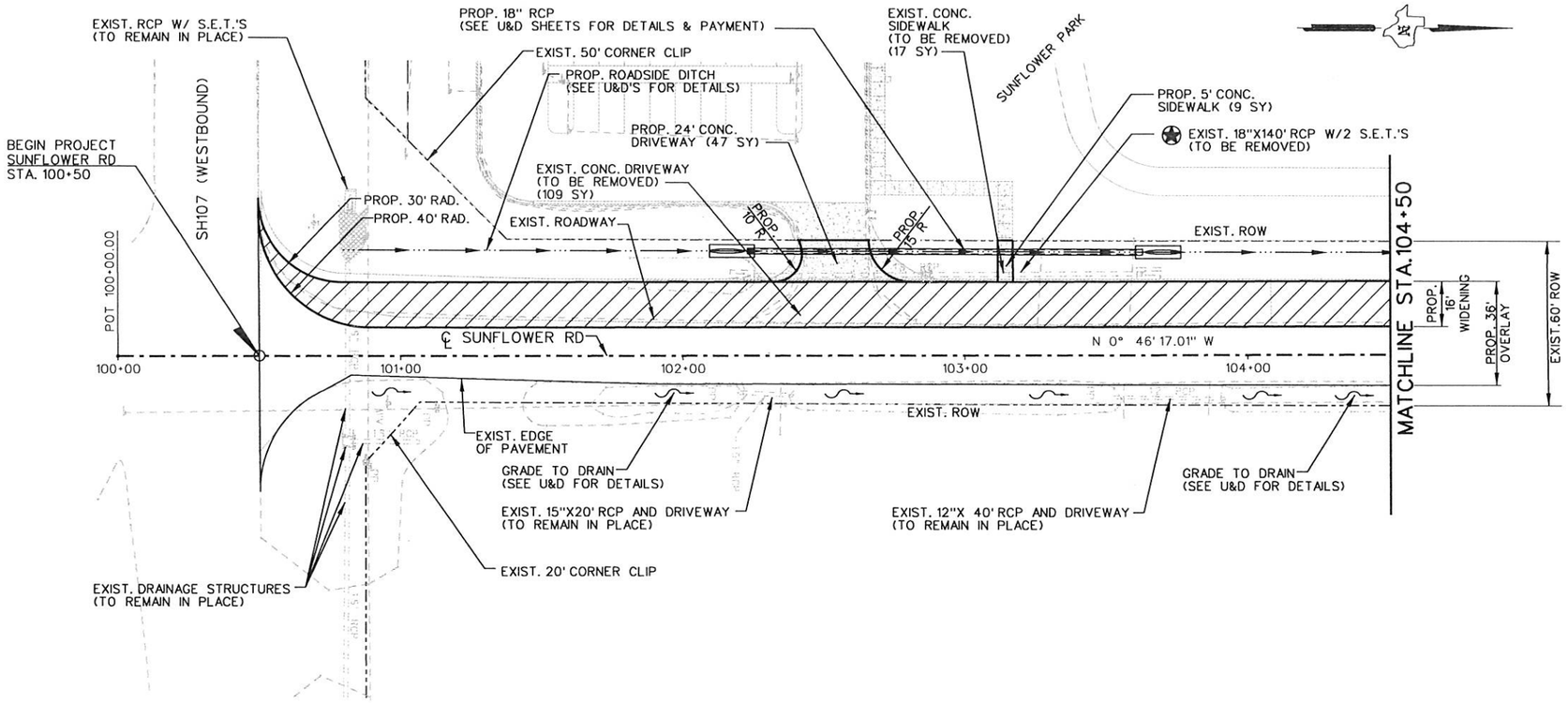
SUNFLOWER ROAD ROADWAY DATA

SHEET 1 OF 1

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CK:		6	TEXAS					Sunf.
ENGINEER:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK:		PHR	HIDALGO	921	02			28
REVIEW:								
CK:								

M:\Chris\Precinct 4\Sunflower\03 ROADWAY\01 AlignData\Sunflower Rd_ALIGNDATA.dgn

1/27/2017



SHEET SUMMARY

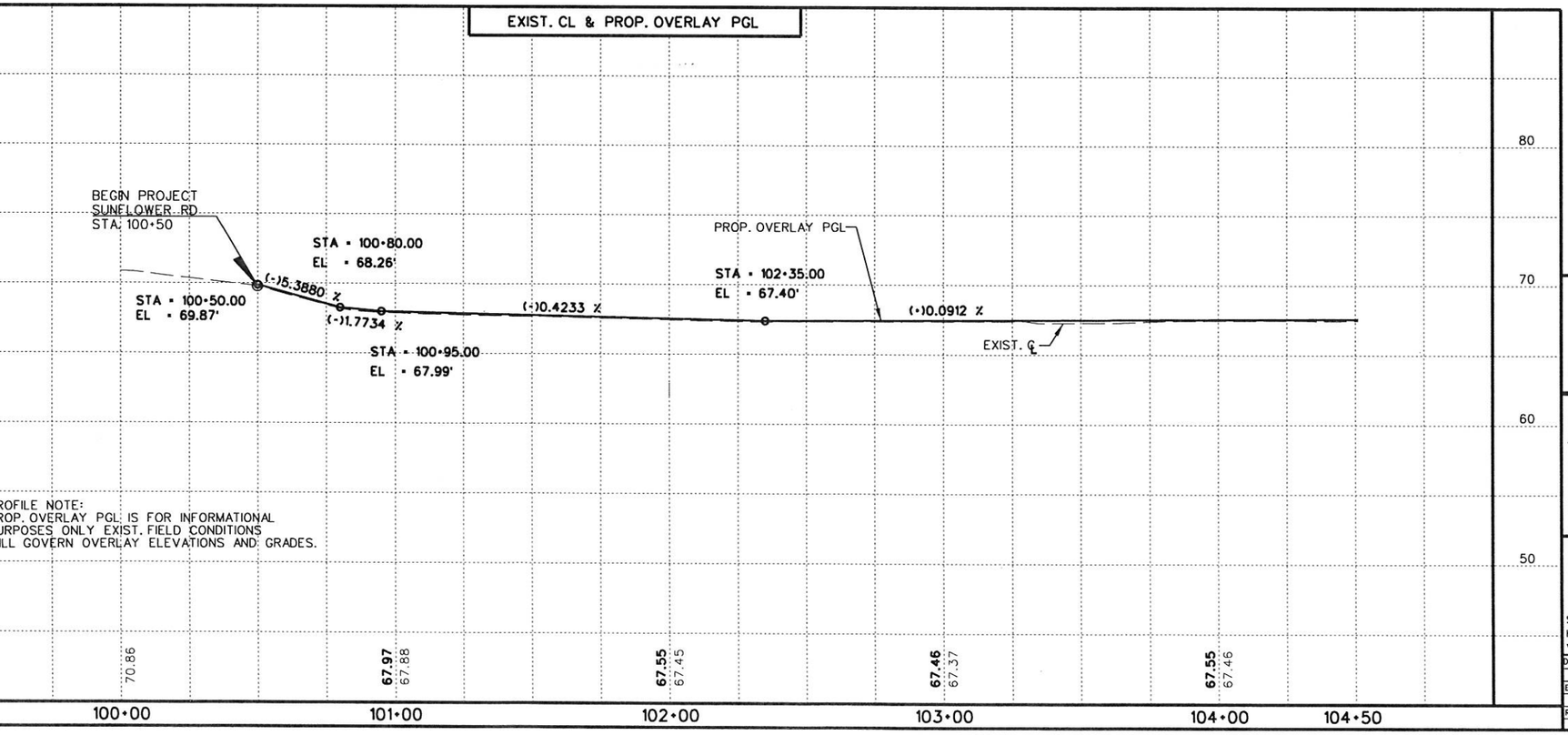
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104	REMOVING CONC (SIDEWALK)	SY	17
104	REMOVING CONC (DRIVEWAYS)	SY	109
496	REMOV STR (SET)	EA	2
496	REMOV STR (PIPE)	LF	282
530	DRIVEWAYS (CONC)	SY	47
531	CONC SIDEWALKS (4")	SY	9

LEGEND:

- PROPOSED ROADWAY WIDENING
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"

NOTE:
SEE RDWY DATA SHEET FOR EXIST. CENTERLINE DATA.

SEE SURVEY DATA SHEET FOR HORIZONTAL AND VERTICAL CONTOUR.





SOUTH TEXAS INFRASTRUCTURE GROUP

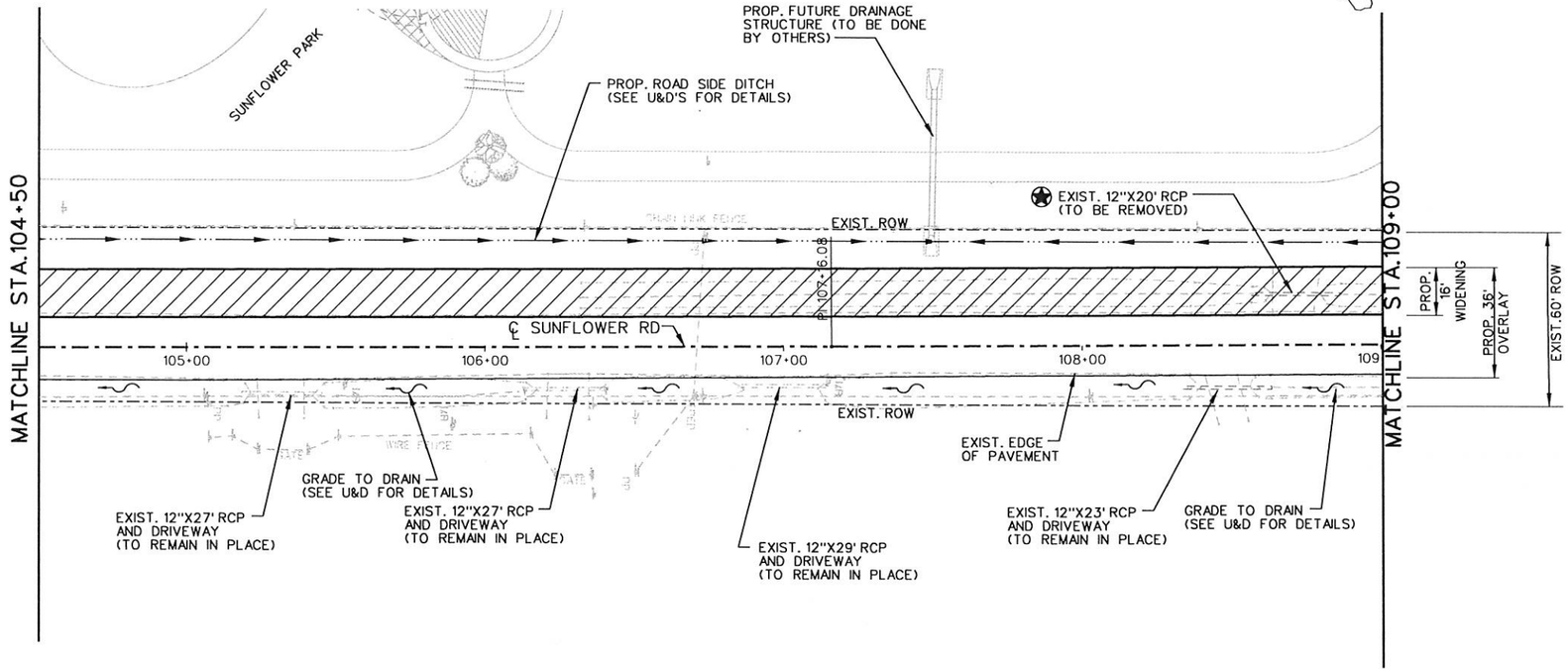
SUNFLOWER ROAD PLAN AND PROFILE

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 1 OF 3

DRAWING:	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK:	6	TEXAS					Sunf.
ENGINEER:	STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK:	PHR	HIDALGO	921	02			29
REVIEW:							
CK:							

M:\Chris\Precinct 4\Sunflower\03 ROADWAY\02 P&P\Sunflower Rd_PP01.dgn
1/27/2017



SHEET SUMMARY

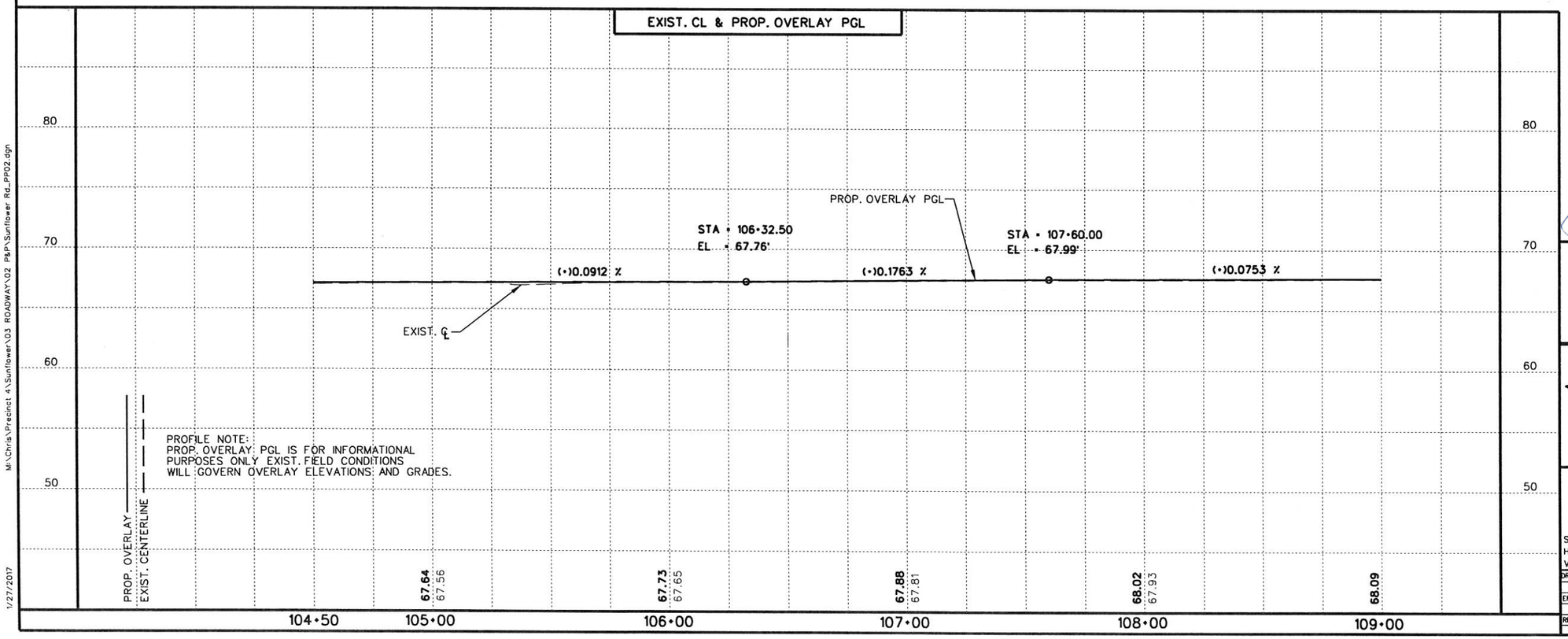
ITEM	DESCRIPTION	UNIT	QUANTITY
496	REMOV STR (PIPE)	LF	20

LEGEND:

- PROPOSED ROADWAY WIDENING
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"

NOTE:
SEE RDWY DATA SHEET FOR EXIST. CENTERLINE DATA.

SEE SURVEY DATA SHEET FOR HORIZONTAL AND VERTICAL CONTOUR.



STATE OF TEXAS
JULIO CESAR CERDA
90524
LICENSED PROFESSIONAL ENGINEER

SOUTH TEXAS INFRASTRUCTURE GROUP

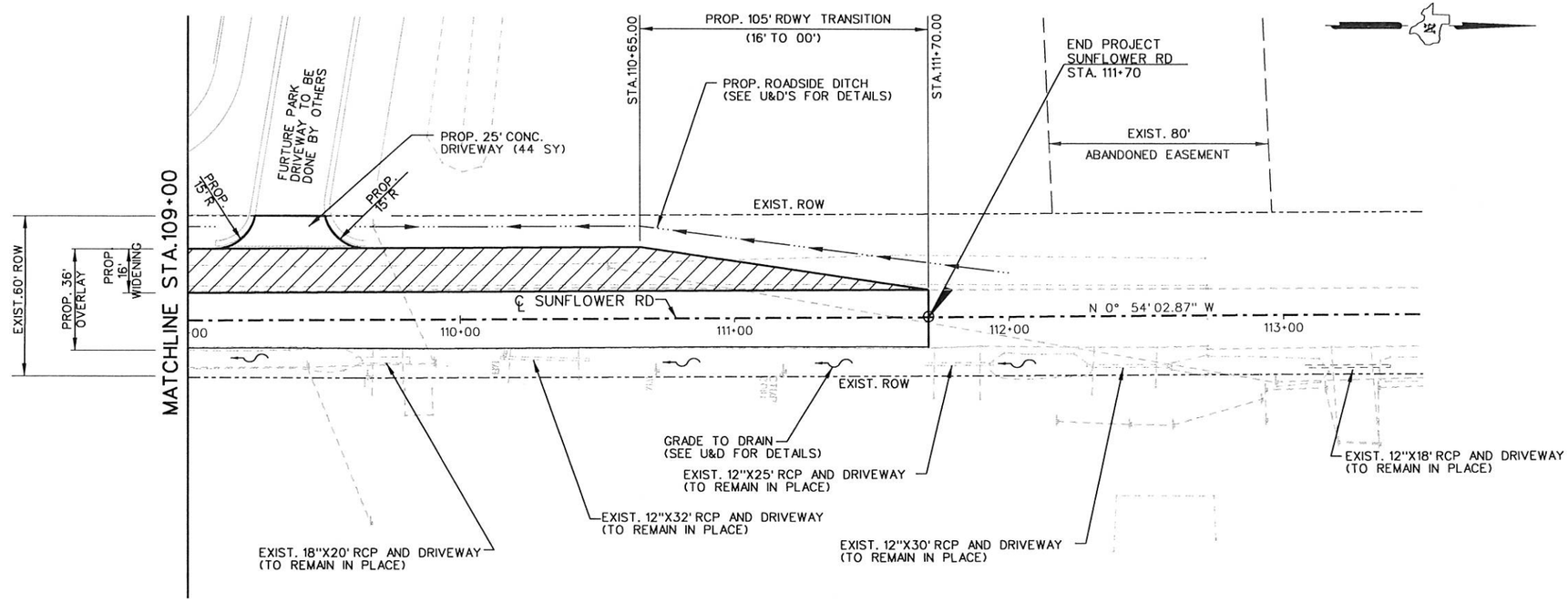
SUNFLOWER ROAD PLAN AND PROFILE

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 2 OF 3

DRAWING:		FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK:		6	TEXAS					Sunf.
ENGINEER:		STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK:		PHR	HIDALGO	921	02			30
REVIEW:								
CK:								

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1/27/2017



SHEET SUMMARY

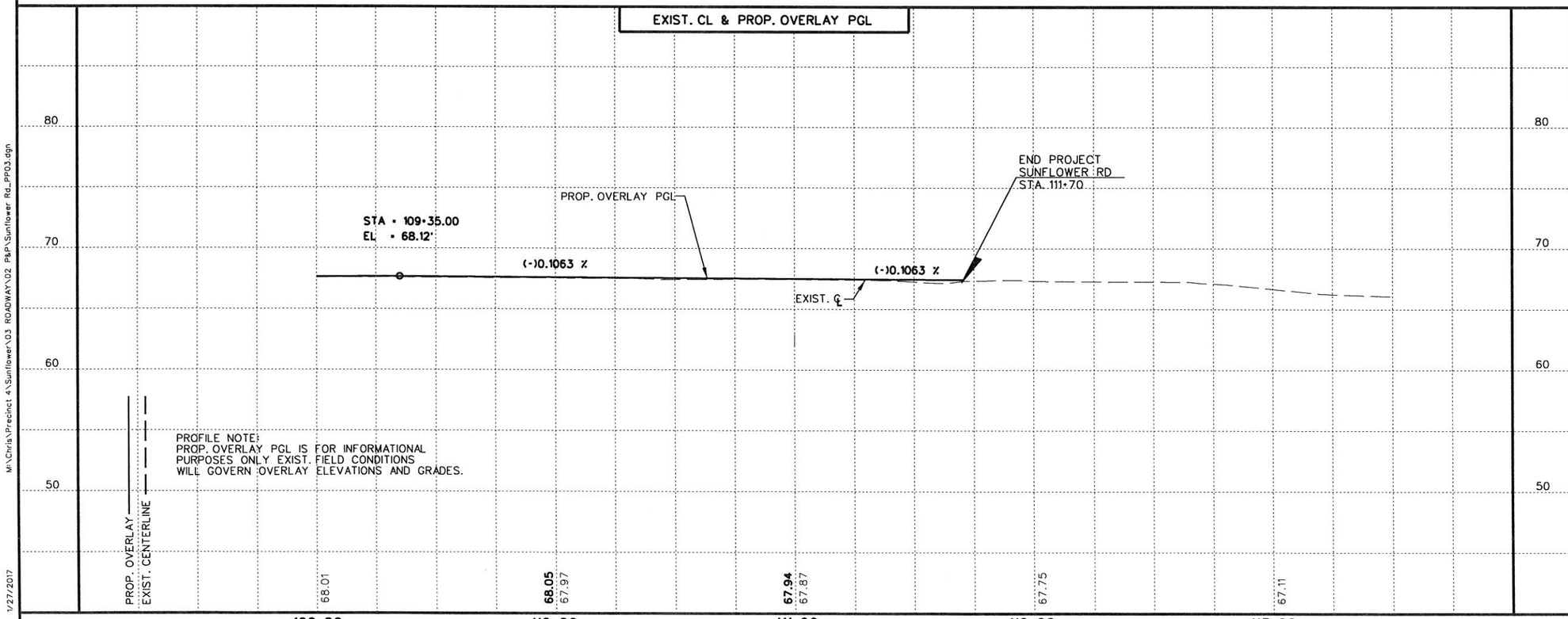
ITEM	DESCRIPTION	UNIT	QUANTITY
530	DRIVEWAYS (CONC)	SY	44

LEGEND:

- PROPOSED ROADWAY WIDENING
- TO BE REMOVED UNDER ITEM 496 INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES
- REMOVAL, RELOCATION AND INSTALLATION OF MAILBOXES ITEM 560
- TO BE REMOVED UNDER ITEM 100 "PREP. ROW"

NOTE:
SEE RDWY DATA SHEET FOR EXIST. CENTERLINE DATA.

SEE SURVEY DATA SHEET FOR HORIZONTAL AND VERTICAL CONTOUR.



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1/27/2017

STATE OF TEXAS
JULIO CESAR CERDA
90524
LICENSED
PROFESSIONAL ENGINEER

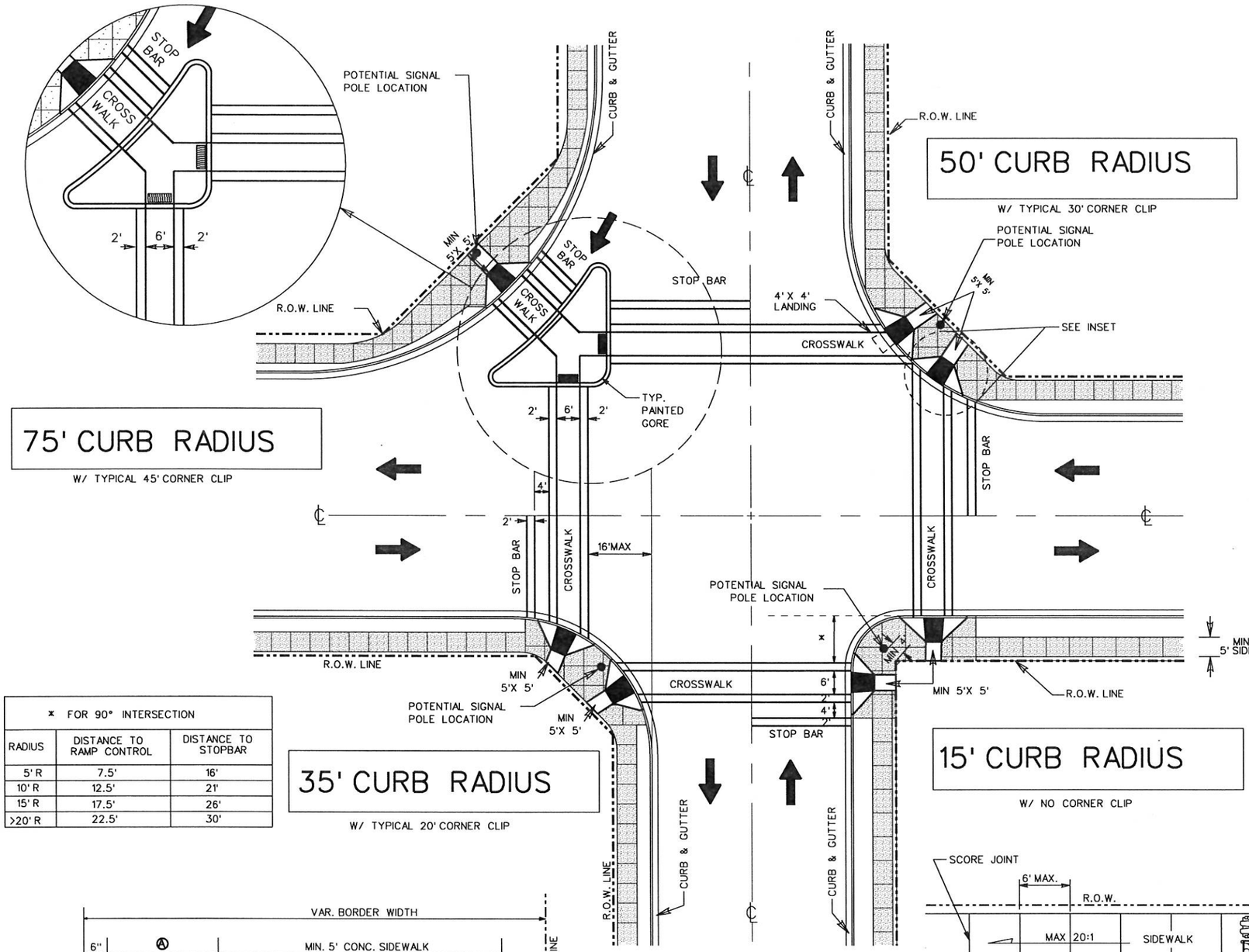
SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER ROAD PLAN AND PROFILE

SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 3 OF 3

DRAWING:		FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK:		6	TEXAS					Sunf.
ENGINEER:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK:		PHR	HIDALGO	921	02			31
REVIEW:								
CK:								



75' CURB RADIUS

W/ TYPICAL 45' CORNER CLIP

50' CURB RADIUS

W/ TYPICAL 30' CORNER CLIP

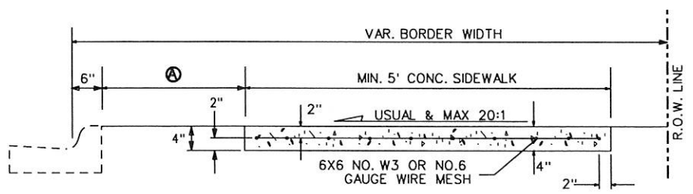
35' CURB RADIUS

W/ TYPICAL 20' CORNER CLIP

15' CURB RADIUS

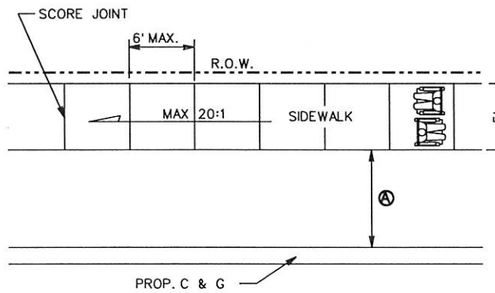
W/ NO CORNER CLIP

* 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'



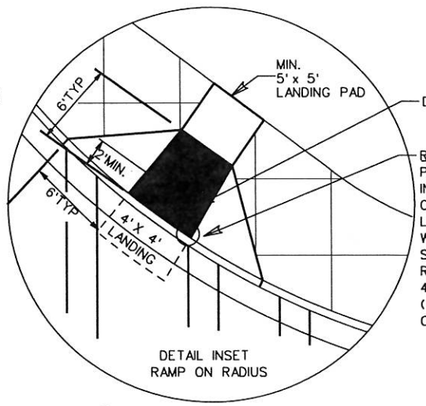
TYPICAL CONC. SIDEWALK

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



DETAIL INSET RAMP ON RADIUS

GENERAL NOTES

- ALL RAMPS SHALL HAVE A 5' x 5' LANDING PAD.
- RAMP CENTER TO BE PERPENDICULAR TO FACE OF CURB. A PERPENDICULAR RAMP MAY BE LOCATED WITHIN THE RADIUS OF A CURBLINE.
- SIDEWALK GRADE TO BE PARALLEL TO TOP OF CURB AND GUTTER UNLESS OTHERWISE SHOWN ON PLANS OR DIRECTED BY THE ENGINEER.
- SIDEWALK WIDTH AS SHOWN ELSEWHERE IN PLANS. MIN WIDTH 5'. PROVIDE DROPPED CURBS AT INTERSECTIONS. ALL CONCRETE SHALL BE CLASS "A" PROPOSED SIDEWALKS TO MATCH EXIST. SIDEWALK.
- NO VERTICAL CHANGES SHALL EXCEED 1/4" IN ELEVATION AT ADJOINING SURFACES.
- TO PROVIDE ACCESS TO PEDESTRIAN BUTTON, SIDEWALK / LANDING PAD SHALL EXTEND AND/ OR ABUT TO SIGNAL POLE CONC. FOUNDATION.
- COLOR TEXTURIZED CONCRETE SHALL BE USED TO COLOR AREAS AT RAMPS. COLOR SHALL BE " BRICK RED " AS PER L.M. SCOFIELD COMPANY STANDARDS COLOR A-26 OR EQUAL. COLOR TEXTURIZED CONCRETE SHALL BE SUBSIDIARY TO CURB RAMP ITEM

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

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PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

SIDEWALK & WHEELCHAIR RAMP DETAILS

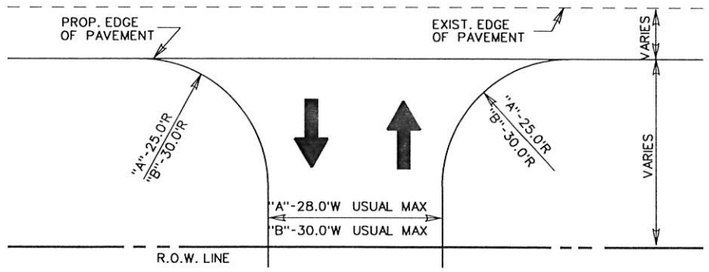
REV. 4/02

SIDEWALK.DGN

FED RD. DIV.NO.	STATE AND PROJECT NO.		FILE NO.			SHEET NO.
6						32
STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TX	PHR		921	02		Sunf.

M: 2002\TxDOT\LP499\DGN\FC160\STDS\SIDEWALK.DGN

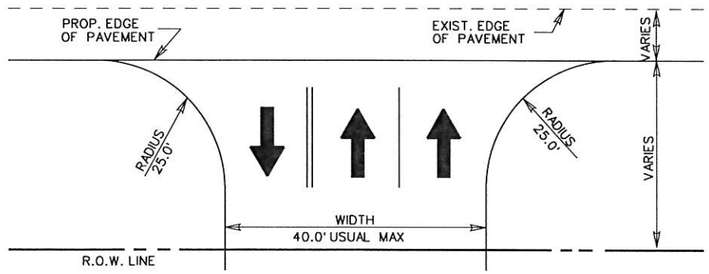
DESIGNS FOR TWO-WAY COMMERCIAL DRIVEWAYS



"A"- ONE ENTRY LANE AND ONE EXIT LANE, FEWER THAN 4 LARGE VEHICLES PER HOUR

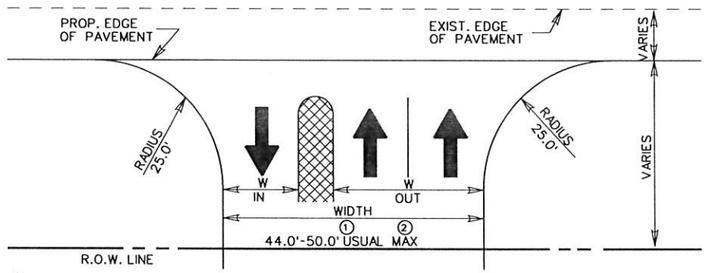
"B"- ONE ENTRY LANE AND ONE EXIT LANE, 4 OR MORE SINGLE UNIT VEHICLES PER HOUR ①

① - *DRIVEWAY DESIGNS FOR LARGER VEHICLES WILL BE CONSIDERED ON A CASE BY CASE BASIS*



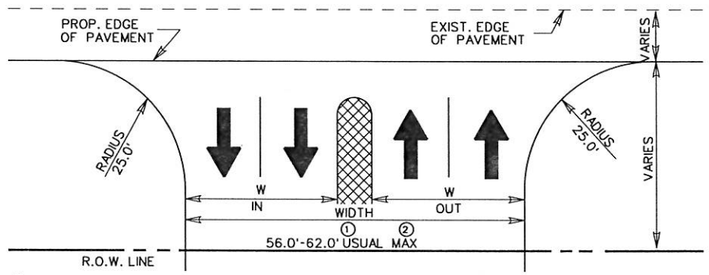
ONE ENTRY LANE AND TWO EXIT LANES (WITHOUT DIVIDERS)

DESIGNS FOR TWO-WAY COMMERCIAL DRIVEWAYS



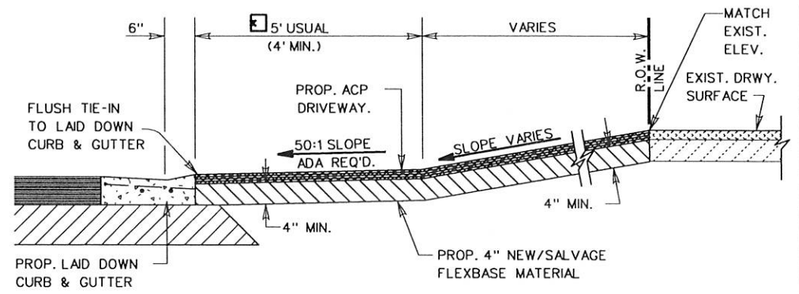
① - *4.0' WIDE DIVIDER, FACE-TO-FACE CURBS*
② - *10.0' WIDE DIVIDER, FACE-TO-FACE-CURBS*

ONE ENTRY LANE AND TWO EXIT LANES (WITH A DIVIDER)



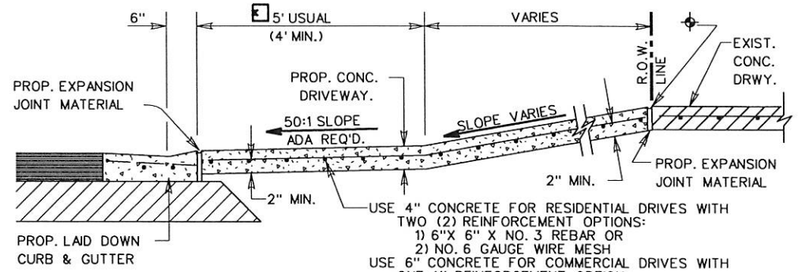
① - *4.0' WIDE DIVIDER, FACE-TO-FACE CURBS*
② - *10.0' WIDE DIVIDER, FACE-TO-FACE-CURBS*

TWO ENTRY LANES AND TWO EXIT LANES (WITH A DIVIDER)



TYPICAL ASPH. CONC. PVM'T, DRIVEWAY SECTION

N.T.S.



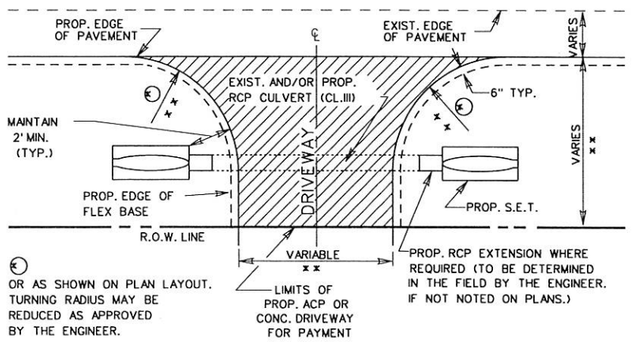
TYPICAL CONCRETE DRIVEWAY SECTION

N.T.S.

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

E PROP./FUTURE SIDEWALK CROSSING LOCATION UNLESS SHOWN ELSEWHERE ON P&P SHEETS. SEE P&P SHEETS FOR PROP. SIDEWALK LOCATION IF SIDEWALKS ARE INCLUDED AS PART OF PROJECT. REFER TO STATE STANDARDS - PEDESTRIAN FACILITIES - FOR ADDITIONAL REQUIREMENTS.

PRIVATE AND COMMERCIAL DRIVES WITHOUT CURB & GUTTER

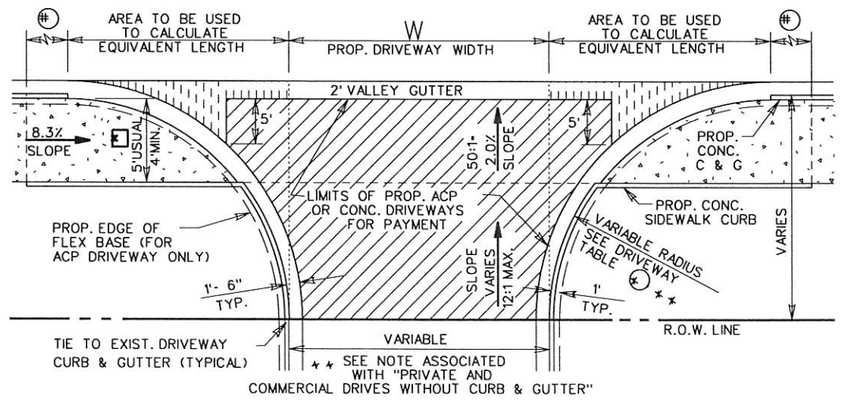


℄ OR AS SHOWN ON PLAN LAYOUT. TURNING RADIUS MAY BE REDUCED AS APPROVED BY THE ENGINEER.

PLAN OF PRIVATE AND COMMERCIAL DRIVES

** FOR PRIVATE RESIDENTIAL DRIVES, TRY TO MATCH EXISTING WITH A MINIMUM WIDTH OF 12 FT. AND A MAXIMUM WIDTH OF 24 FT. WITH 15 FT. USUAL RADIUS. FOR COMMERCIAL DRIVES, USE ABOVE COMMERCIAL DRIVEWAY DETAILS.

PRIVATE AND COMMERCIAL DRIVES WITH CURB & GUTTER



PLAN OF PRIVATE AND COMMERCIAL DRIVES

SEE P&P SHEETS FOR LOCATIONS OF DRIVES
N.T.S.

E PROP./FUTURE CONC. SIDEWALK LOCATION UNLESS SHOWN ELSEWHERE ON P&P SHEETS. REFER TO STATE STANDARDS - PEDESTRIAN FACILITIES - FOR ADDITIONAL REQUIREMENTS.

(#) LIMITS OF SLOPE FOR PROP. CONC. CURB BASED ON 8.3% SLOPE FOR SIDEWALK

LF EQUIVALENT TABLE FOR PAYMENT LIMITS OF 2' VALLEY GUTTER

LF OF VALLEY GUTTER= W + X1 + X2

WHERE X1 AND X2 MAY VARY DEPENDING ON RADIUS

Prop. Driveway Radius	X1 or X2 (Sq Ft Area / 2') Equivalent LF Length
5'	1
8'	2
10'	4
12'	6
15'	9
18'	12
20'	15
22'	18
25'	24
28'	30
30'	34

SEE DRIVEWAY TABLE FOR LIMITS OF LAID DOWN CURB TO BE PAID FOR AS CURB AND GUTTER

DRIVEWAY TYPES

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

CONCRETE (RESIDENTIAL)
EXIST. PRIVATE DRIVEWAYS TO BE CONSTRUCTED AS SHOWN WITH 4" CONCRETE. TO BE PAID FOR BY THE SQ.YD.

CONCRETE (COMMERCIAL)
EXIST. BUSINESS DRIVEWAYS TO BE CONSTRUCTED AS SHOWN WITH 6" CONCRETE. TO BE PAID FOR BY THE SQ.YD.

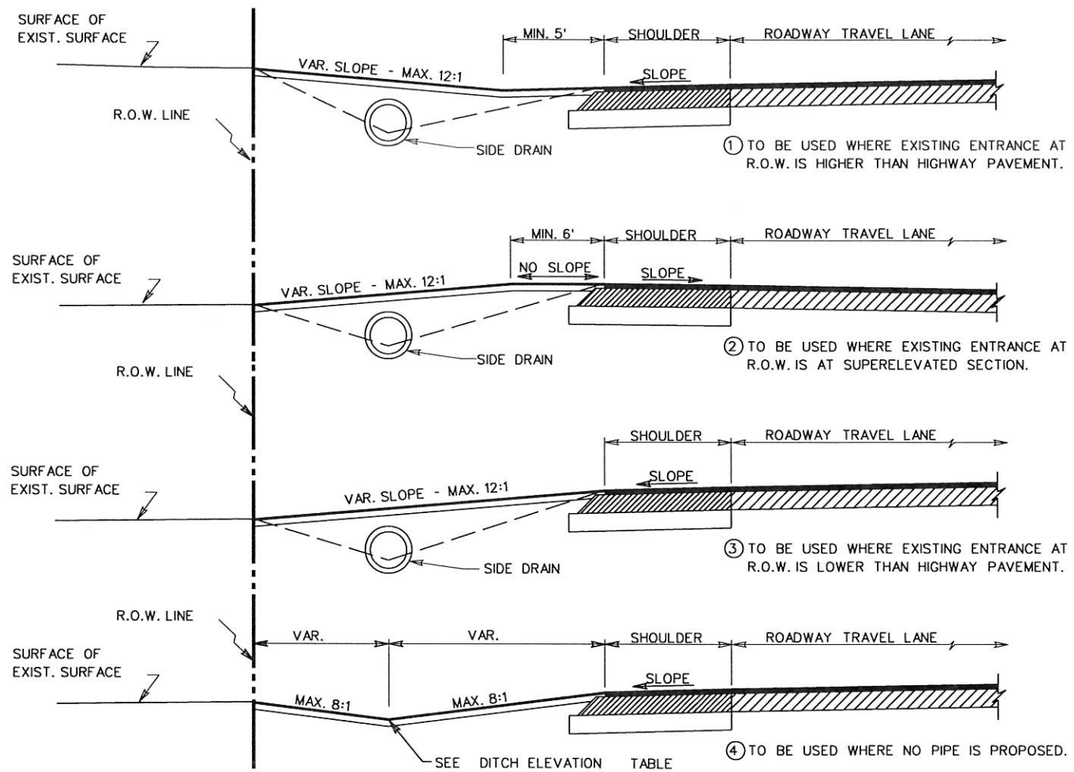
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TEXAS DEPARTMENT OF TRANSPORTATION

DRIVEWAY DETAILS PRIVATE (RESIDENTIAL-COMMERCIAL)

REV. 01/15 DRIVEWAY2.DGN

FED.RD. DIV.NO.	STATE AID PROJECT NO.		FILE NO.			SHEET NO.
6						33
STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TX	21	HIDALGO	921	02		Sunf.



NOTES:

ALL ENTRANCES CONSTRUCTED ON THIS PROJECT ARE SUBJECT TO CONCURRENCE WITH EXISTING GOVERNING REGULATIONS AS SET OUT BY THE STATE HIGHWAY COMMISSION.

ENTRANCE'S BASE AND SURFACING MAY BE EXTENDED BEYOND R.O.W. LINE AS REQUIRED TO MEET EXISTING GRADE IN A SATISFACTORY MANNER OF WHICH NO STEEPER THAN 12:1 SLOPE WILL BE CONSTRUCTED.

ALL FLEXIBLE BASE USED FOR PRIVATE DRIVES & COMMERCIAL DRIVES WILL NOT REQUIRE LIME TREATMENT.

EXACT LOCATIONS, DIMENSIONS, AND TYPE TO BE ESTABLISHED DURING CONSTRUCTION BY THE ENGINEER.

PROP. WIDTH OF DRIVEWAYS TO MATCH EXISTING WIDTH AT R.O.W. LINE.

114 •/SY ACP (COMPACTED) IS EQUAL TO 1 IN. DEPTH
171 •/SY ACP (COMPACTED) IS EQUAL TO 1½ IN. DEPTH.

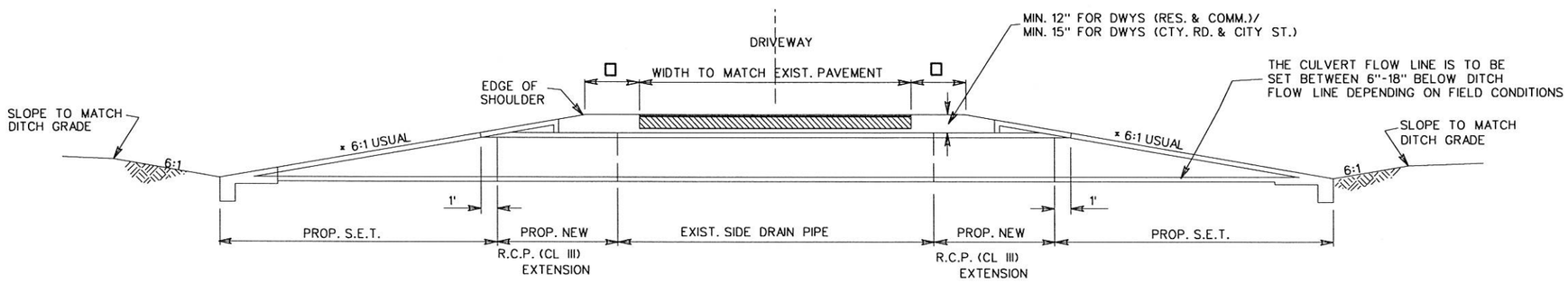
SIDE DRAINS TO BE INSTALLED WHERE ROADWAY DITCH DRAINAGE IS NECESSARY, AS INDICATED ON PLANS AND/OR AS DIRECTED BY THE ENGINEER.

SIDE DRAINS TO BE INSTALLED WITH A MINIMUM OF 12" COVER BY PROPOSED RESIDENTIAL & COMMERCIAL MATERIAL OR 15" COVER OF PROPOSED COUNTY RD. & CITY STREET ROADWAY MATERIAL.

AVERAGE DIMENSIONS SHOWN ON TABLE OF DRIVEWAYS ARE FOR ESTIMATING PURPOSES ONLY.

THE RATE OF PRIME SHALL BE 0.10 GAL/SY FOR PRIVATE AND/OR COMMERCIAL DRIVEWAYS AND 0.20 GAL/SY FOR PUBLIC DRIVEWAYS.

TYPICAL ENTRANCE PROFILE FOR DRIVEWAYS W/OUT C&G



□ - 1' MIN. ON DRIVEWAYS (RES. & COMM.)
2' MIN. ON DRIVEWAYS (COUNTY RD. & CITY ST.)

x - 6:1 SLOPE USUAL
UNLESS OTHERWISE NOTED ON PLANS

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PHARR DISTRICT STANDARD

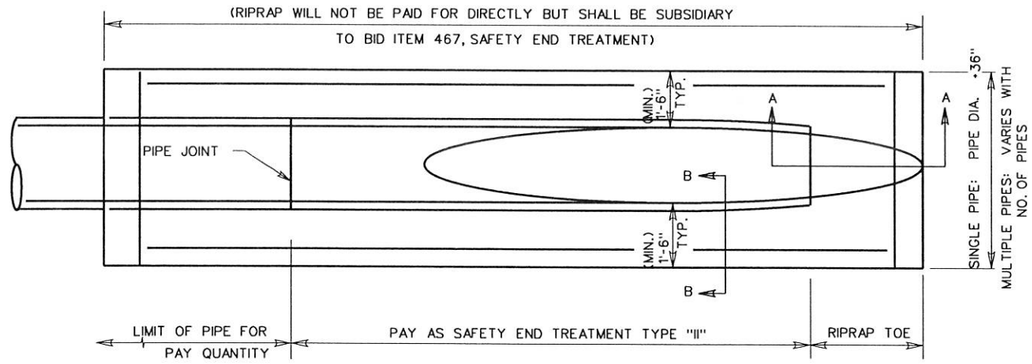
TEXAS DEPARTMENT OF TRANSPORTATION

DRIVEWAY PROFILE DETAILS

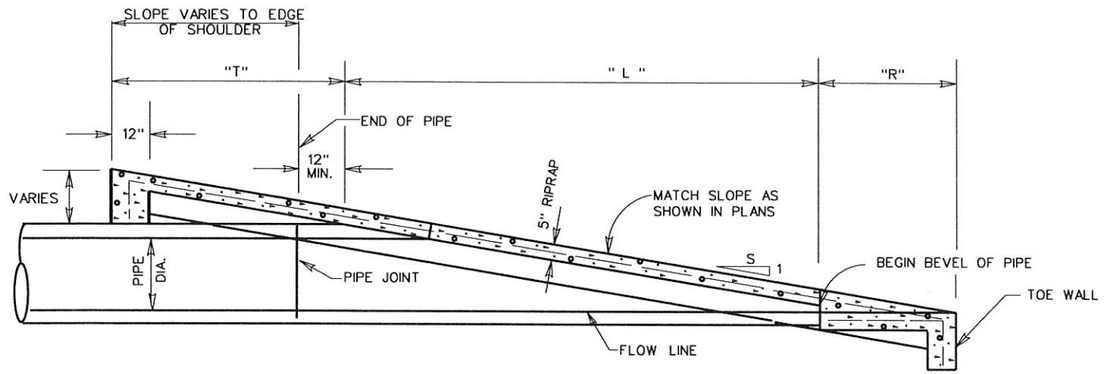
REV. 01/14

DRIVEWAY1.DGN

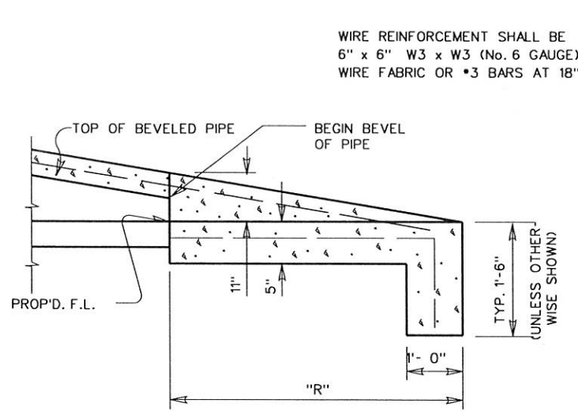
FED.RD. DIV.NO.	STATE AID PROJECT NO.		FILE NO.			SHEET NO.
6						34
STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TX	21	HIDALGO	921	02		Sunf.



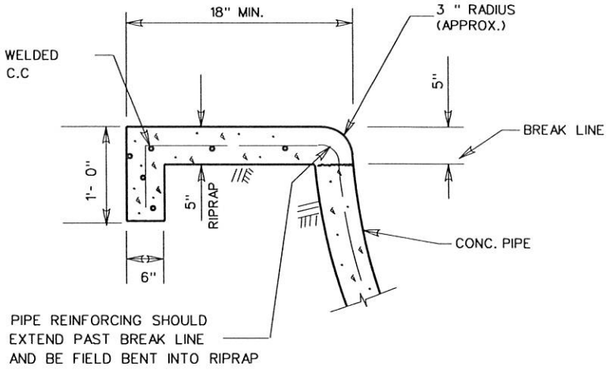
PLAN VIEW



ELEVATION
SAFETY END TREATMENT



SEC. A-A



SEC. B-B

SAFETY END TREATMENT PIPE LENGTHS

PIPE DIA. (IN.)	"L"			
	3:1	4:1	5:1	6:1
12	2'-0"	2'-8"	3'-4"	4'-0"
15	2'-9"	3'-8"	4'-7"	5'-6"
18	3'-6"	4'-8"	5'-10"	7'-0"
24	5'-1½"	6'-10"	8'-6½"	10'-3"
30	6'-9"	9-0"	11'-3"	13'-6"
36	8'-6"	11'-4"	14'-2"	17'-0"
42	10'-1½"	13'-6"	16'-10½"	20'-3"
48	11'-9"	15'-8"	19'-7"	23'-6"

℄ DRIVEWAYS & TURNOUTS ARE 6:1 ONLY

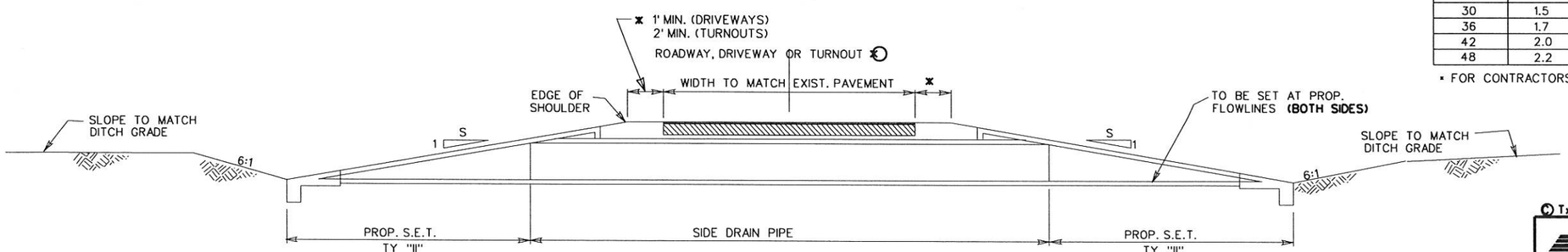
RIPRAP TOE LENGTHS

SLOPE	" R "	"T"
3:1	2'-9"	1'-9"
4:1	3'-8"	2'-4"
5:1	4'-7"	2'-11"
6:1	5'-6"	3'-6"

ESTIMATED RIPRAP VOLUME (CY)

PIPE DIA. (IN.)				
	3:1	4:1	5:1	6:1
12	.9	1.1	1.3	1.6
15	1.0	1.2	1.5	1.8
18	1.1	1.4	1.6	1.9
24	1.3	1.6	2.0	2.3
30	1.5	1.9	2.3	2.7
36	1.7	2.2	2.7	3.2
42	2.0	2.5	3.1	3.6
48	2.2	2.8	3.4	4.1

* FOR CONTRACTORS INFORMATION ONLY (SINGLE PIPE)



TYPICAL SIDEDRAIN SECTION

NOTE:

ALL EXCAVATION AND BACKFILL REQUIRED AT ALL PIPE SIDE DRAIN CONNECTIONS, ADJUSTMENTS AND/OR EXTENSIONS WILL NOT BE PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO THE BID ITEMS INVOLVED AND IN ACCORDANCE WITH ITEM 400 "STRUCTURAL EXCAVATION".

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PHARR DISTRICT STANDARDS

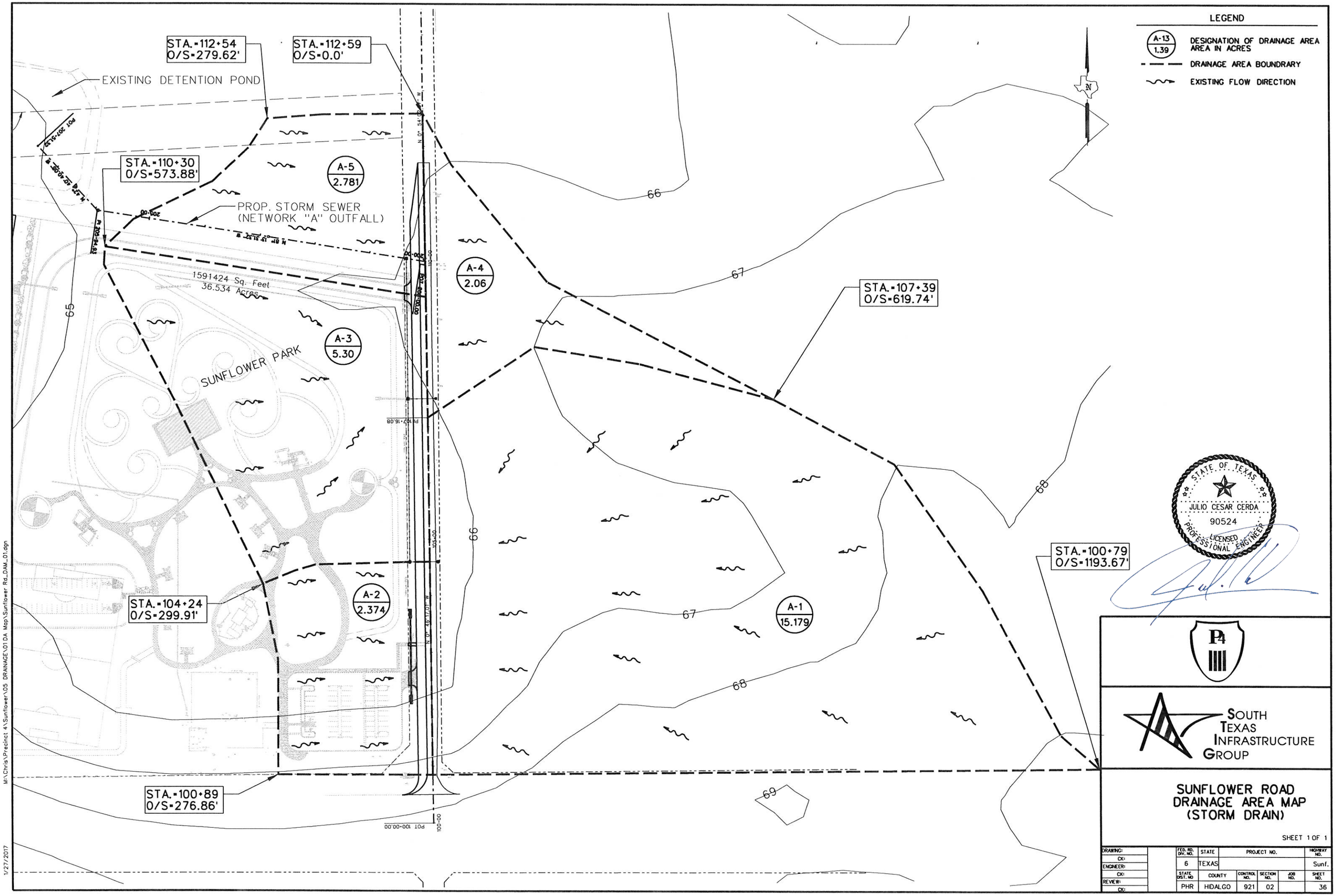
TEXAS DEPARTMENT OF TRANSPORTATION

SAFETY END TREATMENT DETAILS

REV. 9/16

SET.DGN

FED.RD. DIV.NO.	STATE AID PROJECT NO.		FILE NO.			SHEET NO.
6						35
STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TX	21	HIDALGO	921	02		Sunf.



M:\Chris\Precinct 4\Sunflower\05 DRAINAGE\01 DA Map\Sunflower Rd_DAM_01.dgn

1/27/2017

RUNOFF COMPUTATIONS

AREA ID	TOTAL AREA (acres)	TOTAL SUBAREA 1 (acres)	Subarea 1 Description	Subarea 1 "C" Value	TOTAL SUBAREA 2 (acres)	Subarea 2 Description	Subarea 2 "C" Value	TOTAL SUBAREA 3 (acres)	Subarea 3 Description	Subarea 3 "C" Value	TOTAL SUBAREA 4 (acres)	Subarea 4 Description	Subarea 4 "C" Value	Total "C" Value	Tc (min)	Intensity (in/hr)	Discharge (ft/s)
A-1	15.18	15.04	Unimproved Sand/Sandy 0-3%	0.18	0.14	Street Asph/Conc	0.90	0.00		0.00	0.00		0.00	0.19	112.40	1.76	4.99
A-2	2.37	2.15	Industrial Parks/Cemetaries	0.18	0.22	Street Asph/Conc	0.90	0.00		0.00	0.00		0.00	0.25	28.60	4.46	2.62
A-3	5.30	5.02	Industrial Parks/Cemetaries	0.18	0.28	Street Asph/Conc	0.90	0.00		0.00	0.00		0.00	0.22	55.20	2.92	3.38
A-4	2.06	1.94	Unimproved Sand/Sandy 0-3%	0.18	0.13	Street Asph/Conc	0.90	0.00		0.00	0.00		0.00	0.22	24.30	4.91	2.26
A-5	2.78	0.37	Industrial Parks/Cemetaries	0.18	2.27	Unimproved Sand/Sandy 0-3%	0.18	0.14	Street Asph/Conc	0.90	0.00		0.00	0.22	32.50	4.12	2.49

NODE CONFIGURATION

Node ID	Library Item Name	Node Station	Node Offset (ft)	Node Elev. (ft)	Node Type	Profile Type	Spread X-Sect. Slope 1 (%)	Spread X-Sect. Width 1 (ft.)	Spread X-Sect. Slope 2 (%)	Spread X-Sect. Width 2 (ft.)	Spread X-Sect. Slope 3 (%)	Spread X-Sect. Width 3 (ft.)	Composite X-Sect. Spread Slope (%)	Longitudinal Slope (%)	Curb Length (ft)	Curb Depression (ft)	Curb Depression Width (ft)	Curb Height (ft)	Grate Length (ft)	Grate Width (ft)	Grate Area (ft)	Grate Perimeter (ft)
A-1	PSL FG 3x3 w 3x3 gr	104+60.00	15.00	64.50	Grate	Sag	-20.00	5.00	20.00	5.00	2.00	10.00	0.100	n/a	n/a	n/a	n/a	n/a	3.17	3.17	4.54	12.67
A-2	PSL FG 3x3 w 3x3 gr	104+60.00	-36.00	65.34	Grate	On Grade	-25.00	4.00	20.00	10.00	2.00	26.00	0.111	0.188	n/a	n/a	n/a	n/a	3.17	3.17	4.54	12.67
A-3	PSL FG 3x3 w 3x3 gr	107+50.00	-35.00	64.80	Grate	Sag	-25.00	4.00	20.00	10.00	2.00	26.00	0.111	n/a	n/a	n/a	n/a	n/a	3.17	3.17	4.54	12.67
A-4	PSL FG 3x3 w 3x3 gr	107+50.00	15.00	65.25	Grate	On Grade	-20.00	5.00	20.00	5.00	2.00	10.00	0.100	0.077	n/a	n/a	n/a	n/a	3.17	3.17	4.54	12.67
A-5	PSL FG 3x3 w 3x3 gr	110+00.00	-33.75	64.80	Grate	Sag	-25.00	4.00	25.00	8.00	2.00	26.00	0.125	n/a	n/a	n/a	n/a	n/a	3.17	3.17	4.54	12.67
A-MH1	PSL RC 3x3	202+85.00	0.00	66.00	Junction	On Grade	-25.00	4.00	25.00	8.00	2.00	26.00	0.125	0.093	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
A-MH2	PSL RC 3x3	205+93.50	0.00	66.60	Junction	On Grade	-25.00	4.00	25.00	8.00	2.00	26.00	0.125	0.093	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
A-OUT	OUTLET	111+38.50	-626.00	66.60	Outlet	On Grade	-25.00	4.00	25.00	8.00	2.00	26.00	0.125	0.000	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

NODE HYDRAULICS

Node ID	Node Type	Node Profile Type	Node Station	Discharge (ft/s)	Capacity (ft/s)	Max By Pass Flow (ft/s)	By Pass Flow (ft/s)	By Pass Flow Into Node (ft/s)	By Pass Node ID	Node Length (ft)	Max Ponded Depth (ft)	Computed Ponded Depth (ft)	Max Ponded Width (ft)	Computed Ponded Width (ft)
A-1	Grate	Sag	104+60.00	5.02	14.93	0.50	0.00	0.04		n/a	1.50	0.40	8.00	7.38
A-2	Grate	On Grade	104+60.00	2.62	2.58	0.50	0.05	0.00	A-3	n/a	1.50	0.68	8.00	6.14
A-3	Grate	Sag	107+50.00	3.43	14.93	0.50	0.00	0.05		n/a	1.50	0.31	8.00	5.64
A-4	Grate	On Grade	107+50.00	2.26	2.23	0.50	0.04	0.00	A-1	n/a	1.50	0.73	8.00	7.33
A-5	Grate	Sag	110+00.00	2.49	14.93	0.50	0.00	0.00		n/a	1.50	0.25	8.00	4.46
A-MH1	Junction	On Grade	202+85.00	4.60	14.93	0.50	0.00	0.00		6.08	1.50	0.38	8.00	3.05
A-MH2	Junction	On Grade	205+93.50	4.60	14.93	0.50	0.00	0.00		6.08	1.50	0.38	8.00	3.05
A-OUT	Outlet	On Grade	111+38.50	4.60	14.93	0.50	0.00	0.00		6.08	1.50	0.38	8.00	3.05

LINK CONFIGURATION

Link ID	Type	Upstream Node	Downstream Node	Material	Library Item Name	Number of Barrels	Actual Length (ft)	Hydraulic Length (ft)	Manning's N Value	Slope (%)	Rise (ft)	Span (ft)	Soffit Upstream (ft)	Soffit Downstream (ft)	Invert Upstream (ft)	Invert Downstream (ft)
LA-1	Pipe	A-1	A-2	Concrete	24 Inch Dia. Circular	1.00	48.00	51.00	0.012	0.150	2.00	n/a	62.82	62.74	60.82	60.74
LA-2	Pipe	A-2	A-3	Concrete	24 Inch Dia. Circular	1.00	286.92	289.92	0.012	0.150	2.00	n/a	62.74	62.31	60.74	60.31
LA-3	Pipe	A-4	A-3	Concrete	18 Inch Dia. Circular	1.00	47.00	50.00	0.012	0.150	1.50	n/a	62.38	62.31	60.88	60.81
LA-4	Pipe	A-3	A-5	Concrete	24 Inch Dia. Circular	1.00	247.00	250.00	0.012	0.150	2.00	n/a	62.31	61.93	60.31	59.93
LA-5	Pipe	A-5	A-MH1	Concrete	24 Inch Dia. Circular	1.00	247.79	250.79	0.012	0.150	2.00	n/a	61.93	61.55	59.93	59.55
LA-6	Pipe	A-MH1	A-MH2	Concrete	24 Inch Dia. Circular	1.00	305.50	308.50	0.012	0.150	2.00	n/a	61.55	61.09	59.55	59.09
LA-7	Pipe	A-MH2	A-OUT	Concrete	24 Inch Dia. Circular	1.00	59.28	60.78	0.012	0.150	2.00	n/a	61.09	61.00	59.09	59.00

LINK HYDRAULICS

Link ID	Upstream Node	Downstream Node	Discharge (ft/s)	Capacity (ft/s)	Uniform Depth (ft)	Uniform Velocity (ft/s)	Critical Depth (ft)	Critical Velocity (ft/s)	Critical Slope (%)	Frict. Slope (%)	Actual Vel. U.S. (ft/s)	Actual Vel. D.S. (ft/s)	Actual Depth U.S. (ft)	Actual Depth D.S. (ft)	HGL U.S. (ft)	HGL D.S. (ft)	EGL U.S. (ft)	EGL D.S. (ft)
LA-1	A-1	A-2	4.99	10.21	1.03	3.07	0.79	4.35	0.004	0.002	1.59	1.59	2.00	2.00	64.50	64.47	64.53	64.53
LA-2	A-2	A-3	6.01	10.21	1.17	3.14	0.87	4.60	0.004	0.001	1.91	1.91	2.00	2.00	64.47	64.30	64.53	64.42
LA-3	A-4	A-3	2.26	4.74	0.75	2.57	0.57	3.68	0.004	0.002	1.28	1.28	1.50	1.50	64.32	64.30	64.34	64.42
LA-4	A-3	A-5	8.77	10.21	1.53	3.41	1.06	5.21	0.004	0.001	2.79	2.79	2.00	2.00	64.30	63.98	64.42	64.13
LA-5	A-5	A-MH1	9.74	10.21	1.64	3.53	1.12	5.40	0.004	0.002	3.10	3.10	2.00	2.00	63.98	63.58	64.13	63.73
LA-6	A-MH1	A-MH2	9.74	10.21	1.64	3.53	1.12	5.40	0.004	0.002	3.10	3.10	2.00	2.00	63.58	63.10	63.73	63.25
LA-7	A-MH2	A-OUT	9.74	10.21	1.64	3.53	1.12	5.40	0.004	0.002	3.10	3.10	2.00	2.00	63.10	63.00	63.25	63.15

NOTES:

1. CALCULATIONS MADE BY "GEOPAK DRAINAGE" HYDRAULIC COMPUTER PROGRAM.
2. ALLOWABLE PONDING WIDTH = 8' (PONDING ALLOWED WITHIN ROADSIDE DITCH)
3. SEWER CALCULATIONS BASED ON MANNING'S FORMULA.
4. A CONSERVATIVE TW = 63.00' WAS ESTIMATED FOR DESIGN PURPOSES.
5. RAINFALL FREQUENCY = 5 YR.

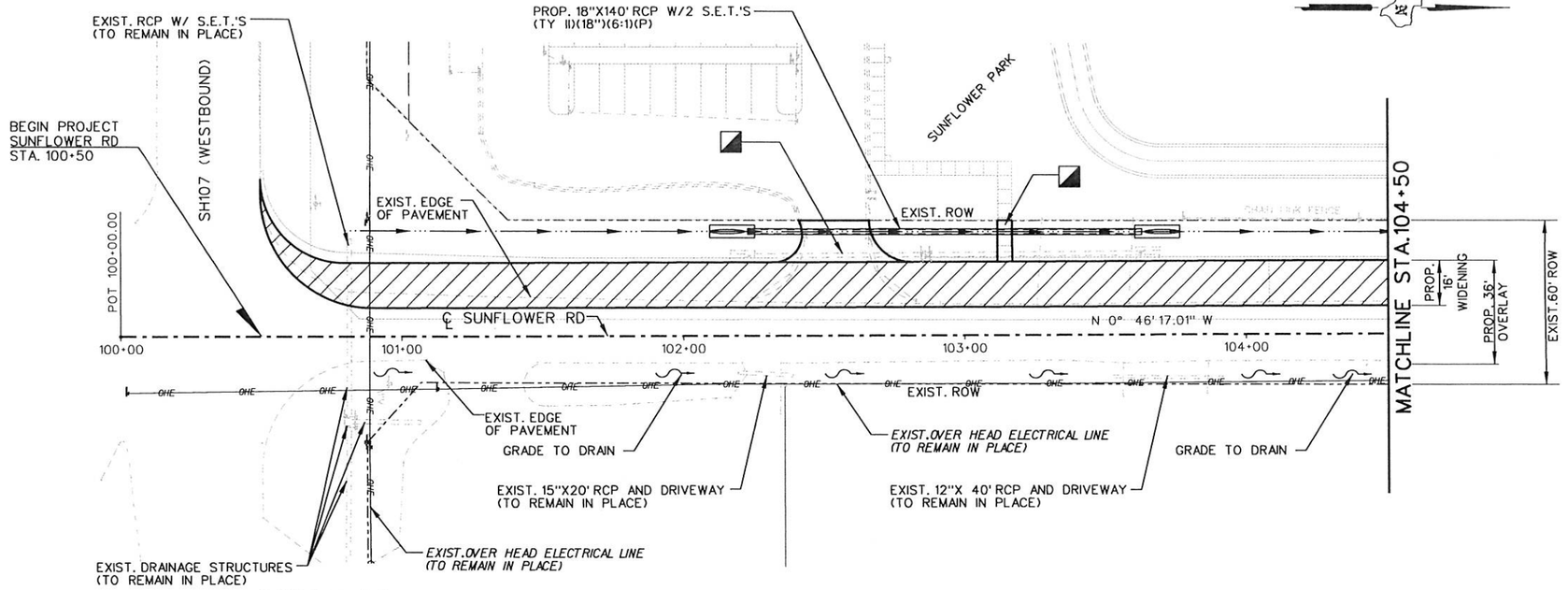
STATE OF TEXAS
JULIO CESAR CERDA
90524
LICENSED PROFESSIONAL ENGINEER

SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER ROAD
HYDRAULIC DATA SHEET

DRAWING:		FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.
CK:		6	TEXAS			Sunf.
ENGINEER:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
CK:		PHR	HIDALGO	921	02		37
REVIEW:							
CK:							

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1/27/2017



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
464	RC PIPE (18")(CL III)	LF	140
467	SET (TY II)(18")(RCP)(6:1)(P)	EA	2

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF STORM SEWER FLOW
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)

NOTES:
SEE ALIGNMENT DATA SHEET FOR EXIST. CENTERLINE DATA.

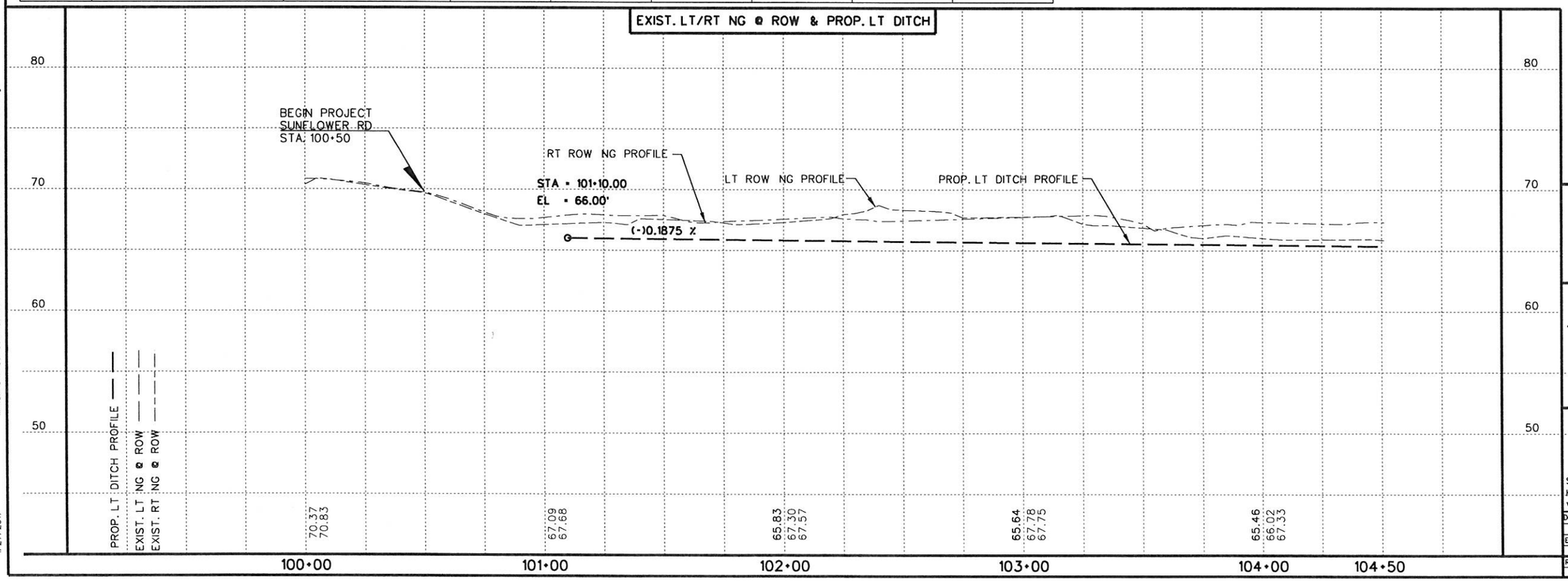
ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)



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1/27/2017

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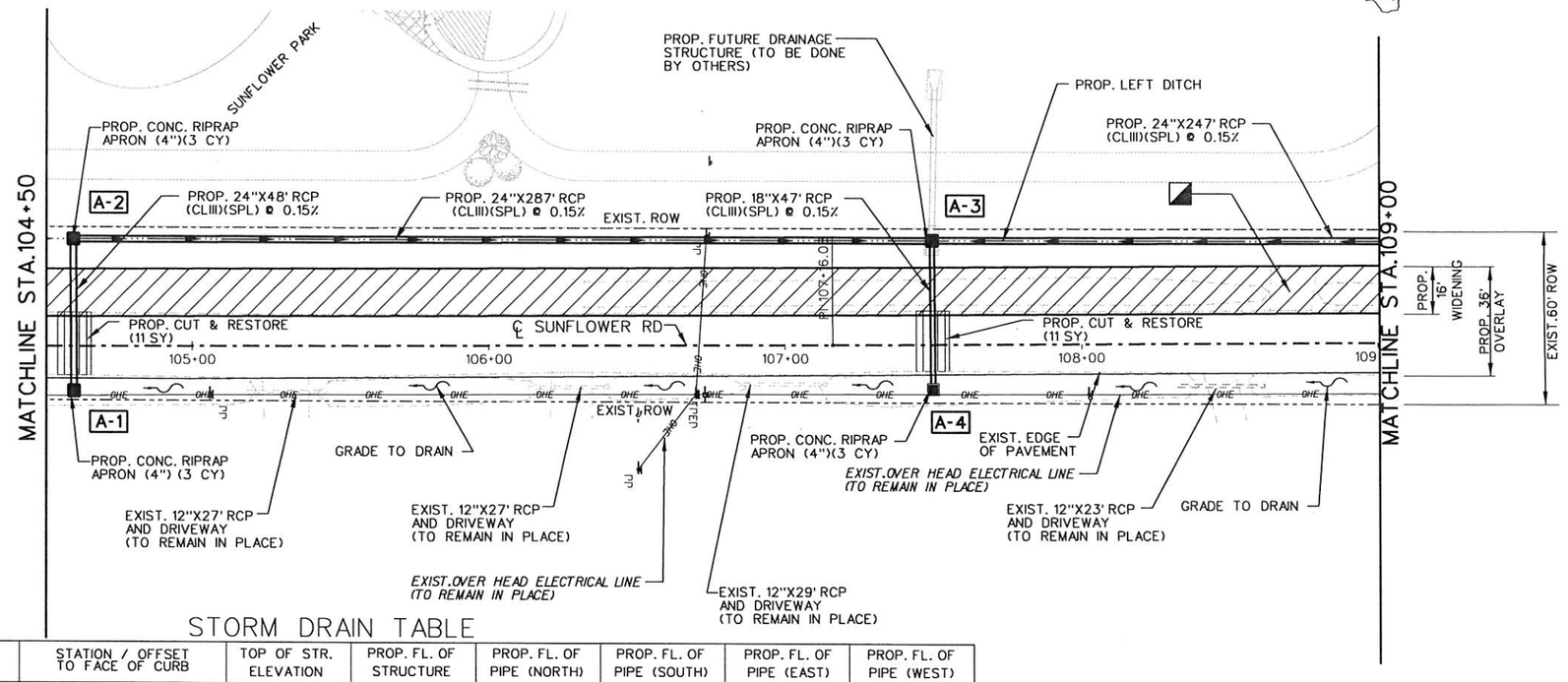
SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER ROAD UTILITIES AND DRAINAGE

SCALE:
HOR: 1" = 50'
VER: 1" = 10'

SHEET 1 OF 5

DRAWING:	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
CK:	6	TEXAS				Sunf.
ENGINEER:	STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
CK:	PHR	HIDALGO	921	02		38
REVIEW:						
CK:						



STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
A-1	PSL FG 3x3 w 3x3 gr	104+60.00, 15.00 RT	64.50	60.82				60.82
A-2	PSL FG 3x3 w 3x3 gr	104+60.00, 36.00 LT	65.34	60.74	60.74		60.74	
A-3	PSL FG 3x3 w 3x3 gr	107+50.00, 35.00 LT	64.80	60.31	60.31	60.31	60.81	
A-4	PSL FG 3x3 w 3x3 gr	107+50.00, 15.00 RT	65.25	60.88				60.88

SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	474
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	249
400	CUT & RESTORE	SY	22
402	TRENCH EXCAVATION PROT.	LF	629
432	RIPRAP (CONC)(4")	CY	12
464	RCP (18")(CL III)(SPL)	LF	47
464	RCP (24")(CL III)(SPL)	LF	582
465	INLET (COMPL)(PSL)(FG)(3x3W/3x3 GR)	EA	4

LEGEND

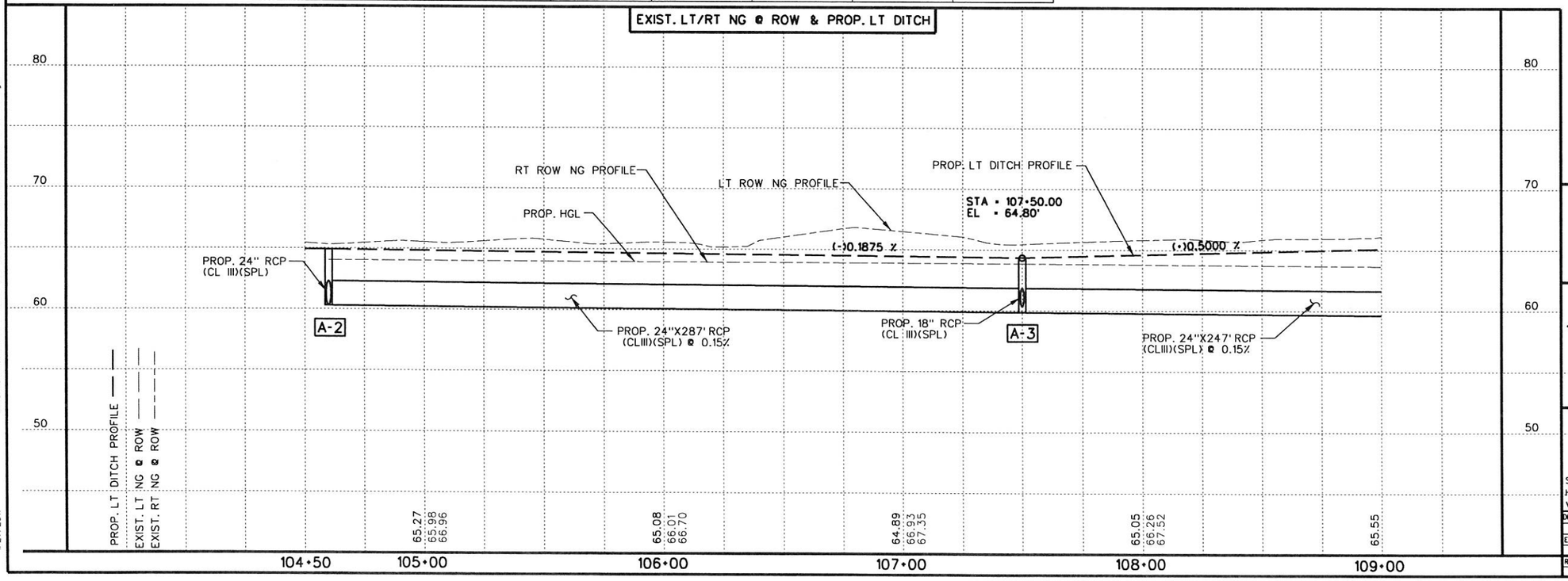
- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF STORM SEWER FLOW
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)

NOTES:
SEE ALIGNMENT DATA SHEET FOR EXIST. CENTERLINE DATA.

ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.



STATE OF TEXAS
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90524
LICENSED PROFESSIONAL ENGINEER

SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER ROAD UTILITIES AND DRAINAGE

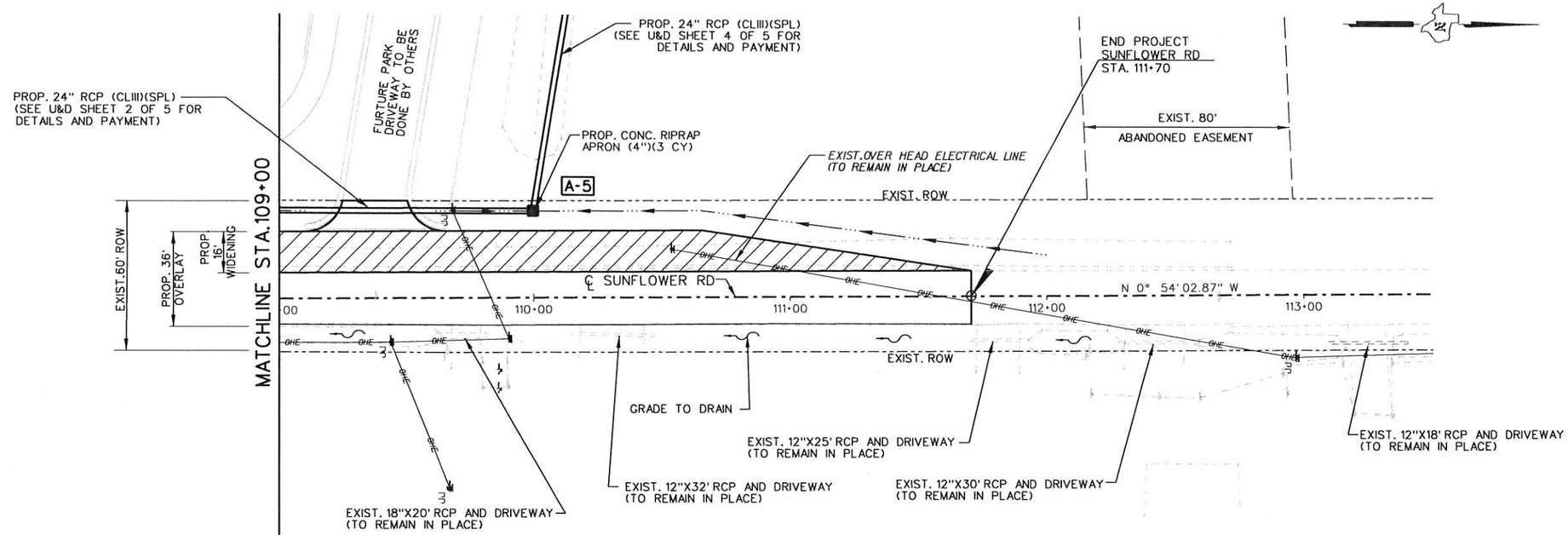
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 2 OF 5

DRAWING:		FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
CK:		6	TEXAS				Sunf.
ENGINEER:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
CK:		PHR	HIDALGO	921	02		39
REVIEW:	
CK:	

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1/27/2017



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
432	RIPRAP (CONC)(4")	CY	3
465	INLET (COMPL)(PSL)(FG)(3x3W/3x3 GR)	EA	1

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF STORM SEWER FLOW
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)

NOTES:
SEE ALIGNMENT DATA SHEET FOR EXIST. CENTERLINE DATA.

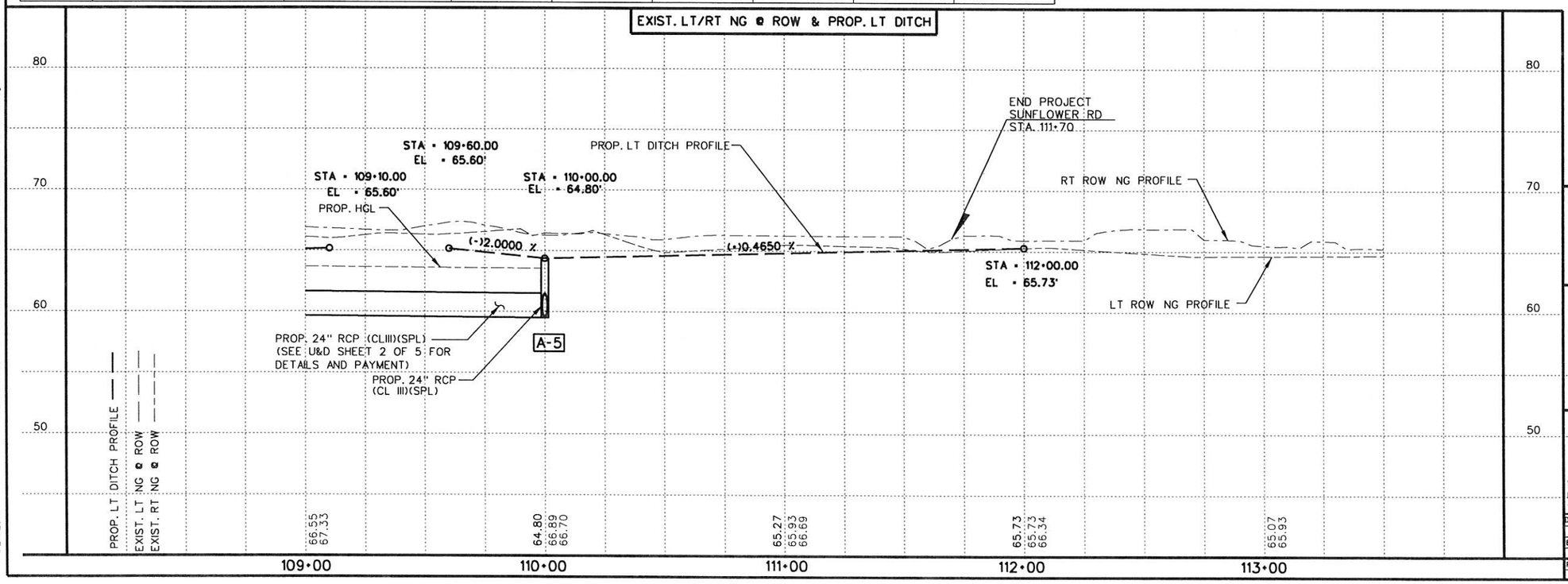
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STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
A-5	PSL FG 3x3 w 3x3 gr	110+00.00, 33.75 LT	64.80	59.93		59.93		59.93



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1/27/2017

STATE OF TEXAS
JULIO CESAR CERDA
90524
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PROFESSIONAL ENGINEER

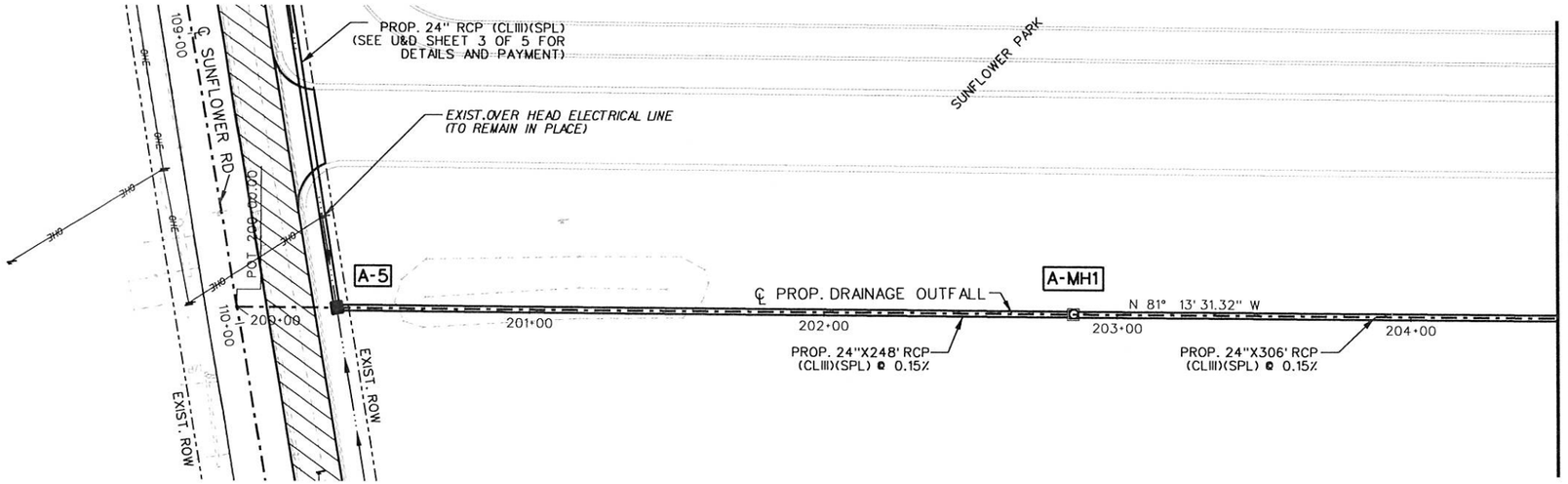
SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER ROAD UTILITIES AND DRAINAGE

SCALE:
HOR: 1" = 50'
VER: 1" = 10'

SHEET 3 OF 5

DRAWING:		FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK:		6	TEXAS					Sunf.
ENGINEER:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK:		PHR	HIDALGO	921	02			40
REVIEW:	
CK:	



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	590
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	223
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	554
464	RCP (18")(CL III)(SPL)	LF	-
464	RCP (24")(CL III)(SPL)	LF	554
465	INLET (COMPL)(PSL)(RC)(3x3)	EA	1

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF STORM SEWER FLOW
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)

NOTES:
SEE ALIGNMENT DATA SHEET FOR EXIST. CENTERLINE DATA.

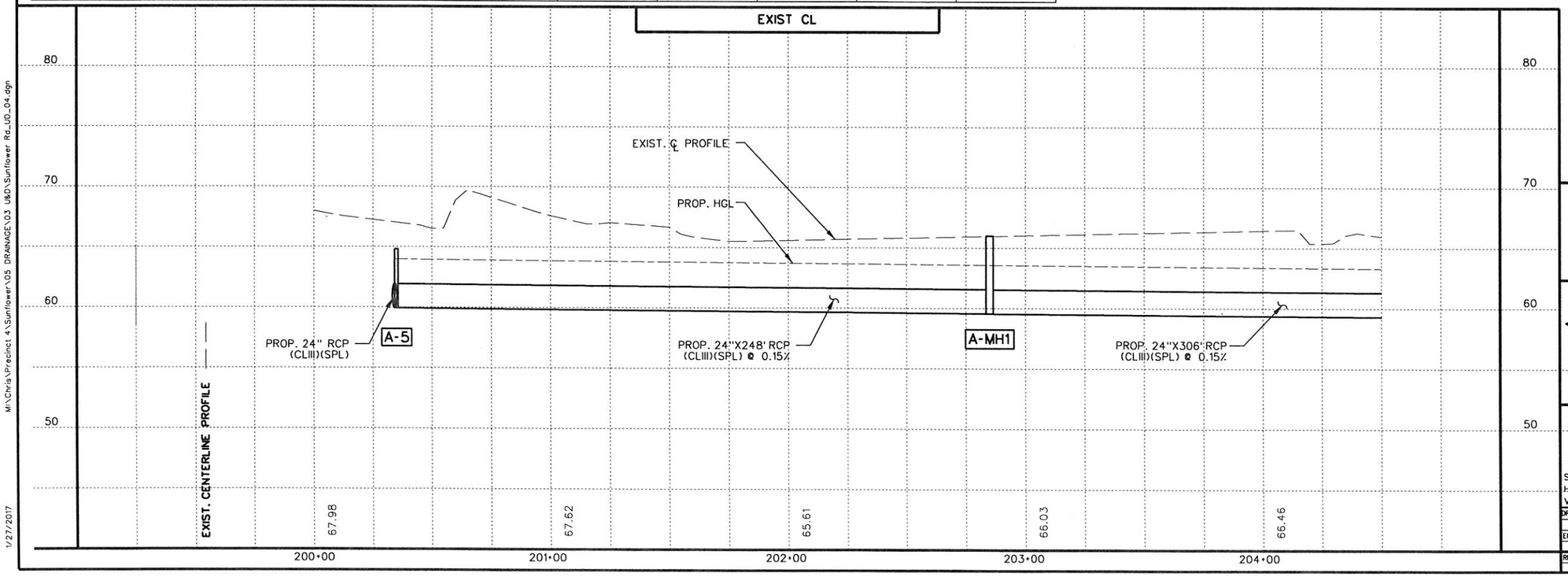
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SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

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STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
A-MH1	PSL RC 3x3	202+85.00, 00.00 RT	66.00	59.55			59.55	59.55



STATE OF TEXAS
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90524
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SUNFLOWER ROAD UTILITIES AND DRAINAGE

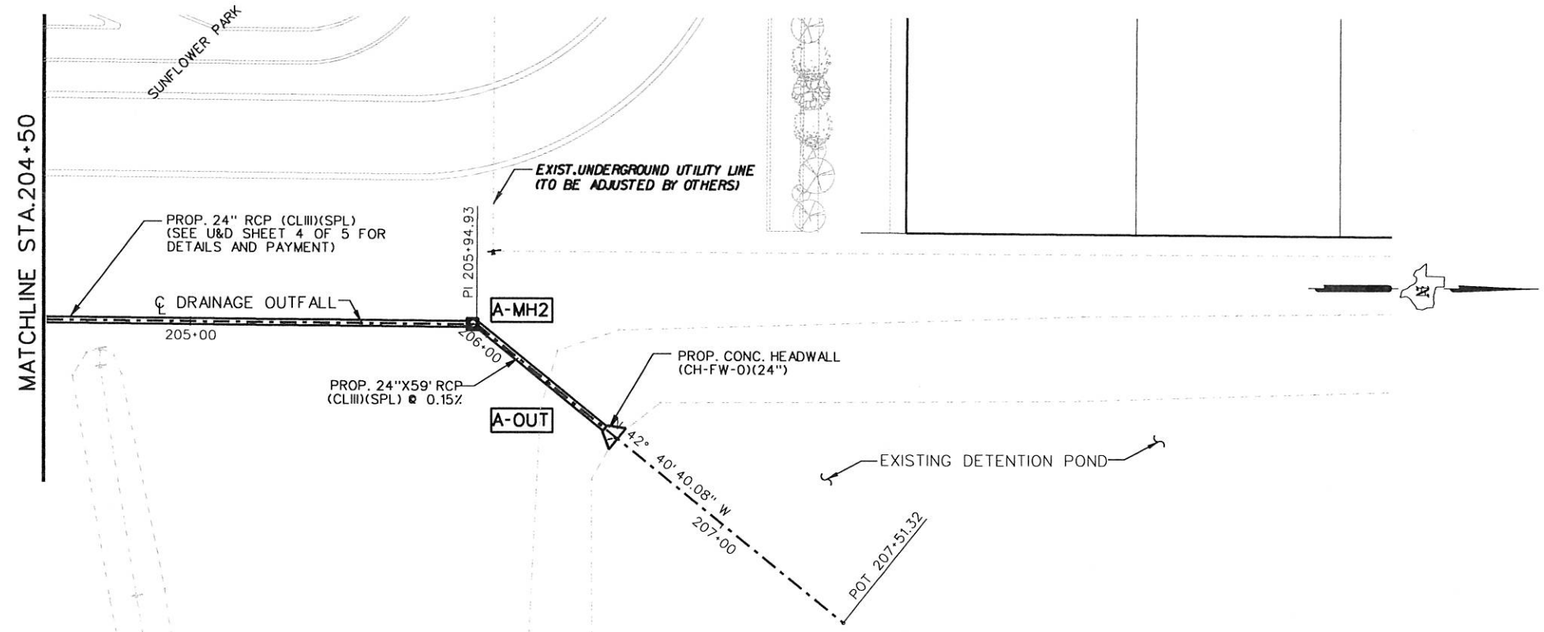
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 4 OF 5

DRAWING:	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK:	6	TEXAS					Sunf.
ENGINEER:	STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK:	PHR	HIDALGO	921	02			41
REVIEW:							
CK:							

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1/27/2017



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
400	STRUCT EXCAVATION (NON-PAY)	CY	72
400	STRUCT EXCAVATION (SPL)	CY	-
400	SAND BACKFILL	CY	24
400	CUT & RESTORE	SY	-
402	TRENCH EXCAVATION PROT.	LF	59
464	RCP (18")(CL III)(SPL)	LF	-
464	RCP (24")(CL III)(SPL)	LF	59
465	INLET (COMPL)(PSL)(RC)(3x3)	EA	1
466	HEADWALL (CH-FW-0)(24")	EA	1

LEGEND

- SEE P&P SHEETS FOR DETAILS
- TO BE REMOVED UNDER ITEM 496. INCLUDES PAYMENT FOR REMOVAL OF ALL APPURTENANCES.
- DIRECTION OF STORM SEWER FLOW
- LIMITS OF PROP. CUT & RESTORE (ITEM 400)

NOTES:
SEE ALIGNMENT DATA SHEET FOR EXIST. CENTERLINE DATA.

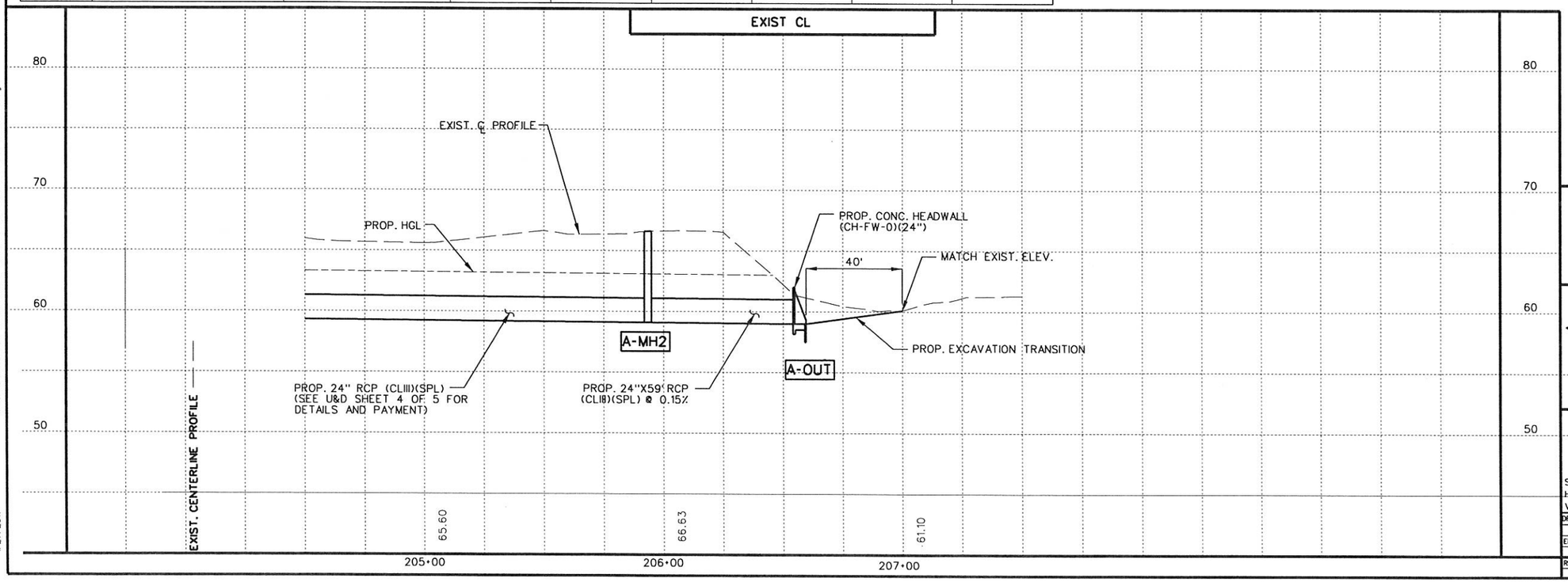
ALL RCP SHALL BE CL III(SPL) UNLESS OTHERWISE NOTED.

SEE HYD. DATA SHEETS FOR HYDRAULIC GRADE LINE (H.G.L.) ELEVATIONS

THE CONTRACTOR SHALL CONFIRM THAT CONFLICTS WITH EXISTING UTILITIES HAVE BEEN RESOLVED IN ADVANCE OF CONSTRUCTION. DAMAGES CAUSED BY OR TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STORM DRAIN TABLE

STRUCTURE ID	DESCRIPTION	STATION / OFFSET TO FACE OF CURB	TOP OF STR. ELEVATION	PROP. FL. OF STRUCTURE	PROP. FL. OF PIPE (NORTH)	PROP. FL. OF PIPE (SOUTH)	PROP. FL. OF PIPE (EAST)	PROP. FL. OF PIPE (WEST)
A-MH2	PSL RC 3x3	205+93.50	66.60	59.09		59.09	59.09	
A-OUT	OUTLET	111+38.50		59.00		59.00		



STATE OF TEXAS
JULIO CESAR CERDA
90524
LICENSED
PROFESSIONAL ENGINEER

SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER ROAD UTILITIES AND DRAINAGE

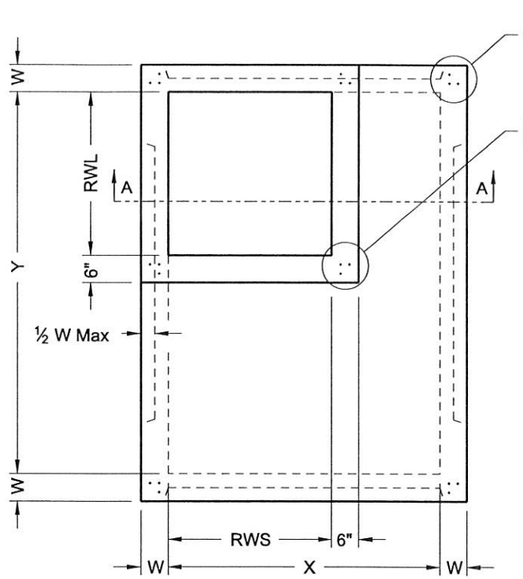
SCALE:
HOR: 1"= 50'
VER: 1"= 10'

SHEET 5 OF 5

DRAWING:		FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK:		6	TEXAS					Sunf.
ENGINEER:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK:		PHR	HIDALGO	921	02			42
REVIEW:	
CK:	

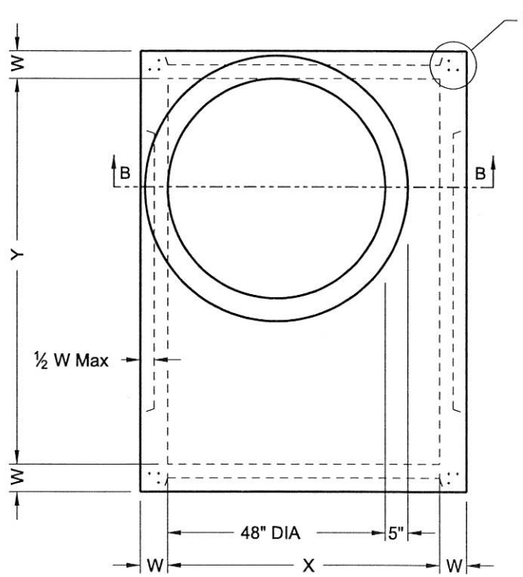
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1/27/2017



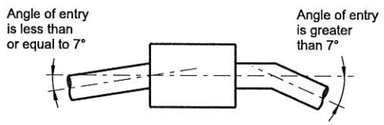
PLAN VIEW "A"

SQUARE REDUCED RISER OPTION



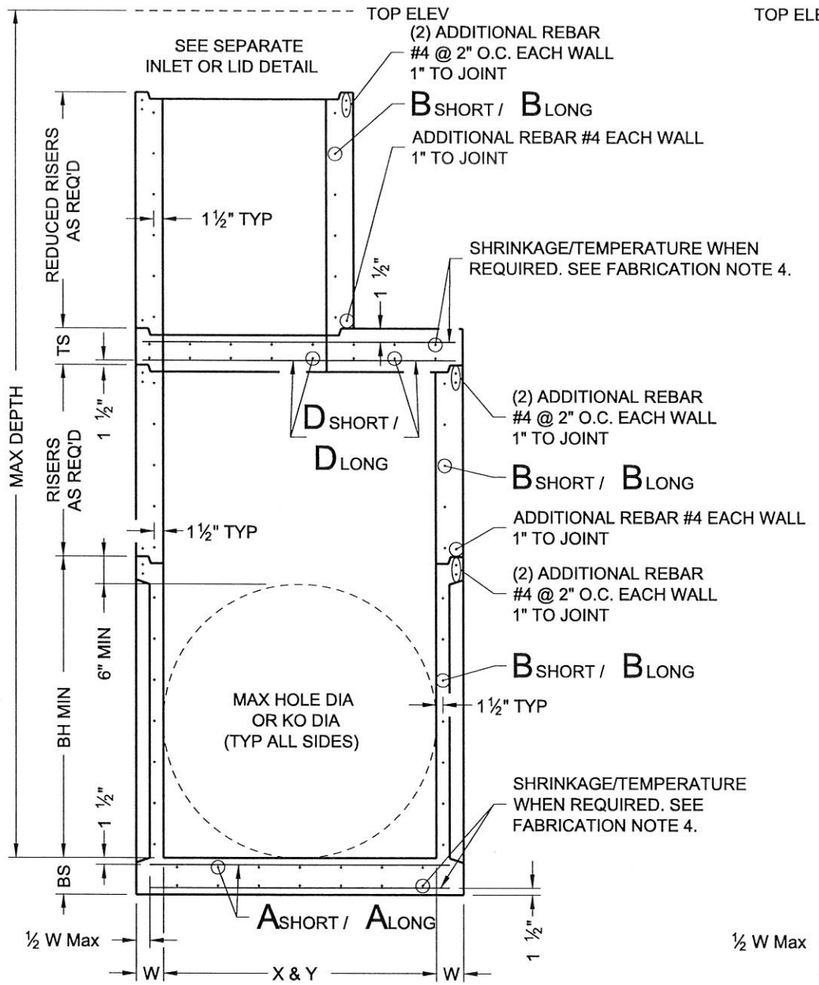
PLAN VIEW "B"

ROUND REDUCED RISER OPTION



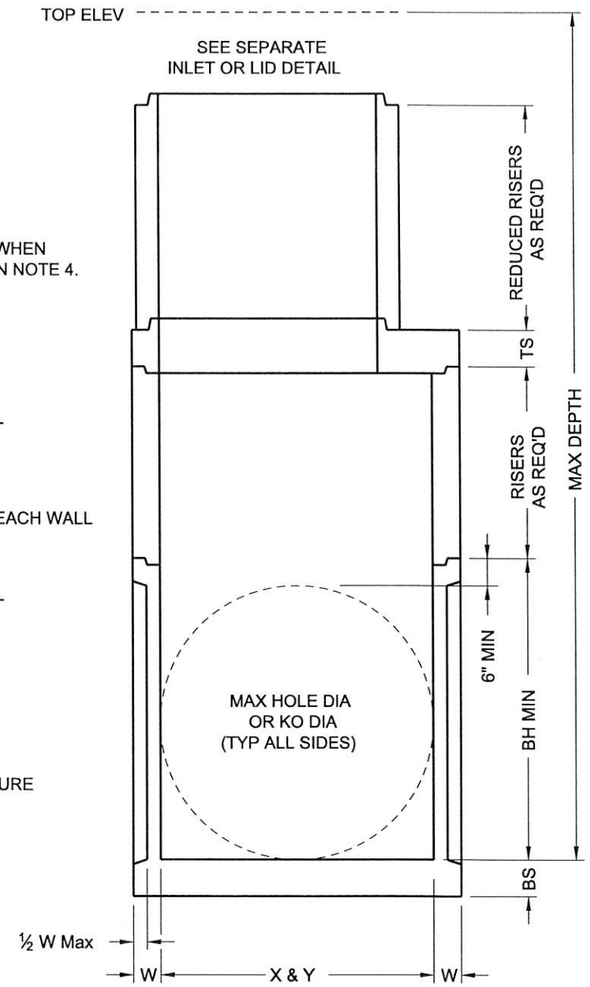
PIPE CONNECTION DETAIL

Connect pipes within 7° of normal to PB wall.
If necessary, use pipe elbow or curved
approach alignment to stay within this limit.



SECTION A-A

SQUARE REDUCED RISER OPTION



SECTION B-B

ROUND REDUCED RISER OPTION

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide typical clear cover of 1 ½" to reinforcing steel at interior or exterior walls.
4. Walls or slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in²/ft each way.
5. No substitution is allowed for vertical and horizontal #4 bars in corners.
6. Manufacture base and risers to nearest 3" increment.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.
9. See sheet PDD for sizes, dimensions, and reinforcing steel not shown.

INSTALLATION NOTES:

1. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to specified inlet or manhole.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. For rigid pipe, cut hole in thin wall panel (KO) 4" Max, 2" Min larger than pipe OD.
5. For flexible pipe, consult boot/seal Manufacturer's specification for placement tolerance and hole size. Center pipe in hole and install boot/seal per Manufacturer's specification.

GENERAL NOTES:

1. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for precast base is subsidiary to the specified inlet, per Item 465, "Junction Boxes, Manholes, and Inlets."

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRECAST BASE

PB

FILE: prestd01.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT January 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0921	02		
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		4.3

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DATE: 1/27/2017 6:40:23 PM
FILE: M:\Chris\Precinct 4\Sunflower\10 STANDARDS\05 DRAINAGE\prestd01.dgn

	Size	MAX DEPTH = 15 ft. to top of BASE SLAB										MAX DEPTH = 25 ft. to top of BASE SLAB										Min Height (See Gen Note 3)	Max HOLE DIA (See Fab Note 2)	Max KO DIA (See Fab Note 2)
		Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)				Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)						
		Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness			
	X x Y	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	BH MIN	HOLE DIA	KO DIA
	ft.	in²/ft	in²/ft	in.	in²/ft	in²/ft	in.	ft. **	in²/ft	in²/ft	in.	in²/ft	in²/ft	in.	in²/ft	in²/ft	in.	ft. **	in²/ft	in²/ft	in.	ft.	in.	in.
Precast Junction Box (PJB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	0.37	0.37	9	0.29	0.29	6	0.24	0.24	6	N/A	0.37	0.37	9	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	0.41	0.41	9	0.47	0.47	6	0.38	0.38	6	N/A	0.41	0.41	9	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	N/A	0.48	0.48	9	0.39	0.18	6	0.23	0.59	6	N/A	0.48	0.48	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	N/A	0.42	0.42	9	0.53	0.26	6	0.39	0.59	6	N/A	0.42	0.42	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	N/A	0.43	0.43	9	0.62	0.62	6	0.59	0.59	6	N/A	0.43	0.43	9	5.5	60	60
	5x6	0.27	0.27	9	0.34	0.45	6	N/A	0.48	0.48	9	0.47	0.45	9	0.38	0.54	8	N/A	0.48	0.48	9	5.5	60/72	60/72
	6x6	0.27	0.27	9	0.45	0.45	6	N/A	0.56	0.56	9	0.52	0.52	9	0.54	0.54	8	N/A	0.56	0.56	9	6.5	72	72
	8x8	0.46	0.46	9	0.51	0.51	8	N/A	0.45	0.45	12	0.87	0.87	9	0.59	0.59	10	N/A	0.45	0.45	12	8.5	96	72
Precast Base (PB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	N/A	N/A	N/A	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	0.47	0.47	6	0.38	0.38	6	N/A	N/A	N/A	N/A	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	3x3	0.30	0.34	9	0.39	0.18	6	0.23	0.59	6	3x3	0.40	0.40	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x3	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	3x3	0.46	0.37	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	4x4	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	4x4	0.39	0.39	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	48"	0.39	0.39	9	0.53	0.26	6	0.39	0.59	6	48"	0.47	0.47	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x5	0.33	0.40	9	0.53	0.26	6	0.39	0.59	6	3x5	0.48	0.48	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	3x3	0.34	0.34	9	0.62	0.62	6	0.59	0.59	6	3x3	0.53	0.53	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	4x4	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	4x4	0.64	0.64	9	5.5	60	60
	5x5	0.38	0.38	6	0.34	0.34	6	48"	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	48"	0.64	0.64	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	3x5	0.34	0.40	9	0.62	0.62	6	0.59	0.59	6	3x5	0.53	0.53	9	5.5	60	60
	5x6	0.31	0.31	9	0.34	0.45	6	3x3	0.34	0.34	9	0.47	0.45	9	0.38	0.54	8	3x3	0.61	0.50	9	5.5	60/72	60/72
	5x6	0.27	0.27	9	0.34	0.45	6	4x4	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	4x4	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	48"	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	48"	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	3x5	0.45	0.45	9	0.47	0.45	9	0.38	0.54	8	3x5	0.61	0.61	9	5.5	60/72	60/72
	6x6	0.29	0.29	9	0.45	0.45	6	3x3	0.41	0.41	9	0.52	0.52	9	0.54	0.54	8	3x3	0.74	0.74	9	6.5	72	72
	6x6	0.27	0.27	9	0.45	0.45	6	4x4	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	4x4	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	48"	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	48"	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	3x5	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	3x5	0.87	0.87	9	6.5	72	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x3	0.61	0.61	12	0.91	0.91	9	0.70	0.70	10	3x3	0.85	0.85	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	4x4	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	4x4	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	48"	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	48"	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x5	0.70	0.85	12	0.87	0.87	9	0.70	0.70	10	3x5	1.01	1.01	12	8.5	96	72

** Unless otherwise indicated.

FABRICATION NOTES:
1. Maximum spacing of reinforcement is 8".
2. At manufacturer's option, provide cast or cored holes or thin wall panels (KO) to the maximum diameter shown for each. When no penetration is required, it is acceptable to provide a wall with no sectional reduction.

GENERAL NOTES:
1. Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PJB for details.
2. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PB for details.
3. Min Height shown is for stock base units. Use stock base units whenever practical. Smaller height base units can be used in special installation circumstances, when noted elsewhere in the plans. Absolute minimum height of base units is 2'-6".

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

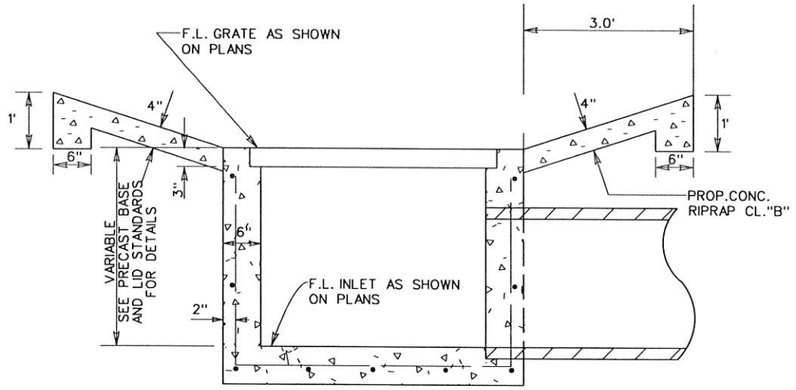
DESIGN DATA FOR PRECAST BASE AND JUNCTION BOX

PDD

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©TxDOT January 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS				
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	PHR	HIDALGO		44

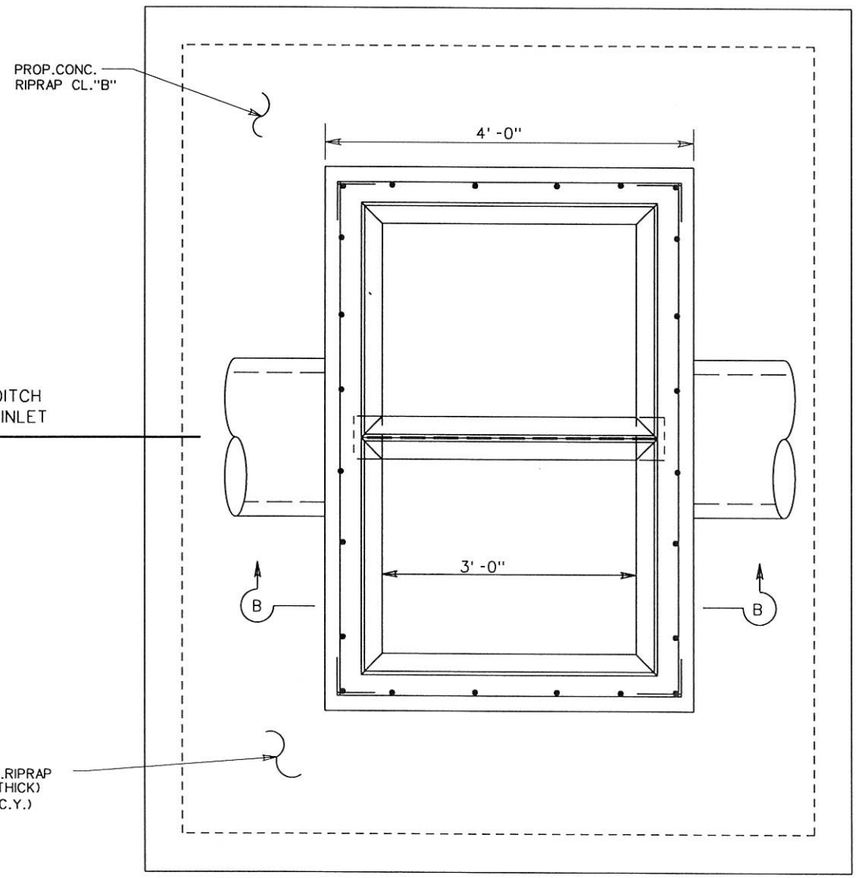
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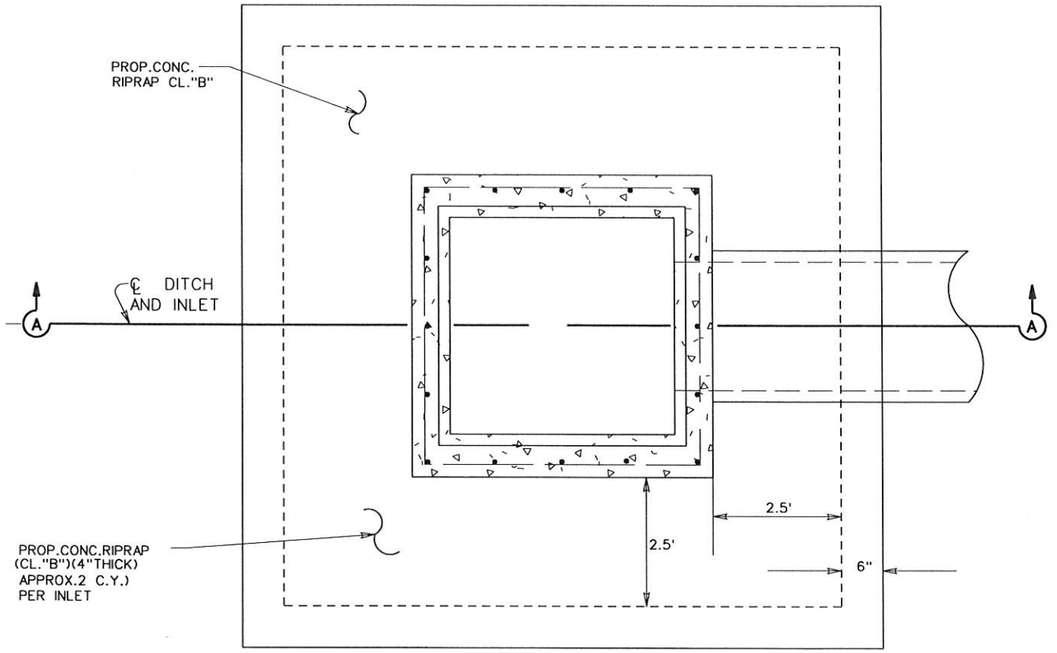
SECTION A-A

1-3'X3' GRATE INLET



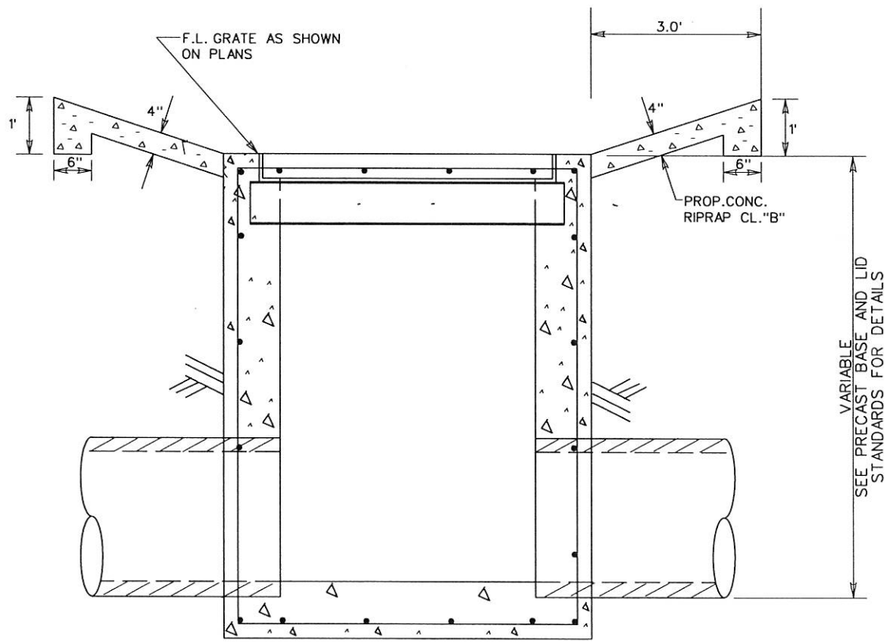
2-3'X3' GRATE INLETS

PLAN



TOP VIEW

1-3'X3' GRATE INLET



SEC. B-B

2-3'X3' GRATE INLETS

NOTE:
PROP. CONCRETE RIP-RAP SHALL INCLUDE WIRE REINFORCEMENT (6" X 6" W3 X W3 - NO. 6 GAUGE) WELDED WIRE FABRIC (SUBSIDIARY TO ITEM 432.)

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GRATE INLET RIPRAP DETAILS

FED.RD. DIV.NO.	FILE NO.	PROJECT NO.				SHEET NO.
6						45
STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	21	HIDALGO				

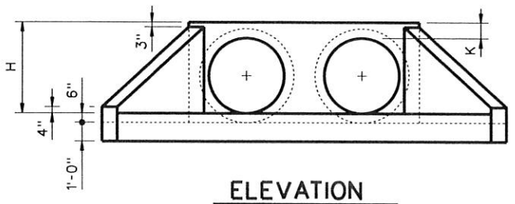
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DATE:
FILE:

TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (4)

SLOPE	DIA OF PIPE,D	Values for one Pipe W	X	Y	L	Reinf (Lbs)	Conc (CY) (1)	Values to be added for each addt'l Pipe X and W	Reinf (Lbs)	Conc (CY) (1)
2:1	12"	4'- 7 1/2"	2'- 6	2'- 10"	3'-8			20		
	15"	5'- 5 3/4"	2'- 9 1/2	3'- 4"	3'-9			22		
	18"	6'- 4 1/4"	3'- 1"	3'- 10"	12			32		
	21"	7'- 2 3/4"	3'- 4 1/2	4'- 4"	13		4.3	0.4 3'- 1"		
	24"	8'- 2 1/2"	3'- 9 1/2	4'- 10"	15			50		
	27"	9'- 1"	4'- 1"	5'- 4"	17			56		
	30"	9'-11 1/2"	4'- 4 1/2	5'- 10"	6'-1			63		
	33"	10'-10"	4'- 8"	6'- 4"	7'-2			74		
	36"	11'- 8 1/4"	4'-11 1/2"	6'- 10"	7'-2			81		
	42"	13'- 5 1/4"	5'- 6 1/2"	7'- 10"	9'-2			95		
	48"	15'- 9"	6'- 1 1/2"	9'- 4"	10'-3			118		
	54"	17'- 5 3/4"	6'- 8 1/2	10'- 4"	11'-4			15		
	60"	19'- 2 3/4"	7'- 3 1/2	11'- 4"	4			17		
	66"	20'-11 1/2"	7'-10 1/2	12'- 4"	5			19		
	72"	22'- 8 1/2"	8'- 5 1/2	13'- 4"	15'-5		2.1	3.3		
3:1	12"	6'- 3"	2'- 6	4'- 3"	11			22		
	15"	7'- 5"	2'- 9 1/2	5'- 0"	5		2.8	0.3 2'- 2"		
	18"	8'- 6 3/4"	3'- 1"	5'- 9"	6			37		
	21"	9'- 8 3/4"	3'- 4 1/2	6'- 6"	18			48		
	24"	11'- 0"	3'- 9 1/2	7'- 3"	8'-2			58		
	27"	12'- 2"	4'- 1"	8'- 0"	9'-2			67		
	30"	13'- 4"	4'- 4 1/2	8'- 9"	10'-2			77		
	33"	14'- 5 3/4"	4'- 8"	9'- 6"	10'-3		8.4	1.2 4'- 8"		
	36"	15'- 7 3/4"	4'-11 1/2	10'- 3"	3			93		
	42"	17'-11 1/2"	5'- 6 1/2	11'- 9"	13'-4			119		
	48"	21'- 1 3/4"	6'- 1 1/2	14'- 0"	5		14.6	2.36'- 7"		
	54"	23'- 5 1/2"	6'- 8 1/2	15'- 6"	17'-6			186		
	60"	25'- 9 1/4"	7'- 3 1/2	17'- 0"	19'-7			219		
	66"	28'- 1"	7'-10 1/2	18'- 6"	21'-7		24.2	3.98'- 9"		
	72"	30'- 4 3/4"	8'- 5 1/2	20'- 0"	23'-9			273		
4:1	12"	7'-10 3/4"	2'- 6	5'- 8"	6'-4		2.4	0.3 1'- 9"		
	15"	9'- 4"	2'- 9 1/2	6'- 8"	7'-7			32		
	18"	10'- 9 1/2"	3'- 1"	7'- 8"	8'-2			42		
	21"	12'- 2 3/4"	3'- 4 1/2	8'- 8"	21			53		
	24"	13'- 9 1/2"	3'- 9 1/2	9'- 8"	21			67		
	27"	15'- 3"	4'- 1"	10'- 8"	12'-3			79		
	30"	16'- 8 1/4"	4'- 4 1/2	11'- 8"	13'-7			89		
	33"	18'- 1 3/4"	4'- 8	12'- 8"	14'-4			101		
	36"	19'- 7"	4'-11 1/2	13'- 8"	15'-4		11.5	1.7 5'- 1"		
	42"	22'- 5 3/4"	5'- 6 1/2	15'- 8"	5			145		
	48"	26'- 6 1/4"	6'- 1 1/2	18'- 8"	21'-7			175		
	54"	29'- 5"	6'- 8 1/2	20'- 8"	23'-8			227		
	60"	32'- 3 3/4"	7'- 3 1/2	22'- 8"	9			280		
	66"	35'- 2 1/2"	7'-10 1/2	24'- 8"	28			3008		
	72"	38'- 1 1/4"	8'- 5 1/2	26'- 8"	30			339		
6:1	12"	11'- 2"	2'- 6	8'- 6"	9			28		
	15"	13'- 2 1/4"	2'- 9 1/2	10'- 0"	11'-2			32		
	18"	15'- 2 1/2"	3'- 1	11'- 6"	13			50		
	21"	17'- 2 3/4"	3'- 4 1/2	13'- 0"	15'-3			69		
	24"	19'- 4 1/2"	3'- 9 1/2	14'- 6"	4			83		
	27"	21'- 4 3/4"	4'- 1	16'- 0"	18'-5			98		
	30"	23'- 5 1/4"	4'- 4 1/2	17'- 6"	20'-5			118		
	33"	25'- 5 1/2"	4'- 8	19'- 0"	21'-6			124		
	36"	27'- 5 3/4"	4'-11 1/2	20'- 6"	22			145		
	42"	31'- 6 1/4"	5'- 6 1/2	23'- 6"	27'-9			179		
	48"	37'- 3 1/2"	6'- 1 1/2	28'- 0"	11			231		
	54"	41'- 4 1/4"	6'- 8 1/2	31'- 0"	35'-4			300		
	60"	45'- 4 3/4"	7'- 3 1/2	34'- 0"	16			353		



ELEVATION

Showing dimensions

(1) Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.

(2) For vehicle safety, curbs shall project no more than 3" above finished grade. Curb heights shall be reduced, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

(3) Provide a 1'-0" footing as shown where required to maintain 4" Min cover for pipes.

(4) Quantities shown are for one structure end only (one headwall).

(5) Min Length = 6" + 3" x $\left(\frac{12 \times H - 7}{12 \times L}\right)$

Max Length = 12 x H + 3" x $\left(\frac{12 \times H - 7}{12 \times L}\right)$ - 1"

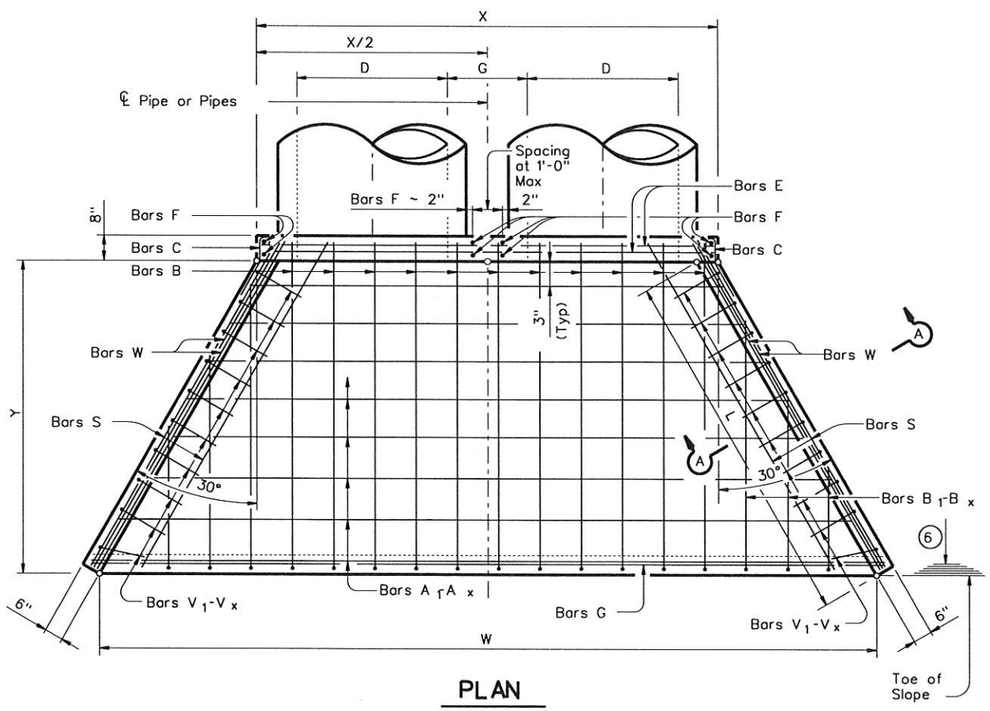
(6) Lengths of wings based on SL:1 Slope along this line.

TABLE OF REINFORCING STEEL (4)

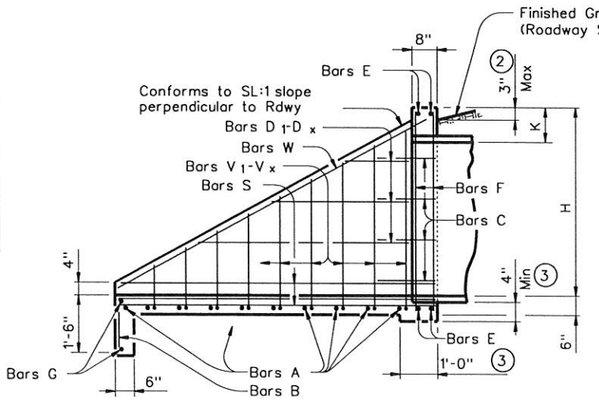
Bar	Size	Spa	No.
A	# 4	1'-0"	~
B	# 3	1'-6"	~
C	# 4	1'-0"	~
D	# 3	1'-0"	~
E	# 5	~	4
F	# 5	~	~
G	# 3	~	2
S	# 4	~	6
V	# 4	1'-0"	~
W	# 5	~	4

TABLE OF CONSTANT DIMENSIONS

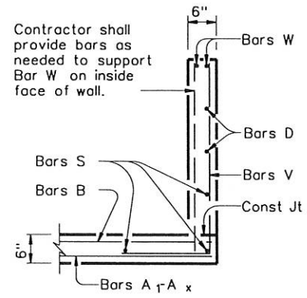
DIA OF PIPE,D	G	K	H
12"	9"	1'- 0"	2'- 0"
15"	11"	1'- 0"	2'- 3"
18"	1'- 2"	1'- 0"	2'- 6"
21"	1'- 4"	1'- 0"	2'- 9"
24"	1'- 7"	1'- 0"	3'- 0"
27"	1'- 8"	1'- 0"	3'- 3"
30"	1'-10"	1'- 0"	3'- 6"
33"	1'-11"	1'- 0"	3'- 9"
36"	2'- 1"	1'- 0"	4'- 0"
42"	2'- 4"	1'- 0"	4'- 6"
48"	2'- 7"	1'- 3"	5'- 3"
54"	3'- 0"	1'- 3"	5'- 9"
60"	3'- 3"	1'- 3"	6'- 3"
66"	3'- 3"	1'- 3"	6'- 9"
72"	3'- 4"	1'- 3"	7'- 3"



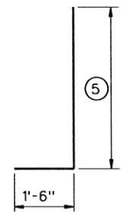
PLAN



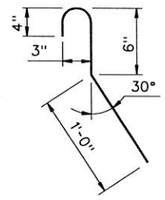
TYPICAL WING ELEVATION



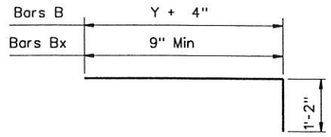
SECTION A-A



BARS V



BARS C
(2'-0" long)



BARS B & B1-Bx

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

Reinforcing steel shall be placed with the center of the outside layer of bars 2" from the surface of the concrete.

All reinforcing steel shall be Grade 60.

All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.

No bridge rails of any type may be mounted directly to these culvert headwalls.

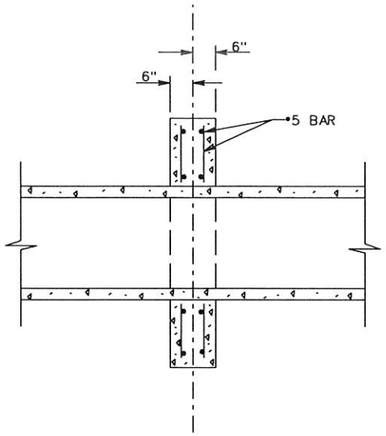
Texas Department of Transportation

Bridge Division Standard

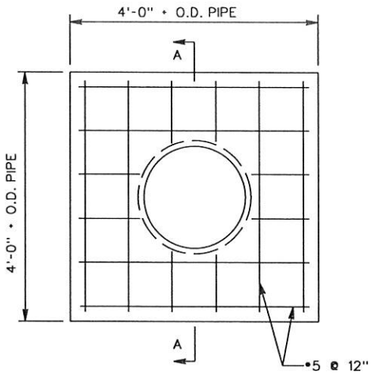
CONCRETE HEADWALLS WITH FLARED WINGS FOR 0° SKEW PIPE CULVERTS

CH-FW-0

FILE: chfw00se.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.
				46

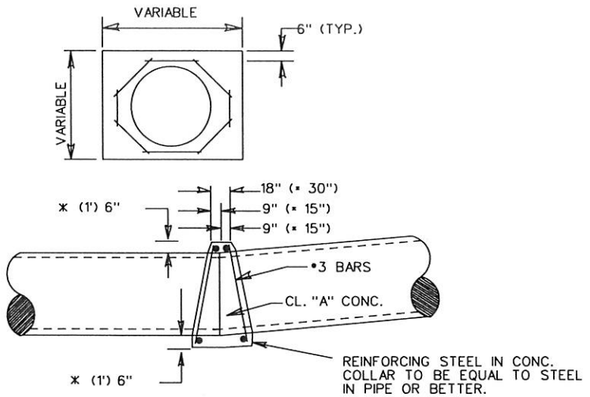


SECTION A-A



FRONT ELEVATION

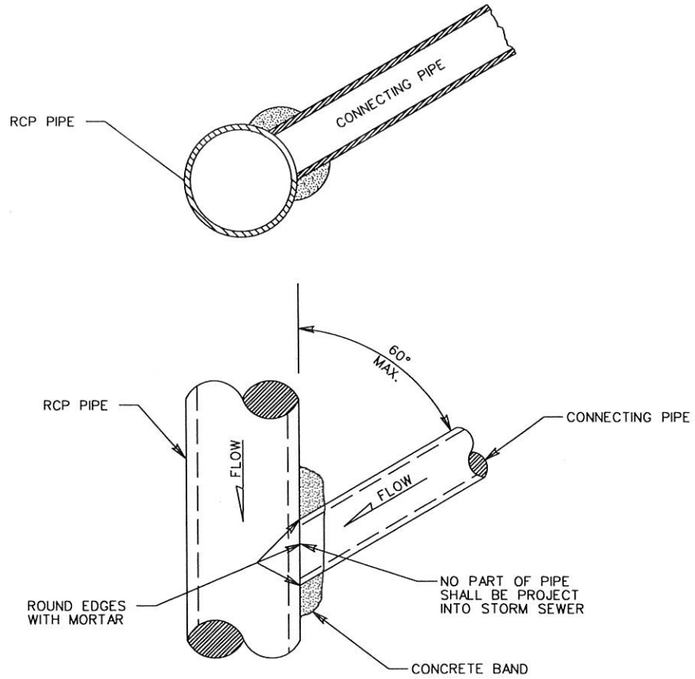
CONCRETE PIPE COLLAR



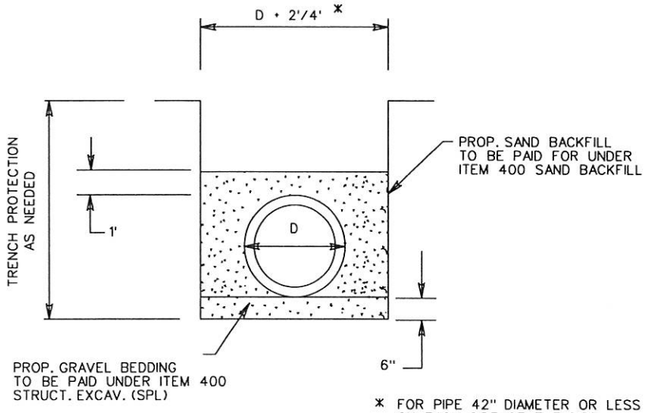
DETAIL FOR CONC. COLLARS DRAINAGE STRUCTURES AND PIPE SIPHONS (HORIZ. & VERT. BENDS)

NOTE: PROP. CONC. COLLAR WILL NOT BE PAID FOR DIRECTLY BUT WILL BE SUBSIDIARY TO THE BIDS ITEMS INVOLVED.

* FOR 42" DIAMETER AND LARGER PIPE

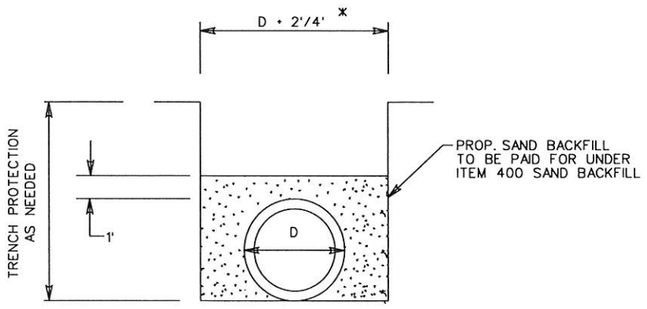


TYPICAL REINFORCED CONC. PIPE CONNECTION WITHOUT MANHOLE



* FOR PIPE 42" DIAMETER OR LESS PLACE 1'OF FILL ON EACH SIDE OF THE PIPE.
FOR PIPE LARGER THAN 42" DIAMETER PLACE 2' OF FILL ON EACH SIDE OF THE PIPE.

SPIRAL RIB CMP
TYPICAL BACKFILL DETAIL GRAVEL & SAND



* FOR PIPE 42" DIAMETER OR LESS PLACE 1'OF FILL ON EACH SIDE OF THE PIPE.
FOR PIPE LARGER THAN 42" DIAMETER PLACE 2' OF FILL ON EACH SIDE OF THE PIPE.

REINFORCED CONCRETE PIPE
TYPICAL BACKFILL DETAIL-SAND

© TxDOT 2014

PHARR DISTRICT STANDARD

TEXAS DEPARTMENT OF TRANSPORTATION

MISCELLANEOUS PIPE DETAILS

REV. 8/14

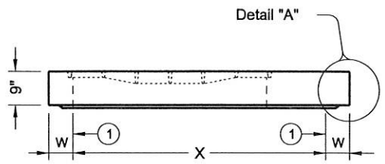
COLLAR.DGN

FED.RD. DIV.NO.	STATE AID PROJECT NO.		FILE NO.			SHEET NO.
6						47
STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TX	21	HIDALGO	921	02		Sunf.

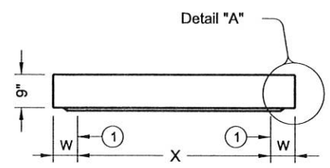
FILE: M:\Chris\Precinct 4\Sunflower\10 STANDARDS\05 DRAINAGE\COLLAR.dgn
DATE: 1/27/2017 5:56:29 PM

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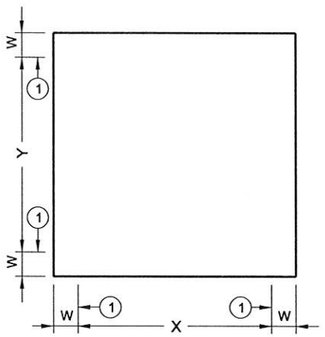
DATE:
FILE:



STYLE 'FG'



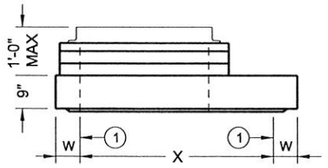
ELEVATION VIEW



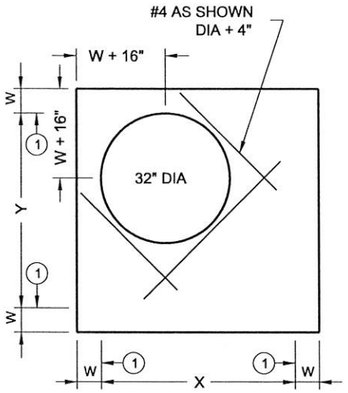
PLAN VIEW

NO OPENINGS

STYLE 'SL'



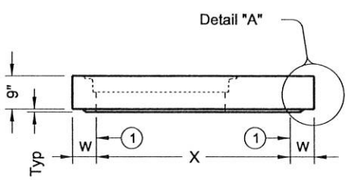
ELEVATION VIEW



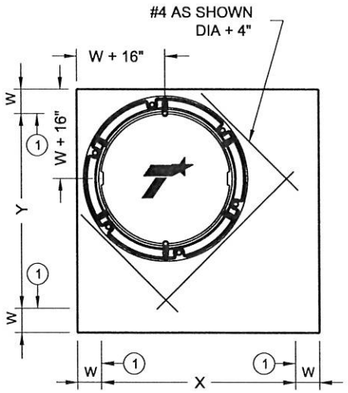
PLAN VIEW

SHIP LOOSE RING & COVER

STYLE 'RH'



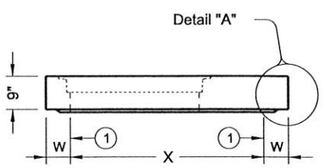
ELEVATION VIEW



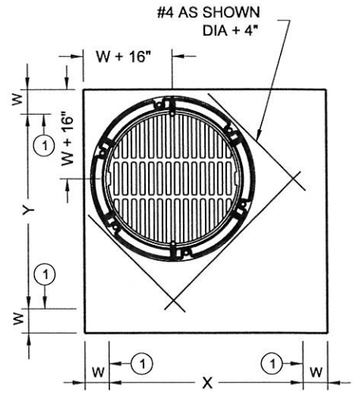
PLAN VIEW

32" DIA CAST-IN RING & COVER

STYLE 'RC'



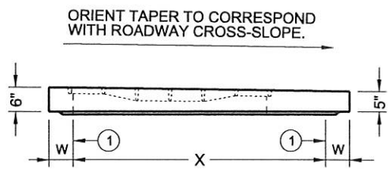
ELEVATION VIEW



PLAN VIEW

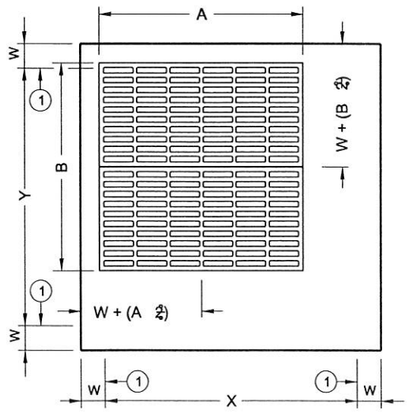
32" DIA CAST-IN RING & GRATE

STYLE 'RG'



STYLE 'SFG'

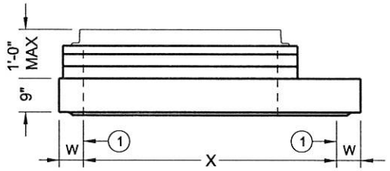
ELEVATION VIEW



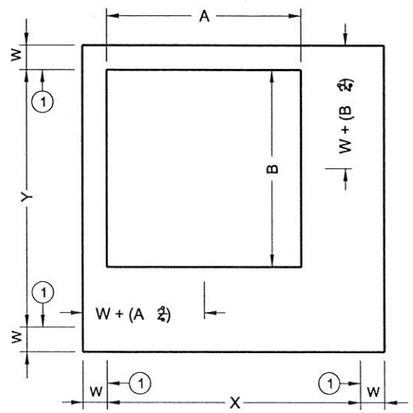
PLAN VIEW

CAST-IN FRAME & GRATE

STYLES 'FG' & 'SFG'



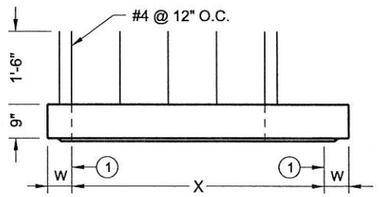
ELEVATION VIEW



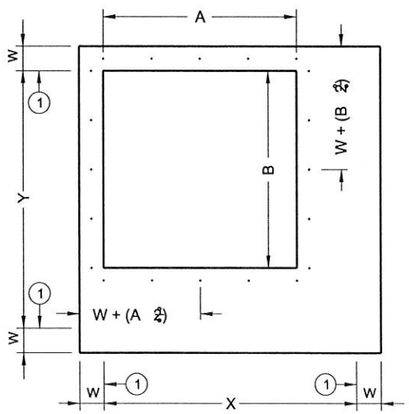
PLAN VIEW

SHIP LOOSE FRAME & GRATE

STYLE 'SH'



ELEVATION VIEW



PLAN VIEW

EXPOSED REBAR

STYLE 'S1'

(1) Matches inside face of wall of precast base or riser below inlet.

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation | Bridge Division Standard

PRECAST SLAB LID

PSL

FILE: prestd05.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT January 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		48

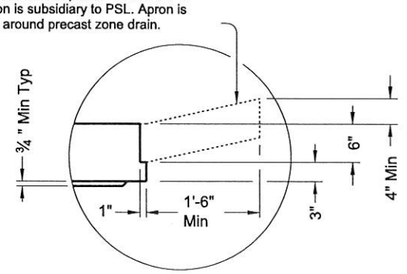
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DATE:
FILE:

Style	Size (X x Y)	W (2)	A x B (nominal)	Short Span Reinf Steel Area	Long Span Reinf Steel Area
SL	3'x3'	6"	n/a	0.37 in□/ft	0.37 in□/ft
RH,RC,RG,SH,S1,FG	3'x3'	6"	3'x3' or 32" Dia	0.37 in□/ft	0.37 in□/ft
SFG	3'x3'	6"	3'x3'	0.32 in□/ft	0.32 in□/ft
SL	4'x4'	6"	n/a	0.34 in□/ft	0.34 in□/ft
RH,RC,RG,SH,S1,FG	4'x4'	6"	3'x3' or 32" Dia	0.41 in□/ft	0.41 in□/ft
SH,S1,FG	4'x4'	6"	4'x4'	0.41 in□/ft	0.41 in□/ft
SFG	4'x4'	6"	4'x4'	0.32 in□/ft	0.32 in□/ft
SL	3'x5'	6"	n/a	0.39 in□/ft	0.39 in□/ft
RH,RC,RG,SH,S1,FG	3'x5'	6"	3'x3' or 32" Dia	0.48 in□/ft	0.48 in□/ft
SH,S1,FG	3'x5'	6"	3'x5'	0.48 in□/ft	0.48 in□/ft
SFG	3'x5'	6"	3'x5'	0.32 in□/ft	0.32 in□/ft
SL	4'x5'	6"	n/a	0.42 in□/ft	0.42 in□/ft
RH,RC,RG,SH,S1,FG	4'x5'	6"	3'x3' or 32" Dia	0.42 in□/ft	0.42 in□/ft
SH,S1,FG	4'x5'	6"	4'x4'	0.63 in□/ft	0.63 in□/ft
SH,S1,FG	4'x5'	6"	3'x5'	0.66 in□/ft	0.66 in□/ft
SL	5'x5'	6"	n/a	0.36 in□/ft	0.36 in□/ft
RH,RC,RG,SH,S1,FG	5'x5'	6"	3'x3' or 32" Dia	0.43 in□/ft	0.43 in□/ft
SH,S1,FG	5'x5'	6"	4'x4'	0.63 in□/ft	0.63 in□/ft
SH,S1,FG	5'x5'	6"	3'x5'	0.63 in□/ft	0.63 in□/ft
SL	5'x6'	6"/8"	n/a	0.48 in□/ft	0.48 in□/ft
RH,RC,RG,SH,S1,FG	5'x6'	6"/8"	3'x3' or 32" Dia	0.48 in□/ft	0.48 in□/ft
SH,S1,FG	5'x6'	6"/8"	4'x4'	0.60 in□/ft	0.60 in□/ft
SH,S1,FG	5'x6'	6"/8"	3'x5'	0.60 in□/ft	0.60 in□/ft
SL	6'x6'	6"/8"	n/a	0.43 in□/ft	0.43 in□/ft
RH,RC,RG,SH,S1,FG	6'x6'	6"/8"	3'x3' or 32" Dia	0.56 in□/ft	0.56 in□/ft
SH,S1,FG	6'x6'	6"/8"	4'x4'	0.56 in□/ft	0.56 in□/ft
SH,S1,FG	6'x6'	6"/8"	3'x5'	0.59 in□/ft	0.59 in□/ft
SL	8'x8'	8"/10"	n/a	0.45 in□/ft	0.45 in□/ft
RH,RC,RG,SH,S1,FG	8'x8'	8"/10"	3'x3' or 32" Dia	0.45 in□/ft	0.45 in□/ft
SH,S1,FG	8'x8'	8"/10"	4'x4'	0.45 in□/ft	0.45 in□/ft
SH,S1,FG	8'x8'	8"/10"	3'x5'	0.45 in□/ft	0.45 in□/ft

(2) See sheet PDD for corresponding wall thickness (W) of base unit or riser.

Construct cast-in-place reinforced concrete apron, when shown elsewhere in plans. Use Class "A" concrete. Apron is subsidiary to PSL. Apron is 1'-6" Min width around precast zone drain.



DETAIL "A"

(Reinforcing not shown for clarity)

When an apron is to be cast around PSL, use detail above to create an apron ledge on all 4 sides.

FABRICATION NOTES:

1. Locate penetration (Style 'RH'), ring and cover (Style 'RC'), ring and grate (Style 'RG'), and frame and grate (Style 'FG') in a corner. Only one penetration is allowed per slab lid.
2. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
3. Provide Grade 60 reinforcing steel or equivalent area of WWR.
4. Provide clear cover of ¾" to reinforcing from lower outside shoulder of slab for structural reinforcement, and 2" from top of slab for shrinkage and temperature reinforcement. Place short span reinforcing closest to surface.
5. Slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing. Provide steel area = 0.11 in²/ft each way.
6. No substitution is allowed for diagonal #4 bars around openings.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.

INSTALLATION NOTES:

1. Precast slab lids are intended for direct traffic and may be placed in roadway.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. Initial installation of grade adjustment rings for Styles 'RH' and 'SH' is limited to 1'-0" Max as shown.
5. Grade adjustment rings for Styles 'RH' and 'SH' may be increased to 2'-0" Max when future construction affects final grade of structure. Make adjustments greater than 2'-0" with additional risers. Adjustments can be made up to Max depth shown on sheet PDD. Structure must be evaluated if Max depth will be exceeded.
6. Orient long dimension of grate slots perpendicular to traffic, unless noted otherwise on plans

GENERAL NOTES:

1. Designed according to ASTM C913.
2. Payment for lid is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, style, size, and opening size (when applicable).

Cover dimensions are clear dimensions, unless noted otherwise.

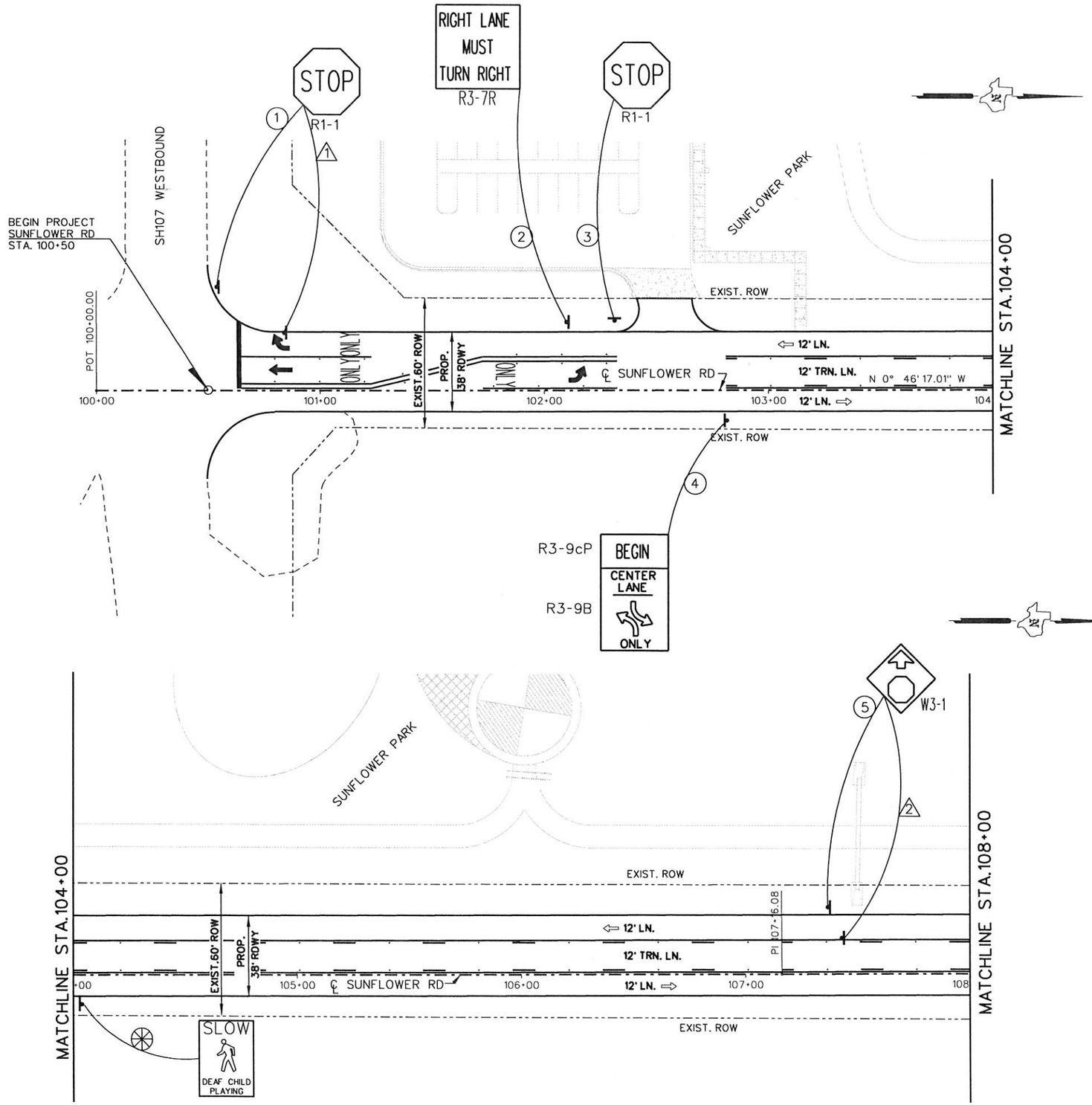
HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation | Bridge Division Standard

PRECAST SLAB LID

PSL

FILE: prestd05.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT January 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		49



LEGEND:

- SIGNS TO REMAIN IN PLACE
- SIGNS TO BE REMOVED (ITEM 644)
- SIGNS TO BE RELOCATED (ITEM 644)
- SIGNS TO BE INSTALLED (ITEM 644)
- SIGN/RDSD FLASHERS TO BE INSTALLED (ITEM 685)
- SIGN/RDSD FLASHERS TO BE RELOCATED (ITEM 685)
- SIGNS SYMBOL

GENERAL NOTES

1. ALL SIGNS IN WORKING AREAS DESIGNATED TO BE RELOCATED SHALL BE REMOVED AND STORED WITHIN THE PROJECT LIMITS. THE CONTRACTOR SHALL MAKE THE PRECAUTIONARY MEASURES TO PREVENT DAMAGE DURING CONSTRUCTION. COORDINATE WITH THE PROJECT ENGINEER FOR STORAGE APPROVAL.
2. CONTRACTOR IS RESPONSIBLE FOR ALL SIGNS DAMAGED DURING CONSTRUCTION. THESE DAMAGED SIGNS WILL BE REPLACED BY THE CONTRACTOR AT HIS EXPENSE.
3. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO CONFLICTS ON ANY SIGNS THAT ARE TO BE RELOCATED.

STATE OF TEXAS
JULIO CESAR CERDA
90524
LICENSED PROFESSIONAL ENGINEER

SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER ROAD SIGNING LAYOUT

SHEET 1 OF 2

DRAWING:		FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK:		6	TEXAS					Sunf.
ENGINEER:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK:		PHR	HIDALGO	921	02			50
REVIEW:								
CK:								

M:\Chris\Precinct 4\Sunflower\07 TRAFFIC\03 Signing\Sunflower Road_SIGN_01.dgn

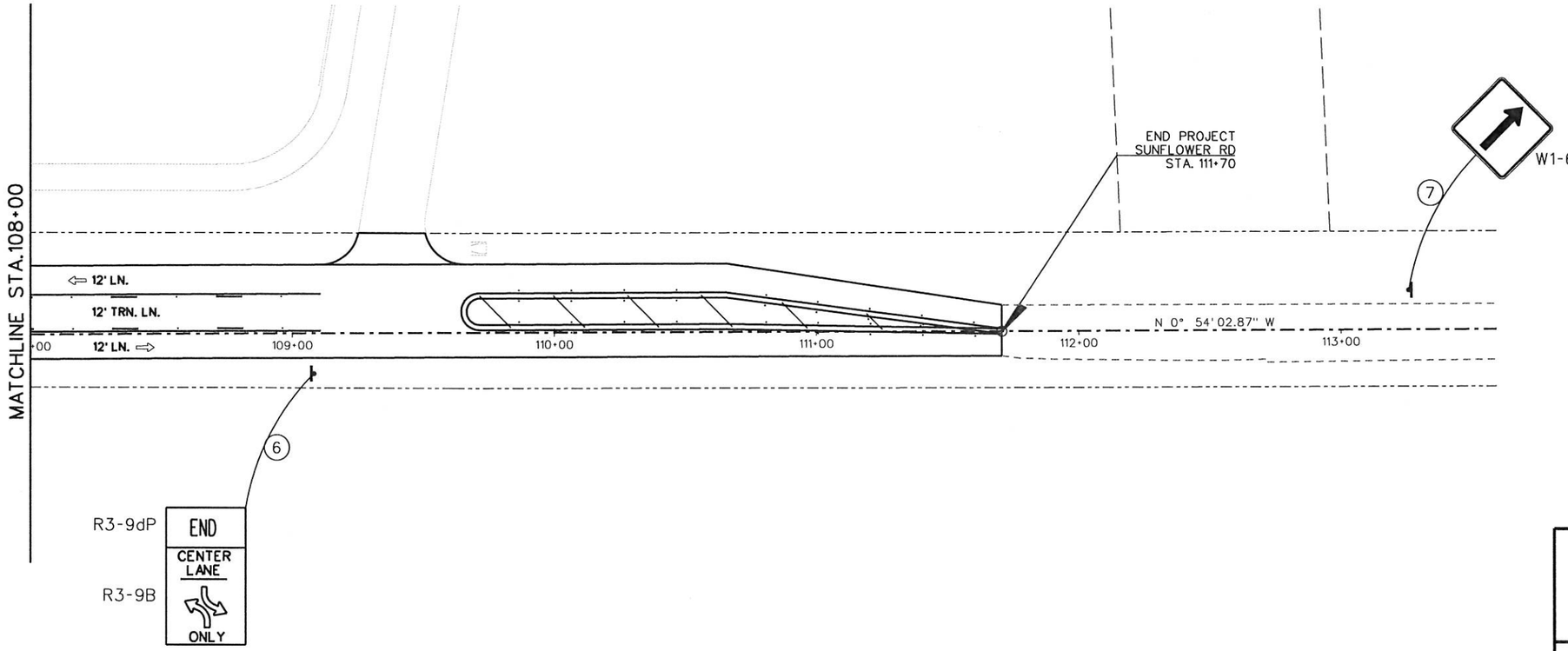
1/27/2017

LEGEND:

- SIGNS TO REMAIN IN PLACE
- SIGNS TO BE REMOVED (ITEM 644)
- SIGNS TO BE RELOCATED (ITEM 644)
- SIGNS TO BE INSTALLED (ITEM 644)
- SIGN/RDSD FLASHERS TO BE INSTALLED (ITEM 685)
- SIGN/RDSD FLASHERS TO BE RELOCATED (ITEM 685)
- SIGNS SYMBOL

GENERAL NOTES

1. ALL SIGNS IN WORKING AREAS DESIGNATED TO BE RELOCATED SHALL BE REMOVED AND STORED WITHIN THE PROJECT LIMITS. THE CONTRACTOR SHALL MAKE THE PRECAUTIONARY MEASURES TO PREVENT DAMAGE DURING CONSTRUCTION. COORDINATE WITH THE PROJECT ENGINEER FOR STORAGE APPROVAL.
2. CONTRACTOR IS RESPONSIBLE FOR ALL SIGNS DAMAGED DURING CONSTRUCTION. THESE DAMAGED SIGNS WILL BE REPLACED BY THE CONTRACTOR AT HIS EXPENSE.
3. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO MAKE ANY ADJUSTMENTS, DUE TO CONFLICTS ON ANY SIGNS THAT ARE TO BE RELOCATED.



STATE OF TEXAS
JULIO CESAR CERDA
90524
LICENSED PROFESSIONAL ENGINEER

SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER ROAD SIGNING LAYOUTS

SHEET 2 OF 2

DRAWING:		FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK:		6	TEXAS					Sunf.
ENGINEER:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.		JOB NO.	SHEET NO.
CK:		PHR	HIDALGO					51
REVIEW:								
CK:								

1/27/2017 M:\Chris\Precinct 4\Sunflower\07 TRAFFIC\03 Signing\Sunflower Road_SIGN_02.dgn

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP - Fiberglass TWT - Thin-Wall 10BWG - 10 BWG S80 - Sch 80	POSTS 1 or 2	ANCHOR TYPE UA-Universal Conc UB-Universal Bolt SA-Slipbase-Conc SB-Slipbase-Bolt WS-Wedge Steel WP-Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P - "Plain" T - "T" U - "U"	1EXT or 2EXT - # of Ext BM - Extruded Wind Beam WC - 1.12 #/ft Wing Channel EXAL- Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY - TYPE TY N TY S
1 OF 2												
	1	R1-1	STOP	36X36	✓		S80	1	SA	P		
	2	R3-7R	RIGHT LANE MUST TURN RIGHT	30X30	✓		S80	1	SA	P		
	3	R1-1	STOP	36X36	✓		S80	1	SA	P		
	4	R3-9cP R3-9b	BEGIN CENTER LANE ONLY	24X8 24X36	✓ ✓		S80	1	SA	P		
	5	W3-1		36X36	✓		S80	1	SA	P		
2 OF 2												
	6	R3-9dP R3-9b	END CENTER LANE ONLY	24X8 24X36	✓ ✓		S80	1	SA	P		
	7	W1-6aT		36X36	✓		S80	1	SA	P		

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

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

http://www.txdot.gov/

NOTE:

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

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 1 OF 1

FILE: sums16.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS				SNFLWR
4-16 8-16	DIST	COUNTY		SHEET NO.
		HIDALGO		52

18

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DATE: 1/27/2017 6:02:19 PM
FILE: M:\Chris\Precinct 4\Sunflower\07 TRAFFIC\03 Signing\Sunflower_sums_16.dgn

SUMMARY OF SMALL SIGNS

PLAN SHT. NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENS.	644 6076 REMOVE SMALL SIGN ASSM.	644 6070 RELOCATE SMALL SIGN ASSM.	685 6002 RELOCATE SMALL SIGN ASSM.
			CSJ: 0921-02-300	INCHES	EA.	EA.	EA.
1of1	1	R1-1	STOP	36X36	X		
	2	W3-1	STOP AHEAD	36X36	X		
				TOTAL	2		

TABULATION OF
SIGNS TO BE REMOVED
OR RELOCATED
UNDER ITEM 644
(WITHOUT REMOVABLE COPY)

STATE OF TEXAS
JULIO CESAR CERDA
90524
LICENSED
PROFESSIONAL ENGINEER

SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER RD
SUMMARY OF SMALL SIGNS TO BE REMOVED

SHEET 1 OF 1

DRAWING:		FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK:		6	TEXAS					SNFLWR
ENGINEER:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK:			HIDALGO					53
REVIEW:								
CK:								

M:\Chris\Precinct 4\Sunflower\07 TRAFFIC\03 Signing\Sunflower Road_SignsRemoval.dgn

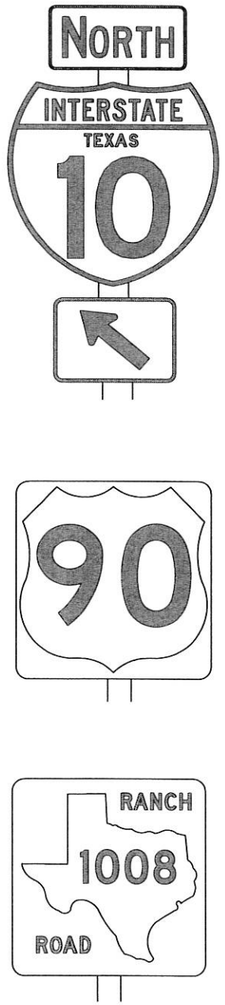
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DATE:
FILE:

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

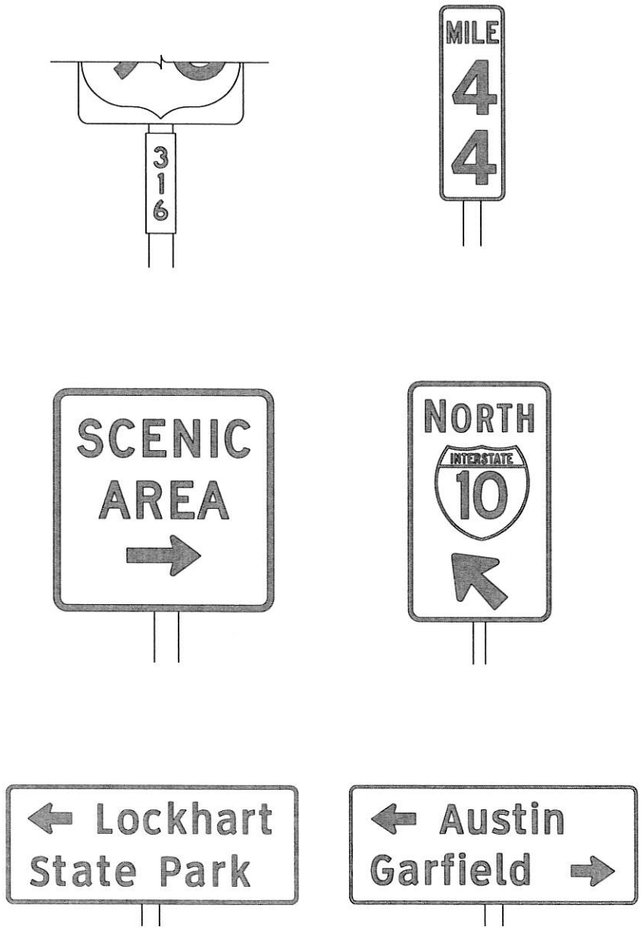
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

REQUIREMENTS FOR BLUE, BROWN & GREEN D AND I SERIES GUIDE SIGNS

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND, SYMBOLS & BORDERS	ALL OTHERS	TYPE B OR C SHEETING



TYPICAL EXAMPLES

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).

2. White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W

3. Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).

4. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.

5. Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.

6. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.

7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.

8. Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

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

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

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

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

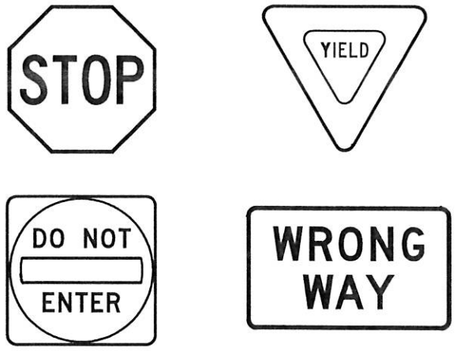
TSR(3)-13

FILE: tsr3-13.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-03 7-13 9-08	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		54

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DATE:
FILE:

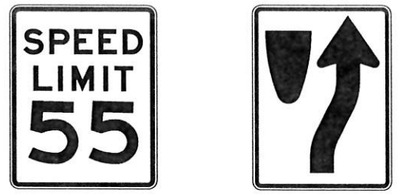
REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS
(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

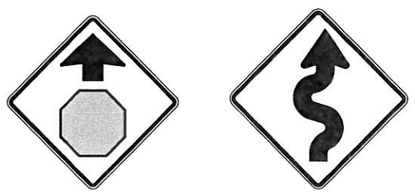
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS
(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND,BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND,BORDERS AND SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLOURESCENT YELLOW	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR SCHOOL SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	FLOURESCENT YELLOW GREEN	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND,BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
8. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

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

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

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

http://www.txdot.gov/

Texas Department of Transportation — Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(4)-13

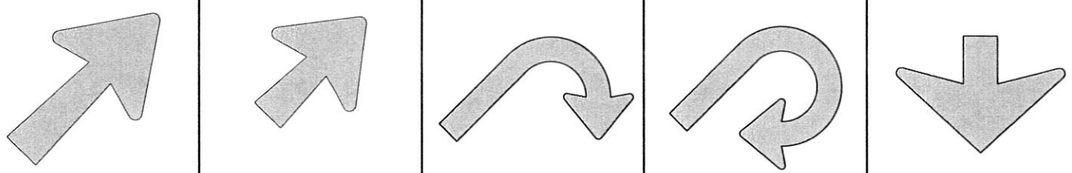
FILE: tsr4-13.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-03 7-13 9-08	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		55

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DATE:
FILE:

ARROW DETAILS

for Large Ground-Mounted and Overhead Guide Signs



TYPE	LETTER SIZE	USE
A-1	10.67" U/L and 10" Caps	Single Lane Exits
A-2	13.33" U/L and 12" Caps	
A-3	16" & 20" U/L	
B-1	10.67" U/L and 10" Caps	Multiple Lane Exits
B-2	13.33" U/L and 12" Caps	
B-3	16" & 20" U/L	

CODE	USED ON SIGN NO.
E-3	E5-1aT
E-4	E5-1bT

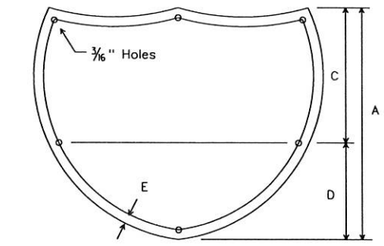
NOTE

Arrow dimensions are shown in the "Standard Highway Sign Designs for Texas" manual.

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

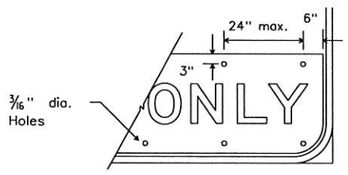
http://www.txdot.gov/

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)

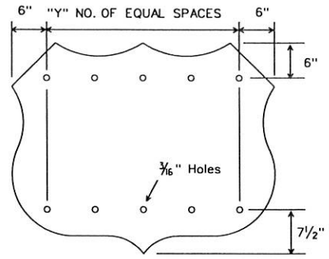


INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4

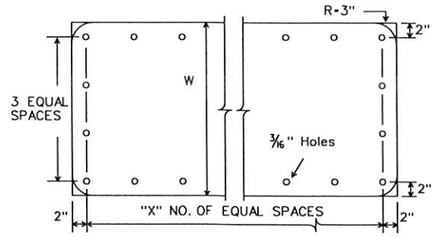


EXIT ONLY PANEL



U.S. ROUTE MARKERS

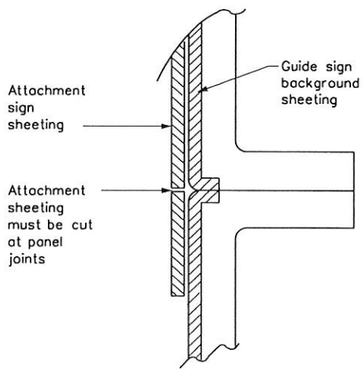
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



STATE ROUTE MARKERS

No. of Digits	W	X
4	24	4
4	36	5
4	48	6
3	24	3
3	36	4
3	48	5

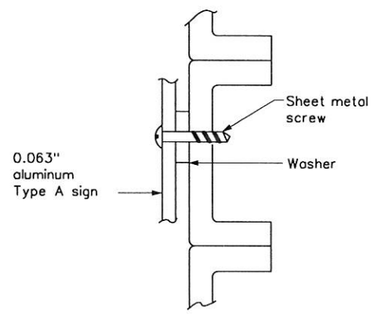
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



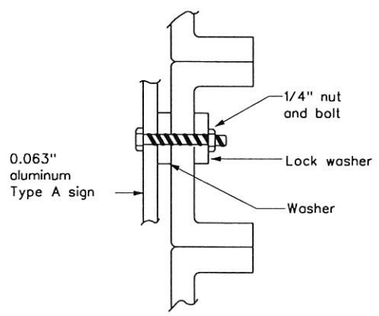
DIRECT APPLIED ATTACHMENT

NOTE:

1. Sheeting for legend, symbols, and borders must be cut at panel joints.
2. Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".



SCREW ATTACHMENT



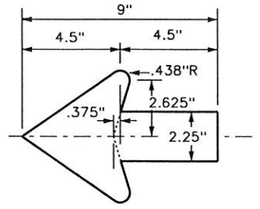
NUT/BOLT ATTACHMENT

NOTE:

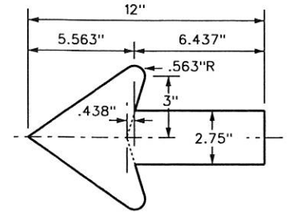
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

ARROW DETAILS

for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(5)-13

FILE:	tsr5-13.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS					
12-03	7-13	DIST	COUNTY		SHEET NO.
9-08		PHR	HIDALGO		56

5

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GENERAL NOTES:

1. Details show a typical warning sign with two flashing beacon heads, other arrangements are possible. When only one beacon is required, install the upper beacon.

2. See Item 685, "Roadside Flashing Beacon Assemblies" for further requirements.

3. See SMD standard sheets for lateral and vertical clearances and sign mounting details. Install signs as shown on the sign layout sheets.

4. Use either a Screw-In Type Anchor Foundation or a Drilled Shaft Foundation as shown elsewhere in the plans. When plans require a Drilled Shaft Foundation, see standard sheet TS-FD. Install the Screw-In Type Anchor Foundation as per manufacturer's recommendations. On a slope, install one edge at ground level. Screw-In/Drilled Shaft Foundation is subsidiary to Item 685. Installation of a ground rod is not required for solar powered flashing beacon assemblies.

5. When used, provide Screw-In Type Anchor Foundations as shown on TxDOT's Material Producer List (MPL) in the file "Highway Traffic Signals".

6. Install beacon heads as shown here, as shown elsewhere on the plans, or as directed. Use hardware specifically designed for mounting beacon heads on poles.

7. Conduit in foundation and within 6 in. of foundation is subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies."

8. Unless otherwise shown on the plans, pole shaft shall be one piece, Schedule 40 Aluminum pipe, ASTM B429 or B221 (Alloy 6061-T6 only). Aluminum conduit will not develop the necessary strength and will not be allowed.

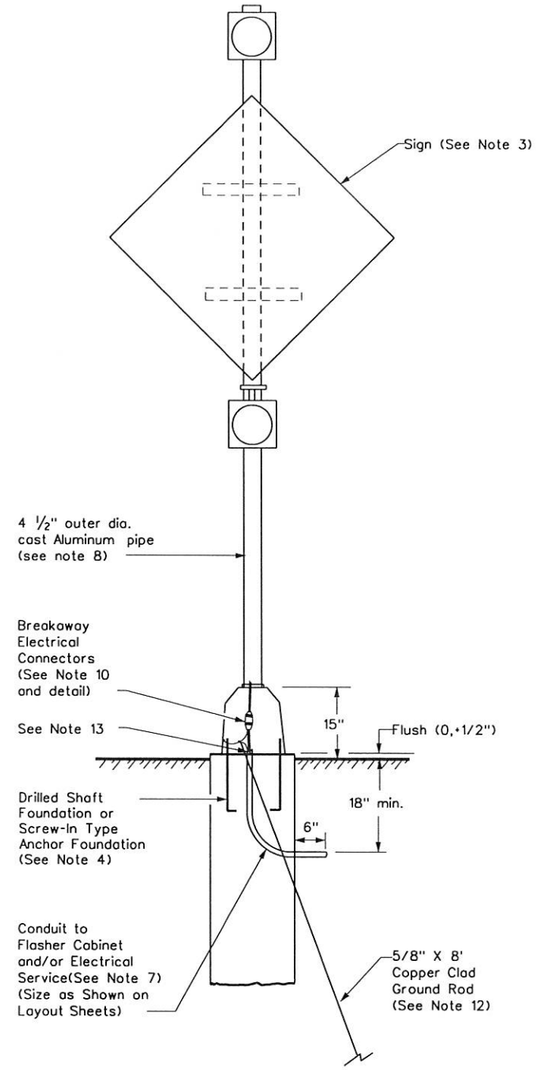
9. Per manufacturer's recommendations, engage all threads on the pedestal pole base and pipe unless the pipe is fully seated into base. In high winds, use a pole and base collar assembly to add strength and prevent loosening of connection.

10. Provide single pole non-fused watertight breakaway electrical connectors for frangible pedestal pole bases, as shown on TxDOT's MPL in the file "Roadway Illumination and Electrical Supplies." Approved models are listed under Item 685. For ungrounded (hot) conductors, install a breakaway connector with a dummy fuse slug). For grounded (neutral) conductors, install a breakaway connector with a white colored marking and a permanently installed dummy fuse (slug).

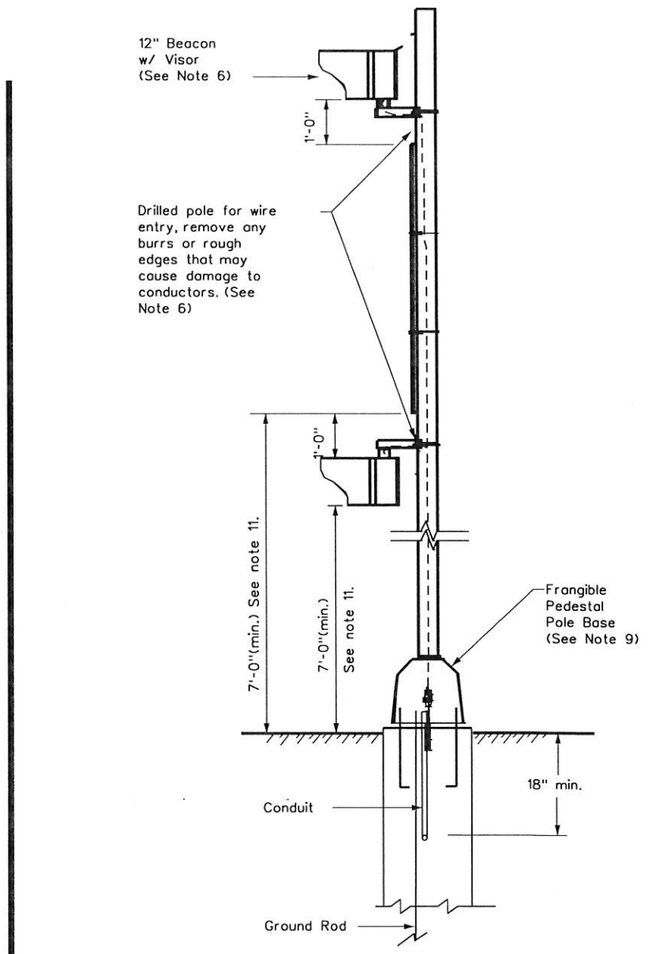
11. Provide clearance as shown above the sidewalk or pavement grade at the edge of the road. When a bottom beacon is not used, mount the bottom of the sign at least 7 ft. above the sidewalk or pavement grade at the edge of the road.

12. Make connections to ground rods according to NEC. Ground rod clamps shall be listed for their intended purpose.

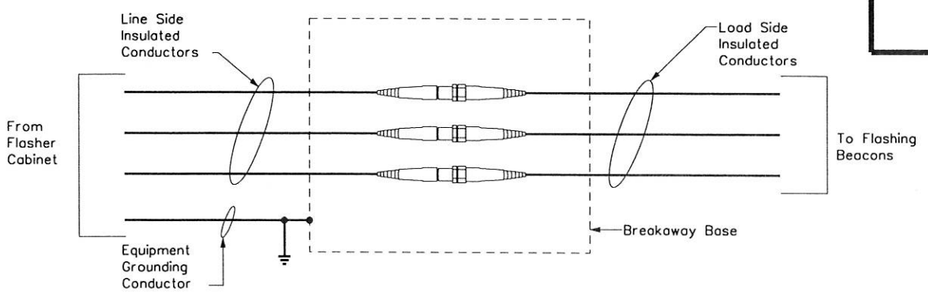
13. Ensure height of conduit and ground rod is below top of anchor bolts.



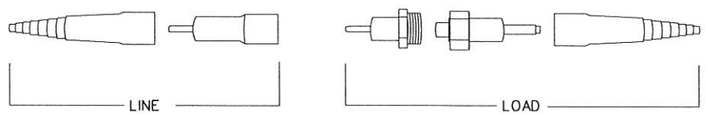
FRONT



SIDE



NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS



NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS
EXPLODED VIEW

Texas Department of Transportation

Traffic Operations Division Standard

ROADSIDE FLASHING BEACON ASSEMBLY

RFBA-13

FILE: rfba-13.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT January 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS				
5-93 12-04	DIST	COUNTY		SHEET NO.
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4-98				

DATE:
FILE:

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

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

Number of Posts (1 or 2)

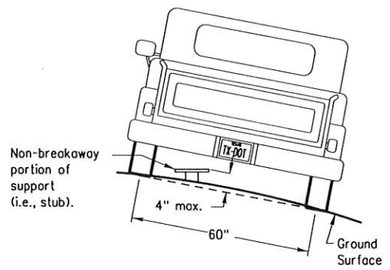
Anchor Type

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

Sign Mounting Designation

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

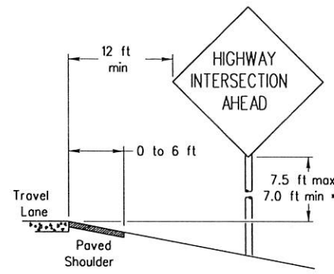
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

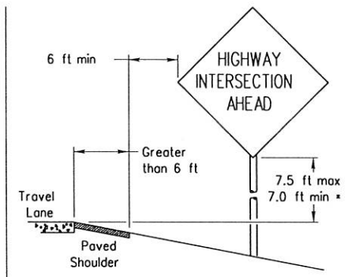
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

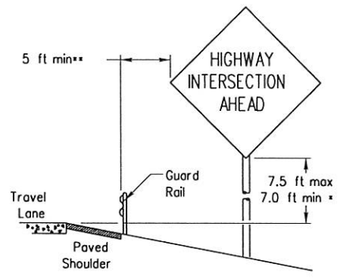
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



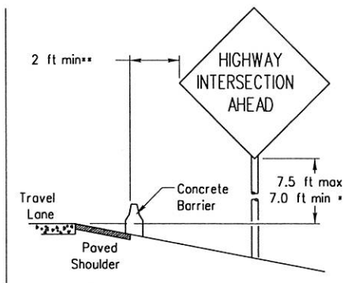
GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

BEHIND BARRIER



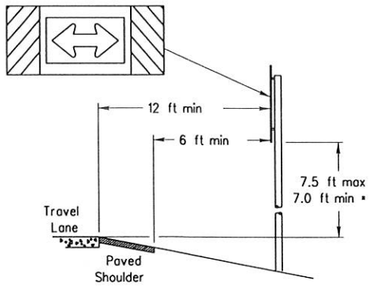
BEHIND GUARDRAIL



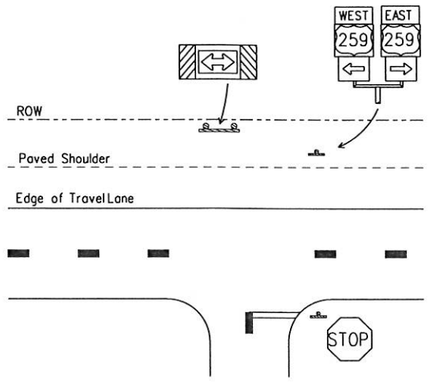
BEHIND CONCRETE BARRIER

**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:

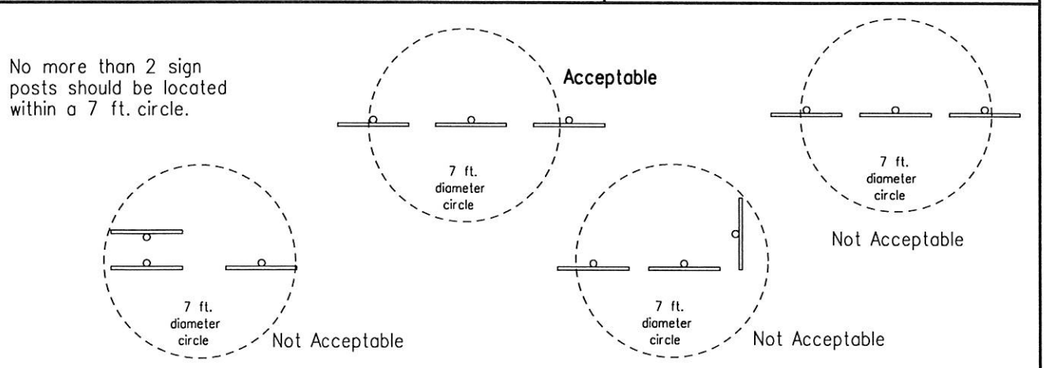
(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

(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.

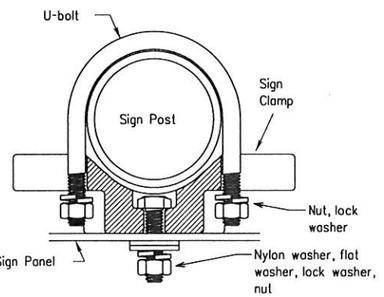
See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

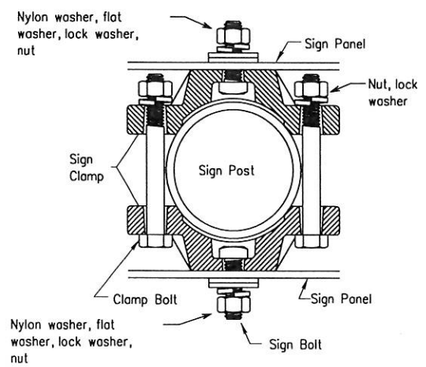


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

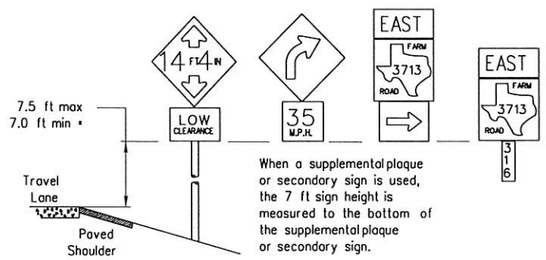
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



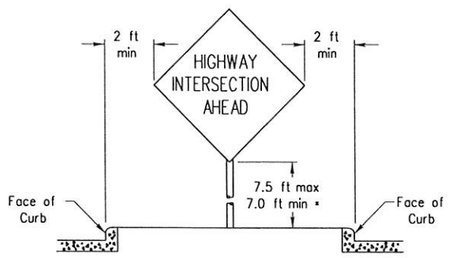
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



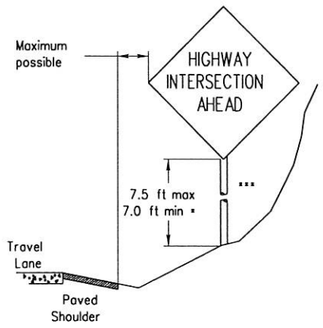
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

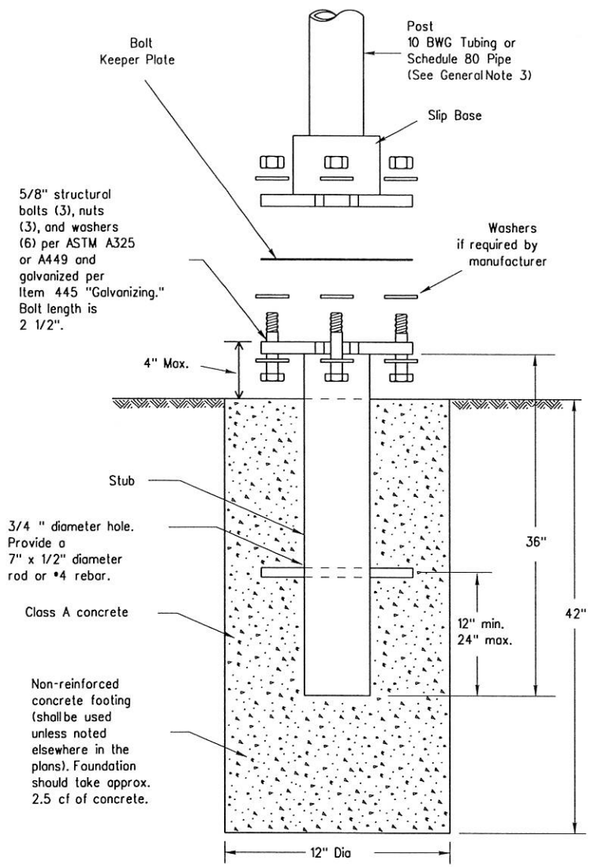
©TxDOT July 2002	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.
	PHR	HIDALGO		58

DATE:
FILE:

26A

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TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

NOTE

There are various devices approved
for the Triangular Slipbase System.
Please reference the Material Producer
List for approved slip base systems.
http://www.txdot.gov/business/producer list.htm_
The devices shall be installed per
manufacturers' recommendations.
Installation procedures shall be
provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   - 10 BWG Tubing (2.875" outside diameter)
     - 0.134" nominal wall thickness
     - Seamless or electric-resistance welded steel tubing or pipe
     - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
     - Other steels may be used if they meet the following:
       - 55,000 PSI minimum yield strength
       - 70,000 PSI minimum tensile strength
       - 20% minimum elongation in 2"
     - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
     - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
     - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
   - Schedule 80 Pipe (2.875" outside diameter)
     - 0.276" nominal wall thickness
     - Steel tubing per ASTM A500 Gr C
     - Other seamless or electric-resistance welded steel tubing or pipe with equivolent outside diameter and wall thickness may be used if they meet the following:
       - 46,000 PSI minimum yield strength
       - 62,000 PSI minimum tensile strength
       - 21% minimum elongation in 2"
     - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
     - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
     - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is:
   http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

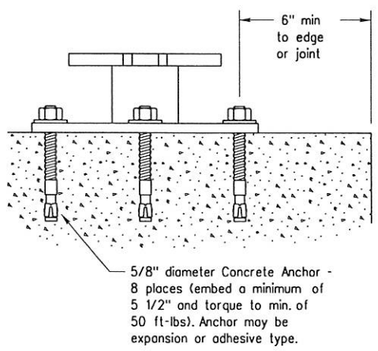
Foundation

1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support

1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



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

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

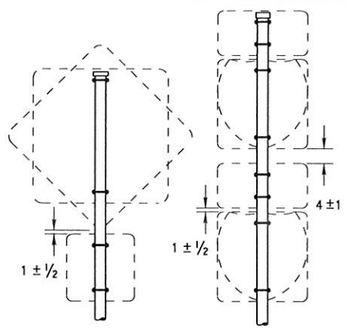
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CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		59

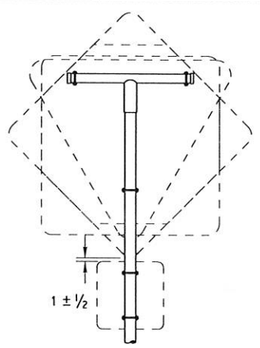
9-08 REVISIONS

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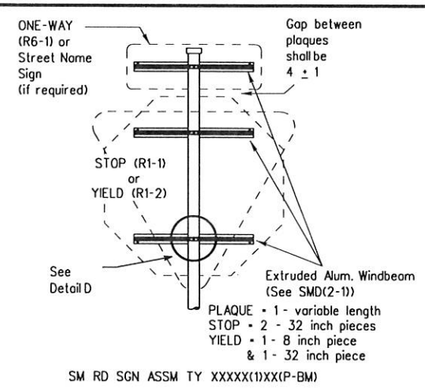
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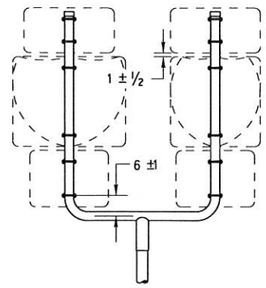
SM RD SGN ASSM TY XXXXX(1)XX(P)



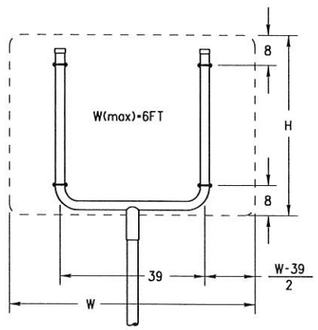
SM RD SGN ASSM TY XXXXX(1)XX(T)



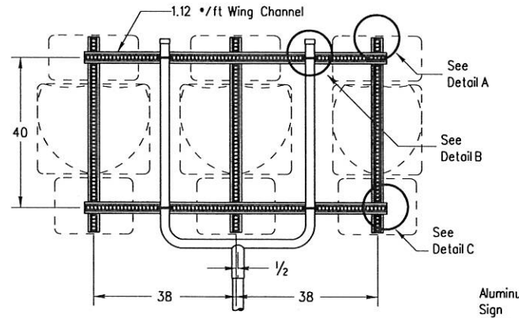
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



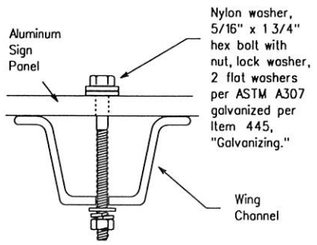
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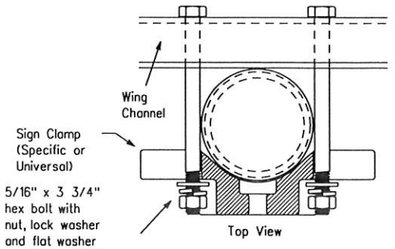
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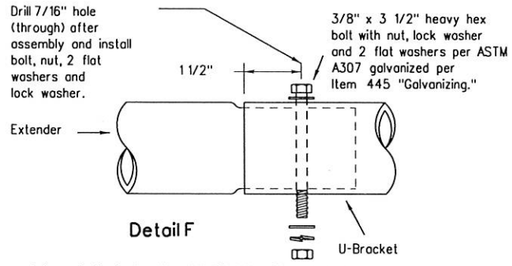
SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)



Detail A

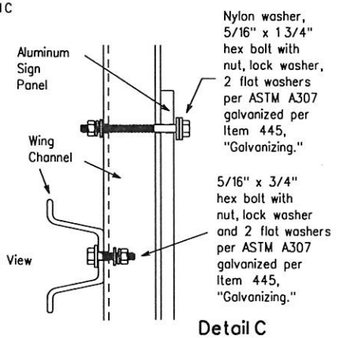


Detail B

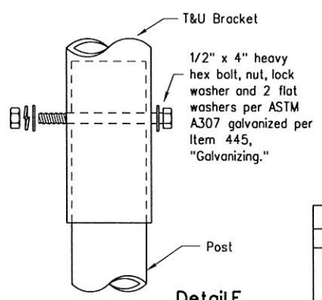


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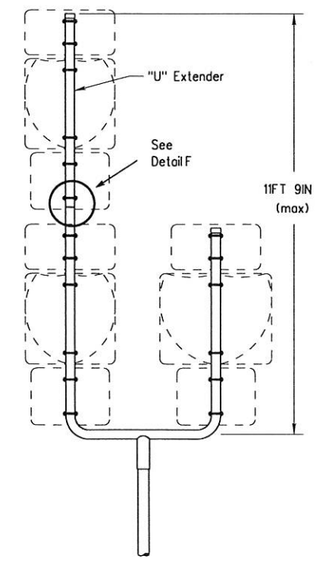
Splices shall only be allowed behind the sign substrate.



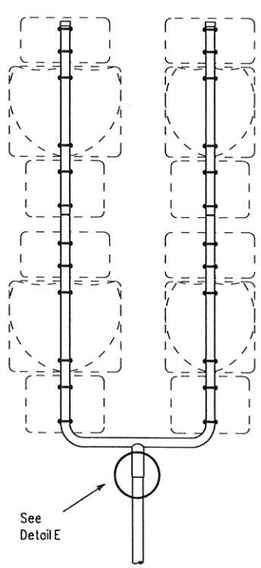
Detail C



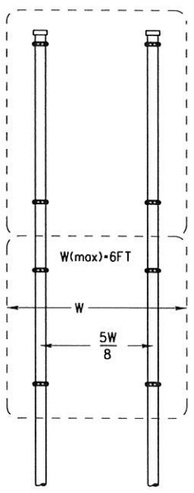
Detail E



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

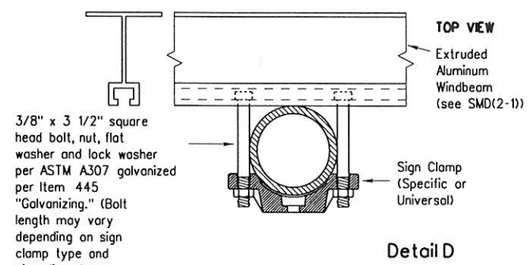


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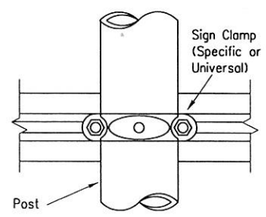


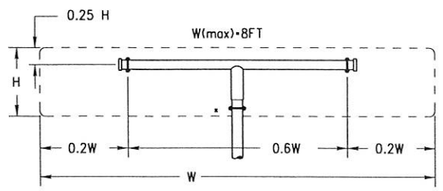
SM RD SGN ASSYM TY XXXXX(2)XX(P)

SIDE VIEW



Detail D

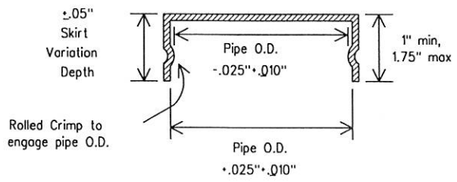




All dimensions are in english unless detailed otherwise.

SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

GENERAL NOTES:

1.

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

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

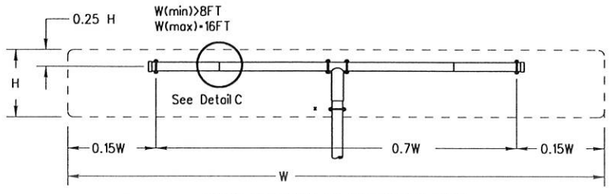
©TxDOT July 2002

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		60

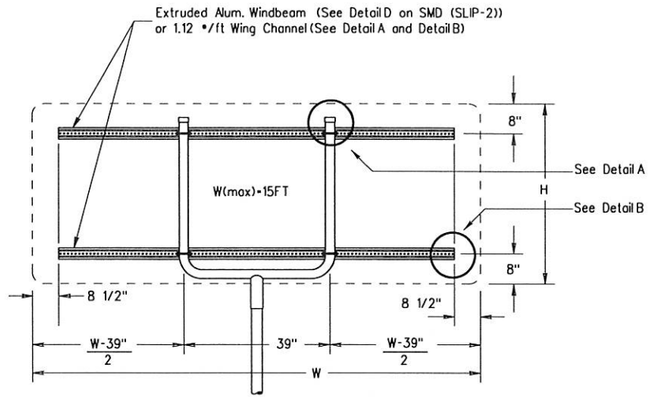
REVISIONS
9-08

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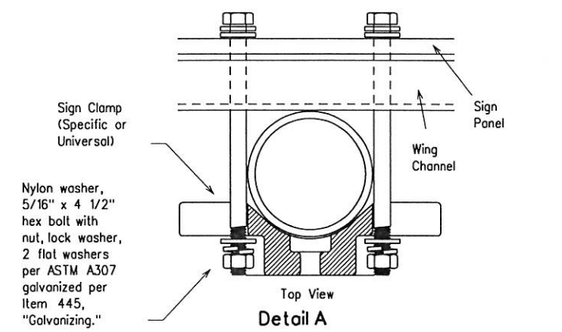
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



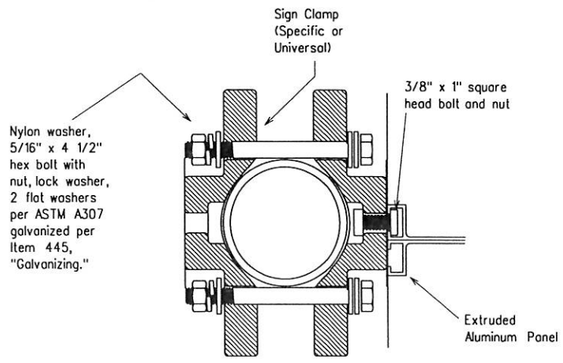
SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



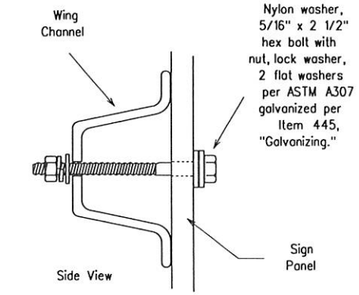
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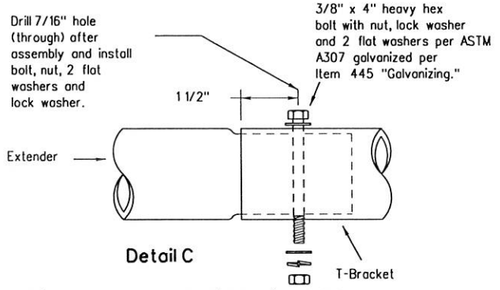
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

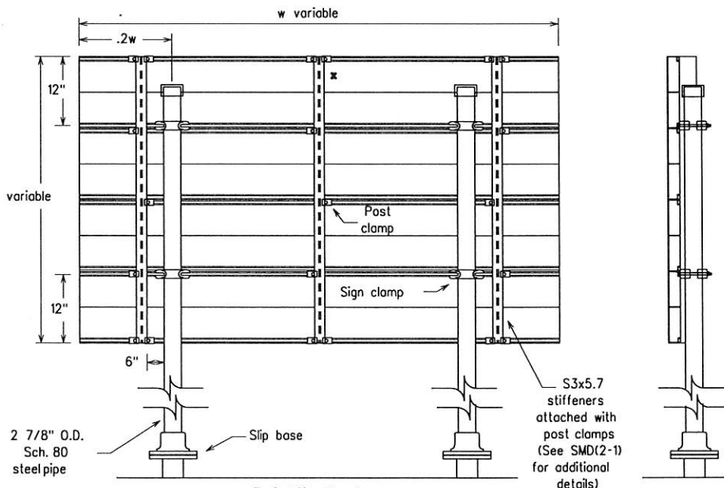


Detail B



Detail C

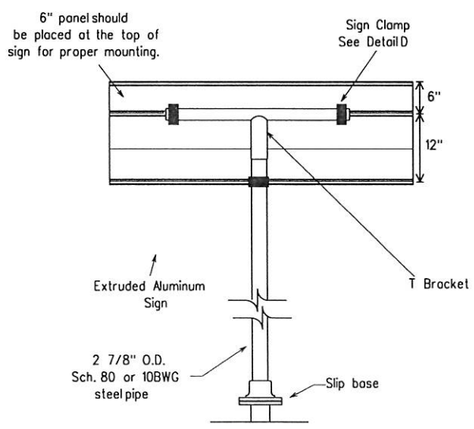
Splices shall only be allowed behind the sign substrate.



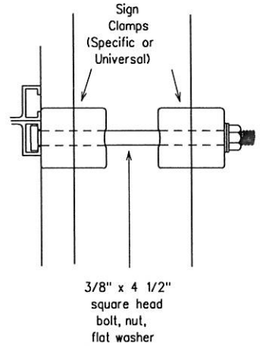
Typical Sign Mount

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

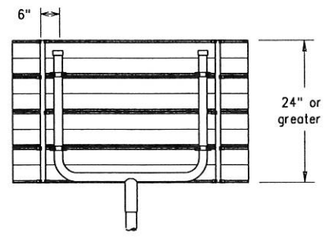
* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



Extruded Aluminum Sign
With T Bracket



Detail E



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

GENERAL NOTES:

1.

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

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Sign blanks shall be the sizes and shapes shown on the plans.
11. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

©TxDOT July 2002

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.
PHR	HIDALGO		61

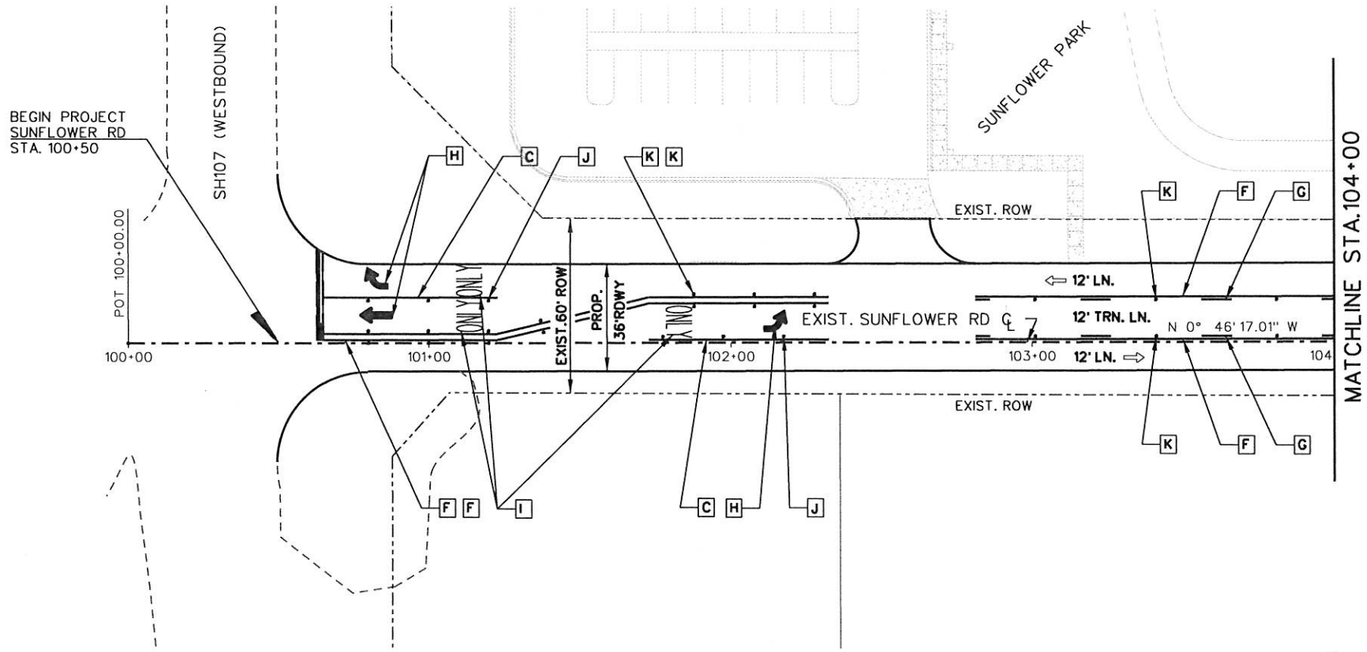
9-08 REVISIONS

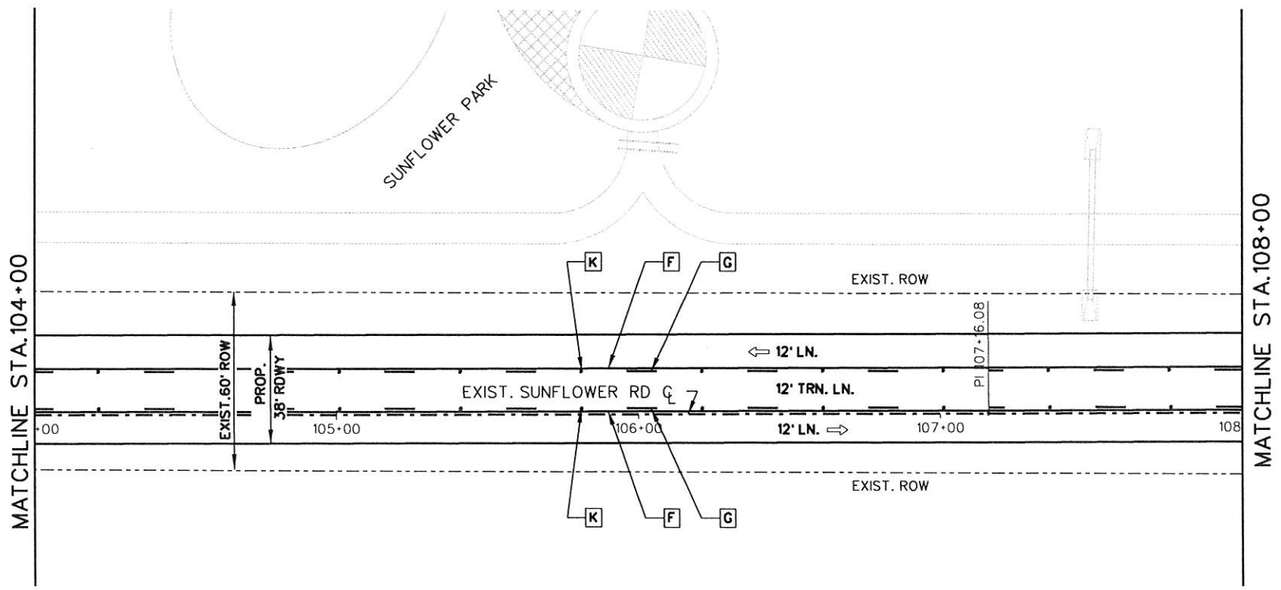
DATE:
FILE:

26D

SHEET SUMMARY

STATION LIMITS	REFLECTORIZED PAVEMENT MARKINGS ITEM 666								PREFAB PAV MRKS ITEM 668		RAISED PAV MRKS ITEM 672	
	TY I(W) 4" (BRK) (100 MIL) (LF)	TY I(W) 4" (SLD) (100 MIL) (LF)	TY I(W) 8" (SLD) (100 MIL) (LF)	TY I(W) 12" (SLD) (100 MIL) (LF)	TY I(W) 24" (SLD) (100 MIL) (LF)	TY I(Y) 4" (BRK) (100 MIL) (LF)	TY I(Y) 4" (SLD) (100 MIL) (LF)	TY I(Y) 12" (SLD) (100 MIL) (LF)	TY B (W) (ARROW) (EA)	TY B (W) (WORD) (EA)	REFL PAV MRK TY I-C (EA)	REFL PAV MRK TY II-A-A (EA)
100+50 TO 104+00			120		30	60	580		3	3	6	24
104+00 TO 108+00						200	800					20
SHEET TOTAL			120		30	260	1380		3	3	6	44





PAVEMENT MARKINGS LEGEND:

TYPE I-THERMOPLASTIC W/ RETROREFLECTIVITY REQUIREMENTS (ITEM 666)
- A 4" WHITE SOLID
- B 4" WHITE BROKEN
- F 4" YELLOW SOLID
- G 4" YELLOW BROKEN

TYPE I-THERMOPLASTIC (ITEM 666)
- C 8" WHITE SOLID
- D 12" WHITE SOLID
- E 24" WHITE SOLID
- L 12" YELLOW SOLID

PREFAB. PAVEMENT MARKERS TYPE B (ITEM 668)
- H SINGLE ARROW WHITE
- I WORD "ONLY" WHITE
- M DOUBLE ARROW WHITE

REFLECTIVE PAVEMENT MARKERS (ITEM 672)
- J TYPE I-C REFLECTIVE CL B
- K TYPE II-AA REFLECTIVE CL B
- ⇦ TRAFFIC FLOW

NOTES:

1. THE PAVEMENT SURFACE SHALL BE FREE OF DELETERIOUS MATERIAL BEFORE APPLICATION OF PERMANENT STRIPING AND PAVEMENT MARKERS. IF THE SURFACE NEEDS TO BE CLEANED, AS DETERMINED BY THE ENGINEER, THE CONTRACTOR SHALL PREPARE SURFACE IN ACCORDANCE WITH ITEM 678, "PAVEMENT SURFACE PREPARATION FOR MARKINGS", EXCEPT FOR "MEASUREMENT" AND "PAYMENT". THE PREPARATION OF PAVEMENT SURFACE SHALL BE SUBSIDIARY TO ITEM 666, 668 AND 672.
2. ALL PERMANENT PAVEMENT MARKINGS SHALL BE THERMOPLASTIC 100 MIL.

STATE OF TEXAS
JULIO CESAR CERDA
90524
LICENSED PROFESSIONAL ENGINEER

SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER ROAD PAVEMENT MARKINGS

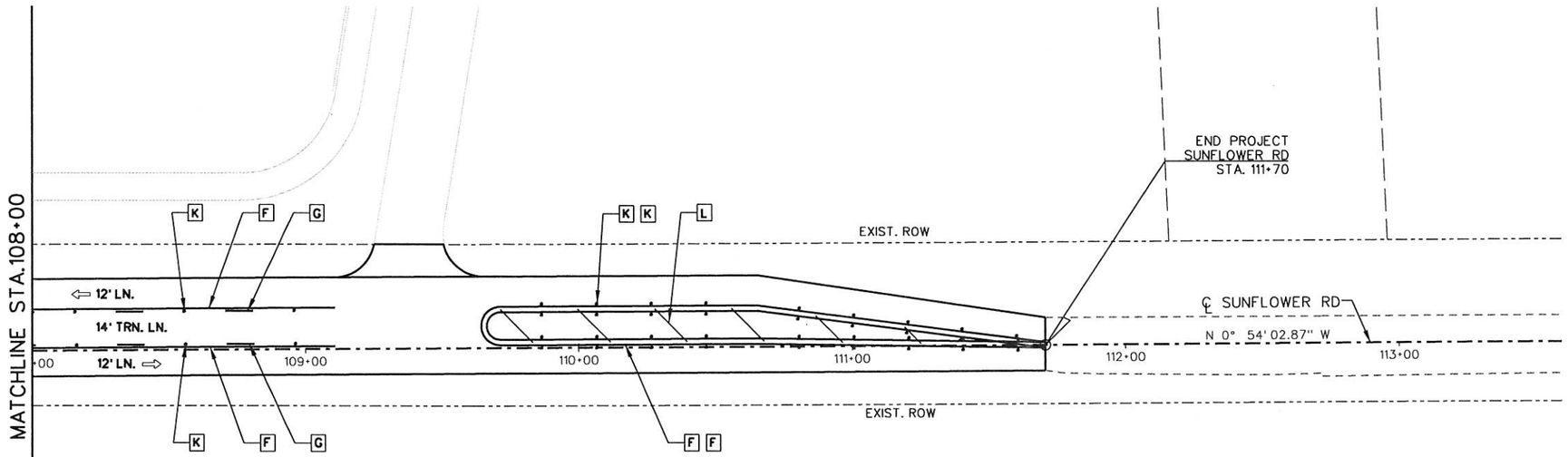
SHEET 1 OF 2

DRAWING:		FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK:		6	TEXAS					
ENGINEER:		STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK:		PHR	HIDALGO					62
REVIEW:								
CK:								

1/27/2017 M:\Chris\Precinct 4\Sunflower\07 TRAFFIC\04 Pavement Markings\Sunflower Rd_PM01.dgn

SHEET SUMMARY

STATION LIMITS	REFLECTORIZED PAVEMENT MARKINGS ITEM 666								PREFAB PAV MRKS ITEM 668		RAISED PAV MRKS ITEM 672	
	TY I(W) 4" (BRK) (100 MIL) (LF)	TY I(W) 4" (SLD) (100 MIL) (LF)	TY I(W) 8" (SLD) (100 MIL) (LF)	TY I(W) 12" (SLD) (100 MIL) (LF)	TY I(W) 24" (SLD) (100 MIL) (LF)	TY I(Y) 4" (BRK) (100 MIL) (LF)	TY I(Y) 4" (SLD) (100 MIL) (LF)	TY I(Y) 12" (SLD) (100 MIL) (LF)	TY B (W) (ARROW) (EA)	TY B (W) (WORD) (EA)	REFL PAV MRK TY I-C (EA)	REFL PAV MRK TY II-A-A (EA)
108+00 TO 111+70						60	1056	100				48
SHEET TOTAL						60	1056	100				48



PAVEMENT MARKINGS LEGEND:

TYPE I-THERMOPLASTIC W/ RETROREFLECTIVITY REQUIREMENTS (ITEM 666)
- A 4" WHITE SOLID
- B 4" WHITE BROKEN
- F 4" YELLOW SOLID
- G 4" YELLOW BROKEN

TYPE I-THERMOPLASTIC (ITEM 666)
- C 8" WHITE SOLID
- D 12" WHITE SOLID
- E 24" WHITE SOLID
- L 12" YELLOW SOLID

PREFAB. PAVEMENT MARKERS TYPE B (ITEM 668)
- H SINGLE ARROW WHITE
- I WORD "ONLY" WHITE
- M DOUBLE ARROW WHITE

REFLECTIVE PAVEMENT MARKERS (ITEM 672)
- J TYPE I-C REFLECTIVE CL B
- K TYPE II-AA REFLECTIVE CL B
- ⇦ TRAFFIC FLOW

NOTES:

1. THE PAVEMENT SURFACE SHALL BE FREE OF DELETERIOUS MATERIAL BEFORE APPLICATION OF PERMANENT STRIPING AND PAVEMENT MARKERS. IF THE SURFACE NEEDS TO BE CLEANED, AS DETERMINED BY THE ENGINEER, THE CONTRACTOR SHALL PREPARE SURFACE IN ACCORDANCE WITH ITEM 678, "PAVEMENT SURFACE PREPARATION FOR MARKINGS", EXCEPT FOR "MEASUREMENT" AND "PAYMENT". THE PREPARATION OF PAVEMENT SURFACE SHALL BE SUBSIDIARY TO ITEM 666, 668 AND 672.
2. ALL PERMANENT PAVEMENT MARKINGS SHALL BE THERMOPLASTIC 100 MIL.

STATE OF TEXAS
JULIO CESAR CERDA
90524
LICENSED PROFESSIONAL ENGINEER

SOUTH TEXAS INFRASTRUCTURE GROUP

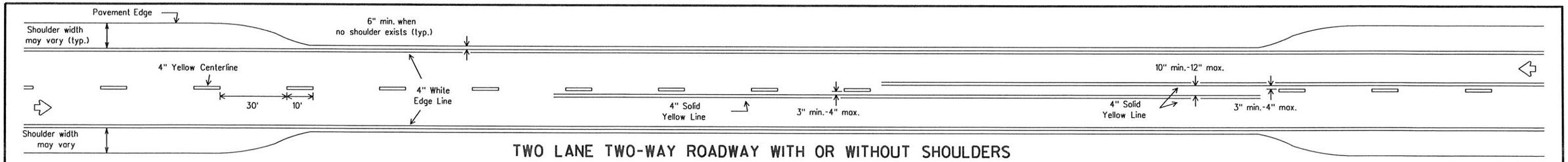
SUNFLOWER ROAD PAVEMENT MARKINGS

SHEET 2 OF 2

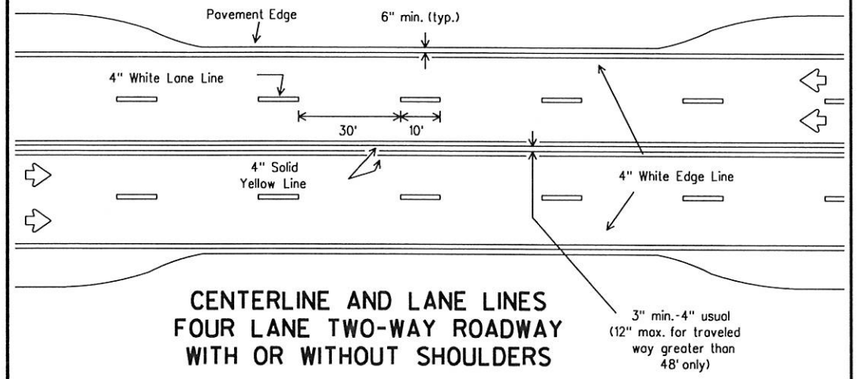
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CK:		6	TEXAS					Sunf.
ENGINEER:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK:		PHR	HIDALGO					6.3
REVIEW:								
CK:								

1/27/2017 M:\Chris\Precinct 4\Sunflower\07 TRAFFIC\04 Pavement Markings\Sunflower Rd_PM02.dgn

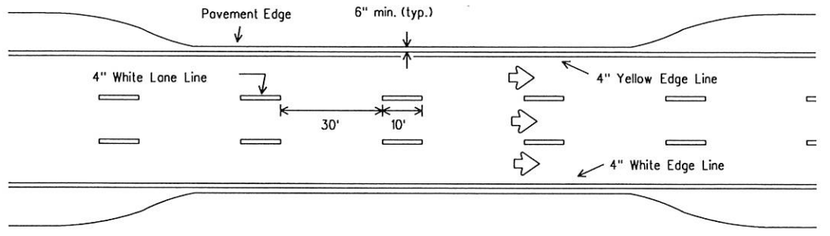
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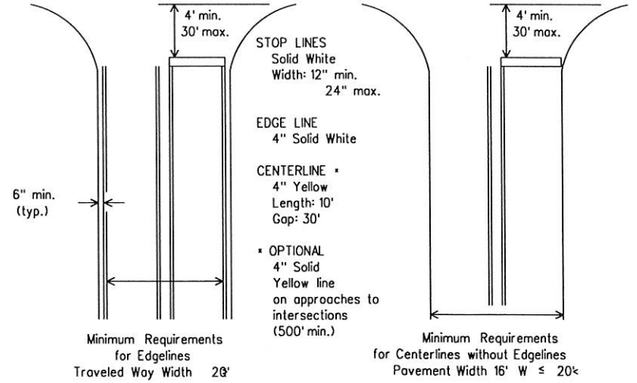
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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

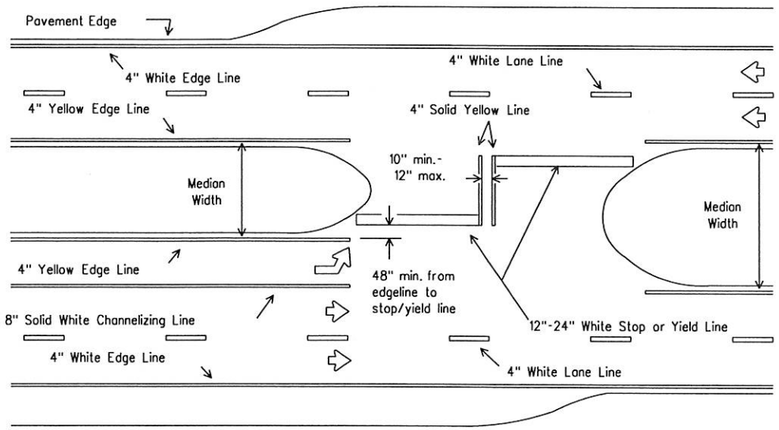


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



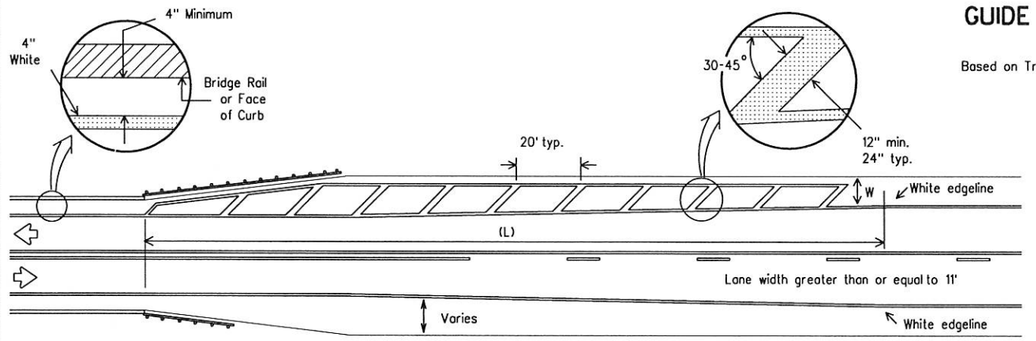
GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways



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 of opposite approaches of the same intersection. The narrow median width will be the controlling width to determine if markings are required.

FOUR LANE DIVIDED ROADWAY INTERSECTIONS



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 is not required if delineators or barrier reflectors are used along the structure.
5. For guard fence details, refer elsewhere in the plans.

ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT

TABLE 1 - TYPICAL LENGTH (L)

Posted Speed x	Formula
≤ 40	$L = \frac{WS^2}{60}$
≥ 45	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 crosshatching 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 crosshatching should be:

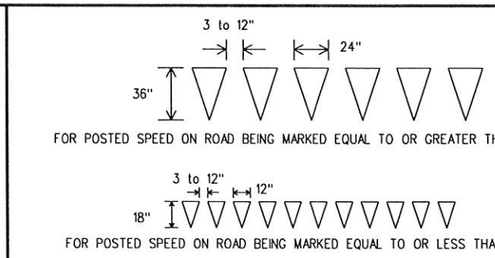
L = 4(40) ? 60 = 106.67 ft. rounded to 110 ft.

GENERAL NOTES

1. 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.
2. 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.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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



YIELD LINES

Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-12

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

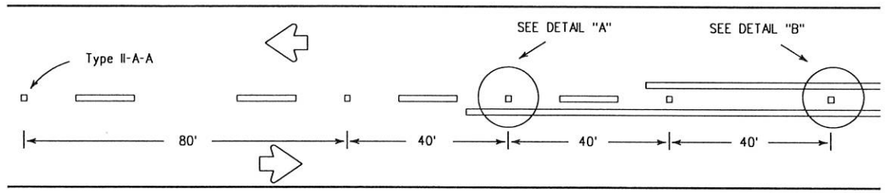
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5-00	DIST	COUNTY		SHEET NO.
8-00		HIDALGO		64
3-03				

DATE:
FILE:

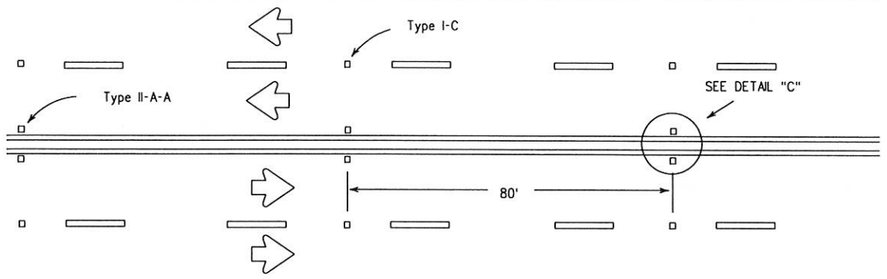
22A

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REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

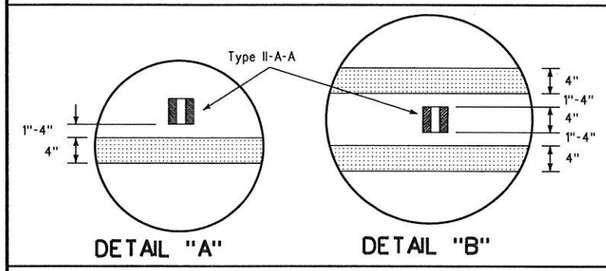


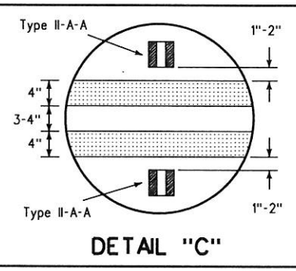
CENTERLINE FOR ALL TWO LANE ROADWAYS

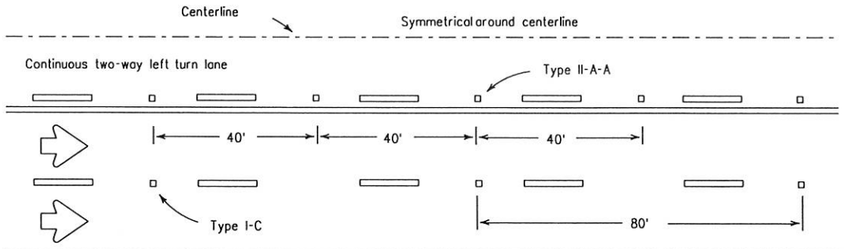


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS

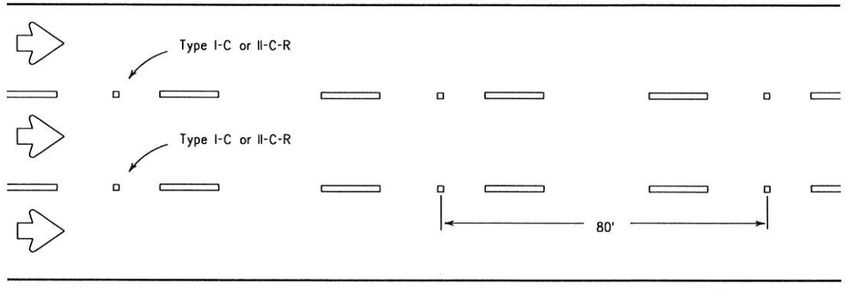
Raised pavement marker Type I-C, clear face toward normal traffic, shall be placed on 80-foot centers.





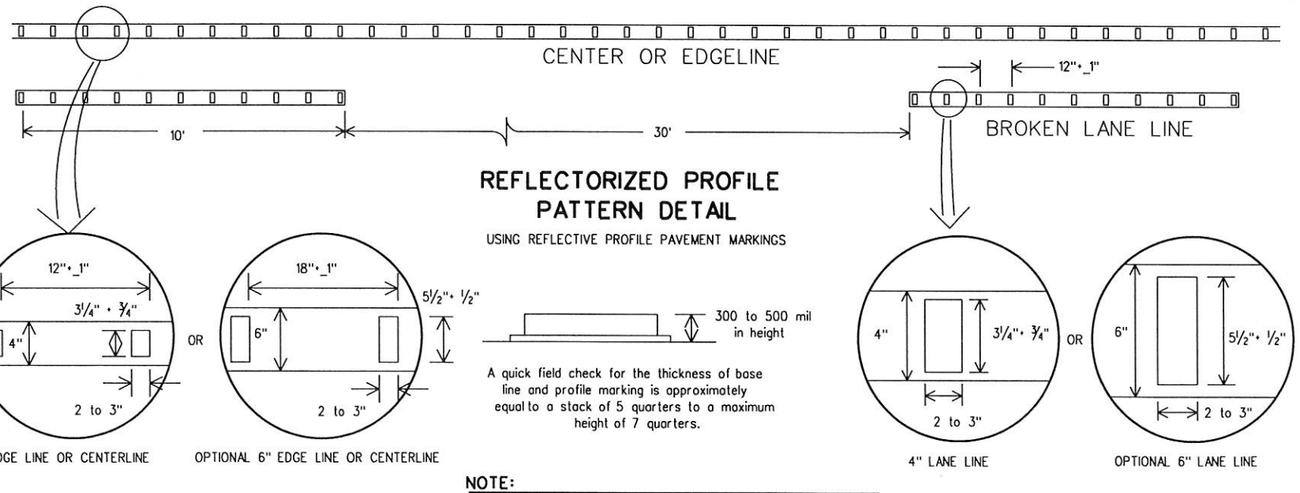


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



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.



4" EDGE LINE OR CENTERLINE — OPTIONAL 6" EDGE LINE OR CENTERLINE — 4" LANE LINE — OPTIONAL 6" LANE LINE

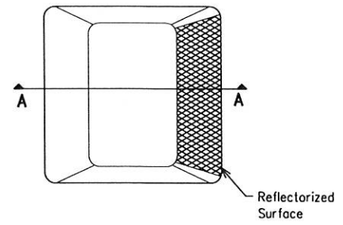
NOTE:
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

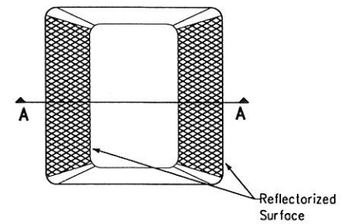
1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

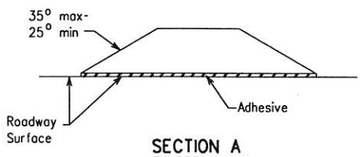
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation
Traffic Operations Division

POSITION GUIDANCE USING RAISED MARKERS
REFLECTORIZED PROFILE MARKINGS
PM(2)-12

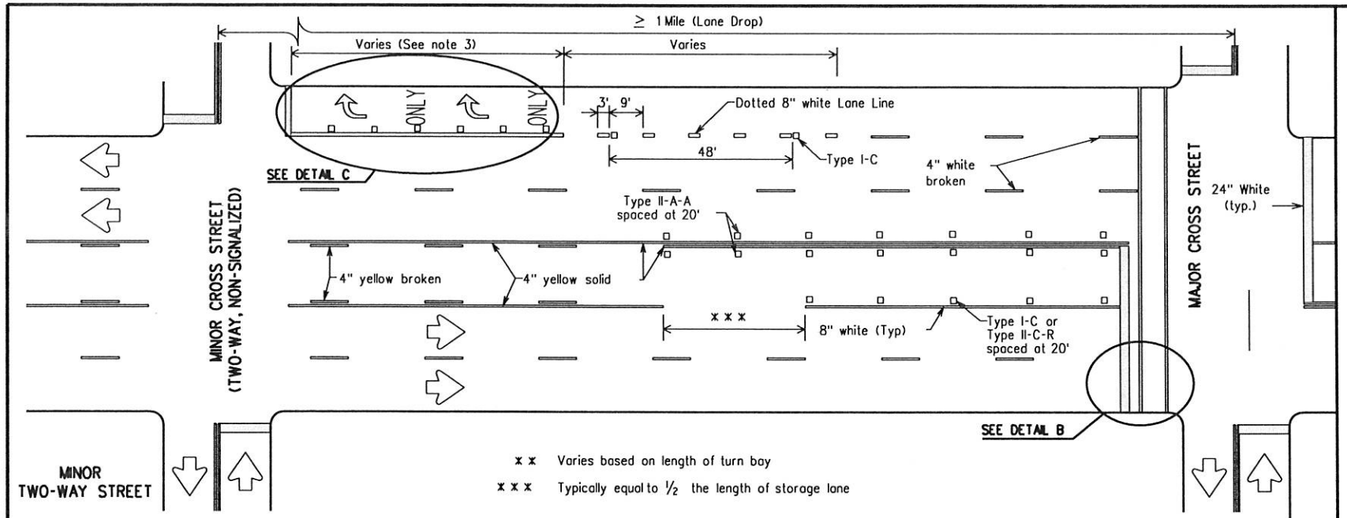
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REVISIONS		DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
4-92	2-10	CONT	SECT	JOB	HIGHWAY
5-00	2-12				Sunf.
8-00		DIST	COUNTY		SHEET NO.
2-08			HIDALGO		65

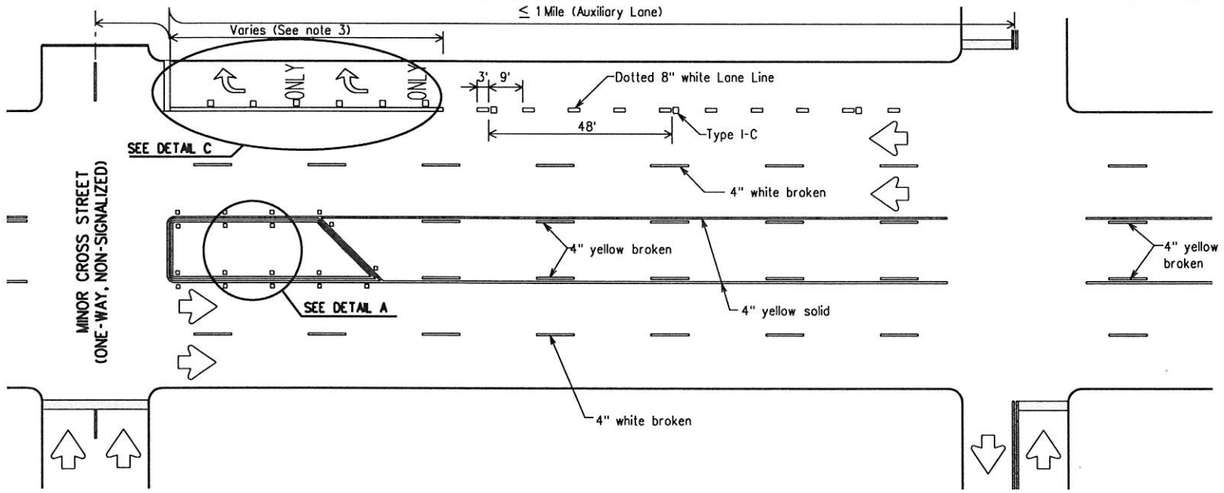
DATE:
FILE:

22B 1

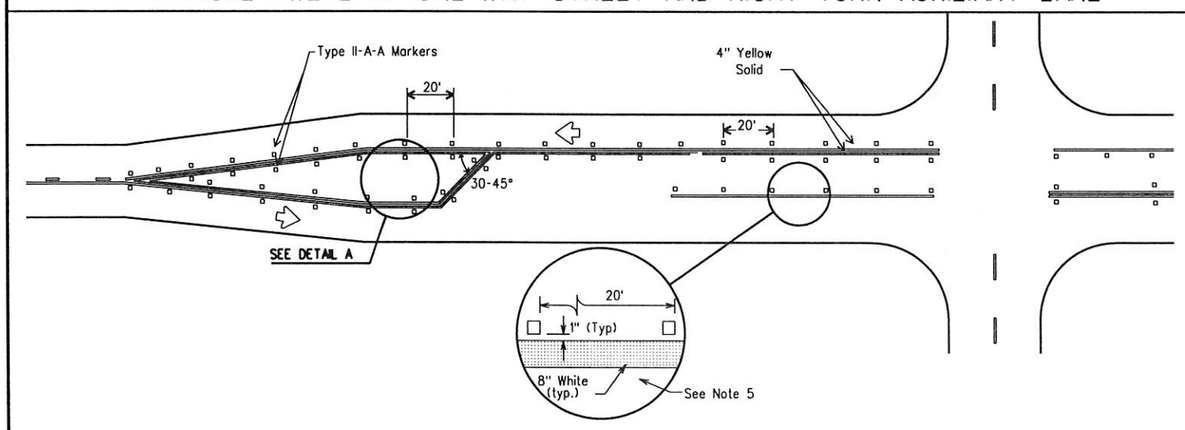
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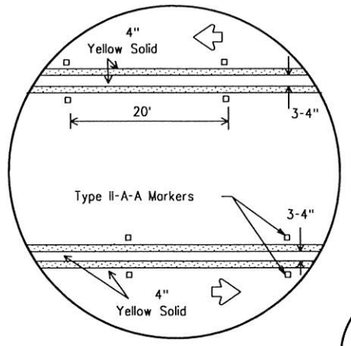
TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



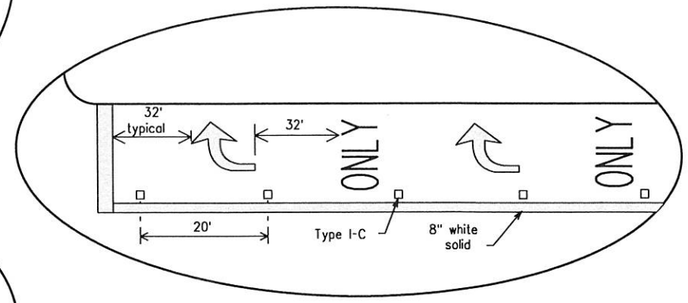
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



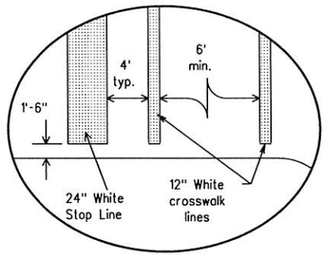
TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A



DETAIL C

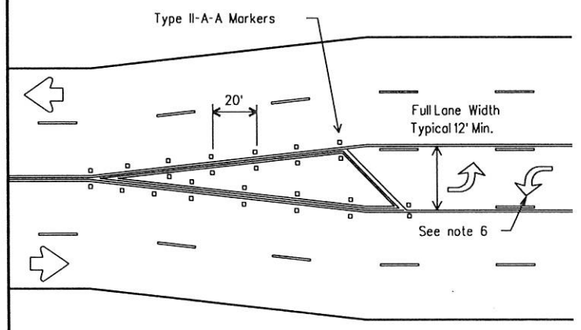


Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

DETAIL B

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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



TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

1. Refer elsewhere in plans for additional RPM placement and details.
2. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows as shown in the Standard Highway Sign Designs for Texas.
3. When lane used word and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
4. Other crosswalk paterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used.
5. 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.
6. A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stoted elsewhere in the plans.

Texas Department of Transportation
Traffic Operations Division

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

PM(3)-12

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REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
5-00 2-12	CONT	SECT	JOB	HIGHWAY
8-00				Sunf.
3-03 2-10	DIST	COUNTY		SHEET NO.
		HIDALGO		66

22C

DATE:
FILE:

SITE DESCRIPTION

PROJECT LIMITS: *Sunflower Rd.: FROM SH 107 to 0.2 MI. NORTH OF SH 107*

PROJECT SITE MAPS:

•Project Location Map: Title Sheet and Project Layout Sheet
•Approx. Slopes Anticipated After Major Gradings and Areas of Soil Distrubance: Typ Section Sheet
•Major Controls and Locations of Stabilization Practices: SW3P Layout Sheet
•Project Specific Locations: To be specified in the Project SW3P File and held by the County
•Surface Waters and Discharge Locations: Utility and Drainage Layout Sheets

PROJECT DESCRIPTION:
Widening of a non-freeway facility consisting of grading, compacting subgrade, lime treated flexible base, asph. conc. pvmt, storm sewer, signing, delineation, and pavement markings.

MAJOR SOIL DISTURBING ACTIVITIES:
Soil disturbing activities will include preparing the right-of-way; excavation and embankment for the roadway; installation of proposed storm sewer system; and establishment of final seeding.

Disturbed areas on which construction activity has ceased (temporarily or permanently) shall be stabilized within 14 days unless activities are scheduled to resume and do whithin 21 days. Final seeding should be accomplished on all areas as soon as construction stage is complete.

TOTAL PROJECT AREA: *1.54 Acres*

TOTAL AREA TO BE DISTURBED: *1.54 Acres (100%)*

WEIGHTED RUNOFF COEFFICIENT:
Before Construction = 0.18
After Construction = 0.20

EXISTING CONDITION OF SOIL & VEGETATIVE *Existing soil conditions are:*
Hidalgo Sandy Clay Loam; soil characteristics include moderately deep, moderately well drained, moderate permeability. Used mostly as livestock grazing and wildlife habitat with a few areas farmed.

NAME OF RECEIVING WATERS:
All runoff drains into an existing storm sewer system which goes into Hidalgo County's existing detention pond which is released at a controlled rate by the county.

ENDANGERED SPECIES, DESIGNATED CRITICAL HABITAT AND HISTORICAL PROPERTY:
No designated Critical Habitat or Historic Properties have been found on this project site.
No Impacts to T&E species is anticipated.

The documentation satisfying TPDES Construction General Permit eligibility pertaining to the existence or of any protective action taken with regards to endangered species or designated critical habitat or historical property in this project area is contained in the project's Phase I Environmental Site Assessment and can be vewed at the address shown below:

HIDALGO COUNTY PRECINCT #4
1051 N. DOOLITTLE RD.
EDINBURG, TX 78542

PHONE: 956-383-3112

EROSION AND SEDIMENT CONTROLS

SOIL STABILIZATION PRACTICES: (Select T = Temporary or P = Permanent, as applicable)

- ___ TEMPORARY SEEDING
- ___ MULCHING (Hay or Straw)
- ___ BUFFER ZONES
- ___ PLANTING
- P SEEDING
- ___ SODDING
- ___ OTHER: (Specify Practice)
- ___ PRESERVATION OF NATURAL RESOURCES
- ___ FLEXIBLE CHANNEL LINER
- ___ RIGID CHANNEL LINER
- ___ SOIL RETENTION BLANKET
- ___ COMPOST MANUFACTURED COMPOST
- T BIODEGRADABLE EROSION CONTROL SOCKS

STRUCTURAL PRACTICES: (Select T = Temporary or P = Permanent, as applicable)

- ___ SILT FENCES
- T BIODEGRADABLE EROSION CONTROL SOCKS
- ___ HAY BALES
- ___ ROCK FILTER DAMS
- ___ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- ___ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- ___ DIVERSION DIKE AND SWALE COMBINATIONS
- ___ PIPE SLOPE DRAINS
- ___ PAVED FLUMES
- ___ ROCK BEDDING AT CONSTRUCTION EXIT
- T TIMBER MATTING AT CONSTRUCTION EXIT
- ___ CHANNEL LINERS
- ___ SEDIMENT TRAPS
- ___ SEDIMENT BASINS
- T STORM INLET SEDIMENT TRAP
- ___ STONE OUTLET STRUCTURES
- ___ CURBS AND GUTTERS
- P STORM SEWERS
- ___ VELOCITY CONTROL DEVICES
- ___ OTHER: (Specify Practice)

STORM WATER MANAGEMENT:
Storm water drainage will be provided by roadside ditches draining a proposed storm drain system outfalling into a Hidalgo County detention pond.

STORM WATER MANAGEMENT ACTIVITIES: (Sequence of Construction)

The order of activities will be as follows:
1.- Install perimeter controls, clear R.O.W. where construction will take place.
2. Install proposed inlets, pipes, and install biodegradable erosion control logs along project.
3. Construct proposed roadway as shown on TCP, Plan and Profile sheets, and proposed typical sections
4. Once all construction activity is complete, permanent seeding on proposed areas shall be done according to plans or as instructed by the engineer.

NON-STORM WATER MANAGEMENT DISCHARGES:
Non-storm water discharges should be filtered, or held in retention basins, before being allowed to mix with storm water. These discharges consist of non-polluted ground water, spring water, foundation and/or footing drain water; and water used for dust control, pavement washing and vehicle wastewater containing no detergents.

OTHER REQUIREMENTS & PRACTICES

OTHER EROSION AND SEDIMENT CONTROLS:

MAINTENANCE: *All erosion and sediment controls will be maintained in good working order. If a repair is necessary, it will be done at the earliest date possible, but no later than 7 calendar days after the surrounding exposed ground has dried sufficiently to prevent further damage from heavy equipment. The areas adjacent to creeks and drainage ways shall have priority followed by devices protecting storm sewer inlets.*

INSPECTION: *An Inspection will be performed by a County Representative every 14 calendar days as well as after every half inch or more of rain (as recorded on a non-freezing rain guage to be located at the Project Site). An Inspection and Maintenance Report will be made per each Inspection. Based on the inspection results, the controls shall be revised per the inspection report.*

WASTE MATERIALS: *All waste materials will be collected and stored in a securely lidded metal dumpster. The dumpster will meet all state and local solid waste management regulations. All trash and construction debris from the site will be deposited in the dumpster. The dumpster will be emptied as necessary or as required by local regulation and the trash will be hauled to a local dump. No construction waste material will be buried on site.*

HAZARDOUS WASTE (INCLUDING SPILL REPORTING): *At a minimum, any products in the following categories to be hazardous: Paints, Acids for cleaning masonry surfaces, Cleaning Solvents, Asphalt products, Chemical additives for soil stabilization, or Concrete curing compounds and additives. In the event of a spill which may be hazardous, the spill Coordinator should be contacted immediately. Emptying of excess concrete should not be allowed on site. Likewise, washout of concrete trucks should not be performed on site. These discharges are considered non-allowable non-storm water discharges. Concrete trucks should never be allowed to dump into storm drains or sanitary sewers.*

SANITARY WASTE: *All sanitary waste will be collected from the portable units as necessary or as required by local regulation by a licensed sanitary waste management contractor.*

OFFSITE VEHICLE TRACKING: *The Contractor shall be required, on a regular basis or as may be directed by the Engineer, to dampen haul roads for dust control, stabilize construction entrances and to remove excess dirt from the roadway.*

MANAGEMENT PRACTICES:
1. Disposal areas, stockpiles, and haul roads shall be constructed in a manner that will minimize and control the amount of sediment that may enter receiving waters. Disposal areas shall not be located in any wet land, water body or stream bed.
2. Construction staging areas and vehicle maintenance areas shall be constructed by the Contractor in a manner to minimize the runoff of pollutants.
3. All waterways shall be cleared, as soon as practical, of temporary embankment, temporary bridges, matting, false work, piling, or debris or other obstructions placed during construction operations that are not a part of the finished work.
4. This plan is a working document, and must be kept current in order to comply with EPA standards.

OTHER:
1. Construction materials stored on site to be provided by Project Field Office.
2. The project SW3P File located at the county office shall contain the N.O.I., CGP Coverage Notice, EPA NPDES Form, Signature Authorization, Certification/Qualification Statements, Inspection Reports, Required Maps, and the NPDES Permit, Part II.

STATE OF TEXAS
JULIO CESAR CERDA
90524
LICENSED PROFESSIONAL ENGINEER

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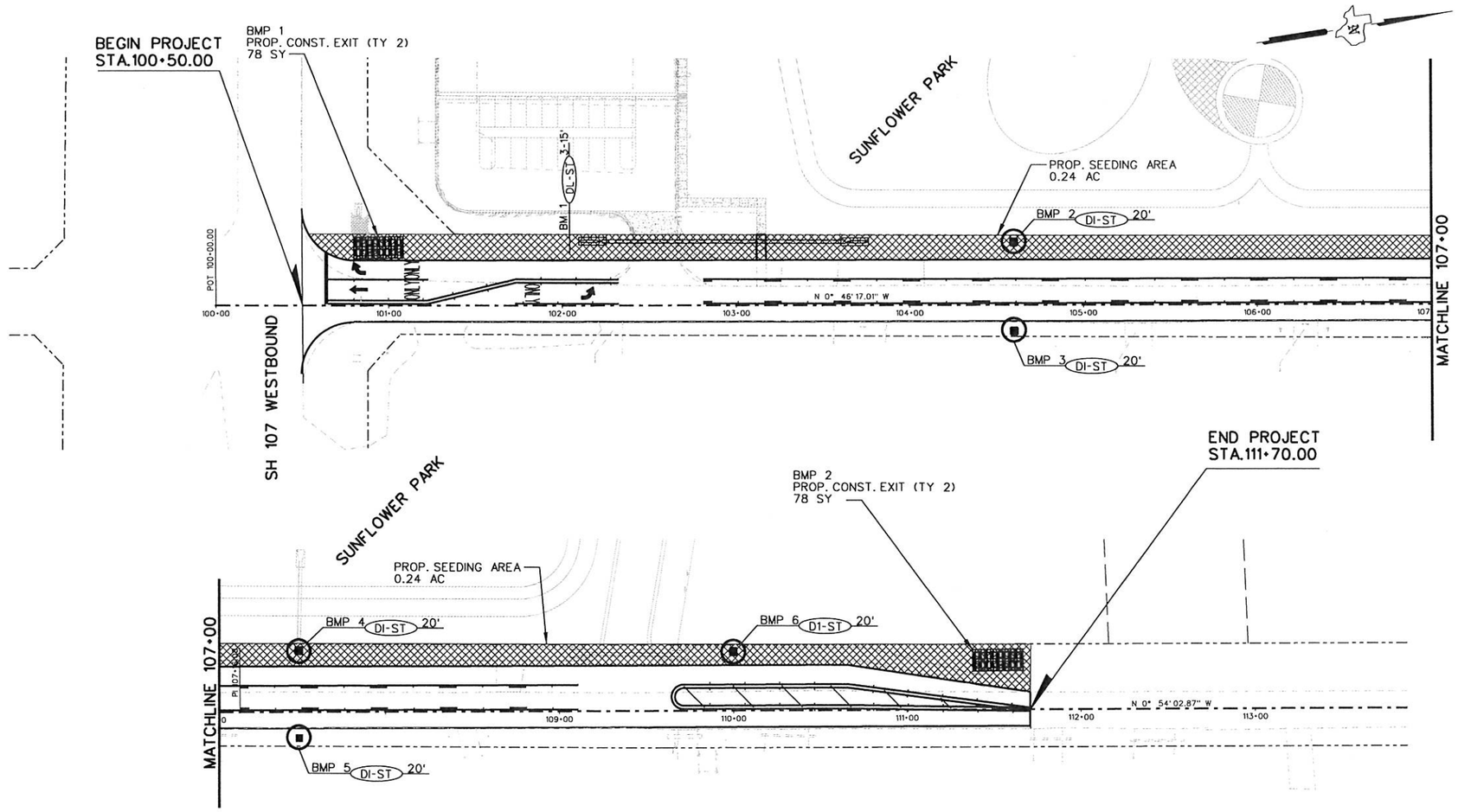
Texas Department of Transportation

TxDOT STORM WATER POLLUTION PREVENTION PLAN (SW3P)

REV. 2-20-14 SW3P.DGN

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			67A
STATE	DIST.	COUNTY	
TEXAS	PHARR	HIDALGO	
CONT.	SECT.	JOB	HIGHWAY NO.
-	-	-	SUNFLOWER

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1/27/2017



SHEET SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
164	CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	AC	0.36
166	FERTILIZER (NON-PAY)	TON	180
168	VEGETATIVE WATERING	MG	55
506	BIOGRD EROSN CONT LOGS (12" DIA) INSTALL	LF	145
506	BIOGRD EROSN CONT LOGS REMOVE	LF	145
506	CONSTRUCTION EXITS (INSTALL)(TY 2)	SY	156
506	CONSTRUCTION EXITS (REMOVE)	SY	156

LEGEND

- PROP. CONSTRUCTION EXIT (TY 2)
- BMPX (CI-ST) XX' — PROP. CURB INLET SEDIMENT TRAP ID AND LENGTH
- BMPX (DI-ST) XX' — PROP. DROP INLET SEDIMENT TRAP ID AND LENGTH (LF)
- BMPX (DL-ST) XX' — PROP. DITCH LINE SEDIMENT TRAP (LOG) ID AND LENGTH (LF)
- BMPX (RFD1) XX' — PROP. ROCK FILTER DAM (TYPE 1) ID AND LENGTH (LF)
- PROP. SEEDING AREA

I.D.	TCP PHASE INSTALLED	DATE INSTALLED	DATE REMOVED
BMP 1	1		
BMP 2	1		
BMP 3	1		
BMP 4	1		
BMP 5	1		
BMP 6	1		

NOTES:
1. EROSION CONTROL DEVICES MAY BE MODIFIED TO MEET FIELD CONDITIONS OR AS DIRECTED BY THE PROJECT ENGINEER
2. DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITY HAS CEASED, TEMPORARILY OR PERMANENTLY, SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITIES ARE SCHEDULED TO RESUME, AND DO, WITHIN 21 DAYS.
3. FERTILIZER IS NON-PAY. SUBSIDIARY TO SEEDING (ITEM 164). APPLICATION RATE = 500 LBS/AC
4. VEGETATIVE WATERING APPLICATION RATE = 3394 GAL/AC @ 45 CYCLES
5. PERMANENT SEEDING TO BE DONE AFTER ALL ROADWAY CONSTRUCTION IS COMPLETED.
6. FRONT END LOADER WORK RATE = 0.5 HR/INLET

STATE OF TEXAS
JULIO CESAR CERDA
90524
LICENSED PROFESSIONAL ENGINEER

SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER ROAD SW3P LAYOUT

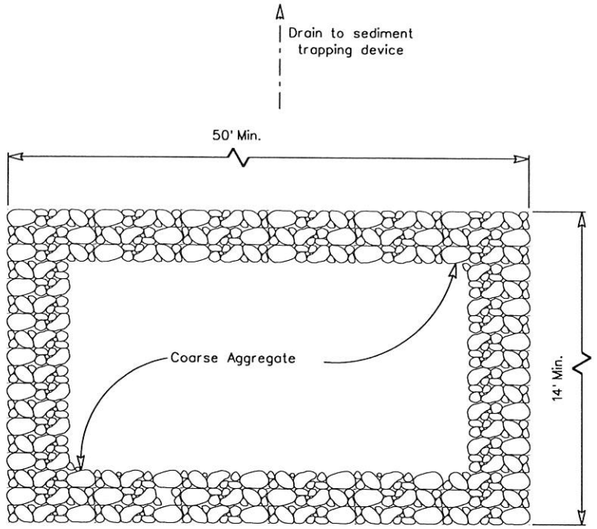
SCALE: 1" = 300' SHEET 1 OF 1

DRAWING:		FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK:		6	TEXAS					Sunf.
ENGINEER:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK:		PHR	HIDALGO					67B
REVIEW:								
CK:								

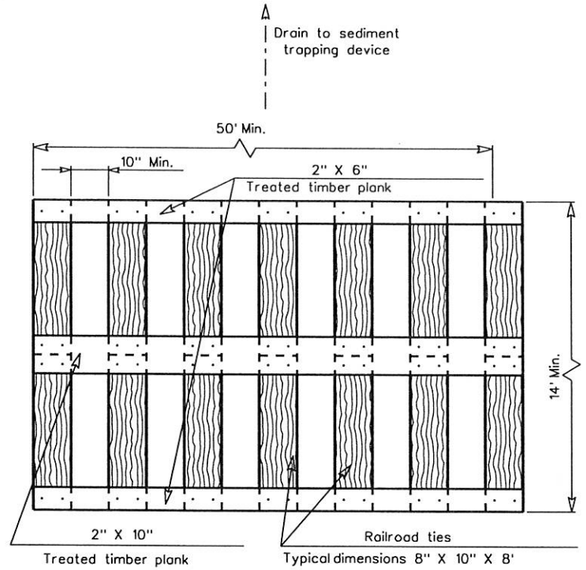
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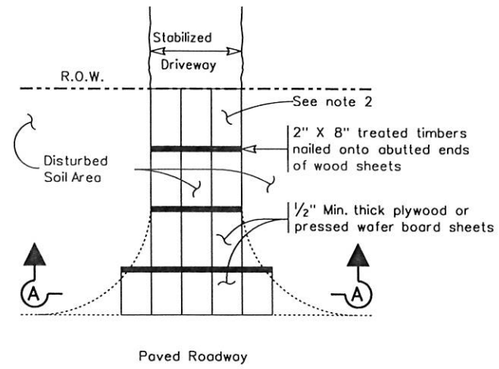
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FILE:



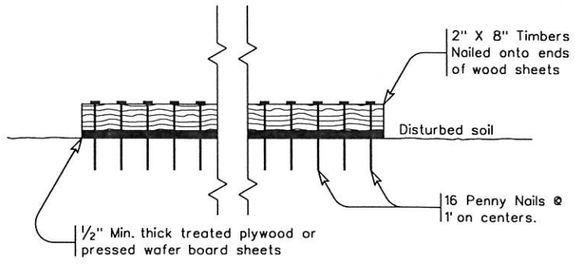
PLAN



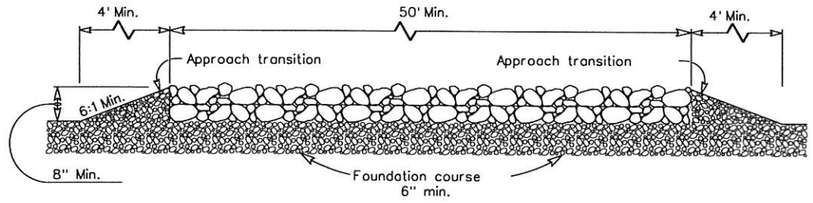
PLAN



PLAN



SECTION A-A

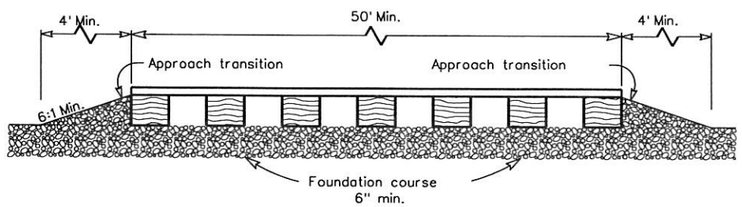


PROFILE

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 aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.



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 than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

CONSTRUCTION EXIT (TYPE 3)

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

Texas Department of Transportation
Design Division Standard

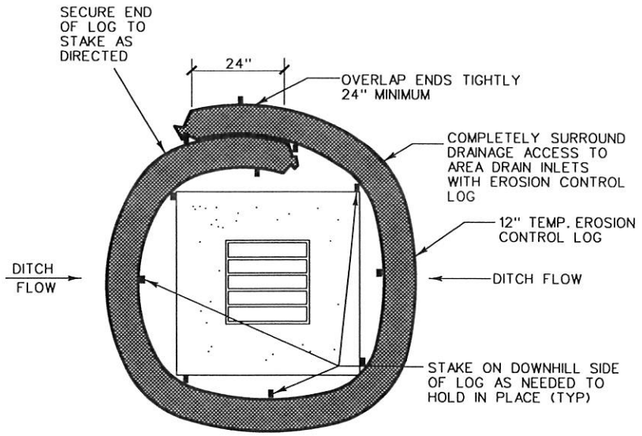
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-93

FILE: ec393.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT June 1993	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.
		HIDALGO		68

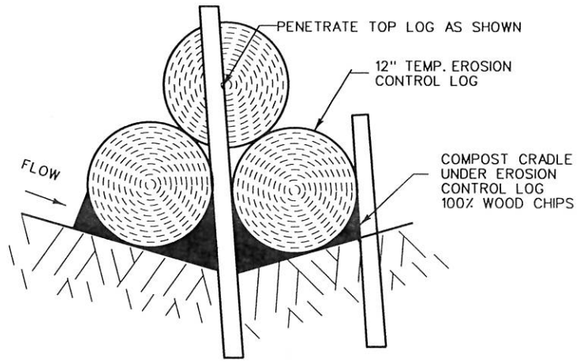
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DROP INLET SEDIMENT TRAP

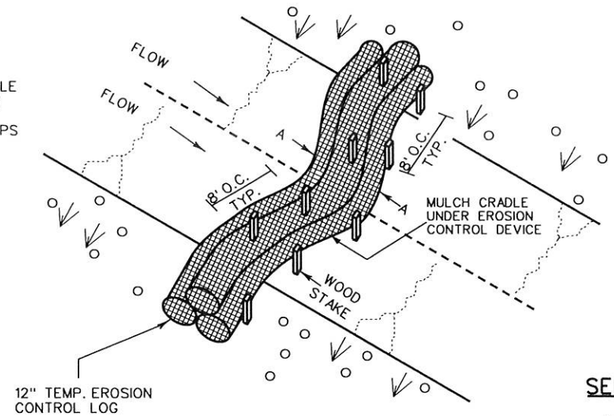
NTS

DI-ST



DITCH LINE SEDIMENT TRAP A-A

DL-ST



DITCH LINE SEDIMENT TRAP

DL-ST

PLANS SHEET LEGEND

DI-ST — DROP INLET SEDIMENT TRAP

DL-ST — DITCH LINE SEDIMENT TRAP

BOCI-ST — BACK OF CURB INLET SEDIMENT TRAP

ROW-ST — RIGHT OF WAY SEDIMENT TRAP

CI-ST — CURB INLET SEDIMENT TRAP

SEDIMENT BASIN & TRAP USAGE GUIDELINES

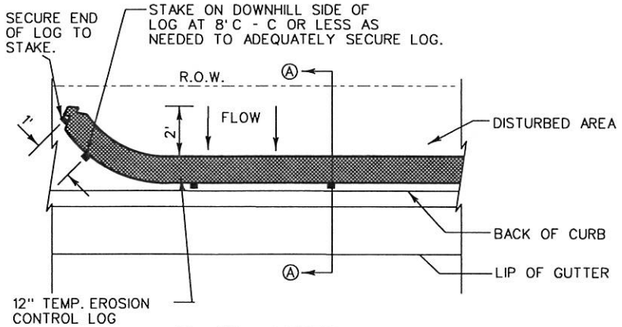
A sediment trap may be used to precipitate sediment out of runoff draining from an unstabilized area.

Traps: the drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Sediment traps should be placed in the following locations:

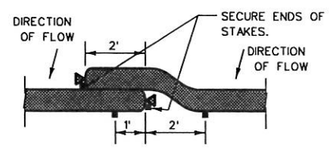
1. Immediately preceding drain inlets
2. Just before the drainage enters a water course
3. Just before the drainage leaves the right of way
4. Just before the drainage leaves the construction limits where drainage flows away from the project

The trap should be cleaned when the capacity has been reduced by ½ or the sediment has accumulated to a depth of 1', whichever is less.
Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for seperately.



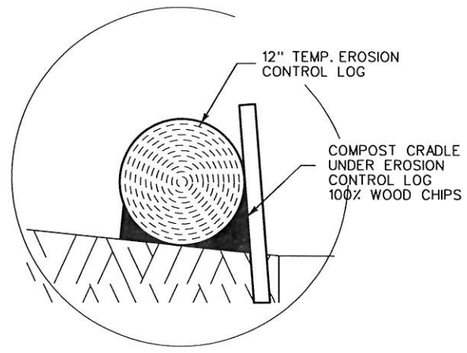
PLAN VIEW

NTS

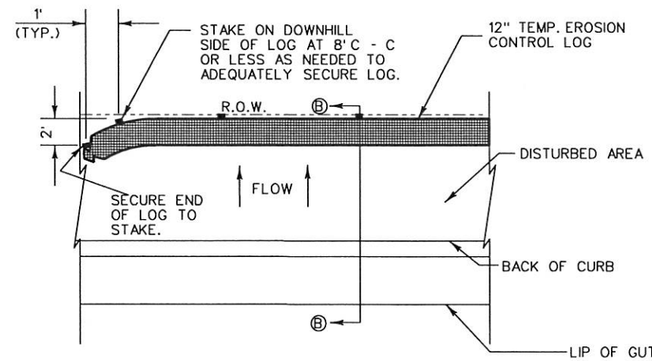


LAP DETAIL

NTS



COMPOST CRADLE

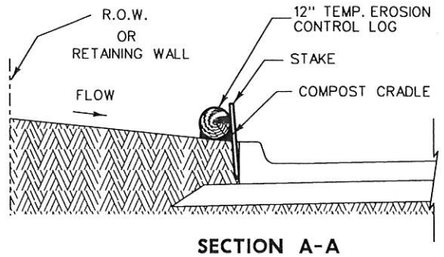


PLAN VIEW

NTS

GENERAL NOTES

1. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED. MAXIMUM LENGTH OF LOGS SHALL BE 30' FOR 12" DIAMETER LOGS.
2. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
3. STUFF LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE DENSITY THAT WILL HOLD SHAPE WITHOUT EXCESSIVE DEFORMATION.
4. STAKES SHALL BE 2" X 2" WOOD 4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG.
5. COMPOST CRADLE MATERIAL IS INCIDENTAL AND WILL NOT BE PAID FOR SEPARATELY.

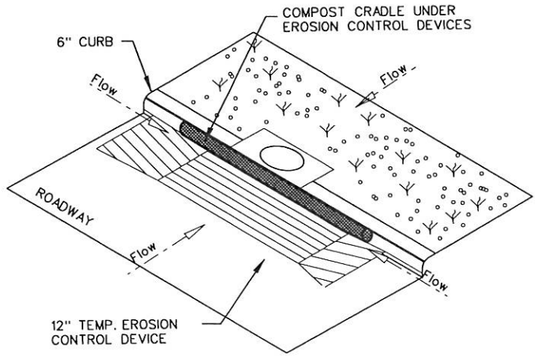


SECTION A-A

BACK OF CURB INLET SEDIMENT TRAP

NTS

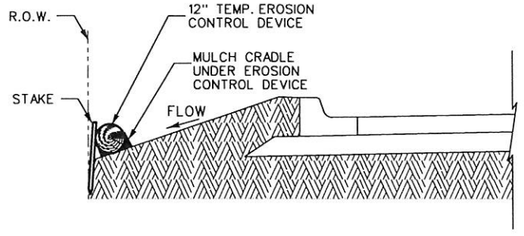
BOCI-ST



CURB INLET SEDIMENT TRAP

NTS

CI-ST



SECTION B-B

RIGHT-OF-WAY SEDIMENT TRAP

NTS

ROW-ST

PHARR DISTRICT STANDARD

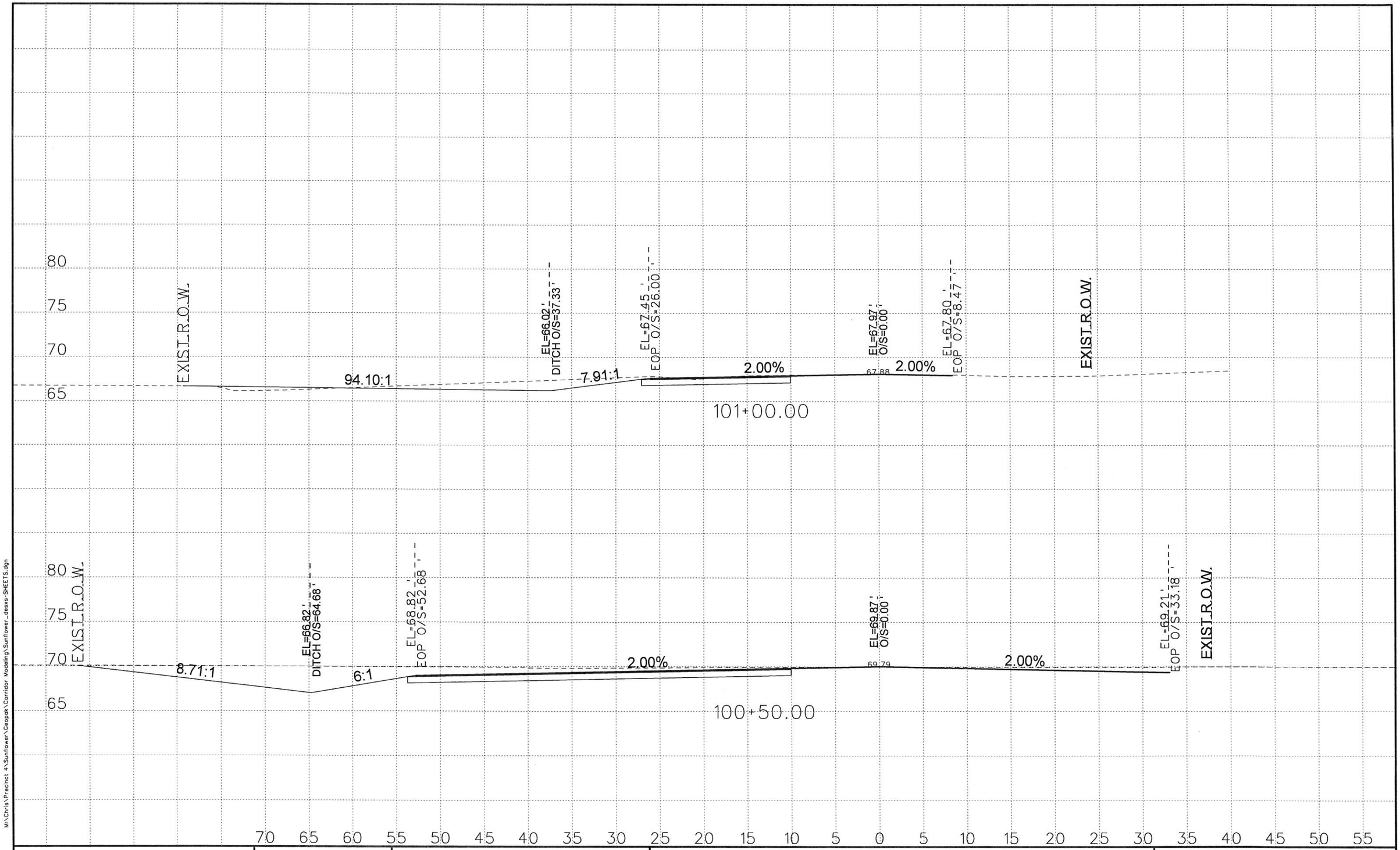
Texas Department of Transportation

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TEMPORARY EROSION CONTROL LOGS
TECL-06 (PHR)

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© TxDOT June 1993	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.
				69

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



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P4

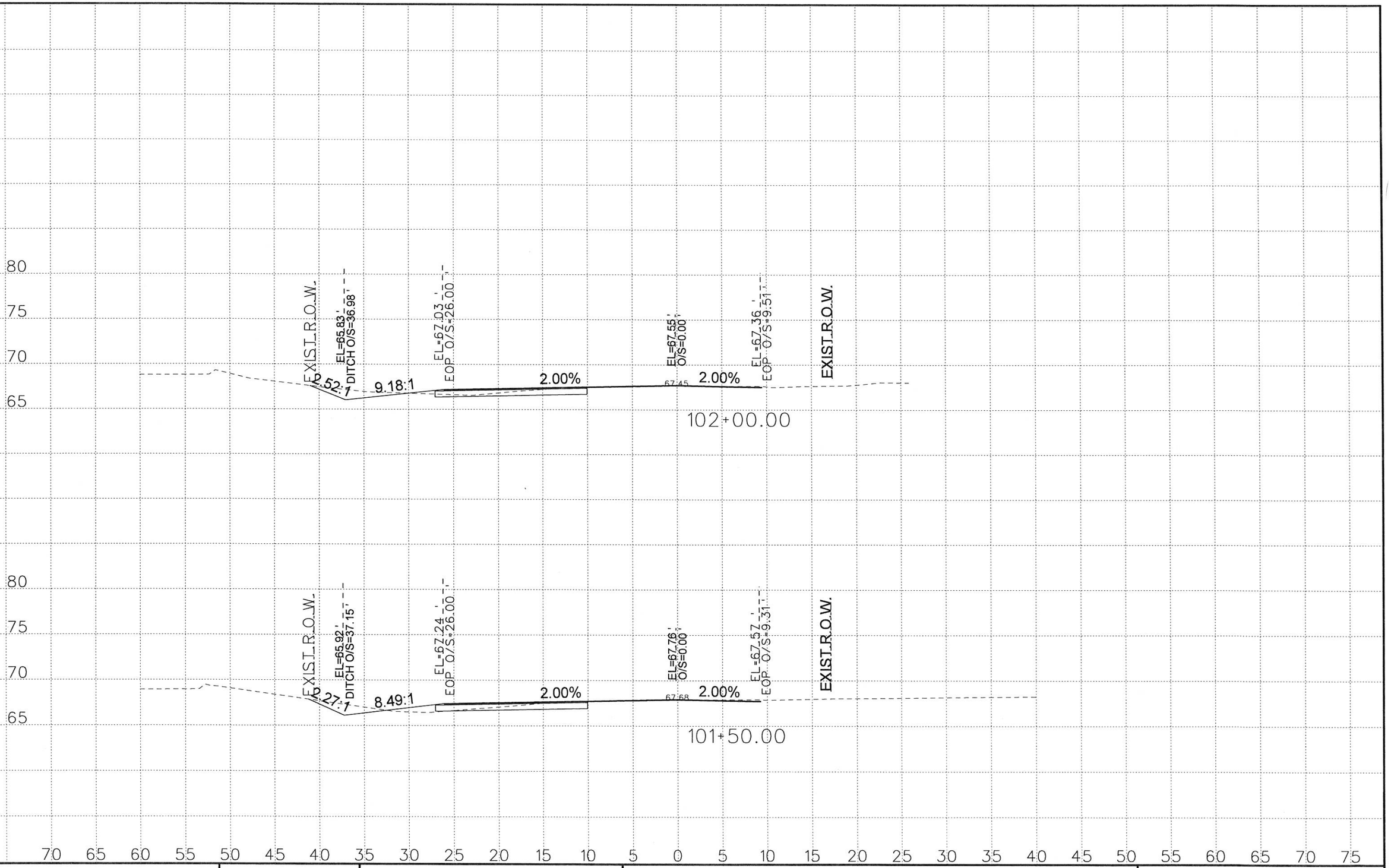
SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER CROSS SECTIONS

DESIGN
CROSS SECTIONS

SCALE: 1" = 10'

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CK DN:		6	TEXAS					
DW:		STATE DIST. NO	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.	
CK DW:		PHR	HIDALGO					
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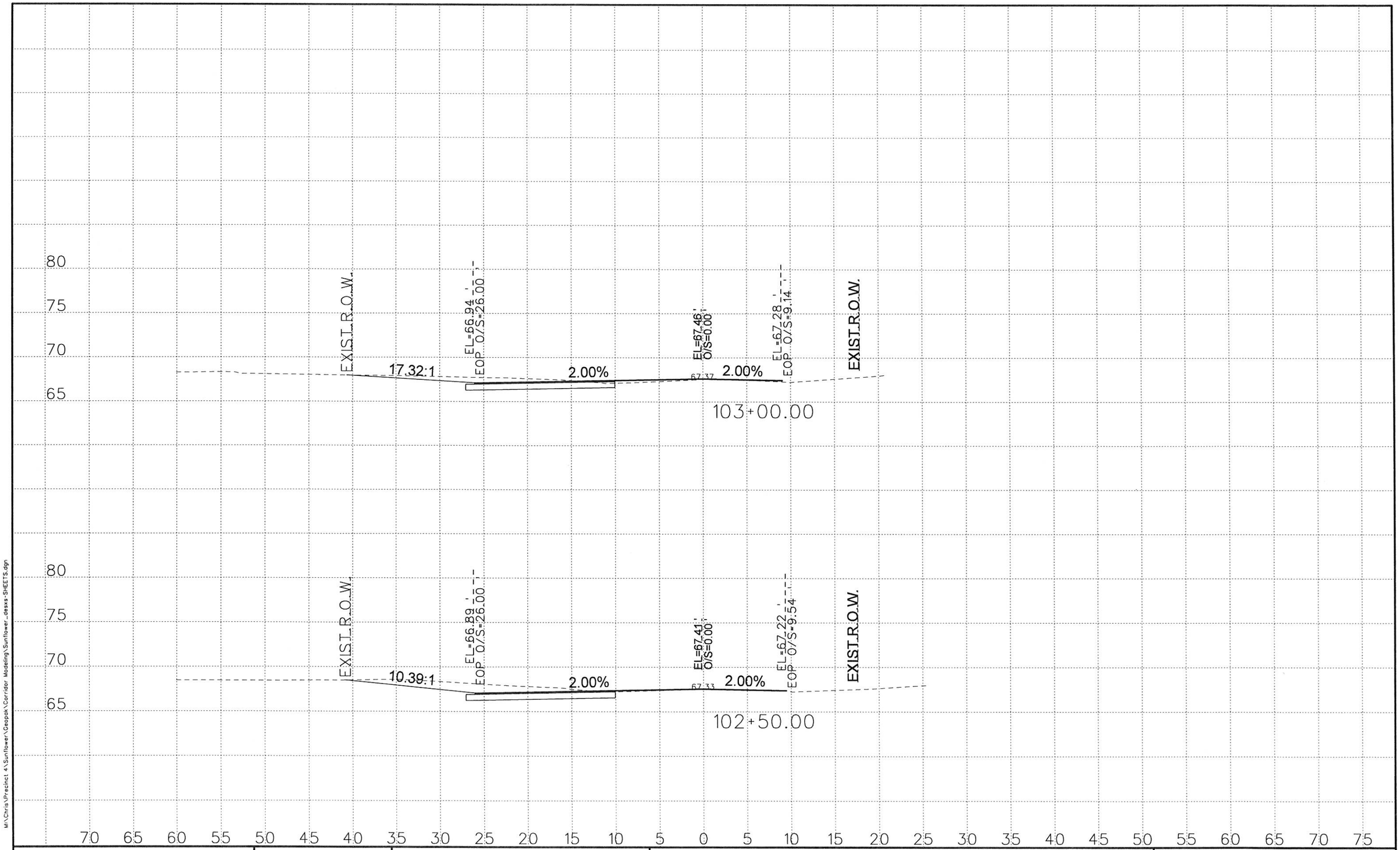
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SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER CROSS SECTIONS

DESIGN
CROSS SECTIONS
SCALE: 1" = 10'

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CK DW:		PHR	HIDALGO					
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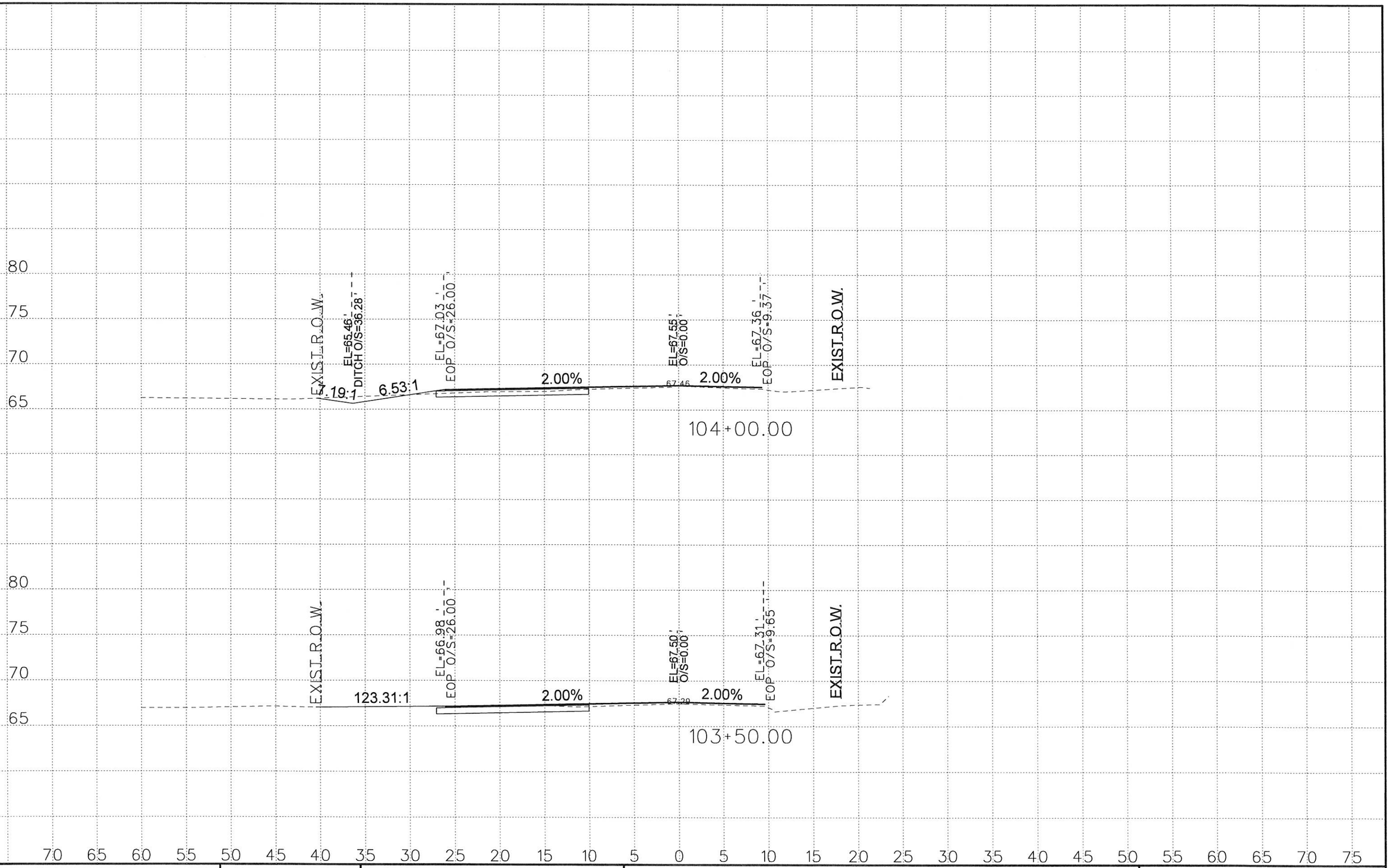
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SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER CROSS SECTIONS

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CROSS SECTIONS
SCALE: 1" = 10'

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CK DW:		PHR	HIDALGO				
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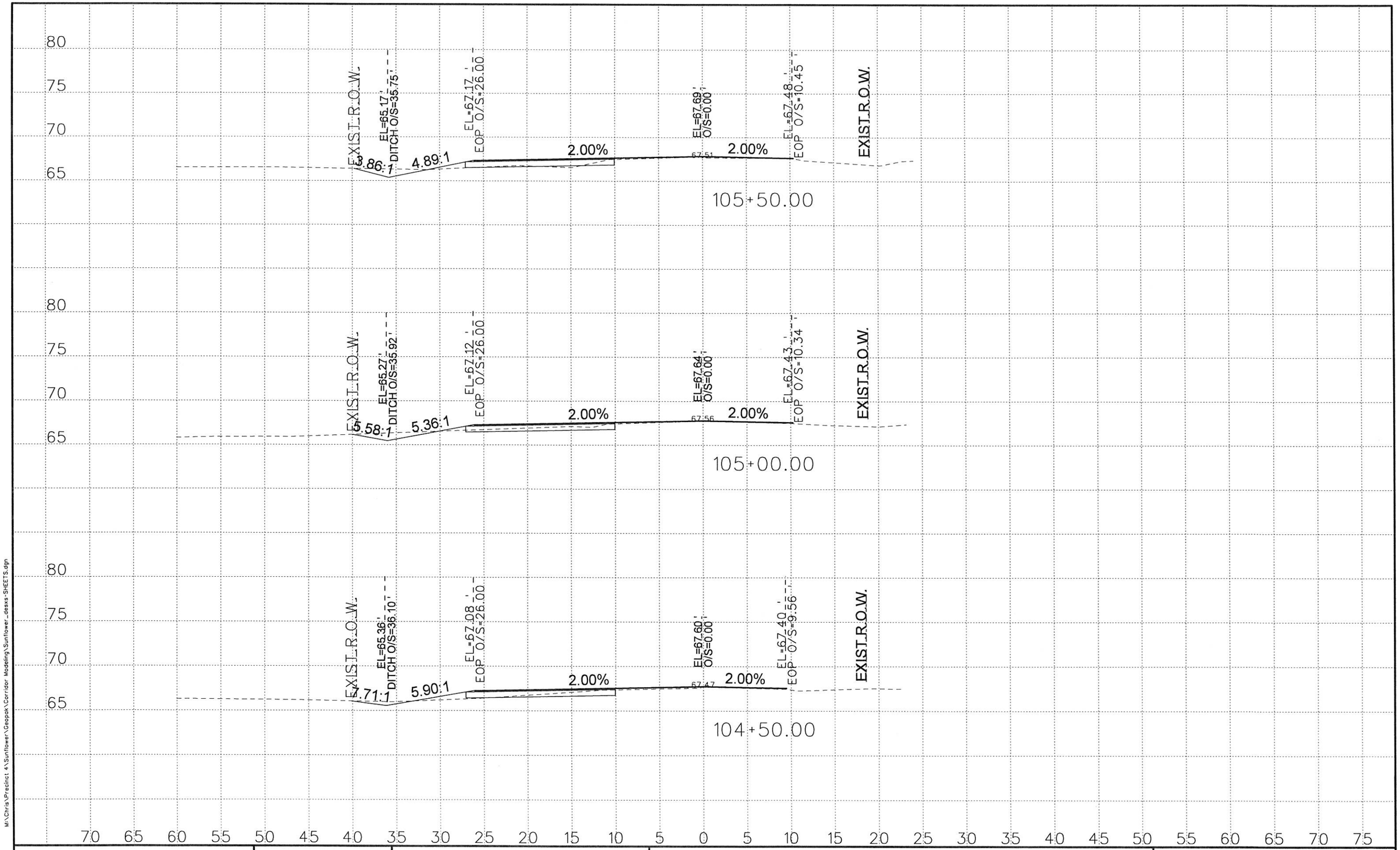
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SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER CROSS SECTIONS

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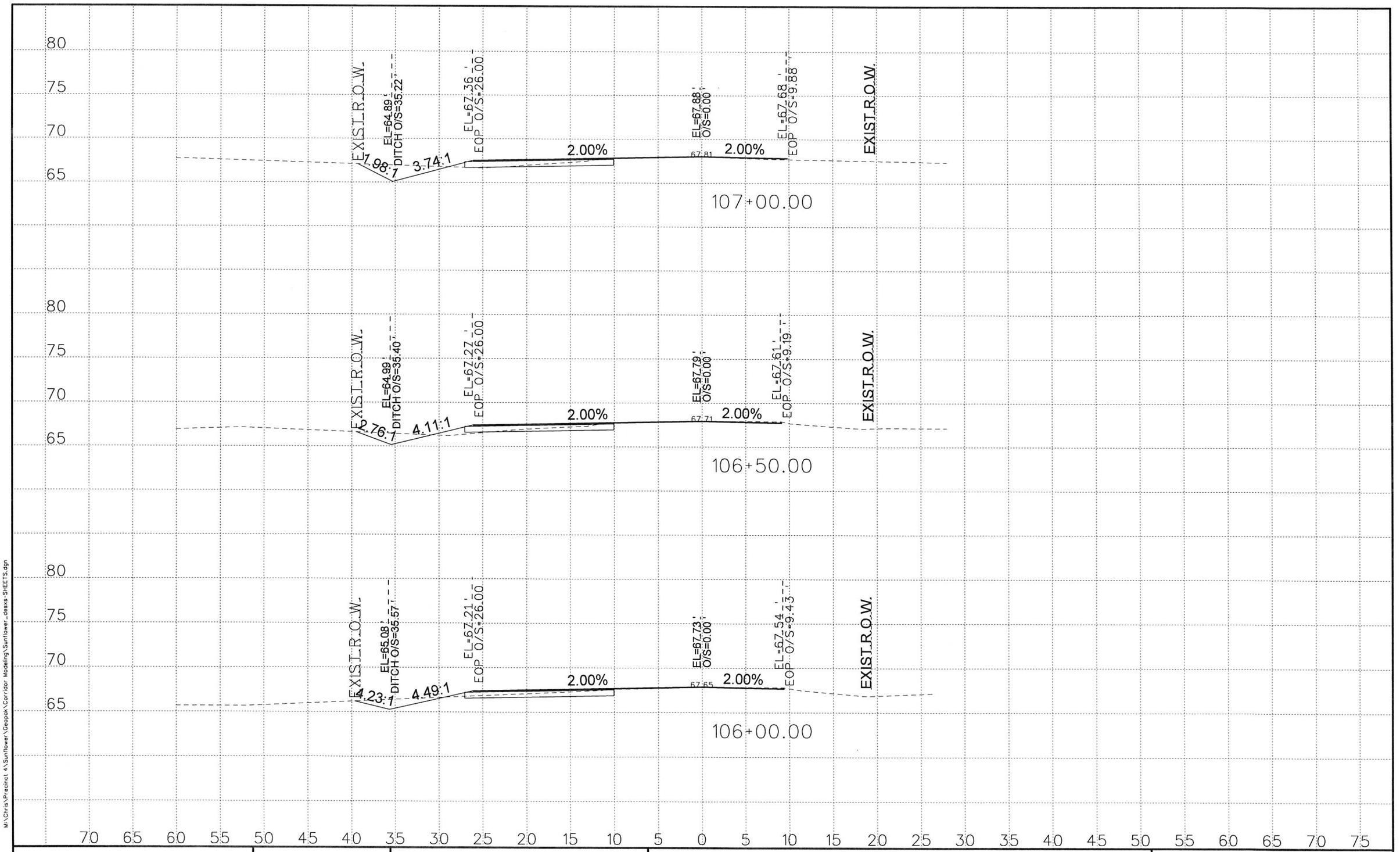
SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER CROSS SECTIONS

DESIGN CROSS SECTIONS

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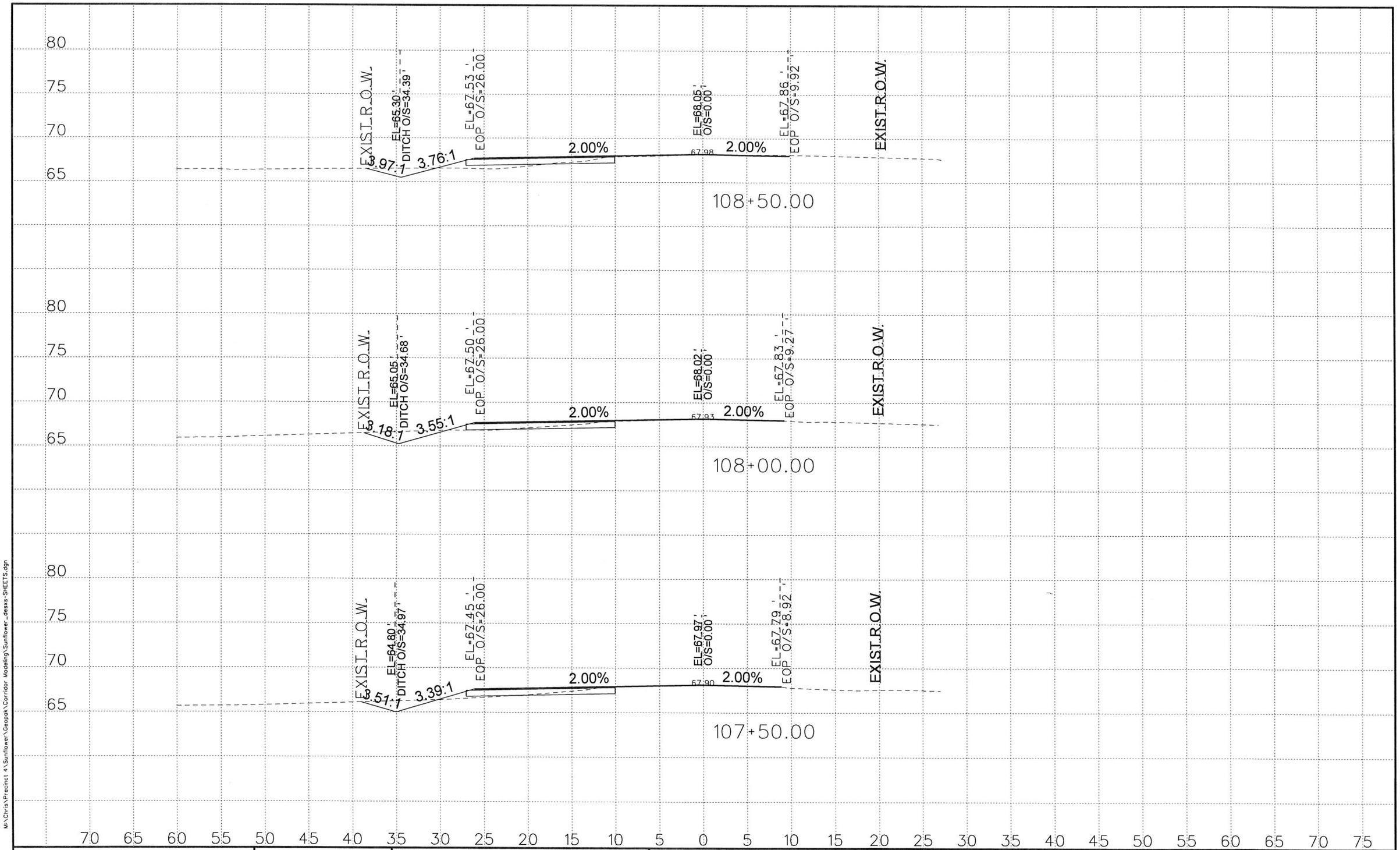
SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER CROSS SECTIONS

DESIGN
CROSS SECTIONS

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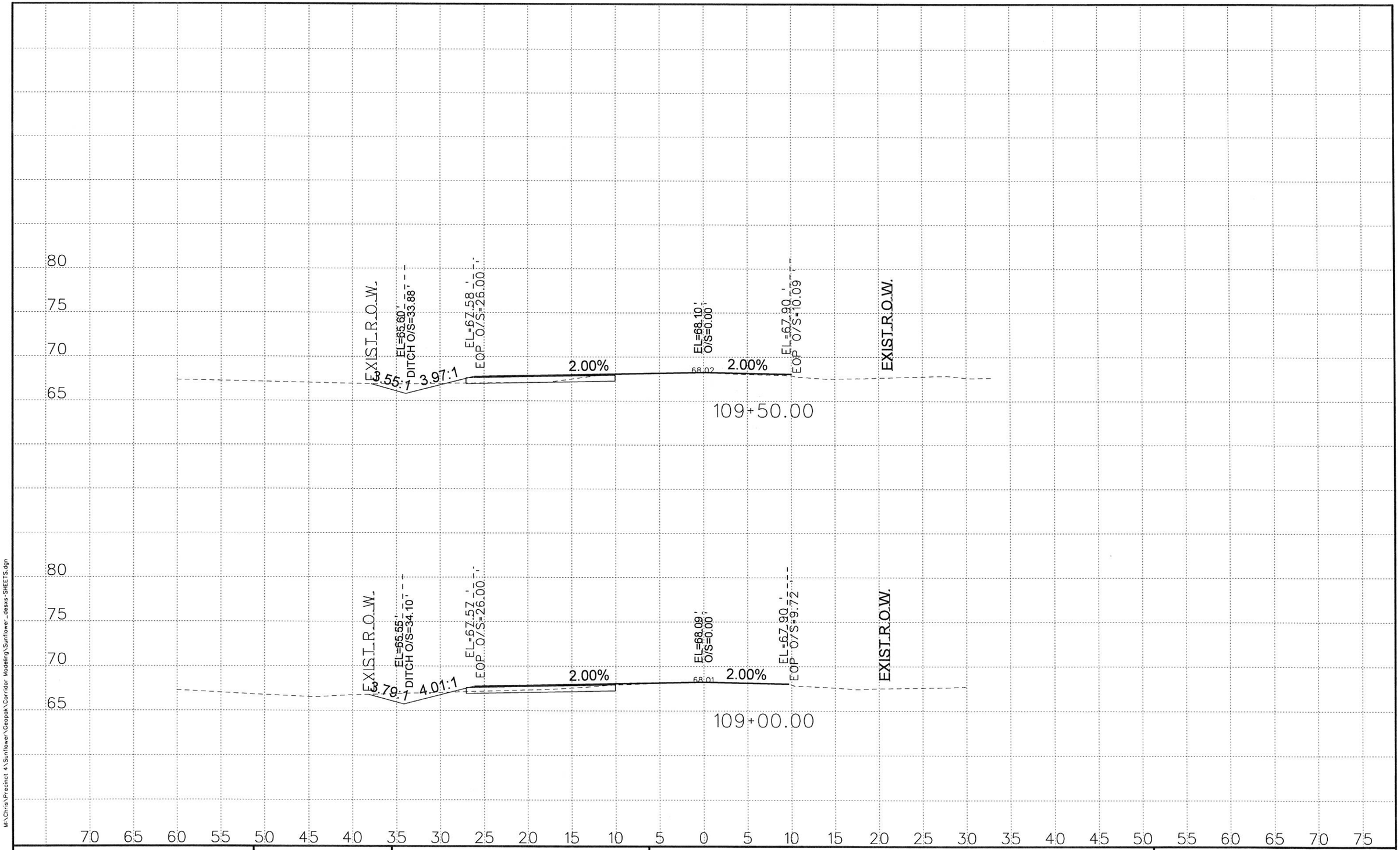
SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER CROSS SECTIONS

DESIGN CROSS SECTIONS

SCALE: 1" = 10'

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CK DW:		PHR	HIDALGO					
TR:								
CK TR:								



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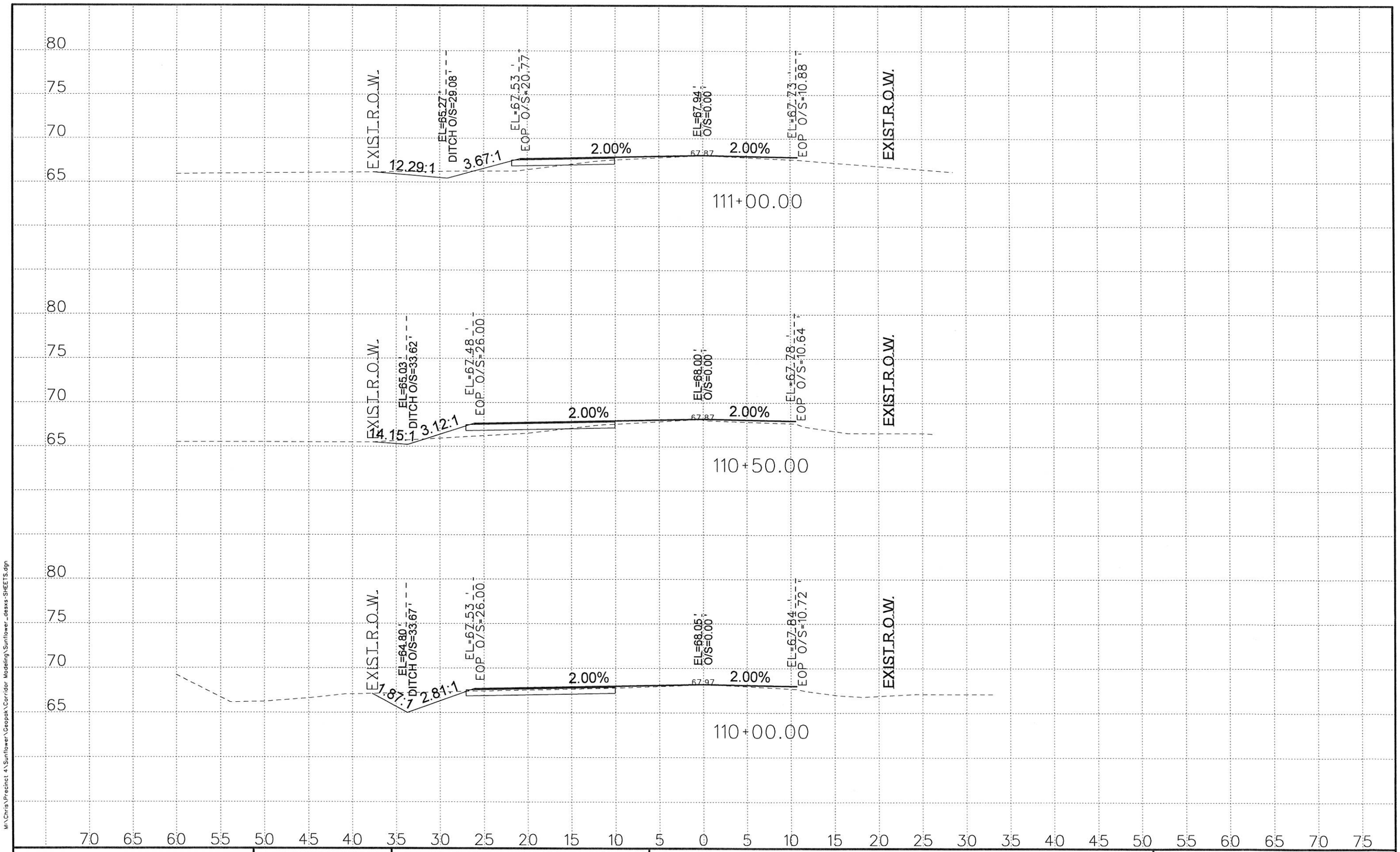
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SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER CROSS SECTIONS

DESIGN
CROSS SECTIONS
SCALE: 1" = 10'

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DW:		STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	HIGHWAY NO.
CK DW:		PHR	HIDALGO				
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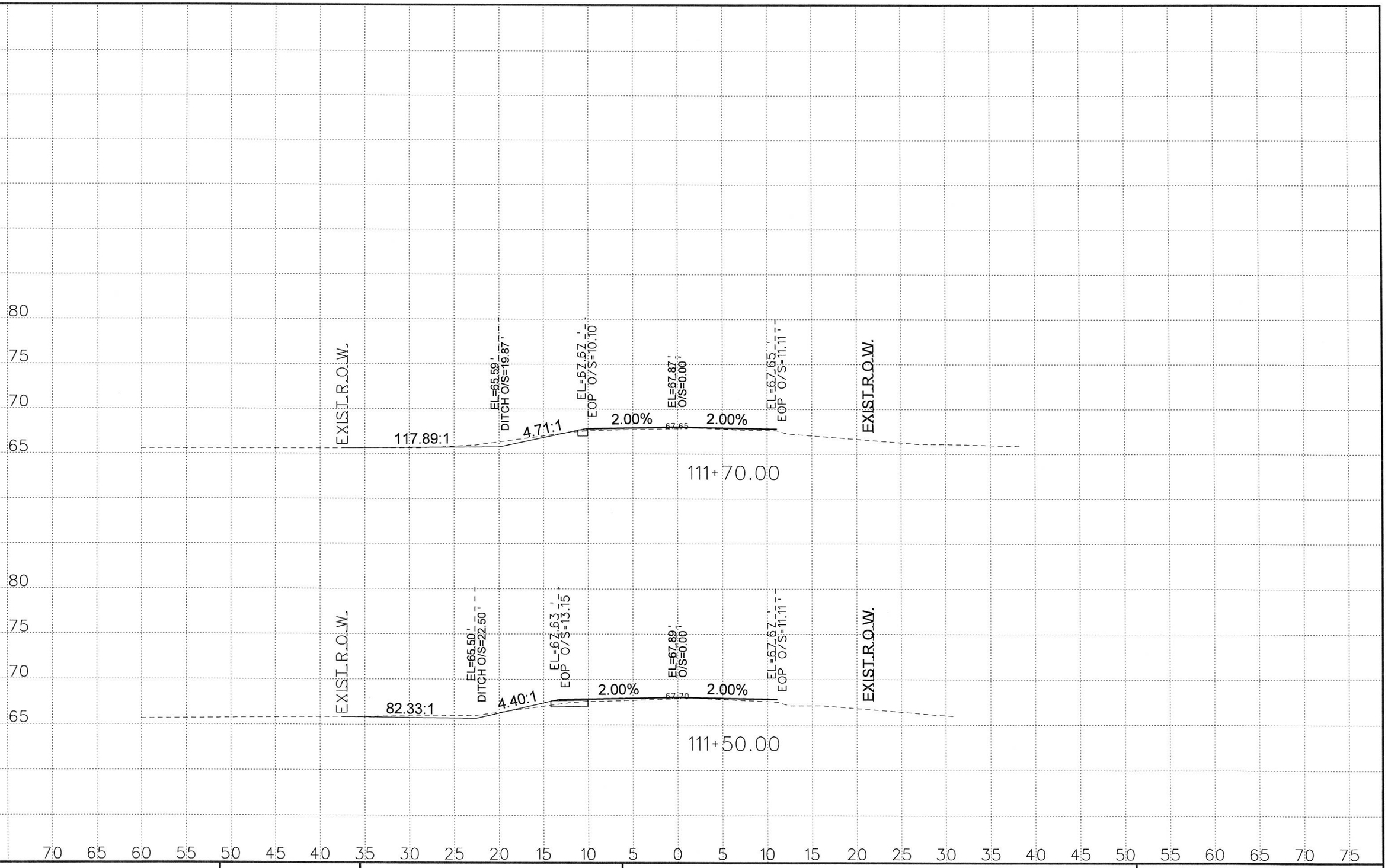
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SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER CROSS SECTIONS

DESIGN
CROSS SECTIONS
SCALE: 1" = 10'

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



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1/27/2017

P4

SOUTH TEXAS INFRASTRUCTURE GROUP

SUNFLOWER CROSS SECTIONS

DESIGN
CROSS SECTIONS

SCALE: 1" = 10'

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